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Independent Evaluation of SDC's Engagement in Climate Change Adaptation and Mitigation 2015 – 2020

Annexe 13
Evidence from the Design and Performance Study
(Volume 2)

Commissioned by the Evaluation and Corporate Controlling Division
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Annex 13.1: Seed Projects in Africa

Project highlights.

7F-03316: **SADC Southern African Development Community - Seeds (SSSN 2)**. Entry point for the seed and small-farming initiative, the whole of which was oriented to promoting resilience to climate change and other stresses among small farmers in rain-fed farming systems.

7F-00404: **Maize initiative in Southern Africa (NSIMA)**. The SDC seed and small-farming initiative promoted new traits and varieties which were both context specific and robust to environmental change, with the aim of greater food security for small farmers. Most maize seeds now on the market in the region (Zambia, Zimbabwe, Malawi, parts of South Africa, Mozambique, Lesotho and Eswatini) were produced under NSIMA.

7F-08780: Strengthening Agrobiodiversity in Southern Africa (SASA). Implemented by the African Centre for Biodiversity; promoted policies favouring small farmers by ensuring their representation, opening policy spaces for seed diversity and agroecology through farmer-managed seed systems, farm input subsidy programmes and networks across the SADC region to build capacity, awareness and confidence in agroecological farming.

7F-08781: **Seed and Knowledge Initiative (SKI)**. Implemented by Biowatch in consortium with other African NGOs; promotes informal seed systems and improving those preferred by farmers through agroecological farming, an approach to sustainable and restorative farming that marries traditional land husbandry with the introduction at community level [1] of modern ecological understanding and new techniques and crop mixtures.

7F-01324: **Beans & Maize (PABRA)**. The Pan Africa Bean Research Alliance brought beans, micronutrient fortification and nitrogen fixation to the seed and small-farming initiative, supporting crop diversification and improved productivity and nutrition, with a strong emphasis on promoting gender equity. System-wide strengthening effects at community level, and at continental scale by way of replication and amplification through policy influence and partnerships.

7F-07646: **Strengthening Seed and Output Markets (SAMP)**. Demonstrated seed production models involving small farmers; provided a route for speeding their access to new varieties; improved their market access and links to outlets; improved household wellbeing and resilience through improved assess to loans, net income, diets, gender equity and financial literacy.

7F-10511: **Markets and Seeds Access Project in Zambia, Zimbabwe (MASAP)**. A continuation and extension to Zambia of 7F-07646 (SAMP) demonstrating seed production models involving small farmers, provides a route for speeding their access to new varieties, improves their market access and links to outlets, and improves household wellbeing and resilience.

Part A: Basic data

A1. Project number & name.

7F-03316 - SADC Southern African Development Community - Seeds. The SDC web-site and spreadsheet gives details of Phase 2 (2010-2014) and does not mention Phase 1 (2004-2010). Phase 1 was also known as **SADC Seed Security Network** (SSSN) or **SADC Harmonised Seed Regulatory System** (HSRS). Phase 2 was also known as **SADC Seed Security Network II** (SSSN 2) or **Harmonised Seed Security Project** (HaSSP). Like **7F-00404 - Maize initiative in Southern Africa** (also known as the **New Seed Initiative for Maize in Southern Africa**, NSIMA III, 2011-2015), it is outside the field of evaluation but the projects act as an entry point for several other seed-related projects in Southern Africa, particularly:

- **7F-08780 - Strengthening Agrobiodiversity in Southern Africa** (SASA, **earmarked collaboration** with the African Centre for Biodiversity or ACB, 2013-2016 and 2016-2023).
- **7F-08781 - Seed and Knowledge Initiative** (SKI, 2013-2019).
- **7F-01324 - Beans & Maize** (contributions to the Pan-Africa Bean Research Alliance or PABRA, 2012-2021, which as an **unearmarked contribution** appears to be outside the ToR but is examined for relevance).
- **7F-07646: Strengthening Seed and Output Markets in Zimbabwe, Lesotho and Swaziland** (also known as the **Seeds and Access to Markets Project**, SAMP, 2010-2021).
- **7F-10511 - Markets and Seeds Access Project** (MASAP, 2021-2025, which may be considered a continuation of SAMP but is too recent to be evaluated).

[1] The community or local level is understood to comprise small-scale societies in predominantly rural settlements and municipalities, or in urban settings the neighbourhood.

A2. Sources.

Process of PRF development: (a) a draft PRF was prepared by the core team using documents listed in the bibliography and with input by SDC interviewees; (b) the draft PRF was reviewed by the national consultant **Dominica Chingarande**, who conducted interviews listed in Annex 13.22; and (c) the PRF was revised by the core team in light of field findings. A Contribution Narrative covering all the African seed and small farmer projects plus 7F-07807 and 7F-08531 was presented at the evaluation's Core Learning Partnership meeting on 13 Dec 2021.

- **7F-03316 (SSSN 2/HaSSP)**: 2010-2014: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2004/7F03316/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html.
- **7F-00404 (NSIMA III)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/1996/7F00404/phase6?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **7F-08780 (SASA)**:
  - *Advocating for Agro-Biodiversity* (Jul 2013 to Aug 2016): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2013/7F08780/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
  - *Strengthening Agro-biodiversity in Southern Africa* (Sep 2016 to Aug 2019): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2013/7F08780/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html
  - *Strengthening Agro-biodiversity in Southern Africa* (SASA, Sep 2019 to Aug 2023): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2013/7F08780/phase3?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **7F-08781 (SKI)**: Seed and Knowledge Initiative (SKI, Aug 2013 to Feb 2019): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2013/7F08781/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **7F-01324 (PABRA)**:
  - *Regional Research Beans & Maize East Africa* (Jan 2012 to Dec 2014): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/1983/7F01324/phase12?oldPagePath=/content/deza/en/home/projekte/projekte.html
  - *Contribution to the Pan African Bean Research Alliance PABRA* (Jan 2015 to Dec 2021): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/1983/7F01324/phase13?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **7F-07646 (SAMP)**:
  - *Strengthening Seed and Output Markets* (Jul 2010 to Sep 2013): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2010/7F07646/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
  - *Strengthening Seed and Output Markets in Zimbabwe, Lesotho and Swaziland* (SAMP2, Oct 2013 to Sep 2015): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2010/7F07646/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html
  - *Seeds and Access to Markets Project (SAMP) Phase 3* (Dec 2015 to Feb 2022): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2010/7F07646/phase3?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **7F-10511 (MASAP)**: not yet documented in SDC project database.

A3. Dates & financial data.

- **7F-03316 (SSSN 2/HaSSP)**: Jan 2010 to Sep 2014; budget CHF 4.50 million.

- **7F-00404 (NSIMA III)**: Jan 2011 to Sep 2015; budget CHF 2.92 million.
- **7F-08780 (SASA)**: Phase 1 Jul 2013 to Aug 2016, budget CHF 1.85 million; Phase 2 Sep 2016 to Aug 2019, budget CHF 1.05 million; Phase 3 Sep 2019 to Aug 2023, budget CHF 1.55 million.
- **7F-08781 (SKI)**: Aug 2013-Feb 2019; budget CHF 4.68 million.
- **7F-01324 (PABRA, 2012-2021)**: Phase 12, Jan 2012 to Dec 2014, budget CHF 3.42 million; Phase 13, Jan 2015 to Dec 2021, budget CHF 11.60 million.
- **7F-07646 (SAMP, 2010-2021)**: Phase 1, Jul 2010 to Sep 2013, budget CHF 4.03 million; Phase 2, Oct 2013 to Sep 2015, bud get CHF 4.50 million; Phase 3, Oct 2015 to Dec 2021, budget CHF 9.90 million.
- **7F-10511 (MASAP, inception Jul-Oct 2021, Phase 1 Dec 2021 to Nov 2025)**: CHF 0.20 million committed in 2020-2021.

A4. Location(s).
- **7F-03316 (SSSN 2/HaSSP)**: Malawi, Swaziland, Zambia and Zimbabwe.
- **7F-00404 (NSIMA III)**: Botswana, DRC, Lesotho, South Africa, Swaziland.
- **7F-08780 (SASA)**: SADC.
- **7F-08781 (SKI)**: Zimbabwe, Zambia, Swaziland, Mozambique, South Africa.
- **7F-01324 (PABRA, 2012-2021)**: Africa.
- **7F-07646 (SAMP, 2010-2021)**: Phase 1 SADC; Phase 2 Zimbabwe, Lesotho, Swaziland; Phase 3 SADC.
- **7F-10511 (MASAP, 2021-2025)**: Zambia, Zimbabwe.

A5. SDC Geography.
- **7F-03316 (SSSN 2/HaSSP)**: SADC, Africa.
- **7F-00404 (NSIMA III)**: SADC, Africa.
- **7F-08780 (SASA)**: SADC, Africa.
- **7F-08781 (SKI)**: SADC, Africa.
- **7F-01324 (PABRA, 2012-2021)**: Africa.
- **7F-07646 (SAMP, 2010-2021)**: Zimbabwe, Eswatini, Lesotho.
- **7F-10511 (MASAP, 2021-2025)**: Zambia, Zimbabwe.

A6. SDC Domain.
- **7F-03316 (SSSN 2/HaSSP)**: South Cooperation: East and Southern Africa.
- **7F-00404 (NSIMA III)**: South Cooperation: East and Southern Africa.
- **7F-08780 (SASA)**: South Cooperation: East and Southern Africa.
- **7F-08781 (SKI)**: South Cooperation: East and Southern Africa.
- **7F-01324 (PABRA, 2012-2021)**: South Cooperation: East and Southern Africa.
- **7F-07646 (SAMP, 2010-2021)**: South Cooperation: East and Southern Africa.
- **7F-10511 (MASAP, 2021-2025)**: South Cooperation: East and Southern Africa.

A7. Partners.
- 7F-03316 (SSSN 2/HaSSP): SADC Secretariat, Food, Agriculture and Natural Resources Policy Analysis Network (implementing agency).
- 7F-00404 (NSIMA III): International Maize and Wheat Improvement Centre (CIMMYT) partnering a network of multi-stakeholder National Coordinating Units (NCUs, mainly national agricultural research systems, NGOs, the private sector and regional organizations), in using innovative approaches to strengthen the maize seed value chain (Nyakanda, 2013).
- 7F-08780 (SASA): African Centre for Biodiversity (ACB, Johannesburg - www.acbio.org.za/about/acb - see H3.1).
- 7F-08781 (SKI): Bread for the World (co-financier); Biowatch (South Africa) (implementing agency); 13 partners variously active in four states: South Africa, Zimbabwe, Zambia and Malawi (see H3.2, plus AFSA).
- 7F-01324 (PABRA): Pan-African Bean Research Alliance (PABRA, Nairobi - https://www.pabra-africa.org).
- 7F-07646 (SAMP): contracted firms GRM and Palladium with local partners and community-owned seed and commodity enterprises.
- 7F-10511 (MASAP): "Partner organisations will include seed value chain actors such as government (seed services and quality control), research, extension, civil society and the private sector (seed companies and financiers) in Zambia and Zimbabwe" (SDC, 2020b: 5).

An indicative list including named private and public institutions is annexed, but "needs to be developed further through the seed studies planned by the Cooperation Office" (SDC, 2020b: Annex 7).

Part B: Purpose, relevance and approach

B1. Purpose.

7F-03316 (SSSN 2/HaSSP):

- "The objective of this second phase is to assist four countries (Zambia, Zimbabwe, Malawi and Swaziland) to implement and domesticate the new regional policy at national level with the perspective of demonstration to the other SADC countries. Four national seed networks bringing local stakeholders together (i.e. government, farmers unions, private sector, seed scientists etc.) will be established to operationalise the policies. A regional database will be set up in Zambia cataloguing and informing on new seeds data and enabling the dissemination of critical seed information within the region. By the end of the phase new regulations and policies in the four countries will have been adopted and practiced by the main stakeholders to enhance the release and use of new seed varieties." (SDC web-site).

7F-00404 (NSIMA III):

- "The 'New Seed Initiative for Maize in Southern Africa' (NSIMA) was launched for the purpose of conducting research into drought-tolerant maize varieties that can generate bigger harvests than conventional varieties, even in less fertile soil. The ultimate aim is to achieve greater food security. At the same time, NSIMA activities involve cooperation with government and private-sector stakeholders in the maize sector to encourage seed production and trade (also for small-scale producers)." (SDC web-site).
- "NSIMA was mounted with the objective to strengthen the maize seed value chain for the improvement in livelihoods of resource-poor smallholder farmers. Under CIMMYT coordination, NSIMA is run as a network of multi-stakeholder National Coordinating Units (NCUs) in participating countries comprised of Swaziland, South Africa, Lesotho, DRC and Botswana. The project approach is for NCUs to identify constraints and bottlenecks, followed by the formulation of specific objectives and activities that provide sustainable outcomes enhancing the flow of resources in the seed value chain. Activities include availing improved germplasm, technical backstopping, capacity building, advocacy for appropriate policies, partnerships and promotion of activities that enhance the seed value chain." (Nyakanda, 2013: viii).

7F-08780 (SASA):

- **Advocating for Agro-Biodiversity (Jul 2013 to Aug 2016, CHF 1.85 million)**: to promote "recognition in regional and national policies, laws, regulations and programs of women and men farmers' diverse forms of knowledge, their rights to save, use and exchange seed, the importance of maintaining agro-biodiversity for food security, and the role of state institutions in protecting the above." (SDC web-site).
- **Strengthening Agro-biodiversity in Southern Africa (Sep 2016 to Aug 2019, CHF 1.05 million)**: "to promote seed diversity and agro-ecological practices in order to strengthen food security in Southern Africa." (SDC web-site). "This phase's goal is to increase food sovereignty and food security in southern and East Africa through seed diversity and agroecological practices by advocating for biosafety in Africa, securing agricultural biodiversity in southern and East Africa, and contesting corporate expansion while changing the narrative towards the redirection of public funds towards agroecology. The four broad issues addressed by ACB arise in a context that limits the power of the majority as corporate private sector interests in commodity production take precedence over the requirements to support investments in Africa's localised and biodiverse food systems." Mulvany *et al*. (2019).
- **Strengthening Agro-biodiversity in Southern Africa (SASA) (Sep 2019 to Aug 2023, CHF 1.55 million)**: "to establish agricultural policies in Southern Africa that meet farmers' rights, diversifies farmers' seed systems and contribute to sustainable maintenance and use of agricultural biodiversity." (SDC web-site).

7F-08781 (SKI):

- "The project contributes to strengthening and consolidating local knowledge and practices on seeds for better resilience. In parallel, research is conducted on community seed systems and the interface between the formal and informal seed sectors. This will inform advocacy strategies and influence the policy-making and scientific narrative for improved seed and food security" in Southern Africa (Lesotho, Malawi, South Africa, Swaziland, Zambia, Zimbabwe). (SDC web-site).

- "The project has a four-pronged approach that: 1) strengthens seed diversity and related local cropping practices based on agro-ecological farming (AE) principles to meet social, economic and environmental goals at community level; 2) supports the building of a platform of farmers and organisations in the region for collective action; 3) supports advocacy for change from local community to policy level; and 4) supports participatory research on both university level and community level." (Marimo *et al*., 2018: v).

7F-01324: Beans & Maize (contribution to PABRA):

- **Phase 12 (2012-2014)**: "Ten million households (60% headed by women) have access to seeds of multiple-stress-tolerant bean varieties, planting these varieties on estimated 1.3 million hectares. Several national beans programs released more than 100 improved bean varieties belonging to major market classes, some of them with resistance to abiotic and biotic stresses. The goal of this program is to improve food security, nutrition, health, income and livelihood of more than 16.5 million resource-poor smallholder families (ca 100 million people) in Sub-Saharan Arica by addressing productivity, environmental stresses and market challenges." (SDC web-site).
- **Phase 13 (2015-2021)**. "The greatest global challenge today is how to ensure food and nutrition security of a rapidly growing human population, considering climate change and without adversely affecting the natural base upon which the production is dependent. Beans, as the most important consumed grain legume, are a very good source of vitamins, minerals, and plant derived micronutrients. Significant yield increase of more than 60% are possible, following access to and use of improved varieties coupled with integrated crop management practices." (SDC web-site).

7F-07646 (SAMP):

- **Strengthening Seed and Output Markets (Jul 2010 to Sep 2013)**: "Under the mandate of Swiss Development Bill, SDC Cooperation Office Southern Africa has developed a Regional Food security strategic framework with Implementation at Local Level as focus. The overall result of this project is to improve the food security of approximately 40,000 people in the three countries, in Zimbabwe, Lesotho and Swaziland and to make them less dependant [on] humanitarian assistance. This objective will be achieved by improving local production of high quality ... seeds and accompanying training measures through the agriculture extension officers in the region. This will be done as complementary measure of the existing humanitarian assistance project provided by SDC in Zimbabwe and by WFP in Swaziland and Lesotho. (SDC web-site).
- **Strengthening Seed and Output Markets in Zimbabwe, Lesotho and Swaziland (SAMP 2, Oct 2013 to Sep 2015, CHF 4.5 million)**: "This project will increase food security by developing the capacity of smallholder farmers to locally produce improved seed and stimulate local formal and informal seed markets. To achieve this, the project will work to remove barriers to accessing inputs and agronomic training; develop farmer and community organizational skills to meet seed production standards; and promote efficient strategies for seed processing, packaging, marketing and informal exchanges." (SDC web-site).
- **Seeds and Access to Markets Project (SAMP 3, Oct 2015 to Dec 2021, CHF 9.895 million)**: "The project contributes to increased food and nutrition security of smallholder farmers by improving availability of and access to adequate quantities of quality seeds and planting material of suitable and diversified crop varieties. This enables smallholder farmers to produce enough food to sustain themselves, their communities, and earn higher incomes. The project strengthens national and local farmer-led institutions, supports community seed and commodity production and strengthens seed and commodity distribution networks." (SDC web-site).

7F-10511 (MASAP):

- **Summary** (https://afci.de/jobs/markets-and-seeds-access-project-zambia-and-zimbabwe): "The overall goal of the programme is to improve resilience in food security of smallholder households (especially women and youth) by increasing adoption and utilisation of improved open and self-pollinated varieties of small grains (sorghum and millets) and legumes (cowpeas and groundnuts) through strengthening the seed and commodity value chains in Zambia and Zimbabwe [see H3.3]. **Outcome 1**: Sustainable community owned enterprises and associations provide services that lead to smallholder farmers – in particular women and youth - having higher and diversified incomes resulting from adoption and utilization of small grains and legumes seeds and sales of these commodities. **Outcome 2**: Sustainable and

predictable availability of early generation seed[2], access to affordable quality seeds of small grain and legume and related services by smallholder farmers through increased engagement of the private sector. **Outcome 3**: Evidence based national agricultural and food security policies, as well as private sector plans, supportive of small grains and legumes sectors' needs and interests, and that are gender and youth responsive, are developed and implemented."

B2. Relevance to partners.

7F-08780 (SASA):

- "SASA project activities are regarded as vital and indispensable by national level networks promoting agricultural biodiversity. This was the universal perception across project beneficiaries consulted in the progress evaluation: government representatives at the technocrat level in all SASA target countries, CSO representatives and farmer leaders." (Mulvany *et al*., 2019: 42).
- "Relevance to small-scale farmers is ensured by seeking, to the extent possible, their views on specific issues, gathered in authentic, participatory processes and action research, and by working through and with the legitimate representative structures of farmer organisations such as MIVWATA, ESAFF, Women's Rural Assembly, UNAC, ZIMSOFF and many others." (Mulvany *et al*., 2019: 44).
- "The demand for support continues to increase at national and regional levels and this has shown up some capacity requirements in the areas of research and advocacy, monitoring and evaluation, as well as strategic communications and in-depth engagement with partners." (Mulvany *et al*., 2019: iv).

7F-08781 (SKI):

- "By fostering seed sovereignty as a pathway to food security the project remained relevant in a context where majority of smallholder farmers find it difficult to access hybrid seeds and other farming inputs. The policy context in the project countries was characterised by increased support for commercial seed systems characterised by hybrids and a significant influence and pressure by multinational seed companies on national seed policies ... at the expense of farmer-led systems." (Marimo *et al*., 2018: 6).
- Different stakeholders can have very different needs and expectations from the same project. For example, "one group of the targeted farmers was mainly interested in subsistence [while] the second group's interest was increased income, crop diversification and nutrition." (Marimo *et al*., 2018: 9).
- "In line with Domain 1 in the Swiss Agency for Development Cooperation's (SDC) Regional Cooperation Strategy for Southern Africa, 2018-2022, our work also aims 'to increase resilience for food security for smallholder households in the SADC region.' We contribute to this strategy through supporting agroecological production, diversified diets, and community-based seed systems as the basis of food security." (SKI, 2021: 5).

7F-07646 (SAMP) and 7F-10511 (MASAP):

- "The Seeds and Markets Project (SAMP), which ran from 2010 to 2019 aimed at providing sustained access to improved quality seeds for smallholder farmers in three countries. ... Given the low adoption rates of seeds of improved varieties (especially [open-pollinated] and self-pollinated crops), and weak linkages between breeders and seed producers, it was considered necessary for SDC to pursue and build on its recommendations. ... MASAP is congruent to the SADC Regional Agricultural Policy, which assures the access to affordable yield enhancing seeds and fertilizers for sustained application on farms to raise productivity. At national levels, the project aligns to the Zambian National Agriculture Policy (2012-2030) and the Zimbabwe National Agricultural Policy Framework (2019-2030) that have a provision for increasing diversified crop productivity, nutrition and appropriate agricultural inputs (including seeds) and product markets. These national policies are also consistent with the new Swiss International Cooperation Strategy for 2021-24 that underlines two thematic priorities of alleviating poverty through creating decent local jobs and addressing climate change. The project supports the Global Programme Food Security strategy (2017-2020) thematic priority 1.3 on Sustainable Use of Agrobiodiversity that provides for ecological use

[2] Early generation seed (also called 'foundation seed') refers to the seed that seed companies and seed producers (farmers, seed associations, etc.) require for multiplying and producing certified seed that will be sold to farming households (SDC, 2020).

of plant resources and in particular smallholder farmers' access to local and quality seeds." (SDC, 2020b: 3-4).

B3. Relevance to SDGs. (https://sdgs.un.org/goals)
All the projects are seen as contributions to achieving various SDGs of which the most prominent and consistent are the following:

- **SDG 1: No poverty**, especially Target 1.4 (*By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance*), Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*), Target 1.b (*Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions*).
- **SDG 2: Zero Hunger**, especially Target 2.4 (*By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality*) Target 2.5 (*By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed*), Target 2.a (*Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries*), and Target 2.b (*Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round*).
- **SDG 5: Gender Equality**, especially Target 5.5 (*Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life*) and Target 5.a (*Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws*).
- **SDG 13: Climate Action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*), and Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 15: Life on Land**, especially Target 15.3 (*By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world*), Target 15.6 (*Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed*), Target 15.9 (*By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts*).

B4. Relevance to other development objectives.
All projects: agriculture and food security.

B5. Relevance of the approach in principle to the climate response.
Preliminary assessments in the Inception Phase:
All projects: (Agro-)Ecosystem/community adaptation [EA].

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **7F-03316 (SSSN 2/HaSSP)**: mitigation - NOT (0); adaptation: - PRINCIPAL (2) [*this assessment is that it should be SIGNIFICANT (1) in view of its multiple objectives*].
- **7F-00404 (NSIMA III)**: mitigation - NOT (0); adaptation: - PRINCIPAL (2) [*this assessment is that it should be SIGNIFICANT (1) in view of its multiple objectives, and its limited focus only on maize*].
- **7F-08780 (SASA,** NOT FOUND in the SDC climate change spreadsheet): [*this assessment is that it should be 'mitigation - NOT (0); adaptation: - SIGNIFICANT (1)' because all phases promote access by farmers to diverse and locally/climatically adapted seed varieties*].
- **7F-08781 (SKI)**: mitigation - NOT (0); adaptation: - SIGNIFICANT (1).
- **7F-07646 (SAMP, 2010-2021)**: mitigation - NOT (0); adaptation: - SIGNIFICANT (1).
- **7F-01324 (PABRA, 2012-2021)**: mitigation - NOT (0); adaptation: - SIGNIFICANT (1).
- **7F-10511 (MASAP, 2021-2025)**: mitigation - NOT (0); adaptation: - SIGNIFICANT (1).

Part C: Narrative overview

Many people live at the edge of farming viability in Africa, a position aggravated by the effects of climate change. Adaptation to climate change has therefore become a key theme in Africa, particularly relating to drought resilience in farming systems, and sharing solutions among locations with similar challenges. There is however a confidence in Africans' ability to cope, to value traditional knowledge-based as well as science-based solutions, to undertake collective works for common benefit, and to share knowledge and learn from each other. Because so many African farmers are small-holders, solutions must be fine-grained and intimately adapted to local conditions, while also being available across large areas often with uncertain communication and transport links.

Most improvements in agricultural productivity have always arisen from the manipulation of germplasm through selective breeding on farms, and the exchange of improved varieties, and this is likely also to be the case for adaptation. For example, Mulvany *et al*. (2019: iv) observed that “the need is for the seeds themselves to have adaptability embedded in their genes, i.e. for the seeds to be heterogeneous, if they are to become the core of a production system that enriches agroecology, sustains agricultural biodiversity and helps realise food sovereignty.” The essential point is that environmental change affects ecosystems (farms) and the organisms within them (crops, was well as pollinators, soil biota, pests and those that regulate pest numbers), and in adapting to it farmers hope to accelerate the evolution of selected lineages (valued plants) in a direction favourable to themselves.

But other things are needed as well, including the freedom and technical capacity for diverse viable seeds to be distributed across frontiers, shared for use on in-farm trials with the data also being properly analysed and shared along with selected germplasm, and the whole process protected from hostile competing interests. But the genes of crop plants are only part of the picture, and the need is to accelerate these processes in order to cope with rapid environmental change, while combining genetic improvements with complementary techniques of climate-smart cultivation (such as targeted irrigation and conservation farming) to promote sustainable agroecology systems, risk-sharing arrangements (such as weather index-linked crop insurance) to buffer small-holders financially against environmental shocks, and easier marketing arrangements to reward innovation and promote replication.

This contribution narrative covers a family of SDC-funded projects, programmes and institutions that began in the context of a long-standing SDC interest in farming systems and food security. The common aim of the latter was identified by SDC & SECO (2014: 22-23) as being "to remove knowledge-based, regulatory or organisational barriers to the flow of potential solutions to livelihood constraints in the context of deteriorating environmental conditions (e.g. saline intrusion, drought, flood, and soil depletion) that are associated with or could be aggravated by climate change." The present account is intended to clarify how actions by SDC in Africa in the period 2010-2021 all fitted together as complementary contributions to the over-arching task of promoting resilience to climate change among small-holding farmers in rain-fed farming systems. The project chosen for the performance study (7F-03316) turned out to have been an important entry point for the larger story, even though it had been included in the sample in error because it ended in 2014. The complete set of projects examined here are listed in the following table, all of them having the effect of supporting smaller farmers in becoming more resilient to all challenges, including climate change.

Number	Name [location]	Abbreviation	Timing	SDC Budget (CHF)
Germplasm and farming system adaptation projects				
7F-03316	SADC Southern African Development Community - Seeds, (Phase 2: SADC Seed Security Network II/Harmonised Seed Security Project) [Malawi, Swaziland, Zambia, Zimbabwe].	SSSN 2/HaSSP	2010-2014	4.50 million
7F-00404	Maize initiative in Southern Africa (the New Seed Initiative for Maize in Southern Africa) [Botswana, DRC, Lesotho, South Africa, Swaziland].	NSIMA III	2011-2015	2.92 million
7F-08780	Strengthening Agrobiodiversity in Southern Africa (collaboration with the African Centre for Biodiversity) [Southern Africa Development Community, SADC].	SASA	2013-2023	4.45 million
7F-08781	Seed and Knowledge Initiative [Zimbabwe, Zambia, Swaziland, Mozambique, South Africa].	SKI	2013-2019	4.68 million
7F-01324	Beans & Maize (collaboration with the Pan-Africa Bean Research Alliance) [Africa, with a later focus on Burundi and Zimbabwe].	PABRA	2012-2021	15.02 million
7F-07646	Strengthening Seed and Output Markets in Zimbabwe, Lesotho and Swaziland (the Seeds and Access to Markets Project) [Phase 3: extended to SADC].	SAMP	2010-2021	18.43 million
7F-10511	Markets and Seeds Access Project (in effect, a continuation of SAMP) [Zambia, Zimbabwe].	MASAP	2021-2025	N/A
Complementary vulnerability and resilience projects (see PRFs for 7F-07807 R4 and 7F-08531 RVAA)				
7F-07807	Rural Resilience in Southern Africa/R4 Initiative (Phase 1 was 'Ensuring food security for smallholder farmers with microinsurance and microcredit.', and both followed the 2011-2012 'Weather Index Based Crop Insurance/R4' project) [Malawi, Zambia, Zimbabwe].	R4 Initiative	2014-2021	16.60 million
7F-08531	Regional Vulnerability Assessment and Analysis [SADC].	RVAA	2013-2022	13.36 million

The starting point was with maize, and most maize seeds available on the market in the region (Zambia, Zimbabwe, Malawi, some parts of South Africa, Mozambique, Lesotho and Eswatini) today were produced under 7F-00404 (NSIMA). This was launched for the purpose of conducting research into drought-tolerant maize varieties that can generate bigger harvests than conventional varieties, even in less fertile soil. The ultimate aim is to achieve greater food security. At the same time, NSIMA activities involve cooperation with government and private-sector stakeholders in the maize sector to encourage seed production and trade (also for small-scale producers). In parallel, SDC supported regional institutions in standardised research, development and licencing in each country, so that one variety, for example, could be tested and licenced once rather than separately for each country (7F-03316: SSSN), which concerned development of the SADC's Harmonized Seed Regulatory System (HSRS, later taken over by USAID). Then the engagement with the Pan Africa Bean Research Alliance (7F-01324: PABRA) brought in beans and micronutrient fortification and crop rotation (nitrogen fixation) to allow crop

diversification and improved productivity and nutrition, with a strong emphasis on promoting gender equity throughout.
The three phases of 7F-07646 (SAMP) led to 7F-10511 (MASAP), and together they responded to the two Swiss food security strategies in this period (2012-2017 and 2018-2022), the overall narrative of both being to help smalle-holding farmers become more resilient to all challenges, including climate change, with the seed value chain as an entry point. Another project in this family was 7F-08781 (SKI) in Malawi, South Africa, Zambia, Zimbabwe, managed by Biowatch with a consortium of other African NGOs. This is currently in Phase 2 (2019-2023) and focuses on informal seed systems and improving those preferred by farmers, and also on agroecological farming practices. The latter is an approach to sustainable and restorative farming that marries traditional land husbandry with the introduction at community level of modern ecological understanding and new techniques and crop mixtures. The core theory of change of SKI is that transforming the current food system through diverse, resilient farmer-led seed systems and amplifying agroecology is a key strategy towards food sovereignty, ensuring better nutrition, regenerating healthy ecosystems, and thus helping to address crises in global food and ecological systems, including climate change, land degradation, and natural resource depletion.
Working on similar themes at a higher political level is 7F-08780 (SASA), which is implemented by the African Centre for Biodiversity (ACB) and aims to promote seed/agricultural policies that favour small farmers by ensuring farmer representation, and empowering civil society to push for policy change (e.g. on intellectual property).
Interviewees drew attention to the weakness of the early focus on maize rather than drought-tolerant varieties such as sorghum and millet, and also to a lack of effectiveness in creating a strong seed market and putting in place mechanisms to ensure continuous access to that market by smallholder farmers. But they also noted the strengths of the partnerships upon which the various interventions relied and rely, including with research institutions, private companies, CSOs, government institutions and smallholder farmers. Where an advocacy component is included, relevant regional and continental networks are effectively engaged. These partnerships, as well as strong research and capacity-building components, help to ensure sustainability of results. The whole family of projects was designed to support policy, implementation and research across the entire seed value chain and involving diverse institutions, CGIAR centres, small-holders and farmers' and traders' associations. It covers small-holders, national and regional stakeholders and everything up to international intellectual property and issues concerning genetically modified organisms (GMOs). The connecting theme is promoting resilience to climate change among small farmers in rain-fed farming systems, and assessments of the various projects reflect this, being scored in the range 4-6 (mean/median 5, 'good' in all cases) for **design**, **effectiveness**, **impact** and **sustainability**, while also generally having **high transformative potential** for adaptation. There was however a widespread perception among interviewees that the individual projects and even the whole series over a decade or more were too short to deliver the kinds of transformative change that was desired by stakeholders and sought by SDC. The fact is that the momentum of unfavourable change in multiple dimensions and at continental scale is too vast for directions to be changed quickly or easily.

Part D: Design quality

Mulvany *et al*. (2019: iv) identified the key issue for climate change adaptation in the context of farmer-managed seed systems, by noting the “the need for the *seeds themselves to have adaptability embedded in their genes*, i.e. for the seeds to be heterogeneous, if they are to become the core of a production system that enriches agroecology, sustains agricultural biodiversity and helps realise food sovereignty.” Other things are needed in practice as well, including the freedom and technical capacity for diverse viable seeds to be distributed across frontiers, shared for use on in-farm trials with the data also being properly analysed and shared along with selected germplasm, and the whole process protected from hostile competing interests. But the essential point is that environmental change affects ecosystems (farms) and the organisms within them (crops, was well as pollinators, soil biota, pests and those that regulate pest numbers), and in adapting to it farmers hope to accelerate the evolution of selected lineages (valued plants) in a direction favourable to themselves. Of course, the genes of crop plants are only part of the picture, which is why the SASA and SKI projects also explicitly propose sustainable agroecology systems as well.

- **7F-08780 (SASA)**. **Overview**. The ACB was established in 2003, and “working with partners and networks has been the bedrock for the success of ACB work at national, regional and

international levels." (see G4). It " has a four-pronged strategy in its work. First, it undertakes research and analysis, often through participatory research with farmers' associations, and the production of unique and high quality policy positions and policy research designed for immediate support to advocacy coalitions throughout the region. Secondly, through dedicated face-to-face engagement and accompanying organisations and social movements in processes of reflection, knowledge-sharing and production of evidence for policy changes, it helps strengthen their capacity to advocate for changes. Thirdly, ACB also undertakes direct advocacy work, with partners when possible, at national, regional and international levels. Finally, effective communications by multiple methods enables the information generated by ACB to be shared widely, contributing to improved awareness and influencing decision making." (Mulvany *et al*., 2019: 8).

- **7F-08781 (SKI)**. **Overview**. "The project design logic or Theory of Change sufficiently addressed the three dimensions required to achieve the desired changes in policy and practice and rightly fully captures key constraints to realisation of food sovereignty, including land grabbing and lack of water rights." (Marimo *et al*., 2018: 6). "The project adopted the most relevant and appropriate strategy for reaching its intended community level beneficiaries with seed and knowledge." (Marimo *et al*., 2018: 7).

A review of design documents for the other projects (SDC, 2010, 2013b for SAMP; SDC 2020b for MASAP; SDC, 2011, 2020a for PABRA) gives no particular cause for concern, especially in view of the extensive record of collaboration, partnership, need analysis, reflection on progress, etc. upon which each successive phase and project was built. A general impression is that design quality might be considered rather higher in SASA, SKI and PABRA (score 6) than for SAMP and MASAP (score 5), and SSSN and NSIMA might be lower still (score 4) because they contained weaknesses (e.g. in concentrating on maize alone, in not fixing seed market issues, and paying less attention to agroecology) that had not yet been corrected by later interventions in the project family. But this would still make the average score 5 ('good') for all of them.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.

All projects: not applicable.

E2. System change.

All projects: not applicable.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.

7F-00404 (NSIMA III):

"Overall performance [of the National Coordinating Unit (NCU) in Katanga] is rated good [B minus]. In Lesotho, the composition of the NCU is unstable with high turnover and lack of clarity of terms of reference of representatives. As a result, NSIMA activities and output levels are rather low. Indeed, inadequate staff and capacity levels have resulted in failure to plant some requested trial kits and reduced production of basic seed. With an overall rating of [D plus], reconstitution of the Lesotho NCU is highly recommended. Regarding other NCUs, overall rating for Botswana is satisfactory [C minus], South Africa [C minus] and Swaziland [C plus]. ... According to stakeholders, the NSIMA model is seen as fostering collaborative networks, enhancing knowledge and information flow on new technologies, and enhancing movement of germplasm along the seed pipeline. Additionally, the NSIMA model introduces efficiencies to the seed value chain through its approach of leveraging complementary roles with NARS, CBOs and the private seed sector, and shared use of resources and capacities (material, human, financial, institutional, and infrastructural). Among its weaknesses, there is a presumption of stable institutional frameworks, and availability of time and resources to complement project financial resources. Regarding funding levels, the model is limited if a partner is operating in 100% cost recovery mode. Also, since the principal coordinator in the model is not expected to implement activities at cooperating NCU level, limited powers for decision-making among partners restricts the model's effectiveness." (Nyakanda, 2013: ix).

7F-08780 (SASA):

- **Competing coalitions**. "The evaluation was set in a framework of three broad coalitions addressing food and agriculture systems: the Agribusiness and Green Revolution coalitions, favoured in current policy arrangements, and the Ecological Food Systems Transition coalition, which, for ACB, has huge potential. This [latter] coalition, rooted in food sovereignty, could continue to provide resilient biodiverse and localised food systems for the

majority of people in most countries in the region, the more so when the power of the other coalitions is challenged and held in check." (Mulvany *et al*., 2019: iii) [see H3.4].

- **Overview**. "The contribution of ACB to the overall SASA goal has been to give a bold lead in opening up policy spaces for seed diversity and agroecology, especially through its work on farmer-managed seed systems (FMSS) and farm input subsidy programmes (FISPs). It supports networks across the SADC region to constrain corporate control of policy levers and to build capacity, awareness and confidence that the agroecological alternative is viable." (Mulvany *et al*., 2019: iv).
- **Biosafety and new technologies**. "ACB has continued its focus on biosafety and GM and GM 2.0 technologies, including synthetic biology, genome editing and gene drives, and the regional impacts of the consolidation of power in global seed corporations, such as the Bayer/Monsanto merger. These issues are now better framed within a context of their impacts on agricultural biodiversity, farmers' seed systems and agroecology." (page iii). "Network partners especially in Tanzania, Malawi, Swaziland, South Africa, and Mozambique, as well as in Nigeria, are actively involved in opposing GM commercial releases and have been able to request targeted support from ACB in terms of information, legal reviews and opinions on biosafety laws proposed reviews and on resistance strategies for GMOs. Network partners working with ACB have scored significant successes in halting the release of GM varieties of maize and cotton and their commercialisation." (Mulvany *et al*., 2019: 44).
- **Seed laws and Farmers' Rights**. "CSO partners describe ACB as a catalyst, facilitator and technical expert, not only in challenging the basis of the seed policies and their embrace of PVP [plant variety protection] and IP [intellectual property] restrictions but also in finding ways to ensure there are exceptions and exemptions for farmers' seed systems and farm-saved seed in national laws." (page iii)." At country level in Eastern and Southern Africa, various strategies were used by ACB to ensure farmers' voices and concerns were incorporated into seed laws and policies through coordinated processes at national and regional level." (Mulvany *et al*., 2019: 45).
- **Farmer-Managed Seed Systems (FMSS)**. "Recognition of ACB's work on FMSS is cited by people and organisations in many networks, in all parts of the world. ACB has contributed significantly to the topical discourse on Participatory Plant Breeding (PPB), highlighting the current constraints, beyond funding, to implementing PPB within FMSS on a wide-scale, in the context of hostile seed laws, policies and regulations." (Mulvany *et al*., 2019: iii).
- **Farm Input Subsidy Programmes (FISPs)**. "In the interest of building a strong coalition, ACB conducted research and regional dialogues on FISPs in South Africa, Tanzania, Zambia, Zimbabwe, Malawi and Mozambique so that they would guide the strategy for ACB work on FISPs. The evaluation confirmed that the multiple engagements made by ACB in different countries and at regional level on FISPs had been done effectively. Awareness raising workshops were backed by sharing materials and research publications on FISPs to enlighten and fire up engagement in the resistance to FISPs in social movements and farmer organisations such as MVIWATA in Tanzania, and CSOs and their networks, such as ADECRU, Livaningo and Justicia Ambiental in Mozambique, and ZAAB in Zambia." (Mulvany *et al*., 2019: 45).
- **Impact**. "Resilience of food systems and agricultural biodiversity is a macro-level environmental, economic and social question affected by an extremely wide-range of factors. Nevertheless, through its impact on seed laws, biosafety, critique of AGRA [Alliance for a Green Revolution in Africa], and dissemination and awareness raising of agroecological alternatives, the impact of ACB has been essentially defensive: to challenge and frustrate the most aggressive changes to agricultural policy and practice that would open the way to full scale industrialisation of African agriculture, unfettered use of biotechnologies and irreversible damage to agricultural biodiversity. Testimonies from across the SADC networks relate 'what might have been' had the networks not been galvanised by ACB's radical and outspoken critiques. Laws and regulations would have been in put place through 'closed door' policy revisions which would have left civil society with a much diminished terrain of action for promoting agricultural biodiversity" (Mulvany *et al*., 2019: 46-47).
- **Sustainability**. "Network partners especially in Tanzania, Malawi, South Africa, and Mozambique are actively involved in opposing GM commercial releases. CSO partners and networks have attributed the success to well- researched information by ACB, participatory planning and mapping of campaigns and advocacy strategies, biosafety capacity building events to share knowledge and experiences, mobilisation of communities to oppose GM

experiments within communities (Mozambique) and use of briefing and policy papers. ... [But] national networks have not reached sustainability in terms of technical/legal capacity to handle their own research, document preparation and technical /legal policy influencing." (page 47). Financially, ACB "has been successfully diversifying sources of funding and exploring donor opportunities in North America. Through close engagement with a number of foundations, especially in their seed and agroecology fora, ACB is securing valuable, and potentially lasting, new funding partnerships." (Mulvany *et al*., 2019: 50).

7F-08781 (SKI):

- **Resilience**. "Project interventions contributed to enhanced resilience of beneficiaries to increased climatic variability and climate change. Discussions with respondents suggest that the project interventions enhanced capacity to respond to increased climatic variability and climate change. The project promoted drought tolerant crops (e.g. sorghum, millet) and seed varieties that were perceived as being appropriate to the rainfall pattern (e.g. short season) under increased climate uncertainty. Further, farmers reported better tolerance to new crop pests, such as the fall army worm, by local varieties as compared to hybrid maize." (Marimo *et al*., 2018: 5).
- **Agrobiodiversity**. "The project has considerably strengthened seed exchanges in communities leading to significant increases in seed diversity across various crop types. Since 2015, 3,008 farmers have participated in seed and knowledge fairs, on average 4- 5 fairs per annum at ward or cluster levels in each country, supported by SKI partners and important for facilitating farmer exchanges in different crop varieties and associated knowledge. The project facilitated introduction of new crops and seed varieties, through these farmer exchanges as well as through linkages with national gene banks. Introduced seed varieties represented a wide range of crop types, including open pollinated maize, small grains (finger-millet, pearl-millet and sorghums), pumpkin, sesame and watermelons, together with self-pollinating bambara nut, beans, cowpea and groundnut. In some instances, completely new crop types were acquired, as in Zambia where sorghum, millets and cowpeas were introduced in predominantly maize growing zones. In addition, farmers in Zambia, Malawi and South Africa credited the project with returning lost varieties and crops largely sourced among communities. To a lesser extent variety re-introductions have been through collaborations with community seed banks and national gene banks, as in the case of Zimbabwe with respect to sesame and finger millet." (Marimo *et al*., 2018: 10-11).
- **Agroecology**. "Up to 6,158 farmers, 75% being women, gained knowledge and skills in seed production, multiplication and storage, soil improvement, moisture management, intercropping and food production, through use of diverse learning methods and approaches including workshops, farmer- to-farmer training, field days, and exchange visits. Significant increases in agro-ecological (AE) knowledge and practice among farmers was evident, for instance in permaculture[3] within CELUCT, and PORET. SKI participating CBO organizations in South Africa and Zambia have variously adopted permaculture approaches. Hence, whilst in Zimbabwe and South Africa AE adoption is extensive, there are emerging indications of adoption in Zambia and Malawi. There were significant impacts [e.g. reducing deforestation] of the adoption of AE practices where it occurred at sufficient extent." (Marimo *et al*., 2018: 11).
- **Impact**. Emerging impacts were noted by Wilson (2017), some unintended and most in South Africa and Zimbabwe where partners had worked for two years, although even in Zambia and Malawi partners claimed that staff capacity and organisational interest to focus on seed issues had increased. These include: (a) Revival of nearly lost seed varieties, related knowledge and cultural practices. (b) Increase in seed diversity and seed saved. (c) Improved seed and food security for households using indigenous seeds and agroecology practices. (d) Improved household and community relationships as food, seed and knowledge is shared (an unintended outcome). (e) Economic gains are being achieved by agroecology farmers. (f) An improved, more balanced, nutritious and varied diet for agroecology farming households. (g) Increased capacity and support of local leaders.
- **Sustainability**. "Local level farmers are motivated to continue with local seed e.g. farmers organising themselves for seed fairs, agricultural shows, seed exchange visits, etc. ... Use of CBOs rooted in targeted communities ensured retention of institutional memory at

[3] Originally from 'permanent agriculture', permaculture is effectively a synonym for agroecology, both being systems of farming that mimic natural ecosystems to yield sustainable harvests while preserving and regenerating soils, water and biodiversity.

household, organisation and community institutions for continuity of activities after project closure. ... Effective participatory learning and action underpinned by experiential and deep learning was appropriate for the target group and led to internalisation of knowledge. ... The project demonstrated strong ownership by beneficiaries." (Marimo *et al*., 2018: 28-29).

7F-07646 (SAMP, 2010-2021):

- **Results from SAMP 1**: "SAMP 1 showed that small-scale farmers were able to improve their seed security, provided they were offered a combination of agronomic and foundation seed support. SAMP 1 managed to mobilize close to 4,500 small-scale farmers and support them in becoming seed producers. SAMP 1 had managed to increase the number of agro-dealers (Zimbabwe) from 1 in 2010, to 27 in 2013, and that this had led to an increase in the sale of seed from 50 tons (Seed Co. maize) to 86.5 tons over the same period. Through agro-dealer consignment agreements, SAMP 1 was able to demonstrate that input costs can be brought down thanks to bulk purchases which minimize transport costs." (SDC web-site).
- **Results from SAMP 2**: "(a) Partnership with International Research Centres (CGIAR) has enabled sourcing of foundation seed and subsequent multiplication/bulking by smallholder farmers in Zimbabwe and Swaziland. (b) An increased agro-dealer network of 57 male and 30 female agro-dealers (increase from 30 at the end of SAMP 1) reaches smallholders across Masvingo province in Zimbabwe. (c) 70% of seed producers in Swaziland indicate that they have improved their household incomes. (d) Farmers that grow both seed and commodities with SAMP support in Zimbabwe are less likely to be reliant on government allowances or remittances for income. (e) Smallholder farmers in Zimbabwe have been able to produce and sell 592 tons of agricultural commodities such as onions, cowpeas, maize, chilies and beans. (f) Seed production in Lesotho has been up-scaled in two seasons to 5 districts with 70 seed growers producing 129 tons maize seed and 24 tons of bean seed." (SDC web-site).

7F-01324 (PABRA, 2012-2021):

- "SDC provided support to PABRA for the implementation of the project titled Improving food security, nutrition, incomes, natural resource base and gender equity for better livelihoods of smallholder households in Sub-Saharan Africa over the period 2015- 2019. ... The project activities are being implemented mainly in two flagship countries: Burundi and Zimbabwe, but with targeted interventions across the other 18 countries across ECABREN and SABRN. Selection of Burundi and Zimbabwe as flagship countries for intensive investment was based on the identified need to revive agriculture especially following internal political and economic challenges. ... Over the five years, the following achievements have been made: In Burundi: i) Institutional capacity building - functional and vibrant ISABU Bean program. ii) Release of 13 new bean varieties that are high yielding, drought tolerant and nutritious, iii) Increased farmers access to seed of new varieties, iv) Doubling of bean yield from 750 kg/ha in 2015 to 1,450kg/ha in 2018, v) Farmers adopting good agricultural practices (GAP) leading to increase in national productivity, vi) Farmer mobilization and organization, vii) Nutrition interventions. In Zimbabwe: i) Institutional capacity building, ii) Release of three biofortified bean varieties, iii) The uptake of biofortified varieties has grown tremendously with 85,000 households currently accessing the biofortified beans compared to 3,000 households in 2015, iv) Promotion of biofortified varieties, was enhanced following the launch of Zimbabwe's National fortification policy, v) Release of a small white pea bean variety – the first ever to be released in Zimbabwe. When this bean is promoted for local grain production, it will replace imports, and it is estimated that Zimbabwe could save up to USD 120,000 per month on imported beans. Across the other countries, targeted support has been given in areas of variety development, seed production, integrated crop management and nutrition interventions. To date the project has been able to reach more than 840,000 households accessing seed of improved dry bean varieties." PABRA & CIAT (2019: 4-5; see also PABRA, 2021a, 2021b); PABRA & CIAT, 2015, 2017; Rubyogo, 2021).

Interviewees stressed that all the projects have added value through their emphasis on farmer-led initiatives as well as their capacity to engage local stakeholders to take an active part in the whole process. Findings confirm that farmer-led seed systems have the capacity to provide quality sorghum seeds for crop production in the region. They channel seeds of reasonable quality within comparable levels to the set certification standards. Such systems not only present opportunities to deliver seed, food and nutritional security but also have the potential to provide solutions that are resilient to changing climates. Farmer-led seed systems deserve greater recognition and continued support from governments and other actors in order to develop a

tailored and appropriate seed system that meets the ever-evolving needs of smallholder farmers in the region.
The SDC seed initiatives generally promoted new traits and varieties which were both context specific and robust to environmental change. New varieties and traits could lead to less intensive use of other inputs such as fertilizers and pesticides. In addition to increasing productivity generally, several new traits and varieties offered farmers greater flexibility in adapting to climate change, including traits that confer tolerance to drought and heat (small grain), and early maturation in order to shorten the growing season and reduce farmer's exposure to risk of extreme weather events. To the extent that these varieties reduce the need for pesticides, they also reduce carbon emissions and impacts on biodiversity and human health. The use of such varieties enabled farmers to diversify and produce profitably' even under adverse conditions.
Scores:

- **7F-00404 (NSIMA III)**. **Effectiveness**: 4; **Impact**: 5; **Sustainability**: 4.
- **7F-08780 (SASA)**. **Effectiveness**: 6; **Impact**: 5; **Sustainability**: 5.
- **7F-08781 (SKI)**. **Effectiveness**: 6; **Impact**: 5; **Sustainability**: 5.
- **7F-07646 (SAMP)**. **Effectiveness**: 5; **Impact**: 5; **Sustainability**: 5.
- **7F-01324 (PABRA)**. **Effectiveness**: 6; **Impact**: 6; **Sustainability**: 6.

F2. System change.
7F-08780 (SASA):

- "ACB's interventions across the SASA countries have been supportive, enabling and have improved the capacity of in-country partners and other relevant networks across Africa. It has also sought synergy with similar processes in Francophone Africa. In all countries there is strong appreciation of ACB's research, timely information provision and knowledge support, and its training on conducting advocacy and campaigns on GMOs." (Mulvany *et al*., 2019: 8).
- "By taking such a 'governance' approach to its research and policy development on FMSS, embracing technical, legal, social and political dimensions across the coalitions at all levels, ACB could become significant leaders in this issue hitherto unexplored by African CSOs. There are many forms of FMSS being promoted, but none explicitly tackles the need for the seeds themselves to have adaptability embedded in their genes, i.e. for the seeds to be heterogeneous, if they are to become the core of a production system that enriches agroecology, sustains agricultural biodiversity and helps realise food sovereignty. ACB could take the lead in defining the nature of heterogeneous FMSS and the governance and policy frameworks they require and, starting with partners in the Ecological Food Systems Transition coalition, explore how this type of FMSS could become accepted, by farmers and policy makers alike, as the most appropriate seed system for reliably producing nutritious food." (Mulvany *et al*., 2019: iv). **Transformative potential for adaptation**: high.

7F-08781 (SKI): See sustainability note in F1.

- Increased use of biofertilisers was noted by interviewees and SKI (2020) confirmed growing uptake of biofertilisers among many farmers, showing how a project can create a practical movement through demonstration, knowledge creation and advocacy. Interviewees also noted improved food security among participating farmer communities through more resilient farmer-led seed systems and agro ecology, which was also reflected in detailed field findings in SKI (2020). Across the SKI partnership, partners and farmers reported that the added uncertainties and struggles of Covid-19 and lockdowns in the region combined with the success of their work re-emphasised for them the value of traditional knowledge and autonomy. **Transformative potential for adaptation**: high.

7F-07646 (SAMP, 2010-2021):

- "SAMP had multi-level impacts. It contributed to the transformations of the seed sector by demonstrating a model of seed production that involves smallholder farmers. It provided a route for reducing the time lapse between variety development and availability to farmers. The project contributed to improved market access for smallholder farmers (SHFs) and linkages to outlets they otherwise would not access. At the household level, SAMP contributed to household wellbeing through direct income gains, cost savings on seed purchases, assess to farm input loans, improvements in dietary knowledge and consumption, HIV and AIDS impact mitigation, addressed gender roles and improved financial literacy. It also contributed to increased farmers' resilience against environment and climate change shocks as participating farmers enjoyed better yields and incomes than non-participating farmers in seasons with adverse conditions. Some benefits of the project had a wider reach.

Key among these was the production of open pollinated variety (OPV) seed and bio-fortified beans whose reach spread the benefits of the project beyond the participating farmers and contributed to national seed sovereignty. ... The true worth of the investment is in what extension personnel noted as the significant difference between SAMP and other development interventions in the project districts in Zimbabwe, that: *'unlike other projects that come and go, SAMP is leaving something tangible in the community that has the potential to continue to grow and provide benefits in perpetuity'*. This observation also holds for Eswatini and Lesotho when considering the social and economic infrastructure established by the project in the form of farmers' associations and COEs and the capacitation of national seed units." (Chikandi *et al*., 2020: iii). **Transformative potential for adaptation**: high.

7F-01324 (PABRA, 2012-2021):

- "Three decades ago, before PABRA came into being, regional capacity for bean-related research was sparse. Most countries had limited human, physical, and financial resources to undertake research for development. From 1980 to 1995, regional efforts to overcome bean production constraints matured into the PABRA network, which established a framework for collaboration among research institutions in bean-producing areas with similar agro-ecological, production, and socio-economic conditions. Since 1996, PABRA has undergone tremendous evolution in its effort to serve its stakeholders and to better achieve its goals. In addition to a greatly diversified set of partners represented in PABRA's governance as well as a broader donor base, researchers have shifted from working in isolation on area-specific projects to working across bean value chains through client-driven, multidisciplinary teams. The PABRA network has been organized around a vision for transforming beans from a subsistence crop to a cash crop for smallholder farmers who produce bumper yields of nutrient-rich beans that bring good market prices." (PABRA, 2020: 10). There are certainly elements of the PABRA approach, including food and nutritional security in the face of drought and enhancing the position and influence of women, that would exert system-wide strengthening effects (the definition of transformative change for adaptation), significant at community level and even at continental scale by way of replication and amplification through policy influence and partnerships. **Transformative potential for adaptation**: high.

Part G: Other aspects of design and performance

G1. Efficiency issues.

- **7F-08780 (SASA)**: "ACB has an evolving structure with rigorous management by the leadership team and oversight of all content, administrative and financial matters by the Board." (Mulvany *et al*., 2019: iii).
- **7F-08781 (SKI)**: " SKI presents value for money – small grants with large scale impacts", but "delays in implementation [variously due to capacity constraints within partners and slow banking processes] have been a feature of the project from inception" (Marimo *et al*., 2018: 23).
- **7F-07646 (SAMP, 2010-2021)**: (a) *Expenditure*. Structural issues with "the budgeting approach created scope for both redundancies and inefficiencies and did not allow for results-based review of spending. ... According to the budgets, more was being spent on the delivery mechanism than on the project activities. This raises the question of whether more could have been achieved with the same funding if other delivery mechanisms were used." (b) *Implementation*. "The project started well in Eswatini and Zimbabwe, and it was slow to start in Lesotho owing to registration issues of GRMI. Lesotho was supported from SA in the beginning until an MoU was signed with MoAFS in 2012." (c) *Activity to output conversion*. "The extent of output achievement was in line with expectations. The evaluation did not seek to estimate the unit cost of achieving each output. Engagements with key informants suggested that there were concerns about the approach adopted by GRMZ." (Chikandi *et al*., 2010: 14-14).

G2. Coherence issues.

- **7F-08780 (SASA), 7F-08781 (SKI) and 7F-01324 (PABRA, 2012-2021)**: All these are network-based institutions that comprise diverse partnerships, in which all partners engage with their own supporters in various ways, resulting in an ecosystem of practitioners that include aid donors, partner governments and NGOs and CSOs at all levels. High levels of coherence is therefore a given.
- **7F-07646 (SAMP, 2010-2021)**: "GRM was informally aware of other SDC funded projects in the target areas of SAMP. However, no formal alignment or collaboration took place. This is unfortunate as there were clear opportunities for synergies which could have increased the

possibilities of impact. For example, towards the very end of SAMP3+ GRM became aware of an SDC funded project for HIV mitigation in Lesotho. The SDC funded irrigation project in Masvingo is another example. In future it is highly recommended that formal structures are put in place for cross programming with other SDC funded projects." (SDC, 2019: 13).

G3. Replicability issues.

- **7F-08780 (SASA)**: "The Seed and Knowledge Initiative (SKI) managed by Biowatch and the Strengthening Social Accountability and Oversight Capacity managed by Action Aid International, together with the SASA project, managed by ACB, all work on complementary issues, often in the same countries and sometimes with the same partners. There appears to be mutual respect for the unique contributions of each project: SKI – working at local and meso levels, through relatively few partners in their four focus countries, with farmers and building up the understanding of their knowledge systems, especially about their seeds, with occasional national level engagements, through partners, with governments; AAI – working with mainly regional (SADC) parliamentarians on the one hand and with local communities on the other to monitor the delivery of public services, including FISP and their impact on agroecological systems; ACB – prioritising quality research, analysis and advocacy on complex legal and technical issues and making special contributions to important national and regional processes in countries across the whole region and beyond, working especially with, and for the benefit of, social movements. The quality and usefulness of ACB's research outputs and expertise were highly welcomed by both projects and add to their knowledge on some of the issues. Both SKI and AAI volunteered that processes which SDC had set in train at the start of this phase to bring the three projects together could be revived in the next phase. All projects deal with some aspects of governance at different levels." (Mulvany *et al.*, 2019: 56).
- **7F-08781 (SKI)**: "The regional Community of Practice established under SKI has been highly appreciated by partners for enhancing knowledge sharing, relationship building across countries and speeding up change in practices. ... Farmer exchange visits yielded results of speeding up broad learning and the adoption of seed and crops by farmers." (Marimo *et al*., 2018: 13-14). Success factors for SKI include that agroecology practices have been used for a long time by smallholder farmers to whose needs they are well adapted, and that there is a community of interest and practice in place across Africa that is used to sharing knowledge and best practices, into which the SKI learning network fits very well.
- **7F-07646 (SAMP, 2010-2021)**: "By supporting different components of the nutrition value chain, SAMP has made systemic changes which will allow benefits of the project to be replicated and scaled up, well beyond the lifetime of the project. ... There is evidence that the Community Owned Enterprise (COE) model and other SAMP initiatives are being replicated by other development partners. For example, the DFID funded LFSP has moved to more farmer focused institutions. In eSwatini, eSWADE is favouring the COE model in giving farmers access to markets in the new irrigation areas." (SDC, 2019: 14).
- **7F-01324 (PABRA, 2012-2021)**: The key feature of PABRA is a country-led framework with the member countries participating in everything, but free to determine their own priorities based on their own needs. This is an excellent model for cooperation between national governments, local people and science, with equal sharing of information and equal access to materials and knowledge. This is highly replicable, parrticularly where an 'experimentalist' approach to governance is valued (see H3.5).
- **7F-10511 (MASAP, 2021-2025)**: in effect an extension of SAMP that includes replication in Zambia.

G4. Partnership issues.

7F-08780 (SASA):

- "During the evaluation process it became apparent that multi-country and regional learning exchanges were seen by many as a key driver for developing and disseminating innovative ideas about farmer- managed seed systems, as organisations in some countries are more advanced than others in terms of experience and practice in their work on FMSS. Partners in all countries welcomed the way in which ACB organised the process of sharing research results. This has also resulted in more CSOs and farmers' organisations, as well as government officials, engaging in dialogues with a diversity of views that reflect on the strategic importance of FMSS and how these can be protected and enhanced." (Mulvany *et al*., 2019: 15).

- ACB has established over 40 partnerships with change agents across the region, and "the ability to manage and respond to partner and network demands for support and information is a key area for organisation and resilience building by ACB. Working with partners and networks has been the bedrock for the success of ACB work at national, regional and international levels. The focus has been on working with organisations which share the vision of ACB on seed and food sovereignty and agroecology for the benefit and sustainability of small-scale farmers based on a mutually beneficial relationship. This strengthens the foundation for strategic engagement of other key actors (CSOs, government departments) through information and knowledge-sharing platforms and exposure visits." (Mulvany *et al*., 2019: 27).

7F-08781 (SKI):

- SKI partners in Malawi, South Africa, Zambia and Zimbabwe are listed in H3.2. In addition to these, SKI also developed a strategic relationship with the Alliance for Food Sovereignty in Africa (AFSA), an NGO that promotes agroecology (see AFSA, 2021) and has experience of lobbying the African Union on topics of interest to SKI. Together they establishing a programme called 'Healthy Soil, Healthy Food' (SKI, 2021: 12), which yielded a joint publication on soil health (AFSA & SKI, 2021). "SKI's approach of not imposing practices among partners in favour of more organic partner led change was highly appreciated by partners. There were notable achievements of this approach [but] these processes are inherently slow and require more time which might be in tangent with project funding that have specific time frames." (Marimo *et al*., 2018: 25).

7F-07646 (SAMP, 2010-2021):

- "Although there were no formal partner agreements with partner organizations, GRM signed MoU's with government institutions which collaborated and received funds from SAMP3+. These were: Crop Breeding Institute (CBI) - Zimbabwe; Dept of Agriculture Research (DAR) - Lesotho; and Dept of Agriculture Research and Specialist Services (DARSS) - eSwatini. These MoU's laid out the roles, expectations and responsibilities of each party." (SDC, 2019: 12).

7F-01324 (PABRA, 2012-2021):

- "PABRA is a regional bean research partnership comprising three bean research subnetworks covering 31 countries. PABRA aims at improving the livelihoods of smallholder bean farmers in sub-Saharan Africa. The three networks are the Eastern and Central Africa Bean Research Network (ECABREN), the Southern Africa Bean Research Network (SABRN) and the West and Central Africa Bean Research Network (WECABREN). PABRA is facilitated by the International Center for Tropical Agriculture (CIAT) of the CGIAR (Consultative Group for International Agricultural research) and funded by several development partners such as the Swiss Agency for Development and Cooperation (SDC) and Global Affairs Canada (GAC). The financial support from SDC contributes to PABRA's interventions in 20 countries under ECABREN and SABRN." (SDC, 2020a: 1-2).

7F-10511 (MASAP, 2021-2025):

- "Partner organisations will include seed value chain actors such as government (seed services and quality control), research, extension, civil society and the private sector (seed companies and financiers) in Zambia and Zimbabwe. The role of government will manifest at three levels as follows: extension support to smallholder seed producers and farming communities; variety release, seed certification and seed quality control for seed production; seed policy development to ensure support and recognition of OPV seed and market-friendly subsidies. Access to developed seed material will be through partnerships with public and private breeders and the Consultative Group on International Agricultural Research(CGIAR) Centres in the region that have a mandate on breeding seeds of maize, legumes and small grains. The project will engage particularly with private sector partners concerning seed marketing and distribution channels and financing for seed production. Sub-regional and regional bodies will also play an important part in strengthening the seed system value chain at policy level such as the SADC Seed Centre, whose role is development and implementation of regional seed policies." (SDC, 2020b: 5).

G5. Connectedness issues.

All these projects are ultimately vulnerable to volatility of commodity prices and inputs on local and international markets, and to the machinations of actors that are able to affect the policy and legislative environment and terms of trade in ways that are contrary to the interests of small farmers. These latter challenges are particularly described in the SASA project documents since

they are the focal interest of the ACB. The Covid-19 pandemic has also deepened severe socio-economic issues such as hunger, poverty, economic/political instability, and inequality that have plagued southern Africa, putting organisations and the communities where they work on difficult ground.

G6. Cross-cutting themes.

7F-08780 (SASA):

- “The issues concerning the recognition and protection of the gendered roles that farmers have in FMSS has yet to be clearly articulated, though steps are being taken to address this, for example through the Gender and Seed Sovereignty workshop in Durban, involving participants from Mozambique, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe [see Whittingham, 2017].” (Mulvany *et al*., 2019: 15). See also

7F-08781 (SKI):

- “In both South Africa and Zimbabwe partners largely work with women as subsistence seed and crops are mostly their domain. The exception is with partners that primarily use a community dialogue approach, as they encourage engagement by all members of a community. However across southern Africa women and youth have traditionally had less power than men in terms of decision-making on household assets including whether produce is sold or eaten by the family or, livestock restraint. The voice of women and youth in traditional forums is limited. People living with HIV continue to be stigmatized and communities hesitant to discuss the issue though many families are affected.” (Wilson, 2017: 17).
- "Among [the] majority of partners gender mainstreaming is limited to equal representation of men and women among project participants and in project structures. Partners would have to move beyond counting men and women in positions, to more nuanced mainstreaming that recognises structural challenges in resource entitlement, control and effective participation in decision making at household and community levels." (Marimo *et al*., 2018: 9).

7F-07646 (SAMP, 2010-2021):

- "To ensure that the benefits of SAMP3+ were shared between men and women and to increase overall female participation in decision making at the household and institutional levels, SAMP3+ implemented the Gender Action Learning System (GALS) approach. Although not reported in the log-frame, the results of the GALS at household level have been very positive. Some of these are: (a) increased control and share of income by women; (b) sharing gender roles including household chores, farm and care work. At the COE level, GALS has also played an important role in the placing of women in decision making positions either at Board or Association level." (SDC, 2019: 6).

7F-01324 (PABRA, 2012-2021):

- "PABRA works along the continuum of innovative research to effective adoption and sustainable management of small farmers' enterprises. Its main objective is to improve the livelihoods of smallholder bean farmers (especially women) by delivering on four outcomes: improved food security, nutrition security, increased trade and gender equality." (SDC, 2020a: 1). "PABRA's activities showed significant results on gender too: Out of the 685,000 households, (an increase of 174% compared to baseline 2014) who accessed improved technologies, 411,000 (60%) were female. Or, women occupy 57% of key positions across the business platforms. This has increased their decision-making power and control at farm and household level." (SDC, 2020a: 4).

7F-10511 (MASAP, 2021-2025):

- Rated significant for gender (Checklist for scoring the SDC Gender Policy Marker in the SAP), having a gender analysis that informed the design of the project and with explicit gender equality objective(s) backed by gender-specific indicator(s). Comment: "The implementing agency shall conduct a gender analysis of the project looking at the context, roles and relations between the needs and actions of both men, women and the youth across the seed value chain in Zambia and Zimbabwe" (SDC, 2020b: Annex 3).

G7. Capacity building issues. Strong capacity building intentions and effects are evident from performance assessments and interviewee comments covering 7F-08780 (SASA), 7F-08781 (SKI), 7F-01324 (PABRA) and 7F-07646 (SAMP).

Part H: Other matters arising from the review

H1. Follow-on questions. These focused on the collective contribution story that might be told about the seed family of SDC projects, obtaining stakeholder views and filling gaps in documentation. All are answered elsewhere.

H2. Missing documents. Not applicable.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: The African Centre for Biodiversity

An external review of ACB (Klugman & Currie, 2016: 46-[47]) found "ACB to be an extraordinary organisation for a number of reasons", summarised as follows.

- **The quality of its evidence is high**. "All partners recognise the validity of the evidence that ACB mobilises, as do those whose views differ from ACB's regarding the answers to African agriculture."
- **It is exceptionally strategically adept**. "ACB has been able to identify potential or looming issues well in advance so that it has been ready to take action when opportunities have arisen."
- **It has overcome formidable national and global opponents**. "ACB has played a key role in holding back the intrusion of GM seed and GM products in South Africa and elsewhere on the continent."
- **It is extremely highly regarded by its peers locally, regionally and internationally**. "ACB is perceived to be bringing unique information and capacity development skills into the field and to be doing so in ways that strengthen individuals, organisations and networks."
- **Its staff communicate and learn very effectively**. "Its ability to shift strategy overnight, to rapidly mobilise consumers or partners, and to do things differently from campaign to campaign based on prior learning is remarkable."

H3.2 List of Seed and Knowledge Initiative (SKI) Partners

Malawi

- **The Biodiversity Conservation Initiative** (BCI) is a non-profit, locally registered organization based in Mzuzu, Malawi. Its mission is to support community development through conservation and sustainable use of local biological resources.
- **Soils, Food and Healthy Communities** (SFHC, www.soilandfood.org) is a participatory project, in which farmers work to improve soil fertility, food security and nutrition using grain or perennial legumes. SFHC project activities aim to improve child nutrition, food security and soil fertility, with an emphasis on community-based, participatory methods. Other focus areas include: seed distribution; training; annual field days; and several other integrated activities that promote agricultural, nutritional and social practices.
- **SCOPE Malawi** (www.scopemalawi.com) assists schools and colleges to demonstrate sustainable land use to enhance healthy environments in and out of school. They partner with schools and colleges to promote productive, multi-purpose and healthy environments that are designed to meet the educational, nutritional and other basic needs of the learners, teachers and parents/farmers.

South Africa

- **Biowatch South Africa** (www.biowatch.org.za) is a SKI founding partner and is the SKI lead partner. An environmental and social justice NGO, Biowatch challenges industrial agriculture and demonstrates ecologically sustainable alternatives to ensure biodiversity, food sovereignty and social justice. Biowatch works simultaneously at policy level and directly with projects on the ground involving small-holder farmers. Biowatch is supporting small-holder farmers in agroecological practice, and affirming and building on traditional agricultural knowledge through agroecological training, farmer exchanges and supporting seed rituals. Biowatch works in five project sites in northern KwaZulu-Natal: Ingwavuma, KwaNgwanase, Pongola, Mkhuze and Mtubatuba.
- **EarthLore Foundation** (www.earthlorefoundation.org) is a SKI founding partner. EarthLore (formally Mupo Foundation) partners with local communities to secure land, seed, food and water sovereignty. By reviving indigenous knowledge and protecting sacred natural sites, communities can become more resilient to climate change and the industrial processes which threaten livelihoods and endogenous development. EarthLore works with communities in Mpumalanga and KwaZulu-Natal, and in the Bikita district of Zimbabwe. Activities include

strengthening traditional agricultural knowledge; reviving and enhancing seed diversity and related practices; and enabling the inter-generational transfer of knowledge, culture, biodiversity and livelihood strategies.

- **University of Cape Town's Bio-economy SARChI Chair** (based in the Department of Environmental and Geographical Science, http://bio-economy.org.za/) is a SKI founding partner. The Chair, through Associate Professor Rachel Wynberg and a team of postgraduate students and postdoctoral fellows, brings research and collaborations linked to seed, knowledge and agroecology; policy expertise; and a track record of working on issues relating to traditional knowledge, intellectual property, biodiversity and social justice. Recent and current research focuses on the governance of natural resources and social justice; the resilience of local seed systems; links between seed and food security; implications of new genetic technologies for small-holder farmers; access, benefit sharing and farmers' rights; wild foods; and the social-ecological relationships within different systems of maize agri/culture. Central foci of the Chair are to bridge the gap between theory and the real world of environmental, inequality and poverty challenges, and to bring critical perspectives with regard to the social and environmental dimensions of the bio-economy.
- **Ukuvuna** (www.ukuvuna.org) is dedicated to the implementation of optimised sustainable projects within communities in southern Africa. Ukuvuna aims for a fruitful process, a period of gathering yield or produce or harvest. Something positive that cares for the earth and the people (especially women and youth). The focus is on practical skills for diversifying livelihood activities towards creating replicable models of best practice for living sustainably. The process involves a mindset transformation, adaptability and resilience of individuals, families and society, whilst creating awareness on HIV/AIDS and gender differences.

Zambia

- **Community Technology Development Trust** (CTDT) is a not for profit NGO registered in 2009 with the objective of contributing to the livelihoods of rural communities through interventions aimed at promoting biodiversity conservation and natural resources management in food production practices. CTDT promotes the management of agro biodiversity to enhance sustainable livelihoods through intervention strategies aimed at facilitating restoration and enhancement of traditional plant varieties and animal breeds. CTDT strives to enable farmers to own, manage, control and benefit from agro biodiversity through supporting conservation, restoration and enhancement of local crops and livestock. CTDTworks in three districts of Chikankata, Rufunsa and Shibuyunji in Zambia.
- **Kasisi Agricultural Training Centre** (KATC, www.katczm.org) is a farmer training institution that focuses on organic and sustainable agriculture, empowering rural communities to improve their livelihood through research, training, extensions, conservative development and market linkages. KATC develops local strategies to conserve environmental resources and retrains subsistence farmers in organic agriculture, teaching farming techniques that do not require fertilisers and pesticides and that require reduced water input or irrigation.
- **Regional Schools and Colleges of Permaculture** (ReSCOPE, www.seedingschools.org) is a regional programme in east and southern Africa that promotes sustainable land use through a whole school approach as a way of supporting community development and sustainable lifestyles. ReSCOPE's approach aims at addressing issues such as hunger and malnutrition, a theory-focused education system, and community disconnection from culture, nature and history/past. It uses specific participatory tools involving teachers, pupils, parents, community leaders and other stakeholders to demonstrate the potential for agroecology in addressing these issues at school community level. ReSCOPE has integrated work to promote farmer seed systems in its programmes in Kenya, Malawi, Uganda, Zambia and Zimbabwe.
- **The Zambia Alliance for Agroecology and Biodiversity** (ZAAB, www.zambianagroecology.org) is a national network of faith, farmer and civil society based organisations. The collective work of ZAAB advocates for citizens' rights to food sovereignty, embedded within social and ecological justice in Zambia. ZAAB supports the adoption of agroecology as a holistic, citizenry solution to sustainably build Zambia's food and farming systems and strengthen resilience against the effects of climate change.

Zimbabwe:

- **Participatory Ecological Land Use Management** (PELUM, www.pelumzimbabwe.wixsite.com) Zimbabwe is a network comprising of civil society organisations working with smallholder farmers to upscale participatory ecological land use management practices in Zimbabwe. PELUM Zimbabwe was founded in 1995 and is a

member of the PELUM Association which operates in 12 countries in East, Central and Southern Africa. The PELUM Association's work is underpinned by Agroecological principles.

- **Participatory Organic Research Extension and Training** (PORET, www.poret.org) is a grassroots based participatory project trust that works with poor rural communities to address hunger, malnutrition and poverty. PORET's aim is to support farmers in the low rainfall area of Chimanimani District in adopting techniques and skills which are essential for them, their families and the whole area to survive and attain sustainable, productive and healthy lifestyles.
- **Towards Sustainable Use of Resources Organisation** (TSURO, www.tsuro-chimanimani.org.zw) is a Zimbabwean community-based organisation operating in the eastern district of Chimanimani. TSURO works towards a vision of empowered, peaceful and united small farming communities with well sustained natural resources, healthy and food secure people with productive food processing and marketing initiatives. TSURO works to empower the communities of Chimanimani District to improve their livelihoods and relationships through programmes in sustainable agriculture, natural resource management, community health, agro-processing and marketing.
- **Zimbabwe Small Holder Organic Farmers' Forum** (ZIMSOFF, http://zimsoff.org/) is the voice of the peasants struggling for social justice in Zimbabwe that envisions improved livelihoods of organized and empowered smallholder farmers practicing sustainable and viable ecological agriculture. ZIMSOFF is campaigning to influence policies and public awareness towards agroecology and smallholder farmers' rights on access to healthy soils, clean water and local seed.

H3.3: Ecological and sociocultural features of Open Pollinated Variety crops grown by smallholder farmers in Zambia and Zimbabwe (from Chisvo *et al*., 2021).

Maize. *Ecological factors*: Greater genetic variability than hybrids engenders higher tolerance to drought, pests and diseases and wider ecological plasticity (ability to adapt to different agro-ecologies) than hybrids. *Socioecological preferences*: Some OPVs of maize have hard flinty grain that has taste and flavour preferred by small-holder farmers and that is resistant to weevil damage increasing storability.

Sorghum. *Ecological factors*: Sorghum can withstand drought thanks to its massive deep penetrating roots, its ability to reduce transpiration when moisture stressed and its ability to reduce growth to near dormancy when stressed, only to resume growth when moisture is available again. Susceptible to bird damage. *Socioecological preferences*: The socio-cultural uses of sorghum are similar to the other small grains (millets). High labour demands for women to dehull (decorticate) the grain.

Millet. *Ecological factors*: Pearl millet is a very hardy crop, which can be grown under very high temperatures and low rainfall conditions compared to other cereals. Nutritionally, it is rich in iron and has higher energy and protein levels than other cereals grown under similar conditions. Its grain can be stored for years without insect damage, making it an important food security crop. Susceptible to bird damage. *Socioecological preferences*: Both finger millet and pearl millet are used to brew traditional opaque beer that is part of ancestral worship ceremonies that are part of ancient African religions in southern Africa. High labour demands for women to dehull (decorticate) the grain.

Groundnuts. *Ecological factors*: Groundnuts grow well in warm climate with moderate rainfall (800 to 1,000 mm per annum), although they require dry weather during ripening. Groundnuts grow well in most part of Zambia and Zimbabwe particularly locations where soils are light textured and friable, as well as well drained. Dry spells that encourage aphid populations to increase cause outbreaks of groundnut rosette virus, a disease carried by aphids. *Socioecological preferences*: Groundnuts are considered a "woman's crop" and women are the custodians of their germplasm (varieties) and agronomy. They are processed into peanut butter and provide unsaturated oils, proteins and carbohydrates that balance starchy diets.

Cowpeas. *Ecological factors*: Cowpea is one of the most drought-tolerant crops: some cowpea cultivated varieties can produce a good harvest with as little as 300 mm of rainfall a year. It can also thrive in poor soils. *Socioecological preferences*: Cowpeas are generally grown by women who manage the crop to satisfy immediate vegetable and legume household requirements and to trade at the market. Under small-holder farming conditions, cowpeas are usually intercropped with taller cereals such as maize, sorghum and millets.

Dry beans. *Ecological factors*: Dry beans are best towards the end of the rainy season in February and March because they are sensitive to high temperatures and rainfall during peak flowering that causes flower abortion. Temperatures should not exceed 30° C during flowering,

and they are frost sensitive and floral and pod sterility may also result if temperatures drop below 15 °C. *Socioecological preferences*: Dry beans are generally grown for income generation by households and during FGDs [Focus Group Discussions], small-holder farmers classified them as men's crops.

H3.4: Three coalitions for agricultural development in Africa (from Mulvany *et al*., 2019: iii):

- **The Agribusiness Coalition**. The State could exercise a role in challenging the dominance, efficacy and safety of the approaches promoted by the Agribusiness coalition through, among others, competition, biosafety, seed, environmental and land policies and regulations, but it is not always able to do so. A number of instruments that the State could and should use include: Competition policy considerations in terms of mergers and acquisitions, for example in relation to acquisitions and mergers in the seed industry; Biosafety regulations, in terms of the import, development and release of genetically modified organisms, for example GM crops, or the products of more recently developed genetic modifications using synthetic biology, genome editing or gene drives; Environmental policies, for example in relation to climate change mitigation, sustaining biodiversity and limiting the expansion of deserts as well as ensuring high standards for air and water quality, the protection of landscapes, watersheds and soils, among other issues; Land tenure concerns, for example ensuring that the rights of farmers, and others who work in rural areas, to their territories are respected in line with the Voluntary Guidelines on the Responsible Governance of Tenure (VGGT).
- **The Green Revolution Coalition**. Key interventions within the context of the Green Revolution coalition include AGRA, which has significant funding from the Gates Foundation; CAADP [Comprehensive Africa Agriculture Development Programme], which has a Compact with SADC; and the NAFSN [New Alliance on Food Security and Nutrition], which has partnership agreements in Malawi, Mozambique and Tanzania in the SADC region. These interventions respond to political priorities often initiated by the African Union and articulated in, for example, the Maputo and Malabo Declarations on increasing investments in agriculture, the Abuja Declaration on Fertilizer for an African Green Revolution; the Lusaka Agreement and subsequent Protocols of ARIPO [African Regional Intellectual Property Organisation] and related COMESA [Common Market for East and Southern Africa] and SADC agreements on harmonising seed laws, which increase the opportunities for governments to impose the restrictions embedded in the Union for the Protection of new Varieties of Plants (UPOV) Convention on the use of farm-saved seeds. Apart from requiring the setting of national priorities in line with international, continental and regional agreements and programmes, these processes may also require changes in regional standards and national laws and regulations on Intellectual Property and seed, among others, and they support the use of subsidies to expand the market for agricultural inputs. These form some of the many 'lock-ins' which limit opportunities for the State to confront and resist the vested interests that promote this capture of the small-scale farming sector and the food system.
- **The Ecological Food Systems Transition Coalition**. This calls for all food systems to transition to the more resilient, sustainable and equitable approach for the public good, not corporate profit. This approach has been demanded internationally by social movements, CSOs and progressive scientists and activists in the Declaration and Synthesis Report of the Nyéléni 2007: forum for food sovereignty [Nyéléni, 2007a, b]; the UN/World Bank International Assessment for Agricultural Knowledge, Science and Technology for Development in 2008 [IAASTD, 2009]; the Declaration of the International Forum for Agroecology, held in the Nyéléni Centre in 2015 [Nyéléni, 2015]; many other UN and civil society processes over the past decade, especially within context of the UN's Committee on World Food Security (CFS) and its Civil Society Mechanism (CSM) since 2010; and related civil society-led processes in the region to promote agroecology, farmers' seeds and food sovereignty. There are many other instruments agreed by governments regionally and internationally that could be used to support the Ecological Food Systems Transition coalition and curb the power of the Agribusiness and Green Revolution coalitions, including, for example: the realisation of Farmers' Rights under the International Seed Treaty (IT PGRFA) and the recognition of 'informal' (i.e. farmer) seed systems in the FAO/CGRFA Voluntary Guide for National Seed Policy Formulation [FAO & CGRFA, 2015]; the implementation of the United Nations declaration on the rights of peasants and other people working in rural areas, adopted in 2018; and Decisions of the UN environmental organisations, including on biodiversity, climate change and desertification, which include strongly worded intentions and

commitments to limit the negative impacts of industrial production systems and related technologies and to promote more ecologically resilient systems that can address societal and environmental challenges.

H3.5 Experimentalist governance in strengthening farming systems in Africa (source: PRFs for all projects listed in Part C).

The activities of SADC and its member states, and of PABRA and its collaborating scientists and institutions, are examples of 'experimentalist governance' applied to environment and development issues. Experimentalism is a form of governance that is typically established by agreement among central, global or apex actors and local, national or subsidiary ones, and has three defining characteristics:

- there are over-arching but provisional goals and ways to assess progress;
- there is broad discretion for subsidiary actors to pursue the goals in their own way, provided that they report regularly and transparently so that they can all learn from each other (e.g. through peer dialogue and periodic reviews); and
- there are opportunities to revise the goals and ways of assessing progress, and the decision-making procedures themselves, in response to the results of the review process (Sabel & Zeitlin, 2012).

Thus, it involves free actors in a common enterprise where progress is made iteratively, through repeated cycles of design, effort and learning, followed by re-design, renewed effort, and new learning, until the goal is reached or changed. This approach is central to the design and operation of the Paris Agreement, where the over-arching goal is to respond effectively to the threat of climate change, and the process is based on partners sharing experience freely in trying to do so. In the case of SADC here, the over-arching goal (for RVAA) is to understand and reduce vulnerability, or (for SSSN) to facilitate discovery, use, exchange and commercialisation of new seed varieties, and all parties have agreed to follow certain protocols of analysis and information sharing in order to seek solutions collectively. In the case of PABRA, the over-arching goal is to identify opportunities to use bean germplasm and various techniques to improve nutrition, and all parties have agreed to pool their knowledge. The case of SASA, the ACB and networks across the SADC region, in the search for appropriate farmer-managed seed systems, farm input subsidy programmes, and plant variety and intellectual property protections, may fall into the same category. All such systems are based on equal sharing of information and equal access to materials and knowledge among their participants. It is notable that these advances in applied experimentalist governance have all been encouraged and enabled by 'federal' systems (the EU for the Paris Agreement, Switzerland for the others), and provide a model for adding value that can be applied to many other challenges in many contexts.

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Part J: Acronyms and abbreviations

AAI	Action Aid International
ACB	African Centre for Biodiversity
AFSA	Alliance for Food Sovereignty in Africa
AGRA	Alliance for a Green Revolution in Africa
CGIAR	Consultative Group for International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Centre (*Centro Internacional de Mejoramiento de Maíz y Trigo*)
FISP	Farm Input Subsidy Programme
FMSS	Farmer-Managed Seed System
GMO	Genetically modified organism
HaSSP	Harmonised Seed Security Project
HSRS	Harmonised Seed Regulatory System
IP	Intellectual Property
MASAP	Markets and Seeds Access Project
NCU	National Coordinating Unit
NSIMA	New Seed Initiative for Maize in Southern Africa
OPV	Open Pollinated Variety
PABRA	Pan-Africa Bean Research Alliance
PPB	Participatory Plant Breeding
PVP	plant variety protection
SADC	Southern African Development Community
SAMP	Seeds and Access to Markets Project
SASA	Strengthening Agrobiodiversity in Southern Africa
SKI	Seed and Knowledge Initiative
SSSN	SADC Seed Security Network

Annex 13.2: Adaptation in Peru (PACC)

Project highlights.

7F-05409: **Climate Change Adaptation Programme in Peru (PACC)**. A pioneering, exemplary project that laid the foundations for Peru to recognise the climate change threat by promoting legislative change and developing national strategies to safeguard strategic ecosystem services through catchment management and enhanced nutritional and food security through agroecology.

Part A: Basic data

A1. Project number & name. 7F-05409. Phases 2-3 - Climate Change Adaptation Programme. Phase 4: Climate change in Peru – Peruvian population learning to manage the consequences of climate change. Here called Programme for Adaptation to Climate Change (*Programa de Adaptación al Cambio Climático*, PACC).

A2. Sources.
Process of PRF development: (a) draft PRF prepared using documents listed in the bibliography; (b) draft PRF reviewed by national consultant **Marina Marill** who also conducted the remote and face-to-face interviews listed in Annex 13.22; (c) the PRF was revised in light of field findings.

- **7F-05409 (Climate change in Peru – Peruvian population learning to manage the consequences of climate change, May 2013 to Jun 2017)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2007/7F05409/phase4?oldPagePath=/content/deza/en/home/projekte/projekte.html

A3. Dates & financial data.

- **Phases 1-3 ('Phase 1')**: Feb 2008 to Apr 2013
- **Phase 4 ('Phase 2')**: May 2013 to Jun 2017 (budget CHF 5,568,712).

A4. Location(s). Peru (regions of Apurímac and Cusco)

A5. SDC Geography. Latin America and Caribbean

A6. SDC Domain. South Cooperation/SC LAC
Fund Centre: GP CC
Region: Global/Andean Region

A7. Partners.

- **Main National Partner**: Ministry of Environment (MINAM). **Main sub-national partners**: Regional Governments of Apurímac and Cusco. **Other partners**: Ministry for Development and Social Inclusion- Social Development Cooperation Fund (MIDIS-FONCODES), Universities of Micaela Bastidas of Abancay (Apurímac) and San Antonio Abad (Cusco) and a consortium of Swiss Education and Research institutes (Universities of Zurich and Geneva, Metadata GmbH, Auroscope, the Swiss Federal Institute for Forest, Snow and Landscape Research and MeteoSwiss). **Service provider**s: Helvetas, Libélula (NGO, Peru) and the Centre for Studies and Prevention of Disasters (PREDES).

Part B: Purpose, relevance and approach

B1. Purpose.
Phase 2 overall objective/goal: To "contribute to consolidating the livelihood basis and reducing the vulnerability of the population to climate change, with regard to those living in medium and high poverty levels in rural highland areas." (SDC, 2013: 1). The **specific objective** is that the vulnerable rural highland population increases its ability to adapt to the major challenges of climate change, reducing impacts on their livelihoods, through effective efforts of public and private actors. To achieve this the following outcomes are expected:

- **Outcome 1**: Government entities will scale up adaptive responses through evidence-based public policy, generating inputs for the global dialogue.
- **Outcome 2**: The regional and local governments of Apurímac and Cusco will implement adaptation strategies effectively and in a concerted manner.
- **Outcome 3**: Rural Andean populations in prioritised areas will strengthen innovative and adaptive responses, providing evidence that is useful for decision-making on public policy.

- **Outcome 4**: The Universities of Cusco and Apurímac will generate applied research and train professionals that meet regional demands for managing climate change adaptation.

Evolution of purpose: Phase 1 was clearly designed to engage with the scientific community and other stakeholders in order to build up a knowledge base on vulnerability and the effects of climate change. This was then be used to support the design of the second phase in which advocacy and dialogue was to used to promote adaptation mainstreaming in regional, national and sector policies. This phasing provides evidence that SDC places great importance on learning and developing the interest and confidence of its main partners to address climate change in the knowledge SDC will support them with resources in the next phase.

B2. Relevance to partners.

Relevance to Peru. Phase 1 supported implementation of the 2003 National Climate Change Strategy (ENCC), which in accordance with Law 27867 (Art 53 c), which required sector and regional government policies, plans and programmes linked to the environment and land use to formulate, coordinate, steer and supervise the application of CC strategies. Both Regional Governments of Apurímac and Cusco launched regional strategies on CC (ERCC) in 2012, in which both mentioned the technical and financial support of PACC (Government of Apurímac, 2012; Government of Cusco, 2012; Government of Peru, 2015). The Final External Review of PACC Phase 2 (Pérez *et al*., 2017) confirmed the project's relevance to MINAM and the regional; governments, because:

- The 2015 update of the ENCC recognised the importance of CCA in the agriculture sector on the grounds that "65% of the active working population is engaged in agriculture and more than 80% of this population lives in poverty in rural areas", and acknowledged the support of SDC (Government of Peru, 2015: 20; 83).
- The 2015 NDC (Republic of Peru, 2015) sought to reduce vulnerability to climate change in the priority sectors of agriculture, forests, fisheries, health and water, with cross-cutting approaches that included disaster risk management, resilient public infrastructure, poverty and vulnerable populations, gender, interculturality, and promotion of private investment. It listed 91 adaptation measures to be applied, including 17 linked directly to PACC (e.g. "create lines of scientific research, within the framework of the Scientific Research Agenda in CC, and promote academic and technological development in CC, in universities and study and research centres, considering traditional knowledge.", page 63).

These sources, and bearing in mind its contribution to preparations for the UNFCCC CoP 20 in Lima in 2014, confirm the project's relevance to its partners in Peru: (a) by contributing to the national agenda on CCA; (b) supporting the formulation and updating of national policy instruments such as the NDC (see Government of Peru, 2020) and ENCC; (c) developing models and sub-national strategies for CCA in Cusco and Apurímac that could be used in other highland regions; (d) increasing public investment in ecosystem services and biological diversity; and (e) increasing national capacity to access funds for CCA from GCF and other international sources.

Relevance to Switzerland. The Phase 2 credit proposal noted alignment with SDC priorities in that "the initiative contributes to generate on-the-ground innovative adaptation responses in agriculture and sustainable natural resource management that feed into national and international public policies. They are based on knowledge exchange and linkages between science, public and private sector and civil society." (SDC, 2013: 1).

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 1: No poverty**, especially Target 1.1 (*By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day*) and Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*).
- **SDG 2: Zero hunger**, especially Target 2.1 (*By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round*).
- **SDG 4: Quality education**, especially Target 4..7 (*By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development*) and Target 4b (*By 2020, substantially expand globally the number of scholarships available*

to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries).

- **SDG 13: Climate action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*).
- **SDG 15: Life on Land**, especially Target 15.1 (*By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements*) and Target 15.4 (*By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development*), Target 15.5 (*Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species*).

B4. Relevance to other development objectives.
Hyogo Framework for Action (2000-2015) and **Sendai Framework for DRR** (2015-2030).
OECD. (a) **CCA at international level**: OECD supports efforts on climate action, with a focus on enhancing societal and economic resilience, improving productivity and reducing inequalities. (b) **CCA at country level**: OECD supports countries in their climate adaptation planning processes across ministries and as providers of development finance, and in translating scientific, economic and social science research into useful insights, guidance and recommendations to policy makers. (OECD, 2017).
UNFCCC. Parties acknowledge that adaptation action should follow a country-driven, gender-responsive, participatory and fully transparent approach, considering vulnerable groups, communities and ecosystems, and should be based on and guided by the best available science and, as appropriate, traditional knowledge, knowledge of indigenous peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions. UNFCCC also states that, “Successful adaptation not only depends on governments but also on the active and sustained engagement of stakeholders including national, regional, multilateral and international organizations, the public and private sectors, civil society and other relevant stakeholders, as well as effective management of knowledge.” (UNFCCC, 2016).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Nil.
Adaptation: Capacity-based adaptation (CA) oriented to Ecosystem-based adaptation (EA).

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:
Mitigation. NOT (0).
Adaptation. PRINCIPAL (2).

Part C: Narrative overview

Background and purpose. PACC was designed to respond to the growing impact of temperature and precipitation variations on the country's ecosystems, agriculture, food security and livelihoods. To achieve sustainable development, it recognised the importance of reducing the vulnerability of rural populations to climate change and rural poverty by focusing on partnerships at three levels of intervention at: a) the local level (local municipalities and rural communities), b) at the regional level (Regional Governments of Apurímac and Cusco); c) the national level (Ministry of Environment). All interventions were designed to be implemented in line with UNFCCC and DRR principles, with strong emphasis given to sustainability, gender and social equity.
Phase 1 actions. The first phase (2008-2013, PACC 1), promoted research, activities and policy development to support the application of agricultural practices that improve livelihoods and reduce the vulnerability of rural communities to the effects of CC at the same time. In particular, the project demonstrated that by first establishing baseline data on the effects of CC on glaciers, water resources and agriculture, stakeholders could take informed decisions on how to assess, identify and implement agricultural adaptation measures suited to local conditions and needs. This approach also supported the mainstreaming of CCA in the Participating regional governments’ policies and strategies and plans.

Phase 2 actions. The second phase (2013-2017, PACC 2) focused on increasing the adaptive capacities of vulnerable rural populations in the high Andes of Apurímac and Cusco in order to strengthen their resilience to growing effects of CC on their livelihoods. At the political level, the project design builds on lessons learnt from PACC 1 to support the case for the integration of CCA at the national policy level and in research agendas. To achieve this PACC 2 had four main components: **Component 1** supported public management of CCA; **Component 2** promoted adaptive responses in the targeted communities in the high Andes; **Component 3** improved research and training on CCA; and **Component 4** supported the scaling up of adaptive responses and experiences in national policies and strategies. Key achievements of PACC 2:

- It supported the development of a platform of over 30 public and private institutions in Cusco to promote the implementation of the Regional Climate Change Strategy.
- It led to increased public investment is CCA in both Apurímac and Cusco.
- It enhanced adaptive capacity among 70,000 rural families.
- It helped position Peru in the international climate change arena, starting with CoP 20 in Lima (Dec 2014).
- It strengthened research capacity on CC and its effects on hydrology and glaciology by promoting cooperation between a Swiss scientific consortium (see A7) and universities in Apurímac and Cusco.
- It helped establish the scientific justification for mainstreaming CCA measures in the Apurímac and Cusco regional governments for use as models at national level in line with the updated ENCC.

In conclusion, PACC was a pioneering and exemplary project, because it was the first to focus on adaptation to climate change and contributed to laying the foundations in the country to recognising that climate change is happening and poses a major threat to the most vulnerable in Peru. Also significant is PACC's contribution to the systematic change evidenced in MINAM, in particular, its commitment to establishing the National Framework Law for Climate Change (2014), the first of its kind in Latin America and which has led the institution to develop national strategies to safeguard strategic resources through, for example, watershed management and to enhance food security and nutrition through the expansion of agroecology.
Overall scores: Design quality - 5; Effectiveness - 6; Impact - 6; Sustainability - 6; Transformative potential - very high for adaptation, moderate for mitigation.

Part D: Design quality

D1. Theory of change.
The central hypothesis of PACC 1 and 2 was that scientific research would generate knowledge to guide decisions that would support CCA among vulnerable farming communities in the high Andes. By establishing resilient rural communities, the project would build the case for mainstreaming CCA, first in the policies, strategies and plans of the Apurímac and Cusco regional governments, and then in national policies and strategies to facilitate implementation of the 2015 ENCC in line with its 2021 goal of Peru having "adapted to the adverse effects of, and taken advantage of the opportunities posed by, climate change in order to lay the foundation for sustainable low carbon development" (Government of Peru, 2015).

D2. Assumptions underlying the theory of change.
There is no logical framework to clarify the main assumptions of PACC 2, but the following can be reconstructed from existing documents.
Assumption 1. That scientific research on climate change, water and ice would provide information to support pilot activities at community level that would assist community adaptation through effective pilot projects.
Assumption 2. That findings from research and pilot CCA actions would be seen as useful by policy-makers and planners first at regional government level and then at national level, which could be used to make PACC 2 into an active partner of government in the role of technical/scientific adviser and lobbying for the scaling up of CCA responses that have been validated by upland farmers and stakeholders as effective and sustainable.
Assumption 3. That scientific partners would maintain an effective flow of relevant and quality-assured information to support policy dialogue and that government partners would commit sufficient human and financial resources to mainstream and implement the recommended CCA initiatives.

D3. Plausibility of assumptions and links.
The project was designed to emphasise the development of partnerships to facilitate dialogue and information exchange that encourage bottom-up learning and top-down coordination on CCA processes, this meeting the needs of the main stakeholders/end beneficiaries. This approach was aided by a comprehensive risk assessment with corresponding mitigation measures (SDC, 2013: Annex 5) to ensure the validity of the assumptions. A weakness in the concept of research partnerships and linked pilot community activities was that in the Andean cultural context the registering, validating, processing and use of written data is not common and knowledge is usually managed orally through memory, association and territorial mind mapping of cropping patterns, risks, etc. Apart from this, which has practical implications for how actions and their effects are monitored and reported, the assumptions upon which he theory of change was based were plausible enough.

D4. General quality of the project design (Score 5).
Stakeholder consultation. The design of PACC 2 built on stakeholder analysis and partnerships established in PACC 1, and there was a strong emphasis on inclusive participatory processes throughout.
Risks. The risk analysis identified high risks of political change (to be off-set by emphasising the over-arching importance and continuity of climate risks independent of political issues), and unregulated mining operations (to be monitored closely). Most attention was given to the risks involved in the changing role of PACC 2 from research to policy guidance, which would be mitigated through "adaptive management, flexibility and creativity to steer the program's actions towards opportunities in the institutional context. Courses of action will be defined jointly together with the counterparts, roles. clarified and mutual commitments formulized. At the same time, PACC will keep some control over project actions critical to achieving the desired change - such as support to Regional Governments in mainstreaming adaptation. The tool of a solid results-based monitoring and evaluation system (M&E) that will be applied together with the partners provides the necessary information for such an adaptive steering." (SDC, 2013: 4). The high expectations placed on the M&E system misses the knowledge management problem noted in D3.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.
Mitigation is not mentioned in the design document (SDC, 2013) and features in the final review (Pérez *et al*., 2017) mainly in the sense that PACC 2 supported a national direction of travel towards low-carbon sustainable development. Certain CCA actions involve planting trees and conserving or enriching soils which have carbon-capture effects, but although presumably significant there was no attempt to measure them or to include research specifically on ecosystem carbon.

E2. System change.
PACC was not designed to bring about system change on CCM. However, through its actions on CCA, PACC has provided greater scope for the regional governments and MINAM to explore whether CCA actions are increasing carbon storage and thus contributing to UNFCCC mitigation goals, and this is considered to offer moderate potential for transformative change.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.
Effectiveness (score: 6).
PACC 1 secured important results at the local/regional level in Apurímac and Cusco, while PACC 2 built on these results by promoting research and integration of CCA at the national level. The following specific findings were identified in relation to the following planned outcomes.

- **Outcome 2**.
  - Regional government ordinances created the Regional Council for CC in Cusco Department (CORECC) and the Regional Council for Environment in Apurímac Department (CAR), supported by the establishment of thematic committees on different aspects of CCA (water, food security, production, energy, risk management, health, biodiversity, education and housing).
  - Regional strategies on CC were elaborated, approved and implemented.

- CORECC and CAR each adopted an implementation plan for their respective regional CC strategies in 2014, which helped three municipalities in each department to identify, adopt and apply coordinated integration of CCA into their local development plans.
- PACC supported the production of a 'Guide to Updating Development Plans in the Context of Climate Change', which can be applied in other municipalities in the two Departments, as well as nationally.
- CORECC applied a monitoring plan with baselines from 2015 and reporting on 22 indicators (Peréz *et al*., 2017 noted that this report would be especially useful in the water and agriculture sectors, and ss a model for other regional governments).

- **Outcome 3**. Around 70,000 households are estimated to have directly or indirectly benefitted from the project (see H3.1 for a video on PACC activities and H3.2 for descriptions of ten of the more successful pilot projects). This was aided by the partnership with MIDES-FONCODES, which integrated CCA into its national *Haku Wiñay/Noa Jayatai* ('We will grow' in Quechua and Shipibo) social development programme, starting in pilot areas in Apurímac and Cusco. This included technical manuals, planning, management and monitoring, and in 2015 was extended nationally with 18 FONCODES territorial units across the country applying CCA together with the support of a large number of local promoters (*yachachiqs*).
- **Outcome 4**.
  - Capacity was built at universities in Apurímac and Cusco to do research in support of decisions on resilient development planning, but the forging of links between research centres had not materialised by the end of the project, and the research agendas did not include mitigation-relevant options such on renewable energy.
  - Capacity was built at universities in Apurímac and Cusco to advise on large-scale multi-disciplinary research projects supported by Swiss scientific entities, with courses on scientific discovery and disclosure, and publication of scientific articles.
  - Additional funding for research was mobilised from companies in the mining sector.
  - A post-graduate course on CC and sustainable development (CCSD) was developed at UNSACC (Cusco), with 55 master's graduates by the end of 2016, and special modules taught by experts of the the University of Zurich and other members of the scientific consortium (the high quality of the course as assessed by students led to integration of CCA/CCM into other university subjects in the pure and applied life sciences).

Impact and sustainability (score 6).
PACC 2 contributed to the development of the adaptation policies of two regional governments, prioritising vulnerable rural communities where the establishment of resilient agricultural practices was seen as key to their resilience. Good practices were to be upscaled at the regional and national level supported by research and professional training (see Orlowsky *et al*., 2017). See also F2, where all transformational changes induced by PACC are considered to have produced a positive impact and are sustainable.

F2. System change.
PACC has been instrumental in many ways that can be traced to abundant interim and advanced signals of transformative change at multiple levels of Peruvian society (see Peréz *et al*., 2017: 8-10 & 24-44):

- **Livelihood co-benefits**. Strengthening of institutional mechanisms on CCA in both Cusco and Apurímac Departments has been a major factor in increasing public and private investment in rural development projects that integrate adaptive practices in the high Andes.
- **Building resilient communities**. Applying CCA at the community level has helped mobilise and motivate farmers and their organisations to apply methods and technologies to enhance their resilience and role as guardians of their natural resources.
- **Political advocacy**. Applying effective monitoring and documenting of CCA experiences has enhanced political advocacy for upscaling CCA at regional and national levels.
- **University education**. Designing and delivering a popular post-graduate course on CCSD at UNSAAC (Cusco), has enabled the university to capture outside expertise on CCA to enrich and promote wider learning on CC, while research collaboration continued between universities in Apurímac, Cusco, Geneva and Zurich.
- **Ecosystem and livelihood co-benefits**. Contributing to the updated ENCC enabled the inclusion of scientific research to monitor climate risks (such as glacial retreat and its effects on water resources, on the variation of temperatures and rainfall patterns, and on the level of intensity and frequency of extreme weather events) and has supported policy dialogue on CCA.

- **International dialogue**. Stimulating informed dialogue on the importance of integrating CCA at the national level and international forums such as CoP 20.
- **Community education and involvement**. Developing technical manuals, planning, management and monitoring for the *Haku Wiñay/Noa Jayatai* programme, and in 2015 its extension to 18 FONCODES territorial units across the country with the support of a large number of *yachachiq* local promoters.
- **Appreciation of systemic risk**. Developing a capacity for risk management associated with major climatic events such as ENSO.

Part G: Other aspects of design and performance

G1. Efficiency issues.

Overview. Peréz *et al*. (2017) found that PACC had achieved a satisfactory level of efficiency due to effective management and an emphasis on partnerships. The strength of the project's design also appears to have been a factor in facilitating the conversion of resources into tangible results and achieving a satisfactory level of value for money. The fact PACC had two clear phases ensured that fragile partnerships started in PACC 1 could be consolidated and amplified in PACC 2 (see G2 and G4).

Implementation mechanisms. The project Steering Committee worked well and comprised representatives of the International Cooperation Agency (APCI), MINAM, SDC, the Cusco and Apurímac regional governments, the universities UNSACC (Cusco) and UNAMBA (Apurímac), and MIDAS-FONCODES. The research consortium supported by the Universities of Zurich and Geneva made a positive contribution to CCA studies. The implementing consortium of Helvetas, Libélula and PREDES included a good mix of expertise and capacity to provide the advisory services and coordination required.

G2. Coherence issues.

Peréz *et al*. (2017) found that PACC Phases 1 and 2 had promoted coherence through partnerships that performed well in promoting: (a) scientific research and teaching through university collaboration; (b) social development through the MIDIS-FONCODES programmes, and (c) environmental protection through inputs to MINAM on the ENCC and to regional governments on natural resources management. But less synergy was found with the Ministry of Economy and Finance (where it had been hoped to leverage additional funds from national and international sources), the National Strategic Planning Centre, the Regional Council for Science and Technology (CONCYTEC, where it had been hoped to prepare regional research agendas to link up universities with other actors in Peru), and with the private sector.

There were also weaknesses in promoting coherence between CCA and DRR (see H3.3 for guidelines on how this could be applied more effectively), which were defeated by the complexity of the respective, and separate, Peruvian systems. This also led to missed opportunities, for example in PACC not leveraging international funding through Sendai, or from the climate funds accessible to MINAM, while Barrott (2017) drew attention to the low level of cooperation with the business sector. Meanwhile, although SDC (2013) mentions coordination and synergy with the first phase of the project: Adapting Public Investment to Climate Change in Latin America 2010-2014 (IPACC), funded by Germany, the second phase (2015-2019) provides no evidence that coherence between PACC and IPACC II was established. (www.giz.de/en/downloads/giz2018-en-ipacc-peru.pdf).

G3. Replicability issues.

Evidence on the potential replicability and actual replication of CCA-relevant research and actions includes:

- that the training of teaching staff and researchers on CCA stimulated dialogue within academia and research institutions to replicate initiatives such as the Master's course on CCSD;
- that through applying ENCC, other regions have entered into dialogue with Cusco on replicating its regional strategy on CC; and
- that public investment in CCA has increased and reportedly supported over 70,000 upland families in applying CCA actions in the Apurímac and Cusco departments by 2017.

Replicability appears to have been highest where it was 'in tune' with local needs, capacities and indigenous technologies, such as the use of local varieties to improve pasture and family gardens. This aligns with the expectation that when local communities like what they see and understand it, they will replicate it willingly.

G4. Partnership issues.
The project design placed a strong emphasis on partnerships. Pérez *et al*. (2017) found that partnerships at several levels had been instrumental in increasing awareness, capacity, research and/or adaptive responses to advance the CCA agenda. These included: (a) academic and research institutions (i.e. universities in Cusco, Apurímac and other departments with the universities of Zurich, Geneva and technical bodies in the Swiss consortium); and (b) central government programmes/initiatives (i.e. the *Haku Wiñay/Noa Jayatai* programme with FONCODES, the ENCC updated and subsequent National Adaptation Plan and launch of the InterClima platform with the Directorate General for CC in MINAM, and supporting MINAGRI on development of the National Programme on Sowing and Harvesting Water and to optimise efficiency, effectiveness and sustainability). See also G1 and G2.

G5. Connectedness issues.
Apart from climate change itself, the vagaries of national politics, and high rates of staff turnover typical of the fragile institutions of the Andean region, influential factors beyond the project's control were few but included: (a) university strikes and protests following the introduction of the new University Law between 2014-2015, which prevented some research activities from taking place in Apurímac; and (b) illicit coca production and drug trafficking in the VRAEM zone which covers the north-western parts of Cusco and Apurímac (Castillo, 2018).

G6. Cross-cutting themes.
Gender. Pérez *et al*. (2017) found that PACC had generally paid insufficient attention to gender (page 10). Their only other significant finding on the issue was that "evidence from the field that the use of productive technologies has great impact on women`s lives. Women are at the nexus of several productive technologies in and around the family homestead: irrigation of crops and improved pasturage in small fields near the house, cultivation of vegetables in the improved gardens and small greenhouses in the courtyard or near the house, the collection and use of organic fertilizers on gardens and nearby cash crops, and the raising of small animals, particularly guinea pigs. Women's productive roles become key to longer term capacity building." (page 51).

G7. Capacity building issues.
The documentary record is silent on capacity assessment but capacity building is integral to all of the effectiveness, impact, sustainability and transformative achievements listed in F1 and F2.

Part H: Other matters arising from the review

H1. Follow-on questions, answers and suggestions arising from interviews by national consultants.
Question 1. *Is the scientific network established between UNAMBA-Apurímac, UNSACC, University of Zurich, University of Geneva and the consortium of Swiss scientific entities still working effectively? If yes, has it been expanded to officially include other universities in the same and other Departments? Provide examples.*

- **Answer**. The scientific network did not fully materialize, because UNAMBA experienced internal governance problems that affected the research programme that left the university without official interlocutors. Even so, PACC was relevant to UNSAAC and Cusco's Regional Government and the relationship with participating Swiss universities continues. For example, they have published scientific journals on climate change in the tropical Andes since PACC's closure in 2018; the latest publication was produced in October 2021. The main systemic change evident from PACC has been the shift in the university's education policy, leading to the full incorporation of CC in the university curriculum. Moreover, the interviews confirm learning on CCA has increased with each new batch of students since 2018, signifying a critical mass of students is developing with respect to the understanding and promotion CCA in the high Andes of Peru. However, there is no evidence so far to indicate that the so-called scientific network established between UNSAAC and the Swiss universities of Geneva and Zurich has expanded to include other universities of Peru, or been replicated elsewhere in Peru or the Andean region.
- **Suggestion**. SDC should draw lessons and systematise results of PACC so that the successful scientific network established between USAAC and Swiss universities is expanded to other interested universities throughout the Peruvian Andes and similar SDC programmes, such as PIAACC in Bolivia or the regional programmes, Andean Forests (ANFOR) and Resilient Andes. This should be promoted with the support of the government

and other private institutions, focusing on departments where there is extreme poverty such as Huancavelica in Peru.

Question 2. *What are the main gaps identified in the scientific network that still need to be addressed to optimise its efficiency (for example, through joint-research exercises) effectiveness and sustainability?*

- **Answer.** Three main gaps have been identified. They are: a) the type of research promoted; b) the lack of a consistent research process which, for example, has affected qualitative research due to a lack of regular and direct contact with research sources , thus reducing the scope for mutual learning and information exchange; c) the Swiss researchers visited Peru over short periods only. This limited the opportunities for useful exchanges of knowledge and information with the local researchers and concentrated dialogue among teaching staff.
- **Suggestion.** A minimum period of stay of one year should be put in the place for visiting researchers, taking into account the Peruvian Andes has different seasons with specific climatic and environmental characteristics that need to be studied and contrasted. Moreover, it is highly recommended to identify key local researchers, who cover different territories within the participating Departments so they access to long-term research funding and are encouraged to apply longer-term research on the effects of CC. In this way, it is more likely students will become university lecturers who can guide more effectively the updating of the curriculum to promote the most appropriate, effective and sustainable forms of adaptation and mitigation to climate change to reduce poverty and enhance resilience.

Question 3. *Are the people trained in CCA in the Regional Governments still there? If yes, have they updated the CC strategies and implementation plans since their launch? If no, how is CCA managed within the Regional Government?*

- **Answer**. One of the main impacts of the program so far has been some of the university students who have received training on CCA have become local leaders, and in some cases been elected as mayors of the municipalities where they live. Many of these have supported the application of CCA in their local communities. For example, there has been the scaling up of of water capture technologies known as *cochas* in both Cuzco and Apurímac departments; namely ponds established in natural depressions that produce underground streams from which water is recaptured and used for agroecological practices.
- **Suggestion.** The university network and SDC should do more to capture good practices that are being upscaled in local communities and showcase them through more effective communication campaigns designed to encourage their replication to support sustainable and resilient farming systems given they are low-cost technologies that are easy to operate and maintain and which when combined with local crop varieties can deliver a high cost-benefit ratio and social and environmental co-benefits. To help speed up the adoption of these technologies, it is recommended that demonstrations of good practices are promoted in local fairs and festivals and to support their replication through their dissemination with the support of the State to ensure logistical support and to promote replication through incentives and prize-giving to the most innovative practices (in terms of reducing the impact of climate change and enhancing resilience to it).

Question 4. *What has SDC/GPCC and MINAM/Regional Governments learned from PACC and is there evidence good practices on CCA have been upscaled/out-scaled to the whole country?*

- **Answer.** PACC is a pioneering and exemplary project, because it was the first to focus on adaptation to climate change and contributed to laying the foundations in the country to recognising that climate change is happening and poses a major threat to the most vulnerable in Peru. Also significant is PACC's contribution to the systematic change evidenced in MINAM, in particular, its commitment to establishing the National Framework Law for Climate Change (2014), the first of its kind in Latin America and which has led the institution to develop national strategies to safeguard strategic resources through, for example, watershed management and to enhance food security and nutrition through the expansion of agro-ecology.
- **Suggestion**. The lessons learned from the first and second phases of PACC together with its impact to date (especially in Cusco Department) should be captured in an ex-post evaluation and key findings communicated to local and national university actors in the interests of establishing dialogue on the development of a national strategy to upscale good practices that support a coordinated research response to CCA in all three main regions of Peru (Coast, Andes and Amazon), as well as in relation to the SDC's programmes supporting CCA in the Andean region (such as ANFOR).

Question 5. *Is there evidence of convergence between CCA and DRR disciplines (at National and Regional Gov. levels), especially on managing disaster risks associated with abnormal climatic phenomena/weather events.*

- **Answer.** There is limited evidence of formal convergence at both the national and sub-national levels, since risk management has a National System and its own National Plan for Disaster Risk Management (which includes prevention), while CCA is led by MINAM. However, in practice there is evidence of convergence in areas such as hydro-meteorological data collection, which is used to support both DRR and CCA. Also significant is the lack of convergence on these issues in SDC programmes, although there are cases where DRR and CCA converge. For example, in Apurímac the ANFOR programme is supporting the recovery of forest ecosystems over a 30,000 ha area, which will perform two important functions: (a) reduce the risks of natural disasters that are common in the Andes, such as *huaycos* (mud-slides) and; (b) reduce the effects of climate change, in particular the growing effects of prolonged droughts on vulnerable rural communities.
- **Suggestion.** SDC should explore ways in which it can integrate DRR into its ongoing regional programmes on CCA and promote national and sub-national policy reforms that support the convergence of DRR and CCA so that scarce national resources are concentrated on coordinated approaches to preventing disasters linked to climate change and develop adaptive sustainability.

Question 6. *Is there convergence emerging between CCA actions in the field and restoration of upland ecosystems?*

- **Answer**. There is important evidence showing that CCA is helping to restore high Andean ecosystems that have been affected by over-exploitation of resources, especially over the past 50 years, due to poor development policies and practices and ineffective law enforcement. For example, the restoration of *paramos* (upland grasslands) and *bofedales* (Andean wetlands) has played an important role in restoring aquifers and encouraging some local government to introduce ordinances to designate them as protected areas, which is crucial to sustaining CCA of the local communities concerned. Indeed, there is evidence of **transformational changes** taking place by local communities through the issuance of local ordinances to support the switch from unsustainable agricultural practices to to becoming the guardians of their natural resources. For example, in Apurímac PACC has helped inspire the 'Green Apurímac' initiative, which centres on restoring more than 60,000 hectares of high Andean soils, prairies, lagoons, wetlands, through mainly in-kind approaches due to limited funding available through the regional and municipal governments concerned.
- **Suggestion.** SDC should do more to capture the impact of its programmes at the community level (where key stakeholders/beneficiaries are likely to still be present) preferably between three and ten years after the implementation phase.

Question 7. *How far have governance issues been addressed and applied to support the CCA agenda (especially applying the law on polluters of NR and illegal extraction of water)?*

- **Answer**. In the rural setting, effective governance relies heavily on local community-based schemes given the law enforcement agencies have few resources and limited capacity to apply environmental laws. For example, PACC contributed to developing more effective governance in Cusco Department by training and supporting the development of the CORECC, through which civil society actors are able to learn and exchange information on good governance initiatives being applied at the local community level. Similarly, it has helped the Directorate of Energy and Mines become more proactive in applying measures to restrict the activities of informal mining to protect water resources (from mercury pollution). In addition, CORECC has overseen the formulation of the climate change strategy for Cusco Department and the creation of the Regional Council Agreement.
- **Suggestion**. SDC and its partners should pay more attention to the important role that effective law enforcement plays in deterring illegal and unsustainable use of natural resources. In particular, attention should be given to: (a) adoption of a more inclusive approach that ensures the formal organs of the State, such as the Judiciary, the Public Ministry, and the National Police are trained to support the application of environmental ordinances, laws, by-laws and regulations; and (b) strengthening the capacity of Local Defense Committees to actively support local communities, forest rangers, etc. apply effective governance.

Question 8. *Looking back, what could and should PACC 2 have done differently to reach its objectives?*

- **Answer**. The programme's scope should have been more ambitious, ensuring a specific focus on helping the regional governments of Apurímac and Cusco gain access to international climate funds, such as the GCF, in order: (a) to scale up research and apply effective CCA over a wider number of local communities; and (b) to build a robust network mechanism to promote synergies with other relevant donor-funded and government interventions, such as Sierra Azul executed by MIDIS. In addition, greater attention is urgently required to complement the technical assistance provided by SDC-funded projects; namely the development of rural extension services for agriculture, through which CCA is not only promoted, but also sustained and monitored. Finally, more attention should be given to check-listing university partners to ensure SDC-funded projects select educational establishments that do not experience the shortcomings discovered in UNAMBA after the PACC programme had started.

H2. Missing documents. (a) Government evaluation of PACC (if conducted). (b) Ex-post review of PACC (if conducted since 2017)

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1 Visibility of PACC
See - video on PACC Phase 2 (2015): www.youtube.com/watch?v=KTt0z3zP5eo.

H3.2 Ten effective, low-cost, replicable CCA solutions identified by PACC (source: Barrott, 2017).
1. Water Sowing and Harvesting. This is an ancient technology that makes use of natural depressions of the landscape to refill local aquifers. Water sources are increasingly disappearing in the Andes during the dry season, which reduces water availability for agricultural and human consumption. This technique results in water flow reappearing and/or increasing downhill, leading to improved pastures, moderation of the microclimate and conservation of biodiversity and the landscape. Approximate cost: USD 74 to build an 80 m^3 dam.
2. Pasture Rotation and Temporary Closure of Grazing Areas. This is a technique that involves moving cattle from one pasture unit to another according to a set schedule. It solves problems of overgrazing and degradation of vegetation cover, water and wind erosion and loss of biodiversity. It also improves the capacity of rainwater to infiltrate the soil and be stored in the subsoil, improving pastures for the feeding of cattle. Approximate cost: USD 1'577/ha. (Materials: USD 989; labour: USD 588).
3. Agroforestry. This is the deliberate association of trees or shrubs in agricultural system, e.g. by means of living fences. In the high Andean areas sudden climatic variations are eroding the soil, decreasing food production and thus food security. Agroforestry helps to protect crop areas from cattle intrusion, strong winds and temperature changes. It also creates new microclimates, improving soil fertility and moisture retention. Approximate cost: USD 0.36 per seedling.
4. Organic Fertilizers. Organic fertilizers are made from animal faeces, vegetable remains, food waste, crops or other organic and natural source. In many areas soil fertility has declined due to inadequate crop rotation and fertilizer use, combined with lack of knowledge about new fertilizer techniques with local inputs. Organic fertilizers help to reduce reliance on artificial chemicals and lower production costs. They also increase soil organic matter, fertility and yields. Approximate cost (if bought): From USD 29 ('biol'), USD 33 (compost) to USD 107 (Andean practices associated with livestock management).
5. Healthy Housing. Thanks to improved house design and location, it is possible to prevent diseases and improve the health of the family, thus increasing the physical and emotional well-being of its inhabitants. The houses in high Andean are regularly built-in areas under risky conditions and heavy rain can be the source of collapses and disasters. Traditionally, inhabitants often cook with wood inside, resulting in respiratory and eye problems. Better housing improves the health conditions of families and improves their social relationships. It also encourages work organization and collaboration among community members. Approximate cost (per house): USD 1,351 (USD 393 in labour and USD 958 in materials).
6. Local Climate Monitoring. This is the reading, recording, compilation and systematic analysis of the values of meteorological variables from a station and provides families and municipalities with climate information for decision making. Approximate cost: USD 6'690 for a manual weather station (USD 2'304 in materials, USD 3'374 in equipment, USD 951 in labour for installation and USD 61 per month for 3 readings).

7. Promoting Early Childhood Development. This integrates a set of interventions in education, nutrition and emotional and social stimulation aimed at children from 0 to 5 years. Children in high Andean areas are prone to chronic malnutrition, resulting in delays in psychomotor development, language and social skills. Early childhood interventions help to improve the nutrition of children, which strengthens their immune system, while developing their intelligence and improving school performance. Approximate cost: USD [*missing data*] for setting up an early stimulation centre; USD 767 for breastfeeding promotion; and USD 13,804 in annual professional counselling per district (which in the rural high Andes would comprise between 3,000 and 20,000 families).

8. Vegetable Production in Greenhouses. This consists of producing vegetables and fruit in greenhouses covered with plastic or polycarbonate sheets. Andean average elevation hinders vegetable production, leading to a poorly balanced family diet. Vegetable production ensures family food security and improves nutrition and health. It also allows the generation of additional income through the sale of surplus production. Approximate cost: USD 216 for the installation of an open-air greenhouse; USD 382 for a greenhouse made of plastic; USD 620 for a greenhouse made of polycarbonate.

9. Animal Husbandry. This practice promotes family raising of guinea pigs, whose meat is high in protein. This diversifies the family diet and helps to reduce protein deficiency, chronic malnutrition and anaemia, which make families more vulnerable to climate change. The sale of surplus production also allows the family to obtain extra income. Approximate cost: USD 123 for a reproductive unit of one male and ten females.

10. Community Leadership Training Programme. This involved training lead 'rural promoters' to enhance technical assistance and social support to families, thus helping to improve agricultural practices through the promoters' proximity to rural families. Approximate cost: USD 307/month.

H3.3 Building coherence between CCA and DRR (Source: OECD, 2020).

Climate change adaptation and disaster risk reduction are managed by different sets of institutions in Peru, with regional governments being required to participate fully with both. PACC attempted to close this gap by funding the training of over 2,000 officials and university staff on risk management and CCA in public investment planning and management. But the National System for Disaster Risk Management includes the National Council for DRM itself as well as national centres for DRR (CENEPRED), civil defence (IDECI) and strategic planning (CEPLAN), the police and armed forces, and the regional governments. This complexity was not adequately factored into project design and planning, so performance was limited. Light on how to integrate CCA and DRR is shed by a study on 'Common ground between the Paris Agreement and the Sendai Framework" (OECD, 2020), which included comparative analysis of the national approach in Peru, Ghana and the Philippines. It found the following key areas where convergence can be promoted.

- **Aligning responsibility for co-ordination with responsibility for implementation of CCA and DRR policies**. For example by: (a) ministries and agencies at the national level should have information and incentives to integrate CCA and DRR across their portfolios, and report back on progress centrally; (b) making use of ministries and agencies with a presence at the local level and responsible for implementation to ensure that national directives on CCA and DRR are integrated with local development plans; (c) reinforcing the mandate of relevant ministries and agencies to enforce existing regulatory measures and provide incentives in support of CCA and DRR, such as land-use management and environmental protection; and (d) build on international momentum on CCA policies to also bring domestic attention and resources to the reduction of climate-related disaster risks, and specifically risk prevention measures.
- **Make tailored climate information readily available to support evidence-based policy**. For example, by: (a) providing support/incentive mechanisms to encourage owners of data to make climate information easily accessible for users at all levels; (b) converging risk assessment methods across sectors to support coherent decision-making on CCA and DRR on the ground; (c) generating comprehensive information related to current vulnerability and exposure, and layer this with information on future hazards, which is inherently uncertain and requires careful interpretation; and (d) ensuring there are channels for locally collected data on vulnerability to contribute to the wider understanding of vulnerabilities.
- **Enhance capacity to translate coherence in planning into coherence in implementation**. For example by: (a) supporting local governments in implementing national

directives on CCA and DRR by providing, for instance, incentive and review mechanisms (e.g. funding allocations and approvals of local development plans) as well as guidance, tools and checklists; (b) understanding local CCA and DRR priorities and capacity constraints, recognise challenges to continuity in building capacity, and tailor efforts accordingly; (c) providing tools and strengthen the capacity of stakeholders – especially at the local level (e.g. by working with local universities) – to use climate information including projections in a way that supports robust decision making on CCA and DRR; and (d) facilitating peer learning on good practices to common challenges (e.g. erosion) among local governments.

- **Optimise long-term funding allocation across different risks through budgeting tools, ex-ante financing plans and greater transparency in public spending**. For example, by: (a) making use of financial management tools (e.g. budget coding and expenditure review), risk assessments, and economic analysis (e.g. cost-benefit, cost-effectiveness and multi-criteria analysis) to support budget allocation for CCA/DRR; (b) improving transparency in national and sub-national public spending (e.g. budget and expenditure tracking) to identify areas for improvement in coherence between CCA and DRR, and review the results to future financial decision-making; and (c) establishing ex-ante financing plans, including approaches for financial protection that ideally take stock of potential public disaster costs (including future climate impacts) and identify financing options for response, recovery and rehabilitation.
- **Monitor, evaluate and learn from CCA and DRR**, such as by mapping data and information to support learning on CCA and DRR, identify synergies on reporting and guide future reforms of policies, strategies, plans on CCA/DRR.

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Part J: Acronyms and abbreviations

APCI	International Cooperation Agency
CORECC	Regional Council for CC in Cusco Department
CAR	Regional Council for Environment in Apurímac Department
CCA	Climate change adaptation
CCM	Climate change mitigation
CENEPRED	National Centre for the Estimation, Prevention and Reduction of Disaster Risk
CEPLAN	National Centre for Strategic Planning
ENCC	National Strategy for Climate Change
ERCC	Regional Strategy for Climate Change
IDECI	National Institute of Civil Defence
GCF	Green Climate Fund
MIDIS-FONCODES	Ministry for Development and Social Inclusion - Social Development Cooperation Fund
MINAM	Ministry of Environment
PREDES	Centre for Studies and Prevention of Disasters
UNSAAC	National University of Saint Antony Abad of Cusco
UNAMBA	National University of Micaela Bastidas of Apurímac
VRAEM	Valley of the Rivers Apurímac, Ene and Mantaro

Annex 13.3: Biocultura in Bolivia

Project highlights.

7F-05448: **Programa BioCultura: Living in harmony with Mother Earth**. Helped strengthen laws, accountable governance and planning at all levels, in favour of adaptation and mitigation by excluding open-access regimes of exploitation and encouraging more accountable decision making especially in the vulnerable Andean region; recognised as having shaped key parts of the Bolivian position on climate change.

Part A: Basic data

A1. Project number & name. 7F-05448 - Biocultura and Climate Change (*Proyecto Biocultura y Cambio Climático*, PBCC)

A2. Sources.
Process of PRF development: (a) draft PRF prepared using documents listed in the bibliography; (b) draft PRF reviewed by national consultant **Mario Zenteno** during four days in La Paz and four in Cochabamba; (c) the PRF was revised in light of field findings. A Contribution Narrative about Biocultura and its role in Bolivia's policy development was presented at the evaluation's Core Learning Partnership meeting on 13 Dec 2021.

- **Phase 1 (2007-2012)**. Biocultura: Living in harmony with Mother Earth. Because the first 14 months were dedicated to a preparatory period leading to a revised Budget Proposal, the preparatory period is referred to hereafter as Phase 1 and the implementation of BioCultura refers to Phase 2.
- **Phase 2 (2009-2015)**. Biocultura: Living in harmony with Mother Earth. www.eda.admin.ch/countries/bolivia/en/home/international-cooperation/projects.html/content/dezaprojects/SDC/en/2007/7F05448/phase2
- **Phase 3 (2016-2020)**. Biocultura and Climate Change. http://biocultura.prorural.org.bo/?cat=128
- **Phase 4 (2021-2023)**. Biocultura and Climate Change (exit Phase).
- Main source: Pro-Rural (2021).

A3. Dates & financial data.

- **Phases 1-2**: Oct 2007 to Jun 2014. SDC budget CHF 1,250,000 (preparatory period of 14 months - Phase 1) and CHF 13,400,000 (for Phase 2).
- **Phase 3**: Aug 2014 to Dec 2019, extended to 30/09/2020. SDC budget CHF 12,000,000.
- **Phase 4 (exit phase)**: Oct 2020 to Oct 2023. SDC budget CHF 3,300,000.

A4. Location(s). Bolivia

A5. SDC Geography. Latin America and Caribbean

A6. SDC Domain. South Cooperation/SC LAC
Phases 1-2: SDC Theme: Sustainable management of natural resources (2008-2014).
Phase 3: Global Programme Climate Change and Environment

A7. Partners.

- **Phases 1-2**. **Main National Partner**: Vice Ministry for Environment, Biodiversity, Climate Change and Forest Resources Development (VMA). **Main sub-national partners**: Andean region municipalities. Service provider: a consortium of institutions specialised in biodiversity: Proinpa Foundation, Agroecological Research Centre of the Higher University of St Simon, Cochabamba (AGRUCO- UMSS) and Swiss Inter-cooperation.
- **Phase 3**. **Main National Partners**: Ministry for Environment and Water (MMAyA) and the Plurinational Authority for Mother Earth (APMT). **Main sub-national partners**: Five Autonomous Departmental Governments (GADs) of Chuquisaca, Cochabamba, La Paz, Oruro, and Potosí; 25 municipal governments (GAMs) including one in Tarija Department that includes four Indigenous Territories and 11 Life Systems. Service provider: Pro-Rural (Bolivian Association for Rural Development).

Part B: Purpose, relevance and approach

B1. Purpose.
Phase 1 Goal: to promote the development of public policies and strengthen local mechanisms for the management of biodiversity within the peasant and indigenous communities of the

country in the interests of developing economic opportunities, increasing food security, conserving biodiversity and giving recognition to their cultural identity. The **main approach** was to support a programme approach, in which the next phase would focus on strengthening institutional and community capacity to enhance participation, harmonization, ownership and alignment with national development priorities (in particular, at that time, the Participation, Culture and Environmental Sustainability Programme).

- **Specific objective 1**: to foster the development of a favourable political and institutional framework to support local management of biodiversity, through local and participative approaches.
  - **Outcome 1.1.** The Vice Ministry will develop its National Program and/or other national programs, based upon recommendations suggested by communities, using a demand-driven approach.
  - **Outcome 1.2**. The indigenous and peasant communities will institutionalize their local norms and practices for managing biodiversity, through their involvement in public policy decision-making processes at the national, regional, and local levels.
- **Specific objective 2**: to enhance rural livelihoods and develop sustainable and viable economic alternatives based on biodiversity-related products and services.
  - **Outcome 2.1**. Indigenous and peasant communities will develop and/or improve the ways in which they use and conserve in-situ agrobiodiversity within their territories.
  - **Outcome 2.2**. Indigenous and peasant communities will improve the ways in which they use and conserve forest ecosystems and their associated products and services.
  - **Outcome 2.3**. Genetic resource ex-situ conservation systems (gene banks) will be strengthened and will provide conservation services adequate to the needs of indigenous and peasant communities.
  - **Outcome 2.4**. Innovative livelihoods and inclusive, sustainable, and viable economic alternatives will be developed allowing the increase of income and food security among communities.
  - **Outcome 2.5**. Communities' representative organizations and local economic organizations will be strengthened, so as to support the local management of biodiversity.
- **Specific objective 3**: to develop innovation capabilities among indigenous and peasant communities, through knowledge management.
  - **Outcome 3.1**. Indigenous and peasant communities will recognize the value of and document their local knowledge and experiences, hence strengthening their cultural identity.
  - **Outcome 3.2**. Indigenous and peasant communities will engage in knowledge exchange with other communities in the country and abroad, hence increasing their capabilities for innovation.

Phase 2 Goal: to promote the conservation and sustainable use of Andean ecosystems and reduce poverty of peasant and indigenous communities of Bolivia. The **main approach** was that of ecosystem management, in which local communities, government decision-makers and research institutes were to be engaged in developing policies that would be coherent with local knowledge and would lead to new sustainable economic activities.

- **Specific objective**: to promote the conservation and sustainable use of Andean ecosystems and their biodiversity in territories defined in the Andean region of Bolivia.
  - **Outcome 1**: communities' local knowledge on ecosystem management and biodiversity conservation has been developed and reinforced in the 300 participating indigenous and peasant communities.
  - **Outcome 2**: territorial governance in participating territories in the Andean region has been improved allowing equitable access within 150 communities (for men and women) to ecosystem resources and the benefits derived from them and a reduction in conflicts within communities (especially disputes on access to grasslands and water use rights).
  - **Outcome 3**: the sustainable use of ecosystem resources (forestry products, agriculture products, water, etc.) leads to an increase in family income by 50% and aggregate community income by 10% in all 300 targeted communities (women's income increases by 30%) in relation to current levels.
  - **Outcome 4**: ecosystem functions and their derived resources and services have been conserved in at least 85% of participating territories.
  - **Outcome 5**: strengthening of the State (including research and monitoring mechanisms) leads to the implementation of public policies supporting the conservation and

sustainable use of biodiversity, including economic and fiscal incentives to produce biodiversity-based products.

Phase 3 Goal: to contribute to improving the living conditions of families and vulnerable rural communities in the Andean region of Bolivia in a changing environment. The **main approach** was that of promoting community participation in support of local authorities in establishing joint CCA mechanisms for identifying and applying Climate Resilience Plans for Living Well, with the aim of safeguarding the ability of vulnerable rural communities to live in harmony and balance with nature (symbolised by 'Mother Earth').

- **Specific objective 1**: to build capacity at the Ministry of Environment and Water (MMAyA) to implement inter-sectoral and sub-national councils, design environmental sector plans, update the normative and operational framework for environmental management and strengthen the environmental management of protected areas, integrating CCA.
- **Specific objective 2**: to build capacity at the Plurinational Authority for Mother Earth (APMT) to implement Law 300, especially regarding the proper functioning of the Plurinational Fund of Mother Earth (FPMT) and the implementation of adaptation and mitigation/adaptation mechanisms for the integral management of forests and Mother Earth.
- **Specific objective 3**: to position the Bolivian model of Living Well in harmony and balance with Mother Earth in the international arena, and promoting awareness of experiences in the field application of adaptation and mitigation/adaptation mechanisms.
- **Specific objective 4**: to support the departmental governments with technical assistance and in collaboration with APMT to help them formulate and implement Climate Resilience Plans for Living Well at the departmental level.
- **Specific objective 5**: to support local government in implementing the Climate Resilience Plans for Living Well in 25 territories (life systems) and 400 communities comprising 15,000 vulnerable families.

B2. Relevance to partners.

Overview. *Relevance*: successfully demonstrates strong contextual alignment and timing regarding the implementation of national policy on climate change (under Framework Law 300) - in line with two of CIF's five dimensions for achieving transformational change. *Approach*: community-based participation supports local authorities establish joint CCA mechanisms to identify and apply Climate Resilience Plans and whose goal is to safeguard the ability of vulnerable rural communities to live in harmony and balance with nature and Mother Earth.

Phases 1-2:

- **Bolivian society**. Both phases were fully aligned with the pluricultural principles of the 2009 Constitution and Phase 2 in particular complied with the interests and needs of marginalised and vulnerable Andean communities by recognising, valuing, and using their local knowledge and technologies (in combination with cosmopolitan science where relevant) to reduce poverty.
- **Bolivian government**. Relevant to VMA's " ambitious Participation, Culture and Environmental sustainability Program [even though] the Vice Ministry has recognized that it currently lacks the required capabilities for implementing such a program and has hence identified capacity building as one of the utmost priorities of the VMA." (SDC, 2007: 4). Biocultura is also included as a core initiative in Bolivia's National Biodiversity Strategy.
- **Regional partners**. BioCultura 2 was highly relevant to the Andean Community of Nations (CAN) aligned with the Andean Regional Biodiversity Programme (BioCAN, 2010-2014), whose main objectives were to protect the environment of the Amazonian region of Andean countries and support the sustainable use of its forests, and the Amazon Cooperation Treaty Organisation's Bio-commerce Initiative.
- **Switzerland**. Relevant to SDC's commitments on reducing poverty: "Biodiversity's potential for economic and social development has yet to be deployed so that the indigenous and peasant communities located in the Andes can leap out of poverty, where the poverty level reaches almost 80% of the rural population" (SDC, 2007: 4).

Phase 3:

- **Bolivian society**. Successfully demonstrated strong contextual alignment and timing regarding the implementation of national policy on climate change (under Framework Law 300). It was therefore in line with two of CIF's five dimensions for achieving transformational change.

- **Bolivian government**. Relevant to MMAyA's responsibilities in applying Framework Law 300, which was designed and enacted with the support of BioCultura 2 and which includes provisions for the application and management of CCA plans to enhance resilience.
- **Switzerland**. Relevant to SDC's priorities under the GP CCE and its strategic aim of promoting sustainable development, since BioCultura 2 demonstrated that by recognising and integrating local knowledge on ecosystem management, local communities can conserve and use biodiversity sustainably to reduce poverty while also enhancing their resilience to climate change impacts.

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 1: No poverty**, especially Target 1.1 (*By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day*) and Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*).
- **SDG 2: Zero hunger**, especially Target 2.4 (*ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters*), Target 2.b (*Correct and prevent trade restrictions and distortions in world agricultural markets*) and Target 2.c (*ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility*).
- **SDG 13: Climate action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*), Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 15: Life on Land**, especially Target 15.4 (*By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development*), Target 15.5 (*Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species*) and Target 15.9 (*By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts*).
- **SDG 17: Partnerships for the Goals**, especially Target 17.9 (*Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation*).

B4. Relevance to other development objectives.

Convention on Biological Diversity (CBD). Phase 1 was explicitly aligned with "the National Government's policy to strengthen the implementation of the instruments suggested by the **CBD**" (SDC, 2007: 3), while Phases 2 and 3 supported several of the CBD's **Aichi Targets**:

- Target 1 (*By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably*);
- Target 13 (*By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity*);
- Target 14 (*By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable*); and
- Target 18 (*By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels*).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Capacity-based mitigation (CM) oriented to Ecosystem-based mitigation (EM).
Adaptation: Capacity-based adaptation (CA) oriented to Ecosystem-based adaptation (EA).

B6. Relevance/approach within the climate response based on SDC classification (see H3.1).
Rio Marks given in the SDC project spread-sheet:
Mitigation. Significant (1), but variously by sub-activity between 0 and 1.
Adaptation. PRINCIPAL (2), but variously by sub-activity between 1 and 2.

Part C: Narrative overview

Background and purpose.
Phase 1 was designed as a preparatory phase for Phase 2 whose main objective was to reduce poverty in the Andean region of Bolivia, given it accounts for 40% of Bolivia's land area and over 80% of the population who live there are below the poverty line and experience the highest levels of malnutrition in Bolivia. Two key root causes of this situation relate to the historical marginalisation of biodiversity-based initiatives to maintain food security and nutrition (based on local knowledge within established 'life systems') and the lack of an institutional framework to support the sustainable use and conservation of biodiversity. Phase 3 responded to threats posed by climate change to the gains of phases 1-2 and to rural lifeways in general, in particular by applying the idea of 'Living Well'.

Effectiveness.
High overall performance of each phase was a major justification for the next one, up to and including the current exit phase. Phase 2 (the results of which justified Phase 3) supported formulation and ratification of the Framework Law of Mother Earth and Integral Development ('Law 300'). This law defines the national climate policy while also strengthening the recognition of traditional Andean organisations (*ayllus* and *markas* - see H3.2), recognising that Andean traditional knowledge can be combined with scientific knowledge to tackle climate change and reduce poverty, and improving compatibility between economic and environmental activities. It also helped improve household incomes, food security and nutritional diversity, promoted the sustainable management of natural resources in community territories and national parks, helped to improve governance of natural resources in 35 municipalities (through new resolutions and statutes) and the development of TCO processes with three indigenous peoples. Phase 3 then facilitated further progress in five main areas (Pro-Rural, 2019):

- **Support for planning**, including the development of Integrated Territorial Development Plans (PTDI) by 25 municipalities and by two of Bolivia's nine departments (Tarija and Chuquisaca), a Community Land Management Plan (PGTC) for a First-nation Peasant Indigenous Territory (TIOC) at Raqaypampa, as well as three Institutional Strategic Plans (PEI) and several Integrated Sector Development Plans (PSDI) for 'living well', all with CCA elements.
- **Support for local regulation**, including the development of 33 municipal regulations (on protected areas, protection and conservation of ecosystems and water, and food security), and of 35 community regulations (to preserve soils and ecosystems and consolidate institutional frameworks), all with CCA elements.
- **Support for enterprise development**, including strengthening 20 local enterprises based on food processing, camelid farming, beekeeping and biocultural tourism.
- **Support for the validation of local cultural practices**, including fairs, ritual practices and reciprocity, to advance social cohesion and CCA based on ancestral knowledge.
- **Support for the National System of Protected Areas**, including the creation and consolidation of reserves and introduction of CCA management practices.

Impact and sustainability.
Biocultura focused on strengthening laws, regulations, accountable governance and planning at all levels, so specific impacts are harder to identify than they would have been if Biocultura had concentrated on the more tangible parts of the TCO process. There were however signals that by 2021 influence was being exerted at the highest level of government, with Biocultura recognised as having shaped the main elements of the Bolivian position on climate change, as ratified by the head of VMA, the Ministry of Foreign Relations and the Plurinational Authority of Mother Earth (Pro-Rural, 2021). Impacts were also being seen in terms of political commitment to legislative reform by the VMA, including an environmental agenda covering the development

of new laws for protected areas, the Defence of Mother Earth, Knowledge and Wisdom, eco-towns and sustainable cities, among others.

Transformative potential.

There was evidence of progress on four of the five CIF indicators of transformational change: (a) by demonstrating **strong contextual alignment and timing**, i.e. with the constitutional reform process in 2006-2009, and supporting local knowledge and technologies to reduce poverty; (b) by showing **evidence of systemic change**, because Phase 2 was instrumental in the design, approval and application of Framework Law 300, in which CCA is a priority in the context of maintaining harmony with nature and 'living well'; (c) by providing **evidence that adaptive sustainability is emerging** and likely to be consolidated in Phase 4; and (d) by **scaling up of change** to achieve harmony with nature. The last point seems to add another indicator of transformational change, that of cultural shift, which may well be the most important of all from a 'grand strategic' point of view.

Overall assessment: **design quality** - excellent (score 6); **effectiveness** - excellent (score 6); **impact** - excellent (score 6); **sustainability** - excellent (score 6); **transformative potential** for adaptation very high, for mitigation moderate.

Part D: Design quality

D1. Theory of change.

The need for Biocultura arose from recognition that many of Bolivia's natural ecosystems had been destroyed or were under threat, that biodiversity is a key resource for sustainable development and poverty relief, that biodiversity and indigenous cultures are co-dependant and faced common threats, and that an opportunity had arisen with new Bolivian policies to preserve both in the context of a new constitutional settlement. It was also realised that healthy ecosystems provide environmental security and so contribute to climate change adaptation (CCA), while storing carbon and thus contributing to climate change mitigation (CCM).

After a preliminary design and adaptation phase, Phase 2 sought to build capacity to manage ecosystems and restore harmony between man and nature, at the municipal level and among local peasant and indigenous community organisations. To do this, it proposed to focus on: (a) strengthening the capacity of local government to operate in accordance with local needs and customary norms; (b) applying research and monitoring mechanisms to support public policy design, enforcement and fiscal incentives to bring about biodiversity conservation and its sustainable use; (c) strengthening local knowledge to enhance cultural identity and recognition that local knowledge is crucial to effective ecosystem management; (d) improving territorial governance of ecosystems and their resources and services to secure a reduction in conflicts over these resources and services and to integrate women in decision-making on ecosystem management; and (e) promoting the conservation and sustainable use of ecosystem resources and services to increase food security, nutrition and incomes and, thus, greater awareness on the value of biodiversity at all levels.

The last years of Phase 2 and the design of Phase 3 coincided with changing government priorities and increasing signs of climate change impacts that made it essential to consolidate earlier gains while also increasing institutional capacity to support CCA by rural communities. Phase 3 therefore proposed to focus on: (a) formulating environmental sector plans, reforming environmental management frameworks at national level, and delivering Climate Resilience Plans for Living Well at local level; and (b) building the capacity of FPMT managers to enable the public sector to implement those new frameworks and plans. The overall approach was to encourage communities and local authorities to work together on CCA planning in order to safeguard life in harmony and balance with nature and Mother Earth.

D2. Assumptions underlying the theory of change.

Phase 2 was based on the assumptions: (a) that policies to conserve and sustainably use biodiversity to reduce poverty in rural communities would be stable; (b) that local governments and communities would remain willing to participate in ecosystem management and to establish joint ownership of the management process with the cooperation of VMA; and (c) that improved governance of ecosystems, in line with traditional values and with the support of public institutions and cosmopolitan science, would result in greater contentment and livelihood and environmental security among local people.

Phase 3 was based on the assumptions (a) that continued participation by social organisations and municipal and departmental governments would be sufficient for Climate Resilience Plans for Living Well to be developed, adopted and implemented; (b) that the process would continue to be encouraged by the Plurinational Authority of Mother Earth (APMT) and the Ministry for

Environment and Water (MMAyA); and (c) that the implementation of Climate Resilience Plans for Living Well at local level with the support of the state would result in consolidated and increased gains in local livelihood and environmental security.

D3. Plausibility of assumptions and links.
All assumptions are plausible in principle, given that they are aligned with legal obligations to establish resilient life systems as a pre-requisite to live well. Political processes in Bolivia are relatively volatile, however, with ever-present risk of major change. On the other hand, indigenous priorities seemed to have become so deeply entrenched in Bolivian governance after 2006 that a complete reversal, although attempted repeatedly in 2007-2021[4], is unlikely.

D4. General quality of the project design (Score 5).
The design of Phases 2-3 built on a preparatory phase and lessons learned that have helped establish robust designs. In particular, they are aligned to the country's legal framework and reform process dedicated to re-establishing harmony between man and nature. Their main strength is their response to the need for greater capacity to implement the main interests of stakeholders at the national and sub-national levels of government (MMAyA, APMT, GADs, GAMs, etc.) as well as at the community level where life systems have been increasingly threatened by the loss of biodiversity and the increase in stresses linked to climate change.
To promote replication and scaling up of successes at local level throughout Bolivia would have required a robust knowledge management system at APMT supported by an effective communication strategy oriented to the public and to policy dialogue. Phase 3 would have been the correct moment to establish such a system, but the opportunity was missed in favour of only disseminating experiences internationally. The same missed opportunity also means that key line ministries (such as the Ministry of Rural Development and Lands, and in particular the Vice-Ministry of Rural and Agricultural Development) have had little access too these good practices, which would have helped them in their own efforts to comply with Law 300. The strategic costs of such missed opportunities are significant and in this case reduce the design quality score to 5 ('good').

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.
Biocultura has always recognised that CCA and CCM are inextricably linked because of the connections between ecosystems, ecosystem carbon, ecosystem services, biodiversity, environmental security and sustainable harvests and livelihoods. The specific activities of Biocultura are not generally reported as 'mitigation' actions, however, and the emphasis is on adaptation and joint adaptation/mitigation throughout. Yet the first half-yearly report of 2016 states (in Spanish) that "The mitigation and adaptation actions of local projects will contribute to the reduction of carbon emissions into the atmosphere. In this sense, a contribution model has been developed and a first quantification exercise has been carried out, detailed in Annex 2." (Pro-Rural, 2016: 19). This annex was not available to the evaluation team.

E2. System change.
The strengthening of participatory community control of ecosystems, informed by local, traditional and other knowledge, almost always improves conditions for carbon conservation by excluding open-access regimes of exploitation and encouraging longer-term and more accountable decision making. Since this is the key direction of travel of indigenous and peasant community empowerment in Bolivia, to which Biocultura has contributed greatly, the whole effort must be considered a major contribution to enabling system change for mitigation, and to have at least moderate potential to induce further transformative change.
The position with respect to climate change mitigation in Bolivia is complex and evolving, however. Law 300 is a barrier to some kinds of investment in carbon conservation. It clearly aims to discourage REDD+ transactions and all the financial dealings (and undue power of bankers) associated with them. In 2016, however, Biocultura "supported the preparation of the document 'Bolivian Position in the international negotiations of the United Nations Framework Convention on Climate Change (UNFCCC)' [which] collects the country's experiences in the COP negotiations since 2010. ... Among the concepts of the Bolivian position, included in the

[4] In 2008, rightist groups tried to establish autonomy in wealthier regions through unilateral referendums (declared illegal), a recall referendum (defeated) and an attempted coup (thwarted); and a political crisis followed disputed elections and a military intervention in 2019-2020 that was eventually resolved through fresh elections and a return to the progressive agenda.

official texts of the UNFCCC, [are] the emphasis on Mother Earth and the joint forest management mechanism for the adaptation and mitigation that Bolivia has proposed since 2011. This mechanism is different from carbon markets (a trading system through which governments, companies or individuals can sell or purchase greenhouse gas reductions)." (Ranaboldo *et al*., 2018: 4-5).

As an injection of a contrary principle into the investment realm, this position is comparable to the prohibition of interest in Islamic banking, even though other kinds of return on investment, such as equity arrangements, are permitted. While rejecting transactional and finance-based arrangements imposed by the powerful on the weak, Law 300 would allow for joint forest management (that is, 'joint' both between partners and between CCA and CCM). It would presumably also allow the exchange of gifts between peoples and between communities and Mother Nature, with sustainable development and conservation of biodiversity and ecosystem services (including carbon) potentially being seen as different kinds of reciprocal gift. In any case, voluntary support by public institutions for community participation in conserving ecosystem carbon and biodiversity in the context of free, prior and informed consent is hardly controversial, even in Bolivia. Problems only arise, in Bolivia and elsewhere, when private interests become entangled with a public-interest agenda.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.

Effectiveness (score: 6).

High overall performance of each phase was a major justification for the next one, up to and including the current exit phase. Phase 2 (the results of which justified Phase 3) supported formulation and ratification of the Framework Law of Mother Earth and Integral Development ('Law 300'). This law defines the national climate policy while also strengthening the recognition of traditional Andean organisations (*ayllus* and *markas*) [see H3.2], recognising that Andean traditional knowledge can be combined with scientific knowledge to tackle climate change and reduce poverty, and improving compatibility between economic and environmental activities. It also helped improve household incomes, food security and nutritional diversity, promoted the sustainable management of natural resources in community territories and national parks, helped to improve governance of natural resources in 35 municipalities (through new resolutions and statutes) and the development of TCO processes with three indigenous peoples. Phase 3 then facilitated further progress in five main areas (Pro-Rural, 2019):

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- **Support for enterprise development**, including strengthening 20 local enterprises based on food processing, camelid farming, beekeeping and biocultural tourism.
- **Support for the validation of local cultural practices**, including fairs, ritual practices and reciprocity, to advance social cohesion and CCA based on ancestral knowledge.
- **Support for the National System of Protected Areas**, including the creation and consolidation of reserves and introduction of CCA management practices.

Impact and sustainability (score 6).

Biocultura focused on strengthening laws, regulations, accountable governance and planning at all levels, and there were signals that by 2021 influence was being exerted at the highest level of government, with Biocultura recognised as having shaped the main elements of the Bolivian position on climate change, as ratified by the head of VMA, the Ministry of Foreign Relations and the Plurinational Authority of Mother Earth (Pro-Rural, 2021). Impacts were also being seen in terms of political commitment to legislative reform by the VMA, including an environmental agenda covering the development of new laws for protected areas, the Defence of Mother Earth, Knowledge and Wisdom, eco-towns and sustainable cities, among others. The National Planning System continues to incorporate concepts and methodologies from Biocultura in its instruments for municipal Planning, including the 'life systems' concept, and these approaches

to CCA are built into the 2021-2025 planning cycle (MPD, 2020). Meanwhile, several conditions are being met that are likely to sustain the main activities of Biocultura:

- Far greater awareness has been established on the importance of conserving biodiversity in general, and agrobiodiversity in particular, as a way to maintain food security and support adaptation among vulnerable rural communities.
- Bolivia's capacity to retain sovereignty over its genetic resources has been enhanced by advancing the policy and legal framework on conserving biodiversity within the CCA process.
- The ideas and practices that encourage and enable harmony with nature have been advanced by validating the importance to CCA of a cultural dimension[5] in which local and traditional knowledge is combined with external knowledge and science.
- Public investment on adaptation and biodiversity conservation has been facilitated through tripartite contracts between municipal, community and private stakeholders, leading to increased funding, resilience and livelihood security.

It should be added that a political crisis from 2019 to elections in October 2020 resulted in vice-ministerial changes in the Ministry for Development Planning which affected the channelling of SDC's funds. Diversion of funds to the Covid-19 pandemic in 2021 also appears to have affected the funding of APMT.

F2. System change.

By enhancing the adaptive sustainability of rural communities the country has built the case for scaling up CCA. Thus, Biocultura: (a) helped institutionalise new decision-making powers in place to promote resilience to climate change in the form of the APMT supported and guided by the MMAyA; (b) promoted integration of CCA in important planning documents, such as Integrated Territorial Development Plans and Climate Change Adaptation Plans that were produced at the local level on Phase 2; (c) increased capacity at the community level to apply adaptation to climate change that recognises and values their local knowledge to achieve resilience; and (d) instigated new forms of policy dialogue and decision-making on reforms and public investment to advance CCA that is evidence-based and depends on local participation. These achievements promoted systemic change in favour of adaptation at the national, sub-national and community level, especially in the Andean region where rural communities are particularly vulnerable to the effects of climate change. Thus there was evidence of progress on four of the five CIF indicators of transformational change: (a) by demonstrating **strong contextual alignment and timing**, i.e. with the constitutional reform process in 2006-2009, and supporting local knowledge and technologies to reduce poverty; (b) by showing **evidence of systemic change**, because Phase 2 was instrumental in the design, approval and application of Framework Law 300, in which CCA is a priority in the context of maintaining harmony with nature and 'living well'; (c) by providing **evidence that adaptive sustainability is emerging** and likely to be consolidated in Phase 4; and (d) by **scaling up of change** to achieve harmony with nature.

Most significant was probably Biocultura's direct support to the design and adoption of Law 300, which also establishes the country's policy on climate change and adaptation to it. The law contributed to altering the principles on which the relationship between humanity and nature is based, which is central to systemic change. As explained by Pro-Rural (2019: 6), Biocultura has contributed to the configuration of "a new national and sub-national planning process ... that fully recognises the importance of climate change and disaster risk reduction". Similarly, by supporting the application of Law 300, the Bolivian government has stimulated international debate (supported by SDC in line with the third Specific Objective of Biocultura's Phase 3) on the rights of nature and Mother Earth and how the respect of these rights is crucial to combatting climate change. Thus, Law 300 establishes nature as 'sacred' so that its environmental functions cannot be monetarised and converted into commodities. This approach in based on the reciprocal giving of gifts by nature (in the form ecosystem goods and services) and humanity (in the form of respectful and careful living), as detailed by PSB (2014: 9).

Part G: Other aspects of design and performance

G1. Efficiency issues.

Biocultura emphasised competitive bidding in the selection of contractors, and conserved its resources through cost-sharing partnerships and other synergies between the public, private

[5] 'Harmony' or 'peace' with nature, enabled and sustained by a cultural shift away from conflict with the rules of ecological sustainability, is not among the CIF's five dimensions of transformative change. Yet precisely this cultural shift is essential to changing climate and ecological outcomes during this century.

and grass-roots sectors. Phases 2 and 3 achieved satisfactory value for money at the local level, by covering 12% more end-beneficiaries than originally planned, and by approaching targets (to the extent of 85-99%) for improving their food security, real incomes and socio-cultural capacity on CCA. This correlates with more local plans that integrate CCA being implemented than originally planned, and with a major (592%) increase in local spending on CCA. Lower levels of efficiency were evident, however, in setting up the FPMT, since: (a) the CHF 2 million in seed capital has not been accessed by local authorities; and (b) the APMT and other institutions have not mobilised new funding from the GCF or other climate funds. Nevertheless, Pro-Rural (2019) was able to report that the overall benefit-cost ratio was BOB 1.13, meaning that Biocultura had generated an additional BOB 0.13 for each BOB 1.0 spent.

G2. Coherence issues.

Coherence at national level appears to have been satisfactory given Law 300 has established clear mandates for the APMT and MMAyA, although coherence with the Ministry for Rural Development and Lands was less evident in Phase 3, even though one of Biocultura's three thematic areas of intervention (these being focused on the High Andean Wetlands, agrobiodiversity and food security centres, and strategic protected areas) is fully linked to the agriculture sector. At the sub-national level, coherence between the two participating GADs and their GAMs was high in Phases 2-3 due to the continuation of a tripartite agreements that required GAMs, CSOs (*ayllus*, farmer organisations) and the private sector to implement actions in the field. Indications are that there is room for improvement in coherence between ministries (and between APMT and MMAyA in particular), especially on agri-business development and law enforcement. This was probably affected by political divisions linked to the recent political crisis, and not off-set by adequate knowledge management systems.

Coherence between SDC-supported projects in Bolivia was limited, and enquiries by the national consultant led to the conclusion that "all programmes worked in silos, not permitting value-added from potential synergies, e.g. *yapuchiris* approach from PRRD, against Biocultura" (see PRF for 7F-07312 PRRD). Little evidence was collected concerning coherence between Biocultura and other donor-supported activities in the rural sector in Bolivia, although a number were active in the relevant period. SDC (2016), for example, lists the following: (a) BOB 24 million from Denmark as start-up capital for the Plurinational Fund of Mother Earth, for adaptation and mitigation; (b) EUR 2.6 million from Brazil, Italy and the Development Bank of Latin America (CAF) for the 'Amazonia sin Fuego' programme in 2012-2014; (c) EUR 12 million from Germany (KfW) for the 'Agua y Cambio Climático' irrigation programme in 2013-2016;.(d) unspecified funding from Germany and Sweden for Phase II (2011-2014) of the Sustainable Agricultural Development Programme (PRO-AGRO-GIZ) as part of a trilateral cooperation seeking areas of convergence between poverty reduction and CCA; and (e) USD 16.5 million from SDC for the multi-donor 'Plan Nacional de Cuencas' in 2014-2018.

G3. Replicability issues.

A major strength of Biocultura is that the partnerships involved are not designed only to establish resilient life systems locally, but also to stimulate dialogue and decision-making on their replication in other areas to establish a critical mass of rural communities that 'live well'. Phase 4 provides for replication of the Biocultura model by systematizing the knowledge gained from 10 municipal experiences - in particular its thematic approach at the sub-national level to establish resilient life systems that conserve and sustainably manage upland wetlands, protected areas and agro-ecological systems. This whole approach is replicable to other Andean countries, for example in the Andean region of Peru where *ayllus* are present and agro-ecology is widely practised, where it might be promoted through the Potato Park in Cuzco, which covers the departments of Apurimac, Arequipa, Ayacucho, Cuzco, Huancavelica and Puno. Similarly, the model can be replicated in Ecuador where Andean communities have similar organisations to the *ayllu* system and apply agro-ecology, especially in Chimborazo, Bolivar and Cotopaxi provinces. This is likely to be facilitated by the fact that in 2008 Ecuador adopted a similar constitution to that of Bolivia, being also based on the idea of *Sumak Kawsay* (see H3.3).

There is growing evidence from FAO and UNEP that agro-ecological approaches combined with the conservation and sustainable use of natural resources can both enhance resilience and store or capture carbon, so the potential for replicating the Biocultura approach is clear, especially in upland communities. Such initiatives can also safeguard the interests of downstream communities and settlements since agroecology and conservation of biodiversity and ecosystems also protect essential environmental services. Pro-Rural (2019: 7) notes that more needs to be done to communicate the benefits of the BioCultura approach: “Similar

processes of revaluation of natural resources and Mother Earth have been taking place globally and the region in particular, which generate important knowledge, experiences and innovations that promote new approaches to address the issue [of climate change] in our country. The internationalization of the BioCulture approach and the spread of the experience at the national level are central elements to achieve a greater impact of the project."

G4. Partnership issues.
A major strength of Biocultura was an in-depth analysis of potential stakeholders to identify dynamic partnerships that can take on a proactive role in the policy reform process and implement it at the local level. The strategy has been to build a culture of informed decision-making to support the next cycle of reforms on the policy, legal, regulatory and institutional frameworks, or on the development of sustainable life systems in the participating *ayllus* and GAMs. Partnerships are seen as crucial to bringing stakeholders together to promote consensus and influence decision-making to deliver transformational change, for example: "one of the success factors of the project at the local level has been the formal articulation of public and private actors around the project objectives, this has not only allowed the mobilization of additional resources to achieve the goals but has also generated the willingness of the parties to participate and contribute to CCA." (Pro-Rural, 2019: 6). Although this is a positive assessment, it must be said that the Bolivian economy largely depends on fossil fuel use and sale, so public investment in the Biocultura model cannot be taken for granted and it is likely that progress will depend on sub-national processes and integration of multiple programmes. This approach appears to be part of a common strategy for implementing the SDC project portfolio in the Andean region, since similar approaches are seen in 7F-05409 PACC in Peru and 7F-07312 PRRD in Bolivia. Moreover, the 2017-2024 Resilient Andes Programme, 7F-09972 (ARIACC) in Bolivia, Ecuador and Peru provides an opportunity to capitalise on the local and regional networks that exist between NGOs, CSOs and public and private actors in the interests of providing services that build resilience and adaptive capacities of poor and vulnerable rural populations in the Andes.

G5. Connectedness issues.
- **The heterogeneity of Bolivian actors** in the public and private sectors and the way they interact with rural communities is a major challenge to delivering results efficiently, especially when they have conflicting agendas, or experience changes of personnel that adopt different political priorities.
- **Food insecurity and poor nutrition** is a consequence of structural weaknesses that have excluded a large section of Bolivian society from the fair distribution of resources. Although the new Constitution and ground-breaking legislation, such as Law 300, have been adopted, breaking down the culture of exclusivity is a long-term process that cannot be resolved through a project approach.
- **The Covid-19 pandemic** is likely to have major social and economic consequences for the Bolivian peoples. The country has run fiscal deficits in recent years, and there is evidence that the Ministry of Hydrocarbons and Energy is keen to apply a new law that allows the opening of protected areas to 'responsible' oil and gas exploration in hope of generating increased revenue. This is also likely to encourage the expansion of illegal mining for gold and silver.

G6. Cross-cutting themes.
Gender in project design. The design of all phases included needs assessments and compliance with national legislation on gender equity. For example: "Although in Andean production systems, women play a key role, their influence in formal decision-making processes is not very visible, and they are often left out of technical advice and protection measures [including] training. As a result of the fact that many men migrate to cities, the importance of women has increased even more. The important factors to overcome gender inequality are, on the one hand, the growing influence of peasant women's organizations and national regulations that stipulate that participation in municipal administration must be equitable. The project has a gender strategy that will be reviewed to identify complementarities between the western and indigenous views of the role of women. The objective is to deepen the participation of women in decision-making bodies and improve their access to training, technical assistance and the means of production." (SDC, 2016: 30). This approach to gender resulted in significant achievements such as the strengthening of 175 women's organisations in 27 GAMs, and the approval of 30 new local regulations supporting women's rights and access to resources (Pro-Rural, 2019: 3).

Gender in adaptation. SDC (2016) assessed the potential impact of climate change on women and youth in order to prioritise actions to improve their resilience at the local level. The measures taken as a result helped create "a gender network made up of women from all SdVs ['life systems'] through which the importance of women in CC management has been promoted according to their different roles (political, economic, leadership)." (Pro-Rural, 2019: 4).
Governance. Three specific actions sought to promote good governance: (a) support for the implementation of policies and institutional strengthening of the authorities in charge of promoting CC governance at the national and sub-national levels; (b) training on applying local enforcement practices in prioritised territories; and (c) signing of Complementarity Agreements with Mother Earth established in the 'life system' (SdV) management approach. These agreements include obligations and duties that must be followed and applied by the Climate Resilience Plans adopted at the Departmental and Municipal levels (in accordance with Article 47 of Law 300).

G7. Capacity building issues.
Pro-Rural (2019: 5) reported that capacity had been built in the following areas.

- **Political-Institutional**. Strengthening of planning capacity has not only enabled the implementation of integrated nature-based solutions at the local level (through PTDI, PGTC and PEI), but facilitated dialogue on aligning municipal regulations to support their implementation. These include regulations to support the creation of protected areas, protection and conservation of ecosystems, apply water and soil management, protection of water sources, application of food security strategies integrating CCA, legalisation of local institutions and organizations through statutes, among others to promote change at the local level.
- **Economic-Productive**. Strengthening of local community capacity to run local income-generating enterprises, resulting in 20 productive enterprises in the processing of agro-biodiversity products, wool and meat production from camelid farming, beekeeping, biocultural tourism, etc.
- **Socio-Cultural**. Strengthening of over 133 local practices to promote social co-existence (local fairs, ritual practices and reciprocity) to support CCA based on ancestral practices and knowledge.
- **Ecological-environmental**. Strengthening the capacity of the National Service for Protected Areas (SENAP) has enhanced the national protected areas system through the creation of three new conservation areas and the introduction of adaptation measures to reduce the impact of CC on the System.
- **Department governments**. Strengthening of the GADs for Tarija and Chuquisaca has resulted int the identification and approval of PTDI that incorporate specific actions to address CC and which have facilitated a major increase in public investment in CCA to develop resilient life systems (over Bs. 500 m.).
- **National government**. Strengthening of the FPMT mechanism and its guidelines and tools has enabled the state to sanction funding for projects promoting the conservation and sustainable use of natural resources and this is being monitored and controlled by the MMAyA, although no projects had been funded to support CCA to October 2019 (see also F1). The Ministry for Foreign Relations is also reported to have presented the Biocultura approach to CCA in six international multi-lateral events.

Part H: Other matters arising from the review

H1. Follow-on questions, answers and suggestions arising from interviews by national consultants.
Question 1. *SDC's approach to CCA in the Andes relies heavily on the establishment of public, private, and community-based partnerships to mobilize resources and deliver change - the establishment of resilient rural communities. Is this approach part of a common strategy to implement the SDC project portfolio in the Andean region given similar approaches are observed in PACC (Peru) and PRRD (Bolivia)?*

- **Answer**. Yes, the development of partnerships is a key aspect of SDC cooperation in the Andes. For example, the partnerships between municipalities and local communities have stimulated new cultural approaches to the implementation of not only the BioCultura programme, but also more than 10 other on-going initiatives linked to tourism, natural resources management, and biodiversity conservation. Moreover, these partnerships significantly enhance knowledge and capacity development from one phase to another of

SDC's programmes and projects that helps retain memory within the partnership networks as they grow and consolidate over time.

- **Suggestion**. The Resilient Andes programme should be used as an opportunity to support the growth and consolidation process of the partnerships and networks of BioCultura , based on a systematisation of bilateral and regional projects that have been supporting climate action (and DRR) in the Andean region to 2021. Moreover, The Resilient Andes programme should aim at stimulating the scaling up of partnerships so that the main elements of the BioCultura initiative are promoted and scaled up at the national level and used as a demonstration model for expanding the networks in the Andean regions of Peru and Ecuador so that endogenous development is fully recognised and valued as an effective means to establishing CCA among local actors and local governments at the municipal and departmental/provincial levels in Bolivia, Ecuador and Peru.

Question 2. *If yes, how does SDC facilitate regular cross-fertilization between its projects to avoid fragmentation and to optimize learning on CCA and opportunities to combine it with CCM? If not, what needs to be done to ensure knowledge and data management is captured and made available to stimulate effective cross-party policy dialogue to ensure SDC applies a more coordinated approach to its cooperation on CC in 2021-2024 in LAC (and with other strategic hubs for CC – New Delhi and Beijing – plus SDC HQ) taking into account SDC is pulling out of bi-lateral cooperation in 2024?*

- **Answer.** SDC promotes cross-fertilisation through the diffusion of information through its project websites and taking stock of experiences and success stories in publications. However, this does not appear to be an effective way to engage stakeholders in learning. Moreover, SDC projects and programmes generally review each phase internally among a small number of stakeholders in order to determine how each project is contributing to integrating CCA with CCM into its main activities. As a result, the review process is largely project/programme-focused which has helped to maintain a fragmented approach to the review of project design, performance and potential for transformational change. This is not aided by the complex political context since 2019 to date, which has not been conducive to developing institutional capacity (of the State, as opposed to government) and embedding learning in public institutions.
- **Suggestion.** SDC should promote the systematization[6] of all its projects linked to CCA and DRR in the interests of establishing a programmatic vision of SDC cooperation that supports a coordinated approach to integrating CCA and CCM in the PDES from the national government. It should also consider supporting the development of this programmatic approach by identifying and designing a knowledge management program that instead of focusing on capturing successful actions and approaches, places more importance on developing learning and understanding through academia that supports the establishment of a unified platform for knowledge management (as opposed to one project one knowledge management system). Moreover, this approach would help strengthen the case to apply Law 300 on Mother Earth through a set of coordinated sectoral platforms for CCA and CCM linked to industry, energy, and agriculture (that is increasingly dependent on nature-based solutions to production).

Question 3. *The combination of the political crisis in 2019 and the COVID-19 pandemic (2020-2021) has caused staff rotations, changes in political priorities, and new economic challenges. How far is Phase 4 prepared and able to mitigate the risks associated with these developments?*

- **Answer**. Political and economic crises have affected the financial capacity of the government to inject funding into its CCA and CCM policies and agenda. This situation has been very challenging for Phase 4 to mitigate and is one reason why SDC launched the Resilient Andes programme (2020-2027) with the objective "to improve the resilience and capacity to adapt to climate change of rural Andean populations (women and men) living in poverty and vulnerability in Bolivia, Ecuador and Peru, aiming at improving their food security and water security" (Helvetas, 2021).
- **Suggestion.** To mitigate the above crises SDC should adopt a more creative, dynamic, and territorial approach to CCA. The approach should also be flexible, to ensure it reaches out to other key elements linked to CCA, (such as health, or education) so that the overall aim of

[6] A difference in nuance exists between the capturing of information ('systematisation') in the European sense and the Bolivian (Quechua-Aymara) idea of 'cultivating' knowledge through a more narrative (story-telling) approach, in which experiences are understood in their holistic context and their meanings explored through internal inquiry and review.

CCA is to encourage different actors to apply intersectoral and transdisciplinary approaches that support the establishment of adaptive sustainability as the main driving force for change. Relevant cross-cutting issues relating to gender, good governance and natural resources management should be fully integrated into this approach.

Question 4. *Can the BioCultura model be replicated as a viable approach to developing resilient communities in other regions of Bolivia and also in Ecuador and Peru? If yes, what needs to be done to replicate the model and scale it up during Phase 4? If not, what needs to be done to ensure it can be replicated and up-scaled?*

- **Answer.** Local NGO partners have successfully supported the development of several approaches to endogenous development through the BioCultura initiative. However, the biggest challenge to replicating endogenous development in local Andean communities is that such development relies on gnoseological principles that are mainly practiced by pre-Colombian indigenous communities (local enquiry, observation and cosmovision). Moreover, by making BioCultura unique to Bolivia[7], learning on this initiative has not been widely shared, both within Bolivia, or in other Andean communities that are aware and practice similar principles where it could be replicated both in the field as well in education, where knowledge on these principles can be multiplied through formative approaches.
- **Suggestion**. Through new initiatives such as the regional programme Resilient Andes, SDC should explore where the BioCultura approach could be validated to determine where the BioCultura model could be scaled up to consolidate the life system approach in a given landscape. For instance, this could be developed in Globally Important Agricultural Heritage Sites supported by FAO[8], as suggested by Pro-Rural.

Question 5. *Ineffective knowledge management appears to be exacerbated by the absence of effective monitoring, in particular MRV, through which nature-based solutions to CC could also throw light on their ability to capture/store carbon and other GHGs. As a result, monitoring of the NDCs appears to be weak and the contribution of BioCultura to them inadequately reported. What should be done to address this gap and enhance learning on carbon sequestration, such as concerning the conservation of upland wetlands? Note: "wetlands cover approximately six to nine percent of the Earth's surface and contain about 35 percent of global terrestrial carbon." (See Government of Australia, 2012: iii).*

- **Answer.** very little has been achieved concerning the programme's contribution to carbon sequestration analysis. Instead, the SDC's policy has focused on reducing environmental degradation and enhancing food sovereignty and security. Moreover, the programme does support the Plurinational State's CCA strategy, which is consistent with the iNDCs, but not towards the development of an explicit CCM framework.
- **Suggestion.** SDC should do more to not only strengthen the national CC Authority which at the operational level has not been very effective (APMT), but on supporting the development of the Plurinational Fund of Mother Earth, including the possibility to access climate funds to support the identification of project proposals that can be financed from this fund and which support the development of carbon inventories in the Andean and Amazon regions of Bolivia, as well as the implementation of the PDES and NDCs.

Question 6. *How can SDC communicate better its achievements to induce change at the highest level of government in the Andean region taking into account the BioCultura approach that could be applied in selected communities in Ecuador and Peru?*

- **Answer**. Biocultura is a rural development model that transcends the community through a territorial or landscape approach (since phase 2) to establish life systems (so-called in national planning, as opposed to development systems). The premise of the BioCultura initiative has been the conservation of the environment. However, in spite of a high level of intellectual effort to interpret local development, the practical lessons of the implementation of the initiative on the development and adaptation of local communities and their natural environment have not been fully systematised to identify key lessons learnt and good practices that programmes such as Resilient Andes could learn from.
- **Suggestion.** BioCultura should link its approach to other conceptual models in the Andean region in seeking ways to integrate CCA, agroecology, and the validation of indigenous cultural approaches in development planning. Questions include whether the BioCultura

[7] Parallels in the PRFs of other SDC projects involving indigenous peoples (e.g. in Laos, Mongolia, Myanmar) suggest that it may be useful to study common patterns in concepts of ecosystem and knowledge management and meaning and their practical implications.

[8] https://www.fao.org/giahs/giahsaroundtheworld/en/

model is a true expression of indigenous cultural ideas, and whether it is better than others in the Andean region at enhancing the resilience of communities' 'life systems'. Once these are answered, it will be important to consider with knowledge-holders how BioCultura could best be linked to the academic sector under PIA-ACC to stimulate long-term research and knowledge management on the BioCultura model, and to apply its best practices in the Resilient Andes programme.

H2. Missing documents. (a) Budget Proposal for Phase 3 (used instead of the Prodoc for Phase 3 (2014-2019), before extensions. (b) Annex 2 of Pro-Rural (2016).

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1 Climate mitigation through forest conservation.
A recent review of evidence for carbon storage in tropical forests concluded that "for the purposes of considering portfolios of potential investments that may cover multiple forests in multiple locations, it would be reasonable to take as a conservative average the range of 160-240 t/ha carbon (mid-point 200 t/ha) for natural moist tropical lowland forests, and 40-120 t/ha (mid-point 80 t/ha) for natural seasonal and montane forests." (Danida, 2021a: 29). Establishing a new protected area in a tropical forest zone therefore prevents a substantial quantity of GHG emissions if the area is under threat and protection is likely to preserve it intact for at least 20 years. In this case, the total amount of stored carbon can be accounted as an immediate mitigation gain, which is important because the mitigation value of carbon conservation declines rapidly over time (Danida, 2021b). Additional carbon storage can then be expected from re-growth of any forest in the reserve that had previously been damaged, at a rate of about 1.5 t/ha/yr if moderately disturbed, and 2.8 t/ha/yr if very disturbed (Danida, 2021a: 30). Since over a 20-year time horizon most tropical forests are under threat, and since community-based protection arrangements are often highly effective, forest conservation through community action can be a strongly cost-effective mitigation action, with abundant co-benefits in the form of environmental services, biodiversity, livelihoods and human rights. The link with Biocultura can be seen when it is considered that those parts of the Bolivian Amazon where indigenous territories received community land titles in 1995-2010 have now often become forest islands in a sea of new soya plantations (Theilade, 2020). This and other evidence from Peru and Brazil show that indigenous territories may well be the *only* effective governance mechanism capable of withstanding deforestation pressures under modern conditions in the Amazon Basin. This amplifies the message that such territories are at least as effective as national parks at protecting biodiversity and natural forests (e.g. Nepstad *et al*., 2006; Porter-Bolland *et al*., 2012; Schleicher *et al*., 2017).

H3.2 A note on traditional Andean lifeways (source: Warren Olding, from the Programmes for Self-Development in La Paz, Oruro and Potosi Departments (1990 to 2004), funded by the EU).
In traditional Andean lifeways, *ayllus* are ancestral family/communal organisations, and *markas* are comparable to 'parishes' in that each has a spiritual representative within the community. The system contrasts with the Western idea that communities are led by individuals, since here individuals are led by the community. Thus individual rights are valid only in contributing to upholding the rights of the community (i.e. as guardians of harmony with nature). Mapping of the *ayllus* and *markas* took place for the first time in 1992-1993 under EU-funded Self Development Programmes in Bolivia. They were geo-referenced to the cosmological map of the Incas, because their main role was to maintain harmony between nature/food production and the Earth's travel through time, based on the Inca Calendar. As a result, everyone who lived in the *ayllu* had to possess rights to land in order to retain their role as guardians of 'harmony', leading to *in-situ* conservation of biodiversity/agro-biodiversity. In return, they would reap rewards or 'purpose' (solidarity, fresh water, the harvest festival, knowledge, children, etc.). It appears that even textile patterns were designed to tell 'stories' linked to their complex cosmology. *Qullasuyu* was one of the Inca's four main 'quarters' of their realm, *Tahuantinsuyo*, which was not an 'empire' in Western terms, but rather an attempt to create a 'patchwork' of harmony between man, nature and the cosmos. The central belief seemed to have been that if complete equilibrium with nature and the cosmos would be attained, time would stop.

H3.3 Key terms (source: Vitale, 2017 for peoples and 'living well').

Aymara: the second largest indigenous, ethno-linguistic group in Bolivia.

***Buen vivir* (living well; *Sumak Kawsay* in Quechua and *Suma Qamaña* in Aymara)**: an Andean indigenous concept of sustainable development, participatory democracy, respect for Mother Nature, and spirituality; it has been incorporated into the constitutions of Bolivia (2009) and Ecuador (2008).

Carbon conservation: all measures that have the effect of protecting ecosystems and so preventing the release of their carbon through fire and decay, and its capture through the growth of vegetation and the formation of peat and soils.

Cosmologies: in this context, the worldviews and the belief systems of indigenous peoples.

El Niño (El Niño Southern Oscillation, ENSO): cyclic warming in sea temperatures in the east-central equatorial Pacific. ENSO-related temperature fluctuations can have large-scale impacts on weather and climatic patterns. Meteorologists believe that ENSO-related phenomena contributed to the devastating hailstorm of February 2002 and the heavy rains responsible for the mega-landslide of 2011 in La Paz.

Law 300: Framework Law No. 300 of 2012, 'The Framework Law of Mother Earth and Integral Development for Living Well'.

Quechua: the largest ethno-linguistic group in Bolivia, followed by the Aymara.

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Part J: Acronyms and abbreviations

AGRUCO	Agroecology Research Center Universidad Cochabamba
APMT	Plurinational Authority for Mother Earth
BOB	Bolivian Bolivariano (Bs 100 = € 12.53 on 15 Dec 2021).
CONAMAQ	Confederation of *ayllus* and *markas* of the Qollasuyu
FPMT	Plurinational Fund for Mother Earth
GAD	Autonomous departmental government
GAM	Autonomous municipal government
GCF	Green Climate Fund
MMAyA	Ministry for Environment and Water
MRV	Monitoring, reporting and verification (of carbon sequestration/emissions)
PBCC	BioCultura and Climate Change project (*Proyecto BioCultura y Cambio Climático*)
PDES	Economic and Social Development Plan
PGTC	Community Territorial Management Plans
PEI	Institutional Strategic Plans
PGTC	Community Land Management Plan
PRRD	Programme to reduce the risks of disasters in Bolivia (7F-07312)
PTDI	Integrated Territorial Development Plan

REDD+	Reducing (GHG) emissions from deforestation and (forest) degradation, with internationally-agreed forestry, biodiversity and social safeguards.
SdV	Sistema de Vida ('life system')
SERNAP	National Service for Protected Areas
SPIE	National Integrated Planning System
TIOC	First-nation Peasant Indigenous Territory
VMA	Vice Ministry for Environment, Biodiversity, Climate Change and Forest Resources Development (*Viceministerio de Medio Ambiente, Biodiversidad, Cambio Climático y Desarrollo de Recursos Forestales*)

Annex 13.4: Land and Biodiversity in Laos (TABI)

Project highlights.

7F-05450: **The Agro-biodiversity Initiative (TABI)**. Explored livelihood options using the rich resources of agrobiodiversity, non-timber forest products and traditional knowledge of the Lao uplands, while engaging local people in clarifying tenure and planning the use of their village lands and forests in ways recognised by the state. The approach stabilised shifting cultivation systems and was quickly upscaled to exert a wide influence.

Part A: Basic data

A1. Project number & name. 7F-05450 - 2-4: The Agro-biodiversity Initiative (TABI).

A2. Sources.
Process of PRF development: this PRF was prepared by the core team (initially as a training exercise at the start of the project review to ensure common understanding of the methodology), using documents listed in the bibliography and with input by those listed in Annex 13.22.

- **Phase 1 (Inception Phase, Apr-Dec 2008) and Phase 2 (The Agro-biodiversity Initiative, TABI, Jan 2009-Jun 2012)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2007/7F05450/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Phase 3 (The Agro-biodiversity Initiative, TABI, Jul 2012-Jun 2016/Mar 2017)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2007/7F05450/phase3?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Phase 4 (Final Phase, The Agro-Biodiversity Initiative, TABI, Apr 2017 - Sep 2020)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2007/7F05450/phase4?oldPagePath=/content/deza/en/home/projekte/projekte.html.

A3. Dates & financial data.

- **Phase 1 (Inception Phase, Apr-Dec 2008)**: no financial data (see Craig, 2009).
- **Phase 2 (Jan 2009-Jun 2012)**: budget: CHF 4,950,000 (SDC website); disbursement to date: CHF 5,055,747 in Phases 1 and 2 - the Phase 3 credit proposal (SDC, 2012) records expenditure of CHF 5,905,000 "since 1st phase".
- **Phase 3 (Jul 2012-Jun 2016/Mar 2017)**: Phase 3 budget CHF 6,000,000 (SDC, 2012); Additional Phase 3 budget CHF 421,000 (SDC, 2013); extension to Mar 2017, with a total Phase 3 budget of CHF 8,478,337 (SDC website).
- **Phase 4 (Final Phase, Apr 2017 - Sep 2020)**. Phase 4 budget CHF 5,300,000 (disbursement CHF 5,248,106).
- **Overall**: 2008-2020, CHF 19.3 million (5.5 + 8.5 + 5.3 million approx.).

A4. Location(s). Lao PDR

- **Phase 1**: Luang Prabang and Xieng Khouang provinces.
- **Phase 2**: Luang Prabang, Houaphan and Xieng Khouang provinces + pilot areas in Phongsali, Bolikhamxai, Savannakhet, Salavan, Xekong and Attapeu provinces.
- **Phase 3**: 13 provinces - Luang Prabang, Xieng Khouang, Houaphan, Phongsali, Bolikhamxai, Savannakhet, Salavan, Xekong, Attapeu, Oudomxay, Xaysomboun and Champasak provinces.
- **Phase 4**: focal provinces Luangprabang, Xiengkhouang and Houaphan.

A5. SDC Geography.
Funds Centre: East Asia (to 2019), Asia.
Region: South-east Asia
SDC Office: Swiss Cooperation Office and Consular Agency in Laos.

A6. SDC Domain. South Cooperation

A7. Partners.

- **Phase 2**: Contract partner - Private sector, Foreign private sector North.
- **Phase 3**: Contract partner - Foreign private sector North (NIRAS Natura); SDC Field Office. **Other partners** - MAF Department of Planning.
- **Phase 4**: Contract partner - Private sector, Foreign private sector North; NIRAS www.niras.com; MAF; CDE. Other partners - Individuals and entities involved in ABD development and land use planning activities. Coordination with other projects and actors -

LURAS, SURAFCO, WWF, GRET, KfW, MoNRE, RECOFTC, SDC Regional Humanitarian Aid Unit (Bankok).

Part B: Purpose, relevance and approach

B1. Purpose.

"The aim of the Agro-Biodiversity Initiative (TABI) is to leverage the country's rich agro-biodiversity into a mechanism that realises development goals in the near term without jeopardising future capacity to do the same, based on the assumption that the concept and practice of agro-biodiversity can play an important role in supporting farmers to respond and adjust to the rapidly changing contexts. It seeks to conserve, enhance, manage and sustainably utilise the biological diversity found in farming landscapes in order to improve the livelihoods (being food, income and materials for use) of upland farming families in Laos." (Gonsalves *et al*., 2018: 8).

Phases 1 & 2 (Apr-Dec 2008, Jan 2009 to Jun 2012)

- **Purpose**. "The Agrobiodiversity Initiative (TABI) ... will directly address the escalating destruction of biodiversity resources which represent the foundation and safety net for the livelihoods of hundreds of thousands of rural upland farmers in Laos. The design of the TABI is guided by basic principles drawn from outcomes of regional and global meetings on the implementation of Multilateral Environment Agreements, particularly the International Convention on Biological Diversity (CBD), and their practical application to farm level issues." (SDC website). Outcomes and outputs (from Thurland & Keoka, 2011) are as follows.
  - **Outcome 1: Effective governance of the CBD in Lao PDR**. Outputs: (a) a well functioning structure and mechanisms for cooperation and coordination to implement CBD and National Biodiversity Strategy and Action Plan (NBSAP); (b) NBSAP strengthened, updated, agreed and disseminated; (c) key stakeholder organizations have incorporated CBD/NBSAP into their own mandates, and capacities for Implementation strengthened; and (d) awareness in policy-makers on value of biodiversity conservation and sustainable use for socio-economic development.
  - **Outcome 2: Sustainable agriculture systems, which improve livelihoods and enhance and conserve biodiversity are practiced by women and men farmers**. Outputs: (a) appropriate technologies for farming systems and agrobiodiversity management and enhancement are documented and disseminated to farmers; (b) farming communities have greater capacity to manage and sustainably utilise agrobiodiversity farming systems and resources; (c) strengthened capacity of staff and stakeholders to collaborate in and support the development and implementation of District level Agrobiodiversity Action Plans; and (d) education systems have incorporated practical, needs-based agrobiodiversity curricula and activities.
  - **Outcome 3: Sustainable supply and increased benefits from processing and marketing NTFPs and agriculture products based on the principles of economic viability, social equity and biodiversity conservation**. "The outputs expected under this Outcome relate to NTFP and Agriculture product marketing, improved linkages with traders, AEDP Capacity Building, and the NTFP sector strengthened by alliances, shared approaches, and associated legal aspects ... Some of the elements worked with are strengthening of the linkage between product marketing and agro-biodiversity conservation; ensuring equitable benefits to men and women, poor and ethnic groups; better use of local knowledge and applying research on NTFP domestication; identifying market opportunities and value-added for some valuable NTFPs; and seeking cooperation with local and national trade partners, particularly in the area of trade governance and policy development." (Thurland & Keoka, 2011: 16-17).
  - **Outcome 4: Community access to land and agrobiodiversity resources are secured.** The general aim was to improve local access and control over land and natural resources. "Outcome 4 ... is central to the entire TABI program design and program goal." Thurland & Keoka, 2011: 20).
  - **Outcome 5 Knowledge and information is systematically shared and translated into evidence-based policies and approaches**. Outputs: (a) information is captured and knowledge is generated on opportunities for securing livelihoods while conserving biodiversity; (b) impact monitoring systems on ABD and livelihoods are evidence based; (c) TABI partners have access to and share data, information, and knowledge.
  - **Outcome 6: Effective Program Management, and Government structures, processes and capacity are established and effectively main-streaming ABD**

across all relevant sectors and programs. Outputs: (a) TABI project management systems are in place and functioning effectively.; (b) awareness and understanding on the role of agrobiodiversity in livelihood security is developed in stakeholders at all levels; and (c) upgraded capacity in agrobiodiversity management, and ethnic, gender, poverty mainstreamed across the program.

Phases 3 & 4 (Jul 2012 to Jun 2016/Mar 2017 and Apr 2017 to Sep 2020)

- **Purpose**. "Maintaining high biodiversity in agro-ecosystems contributes to poverty reduction in rural livelihood. Better knowledge, tools and institutional arrangements are needed to support poverty alleviation and preserve biodiversity. Considering the current development context in Lao PDR, TABI supports the conservation and sustainable economic use of agro-biodiversity (ABD) in multifunctional landscapes, aiming at improving the livelihood of uplands farmers."
    - **Overall goal**: "To contribute to poverty alleviation and improved livelihoods of upland communities through sustainable management and use of agro-biodiversity in multifunctional landscapes." (SDC, 2017).
    - **Outcome 1 (livelihoods)**: *developed options and systems for ABD-based livelihoods are sustainably applied by upland farming communities in TABI target provinces, enhancing their resilience*. "During this last phase, the focus is on the consolidation of on-going small projects and on the documentation of the methods to enable other actors to continue the support through the mechanisms in place; and to look for out-scaling opportunities in the form of partnerships with other projects or with the private sector, aiming at improving economic opportunities, through the development of viable value chains. This outcome, organised around three outputs, will focus on the sustainability of existing small projects as well as the out-scaling of the most promising ABD value chains or livelihood opportunities." (Gonsalves *et al*., 2018: 4).
    - **Outcome 2 (land-use planning)**: *pFALUPAM procedures provide increased production, equitable benefits, strengthened tenure and good land and forest governance and sustainable management*. "TABI has developed an improved, comprehensive methodology - pFALUPAM. Its outputs promote productive and sustainable forest and land use management in multi-functional upland landscapes and provide strengthened tenure for villagers to undertake ABD-based livelihoods in these areas. The community-organized upland rotations that result from using the methodology are an important precursor to the development of permanent agroforestry systems. Five outputs are proposed to further develop, disseminate and institutionalize the approach under the new phase." (Gonsalves *et al*., 2018: 5).
    - **Outcome 3 (knowledge generation)**: *ABD data, information, knowledge, tools and concepts are capitalized and disseminated to local, national and international levels, verifying and documenting TABI findings and impact; and advocating for the integration of ABD in planning, decision making and policy development*. "The aim of this outcome, through nine outputs, is to lift TABI experience and lessons learnt to a higher level by focusing on the production and dissemination of information products, making a systematic link between the information produced and its use, aiming at embedding ABD issues in policy and decision-making processes, planning and implementation. Finally, this outcome has the ambition to actively engage Lao Institutions in the analysis and production of communication materials in order to move from a project- driven approach to Lao ownership, also contributing to an increased international recognition of the role of ABD in upland livelihoods)." (Gonsalves *et al*., 2018: 5).

Evolution of purpose. From the Phase 1/2 purpose, the project would have been expected to include: (a) conservation and sustainable use of wild biodiversity at national level (CBD implementation); (b) conservation and sustainable use of wild and agricultural biodiversity at local level; (c) a strong focus on NTFPs (medicinal plants, rattans, wild foods, etc.); (d) strengthened local resource tenure (forums, environmental education, local empowerment, participatory resource inventories and planning); and (e) innovative knowledge management and networking for knowledge sharing among communities). But in Phase 3 the focus sharpened on agrobiodiversity, NTFP marketing, and forest land use planning ("Phase 3 will involve new actors at national and local level and contribute to a pluralistic approach towards market and service provision for ABD-based productive activities but also regarding the land use planning processes" - SDC, 2012), and then further in Phase 4 on "sustainable management and use of agrobiodiversity in multifunctional landscapes" (SDC, 2017).

B2. Relevance to partners.

Lao PDR.

- SDC (2012, 2017) stress the relevance of TABI respectively to the National Social Economic Development Plans for 2011-2015 and 2016-2020, which recognize the need for small scale livelihood development to counter the impacts of fast paced macro-economic growth and to ensure environmental sustainability. The same sources also note the relevance of TABI to Lao PDR's Agriculture Development Strategy (2011-2020), which seeks to ensure that agriculture and forestry practices are ecologically sustainable, with an emphasis on biodiversity conservation, eco-tourism, and sustainable use of NTFPs; and to its Forestry Sector strategy up to 2020, which emphasises sustainable management of forests with involvement of local people.
- TABI is also relevant to the National Biodiversity Strategy and Action Plan (MoNRE, 2016) that was developed to meet obligations under the CBD. Finally, in its NDC the Government of Lao PDR (2021) highlights the following adaptation priorities, all of them highly relevant to the aims of TABI: for agriculture (promote climate resilience in farming systems and agriculture; promote appropriate technologies for climate change adaptation, including nature-based and circular economy solutions); and for Forestry and Land Use Change (promote climate resilience in forestry production and forest ecosystems, including in buffer zones of protected areas and other forested areas; promote technical capacity in the forestry sector for managing forest for climate change adaptation; and promote integrated land use planning, natural resources and environment management). Also relevant to TABI, the NDC notes the following unconditional mitigation targets for 2020-2030: "Reduced emissions from deforestation and forest degradation, foster conservation, sustainable management of forests, buffer zones of national parks and other preserves, and enhancement of forest carbon stocks." (page 5).

Switzerland.

- **Phases 1 & 2** were compliant with Swiss/SDC commitments to implementing the Convention on Biological Diversity (CBD), in particular implementing its following aspects: “food, nutrition, dietary diversity, hunger and poverty reduction” (NIRAS, 2012: 3).
- **Phase 3** refocuses on the “integration of agrobiodiversity (ABD) principles into national strategies and plans, rather than CBD and other global initiatives, by developing ABD-based livelihoods options and sustainable forest and agricultural land use planning” (NIRAS, 2017: 4). SDC (2012) also stresses the alignment of Phases 1-3 with Strategic Objective 2 of the SDC Mekong Regional Strategy 2007-2012, in supporting the development of livelihoods in the uplands and other poor areas in terms of increased food security, income and environmental sustainability.
- **Phase 4** builds on Phase 3 and in particular the hypothesis that “agrobiodiversity based development offers a viable alternative to large-scale, unsustainable monoculture and concession based agriculture development in the uplands of Laos to the benefit of upland populations, and contributes to increased food security and resilience; and reduced poverty and inequity.” (SDC & MAF, 2016: iv). It "is in line with the SDC Agriculture & Food Security domain’s objective of the current Mekong Region Strategy 2013-2017 “Supporting agriculture and food security in uplands ... In addition, TABI has strong links with other SDC projects including the Lao Upland Rural Advisory Service (LURAS), the Support to the Reform of the Agriculture and Forestry Colleges (SURAFCO), WWF (rattan) and GRET (bamboo) initiatives, providing opportunities for wider adoption and scaling-up of successful lessons learnt." (SDC, 2017: 4). In addition, "TABI and its land use planning activities are closely aligned with the Swiss Government’s strategic objectives of supporting challenges of environment, food security and development ... The land use planning approach developed by TABI strengthened democratic participation of local communities and contributed in improving local communities’ access to resources and smallholder tenure security. In the absence of communal tenure to land and forest, land use planning activities and approach developed by TABI is particularly significant. This is also reflected in the recent assessment on the state of land carried out by CDE and its associates [Ingalls *et al*., 2018]." (Gonsalves *et al*., 2018: xii-xiii).

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 1: No Poverty**, especially through community-based, participatory actions relying on conservation and sustainable use of agrobiodiversity, NTFPs and village forest lands, with necessary associated improvements in collective tenure security: Target 1.4 (*By 2030,*

ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance); and Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*).

- **SDG 2: Zero hunger**, especially through community-based, participatory actions relying on conservation and sustainable use of agrobiodiversity and NTFPs, with necessary associated improvements in collective tenure security: Target 2.3 (*By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment*); Target 2.4 (*By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality*); and Target 2.5 (*By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed*).
- **SDG 11: Sustainable Cities and Communities**, especially at community and district level: Target 11.3 (*By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries*); and Target 11.4 (*Strengthen efforts to protect and safeguard the world's cultural and natural heritage*).
- **SDG 13: Climate Action**, especially through community-based, participatory actions relying on conservation and sustainable use of agrobiodiversity, NTFPs and village forest lands: Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*); and Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 15: Life on Land**, especially through community-based, participatory actions relying on conservation and sustainable use of agrobiodiversity, NTFPs, Fish Conservation Zones, and village forest lands: Target 15.1 (*By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements*); Target 15.2 (*By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally*); Target 15.4 (*By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development*); and Target 15.9 (*By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts*).
- **SDG 16: Peace, Justice and Strong Institutions**, especially at community and district level: Target 16.6 (*Develop effective, accountable and transparent institutions at all levels*).
- **SDG 17: Partnerships**, especially between SDC/TABI and its institutional partners including communities and government institutions at district, provincial and national level: Target 17.7 (*Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed*).

B4. Relevance to other development objectives. See purpose.

- **UNFCCC/Paris Agreement**: More than 190 countries at the United Nations Conference in Mexico pledged in Dec 2016 to step up the integration of biodiversity into their policies for the forests, fisheries, tourism and agriculture sectors.
- **CBD/Aichi Targets**: 1 (*awareness on value of biodiversity increased*); 7 (*agrobiodiversity conserved*) 13 (*genetic erosion minimised and genetic diversity protected*), 15 (*ecosystem*

resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration); 18 (*traditional knowledge respected*).

- **OECD**: essential to recognise the role of biodiversity in climate change mitigation and adaptation strategies, through carbon sequestration and avoided deforestation, whilst taking action to minimise the adverse effects to biodiversity as a result of climate change.
- **OECD/DAC sector**: biodiversity, agricultural development.

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Capacity-based mitigation (CM) [*oriented to?*] Ecosystem-based adaptation (EM).
Adaptation: Capacity-based adaptation (CA) [*oriented to?*] Ecosystem-based adaptation (EA).

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. SIGNIFICANT (1)
- **Adaptation**. SIGNIFICANT (1)

Part C: Narrative overview

TABI started with the core premise that upland multifunctional landscapes are better, more sustainable, more in keeping with traditional values and lifeways, and ultimately more useful to local people than mono-functional landscapes (such as tree-crop plantations), especially if resource tenure issues can be resolved (i.e. to encourage closed-access/locally regulated use). TABI embarked on an ambitious programme to explore, test and refine livelihood options based on the rich resources of agrobiodiversity, NTFPs and traditional knowledge of the Lao uplands (Outcome 1). This was done in parallel with developing a very participatory land use planning (PLUP, but called FALUPAM in TABI because the acronym PLUP had already been discredited in Laos) and management approach - a 'bottom-up co-creational' approach (Outcome 2). This pioneered a new form of land tenure for Laos - aiming to make communally-owned land legally acceptable and recognised by the state. In Lao PDR all land belongs to the state, and this was a problem because of the state's policy of attracting investors to make use of 'its' land - which effectively meant expropriating local farmers.
The 10-year programme of SDC support gave TABI space to innovate, try out and learn new things. In the shifting cultivation context of the Lao hills the aim was to prevent cultivation cycles from becoming shorter over time, so the focus was on how to make long rotation cycles viable and attractive by introducing other livelihood options based on mushrooms, broom grass, etc. This proved very successful in stabilising the systems and was quickly upscaled from two districts to over 200 villages in clusters and whole districts, exerting an influence over much larger areas of coherent forest cover. TABI thus helped clarify tenure and engage local people in planning the use of their village lands, including surrounding areas of fallow or harvested forest. These efforts were accompanied by a programme to build a knowledge management platform to support education and capacity building (Outcome 3). All three lines of approach seem to have been implemented effectively, with strong evidence of impact, sustainability and replicability in many areas (at levels from tactical to strategic and from household to district), and the nature and effects of the intervention suggest strong transformative potential in mitigation and adaptation, primarily due to the emission and environmental/livelihood security consequences of avoided ecosystem degradation.
Design quality was considered good (score 5) and the impressive results under Outcomes 1, 2 & 3 in Phases 3 & 4, which are given overall scores of 6 each for **effectiveness**, **impact** and **sustainability**, are likely to be almost equally relevant to adaptation and mitigation. The issue of strategic effectiveness and transformation at system (landscape) scale resolves into whether TABI was able to mobilise, motivate, educate and empower upland villagers enough for them to resist external threats in future, ranging from land grabs to climate change. The answer is likely to be that the communities were strengthened enough to resist (or deter, or mobilise political protection against) an increased range of threat intensities which may, or may not, be sufficient to mitigate problems for the foreseeable future. On that basis, and considering the durability of community-based resource systems elsewhere, the high replicability of the TABI approach, and the potency of ecosystem sustainability as a way to prevent and/or reduce net GHG emissions, the **transformative potential for mitigation** is considered high. Considering the durability of community-based resource systems elsewhere, the high replicability of the TABI approach, and the potency of ecosystem and livelihood sustainability as an adaptation strategy, along with

strong biodiversity and environmental security co-benefits, the **transformative potential for adaptation** is considered very high.

Part D: Design quality

D1. Theory of change.
The TABI starting hypothesis was that "agro-biodiversity-based development - as a viable alternative to large-scale, monoculture and concession-based agriculture - affords more opportunities to poor farmers, promotes greater equity, and directly builds on effective food security strategies." A series of steps and interlinked outcomes were envisioned:

- Options and systems for agrobiodiversity-based productive activities are designed, demonstrated and applied by upland farming communities and other stakeholders.
- Participatory forest and land use planning ensures village agricultural land and forest resource tenure and sustainable management.
- Integrated spatial planning and agrobiodiversity knowledge management and exchange tools support evidence-based decision-making.
- Government policies promote agrobiodiversity conservation and sustainable use, and land management, for improved food security and livelihoods in upland communities.
- Partner institutions incorporate and use agrobiodiversity tools and concepts for uplands livelihoods development.

The net result would be that productive agrobiodiversity-based activities and their impacts at central, provincial and district level would consolidate appreciation of the (utility) values of agrobiodiversity and lead to the mainstreaming of agrobiodiversity in plans and policies, and in knowledge production and sharing.

D2. Assumptions underlying the theory of change.
Assumption 1. That development strategies based primarily on the sustainable use of indigenous agrobiodiversity, NTFPs and traditional knowledge (with applied research, experimentation, etc. as needed to make them possible and to encourage and enable livelihood applications) would prove acceptable to local people in the Lao PDR uplands and to government.
Assumption 2. That villagers would be interested in and willing to learn about and find ways to use sustainably their own agrobiodiversity, NTFPs and traditional knowledge resources, and to map and plan the use of those resources in ways that would enhance their own tenure security and well-being.
Assumption 3. That local and national government and other non-local interest groups would tolerate (at worst) and actively support (at best) the livelihood options and land-use mapping outputs developed by TABI, or even seek to learn from and replicate them.

D3. Plausibility of assumptions and links. All assumptions and links between them are entirely plausible based on observations from many other locations, and as events unfolded within Lao PDR in 2009-2020.

D4. General quality of the project design.
Stakeholders & consultation. By Phase 3 (2012-2017) the operation seems to have been so well embedded in the three provinces and many districts and villages that adequate participation by (and consultation with) stakeholders can be assumed.
Risks. SDC (2012) identified the chief risk as a lack of sustained attention from policy makers and the possibility that land use plans and maps could be discarded or not used because of competing interests. Suhardiman *et al*. (2019) supported this perception of risk, describing "land use planning [in Laos] as a function of power and a contested arena of power struggle, driven primarily by the development targets of sectoral ministries and the interests of powerful local actors [yielding] a disjuncture between national and local land use planning processes and a disconnect between formal land use planning and actual land use across scales." SDC (2017: 8) observed that "TABI is dealing with multiple stakeholders in a dynamic environment, and may encounter risks to the realization of the outcomes and outputs. Various challenges may present a limitation to the realization of some project objectives. But TABI has a refined set of strategies and has designed complimentary project activities to deal with these challenges. The level of most risks can be considered medium, and there are promising mitigation measures concerning all major risks identified." The present finds this approach plausible provided that upland areas of Laos are not subject to strong competitive demand from other sectors and interests.
Score: 5.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.

REDD+ potential. The MTR noted that "TABI can share its GIS based information with other projects such as [the] Sustainable Forest Management and REDD+ Support Project ... Such collaboration may open doors for TABI, CDE and DALAM to further engage in policy dialogue with central level policy makers and international donors on how land use planning could be effectively designed in the future to facilitate long-term forest conservation." (Gonsalves *et al*., 2018: xi). Other references to community-based REDD+ opportunities. Thus, community mapping and resource tenure together create many potential opportunities (as many other cases show, from Nepal to Ghana and Bolivia).

Carbon storage in sustainable landscapes. Community-managed forests are subject to diverse harvesting regimes, to meet daily, occasional (e.g. for medicine, festivals) or seasonal needs for targeted items, some of them woody and carbon-rich (e.g. fuelwood, rattan canes), and may include the clear-felling of small patches in a moving swidden-fallow system that may eventually affect all parts of the landscape. The details of net carbon removal by such forests are therefore uncertain and depend on a detailed understanding of rate and scale (e.g. Wilson *et al*., 2017; Luintel *et al*., 2018; Bosques del Mundo, 2019). What is certain is that keeping a landscape largely under woody vegetation prevents the great exhalation of carbon oxides from wood and soil that accompanies catastrophic conversion, which is often in practice irreversible, while also generating sustainable and abundant co-benefits. Since climate change mitigation in an emergency context (i.e. with unstable biosphere tipping points threatening runaway climate breakdown) is all about slowing net emission rates as much and as quickly as possible, anything that prevents the degradation of carbon-rich ecosystems is a top priority.

Biodiversity co-benefits. The extension of community environmental resource assessment and planning to include forests and fallows is a strategic necessity for the landscape-level conservation of wild biodiversity in an inhabited landscape. This is because it removes large areas associated with each community from the prospect of anything other than small-patch conversion (followed by microclimate/population recolonisation and recovery) and/or closed-access resource harvesting (preventing competitive open-access exploitation). In moist tropical forests, much of the native biota can survive under such a regime, along with many ecosystem services. These ecological resources are then available in perpetuity for use by the community in its own interests. Hence, in principle, and drawing on experience elsewhere in the tropics, the TABI/FALUPAM strategy is likely to have strong biodiversity co-benefits.

Outcome 1 (livelihoods) - highlights of MTR findings (from Gonsalves *et al*., 2018: 13-26):

- The TABI approach is to build livelihoods on conservation of agrobiodiversity through sustainable use, thus going beyond some other NTFP approaches that focus only on value addition and market linkages [*evidence for sustainability + ecosystem co-benefits*].
- The TABI approach also recognises the value of forests and fallows, and through its investments at district level TABI brought huge attention to agro-biodiversity education and conservation [*evidence for sustainability + ecosystem co-benefits + education*].
- Because TABI did not adopt a blueprint approach, but instead encouraged districts to test a wide variety of approaches, a short-list of proven agrobiodiversity-based initiatives was developed, all of them involving NTFPs and other agrobiodiversity resources that local people were familiar with and usually a key component of local livelihoods and/or food systems [*evidence for sustainability + livelihood co-benefits*].
- TABI has brought prominence to the importance of NTFPs associated with forests and fallows, resulting in greatly increased appreciation of their value among rural people and officials and increasing government (e.g. Department of Forestry) recognition of the importance of villages managing their forest and NTFP resources [*evidence for sustainability*].
- The agroforestry capacity building initiatives that TABI initiated and supported at district level are significant and are bringing about local change, with strong evidence of uptake of agroforestry and associated support systems in at least two provinces [*evidence for sustainability + livelihood co-benefits*].
- Fish Conservation Zones received a significant share of TABI resources especially in Louangprabang and Houaphan provinces, resulting in strong local interest and district co-ownership, while TABI also encouraged traditional rice-fish systems by supporting district breeding centres and propagation centres [*evidence for sustainability + ecosystem co-benefits + livelihood co-benefits*].

- The MTR cited honey as one example of a long-standing engagement by TABI on a single NTFP-related enterprise, in which honey production traditions were built upon through small improvements in hive management, honey extraction methods, purifications, standards and market linkages, creating incentives to conserve forest bees and forest ecosystems [*evidence for sustainability + ecosystem co-benefits + livelihood co-benefits*].
- Other achievements of TABI in the areas of organic farming and community fire management are given in www.tabi.la/activities/agro-biodiversity-livelihood-options/ [*evidence for sustainability + ecosystem co-benefits + livelihood co-benefits*].
- One weakness was noted in the area of rice biodiversity (see H3.2): "TABI's limited engagement in the area of agro-biodiversity of *upland* rice (especially since Laos is the world's #1 centre of diversity for upland cultivars) is a concern." (Gonsalves et al., 2018: 20). The MTR suggested that "with agro-biodiversity conservation and food culture/security as primary important criteria, new work might be considered on *glutinous* cultivars in the upland ecosystems. ... Climate change challenges in the uplands can provide yet another argument for work on drought resistance in upland rice. ... With Laos achieving near self-sufficiency in lowland rice, it is conceivable that such a shift in *emphasis* to upland rice and associated ecosystems would be easily noted and supported."

Outcome 2 (land-use planning) - highlights of MTR findings (Gonsalves *et al*., 2018: 29-30), Lagerqvist & Chounlamontry (2018, Annex 2 in Gonsalves *et al*., 2018), and Dwyer & Dejvongsa (2017):

- FALUPAM is a participatory land-use planning process that sheds light on the complex reality of land and resource use and the issue of tenure in each community, in diverse local circumstances (examples of the latter are given in H3.3) [*evidence for transformative potential*].
- FALUPAM has proved particularly appropriate for upland communities where swidden agriculture is a major theme in the landscape management system [*evidence for transformative potential*].
- By facilitating realistic land-use planning at village and district levels, even in the absence of formal communal titles, FALUPAM creates a form of communal tenure - i.e. a social conception of ownership, responsibility and accountability (e.g. community representatives felt that having a detailed record of their resource use and rules of management provided valuable tool to legitimatise their access to land and forest resources) - that is likely to stand up well to outside challenges [*evidence of sustainability*].
- FALUPAM is much in demand beyond TABI's three focal provinces in northern Laos, attesting to the usefulness of the approach to stakeholders and highlighting needs across the country [*evidence for replicability*].
- DALAM has the capacity to carry out land use planning activities and continues to work with CDE and with local authorities in TABI focal provinces to consolidate FALUPAM activities.
- Experience with the intricate land use planning system introduced by TABI has confirmed that detail and context are key to achievement, and has taught many lessons that TABI partners should absorb and communicate to others [*knowledge management priority*].
- TABI is uniquely positioned to use its experience and the rich repository of information to generate key lessons learnt and to lead evidence-based policy dialogue on land and natural resource governance in Laos [*knowledge management priority*].
- DALAM and CDE will need to develop a database for monitoring land use activities and provide training for its use at TABI focal provinces [*knowledge management priority*].
- FALUPAM has encountered complex land-use contexts in new areas beyond the original TABI sites, which have slowed down the completion of FALUPAM activities in these locations.

Outcome 3 (knowledge generation) - findings of the MTR (Gonsalves *et al*., 2018: 31-36):

- TABI has developed many information education and communication materials, which have supported capacity development efforts at district and other levels, including videos on the following topics: native oranges, KKN meetings [*it is unclear if this is a metaphor or a topic*], broom grass[9], bamboo, traditional medicine, KKN growing, honey collection, fish conservation, traditional chicken raising, *Chongcha* Tea[10], garden planning, agricultural

[9] *Thysanolaena maxima* (Poaceae) is used to prevent soil erosion and landslides, and for brooms.

[10] Caterpillar excrement tea, from the moths *Aglossa* sp., a genus whose caterpillars are known to eat ants, carrion and manure, and *Hydrillodes morosa*.

biodiversity awareness raising, bee keeping, tea planting, crispy river weed (*khai phen*), organic vegetables, National Steering Committee, hydro wheels, fire management.

- The Pha Khao Lao knowledge sharing platform on agrobiodiversity (NAFRI, nd; www.tabi.la/resources/; www.tabi.la/activities/agro-biodiversity-education/), is likely be among TABI's legacies in relation to which the MTR concluded that "there is little more to say than to congratulate TABI and NAFRI for this exceptional effort." [*evidence for sustainability*]. It is a consolidated source of agrobiodiversity species and product information with a focus on providing 'Lao first' language content. It consists of three interlinked areas:
  - the knowledge base as a compendium of formal knowledge on product, species and policy information;
  - storytelling offers fun and interactive ways to illustrate the powerful connection between agrobiodiversity and Lao communities; and
  - engagement to facilitate outreach activities to amplify the messages of the platform and promote changes in attitudes and behaviours.
- Phase 4 of TABI is intended to identify and leverage opportunities for policy influence.

Overall performance scores: **effectiveness** - excellent (6); **impact** - excellent (6); **sustainability** - excellent (6).

E2. System change. The issue of strategic effectiveness and transformation at system (landscape) scale resolves into whether TABI was able to mobilise, motivate, educate and empower upland villagers enough for them to resist external threats in future, ranging from land grabs to climate change. (See Parts E and F). The answer is likely to be that the communities were strengthened enough to resist (or deter, or mobilise political protection against) an increased range of threat intensities which may, or may not, be sufficient to mitigate problems for the foreseeable future. On that basis, and considering the durability of community-based resource systems elsewhere, the high replicability of the TABI approach, and the potency of ecosystem sustainability as a way to prevent and/or reduce net GHG emissions, the **transformative potential for mitigation is considered high**.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness. See E1. All results under Outcomes 1, 2 & 3 are at least equally relevant to adaptation as they are to mitigation. The SDC classification of TABI as equally significant for both mitigation and adaptation is therefore appropriate, although the whole project could have been designed and implemented with few changes in practice so as to be classified as PRINCIPAL for both mitigation and adaptation.

F2. System change. See E2. Considering the durability of community-based resource systems elsewhere, the high replicability of the TABI approach, and the potency of ecosystem and livelihood sustainability as an adaptation strategy, the **transformative potential for adaptation is considered very high**.

Part G: Other aspects of design and performance

G1. Efficiency issues.

Start-up delays of over six months (mainly due to external factors linked to government changes and bureaucracy) hampered efficiency. TABI demonstrated that costs were higher than the benefits delivered until year 3, especially because FALUPAM is more costly than alternatives (Dwyer & Dejvongsa, 2017). But the fact that FALUPAM can deliver more benefits through land-use plans adapted to local conditions meant that communities became increasingly willing to take up TABI measures from year 3. Lessons included: (a) that an effective communication strategy targeting stakeholders is crucial to winning support for TABI; (b) that sub-project agreements (SPAs) are cost effective where they engage locals in their design to facilitate learning and integration of local good practices and technologies; and (c) that sustaining FALUPAM needs internal and external income generating measures to be in place. These measures would require supportive policies, but the four-year duration was not enough to win this level of support for ABD. Progress report to 2019 indicates development of the under-forest economy (such as bee keeping/honey networks) and institutionalisation of seed production under Khao Kai Noi initiative to facilitate sale of ABD seeds is likely to enhance cost-effectiveness before project end and sustainability. However, effective marketing of NTFPs is being led by Forestry Department, rather than a specialised agency dedicated to promoting SMEs. The high cost of FALUPAM was questioned on the grounds that such a huge amount of information was not necessary for planning, but these reservations were dismissed by the MTR because effective participatory planning and environmental education are necessarily slow,

intricate, labour-intensive and information-demanding (as well as information-generating) activities, and draw their utility from precisely these attributes.

G2. Coherence issues.
The impression is that TABI has been leading the way in community-based agrobiodiversity, NTFP and land-use planning activities in the Lao PDR uplands, with other donors as partners or observers rather than as competitors. The MTR identified a number of opportunities for increased cooperation with government and donors in future, surrounding TABI's core premise (i.e. that upland multifunctional landscapes are better than mono-functional landscape), and accomplishments (i.e. that TABI has carried out detailed assessments of agriculture and forest resources, livelihoods and land uses in c. 250 villages over the past 7 years, including comprehensive data on NTFPs, local crops and cultivars, land types and household income; and that ongoing sub-projects collect comprehensive information on selected products in the TABI landscape, providing a key basis of supplemental information), and including the leveraging of this information base to produce evidence for recommendations to inform high-level government priorities.
Phase 4 appears to be the first attempt to connect FALUPAM with donors promoting REDD+. For example, it aimed to connect with the Integrated Conservation of Biodiversity and Forests (ICBF) project funded by KfW (2015-2022) and the Village Forest Management Agreements project (VFMP) funded by GiZ (2020-2026) which aim to support the establishment of a provincial REDD+ programme in one of TABI's key provinces (Houaphan). However, it was not clear how this (especially MRV) would be managed by MAF or other Lao actors.

G3. Replicability issues.
Strong evidence for high replicability in many specific areas of agrobiodiversity and NTFP use and the FALUPAM process in general (especially in Luang Prabang), but a national legal and regulatory framework was not in place to support its full institutionalisation and funding.

G4. Partnership issues.
Phases 1-3 concentrated on proving the FALUPAM model works to the benefit of upland communities and the local economy. Phase 4 focused on promoting TABI tools and concepts with other projects and development partners through: (i) completing and publishing agrobiodiversity product profiles in collaboration with the National Agricultural Research Institute (NAFRI) and other partners; (ii) the production of user-oriented manuals describing step-by-step how to implement agrobiodiversity management tools, including a rapid FALUPAM tool kit (rather than as a 'hard and fast' manual) from which tools and methods can be selected according to purpose and context; (iii) forging closer cooperative links with other projects, such SDC-funded projects: Support to the Reform of the Northern Agriculture & Forestry College (SURAFCO) and Lao Upland Rural Advisory Service (LURAS) to develop, among others, agrobiodiversity curricula, support the development of farmers' organisations; iv) active participation in sub-sector working groups, particularly the agrobiodiversity sub-sector Working Group and the Land Use Planning Working Group.
The MTR obtained perspectives from various stakeholders, including communities and how they perceived land governance before and after FALUPAM (Table 3 in Lagerqvist & Chounlamontry, 2018), organisations that participated in FALUPAM (CCL, WWF and THPC: Table 4 in Lagerqvist & Chounlamontry, 2018), and other organisations (GIZ, JICA, FAO, IWMI, Department of Forestry: Table 5 in Lagerqvist & Chounlamontry, 2018).

G5. Connectedness issues. Identified risks included that foreign investment from other more powerful economic neighbours (China, Thailand, Vietnam) could distort and undermine the FALUPAM process. Also, that the value chains for NTFPs could be affected by external factors of climate change and economic conditions. Tensions between Hmong and other peoples are mentioned only briefly in Dwyer & Dejvongsa (2017: 26), and there is no mention in project documents of the role if any of opium poppy cultivation and the narcotics trade, which were until recently important in the 'Golden Triangle' region where Myanmar, Laos and Thailand meet.

G6. Cross-cutting themes.
Gender equity & social inclusion. "Aspects of gender and equity in TABI's land use planning approach was not particularly evident during our review process. From our interviews in communities, and project documentation, including the recent progress report (TABI 2018b) we understand that both genders attended series of village meetings, as well as different members of ethnic groups in the community. However, discussions with IWMI researchers and results of ABD score-card trial (Foppes *et al.,* 2018) suggest that these issues were not fully captured in

the process of FALUPAM implementation despite the intention to address them. We understand that complex migration history of communities, various social norms and languages co-existing in communities and fundamental power asymmetries within the communities all complicate the issue of equity and are not entirely within the remit of FALUPAM. However, it is important to analyse how the issue of equity and gender were approached and addressed (or not) in TABI's land use planning activities, and what can be learnt from the experience. Considering the limited human resource available within TABI, such topic can be carried out in collaboration and/or outsourced to other researchers and organisations to generate further learnings." (Gonsalves *et al*., 2019: xii).

G7. Capacity building issues. There is no evidence of baseline assessments or formal monitoring, but uptake, demand and sustainability all seem to be high, and all phases of TABI placed great emphasis on capacity building to apply FALUPAM and promote its ownership among: (a) technical staff and decision makers at the district and provincial levels; (b) farmer associations in targeted upland communities; and (c) civil society organisations.

Part H: Other matters arising from the review

H1. Follow-on questions. These mostly concerned lesson-learning from phase to phase, impacts on biodiversity, indigenous peoples and livelihoods, and replication potential, and to the extent possible the answers are integrated in the text.

H2. Missing documents. Final evaluation.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: Participatory Forest and Agriculture Land use planning, allocation and Management (FALUPAM, from: https://www.tabi.la/activities/land-use-planning/land-use-planing/).
What is FALUPAM? FALUPAM is an iterative approach for land use planning at the village and village cluster level. It is a set of tools that provides Lao Government agencies, investors, donor partners and NGOs the ability to carry out integrated resource planning and monitoring of forests and agricultural lands in an inclusive way, by engaging and working together with local authorities and villagers. The approach is based on the recognition of traditional livelihoods of the uplands and designed in order to contribute to the stabilization of shifting cultivation landscapes, promote long-fallowing and to increase of forest cover. The overall goal of FALUPAM is to ensure the sustainable and equitable use of agriculture and forest land by and for local land users. Based on this it has three primary objectives:

- To develop forest and agricultural land zonation and management plans that reflect local needs and priorities and are owned and implemented by local villagers.
- To develop forest and agricultural land zonation and management plans that meet government requirements and can be approved at local and national level. To develop forest and agricultural land zonation and management plans that ensure the sustainable use of local resources and Agro-Biodiversity

FALUPAM quick facts. Methodology developed since 2011 by The Agro-Biodiversity Initiative in three provinces: Xiengkhouang, Houaphan and Louang Prabang. Implemented by DALAM, PALAM, PONRE, DONRE, with support from NIRAS and CDE. Civil Society partners - WWF, GRET, WCS, CCL and World Renew. Implemented in 250 villages in 10 provinces with detailed maps and socio-economic data collected. More than 70 people trained at the provincial level in implementation. See map of FALUPAM areas: https://www.tabi.la/wp-content/uploads/2018/01/Where-we-work-tabi_PROJECTS-5.jpg.
What makes FALUPAM unique? FALUPAM builds upon previous methods of land use planning which have been tested and implemented in Laos over the last 20 years. There are a few distinctive features about FALUPAM:

- **Iterative planning**. FALUPAM takes an iterative, multi-stage and deliberative approach to land use planning over a longer period, as opposed to a rapid, campaign-style approach. Time is left between visits for villagers to digest and discuss the results before actively taking part the next planning step. This allows district staff and villagers to discuss amongst themselves, gain trust and develop mutual understanding of land and forest issues. See maps: https://www.tabi.la/wp-content/uploads/2018/01/1.jpg and https://www.tabi.la/wp-content/uploads/2018/01/2.jpg.
- **Identifying and mapping actual land use**. In typical land use planning processes, national land use classifications are used as a basis for the current situation of land use instead of on-

the-ground assessment in order to save time and effort. Because of mismatching spatial scales and timing of land use classification, these categories, do not reflect prevailing customary land uses and local knowledge. As a consequence, such approaches do not adequately reflect local needs and interests and present obstacles for local communities and authorities during implementation. FALUPAM is different from other land use planning tools in that it is precise about actual and present land use at the plot and village level, building on local knowledge and customary practice. In FALUPAM, the identification and mapping of current land use is carried out jointly with villagers and village-level authorities. This helps to build trust and also demonstrates that the teams are respect local land use. See maps: https://www.tabi.la/wp-content/uploads/2018/01/3.jpg and https://www.tabi.la/wp-content/uploads/2018/01/4.jpg.

- **Applying state-of-the-art technology and well-trained staff leading the process**. FALUPAM applies the most advanced technology in remote sensing, mapping, digitizing, GIS data management and related disciplines. The most recent satellite imagery is obtained and used in each field mission. Pre-digitization and post-field data compiling are key to obtaining detailed and accurate data, which makes working local villagers a lot easier and productive. Besides from satellite imagery, the most recent and updated vector-based data are also sourced in order to help the mapping process. Post-field data are then cleaned, compiled, processed and used to produce into final maps. These data are then stored in the well-structured GIS database system. Technical government staff and partners are provided with series of essential trainings both theoretical and on-the-job training. They have to be well-trained and able to show some sort of capability prior to the actual field implementation.
- **Creating economies of scale by consolidating agriculture production**. The traditional upland landscape is often a patchwork of activities that makes it difficult to achieve economies of scale. FALUPAM introduces the concept of consolidating production and management into zones for more efficient and effective development. In terms of agriculture production, consolidating activities allows villagers to work together, construct fences and communal works and potentially decrease labour inputs. It is also easier to define and demarcate the boundary between agriculture and forestry zones, and thus create the preconditions that are essential for community land title. It can promote community cohesion and potentially be more equitable for poorer families.
- **Local ownership and recognition**. Village land use planning committees are established for the steering and coordination of the planning process. At the end of the planning process, these committees suggest the approval of the final village reports, for official signatory of the district Governor. The Governor's signature provides a form of legitimacy to the process and helps to ensure the protection of community land and resources from outside development pressures. The committee is also entrusted to seeing the plan is implemented and/or adapted based on local realities.
- **Implementation at the landscape-scale**. Key social and environmental values are best managed at the landscape scale. At minimum, FALUPAM is implemented at the *kumban* (village cluster) level, collaboratively producing village boundaries that are mutually agreeable to surrounding communities while identifying planning and management needs for shared resources that leverage cross-boundary synergies and avoidance of inter-village conflicts.

Who has been involved in FALUPAM? [D]ALAMD leads the testing and implementation of the approach but works with a number of line agencies such as the Department of Forestry and the Department of Lands/MONRE. In addition, DALAMD and TABI have developed a network of provincial level teams that can implement the process. TABI is also working with a number of INGOs, projects and even the private sector to further the implementation of FALUPAM across the country, including: GRET, CCL, WWF, THPC, LURAS/Helvetas and World Renew.

H3.2: **Rice biodiversity**.

"Laos is known for its rich rice biodiversity. In fact, it is a centre of diversity for upland rice. It is the second largest contributor of rice germplasm to IRRI's global seed collection. Thus, rice agro-biodiversity conservation remains a priority consideration in Laos-based agro-biodiversity work. TABI has supported some very innovative work on well-known traditional lowland rice varieties Khao Khai Noi (KKN), supporting clean seed systems. The TABI, NAFRI work on KKN is exceptional and needs to be more widely shared. One study supported by TABI [at 12 villages, Foppes *et al*., 2018] clearly draws attention to the richness of rice agro-biodiversity in Laos. Ethnicity, risk reduction, spreading out labour requirements and addressing the unique

and special rice-based food needs might explain why farmers retain such diversity. A mix of rice with different maturity periods helps distribute labour needs and to mitigate risks from climate (e.g. short duration varieties might escape unseasonal drought or floods). Most of the varieties cultivated in the 12 villages belong to the late maturing upland sticky rice type. There were large differences in the number of varieties cultivated per village, ranging from 37 varieties in Houay Hit village (highest rice richness) to 10 in HouayXeua (lowest). The average number of varieties per village was 17.4." (Gonsalves *et al*., 2018: 20).

H3.3: Incremental improvement of resource tenure in village level.

"In their report on Strategic Analysis of FALUPAM, Dwyer and Dejvongsa (2017) highlight that 'By investing resources in realistic and concrete land-use plans at village and district levels, even in the absence of communal titles, FALUPAM seems to be creating a form of communal tenure that is likely to stand up well to outside challenges (p. 28, emphasis in italics by Dywer and Dejvongsa).' Tenure is referred to as socially constructed relationship with respect to land and associated natural resources (Dwyer 2017). Rule of tenure can be based on a mix of tradition and formal law, and more importantly such rule defines how access to resources are granted to various individuals and groups and the conditions in which they are granted. It is important to remember that tenure is not set in stone, and while it can be secured at a point in time, it can also be also violated. Tenure is subject to change amidst the on-going changes to peoples' livelihood, governance and the socio-economic environment.

"Our observations in eight villages across three provinces also concur with the above view shared by Dwyer and Dejvongsa (2017) in that through participation to FALUPAM and completion of four stages, community representatives sensed an incremental improvement of tenure security. While community representatives were fully aware that the state of tenure over land and forest assured through FALUPAM could change in the future, they felt that having a detailed record of their resource use and rules of management provided valuable tool to legitimatise their access to land and forest resources [*Note: Village book that was handed over to communities not only included detailed resource map and management tools, but also included baseline record of households' access to land, as well as their use of natural resources. This also was an important information to legitimatise community members' claim to land and forest resources*]. In some communities, it also provided a temporary safeguard against state-land concession and ensured communities' land access for basic food production. Our community interviews highlight the importance of recognising different contexts in which land use planning occurs. In each of the eight villages that were visited during the review, the circumstance in which community members used and manage natural resources differed as well as physical features of land and forest. This meant that land use plans had to also adapt and incorporate different needs in each community.

- **O An village, Pek district, Xiengkhouang**. *Forest tea and FALUPAM*. FALUPAM included initiative to mark individual tea trees in the forest and agricultural land use management zones. The process facilitated households to take active interest in improving the management of tea trees in forest environment. FALUPAM also identified areas suitable for new tea plantation. Households' increased financial and labour commitment towards tea production also meant that they were no longer able carry out swidden as before. At the same time, zoning introduced by FALUPAM consequently enabled families to share agricultural labour more easily for swidden cultivation.
- **Mien village, Phoukout district, Xiengkhouang**. *FALUPAM and support for agrobiodiversity-based livelihood activities*. The village participated in FALUPAM in anticipation for receiving support for livelihood activities. They trialled new zoning that reflected longer fallow practice in the uplands. Not everyone in the village was keen to consolidate their swidden. However, when they trialled the consolidated swidden, people realised it was much more 'fun' to work in a bigger group and saved family labour for upland rice cultivation. The new zoning also enabled families to look after livestock more easily. There was also visible reduction of forest fire after the new zoning.
- **Kheung village, Phoukout district, Xiengkhouang**. *FALUPAM as an update to the previous land use plan*. FALUPAM helped to update village boundaries and land use plan, which was developed as part of LUP/LA process with funding from the Asian Development Bank. Households are not dependent on swidden cultivation in this village. There was relatively little friction within the village when the new zoning was introduced.
- **Peung village, Xamneua district, Houapanh**. *FALUPAM as precursor to agricultural land titling*. FALUPAM was introduced in the community, which re-designated parts of swidden

fallow into agricultural land. Following the new zoning, the community further worked with DONRE to ascertain individual claims to agricultural land by issuing land titles. While households can sell such land, it is registered as agricultural land and is not easily transformed into other land. In order to convert agricultural land into non-agricultural land, individuals will need to apply for government approval.

- **Na Meuang village, Viengxay district, Houapanh**. *FALUPAM as means to customary rights to land and forest*. After completion of FALUPAM, neighbouring villagers encroached into the village forest to conduct upland rice farming. Village management rules and agreement on village boundaries were used to resolve conflict at the district level. However, the local government was unable to fine the culprit, as they were brought down from the mountains to resettle in the neighbouring village and were too poor to pay for the damage.
- **Phonexay village, Viengxay district, Houapanh**. *FALUPAM applied in multi-ethnic community with different settlement history*. The new zoning introduced by FALUPAM was not well understood by different members of the community. However, as they trialled the new zoning people eventually came to see the benefit of working together in consolidated swidden fields. They observe notable reduction in forest fire. There is also some flexibility in the overall design of forest and agricultural land use management zones, which allows communities to work out issues each year according to their needs.
- **Houay Hit village, Nambak district, Luangprabang**. *FALUPAM in concession landscape (40 years concession with Sino-Rubber), and multi-ethnic setting*. FALUPAM was introduced in a community with limited swidden area. This was largely due to series of agricultural concessions in the community. Households' main source of income, sales of rubber to the Sino-Rubber company in the district.
- **Namai village, Nambak district, Luangprabang**. *FALUPAM was carried out in concession landscape and in community with waves of migration*. In this community, competition for land has intensified during the last decade. As land was precious, it was already a common practice in the village to buy and sell land prior to the introduction of FALUPAM. Zoning introduced by FALUPAM was perceived as a kind of land distribution, and villagers that purchased the land from others prior to FALUPAM were not happy to let others use their land without charge. In this community they were only able to identify four main areas for swidden. People felt that four-year cycle of rotation was not enough for upland rice cultivation. However, despite the scepticism, representatives of the community also understood the benefits of having detailed land use planning in the village. Community members resent rubber concession even though rubber tapping and sales of latex to Sino-Rubber Company is now the main source of household income. The main source of resentment is that villagers feel as if their land was taken by the state and the foreign investor for free, and that they are merely providing free labour for the investor. This experience made community members particularly keen to ensure that they have legitimate access to remaining land in the village for food production and for other purposes.

"What we can draw from these experiences is that TABI's land use planning activities that culminated into FALUPAM is not merely a tool to distinguish areas of forest for conservation within village landscape, but a process that sheds light on the complex reality of land and resource use and the issue of tenure in each community. The process recognises swidden and fallow system in the upland, which has long been classified as "unstocked forest," and assumed as an area without any agricultural activities. This has often led to the misconception of the upland landscape as an idle and unoccupied land, resulting in widespread promotion of investment and 'development' of such land through concessions and land lease arrangements (See also Heinimann *et al*., 2017). Our interviews in eight communities demonstrated how approaches such as FALUPAM helps to strengthen local tenure over forest and land over time. However, our interviews with communities also highlighted that the process of adopting FALUPAM was not always simple." (Gonsalves *et al*., 2018: vi-viii).

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Part J: Acronyms and abbreviations

ABD	agrobiodiversity
CBD	Convention on Biological Diversity
CCL	Comité de Coopération avec Laos (https://ccl-laos.org)
CDE	Centre for Development and Environment (University of Bern)
CSO	Civil society organisation
DALAM	Department of Agricultural Land Management (of the Ministry of Agriculture and Forestry)
DALAMD	DALAM at district level
DONRE	District Office of Natural Resources and Environment
FALUPAM	Forest and Agricultural Land Use Planning, Allocation and Management (also variously FLUP, FLUPAM, pFALUPAM, pFLUP)
GRET	Groupe de recherche et d'échanges technologiques (www.gret.org)
IRRI	International Rice Research Institute
IWMI	International Water Management Institute
KKN	*kao kai noi* (top-grade glutinous or 'sticky' rice)
LURAS	Lao Upland Rural Advisory Service (Helvetas)
MAF	Ministry of Agriculture and Forestry
MONRE	Ministry of Natural Resources and Environment
NAFRI	National Agriculture, Forestry and Rural Development Research Institute
NTFP	Non-timber forest product
PALAM	Provincial [office/centre for] Agricultural Land Management
PONRE	Provincial Office of Natural Resources and Environment
RECOFTC	The Center for People and Forests
SPA	Sub-Project Agreement
SURAFCO	Support to the Reform of the Agriculture and Forestry College in Luang Prabang
TABI	The Agro-Biodiversity Initiative
THPC	Theun-Hinboun Power Company
WCS	Wildlife Conservation Society
World Renew	https://worldrenew.ca/
WWF	World Wide Fund for Nature (World Wildlife Fund)
XKP	Xiengkhouang province

Annex 13.5: Energy Efficiency in Indian Buildings (BEEP)

Project highlights.
7F-06524: **Indo-Swiss Programme on Building Energy Efficiency (BEEP)**. Developed and disseminated knowledge and technology to improve building design and thermal management systems among sector professionals and institutions; contributed to new government building codes and developed compliance tools; and delivered public outreach activities nationwide.
Part A: Basic data
A1. Project number & name. 7F-06524 1: Building Energy Efficiency. 2: Construction assistance in India: Improving energy efficiency in buildings. 3: Indo-Swiss Programme on Building Energy Efficiency (BEEP).
A2. Sources. **Process of PRF development**: (a) a draft PRF was prepared by the core team using documents listed in the bibliography and with input by SDC interviewees; (b) the draft PRF was reviewed by the national consultant **Pankaj Kumar**, who also conducted interviews listed in Annex 13.22; and (c) the PRF was revised by the core team in light of field findings. • 2012-2017: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2008/7F06524/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html • 2017-2021: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2008/7F06524/phase3?oldPagePath=/content/deza/en/home/projekte/projekte.html
A3. Dates & financial data. • **Phase 1 (Oct 2008 to Dec 2012)**, budget CHF 2.10 million (SDC, 2008, 2013). • **Phase 2 (Dec 2012 to Sep 2017)**, budget CHF 4.75 million (SDC, 2012, 2017a). • **Phase 3 (Oct 2017 to Dec 2021)**, budget CHF 7.00 million (SDC, 2017b).
A4. Location(s). India: nationwide, and state governments of Karnataka, Rajasthan and Andhra Pradesh.
A5. SDC Geography. South Asia: India
A6. SDC Domain. Global Programme Climate Change
A7. Partners. **SDC (2008).** Indian partners[11]: Greentech Knowledge Solutions Pvt. Ltd., Ashok B Lall, Sanjay Prakash; Gil-Sohrabji Godrej Green Business Centre, Hyderabad; Centre of Excellence in Sustainable Housing and Rural Infrastructure (CESHRI), Development Alternatives; ISHRAE, Council of Architecture, Indian Builders Association (IBA). Swiss partners[12]: Sorane SA; Bauart Architekten and Planar AG; EMPA; Industrial Energy Systems Laboratory, EPFL. **SDC (2012)**. Contract partners: Sorane SA; Greentech Knowledge Solutions Ltd. India. Other partners: EMPA, Minergie Association, University of Geneva, City of Zurich. **SDC (2017a)**. Contract partners: Effin'art, Switzerland and Greentech Knowledge Solutions, India (Energy efficiency in buildings); One international and one Indian partner institution to be identified (Renewables in buildings).

[11] Details on Indian partners added by interviewees: Environmental Design Solutions, Energe-se Research & Consulting, Global Evolutionary Energy Design (GEED), Mr. Ram Krishna Sharma, Centre for Media Studies, Ebizon Net info, Genesis Media, The Banyan Tree, Ms. Tanya Srivastava, Innovative Printers, Sri Sri University, Indian Institute of Technology, Bhilai, Ms. Ramya Sasindran, Kamal Cogent Energy, CARBSE, CEPT University, I-CON Consultants, Energetic Consulting, Options and Solutions, Conserve Consultants, Academic & Development Communication Services, Administrative Staff College of India, Hyderabad.

[12] Details on Swiss partners added by interviewees Dr. Jean Decaix, Mr. G. Duthe, Mr. L. Aiulfi, Mr. Stefan Kesslar, Mr. Heinrich Gugerli, Prof. Ulrike Passe, Mr. Thomas Jusselme.

Part B: Purpose, relevance and approach

B1. Purpose.

The **Phase 2 overall goal** was "to contribute to reducing energy consumption in new buildings and to promoting best practices in designing and applying energy-efficient measures." (SDC, 2012), or similarly "to see that energy consumption in new commercial buildings is reduced and that best practices for the construction of low-energy residential and public buildings are broadly known and recognized in India." (MoP *et al*., 2012). This differs from the **Phase 1 objective** in not specifying a 30-40 percent reduction in energy consumption in new buildings by 2020 (SDC, 2008). The **Phase 2 overall objective** was "to reduce energy consumption in new commercial buildings in India and to disseminate best practices in the design of energy efficient residential and public buildings. The **specific objective** was to build capacities and knowledge of builders, architects, engineers, labs, institutions and others, in the area of building energy efficiency in India -- by utilizing Swiss experience and expertise, and by following a multi-stakeholders cooperation process." (SDC, 2017a). Phase 2 had five foreseen outcomes.

- **Outcome 1** (*Builders and developers implement energy-efficient solutions for new commercial buildings*), to address barriers to builders and developers adopting the 2007 Energy Conservation Building Code (ECBC), with these objectives:
  - Design of 20 energy-efficient buildings (several being 25%–30% energy efficient as compared to the baseline buildings) through provision of technical support by Swiss experts in the form of integrated design process charrettes (workshops).
  - Training of 40 Indian senior building design professionals in conducting charrettes.
  - Hands-on exposure and training of 200 Indian building sector professionals through participation in charrettes.
  - Awareness creation among 800 Indian building sector professionals through seminars.
- **Outcome 2** (*Building professionals have access to certified information on the characteristics of Indian thermal insulation products*), to work with EPFL and EMPA in addressing barriers to growth of the building insulation market, with these objectives:
  - Building technical capacities of two to four Indian labs for testing insulation materials through training, technical support, and up-grading of testing equipment.
  - Launching a national programme to test insulation products and envelope components resulting in the availability of certified information database on the characteristics of thermal insulation products and envelope components to the building industry by the end of the programme.
- **Outcome 3** (*The design guidelines and the Minergie-India label are used as a reference by residential sector stakeholders in the composite, warm humid and cold climatic regions*), addresses issues of energy efficiency in residential buildings (which represent over 90% of the building stock and account for 21% electricity consumption), with these objectives:
  - Developing comprehensive design guidelines for energy-efficient residential buildings in India's main climatic regions (the composite, the warm humid, and the cold).
  - Creating a label, based on the existing Swiss Minergie label to certify comfortable low-energy residential buildings.
- **Outcome 4** (*The design templates are used as a reference by public building sector stakeholders in 5–10 selected states*), to support state/provincial governments in designing energy-efficient public buildings, with these objectives:
  - Technical assistance to 5–10 states for the development and dissemination of design templates for designing energy-efficient and ECBC-compliant new public buildings.
- **Outcome 5** (*Increased knowledge and awareness on climate-responsive, high-performance, energy-efficient solutions for new buildings among India's building sector professionals, end-users, local authorities, and policy makers*), to build and manage knowledge on energy efficiency in buildings, with these objectives:
  - Development and dissemination of four to five specific design tools.
  - Training 70 Indian professionals in advanced building energy efficiency topics.
  - Two study tours to Switzerland.
  - Knowledge exchange through a Community of Practice (COP) of sustainable building professionals, a website, an international seminar, and various events linked to green buildings in India.

The **Phase 3 overall goal** is that "energy consumption in new commercial, public and residential buildings in India is reduced through energy-efficient and thermally comfortable design and through the application of renewable energy technologies." (SDC, 2017b). Phase 3

had a modified logframe with four outcomes (building design, technology and policy, and outreach), built around two themes: **energy efficiency in buildings** (i.e. achieving a critical mass of building-sector professionals adept at EETC building design, establishing EMSYS in the market, integrating EETC building rules into the regulatory framework, and getting EETC knowledge to building-sector professionals and others); and **renewable energy in buildings** (i.e. demonstrating two or three innovative RE building technologies, research and policy analysis to help promote those RE building technologies, and training and knowledge dissemination).

B2. Relevance to partners.
India. India's *National Action Plan on Climate Change* "has proposed a national mission on sustainable habitat. Promotion of building energy efficiency is an important component of this mission." (SDC, 2008: 1). India's NDC refers to the *National Mission for Enhanced Energy Efficiency*, within which is the Energy Conservation Building Code (ECBC), which "sets minimum energy standards for new commercial buildings. Eight states have already adopted and notified the ECBC, and over 300 new commercial buildings have become compliant. The Code would be made more stringent to promote construction of even more (Near-Zero) energy-efficient buildings. 'Design Guidelines for Energy Efficient Multi-storey Residential buildings' have also been launched." (Government of India (2016).
Switzerland. "The project is in alignment with SDC's new global programme on climate change, which has energy efficiency in building sector as one of the thematic priorities. In addition the project also wishes to build on SDC's experiences in the rural habitat and building materials sector." (SDC, 2008: 1). "The overall mission of the GPCCE is to contribute to low emission and climate resilient development by promoting sustainable access to energy for all and sustainable management of natural resources. Component two of the strategy document (2017-2020) specifically focuses on energy efficiency in buildings, sustainable urban habitat and bw emission land use. BEEP has demonstrated the potential of reducing energy consumption in buildings in India. Being one of the most energy consuming sectors in one of the world's largest economies, the project has the potential of reducing GHG emissions on a global scale. ... Within SDC's project portfolio, BEEP will work closely with the Capacity building project for low carbon and climate resilient City development in India (CapaCITIES) in which the building sector is one of the core intervention areas for CO_2 mitigation. With regard to building material, synergies will be established with the Low Carbon Cement Project (LCC) and with new building material project in Latin America. From the renewables perspective, Switzerland has one of the highest densities of ground source (geothermal energy) heat pump systems in the world. The pumps are used for heating residential and apartment houses or office buildings etc. Another example is the work on smart grids. Swissgrid along with Berner Kraftwerke (BKW), Migros, IBM are jointly committing to a Smart Grid pilot project for managing the cold storage warehouses in Neuendorf. Lessons will be drawn from such private sector initiatives. With Swiss expertise, the project aims to offer a complete package of knowledge and solutions in making building less energy dependent." (SDC, 2017b: 4).
General. (a) "Energy-related CO_2 emissions from buildings have risen in recent years after flattening between 2013 and 2016. Direct and indirect emissions from electricity and commercial heat used in buildings rose to 10 $GtCO_2$ in 2019, the highest level ever recorded. Several factors have contributed to this rise, including growing energy demand for heating and cooling with rising air-conditioner ownership and extreme weather events. Enormous emissions reduction potential remains untapped due to the continued use of fossil fuel-based assets, a lack of effective energy-efficiency policies and insufficient investment in sustainable buildings." (IEA, 2021). (b) "On the international level, the project contributes to various global processes in the fields of climate change mitigation, urban development and resource efficiency [including several SDGs - see B3] and implementation of the Paris Agreement and the New Urban Agenda[13] [UN, 2017]. "(SDC, 2017b: 4).

B3. Relevance to SDGs. (https://sdgs.un.org/goals)
- **SDG 7: Affordable and clean energy**, especially Target 7.3 (*By 2030, double the global rate of improvement in energy efficiency*), and Target 7.a (*By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including*

[13] The New Urban Agenda was adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador, on 20 October 2016. It was endorsed by the United Nations General Assembly at its sixty-eighth plenary meeting of the seventy-first session on 23 December 2016.

renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology).

- **SDG 8: Decent work and economic growth**, especially Target 8.4 (*Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead*).
- **SDG 9: Industry, innovation and infrastructure**, especially Target 9.4 (*By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities*) and Target 9.5 (*Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending*).
- **SDG 11: Sustainable cities and communities**, especially Target 11.6 (*By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management*).
- **SDG 13: Climate Action**, especially Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*).

B4. Relevance to other development objectives.
Phase 1 (2008-2012) and Phase 2 (2012-2017): OECD/DAC Sector GENERAL ENVIRONMENT PROTECTION, sub-sector Biosphere protection.
Phase 3 (2017-2021): OECD/DAC Sector ENERGY PRODUCTION, DISTRIBUTION & EFFICIENCY, sub-sector [various related to energy and climate] (not specified in SDC web-site).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Technology-based mitigation [TM]; Capacity-based mitigation [CM]
Adaptation: nil

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. PRINCIPAL (2)
- **Adaptation**. NOT (0)

Part C: Narrative overview

Weak Indian thermal management, building design and construction standards, and renewable energy generation mean that excessive fossil fuels are used to heat and cool Indian buildings. Decoupling their construction and thermal management from GHG emissions is vital if Indian and global climate change mitigation targets are to be met. This can be done in several ways, including strict carbon neutrality in construction and power generation, but BEEP itself was designed to target the development and dissemination of knowledge and technology to improve building design and thermal management systems. This was to be done by building capacity and knowledge among sector professionals and related technical and government institutions, including by sharing and adapting to India lessons from Swiss experience in building sector energy-emission decoupling. Thus Phase 1 aimed to begin a multi-stakeholder process, with Integrated Design Process workshops and seminars ('charrettes'), technical assistance to develop and test new materials and systems, and efforts to develop and promote new design guidelines and tools for energy-efficient residential buildings. The same basic approach, of building capacity and sharing knowledge on building design and technology, and policy or regulation, plus outreach, was to continue in the following phases.
It was assumed from the start that cost savings from energy efficiency would incentivise investments in response to awareness of new technical information that BEEP would provide, and that government building codes would be introduced and enforced effectively to amplify these incentives. But the price of Indian fossil energy remained low and regulatory changes were unexpectedly slow. With increasing credibility and influence among growing networks and with government partners, however, it was hoped that technical reforms, models and pilots developed by BEEP would be translated into standard procedures and mandatory codes of

practice. As it happened, BEEP clearly had enough traction among Indian public and private actors for its activities to begin shaping the energy efficiency agenda in the construction sector. The assumptions underlying the theory of change therefore became more plausible over time and by late 2021 were looking rather prescient. An adaptive design process between Phases 2 and 3 coupled with the cumulative impacts of Phases 1 and 2 and an increasingly favorable policy environment obviated most early reservations, resulting in a design quality score of 5 if only Phase 3 is considered. Meanwhile, performance also increased and the following achievements of Phase 3 in promoting energy efficiency were notable by Dec 2021:

- Technical support had been provided to more than 22 building projects (IT Buildings, hospitals, office, residential complexes, academic institutions) with estimated energy saving in the range of 25-40%.
- A media engagement programme on energy efficient buildings has been conducted, and a training programme reached over 2,000 building design professional through a 'BEEP camp'.
- In Andhra Pradesh, three million low-cost houses are incorporating the energy saving code developed by BEEP, and around 15,000 engineers are being trained.
- Detailed market research was carried out on EMSYS, and since it was found that the necessary technology already existing in the market efforts were directed to promotion and on assessing the impacts of EMSYS installation in pilot buildings. The government and private companies such as Mahindra Lifespace are adopting the technology as part of their climate responsive designs for pilot buildings.
- The Eco Niwas Samhita 2021 code was launched, based on BEEP's work on code compliance approaches and minimum energy performance requirements for building services, indoor electrical end use, and RE systems. This code is endorsed by the Government of India and will soon be incorporated in the Energy Conservation Act of India which will make the code mandatory for the residential sector.
- The Eco Niwas Samhita online compliance tool was developed by BEEP as a utility to allow industry professionals test the energy performance of residential projects against the code at design stage.
- A system of national awards for energy efficient building design was launched by BEE, while the National Energy Efficiency Roadmap for Movement Towards Affordable and Natural Habitat (NEERMAN) encourages exceptional building designs that adhere to BEE's Energy Conservation Building Codes.

The renewable energy theme was launched only in 2019 and its progress was inhibited by the Covid-19 pandemic. It had nevertheless piloted and tested three types of hybrid RE technologies (solar PV plus wind, solar thermal plus solar PV, and solar plus biomethane), while signing memoranda of understanding with five property developers, conducting studies on existing RE scenarios and state policies, and undertaking capacity building support and knowledge dissemination activities. Progress across both themes and all outcomes has been cumulative and integrated, and seems also to have accelerated in Phase 3 as previous activities have born fruit. For Phase 3 alone, and leaving aside the Covid-affected outreach activities on RE, the following performance scores are given: **effectiveness** (range 4-6, mean 5.2, median 5), **impact** (range 5-6, mean 5.4, median 5), and **sustainability** (range 5-6, mean 5.6, median 6). It could be argued that fundamental policy shifts away from fossil energy and towards EE and RE were inevitable, so preparing for them would help both to bring them forward and increase their effectiveness when they occurred. This argument applies to BEEP, since when it started the policy and practice environment was unfavourable to rapid progress but had improved dramatically by Phase 3 - partly due to shaping of events and opinion by BEEP itself and partly due to extrinsic factors. The advantages of taking a long view are reflected in the assessment of BEEP as having **high transformative potential** for mitigation by late 2021.

Part D: Design quality

D1. Theory of change.

The ProDoc for Phase 2 (SDC, 2012) and Credit Proposal for Phase 3 (SDC, 2017b) describe buildings as accounting for about 40 percent of both energy use and GHG emissions in India. This differs from the global norm of about 35 percent of energy use and 20 percent of emissions, because of weak Indian thermal management, building design and construction standards, and low levels of RE generation. Thus, on average it takes more fossil fuels to heat and cool Indian buildings than other buildings. About three-quarters of Indian buildings that are expected to exist by mid-century are yet to be built, so decoupling their construction and thermal management from GHG emissions is vital if Indian and global climate change mitigation targets are to be met.

This can be done in several ways, including strict carbon neutrality in construction and power generation, but BEEP itself targets the development and dissemination of knowledge and technology to improve building design and thermal management systems. This was to be done by building capacity and knowledge among sector professionals and related technical and government institutions, including by sharing and adapting to India lessons from Swiss experience in building sector energy-emission decoupling. Thus Phase 1 aimed to begin a multi-stakeholder process in India, with Integrated Design Process workshops and seminars ('charrettes'), technical assistance to develop and test new materials and systems, and efforts to develop and promote new design guidelines and tools for energy-efficient residential buildings (SDC, 2008). The same basic approach, of building capacity and sharing knowledge on building design, technology and policy or regulation, plus outreach, was to continue in the following phases. With increasing credibility and influence among growing networks and with government partners, however, it was hoped that technical reforms, models and pilots developed by BEEP would be translated into standard procedures and mandatory codes of practice.

D2. Assumptions underlying the theory of change.
Assumption 1. That investment in energy efficiency in buildings is a public and private priority, driven by public policy on climate change.
Assumption 2. That raising awareness of technical options for increasing energy efficiency in buildings will combine with existing sentiment to stimulate investment in making buildings more energy efficient.
Assumption 3. That interest can be converted into demand for offered services that make it easier to invest in making buildings more energy efficient.
Assumption 4. That capacity building and knowledge sharing on building design, technology, policy and regulation would lead to standard procedures and mandatory codes of practice that would exert transformative impact.

D3. Plausibility of assumptions and links.
Assumption 1 was originally flawed (see 'risks' in D4) since public policy on climate change was not sending a strong enough signal to private investors to induce incremental investment in EE. This was also affected by the net effect of Indian energy policies and public energy investments, which was that the real price of electricity tended to decline in India after 2008[14]. This also compromised the other assumptions, since under conditions of cheap fossil energy and ineffective regulation it was unlikely that the project would make significant progress[15]. However, BEEP clearly had enough traction among Indian public and private actors for its activities to begin shaping the energy efficiency agenda in the construction sector. The assumptions underlying the theory of change therefore became more plausible over time and by late 2021 were looking rather prescient.

D4. General quality of the project design.
Stakeholders and consultation. "The proposed project has been developed based on consultations with different actors within India and Switzerland." (SDC, 2008: 1). The Phase 3 credit proposal (SDC, 2017b: 4) describes the large groups of stakeholders involved in implementation of Phase 2 and the development of Phase 3, which include "private sector developers, designers, public institutions and other national and state level stakeholders", Government of India bodies such as the Ministry of Power, Bureau of Energy Efficiency (BEE) "and the two project steering bodies - Joint Apex Committee (JAC) and Joint Implementation Group (JIG)", and "working relationships with some academic institutions".
Risks. "While formulating the project it is assumed that there is a business case for Indian private sector (builders, building design professionals, building materials test labs, etc) to develop competencies in energy-efficient building design and construction." (SDC, 2008: 9). The assumption that "Builders and Developers have incentives to implement energy efficient solutions (market demand, price of energy, regulations)" is mentioned for Outcome 1 in the

[14] "Whilst EU average prices have increased by around 10% since 2008 (around 1.1% annual average growth), ... by contrast the real price indices in Argentina (AR) especially, but also India (IN) have declined" (Rademaekers *et al*., 2018: 64).

[15] Comparable cases are given in H3.1 for Indonesia, where similar conditions to those in India in the first few years of BEEP prevailed and where little was achieved by a Danish project (although, as in India, some new ideas were introduced); and in H3.2 for Vietnam, where Denmark took advantage of a real, sustained, proactive and very supportive policy environment to contribute to a number of transformational changes, including in EE in buildings.

logframe of the Phase 2 ProDoc (SDC, 2012). Although the importance of "cost-effective energy efficiency and energy conservation measures" for limiting demand is mentioned in the initial programming document (SDC, 2008), the cost saving implications of EE for public finances and private investment are less stressed in the BEEP rationale than they might have been (or than is the case in similar projects elsewhere: H3.1, H3.3). This is perhaps because of the assumption mentioned above, and this weakness had become clear by the time of the Phase 2 Review (Settembrini *et al*., 2016), the recommendations of which included that life cycle cost analysis be included in case studies of energy conservation measures (page 5), and that cost-benefit analysis be included in business cases for insulation of different building types and different climatic zones (page 18).
It was also assumed during formulation that "an institutional mechanism for implementation of ECBC would be put in place as planned, resulting in implementation of ECBC and development of a market for energy-efficient buildings in India." (SDC, 2008: 9). The same point is made in the end of Phase 2 report: "When BEEP was formulated, it was anticipated that ECBC will be made mandatory during the time frame of BEEP and this will create demand for BEEP services and result in fast uptake of methodologies, tools, technologies developed under BEEP." (SDC, 2017a: 5). But progress on the implementation of ECBC remained slow, and "as a result of the delay in making ECBC mandatory, BEEP activities such as charrettes, seminars and workshops with the PWDs have had to re-focus on awareness raising before addressing capacity building." (SDC, 2017a: 5). An adaptive design process between Phases 2 and 3 coupled with the cumulative impacts of Phases 1 and 2 and an increasingly favorable policy environment obviated most early reservations, resulting in a design quality score of 5 if only Phase 3 is considered.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.
Phase 2 achievements:

- **Outcome 1**: "Technical advice to 18 building projects, with a total built-up area of 1.4 million m^2, showed 30-45% energy reduction potential through better building design with marginal additional costs." (SDC, 2017b: 1).
- **Outcome 2**: (a) "Five Indian labs trained for testing thermal insulation material and BEE assisted in developing a building insulation products labelling scheme." (b) "Facilitated the development and tested the effectiveness of five external movable shading systems[16] [i.e. 'envelope components']." (SDC, 2017b: 1).
- **Outcome 3**: "Guidelines for design of energy efficient for multi-storey residential buildings for hot & dry and warm & humid climates released and highlighted in India's Nationally Determined Contributions (NDCs) to the international climate process. It paves the way for developing energy efficiency regulations tor residential buildings." (SDC: 2017b: 1).
- **Outcome 4**: "Templates developed for the design of energy-efficient public buildings at the state level (Karnataka and Rajasthan). Technical advice provided to Andhra Pradesh for energy efficient design ot its new capital." (SDC: 2017b: 1).
- **Outcome 5**: "1500 building professionals were introduced to the Swiss approach and to specific strategies for enhancing energy efficiency." (SDC: 2017b: 1).

The Phase 2 review (Settembrini *et al*., 2016) found that BEEP had been able to bring together building-sector professionals, public institutions, and national and state stakeholders on the topic of EE in buildings, and had managed to achieve considerable results for each of the main targeted goals. It foresaw that a potential Phase 3 could maintain the network that Phase 2 had created and achieve significant impact by disseminating learning and results. As well as reaching a generally positive conclusion on BEEP's effectiveness, impact and sustainability in Phase 2, Settembrini *et al*. (2016) summarised negative aspects in relation to each outcome and evaluation criterion that tend to reduce performance scores. Thus, although the number of applicants was lower than expected (due to limited awareness of the process among sector professionals), the design charrettes were much appreciated and some design measures arising from them (e.g. on roof insulation and photovoltaics) were well specified; they were facilitated by

[16] "In tropical climates ... high amount of solar radiation causes significant amount of heat gains in buildings through windows, thereby increasing cooling requirements and thermal discomfort in buildings. It is very important to cut the direct solar radiation into buildings. To do so, external movable shades are more effective than internal shades in reducing the heat ingress into the buildings. Further, movable shades give daily and seasonal controls as compared to static shades. This aspect of external movable shades is missing in Indian buildings and is a very relevant energy conservation measure." (Settembrini *et al*., 2016: 17).

Swiss experts, however, and it was not clear how many Indians were equipped to conduct future charrettes. The 'shading design' competition created awareness and brought out new designs, but they were in need of much further improvement. Technical support was given to five insulation testing laboratories, but these were not well distributed within India and testing of insulation turned out not to be the most important constraint on thermal management (relative to cost-effectiveness and the lack of relevant skills). BEEP Design Guidelines were produced and appreciated, but their dissemination was very limited. And design templates were developed but in only three states and for very few buildings.

Phase 3 achievements.

No final evaluation is available, but BEEP (2019) and interviewees reported on progress as follows:

Outcome 1 (**building design**):

- **Theme 1 (energy efficiency)**. Effectiveness 6, impact 6, sustainability 6.
  - **Activities in Oct 2017 to Dec 2018**: two design charrettes; networks of builders and developers initiated in the National Capital/Jaipur, Chennai, Pune/Mumbai and Ahmedabad/Rajkot regions; two case studies on post-occupancy performance monitoring; performance testing of assisted ventilation systems and building energy performance; two camps for students and educators; and testing of public-domain CFD-based interface for natural ventilation.
  - **Achievements as of Dec 2021**: The Eco Niwas Samhita code for the residential sector was developed and launched, along with implementation support to states, and EMSYS and CFD tools were developed. Technical support was provided to more than 22 building projects (IT Buildings, hospitals, office, residential complexes, academic institutions) with energy saving in the range of 25-40%. A media engagement programme on energy efficient buildings was conducted, and a training programme was provided to more than 2,000 building design professionals through a 'BEEP camp'. The latter is now seen as a flagship innovative programme that helps engineers and architects to design climate responsive buildings. Finally, in Andhra Pradesh, three million low-cost houses are incorporating the energy saving code developed by BEEP, and around 15,000 engineers are being trained.

Outcome 2: (building technology):

- **Theme 1 (energy efficiency)**. Effectiveness 5, impact 5, sustainability 6.
  - **Activities in Oct 2017 to Dec 2018**. A preliminary EMSYS market survey was undertaken in Ahmedabad.
  - **Achievements as of Dec 2021**. Detailed market research was carried out on EMSYS, and it was found that the necessary technology already existing in the market but needed to be promoted using scientific evidence. As directed by the Ministry of Power, BEEP is actively working on this promotion and on assessing the impacts of EMSYS installation in pilot buildings. The government and private companies such as Mahindra Lifespace are adopting the technology as part of their climate responsive designs for pilot buildings.
- **Theme 2 (renewable energy)**. Effectiveness 4. Impact 5. Sustainability 5.
  - **Activities in Oct 2017 to Dec 2018**: not applicable as the renewable energy (RE) in buildings component of the BEEP programme launched in 2019.
  - **Achievements as of Dec 2021**: The RE theme is supported by a separate team of IIEC, FICHNER and TERI consultants. Progress since its launch in 2019 has been slower than expected due to the Covid-19 pandemic, but three type of hybrid RE technologies (solar PV and wind, solar thermal and solar PV, and solar plus biomethane have been piloted and tested for impact, five memoranda of understanding have been signed (including with Mahindra Lifespace and Big Basket), and studies are being carried out on existing RE scenarios and state policies for promoting RE technologies.

Outcome 3: (building policy).

- **Theme 1 (energy efficiency)**. Effectiveness 6. Impact 6. Sustainability 6.
  - **Activities in Oct 2017 to Dec 2018**. The final Residential Energy Conservation Building Code (ECBC-R) was launched.
  - **Achievements as of Dec 2021**. The code 'Eco Niwas Samhita 2021' (BEE, 2021a) was launched, based on BEEP's work on code compliance approaches and minimum energy performance requirements for building services, indoor electrical end use, and RE systems. This code is endorsed by the Government of India and will soon be incorporated in the Energy Conservation Act of India which will make the code

mandatory for the residential sector. The Eco Niwas Samhita online compliance tool developed by BEEP is a desktop utility that offers a platform to consumers and industry professionals to help them test design energy performance of residential projects against the Eco Niwas Samhita Part 1 & II benchmark, and evaluate compliance.

Outcome 4: (outreach).

- **Theme 1 (energy efficiency)**. Effectiveness 5. Impact 5. Sustainability 5.
  - **Activities in Oct 2017 to Dec 2018**. BEEP participated in International Energy Agency (IEA) events and promoted itself on social media.
  - **Achievements as of Dec 2021**. The national awards for energy efficient building design scheme was launched by BEE. The National Energy Efficiency Roadmap for Movement Towards Affordable and Natural Habitat (NEERMAN) has been established with the goal of encouraging exceptional building designs that adhere to BEE's Energy Conservation Building Codes. BEEP also show-cased its achievements very effectively at international forums involving IEA and SE4ALL, and at the UNFCCC CoP 26.
- **Theme 2 (renewable energy)**.
  - **Achievements as of Dec 2021**. Capacity building support and dissemination of knowledge products is ongoing, but progress is not as anticipated due to the Covid-19 Pandemic

BEEP works with building industry, policy makers, young professionals, students, and building owners to facilitate adoption of energy efficient and thermally comfortable building design concepts and technologies throughout India. It uses a multi-pronged approach that influences policy changes and also connects industry and the market. It aimed at ensuring that multiple solutions are implemented simultaneously at all levels. At the policy level, the project produced important outcomes during its second phase and was aligned to the country's NDC goals. Besides, in the regulatory framework, inclusion of the '12 S' code is a remarkable outcome of the project. Over the period of the project, knowledge and capacity building efforts through various activities like the BEEP camp, which turned out to be an effective way both to scale capacity building and to institutionalise it through the inclusion of concepts of heat transfer in buildings in the curriculums of premier engineering institutions in India. Thus progress across both themes and all outcomes has been cumulative and integrated, and seems also to have accelerated in Phase 3 as previous activities have born fruit. For Phase 3 alone, and leaving aside the Covid-affected outreach activities on RE, the following performance scores are given: **effectiveness** (range 4-6, mean 5.2, median 5), **impact** (range 5-6, mean 5.4, median 5), and **sustainability** (range 5-6, mean 5.6, median 6).

E2. System change.

The project used a multi-pronged approach to bring stakeholders from government, industry, market and academia to bring energy efficiency solutions in buildings. One of its biggest achievements is the establishment of the EcoNiwas Samhita code for buildings, which was designed in a simple way to help stakeholders (states, engineers and architects) to adapt existing building plans. Getting this code institutionalised in the regulatory framework of the country was an outstanding outcome. Other efforts included introducing concepts of dynamic window shading for heat control as well as optimisation of natural ventilation. BEEP fostered partnerships between government and private agencies helping introduce the concepts of heat transfer in buildings through the BEEP camp. Interviewees at BEE confirm plans to continue the 'BEEP camp' even after the life of this project. Further, efforts by academia and the media to build a repository of knowledge materials and dissemination of the same has been a good outcome to spread awareness about energy efficiency in buildings. Incentive programs like fellowships for media professionals working on EE, and the introduction of national awards for building design (ECBC design awards) have also been effective. It could be argued that fundamental policy shifts away from fossil energy and towards EE and RE were inevitable, so preparing for them would help both to bring them forward and increase their effectiveness when they occurred. This argument applies to BEEP, since when it started the policy and practice environment was unfavourable to rapid progress but had improved by Phase 3 - partly due to shaping of events and opinion by BEEP itself and partly due to extrinsic factors. The advantages of persistence and taking a long view is reflected in the assessment of BEEP high transformative potential for mitigation by late 2021.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness. Greater thermal insulation and solar shading would be of assistance in the cases of heat waves and power cuts, which is an adaptive function.

F2. System change. Some of the design principles and technologies introduced by BEEP would increase the resilience of built environments and their occupants to heat waves and power cuts, which is an adaptive transformation of real if moderate potential significance.
Part G: Other aspects of design and performance
G1. Efficiency issues. Phase 3: BEEP (2019) reported significant under-spending due to greater than anticipated involvement in developing the ECBC-R and slower than expected BEE response times in some areas.
G2. Coherence issues. SDC (2017a): Coordination and synergies with other projects and actors: (a) Affordable housing schemes of the Governments of India; (b) Singapore-ETH Centre tor Global Environmental Sustainability (SEC); (c) United Nations Development Programme; (d) Global Alliance on Building and Construction (GABC) under UN Environment; (e) Capacity building project for low carbon and climate resilient city development in India (CapaCITIES); and (f) German International Cooperation (GIZ). “BEE’s building programme is supported by several bilateral or multilateral programmes, including BEEP, but also UNDP-GEF, USAID and more recently the EU and GIZ. Shakti also supports BEE in ECBC enforcement. These projects are expected to significantly enhance BEE’s capacity to implement building energy efficiency measures in all states of India.” (page 5).
G3. Replicability issues. Comparing the progress of BEEP in India with projects in Indonesia (H3.1) and Vietnam (H3.2) suggests that the most important variable in effective replication of EE and RE projects in the construction sector is political will. If policies, and therefore market and fiscal incentives and regulations, send weak signals then change will be slow, and vice versa. Expectations of political leadership on climate change have been increasing and are unlikely to decline, thus enhancing the replicability of BEEP-like projects. On the other hand, the sense of urgency has also been increasing, placing a premium on projects that are able to act far more quickly than BEEP. But most countries are smaller and perhaps less complex than India, and so may be able (like Vietnam) to respond with more speed, focus and energy. The convergence of demand for action, demand for speed, and compliant policies bode well for the replication of BEEP-like projects.
G4. Partnership issues. The whole project is partnership-oriented and -based (see A7 and Annex 6 of SDC, 2017b), and no significant issues with these partnerships were detected.
G5. Connectedness issues. “The duration of Phase II also saw sluggish growth of the construction sector, particularly in the commercial and residential high-end sectors. This can be attributed to various related factors: unsold inventory in certain building segments, high land cost, poor financial health of big builders and developers, economic slowdown in India, general elections in 2014, etc. Despite the slowdown in 2014 and the 2015, the potential for growth seems significant- both for buildings and energy efficiency in buildings. The ‘Smart Cities’ programme in 2014 and ‘Housing for All’ programme in 2015, announced by the central government, are expected to boost construction activities in the coming years. These programmes, plus the government’s initiatives on solar energy (e.g. International Solar Alliance) and its endorsement of the BEEP design guidelines for residential buildings, are expected to encourage energy efficient and thermally comfortable buildings as well as integration of solar energy in buildings. In particular, the affordable housing segment is seeing greater activity and has become a key construction sector. ... NITI Aayog, the Government of India policy think-tank, has also forecasted significant growth in the construction sector, especially in residential buildings. This, along with wider use of air conditioning is expected to make the residential sector one of the largest consumers of electricity.” (SDC, 2017a: 5)
G6. Cross-cutting themes. On the subject of 'Progress on transversal themes (Governance, gender)', the latest progress report simply states "NA" (BEEP, 2019: 17).
G7. Capacity building issues. Capacity building is integral to all aspects of the project, although it is an explicit goal only of the RE theme (Outcome 7) in Phase 3.
Part H: Other matters arising from the review
H1. Follow-on questions. These focused on the status of BEEP Phase 3 operations regarding the promotion of energy efficiency and renewable energy in buildings, and findings are integrated in the text.

H2. Missing documents.
End of BEEP Phase 3 report, final evaluation.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: Comparison case 1: Danish support (2008-2012) for Component 2 (energy efficiency in the construction and use of large buildings) of the Environmental Support Programme (ESP) in Indonesia, Phase 2 (from Caldecott *et al*., 2021).
Purpose. Component 2 was to encourage and enable increased energy efficiency in the construction and use of large buildings in the public and private sectors, including the establishment of a knowledge management facility (the Energy Efficiency Clearing House or EECH), energy efficiency standards and training of energy auditors and managers, and development of economic instruments for the energy sector.
Theory of change. There is strong political interest in finding ways to reduce energy consumption in all sectors, since increasing energy costs are perceived as having a direct impact on the national economy, public welfare, and private sector competitiveness. By improving energy efficiency, the aim is to allow energy subsidies to be reduced without harming economic performance while also reducing GHG emissions and conserving Indonesia's remaining fossil fuel and timber assets. This will be done by promoting energy conservation in medium- and large-scale industries and new large private and public buildings, by supporting the production of information, norms, standards and capacity to deliver advisory services, and by raising awareness of opportunities to take advantage of them. **Assumption 1**. *That raising awareness of potential cost savings, and practical 'how-to' demonstrations, will increase interest in considering investing in making buildings more energy efficient*. **Assumption 2**. *That interest can be converted into demand for offered services that make it easier to invest in making buildings more energy efficient*.
Impact. Changes during ESP 2 include: (a) **Energy intensity declined** (defined as the ratio of energy consumption in tonnes of oil equivalent per GDP USD million, which fell from 402 in 2008 to 374 in 2012, against a GoI target of 325 by 2025 and a 1% per year). (b) **Energy elasticity declined** (defined as the rate of growth of energy consumption over the rate of growth of GDP, which fell from 1.92 in 2008 to 1.55 in 2012, against a GoI target of below 1.0 in 2025). (c) **Indonesian GDP increased** (from USD 510.2 billion in 2008 to USD 917.9 billion in 2012). (d) **Energy consumption declined** (per sq. metre floor area and per unit of industrial production) where tried. Component 2 supported national efforts to achieve these things, but how much can be attributed to the programme is uncertain.
Sustainability. Enabling measures have been put in place through Component 2 that could exert growing influence over an extended period, albeit inhibited by patchy government interest and a corporate reluctance to adopt new approaches.
Overall conclusion on mitigation performance (contribution to transformation).
Component 2 supported government efforts to reduce energy intensity and elasticity, and these did apparently decline but very little can realistically be attributed to the ESP which had only delivered some enabling measures by the end of ESP 2 in 2012. Mitigation effects are unquantifiable but might become significant in the long term. Score 3.

H3.2: Comparison case 2: Danish support (2013-2017) for Component 2 (Energy Efficiency in buildings), Low-Carbon Transition in the Energy Efficiency Sector (LCEE) in Vietnam (from Caldecott *et al*., 2021).
Purpose. To support the Ministry of Construction to improve capacity for implementing building codes for energy efficiency.
Overview. In LCEE, GoVN agreed that some of Denmark's extra support to VNEEP would allow measures to promote EE in SMEs and buildings at provincial level to occur sooner, and/or with more Danish technical input, and/or with greater availability of investment finance, than they would otherwise have done. This focusing of support on a sub-sector of special interest worked well, and with clear Danish attributability. Because LCEE grew out of VNEEP but also gave rise to DEPP II (and was therefore renamed DEPP 'I'), it can be seen as a bridge towards a more direct bilateral engagement.
Theory of change. Building codes could be formulated, adopted, applied and enforced to shape the design and operation of Vietnam's rapidly-growing stock of buildings in the direction of greatly increased energy efficiency. The key a**ssumption** is that *building codes for greater EE, and the investment needed to put them into effect, would be acceptable to the construction sector and enforceable by the authorities*. This is plausible, but may depend upon the

willingness and capacity of regulatory authorities to require compliance with the building code, and therefore upon idiosyncratic Vietnamese factors.

Impact. **Score**: 6, based on:

- **Enabling measure 1**: With inputs from Danish consultants and feedback from various LCEE activities, the new EE Building Code (QCVN 09:2017/BXD) was approved in December 2017 and came into effect from 1 June 2018.
- **Impact 1**: "Green building construction became a trend in large cities of Vietnam including Hanoi and Ho Chi Minh city as an outcome of LCEE's communication and capacity building activities", and building owners and investors had begun to compete with one another over the 'green credentials' of their buildings and their level of compliance with the EE building code (MFA, 2017: 7).
- **Enabling measure 2**: The Ministry of Construction has developed the national technical regulation "Construction works using economical and efficient energy"; Studies and develop technical standards for energy saving in civil, industrial and urban technical infrastructure programs; established and updated energy use databases of key buildings and large-scale buildings. Specifically, the QCVN 09: 2013 standard has been issued and requires investors of new commercial and residential buildings to comply with the design stage.
- **Impact 2**: (a) Organized capacity building training workshops, introduced the contents, instructions and tools for implementing QCVN 09: 2013 in cities: Hanoi, Da Nang, Ho Chi Minh City, Quang Ninh, Can Tho, Khanh Hoa with the participation of nearly 700 people; (b) Two demonstration building projects (the Royal Tower in Ho Chi Minh city and the Thai Duong Building in Hanoi) were implemented to demonstrate the application of EE Building Code in practice.
- **Enabling measure 3**: An MoU was signed to establish government-to-government cooperation in the building sector in Vietnam, thus establishing a longer-term partnership.

Sustainability. **Score**: 6, based on:

- The project benefited from its integration with VNEEP as a GoVN programme, since "With regards to budget support modality [of LCEE], the Vietnamese government continued to finance EE activities in 2016 and 2017 despite the fact that VNEEP had ended in 2015." (MFA, 2017: 3).
- "The sustainability is ensured through emphasis on capacity development and support to the implementation of legislation at MoIT and 10 [cities and] provinces. In the building sector, a shifted focus to compliance with green and EE building standards were seen as tangible impacts of LCEE's awareness raising and capacity building efforts." (MFA, 2017: 3).
- "Ten provincial [and city] EE action plans are funded from provincial budget and implemented during 2016-2020. This ensures the sustainability of LCEE support." (MFA, 2017: 4).
- **Green building certification**: the green building standards that are being implemented in Vietnam are LEED, LOTUS, Green Mark, and Edge. This is a voluntary certificate: investors self-register and apply for certification. An MoC survey found large commercial 'Green Buildings' certified according to the following standards: (a) LEED: 156 projects (to June 2020); (b) LOTUS: 68 works; (c) EDGE: 29 (figures 2019); and (d) Other: 06 works.

Overall conclusion on mitigation performance (contribution to transformation). Consistent with other Vietnamese strategies and partner interventions in Vietnam since the 1990s, the project appears to be model case of bringing multiple convergent lines of applied knowledge, research, financial incentives, and technical assistance to bear in a sustained way on complex sectoral circumstances in order to induce systematic directional change. The challenge in this approach is to sustain a balanced and focused input for long enough to make the change irreversible, which requires consistent policy support by all concerned for an extended period. These favourable conditions seemed to have been in place throughout the (extended) implementation period (2013-2017). **Score**: 6.

Rationale for expected outcomes - buildings (Figure 4.2 in MoIT *et al*., 2012: 14).	
Rationale	**Outcome**
The main goal of the VNEEP is to reduce energy use – this is backed up by the law on EE and conservation that puts energy monitoring requirements on large buildings. The building code aims to ensure that all new buildings adopt minimum standards. As Vietnam is in a phase of rapid	**Capacity to implement leading to energy saving**. Energy use in buildings reduced as a result of implementation of the building code.

urbanization and expansion of large buildings, efforts at ensuring that new buildings are energy efficient will have a large future impact.		
Demonstration buildings have been proven in many countries as an effective means of technology dissemination and diffusion for adoption of energy efficiency and low carbon technologies. Vietnam has a range of climate conditions that will demand different solutions. A rapidly increasing tourism sector and the development of larger scale office and shopping complexes are increasing the need for forward looking niche demonstrations.	**Demonstration**. Pilot demonstration projects(s) are identified and made ready for implementation.	
Longer term government-to-government cooperation will bring benefits that go beyond those that can be achieved within in a limited project timeframe, since many complex policy and regulatory issues involved in increasing energy efficiency in buildings must be addressed systematically.	**Partnership**. Government to government cooperation initiated between MCEB and MoC.	

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Part J: Acronyms and abbreviations

BEE	Bureau of Energy Efficiency (Government of India)
CFD	Computational Fluid Dynamics
ECBC	Energy Conservation Building Code
ECBC-R	Energy Conservation Building Code – Residential
EE	Energy efficiency
EETC	Energy-efficient and thermally comfortable
EMPA	Swiss Federal Laboratories for Materials Science and Technology (*Eidgenössische Materialprüfungs- und Forschungsanstalt*)
EMSYS	External movable shading systems
EPFL	*Ecole Polytechnique Federale de Lausanne*
IEA	International Energy Agency
MoP	Ministry of Power
NCR	National Capital Region
RE	Renewable energy

Annex 13.6: Nature Conservation in North Macedonia (NCP)

Project highlights

7F-06872: **Nature Conservation Programme in North Macedonia**. Innovative training and knowledge management at a sub-national planning institution and associated municipalities, while promoting sustainable agriculture, ecotourism, nature conservation research, education, pilot projects and Natura 2000 protected areas, integrated forest management for climate change, water and biodiversity values, and public awareness.

Part A: Basic data

A1. Project number & name. 7F-06872 - Nature Conservation Programme.

A2. Sources.
Process of PRF development: (a) a draft PRF was prepared using documents listed in the bibliography and with input by SDC interviewees; (b) the draft PRF was reviewed by the national consultant **Lidija Fajdiga**, who also conducted interviews listed in Annex 13.22; and (c) the PRF was revised in light of field findings.

- **Macedonia: Nature Conservation Programme (Nov 2010 to Dec 2016)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2010/7F06872/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **North Macedonia: Nature Conservation Programme (Jan 2017 to Jun 2021**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2010/7F06872/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Project web-site**: http://www.bregalnica-ncp.mk/?lang=en
- https://www.unep.org/news-and-stories/story/red-lists-gauging-force-nature-north-macedonia
- **Macedonian Ecological Society**: http://mes.org.mk/en/progarama-za-zachuvuvane-na-prirodata-vo-makedonija-faza-ii/
- **Bern University**: https://www.bfh.ch/en/research/research-projects/2017-247-358-402/.
- **Фармахем (Farmahem)**: https://www.farmahem.com.mk).

A3. Dates & financial data.

- **Entry** (Nov 2010-May 2012), budget CHF 151,000 (SDC, 2010, 2011).
- **Phase 1a/inception** (Main Credit 1, Nov 2011-Feb 2013), budget CHF 500,000 (SDC, 2012).
- **Phase 1b/implementation** (Main Credit 2, Mar 2013-Dec 2016), budget CHF 4,389,870 (bringing the total to CHF 5,040,870) (SDC 2013), later reduced by CHF 1,200,000 to CHF 3,840,870 (SDC, 2016a).
- **Phase 2** (Jan 2017 to Jun 2021), budget CHF 4,050,000 (SDC, 2016b, 2020a).
- **Phase 3** (Feb 2021 to Jan 2024), budget CHF 2,055,000 (SDC, 2020b).

A4. Location(s). North Macedonia: Bregalnica catchment/East Planning Region, municipalities of Berovo, Pehčevo, Delchevo, Vinica, Makedonska Kamenica, Kochani, Probishtip, Karbinci, Zrnovci, Cheshinovo-Obleshevo and Shtip.

A5. SDC Geography. South-east Europe

A6. SDC Domain. Eastern Europe: West Balkans.
[the Domain of Cooperation Strategy is given as 'Infrastructure and Environment' by SDC (2020c).

A7. Partners.

- **Phase 1 (Dec 2010 to Dec 2016)**: Implementing partners: Helvetas Swiss Intercooperation (in Swizterland); Farmahem (in Norm Macedonia). Main National Partners: Ministry of Environment and Physical Planning (MoEPP); Ministry of Agriculture, Forestry and Water Economy (MAFWE); Centre for Development of Eastern Planning Region (CDEPR); 15 Municipalities in the Bregalnica region; Hans Em Faculty of Forestry, Landscape Architecture and Ecoengineering at Ss. Cyril and Methodius University in Skopje (HEF); CSOs. Main

International Partners: Bern University of Applied Sciences / School of Agricultural, Forest and Food Sciences. (SDC, 2016c).

- **Phase 2 (Jan 2017 to Jan 2021)**: Implementing partners: Farmahem (lead contractor for coordination and facilitation); Helvetas Swiss Intercooperation (back-stopping role). Main National Partners: MoEPP; MAFWE; CDEPR; Macedonian Ecological Society (MES); 12 Municipalities in the Bregalnica region; Public Enterprise 'National Forests' (PNEF); HEF; CSOs; Main International Partners: Bern University of Applied Sciences / School of Agricultural, Forest and Food Sciences. (SDC, 2020c; Farmahem, 2021a: 7).

Part B: Purpose, relevance and approach

B1. Purpose.

Entry proposal (SDC, 2010: summary):

- **Objective**. A comprehensive, integrated and sustainable system for nature conservation within Bregalnica River basin is introduced, which shall contribute to nature protection in Macedonia in order for the country to reach the NATURA 2000 requirements (EU pre-condition) and therewith mitigate climate change and reduce rural poverty.
- **Outcomes**. Creation of framework conditions for better protection of the ecosystems; developed capacities of the local authorities and communities in nature conservation; improved life conditions of the local population throughout sustainable use of the natural resources and in compliance with SECO projects; pilot programme is introduced and its potential tested for multiplication in other regions of the country.

Phase 1 (Helvetas & Farmahem, 2012: summary):

- **Overall goal**. The main stakeholders on national, regional and local level effectively conserve the natural resources of the Bregalnica Region, integrating up to date conservation approaches with the principles of sustainable natural resources management and the local economic development agenda.
- **Outcome 1**. Framework conditions for nature conservation are improved.
- **Outcome 2**. National, regional and local authorities have agreed on sustainable and effective measures for nature conservation for the upper part of the Bregalnica Region.
- **Outcome 3**. Citizens and local authorities in the Bregalnica Region have gained experience in managing biodiversity, while generating economic benefit from the sustainable use of their natural resources.
- **Outcome 4**. The Centre for Development of the East Planning Region increasingly becomes a leader in the development and promotion of nature conservation in the Bregalnica Region.

Phase 2 (Farmahem, 2017: 5):

- **Overall goal**. Bregalnica region safeguards its natural values and promotes socio-economic development that is sustainable and inclusive.
- **Outcome 1**. Institutions at all levels efficiently implement national legislation for nature conservation and integrated management of natural resources/
- **Outcome 2**. A regional approach for nature conservation and sustainable development in the Bregalnica region is agreed among different interested groups and implemented.
- **Outcome 3**. Citizens and SMEs of the Bregalnica region offer environment-friendly tourism activities/services and sell sustainably produced goods in a socially inclusive way.

Phase 3 (Exit Phase) (Farmahem, 2020: 5):

- **Overall goal**. Relevant institutions and organizations at all levels implement innovative approaches for integrated management of natural resources.
- **Outcome 1**. Institutions at all levels efficiently implement national legislation for nature conservation and integrated management of natural resources/
- **Outcome 2**. Key stakeholders of the Bregalnica region jointly apply a regional approach to promote nature conservation and sustainable socio-economic development.
- **Outcome 3**. The consolidated and documented knowledge, achievements and results of the NCP are used for further application of sustainable management of natural resources in the Bregalnica region and in the country.

B2. Relevance to partners.

Macedonia.

- "The Programme shall help the Republic of North Macedonia in meeting the NATURA 2000 requirements, one of the conditions for EU accession." (project web-site). The Phase 1 ProDoc (Helvetas & Farmahem, 2012) stressed the relevant goals of Macedonia's Law on Nature Protection (gazetted 2004-2012, to incorporate most EU legislation on nature

conservation), the 2004 *National Biodiversity Strategy and Action Plan*, the 2006 *National Environmental Action Plan 2*, the 2009 *Strategy for Sustainable Development*, and the *Spatial plan of Republic of Macedonia* for 2000-2020, noting that most of these goals had not been reached, "primarily due to insufficient Government commitment and the chronic lack of funding" (§ 2.4). The same source noted that "The policy documents and legal framework associated with biodiversity conservation generally reflect International and EU Conventions/Agreements that have been ratified by the Government of the Republic of Macedonia." (§ 2.4).

- As described in the Phase 2 ProDoc (Farmahem, 2017: 7-8) the situation was little changed, apart from further amendments (in 2013 and 2016) to the Law on Nature Protection, with other legislation in preparation. The Phase 3 ProDoc (Farmahem, 2020) confirmed that "a new Law on Nature, based on EU's birds and habitats directives, is in process of elaboration and it is foreseen to be adopted until 2023." (page 6). It also reports the adoption of the *National Strategy for Nature Protection* with an Action Plan for 2017-2027, and the *National Biodiversity Strategy* with Action Plan for 2018-2023, while the *Sixth National Report on the Convention on Biodiversity* had been drafted. An Enhanced NDC was produced in 2021 (Rep. of Macedonia, 2021) which envisions stronger (but unspecified) Land Use, Land Use Change and Forestry (LULUCF) action for mitigation, and development of a National Adaptation Plan "based on nexus approaches in following areas: water, food, energy, health, biodiversity, tourism, forestry, disaster risk reduction, loss and damage, built in infrastructure." (page 24). Thus the NCP was and remains highly relevant to Macedonia's national interests.

Switzerland.

- "In the Swiss **Cooperation Strategy** Macedonia one of the sub-domains within the second domain of intervention (Water and Environment) is the Protection of Biodiversity. This decision is based on previous Swiss interventions in the Republic of Macedonia in the field of nature conservation and sustainable use of natural resources ... for increasing the capacities of the country regarding the implementation of the main national planning documents. The overall objective of this sub-domain is to provide a significant contribution to nature conservation in Macedonia in accordance with EU standards and international agreements. Key principles of the Swiss cooperation strategy with Macedonia are: (a) joint implementation with donor partners in order to generate synergies; (b) shift from project-funding towards contributions to grassroots-based organizations and processes; (c) favouring a more regional approach making optimum use of trans-boundary development opportunities; and (d) creating synergies among different Swiss interventions in the country. Swiss financial cooperation with Macedonia is in support of Macedonia's ambition to become a member of the EU and NATO. One of the key prerequisites for EU accession for Macedonia is to meet the stringent environmental standards applied by the EU to its member states." (Helvetas & Farmahem, 2012: § 2.7).
- Since then, "the Swiss commitment has also been confirmed in the definition of the domain's goal in the **Cooperation Strategy 2017 – 2020**: Strengthening of Macedonia's governance of natural resources. The Swiss experiences in management of natural resources, and linking it to the improvement of the living conditions of the local people (such as stakeholder buy in, financing of protected areas, branding and eco-tourism), provides a unique opportunity and shall, with adequate adaptation to the local context, be applied to Bregalnica." (Farmahem, 2017: 11). And subsequently, "The Swiss commitment has also been confirmed in the definition of the domain's goal in the **Draft Cooperation Programme 2021 – 2024** as well as in definition of domain's outcome and sub-objective for Ensuring the sustainable management of natural resources. With the new Cooperation Strategy, Switzerland will contribute to sustainable management of ecosystems and natural resources with special focus on the Bregalnica region." (Farmahem, 2020: 15). Thus the NCP was and remains highly relevant to Switzerland's national interests.

General. The high utility and cost-effectiveness of nature-based and community-based (NBCB) solutions for mitigation (i.e. the conservation of carbon-rich ecosystems) and adaptation (i.e. the protection and restoration of ecosystem services), and their role as sources of co-benefits including biodiversity and equity (local accountability, participation, benefit sharing, etc.), had been very well established by the 1990s. But this tended to be forgotten by governments and development agencies during the 2000s and 2010s, with very severe consequences for climate, for poor and indigenous peoples, and for biodiversity. This is now being urgently reversed, as the need for cost-effective, quick-acting carbon-negative and nature-positive (CNNP)

investments has belatedly become apparent. But NBCB solutions tend to be slow and complex to implement, and require a particular kind of approach that existing technical bureaucracies have to learn how to accommodate. Any agency that continued to invest in NBCB solutions in the 2000-2020 period, like Switzerland in Macedonia, is now at an advantage in possessing an active portfolio which can be learned from and used to teach others.

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 4: Quality Education**, especially Target 4.4 (*By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship*).
- **SDG 8: Decent Work and Economic Growth**, especially Target 8.2 (*Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors*), Target 8.3 (*Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services*), and Target 8.9 (*By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products*).
- **SDG 13: Climate Action**, especially Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 15: Life on Land**, especially Target 15.1 (*By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements*), and Target 15.9 (*By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts*).

B4. Relevance to other development objectives.
OECD/DAC: variously environmental protection, water sector management, biodiversity
SAP Sector: Biodiversity
Convention on Biological Diversity: multiple objectives.

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Ecosystem-based mitigation [EM], especially related to promoting Integrated Forest Management, ecosystem protection and sustainable (biodiversity-friendly, soil-carbon retaining and organic[17]) farming.
Adaptation: Ecosystem/community adaptation [EA]

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. SIGNIFICANT (1), with some variation between 0 and 1 among specific actions.
- **Adaptation**. SIGNIFICANT (1), with some variation between 0 and 1 among specific actions.

Part C: Narrative overview

The Republic of Macedonia (now North Macedonia) occupies 25,713 sq. km in the central Balkan Peninsula. To the north it borders Kosovo and Serbia, to the east Bulgaria, to the south Greece, and to the west Albania. It is a country with outstanding biodiversity and important nature values, but these resources are under pressure and the regulatory, technical and financial resources for their sound conservation are widely lacking. This is particularly the case for the eastern part of the country where international support efforts have also been scarce. To correct this, a Nature Conservation Programmes (NCP) was proposed as an 'umbrella' programme by Schuerholz & Fajdiga (2010: viii), and the term is still in use (Farmahem, 2020: 5, 9; NCP project web-site). It implies the need, appropriate in this context, for a long-term, over-arching programme of support under which a country can build its capacity to manage its biodiversity and ecosystem resources sustainably. This task is extremely complex and always involves saving (through species and area protection), studying (through inventories and research), teaching about (through participatory, citizen science, social media and formal education) and using (through applied disciplines such as agriculture, tourism, bioprospecting,

[17] The entry proposal (SDC, 2010: 5) included organic agriculture as a possible area of intervention, and organic farming cooperatives are mentioned as small projects in Farmahem (2020: 21) and SDC (2020c: 4).

payments for ecosystem services, etc.) the totality of the resources concerned. This must usually be done against competing demands for the same resources, in awareness that many of the benefits from living natural resources are slow to materialise and tend to flow to public rather than private interests. And it is almost always best done with maximum participation by people who live in and around nature and with their involvement, interest, education and a share in the rewards, so they can become active helpers in all management strategies.

Common themes in defining an 'umbrella' programme include that it must cover an ecologically meaningful spatial unit (such as a river basin bounded by watersheds), within which nature conservation needs are combined with sustainable local development through holistic (comprehensive, eco-systemic) and inclusive dialogue, planning and actions, informed by sound field assessments and involving the national, regional and local levels but with a strong emphasis on local needs and issues. The area for this particular 'umbrella' programme was to cover much of the River Bregalnica catchment in the East Planning Region of N. Macedonia. This was chosen mainly because it is the main water source in eastern part of the country, and because it offered opportunities for local and trans-boundary conservation as well as for synergy with the proposed Bregalnica River Basin management project financed by SECO. Little was known about the biota of the area, although species richness was thought to be high because of the diverse topography, geology, soils, water distribution and micro-climates, and the extent of natural forests remaining in the form of mixed stands of mostly deciduous oak and beech forests covering more than half the upper Bregalnica catchment. The latter forms part of the Eastern Balkan Green Belt and offers excellent opportunities for biodiversity conservation and rural regeneration based on sustainable land uses.

As an 'umbrella' programme, the NCP had to pursue a number of interconnected themes. This approach allows for adaptive flexibility to changing circumstances, and opportunistic shifting of focus and resources from one area to another depending on resistance or progress in each. But it is also poses the risks that without effective strategic management resources will be wasted and momentum dissipated, and that the diversity of activities will make the programme as a whole appear less purposive than it really is. In general terms, the emphasis of the NCP evolved in the following sequence (Helvetas & Farmahem, 2012; Farmahem, 2017, 2020). In **Phase 1**, the focus was on improving framework conditions and legislation, forging agreements with the authorities and other partners, building confidence among Bregalnica stakeholders, and supporting the Centre for Development of the East Planning Region (CDEPR) in building its capacity to become a leader in nature conservation. In **Phase 2** it was on implementing new legislation, building consensus and common actions among Bregalnica stakeholders, and enabling the latter to offer environment-friendly goods and services. And in Phase 3 it is on encouraging partner institutions and Bregalnica stakeholders to innovate and further improve delivery, while managing knowledge and results to support further applications in Bregalnica and elsewhere. Based on NCP (2021a) the main themes of the programme have included the following.

- **Building partner capacities**, with special attention to the Centre for Development of the East Planning Region (CDEPR) and the Bregalnica municipalities, through innovative training and knowledge management.
- **Promoting sustainable agriculture practices**, with special attention to pilot activities for rice and honey.
- **Establishing and using an educational centre for nature conservation**, at the village of Negrevo.
- **Promoting integrated forest management**, building links between Macedonian and Swiss forestry training institutions to increase attention to climate change mitigation and adaptation and biodiversity, and developing a Regional Forest Management Plan for the upper Bregalnica catchment.
- **Supporting small projects**, to involve people in testing and demonstrating nature conservation and sustainable management actions.
- **Raising public awareness**, using social media, events, media campaigns, videos, etc.
- **Enabling ecotourism**, by studying its potential, planning its development, taking priority actions, building capacity, encouraging start-ups, establishing facilities, and institutionalising its coordination.
- **Protecting areas in line with Natura 2000**, by documenting ecological characteristics and sensitivities, identifying potential protected areas, facilitating inclusive dialogue, preparing nomination papers and management plans, and restoring selected key ecosystems.

The **design quality** and **effectiveness** of the NCP were assessed as excellent (score 6), while its **impact** and **sustainability** were found to be good (score 5), and its **transformative potential** was considered very high for adaptation (because of its system-wide resilience-building consequences both socially and ecologically) and high for mitigation (because of its positive consequences for conserving ecosystem carbon, compromised by its lack of explicit focus on GHG emission reduction aims, baselines, records and planned outcomes).

Part D: Design quality

D1. Theory of change.
The challenge faced by NCP designers was to find a way to halt and reverse the deterioration of natural ecosystems and decline in biodiversity, and to promote resilience to climate change, while also obtaining mitigation and socioeconomic benefits in a country with weak conservation capacity. An important enabling factor at policy level was that the country wished to accede to the EU and therefore to comply with EU environmental regulations including Natura 2000. The programme would therefore need to correct a wide range of issues, while knowing that sustainability is best promoted through a participatory, educational and consensus-building approach at all levels of society and particularly where it is closest to nature and has most influence on what happens to nature. The Bregalnica catchment was chosen as the focus because of its key ecological role in providing catchment services at national level, its past neglect and its high biodiversity values, making a regional engagement vital, but stakeholders would also have to be engaged at national level (e.g. for legislative and policy support) and local level (e.g. for grass-roots demonstration, mobilisation and participation), and the general public would also have to be persuaded to support the whole enterprise and, ultimately, be willing to vote for sustainability. The theory of change of the NCP is well articulated by Helvetas & Farmahem (2012: §4.1), spelling out a rational pathway of intervention and expectation from information gathering and capacity building, to increasing capacity, confidence and competence, to strategic planning excellence, to implementation of holistic and integrated actions, and finally to the long-term conservation of nature with widespread and durable public and institutional support.

D2. Assumptions underlying the theory of change.
Assumption 1. That the political leadership of N. Macedonia will support continued alignment with Natura 2000 and other EU directives in the context of EU accession.
Assumption 2. That relevant authorities and other stakeholder at all levels and institutions will adopt the necessary changes to training, administration and participation if they are encouraged and enabled to do so.
Assumption 3. That all directly involved stakeholders will appreciate and respond positively to new ideas and opportunities promoted by the NCP.

D3. Plausibility of assumptions and links.
Assumption 1 is plausible, considering that accession to NATO was achieved in Mar 2020 and discussions on EU accession continue (the Greek veto having been withdrawn once the respective governments had agreed to change the country's name from 'Macedonia' to 'North Macedonia', which came into effect officially in Feb 2019 even though a referendum held to ratify it had previously failed).
Assumption 2 is plausible, but depends on effective persuasion and competent implementation of ways and means with the appropriate distribution of benefits (which however were delivered in practice).
Assumption 3 is plausible, but depends on effective persuasion and competent implementation of ways and means with the appropriate distribution of benefits (which however were delivered in practice).

D4. General quality of the project design.
Stakeholders and consultation. The “overall Programme logic [was] developed in several workshops and planning meetings together with stakeholders and partners in a highly participatory process during a four months inception phase of the Programme. This process has created a strong feeling of ownership by partners and stakeholders on all levels which show interesting perspectives for the sustainability of the Programme.” (Helvetas & Farmahem, 2012: summary). The Phase 1 ProDoc was “based on previous studies and reports as well as on the findings and recommendations from a series of meetings and workshops organized during the inception phase with stakeholders and possible partners on national, regional and local level.”

(Helvetas & Farmahem, 2012: § 1). The NCP continued to put emphasis on partnership and participation throughout.
Risks. The risk analysis in (Helvetas & Farmahem, 2012) identifies one external 'high' risk, that local elections might hamper the NCP either in themselves (by distracting people) or in their results (by changing priorities and/or partners), which was to be mitigated by working with professional groups and multiple partners, and through flexible implementation. It also identified a number of internal 'high' risks, stemming from low interest, capacity or information among partners (including CDEPR), incompatible regulations, and 'difficult' resource ownership issues. These were respectively to be mitigated by outreach, information campaigns, capacity building, 'adjustment' of regulations and policies, and exploration of shared interests with property owners. A final 'high' internal risk was that inadequate time would be available for changes to occur, which has no specific mitigation in Phase 1 (other than everyone working hard), but a solution is implied by the assumption that the NCP would last for three phases over 12 years.
Overall conclusion on **design quality**: excellent (score 6).

Parts E & F combined: Evidence for strategic climate effectiveness and system change

E1. Strategic effectiveness.
Overview
An evaluation mission report towards the end of Phase 1 (Galland, 2016) found that "In general the project in its first three years has produced a lot of documents and very few concrete activities. This is largely understandable and was a necessary first step." (pages 15-16). These documents included a study of forest ecology and management (Andonovski *et al*., 2014), an ecological sensitivity map (Avukatov et al., 2015), a report on the status of protected areas (Brajanoska & Hristovski, 2015), an ecological data gap analysis (Hristovski & Brajanoska, 2015), and a tourism development strategy (Milevski *et al*., 2016). Galland (2016: 16) noted, however, that "the sector of agriculture has been touched only on a very limited way. If more importance is going to be put on the notion of cultural landscape, the incorporation of agriculture will be essential. Promotion of local varieties, breeds and products (branding) should be investigated in parallel with measure to protect the environment (reduction of pesticides and fertilizers)." The same report also noted that "the transboundary component has been almost completely neglected", this despite an ongoing project supported by SDC in western Bulgaria with very similar objectives[18], and "warmly recommended joint work across the border and exchange of experience (branding of local products, ecosystem services, Natura 2000 implementation, sustainable tourism, etc.)"[19].
The Phase 2 ProDoc made similar points about an "emphasis on filling the knowledge gap related to biodiversity and natural values of the region" and the production of key strategic and planning documents in Phase 1. But it also stressed progress at the local level, where "the NCP implemented a diverse range of small pilot activities related to nature conservation, agrobiodiversity and tourism development. Due to the close collaboration with its partners from different sectors, NCP established a strong and trustful partnership providing a promising starting point for the second phase", which was to emphasise synthesis and the embedding of results in a regional approach to nature conservation (Farmahem, 2017: 5). The Phase 3 (exit phase) ProDoc then overviewed the results of both earlier phases, noting that they had been "designed to create a solid conceptual and documentation base, to provide data and information, to strengthen the capacities of different stakeholders, to develop strategic documents and plans for management and sustainable use of natural resources and to implement some of the priorities identified in the documents and plans developed." (Farmahem, 2020: 5). By this stage (2021-2024), the priority is to emphasise "bringing closer partners,

[18] This is mentioned under the title 'Linking agriculture to Nature Protection', which may refer to 7F-08057 Linking regional development and nature protection (Aug 2012-Dec 2017), see also: www.swiss-contribution.bg/en/projects/civil-society/for-the-balkan-and-the-people-linking-nature-protection-and-sustainable-rural-development).

[19] Other than a statement in the Phase 2 ProDoc (Farmahem, 2017: 29) that "NCP will identify and establish close cooperation with Bulgarian organizations/projects (in particular the project supported by SDC) that are working on sustainable management of natural resources.", and mention in the Phase 3 ProDoc (Farmahem, 2020b: 24) of intended 'consultation' with projects in "neighbouring countries working on nature conservation, tourism development (e.g. IME), protected areas (e.g. management bodies of protected areas in the region: Serbia, Bulgaria), green economy or agrobiodiversity." there is no evidence that transboundary conservation efforts were significantly pursued by NCP.

targeted stakeholders and processes, further strengthen the ownership by the partners and targeted stakeholders and work on capitalizing its results."

Effectiveness.

The main achievements in Phases 1 and 2 of NCP were summarised in the Phase 3 (exit phase) ProDoc (Farmahem, 2020: 10-13), and reprised for Phase 2 by Farmahem (2021a), with highlights resulting from support in the following areas (see also updated information in H3.1). These map only partly onto the changing list of outputs in the three phases, and overlap considerably in their effects and influences. They add up to a diverse programme of interventions in the general, coherent field of encouraging and enabling the N. Macedonia people and government at all levels to appreciate, use and plan for a more sustainable approach to nature. They are arranged in the following approximate order from the most national to the most local.

- **Preparing the government's *National Strategy for Nature Protection, 2017–2027*** (Rep. of Macedonia, 2018a), which acknowledges the NCP and SDC, Helvetas Swiss Intercooperation and Farmahem[20].
- **Mapping and assessing the condition of ecosystems and ecosystem services nationwide**, including an ecological gap and sensitivity analysis for the Breglanica region.
- **Participatory drafting of a spatial plan for the East Planning Region (2013-2030)**, including potential protected areas and zones of conflicting interests, which was adopted by Parliament in 2017 and was due to be finalised and further adopted in 2021.
- **Proposing and planning the proclamation by MoEPP of six sites** in the Bregalnica region as 'natural rarities', with three having NCP-supported management plans.
- **Preparing the Centre for Development of the East Planning Region (CDEPR)** to take over coordination of NCP local and regional activities.
- **Training 30+ employees (47% female) from local municipalities and CDEPR** on the preparation and implementation of nature conservation projects.
- **Developing a payment for ecosystem service (PES) mechanism** in a pilot area (the Vevčani Springs Natural Monument), in cooperation with the Municipality of Vevčani and MoEPP.
- **Improving the curriculum and supporting students** at the Hans Em Faculty of Forestry, Landscape Architecture and Ecoengineering at Ss. Cyril and Methodius University in Skopje, by mainstreaming biodiversity and sustainable forest management.
- **Preparing a participatory Regional Forest Development Plan (RFDP)** and action plan for the Maleševo region (later adopted by the Municipalities of Berovo and Pehčevo) and implementing two priority measures.
- **Proposing and planning the establishment of 48,807 hectares of the Osogovo Mountains** (an IBA and habitat of the Alpine newt *Ichthyosaura alpestris*) as an IUCN Category V Protected Landscape, which was proclaimed by government on 20 Nov 2020. (See H3.1 on the exemplary process involved).
- **Initiating the process for proclaiming Maleševo Mountain a protected area**, including a comprehensive study of the areas with active participation by local stakeholders. [Maleševo Mountain was proclaimed an IUCN Category V Protected Landscape on 16 Dec 2021.]
- **Identifying three Natura 2000 sites in the Bregalnica region** and training stakeholders on the benefits of Natura 2000 and its importance for EU accession.
- **Reforesting over six hectares of riparian vegetation** along the lower Bregalnica river.
- **Establishing an Educational Centre for Nature Conservation** in the village of Negrevo.
- **Raising public awareness on the values of nature** by way of various media including the documentary *Honeyland*, which received two Oscar nominations as well as the World Cinema Documentary Grand Jury Prize, the Special Jury Award for Impact for Change (for Tamara Kotevska and Ljubomir Stefanov) and the Special Jury Award for Cinematography (for Fejmi Daut and Samir Ljuma) at the 2019 Sundance Festival.
- **Supporting the implementation of 21 small projects by CSOs and 14 by local municipalities**, involving about 3,000 people and demonstrating cost saving from energy efficiency and raising awareness on sustainable resource management (see NCP, 2021b).

[20] The *Fifth National Report to the CBD* (Rep. of Macedonia, 2014) and *National Biodiversity Strategy and Action Plan for 2018-2023* (Rep. of Macedonia, 2018b) were also prepared in this period with support from the Global Environment Facility.

- **Establishing environment-friendly tourism as a priority concept** through a study and strategy that were approved by the CDEPR, by implementing five key priorities., by training members of the Coordinative Body for Tourism Development, and by training 63 others (mostly unemployed, youth and/or women) in relevant practical skills.
- **Establishing an 'eco-ethno park'**[21] in the municipality of Cheshinovo-Obleshevo and improving access to the Crkvište-Morobizdon archaeological site at Morodvis in the municipality of Zrnovci.
- **Establishing core groups and marketing strategies for sustainable honey and rice production**, and demonstrating economic benefits at 69 households.
- **Contributing to implementation of** 44 actions (about 20% of the total) prescribed by the National Strategy on Nature Protection focused on protected areas and Natura 2000 sites

All of the above contributed to and were paralleled by numerous workshops, specialist training activities, events, study tours, etc., all of them applying the principles of multi-stakeholder participation intersectoral dialogue. The contribution of NCP to improving the national legal framework and institutional capacity for nature conservation in North Macedonia was recognised in the EC's 2019 report on progress made by N. Macedonia[22].

Impact and sustainability.

After eight years of implementation, impacts, lessons learned and sustainability are overlapping categories that illuminate each other. The Phase 3 ProDoc highlights the following lessons learned from Phases 1 and 2.

- The fact that the NCP included many different topics and activities on different levels allowed it to test the success and impact of different pilot activities, but such complexity carries with it the need to engage many different people over an extended period of time.
- Participatory and stakeholder dialogue-based techniques are slow and expensive but provide a stronger guarantee than other approaches of long-term effects and results.
- Shifts in government priorities that accompany N. Macedonia's frequent municipal, parliamentary and presidential elections (and occasional referendums), or for other reasons, can lead to the stranding of initiatives and processes that are started under one policy and then abandoned.
- A sub-national ('regional') approach to nature conservation and sustainable development is best but requires strong capacity and awareness among local stakeholders, especially the authorities.
- Comprehensive knowledge on a region's characteristics and potentials (including on tourism, ecology, forests, biodiversity), well organised and publicly accessible, is a valuable tool for improving planning processes.
- Innovative communication tools (social media, documentaries, etc.) can be very effective ways to promote public and official awareness and understanding of complex issues.
- Establishing synergies and cooperation (including the sharing of information) with other projects improves the impact of all activities and their visibility, whole also reducing interference among overlapping activities. "Having in mind this positive experience and willingness to enhance the impact from collaboration established up to date, NCP will continue to work on establishing new cooperation and synergies with Swiss and other donor projects as well as improving the existing ones." (Farmahem, 2020: 28).

Farmahem (2021a) lists the status of achievement of the logframe indicators, which are summarised as follows:

- **Impact indicators**: all three achieved (of which two concern nature conservation - budget allocations and protected areas - while the third is mean monthly household income).
- **Outcome indicators**: nine of 11 achieved (with weaknesses in PES replication, and a slight under-achievement in the number of protected areas estabished).
- **Output indicators**: 22 of 29 achieved (with weaknesses in PES arrangements, protected area management planning and the number of CSO projects, and slight under-achievements

[21] See: https://eastregion.mk/en/2019/06/17/establishment-of-an-ethno-eco-park-in-the-municipality-of-cheshinovo-oblesevo/.

[22] "For nature protection, a national strategy for nature protection and a national strategy for the protection of biodiversity were adopted. The annual program for nature conservation for 2019 was adopted by the government. Work continues on identifying potential NATURA 2000 sites. Valorisation studies and management plans, required by the Birds and Habitats Directives, were prepared for two protected areas and commenced for two potential protected areas. Steps have been taken to establish ecosystem services." (EC, 2019: 88).

in training, the number of young visitors to the Educational Centre for Nature Conservation, the level of demand for ecotourism support, and the number of environmentally-friendly tourism businesses established).

Key sources of sustainability evident from the achievements of Phases 1 and 2 and likely to be consolidated in Phase 3 include:

- Compliance with Natura 2000 in the context of N. Macedonia's EU accession process, and in other ways responding to national priorities.
- Involvement of the CEDPR in conservation and sustainable development processes in the East Region.
- The idea of PES for sustainable financing of conservation and sustainable development processes.
- Improved forestry training systems at Ss. Cyril and Methodius University in Skopje.
- Collections of organised, publicly-accessible knowledge about the biota and environment of the East Region.
- The new ideas and skills introduced through participation of thousands of people in small projects, core groups and nature protection actions.

These are mostly consistent with the list of sustainability attributes in Farmahem (2017: 30-31), which highlights capacity building (especially CEDPR), a coherent information base (i.e. organised knowledge), addressing national needs (i.e. responding to the requests of MoEPP, MAFWE, CDEPR, etc.), and financial sustainability of protected areas (e.g. PES, with other ideas to be sought). But the Phase 2 ProDoc gives greater prominence to the linking of local activities with national policy dialogue to facilitate replication, and to the rather open-ended task of putting all sustainable development plans into effect. Overall conclusion on performance: **effectiveness** - excellent (score 6); **impact** - good (5); **sustainability** - good (5).

E2. System change.

Farmahem (2017: 31-32) treats climate change as a cross-cutting theme to be mainstreamed alongside nature conservation. It makes the valid observations that:

- "Higher temperatures and decreased precipitation will have an influence on the composition and abundance of habitats and thus on biodiversity [in N. Macedonia]. Also forest fires are likely to intensify and dry conditions will cause damage to forests, thus also have economic consequences."
- "NCP will in particular mainstream climate change and address its adverse effects in activities related to integrative sustainable forest management (output 1.2), integrative management approaches of protected areas (output 2.1), activities related to ecosystem services (output 1.1) and sustainable production of agriculture goods (output 3.3)."
- "Sustainably managing key ecosystems helps biodiversity and people to adapt to changing climatic conditions and to mitigate climate change."
- The accurate valuation of ecosystem goods and services, whether expressed in monetary or other units, can help the public and decision makers to understand their importance and improve investment choices[23].
- Forests play a crucial role in absorbing and storing carbon, and forests can be managed for carbon conservation as well as multiple harvests and other goods (like biodiversity) and services (like environmental security), although they are also under pressure from the effects of climate change itself (i.e. drought, fire and pest attack). Understanding their carbon absorption capacity is necessary to sustainable management actions.
- "In agriculture the ... increasing likelihood and severity of extreme weather events ... will considerably increase the risk of crop failure. .... Agriculture is one of the main economic activities in the region and the capacities of farmers to adapt to clime change and increasing risks are limited." Climate-smart farming, including both adaptation to change and mitigation of emissions (e.g. through better control of irrigation in wet rice) is therefore important.

The NCP has been facilitating system changes in multiple dimensions: regulatory, educational and institutional, in terms of knowledge about the systems concerned and how they can be used and valued more, better and differently, and in terms of public awareness, understanding and

[23] These might include, for example, species richness and uniqueness, and proxies such as patch size and microclimate integrity for biodiversity, indicators of environmental security for catchments and rivers, and dated mitigation values for GHG emission reductions. There is a rapidly developing literature on how to increase realism in ecological/economic valuation, especially in the context of imminent tipping points in global systems.

support for further change, all in a policy environment favouring EU accession. Since the systems concerned are ecological and land-use ones in which sustainability is encouraged and enabled, and also social ones in which cooperation is promoted, these changes are likely to enhance national, regional and local resilience to climate change effects. Adaptation is therefore both a stated aim and a likely outcome of the intervention, and transformational change is likely because of the cumulative and synergistic nature of NCP actions, so the **transformative potential** of NCP is very high for adaptation.
For mitigation, there is a lack of focus on GHG emission reduction aims, baselines, records and planned outcomes, so system level emission reductions would need to be sought and demonstrated more actively. But the NCP action to develop a payment for ecosystem service (PES) mechanism in a pilot area, in cooperation with the local municipality and the national ministry (MoEPP) is of interest because PES systems are known to have helped to transform environmental management and reverese deforestation in some places (e.g. Costa Rica), and have long been of interest to development banks and aid agencies, including Switzerland (e.g. SDC & SECO, 2014). To be truly transformative, however, they need to be set up within a platform of policy, legislation and institutional change, to include an adequate source of funding (e.g. Costa Rica taxes fossil fuels to pay for it), and to be properly managed as a major activity of government. Thus Farmahem (2020: 29) envisions the approach to need major support from the CGF, GEF or EU if it is to be developed fully[24], and Farmahem (2021a) confirms that the development and replication of PES initiatives has been an area of weakness in implementation. These slight weaknesses reduce the assessment of NCP's **transformative potential** for mitigation to high.

Part G: Other aspects of design and performance

G1. Efficiency issues.
SDC (2020c: 6) observes that most of the planned activities "were implemented within the planned timeframe and budget. However, there were two activities which provoked delays in the subsequent activities or postponement to the Exit phase. The proclamation of the protected area Osogovo Mountains took one more year than planned. Since the administrative procedure will be completed by end of October 2020, the planned activities related to the strengthening of the capacities of the manager (management body) could not yet be implemented. Therefore, these activities had to be postponed to the Exit phase. Similarly, the preparation of the RFDP lasted longer than planned and thus no replication of the process in other regions of the country or scale-up interventions from the Action plan in the region by different stakeholders could take place yet." The same source also notes that "activities related to the establishment of the Geo-park Lesnovo were cancelled due to the hesitation of the municipalities (Kratova and Probishtip) to establish a management body and to allocate resources for its operations until financial sustainability of the park would be secured. The remaining funds will be used by the end of 2020 for (a) designing of an educational package for sharing the messages from the documentary movie *Honeyland* through the national educational system and (b) the preparation of a feasibility study for a rescue centre for wild animals in North Macedonia." It also estimated an under-spend of around CHF 430,000 from "postponed activities, cancelled trips, international flights and missions due to Covid 19 pandemic", but that the activities actually done were on budget.

G2. Coherence issues.
"**Harmonisation and alignment**: As the interventions implemented were in line and harmonized with the national planning documents and action plans (*National Strategy on Nature Conservation* and *National Strategy on Biodiversity Protection*), there was a significant support provided by the institutions at all levels. Additionally, the NCP cooperated and collaborated with other Swiss funded projects in the Bregalnica region and country wide as well as with other donor (mainly EU and UNDP) or locally supported projects with complementary goals. The produced synergies increased the impact of all involved projects and programmes." (SDC, 2020c: 7).

[24] An EC call for proposals to support sustainable forest management and the sustainable financing thereof in N. Macedonia was launched early in 2021, but PES is not specifically mentioned (see: https://www2.fundsforngos.org/latest-funds-for-ngos/european-union-seeking-proposals-for-supporting-reforms-in-forestry-north-macedonia/). In the context of implementing the EU Water Framework Directive and achieving 'good ecological status' for European waters by 2027, PES systems are described as "flexible, incentive-based mechanisms that could play an important role in promoting land use change to deliver water quality targets." (see www.cost.eu/actions/CA15206/ and Forest Research, 2021).

G3. Replicability issues.

- **Regional forest development planning**. "The RFDP for the Maleševo region has been developed through a highly transparent and participatory process that included 16 different institutions and stakeholders. Although the RFDP is not a legally binding document, the two municipalities in the Maleševo region (Berovo and Pehchevo) officially adopted the document as a strategy for development. The RFDP was also highly appreciated by the EU funded project “Review of the forestry sector in North Macedonia” with a note to be considered as a good example that the forestry sector shall replicate in other regions in the country." (SDC, 2020c: 2).
- **Protected area proclamation**. "The entire process was recognized and highly appreciated by institutions and partners at all levels (MoEPP, MoAFWE, Ministry of Economy, state agencies, municipalities in the Bregalnica region, PENF, farmers, citizens, expert community, business sector, etc.) as well as the donor community, pointing-out the exemplary process of a proclamating a new protected area in a participatory, transparent and evidence based manner as a “show-case” for further replication." (SDC, 2020c: 3; see also H3.1).
- **Small projects**. "Five small projects from the NCP phase 1 have been up-scaled and/or replicated through collaboration of municipalities and CSOs (Promotion of natural values of Lesnovo, Establishment of the touristic info center Ponikva, Sustainable management of natural resources in the micro region Pijanec-Malesh, Old monumental trees on Maleševo mountain and Straw management project in Kocani (collaboration with SECO funded wastewater treatment project; to be completed in November 2020)" (SDC, 2020c: 5).

G4. Partnership issues.

"**Partnerships**: The lesson learnt from the first phase of the NCP: Good and trustful partnerships with different stakeholders are crucial for effective and efficient implementation of the programme, was confirmed in the second phase. In the actual phase, the role of two partners, MAFWE and the PENF, was even more prominent in the process of proclamation of the protected area Osogovo Mountains and the preparation of the Regional Forestry Development Plan. Implementation of these two activities demanded larger number of staff to be involved in the process, which resulted in a long process of building trust, mutual respect and understanding among the partners." (SDC, 2020c: 7). There is adequate evidence that these processes were undertaken successfully and more generally there little evidence of significant difficulties among partners.

G5. Connectedness issues.

"There were no transformations of context significant for the project implementation." (SDC, 2020c: 7). The issue of how robust the project was or is to external factors beyond its control therefore does not seem to arise, but devastating floods occurred in Aug 2016 and a state of emergency was declared due to a heat wave and extensive forest fires in Aug-Sep 2021.

G6. Cross-cutting themes.

Social inclusion and gender. These issues are "relatively new" in Macedonia (Farmahem, 2017: 32), and Phase 2 would address them by identifying excluded and marginalised groups (Roma people, but also potentially the poor, youth and women in categories assumed to be vulnerable), and then applying a number of 'concrete inclusion measures' (e.g. 10% targets for all activities) with mainstreaming and monitoring efforts such that "NCP will strive to follow and apply these measures wherever possible and feasible and therefore contribute to the improvement of social integration and gender equality in the region and provide data than can be used for undertaking future concrete activities." Farmahem, 2017: 33).

G7. Capacity building issues. "Conduct institutional capacity analysis to identify main needs" is an activity listed in the Phase 1 logframe (Helvetas & Farmahem, 2012: Annex 1), although this seemed to take the form of later stakeholder assessments from which various capacity-building measures followed.

Part H: Other matters arising from the review

H1. Follow-on questions (based on intentions expressed in Farmahem, 2020: 11 and 18-22).
Question 1. *What is the status of the Spatial Plan for the East Planning Region (2013-2030), including potential protected areas and zones of conflicting interests, which was due to be finalised and further adopted in 2021?*

- **Answer**. Draft Spatial Plan of East Planning Region (2013-2030) (including Ecological GAP analyses and Ecological Sensitivity Map) was prepared during the Phase 1 (Output 1.3

completed). Protected areas, identified in the ecological gap analysis, and importance for biodiversity conservation were used as one of the main pillars for its development. Possible conflict situations were considered by overlapping the development plans of different socio-economic sectors. This unique methodology was applied for the first time in the country. Because it presents a good example of integrated and multi stakeholder approach it could be used as a base for development of the methodology for the new national spatial plan. The Draft Spatial Plan was adopted by the Parliament in 2017, while the proposal spatial plan is in the final step of governmental procedure for adoption in Parliament that is expected to be adopted in 2022. According to the national legislation there are two steps of adoption of the spatial plan. The first step is adoption of the draft that is done. Second and final step is adoption of the Proposal spatial plan.

Question 2. *What is the status of Output 1.1, i.e. implementation of the pilot PES scheme in the Vevčani Springs Natural Monument in cooperation with the Municipality of Vevčani and MoEPP, and "strengthening capacities of decision makers (e.g. MoEPP, Municipality) and other local stakeholders (e.g. rural communities, business entities, CSOs, collectors of other forest products etc.) about PES conceptuality and its practical application"?*

- **Answer**. The guidelines for establishing mechanism for payment of ecosystem services (PES) in the Vevčani Springs were completed in 2021. Business plans for three potential PES schemes with financial feasibility analyses were developed and submitted to MoEPP in July 2021 for further comments. The proposed scheme that covers tourism as a most feasible one, is going to be implemented through a model named Destination Management Company (DMC) which is a novelty for this region. Communication plan is developed. Draft plan for general ES campaign that consist strategy for implementation and detail plan of activities with timeframe including modules for capacity building for different stakeholders is developed. the plan will be communicated with MoEPP and municipality of Vevčani. Trainings will be organized according to the Covid-19 situation, and jointly will be decided for the most appropriate time to start the implementation. Due to local elections that were due in Oct 2021, the whole process was postponed to late 2021. It is expected that the new local authorities in Vevčani Municipality (as a final beneficiary) will continue to support the process as was the case with the previous authorities.

Question 3. *What is the status of Output 1.2, i.e. implementation of the integrative forest management approach and the pilot Regional Forest Development Plan (RFDP) for* Maleševo *(and extension to Berovo and Pehƒçevo) through collaboration among the municipalities, ministry and the Hans Em Faculty of Forest Sciences, Landscape Architecture and Environmental Engineering in Skopje and Bern University of Applied Science?*

- **Answer**. The RFDP for the Maleševo region (Berovo and Pehcevo) with Action Plan 2020-2025 was developed by applying participatory approach. Although the document is not binding, it was officially adopted as a strategic plan by the Council of Municipality of Berovo (13 May 2020) and by the Council of Pehcevo Municipality (5 May 2020). In order to establish a link between municipalities and forest management entity, on 16 Jun 2020 a Memorandum of Cooperation for implementation of the RFDP was signed by both municipalities and PENF. The working group responsible for development of the RFDP and monitoring the process of implementation of the action plan consisted of 14 stakeholders: MoEPP, MAFWE, ME, CDEPR, PENF the headquarters in Skopje as well as branches in Pehchevo and Berovo, municipalities of Pehchevo and Berovo, National Association of Private Forest Owners, furniture company 'DIK Fagus', hotel 'Manastir, HEF and MES. In NCP Phase 1 a solid basis for cooperation between Faculty 'Hans Em' and BFH-HAFL was created. Important aspects of the collaboration were the transfer of knowledge and support to the process of mainstreaming biodiversity in the curricula of Faculty 'Hans Em', organization of theoretical and practical lectures with involvement of different stakeholders (e.g. PENF - headquarters and local forest branches, State forest inspectorate) and support to preparation of BSc and MSc theses by Macedonian and Swiss students. The cooperation between Faculty 'Hans Em' and BFH-HAFL will continue in the exit phase. However, in exit phase the focus will be on supporting Faculty 'Hans Em' in implementation of certain initiatives on integrative forest management with other national or international institutions. Memoranda of cooperation with forestry faculties in Serbia and in Bosnia and Hercegovina are expected to be signed soon.

Question 4. *What is the status of Output 2.2, i.e. establishment of the* Maleševo *protected area and management bodies in the Bregalncia region (Osogovo and* Maleševo*) implement their management plans?* **Answers**:

- **Osogovo protected area**. The draft management plan was submitted to PENF and MoEPP for review. A Strategic Environmental Assessment (SEA) for the management plan was prepared and recommendations to improve it were considered. The SEA and management plan will be finalised after public hearings with the stakeholder council. The next step will be to submit the management plan for approval by MoEPP, after which it would be adopted by the Management Board of PENF.
- **Maleševo protected area**. The valorisation study was prepared and a public debate organised after comments by MoEPP. Official opinions from relevant institutions are being submitted, two negative opinions from MAFWE and Ministry of Economy were received (that the reserve was not considered to be essential), but these were set aside by MoEPP as the responsible institution and the Proclamation Act was adopted by the Government on 16 Dec 2021.

Question 5. *What is the status of Output 2.2, i.e. completion of dossiers for potential Natura 2000 sites in the Bregalnica region?*

- **Answer**. Dossiers for potential Natura 2000 sites in the Bregalnica region are completed. Establishment of the Natura 2000 network is a prerequisites for EU accession. By supporting this process in the Bregalnica region, SDC is helping the country fulfil its EU accession obligations. In the exit phase, elaboration of comprehensive 'dossiers' for three potential Natura 2000 sites in the Bregalnica region (Lower Bregalnica, Ovche Pole and Maleševo) will be conducted. Each dossier for a potential Natura 2000 site consists of a standard data form (already completed in the NCP's second phase), a draft management plan (to be elaborated during the exit phase) and an account of campaign activities undertaken (started in the NCP's second phase and planned to continue during the exit phase). Two Standard Data Forms (SDFs) have been prepared, the third one is in the final stage of preparation. The delineation was made with expert support. Preparation of draft management plans for two Natura 2000 sites in Bregalnica Region has been initiated. Natura 2000 activities have slowed due to local elections. In parallel, through the organisation of a specific campaign, NCP will work on raising public awareness and strengthening capacities of different stakeholders (e.g. ministries, public enterprises, agencies, municipalities, business entities, CSOs, scientific institutions, media, etc.) about the benefits and challenges of Natura 2000. With completed documentation and stakeholders who understand and support the Natura 2000 concept and its practical application, identified Natura 2000 sites in the Bregalnica region will be prepared for the designation process, a prerequisite for EU accession. Since the Natura 2000 process is relatively new in North Macedonia, the activities in the Bregalnica region can be used as a model for identification and selection of other Natura 2000 sites, as well as for the methodology and activities involved. This is another added value that is being realized through the NCP.

Question 6. *What is the status of Output 2.3, i.e. building capacity at Public Enterprise 'National forests' (PENF) for restoring riparian forest and for raising and caring for white poplar and willow seedlings?*

- **Answer**. Phase 2, and first year of the Exit phase was used for capacity building of PENF, as well different methodologies in different nursing appropriate places were tested and different experience from neighbouring countries (Serbia) were used in order to produce sufficient quality seedlings that were used for restoration of riparian belt. The MES was directly involved for the capacity building of PENF, to grow seedlings of wild poplar and willow, and to use them for restoration of the selected plots along riparian belt of Low Bregalnica. Staff capacity, knowledge and interest grew during the project from a very low level.

Question 7. *What is the status of Output 2.4, i.e. effective operation of core groups for sustainably produced rice and honey, and other targeted stakeholders (municipalities, PENF as being responsible in future for managing the Osogovo Mountains protected area, other similar projects)?*

- **Answer**. The two achieved refer to the market channels established for selling sustainably produced honey of the core group 'Honey East': (a) orders through their web site (https://medenistok.mk/en/home-en/); and (b) direct sales at events (such as the 'World Bee Day' fair organised in the EU jointly between the Slovenian embassy and NCP on 26 May 2021). The focus is niow on supporting the core group in establishing market channels for selling honey and other bee products through healthy-food stores and other intermediaries. Four members (from different households) of the core group 'Honey East' are now selling honey; applications by other members for permits to do this are still in process. A group for

producing bee colonies was established with the help of NCP, with 'training of trainers' support and leading to state certification of bee producers.

Question 8. *What is the status of Output 3.1, i.e. raised public awareness on natural values and resources of the Bregalncia region and their potential for sustainable use through social media, events, etc., including the 2021 survey on the effects of awareness raising on attitudes, decisions and actions by local people?*

- **Answer**. Public awareness raising was continuous from NCP Phase 1 onward. The baseline for the Exit Phase refers to results from the survey carried out in Dec 2020 during NCP Phase 2. Accordingly, the new target is set for end of exit phase. The maximum that can be expected from these types of surveys is already achieved in the end of NCP Phase 2. However, NCP is going to continue with promoting and dissemination of the activities and results in order to keep the public informed. A general observation is that public awareness has increased.

Question 9. *What is the status of Output 3.2, i.e. enhancing capacity among employees at the Educational Centre for Nature Conservation in the village of Negrevo?*

- **Answer**. With NCP support the Educational Centre for Nature Conservation was established at the old school in Negrevo, and equipped with infrastructure and staff education. At the moment there is one person working at the Centre, employed by the municipality and trained by NCP, who is preparing proposals for further funding. One of these has already been approved and confirms the Centre's sustainability. The Educational Center is recognized by UNICEF in Macedonia as suitable for working on educational projects, and is included in the Rulebook of the Ministry of Education in a list of facilities for teaching in nature.

Question 10. *What is the status of Output 3.3, i.e. management, distillation and dissemination of NCP-generated knowledge among stakeholders at regional and national level?*

- **Answer**. Many documents have been produced and different promotional tools have been created during the NCP Phases 1 and 2. These need to be consolidated in a more structured framework with defined target audience and tailor-made products to serve them. However, some of the previously gained experiences and lessons learned are already used as good examples and approaches in other projects and processes in North Macedonia. It is expected that in the next period a more detail plan for the capitalisation process will be developed, and that this will enable broader distribution of NCP knowledge, achievements and results. The NCP introduced the capitalisation process to North Macedonia, and this is important as a first experience that applies to all Phase 1 and Phase 2 outputs (Farmahem, 2021b: Outcome 3). The process of capitalisation was started in the second half of 2021 with support of HELVETAS; one training has been conducted and five priorities for preparing capitalisation tools have been chosen.

H2. Missing documents. None identified.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: The process of having Osogovo ('Divine') Mountains proclaimed as a protected area.

"Since the protected area will be proclamated by the end of October 2020, the related establishment and strengthening of the management body, as well as the completion of the management plan for the protected area could not yet be achieved. Nevertheless, the proclamation of Osogovo Mountains as protected area (protected landscape) can be considered as the biggest achievement of the NCP phase 2.

"The entire process was conducted fully respecting the principles of transparency and participation and following the procedures set in the national legislation and international/EU guidelines. It was impressive to witness how the stakeholders initially rejecting the idea for a large protected area, fearful of losing power, income or existing privileges, transformed their positions throughout the process and changed their way of thinking. Through numerous meetings, discussions, exchanges, experts' explanations, study tours, sharing positive experiences, stakeholders with opposing interests became supporters. For example, the Public Enterprise National Forests (PENF), which was at the very beginning strongly against the idea fearing that the public enterprise would lose their management role and would become restricted in its operations, changed its position and voluntary applied to become the manager (management body) of the protected area!

"The entire process was recognized and highly appreciated by institutions and partners at all levels (MoEPP, MoAFWE[25], Ministry of Economy, state agencies, municipalities in the Bregalnica region, PENF, farmers, citizens, expert community, business sector, etc.) as well as the donor community, pointing-out the exemplary process of a proclamating a new protected area in a participatory, transparent and evidence based manner as a “show-case” for further replication." (SDC, 2020c: 2-3).

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[25] MAFWE is hesitant due to conflicts between the laws on hunting and nature conservation, especially on hunting management. The government has asked both ministries to work together to solve the problem.

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SDC (2016b) *Phase 2 Credit Proposal, Nature Preservation Programme in Macedonia*. SDC Abteilung OZA/WBA.
SDC (2016c) *End of Phase 1 Report, Nature Preservation Programme in Macedonia*. SDC (Bern).
SDC (2020a) *Change of Credit Duration, Phase 2, Nature Preservation Programme in Macedonia.* SDC (Bern).
SDC (2020b) *Credit Proposal, Phase 3, Nature Preservation Programme in Macedonia.* SDC (Bern).
SDC (2020c) *End of Phase 2 Report, Nature Preservation Programme in Macedonia*. SDC (Bern).

Part J: Acronyms and abbreviations

BFH/HAFL	Bern University of Applied Sciences/*Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften*
CDEPR	Centre for Development of the East Planning Region
CNNP	Carbon-negative and nature-positive (investments and outcomes)
CSO	Civil-society organisation
GCF	Green Climate Fund
GEF	Global Environment Facility
HEF	Hans Em Faculty of Forest Sciences, Landscape Architecture and Environmental Engineering, Ss. Cyril and Methodius University (Skopje)
IBA	Important Bird Area (as identified by Birdlife International)

IME	Increasing Market Employability (in the context of SDC's 'Civica Mobilitas' project 7F-05262 in Macedonia, 2012-2022)
MAFWE	Ministry of Agriculture, Forestry and Water Economy
MES	Macedonian Ecological Society
MoEPP	Ministry of Environment and Physical Planning
NBCB	Nature-based and community-based (approaches and solutions)
NCP	Nature Conservation Programme
PENF	Public Enterprise 'National Forests'
PES	Payment for ecosystem services

Annex 13.7: Building Resilience in Bolivia (PRRD)

Project highlights

7F-07312: **Disaster Risk Reduction Programme in Bolivia (PRRD)**. Built capacity for emergency response at national and departmental levels, promoted understanding and preparation for climate change and other risks at all levels of society, and promoted a 'culture of resilience' at all government levels and across the university system.

Part A: Basic data

A1. Project number & name. 7F-07312 – Disaster Risk Reduction Programme (*Programa de Reducción de Riesgo de Desastres*, PRRD)

A2. Sources.
Process of PRF development: (a) draft PRF prepared using documents listed in the bibliography; (b) draft PRF reviewed by national consultant **Mario Zenteno** during four days in La Paz and four in Cochabamba; (c) the PRF was revised in light of field findings.

- 2010-2014: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2010/7F07312/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- 2014-2018 (PRRD): www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2010/7F07312/phase4?oldPagePath=/content/deza/en/home/projekte/projekte.html
- 2014-2018 (DRR): www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2010/7F07312/phase3?oldPagePath=/content/deza/en/home/projekte/projekte.html

A3. Dates & financial data.

- **Phases 1-3**: Apr 2005 to Mar 2014.
- **Phase 4**: Mar 2014 to Dec 2018.
- **Swiss contribution to all four phases**: CHF 9,250,000.
- **Breakdown of SDC budget for Phase 4**: (a) Component 1: CHF 1,245,000; (b) Component 2: CHF 2,730,000 + CHF 1,400,000 additional credit (for the period 01/01/2017 to 31/12/2018; (c) Component 3: CHF 1,355,000 + CHF 230,000 additional credit (for the period 01/10/2015-30/07/2017).
- **Phase 4** has three main components (each with their own budget proposal) and a transverse component:
  - **Component 1**: *Strengthening the National First Response and Emergency Preparedness System for effective and timely response.*
  - **Component 2**: *Strengthening the resilience of public investments and infrastructure systems.*
  - **Component 3**: *Promoting the use of knowledge and vocational trainings to build a culture of resilience among professionals and population in Bolivia*.
  - **Transverse component**: *to promote gender equity through the coordination and complementary operation of all instruments and activities*.

A4. Location(s). Bolivia

A5. SDC Geography. Latin America and Caribbean

A6. SDC Domain. Humanitarian Aid

A7. Partners.

- **Component 1**: **Main national partner:** National Disaster and Emergency Preparedness System (NRF-EPS) managed by the Vice Ministry for Civil Defence (VIDECI) and focusing on its four main institutions providing Search and Rescue (SAR) response teams or “responders” (Bolivian Air Force, Police, firefighters, Bolivian Red Cross supporting a network of volunteer responders). **Sub-national partners**: Departmental Centres for Emergency Operations in the Autonomous Governments for La Paz, Cochabamba and Santa Cruz. **Service provider**: UNDP Bolivia (with support from OCHA/INSARAG).
- **Component 2**: **Main national partner**: Ministry of Environment and Water (Vice-ministry of Water Resources Management and Rural Development). **Sub-national partners**:

Autonomous Governments of Cochabamba and Tarija (15 rural municipalities). **Service provider**: Helvetas.

- **Component 3**: **Main national partner**: National School of Public Administration (EGPP). **Sub-national partners**: Catholic University of Bolivia, La Paz (UCB), the Higher University of San Simon, Cochabamba (UMSS) and University of San Andres, Santa Cruz (UMSA). **Service providers**: SOLIDAR Suisse, EGPP, UCB, UMSS and UMSA.

Part B: Purpose, relevance and approach

B1. Purpose.

2005-2014:

Aims of PRRD 1-3: (a) to increase awareness and local participation on reducing natural disasters in the interests of developing ownership and local culture on risk prevention; (b) to build better understanding of the causes of disasters based on an adequate assessment and management of risks/disasters; (c) to promote commitment among local public authorities to mainstream disaster prevention in their instruments, planning processes and development policies; (d) to enhance local governance by reducing and resolving conflicts among DRR activities; and (e) to build alliances with cooperation agencies in Bolivia and collaboration with international platforms working on DRR in the interests of improving access to effective mechanisms promoting integrated risk management.

2014-2018 (PRRD-4):

Overall goal of Component 1: Victims of incidents and accidents receive a more effective and timely response and care from NFR-EPS. To achieve this, the following outcomes were foreseen:

- **Outcome 1**: Inter-institutional coordination mechanisms and rules and regulations of the system are effective and efficiently put into practice at the national level and in the three Departments (La Paz, Cochabamba and Santa Cruz).
- **Outcome 2**: First responders of the key institutions within the NFR-EPS are better trained, equipped and their responses well-articulated.

Overall goal of Component 2: SDC contributes to reducing poverty and to improving food security of rural families through enhanced resilience to the effects of climate change and impact of natural hazards, resulting in increased income and reduced post-disaster recovery costs. This would involve: making vulnerable and poor families more resilient to the effects of climate change through public policies and investments that integrate DRR/CCA at national and sub-national levels. To achieve this, the following outcomes were foreseen:

- **Outcome 1**: The systematic integration of DRR/CCA in public investments and national/municipal planning in the sector of water resources management and rural development improves the resilience of 10,000 rural families and indirectly another 350,000 families.
- **Outcome 2**: The quality of Public Investments in national and sub-national projects is improved due to Social Control (Social organisations) that demands the integration of DRR/CCA in development projects

Overall goal of Component 3: To ensure that the socio-economic development of Bolivia is more resilient to the effects of disaster risks and climate change thanks to a culture of resilience that promotes the application of DRR/CCA by trained public officers, university students and population. This would involve: promoting the use of knowledge and new DRR/CCA skills to develop a culture of resilience among public officers, university teachers and students and vulnerable populations that will reduce the vulnerability of infrastructure and livelihoods to the effects of climate change. To achieve this, the following outcomes were foreseen:

- **Outcome 1**: The integration of DRR/CCA in the National School of Public Administration (EGPP) course portfolio and its application by 7,500 trained public officers improve the quality of public investments, in particular in the sectors of water resources management and rural development.
- **Outcome 2**: University curricula, education material and relevant trainings for undergraduates of three universities include DRR/CCA concepts and practices to assess and reduce vulnerabilities with a demonstration in 15 poor municipalities in departments of Cochabamba and Tarija through their end-of-year thesis/internship.
- **Outcome 3**: Population in areas of interventions is timely informed on disasters risks and measures to reduce the vulnerability of their livelihoods thanks to countrywide and local public awareness campaigns

B2. Relevance to partners.

Component 1:

- **Government of Bolivia.** Relevant to VIDECI, which recognises there are deficiencies in the National System for Risk Reduction and Emergency Response, and that Component 1 represents a continuation of SDC's support to risk management in Bolivia.
- **Switzerland**. Relevant to its prioritisation of DRR under Humanitarian Aid (i.e. strengthening national/local response capacity to address conflicts, crises and catastrophes) and SDC's interest in building on: (a) lessons learned and good practices from a similar project in Peru; and (b) SDC's support to the development of the Coordination Centre for Natural Disaster Prevention in Central America.

Component 2:

- **Government of Bolivia**. Relevant because government recognises that public investment does not systematically consider DRR/CCA and national and departmental level public officials with a responsibility in the investment cycle are not well trained and do not know how to use existing DRR/CCA tools and methodologies. Similarly, at the municipal level Municipal Risk Management Units (MRMU) supported during phase 3 (PPRD 3) need to deliver better quality services and cover a wider geographical area.
- **NDC**. Although not mentioned, PRRD is in line with the Paris Agreement's call to promote greater climate resilience, which in the agriculture and forestry sector should be achieved through, "the strengthening of environmental functions and the productive capacities of agricultural and agroforestry systems, irrigation, watersheds and drinking water and sanitation systems … conservation of areas with high environmental functions… restoration and recovery of degraded soils and forests… reduction of vulnerabilities in agricultural, fisheries and agro-forestry systems of production" (See H3.1).
- **Switzerland**. Relevant to SDC's priorities, which includes systematically integrating climate change related issues and DRR into development cooperation, in line with: (a) the commitment of OECD members to "work to better integrate climate change adaptation in development planning and assistance"; (b) Federal Bill of Parliament on inter-national cooperation 2013-2016 under "preventing and dealing conflicts, crises and catastrophes"; (c) SDC's Cooperation Strategy 2013-2016 for Bolivia (poverty and inequality reduction), in particular Outcome 1 of domain 2 (sub-national authorities with capacities to implement CC policies and strategies) and Outcome 2 (vulnerable livelihoods are more resilient to CC); (d) builds on results and lessons learnt from phase 3.

Component 3:

- **Government of Bolivia**. Complies with the government's interest to develop capacity for the effective integration of DRR/CCA into vocational training and undergraduate programmes.
- **Switzerland**: (a) Phase 4 builds on results and lessons learnt and of PRRD Phase 3; (b) contributes directly to the main objective of SDC's Cooperation Strategy 2013-2016 for Bolivia, in particular the Outcome 1 of domain 2 Climate Change (sub-national authorities with capacities to implement CC policies and strategies) and Outcome 2 (vulnerable livelihoods are more resilient to CC); (c) complementary tio PIA-ACC and potentially synergistic with the SDC-funded projects GESTOR and Biocultura in the logic of integrated spatial development.

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 1: No poverty**, especially Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*).
- **SDG 2: Zero hunger**, especially *Target 2.1 (By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round*) and Target 2.4 (*ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters*).
- **SDG 4: Quality education**, especially Target 4.7 (*By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development*).

- **SDG 13: Climate action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*), Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 17: Partnerships for the Goals**, especially Target 17.16 (*Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries*).

B4. Relevance to other development objectives.
Both the **Hyogo Framework for Action** (to 2015) and the **Sendai Framework** (to 2030) are endorsed by the Government of Bolivia. Their relevance is as follows.

- **Component 1** is fully compliant with the priorities of the Hyogo Framework, especially Priority 5 (*Be prepared and ready to act*) and the Sendai Framework, especially Priority 4 of Sendai (*Enhancing disaster preparedness for effective response and to 'Build Back Better' in recovery, rehabilitation and reconstruction*).
- **Component 2** is fully compliant with Hyogo Framework, especially Priority 2 (*Know the risks and take action*) and the Sendai Framework, especially Priority 3 (*Investing in disaster risk reduction for resilience through structural and non-structural measures to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment*).
- **Component 3** is fully compliant with Hyogo Framework, especially Priority 3 (*Use knowledge, innovation and education to build a culture of safety and resilience at all levels*) and the Sendai Framework, especially Priority 3 (*investing in DRR for resilience*).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Nil.
Adaptation: Capacity-based adaptation (CA) through DRR.

B6. Relevance/approach within the climate response based on SDC classification (see H3.1).
Rio Marks given in the SDC project spread-sheet:
Mitigation. NOT (0).
Adaptation. PRINCIPAL (2) - DRR.

Part C: Narrative overview

Background and purpose.
All four PRRD phases have been designed to respond to the fact that Bolivia is ranked as one of the most vulnerable countries in the world and regularly experiences a high number of natural and manmade disasters, (including the worst record in South America for road accidents). The Budget Proposals for the three main Components of PRRD Phase 4 (PRRD-4) were all built on lessons learnt from PRRD Phases 1-3 (2005-2014) and focus on three main gaps:

- **Component 1** is a new area of support and responds to the very low level of institutional response to total incidents registered (15% in 2012). This is primarily because the NFR-EPS does not have the capacity to manage coordinated responses to these incidents and disasters. Moreover, responders are poorly trained and equipped to provide a quality response.
- **Component 2** builds on lessons learnt from PRRD-3, in particular:
  - *At the municipal level*: the MRMUs have developed capacity on assessing risk (detailed risk maps) and integrating it into planning but has not permeated into public investment planning (supported by cost-benefit analysis - MD 2016). Moreover, the MRMUs have unclear roles and functions in managing DRR policies and programmes promoted at the national level (to support Hyogo/Sendai) and even less on applying CCA vis-à-vis Paris/NDCs led by other government institutions.
  - *At the departmental level*: Department Governments are still not prioritising DRR or CCA when defining their budgets and tend to only contact the MRMUs when a disaster is imminent/unfolding.
  - *At the national level*: Vice-ministries have been equipped with new tools to apply DRR/CCA in their planning of new infrastructures, but not enough attention has been

given to strengthening existing infrastructure (to mitigate extreme weather events based on risk maps). Moreover, technical staff need more training to apply DRR/CCA integrated into new public investment guidelines and knowledge management needs to develop and centralised to link up with local government.

- **Component 3** responds to the needs of EGPP and participating universities to address five challenges to establishing a culture of resilience:
  - *limited technical capacity* of national and sub-national public officers in applying norms of DRR/CCA adopted by the Vice-Ministry of Public Investments and External Funding for project design;
  - *low capacity of public officers* in applying methodologies, studies and models to assess vulnerability to and impacts of hazards during the cycle of public investment;
  - *limited integration of the DRR/CCA themes* in university curricula resulting in a deficiency of professionals with adequate capacity to reduce vulnerability in their work;
  - *insufficient capacity of universities* to respond with applied research and investigation on DRR/CCA to support the identification of appropriate measures to reduce the impact of climate change and enhance the knowledge base on good practices for society in general (however most important was formation of professionals in DRR); and
  - *limited information for the general public* about DRR/CCA, in particular, ways to reduce their exposure to hazards.

Performance and transformative potential.
All three sub projects performed well and achieved most of their expected outcomes. Bolivia is in a far better position today than it was in 2005 to manage risk, enhance resilience and to respond in a rapid and coordinated manner to disasters and major incidents. These achievements suggest the strategic effectiveness of PRRD (transformational potential) has been high in the area of DRR/CCA (see F1). In addition, PRRD has contributed to important systemic changes, namely:

- changes in institutional structure (NFR-EPS, UGR & COEs in municipal and departmental governments;
- changes in civil structures to apply CCA, apply early warning systems, etc.;
- changes in university curricula and teacher training to fully apply DRR/CCA as an integral part of existing courses, post-graduate diplomas on CCA/DRR, etc.; and
- integrated DRR/CCA in specialised institutions responsible for meteorology water management, etc.

In turn, these systemic changes have produced changes in function of these institutions and organisations, which are conducive to promoting the further mainstreaming of DRR/CCA and monitoring their application in the national agenda to implement national and international commitments linked to the Sendai Framework and Paris Agreement. Finally, these changes have also induced changes in public investment funding, and there is evidence to confirm budget allocations supporting climate resilient initiatives promoted by PRRD-4 have increased and/or been maintained during Phase 4 (to 2018). Although this needs further triangulation (through ground truthing) the indications are Bolivia has scaled up CCA and this has increased the prospects of adaptive sustainability of the end target groups (rural communities that were previously highly vulnerable to the effects of climate variability and change) (frosts, floods, droughts, landslides, pests, etc.)
Overall assessment: **design quality** - good (score 5); **effectiveness** - excellent (score 6); **impact** - excellent (score 6); **sustainability** - good (score 5); **transformative potential** for adaptation very high, for mitigation low.

Part D: Design quality

D1. Theory of change.
Component 1 (public investment in disaster response capacity): by strengthening the technical and management capacities of the four main institutions of the NFR-EPS through joint training, equipment provision and the establishment of effective coordination mechanisms, based on an agreed set of norms and standard operational protocols, the Bolivian authorities will establish a far stronger disaster response capacity that will result in a far higher number of lives and physical assets being saved from the negative effects of CC and manmade disasters.
Component 2 (public investment in community resilience): by transferring the tools and methodologies developed and validated at municipal level during PRRD 3 to the national level and ensuring that DRR/CCA is integrated in national policies and programmes on water resources management and rural development, the quality of public investment will improve, in

particular by enhancing the resilience of existing rural infrastructure (especially linked to water - dams, irrigation systems). In turn, this will lead to improved food security among the rural population, an increase in average annual income from agriculture (by at least 15% for 10,000 families by end of the project) and a reduction of post disaster recovery costs (by 20% in the 15 participating municipalities of Cochabamba and Tarija Departments) to demonstrate the added-value of DRR/CCA (to 350,000 families).
Component 3 (public investment in national resilience): by improving the training of public officials and university professors and students together with awareness raising among the vulnerable population (through a network of 200 local radio stations) on the benefits of applying DRR/CCA, the quality of public investment will increase to deliver a lasting culture of resilience and reduced vulnerability to hazards (measured by a 25% reduction in current post disaster recovery costs and maintenance costs against the national and subnational budget allocated for recovery).

D2. Assumptions underlying the theory of change.
Component 1 is based on the assumptions (a) that the four institutions of NFR-EPS are willing to accept training against an agreed set of operational protocols, and (b) that they are willing to cooperate fully with one another.
Component 2 is based on the assumptions (a) that capacity building among national institutions will result in better public investment in rural infrastructure, (b) that this investment will result in greater financial and food security at village level, and (c) that this prosperity will translate into greater CSO participation and reduced post-disaster recovery costs.
Component 3 is based on the assumptions (a) that training of high-status individuals (officials, teachers, students) and public awareness raising will increase the profile and understanding of DRR priorities within the general population, and (b) that this will translate into greater public participation and reduced maintenance and post-disaster recovery costs.

D3. Plausibility of assumptions and links.
None of assumptions are inherently plausible since they depend on local conditions and how well they are applied. They are formulated, however, on the basis of lessons learned from the previous phase. The general approach of promoting DRR and CCA together draws attention and responds to the fact that climate change and disaster risk are linked, although none of the three components respond to the practical challenge for government of having to report to two different agreements - UNISDR/Sendai for DRR, and UNFCCC/Paris for CCA.

D4. General quality of the project design (Score 5).
Stakeholders. All three Components have clearly identified their main stakeholders and end beneficiaries. This has been aided by the application of three previous phases and stakeholder assessments.
Consultation. All three Components provide evidence of consultation with the main stakeholders on identifying gaps that limit the application of coordinated approaches to disaster risk reduction, preparedness and response at the national and sub-national levels, and on the mainstreaming of DRR/CCA in national policy, planning and public investment plans, as well as in education (validation of DRR/CCA as an integral part of university courses including post-graduate courses and vocational training). Also significant is consultation on the funding of under-graduates and graduates to support theses researching DRR/CCA in UCB, UMSA and UMSS. However, consultation with line agencies on developing coordinated rehabilitation strategies (post-disaster) is less evident.
Risks.
Component 1. The risk analysis reviews four main risks and proposes the following mitigation measures:

- **Economic risk** (lack of resources prevents the NFR-EPS from operating efficiently and effectively on disaster response) should be mitigated through permanent dialogue between decision-makers on budgetary matters leading to the institutionalisation of this process.
- **Institutional risk** (lack of articulation and coordination between main stakeholders causes delays in project implementation and delivering effective response and change at the community level) should be mitigated through permanent communication between the authorities concerned and application of alternative local processes that are known to promote consensus and participation in decision-making.
- **Political risks** (low level of political support at national and/or departmental levels on the strengthening of the NFR-EPS leading to difficulties in applying agreed protocols and delays in capacity building) should be mitigated through permanent information flows to decision-

makers to apply informed decision-making on developing the system and applying its instruments and norms in a coordinated manner.

- **Management risks** (lack of capacity at the local level to approve strategic decisions and manage its bureaucracy efficiently leading to operational delays and a lack of continuity), should be addressed through the provision of a wide range of information sources, use of externally qualified trainers, establishing clear and concise mechanisms and instruments to support planning and programming from the outset of the project.
- **Implementation risks** should be defined and agreed with stakeholders to facilitate the management and administration of project actions. In general, the risk analysis is satisfactory, supported by the application of simulation exercises through which dialogue, information and decision-making on disaster response can be analysed to determine the strengths and weaknesses of the response in real time.

Component 2. The risk analysis identifies institutional, financial and political risks.

- **Institutional risks** included tensions over leadership between the three Vice-Ministries involved, but this was considered low and to be mitigated through regular dialogue and concertation on priorities. Two other institutional risks were considered to be more serious: (a) that CSOs would assume that by working with the Vice-Ministries they would be exposed to additional regulation, and (b) that the Law on Participation and Social Control would lead to diverse and conflicting requests for public works and services. In these two cases, risk mitigation would focus on applying the Constitution and the Law on Participation and Social Control consistently and clearly, following a 'do no harm' approach, and ensuring that each focus group respects their space and roles without transgressing into the space of other organisations.
- **Financial risks** relate to the decision of municipal mayors prioritising new works, instead of strengthening the resilience of existing ones. To mitigate this participating municipalities are to receive training on committing existing funds to infrastructure improvements and maintenance.
- **Political risks** centre on disruption to operations during presidential elections in 2014 and local elections in 2015 and political campaigns will focus on rapid public work proposals that are not climate smart. To mitigate this awareness campaigns are foreseen to ensure local organisations apply the Law on Participation and Social Control to ensure such works are banned or modified.

Component 3: Institutional and financial risks focus on heavy bureaucracy that prevents the release of adequate resources during and after the project to sustain main activities. To mitigate this the project/SDC will monitor counterpart funding and ensure universities in Bolivia conduct their own monitoring on this through the Network of Bolivian Universities in order to identify appropriate responses. Political risks centre on presidential and local elections causing rotation of key officials who have been trained to apply, mainstream and monitor DRR/CCA. To mitigate this, the project will seek to obtain official commitments from high-level authorities that this will not happen and likewise from the university hierarchy on retaining professors trained in DRR/CCA.

All three components were found to be well designed (or well-enough designed for skilled implementation to deliver good results) based on past lessons, good practices and partnerships. Component 1 use one fewer major disaster simulation in its efforts to galvanise decision-makers to agree to coordinate response strategies, and post-disaster rehabilitation strategies and coordination were also missing. The Component 2 risk analysis lacked consideration of climate-related risks and ways to off-set them in ensuring smooth and rapid operations. For these reasons, overall design quality is assessed as moderate (score 4) for Component 1, good (score 5) for Component 2, and very good (score 6) for Component 3.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.

PRRD is focused on promoting resilience and disaster responsiveness, especially in the agriculture and water sectors. By promoting agroecology, PRRD may contribute to carbon sequestration, but the extent is unknown.

E2. System change.

PRRD has strengthened Bolivian understanding of the link between anthropogenic climate change and the disasters to which it is exposed. It has therefore strengthened the country's voice in demanding CCM (and CCA assistance on agreeable terms for themselves and others) at global and regional level. These demands are already integral to Bolivia's constitutional

commitment to systemic change, including the Rights of Mother Earth and its critique of capitalism as the main cause of nature's demise[26].

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.

Effectiveness (scire 6).

Component 1. Pinto *et al*. (2018) found Component 1 to have achieved important results, at the national level and in two of the three departments targeted, which suggest the project's strategic effectiveness in advancing CCA has been high. The following achievements are particularly significant.

- **An inter-institutional coordination mechanism** for first response was established in the three targeted Departments of Cochabamba, La Paz and Santa Cruz and which has helped lay the foundations to develop the 'National First Response System' supported by strategy to implement the NFR-EPS at national level (the vice-ministries for Civil Defence and Citizen Security are leading its implementation) and already agreed in two departments (Cochabamba and Santa Cruz).
- **Implementation of the Incident Command System** (SCI) in the Departments of La Paz, Cochabamba and Santa Cruz, supported by 2,344 trained operators in the first two levels of the SCI who are able to apply the rules and guidelines governing first response in a clear and coordinated manner;.
- **Preparation and implementation of the unified curriculum** on first response, including a training plan agreed following in-depth consultation and modifications with main stakeholders.
- **Instruction guides** prepared and implemented through training courses.
- **Development of simulations and drills** in the departments of Cochabamba and Santa Cruz between 2016 and 2017, based on international quality standards and involving the mobilisation of around 1,200 operators and authorities. These exercises enabled the application of the SCI and its protocols to be evaluated and validated. Moreover, the simulations and drills have strengthened the capacity of the First Response Teams in key areas, such as interaction and communication with related institutions.
- **Studies on the regulatory framework** for First Response to support its integration into National Regulations DS 2995 and Bi-a ministerial agreement, and in similar regulations at the subnational level.
- **Improved coordination** between the State (Ministries of Health and Environment), Departmental and municipal governments of Cochabamba and Santa Cruz, and state companies (YPFB Refinery in Santa Cruz), to support the application of the National Strategy for First Response and implementation of the Incident Command System.

Component 2. Evidence of strategic effectiveness in advancing CCA is very high. Pinto *et al*. (2018: 22) concluded that Phases 1-3 of PRRD have "made a very significant contribution to the integration of disaster risk management in the Bolivian political agenda and in the municipal planning process", covering 24 municipalities in the Departments of Cochabamba, Chuquisaca, La Paz, Santa Cruz and Tarija. Key achievements included the following:

- **Phase 1 (2005-2007)**: (a) integration of risk management in municipal planning and management; (b) risk diagnosis and planning capacity in hazard mapping and vulnerability; (c) training and awareness on DRR; (d) recovery of local knowledge and working with local expertise such as *yapuchiris* (experimental farmer-trainers; Quispe, 2018).
- **Phase 2**: (a) Training completed on the integration of DRR in municipal planning and management (18 municipalities); (b) application of DRR instruments in municipal management; (c) integration of traditional knowledge in DRR; (d) preparation of financial instruments with a DRR approach to agriculture (to achieve better yields).
- **Phase 3 (implemented by Helvetas)**: (a) increase in the number of municipalities in the highlands, valleys, *yungas* (sub-tropical forests along the eastern slope of the Andes Mountains) and *chaco* (dry zone) establishing risk management units (UGR) and centres for emergency operations (COE) at departmental and municipal levels (COED/COEM); (b) departmental governments and municipalities strengthened with DRR Plans and CCA; (c)

[26] This position is essentially derived from the indigenous view, that "the most destructive value that the European invaders imposed is the quantification and objectification of the natural world, of Mother Earth, by imposing a monetary value on sacred things, and committing genocide against the Indigenous peoples who resisted." (Biggs *et al*., 2017: 7).

Support tools for DRR management (maps and methodological guides produced; (d) consolidation of the *yapuchiri* model and integrated agricultural risk management; (e) disaster and emergency response alliances established with key institutions; (f) application of instruments with a focus on DRR and CCA; (g) agricultural practices incorporating risk prevention/mitigation and CCA practices; (h) municipal counterparts identified to support the application of DRR and CCA.

- **Phase 4** made a "significant contribution to institutionalising DRR/CCA, particularly at the sub-national level and in prioritised sectors." (Pinto *et al*., 2018).
- **Overall**, Pinto *et al*. (2018) found that Bolivia is no longer a country without regulations, tools or institutions with DRR/CCA capacity as was the case in 2005. Instead, with PRRD's support, the country has established risk management units (equivalent to directorates) in five of the country's nine departments (Cochabamba, Chuquisaca, La Paz, Santa Cruz and Tarija) and has risk management units (UGR) operating in 105 of the country's 339 municipalities. Furthermore, SDC's web page on PRRD states the annual municipal budget for DRR had increased by at least 30% (by 2014) and maintained this level of investment during PRRD 4. In addition, the country is able to apply a range of tools and technologies to identify and assess risks in territorial planning and to support the application of DRR/CCA according to different local contexts. Likewise, the new regulations on public investment require sector investment guidelines to fully incorporate climate resilience into the design of new projects. Finally, at the local community level 20,000 people received awareness raising communications on DRR/CCA issues and families who had adopted agro-ecological practices were reported to have enhanced their resilience to the effects of climate variability and change. Taking into account these achievements, the systematisation report concluded that "risk management has been positioned in the country, both at the national and sub-national levels."

Component 3: Pinto *et al*. (2018) provided evidence that strategic effectiveness in advancing CCA is very high. This is demonstrated by the following achievements:

- social leaders and citizens of the 31 municipalities accumulated knowledge on designing, planning and implementing DRR/CCA projects (resilient investment) aided by communication campaigns;
- 1.68 million inhabitants have been informed on DRR/ACC, through 6 countrywide and 20 local awareness campaigns (mainly through 4 national radio networks and 346 local and regional radio stations);
- mobilisation of citizens and municipal governments to support actions on DRR and CCA (based on principles of co-responsibility) covering 31 communities/municipalities;
- 200 local communicators from all over the country trained to apply local information campaigns, advocate and mobilise local authorities and communities to incorporation DRR/CCA in local administrations and projects;
- all 3 participating universities incorporated DRR/CCA in a total of five undergraduate programmes; and
- 1,433 teachers improved their skills in DRR/CCA to facilitate 5,606 students acquire new knowledge and skills on DRR/ACC enabling 815 students to participate in postgraduate diploma course (through the EGPP) entitled, "Resilience in infrastructure projects – focusing on reducing the risk of disasters and enhancing adaptation to climate change".

Impact (score 6).

The PRRD has established favourable conditions for the increased adoption of DRR/CCA in Bolivia:

- The three most relevant ministries (environment and water MMAyA, rural development and lands MDRyT, and public works, services and housing MOPSV), seven departmental governments (La Paz, Oruro, Potosí, Cochabamba, Chuquisaca, Tarija and Santa Cruz) and 67 municipalities have all made formal commitments to fully integrate DRR/CCA in their territorial planning as well as in the implementation of national programmes through their respective UGRs and are demonstrating this by either maintaining, or increasing their budget commitments to DRR/CCA.
- The Ministry for Development Planning (MPD) is formally promoting the implementation of the national policy for resilient investment.
- Ministerial resolutions (MR) have been passed to apply the tool (SDC software and guidelines) to support 'Analysis of Resilience of Public Investment', concerning pre-investment decisions. Three specific sectors have MRs so far: Irrigation (MR 480/2017),

Drinking Water and Basic Sanitation (MR 495/2018), and Solid Waste (MR 585/2018). A similar tool specifically for the housing sector is also in the process of being adopted to promote sustainable cities.

- The early warning system for agriculture (EWS-Agro) is in operation and forms part of the National Early Warning System as well as its articulation to local systems.
- National forums have been established to promote the mainstreaming of DRR/CCA linked to a national agenda (with milestones to achieve).

Sustainability (score 5).

Components 1-3. The sustainability of the majority of PRRD-4 actions is highly likely over the short to medium term, because all three components placed emphasis on: (a) institutionalising First Response and DRR/CCA at all levels of the state to enhance the ownership of DRR/CCA actions, for example response action to fires in 2020 (MPD, 2020); (b) fully engaging the participation of civil society supported by local networks of communicators who have been trained to consolidate their participation in DRR/CCA in line with the Law on Participation and Social Control; (c) integrating DRR/CCA in the educational system to ensure a critical mass of officials are available to apply the new tools and technical guides promoted by each sub project of PRRD (such as sub project 2, which has produced guidelines on the management of urban areas, eco-efficient construction, river management, water reuse, etc.); (d) the awareness campaigns have enhanced dialogue and ownership of DRR/ACC, which is increasing the number of resilient infrastructure projects being promoted at the municipal/department levels (especially in the water and agriculture sectors); and (e) supporting local farmers with early warning systems is likely to safeguard livelihoods and therefore, support to continuing DRR/CCA.

Pinto *et al*. (2018) point out that the sustainability of PRRD-4's main actions will depend on: (a) maintaining sufficient harmony between departmental governments and sector agencies to maintain consensus on the funding and human resources needed to apply the NFR-EPS and DRR/CCA effectively over the medium to long-term; (b) establishing a full-time technical team at the national and departmental levels of government to oversee and guide DRR/CCA actions promoted by PRRD and meet the demands for more training; and (c) the continuation of regular socialization and follow up on awareness-raising on DRR/CCA to consolidate the culture of resilience established by PRRD and which is increasingly recognised as an integral part of the sustainable development of Bolivia. A relevant example is the inclusion of DRR / ACC technical Assistance projects as part of the categorized investment projects al municipal and governorate level (NSA, 2021).

F2. System change.

Achievements highlighted under F1 provide clear evidence that PRRD has been instrumental in bringing about systemic change within all three levels of the Bolivian State/government (national, departmental and municipal). In line with CIF's criterion for "systemic change" as one of the five main dimensions used to assess transformational change (2020) the following applies:

- **Changes in structure**: (a) NFR-EPS has been strengthened, facilitating a new decision-making regime to operate on disaster response; (b) risk management units (UGR) and centres for emergency operations (COE) have been integrated into national, departmental and municipal institutions, facilitating coordinated (top-down and bottom-up) decision-making on applying DRR/CCA in key sectors such as public works linked to establishing resilient water and agriculture sectors among the most vulnerable communities; (c) enhanced civil society's capacity to adapt to CC and apply DRR aided by the introduction of resilient irrigation systems, adapted agroecological practices and technologies and early warning systems; (d) integrated DRR/CCA in university curricula and teacher training to establish a critical mass of public officials who will be in a position to fully apply DRR/CCA in their work in a coordinated manner at all levels of government and in the interests of developing a culture of resilience in Bolivia; and (e) integrated DRR/CCA in specialised institutions (such as the National Service for Meteorology and Hydrology) to support the application of climate and hazard warning information.
- **Changes in function**: (a) at the national level there is evidence that several ministries (MNP, MMAyA, MDRyT, MOPSV, Ministry of Defence (INDECI), Ministry of Education (EGPP) have established new functions to apply DRR/CCA; (b) at the sub-national level at least seven departmental governments and 67 municipalities have established new functions relating to territorial planning, designing and implementing resilient infrastructure, communicating

DRR/CCA, managing knowledge and data on DRR/CCA and so forth; (c) civil society have new functions, in particular operating a network of communicators on DRR/CCA and applying the Law on Participation and Social Control to ensure public investment in their communities is climate smart and compliant with new national and sub-national norms, plans and guidelines that have integrated DRR/CCA; (d) the education and research sector have new teaching and research functions; and (e) national forums have new functions that require them to advocate for the mainstreaming of DRR/CCA and monitor the application of the national agenda to implement national and international commitments linked to the Sendai Framework and Paris Agreement.

- **Changes in funding**: there is evidence to confirm that budget allocations supporting climate resilient initiatives promoted by PRRD-4 have increased by as much as 30% in real terms at the municipal level and have been maintained during Phase 4 (to 2018). This has facilitated the scaling up of CCA and has increased the prospects of adaptive sustainability of rural communities that were previously highly vulnerable to the effects of climate variability and change (frosts, floods, droughts, landslides, pests, etc.)

Transformative potential was enhanced in Phase 4, by the decision to apply a joint approach to DRR/CCA (rather than DRR alone in Phases 1-3). This has enabled national and sub-national stakeholders to analyse and understand vulnerability within the context of Agriculture, Irrigation, water systems and Infrastructure and climate variability to support the identification of actions that not only enable them to cope with climate change challenges, but to be resilient to them, suggesting very high transformative potential. However, given the lack of CCM measures, the scope for preventing climate change (by emphasising carbon capture/drawdown as well as sequestration) has not been exploited and promoted in the national agenda.

Part G: Other aspects of design and performance

G1. Efficiency issues.
The project shows an approximate cost of CHF 25.7 per final beneficiary in project pilots, training and awareness Pinto *et al.*, 2018: 41). In terms of costs avoided, the resilient pilot projects implemented are estimated to have avoided losses (due to climatic events) of approximately CHF 3.8 million, which when compared to the cost of these projects (mainly resilient infrastructure) of CHF 705,000 show the cost-benefit of such projects is high. On the basis of this finding, cost-benefit analysis has been integrated and applied in the sectors where MRs have been reached (national programmes for irrigation, drinking water, sanitation and solid waste) where the indications are the cost-benefit ratio is high (up to USD 350 million in 2017).

G2. Coherence issues.
Good coherence between levels of government. Taking into account Bolivia has a history of very low levels of coherence between its national and sub-national government institutions, this situation appears to have been significantly reduced thanks to the establishment of project steering committees, creation of new coordination mechanisms, application of permanent communications and improvements of knowledge management, among others.
Good coherence between components, other SDC-funded projects and other donors.
There is ample evidence of coherence between different SDC-funded projects linked to DRR, CCA, supporting key sectors (agriculture, water, education - see also G4), and between different donors in particular from the EU. But the exit strategies of the PRRD-4 components do not clarify how the main stakeholders will interact and manage international climate finance to advance DRR and CCA and, more specifically, how they will work with MDP on supporting the World Bank's loan to develop Disaster Risk Management policies (World Bank, 2017).

G3. Replicability issues.
According to the systematisation report, the project has achieved a significant level of replication of its actions, through the involvement of sector and territorial actors, SDC funded projects (see G4) and by engaging universities in the promotion of integrated approaches to DRR/CCA. In addition, ownership of DRR/CCA has been replicated through the full participation of sub-national levels of government (downscaling), especially in Tarija and Cochabamba during Phase 4 (includes 5 municipalities that have internalized the results of local climate assessments in their territorial planning and investment plans).

G4. Partnership issues.
All three Components demonstrate a commitment to coordinate and establish synergies/partnerships with donor-funded initiatives supporting DRR/CAA. For example:

- Component 1 on disaster preparedness and response, foresees synergies with DIPECHO (EU), the Red Cross (CH) and INSARAG (UN-OCHA) DIPECHO 2012.
- Component 2 on establishing resilient rural communities recognises the importance of synergies with SDC-funded projects PROMER, PMS and CONCERTAR and more specifically on developing resilient agriculture with SDC-funded projects BIOCULTURA-CC and GESTOR. The Credit Proposal also includes training on the application of the CEDRIG tool to support PCM in Bolivia.
- Component 3 on training and education on DRR/CCA the Credit Proposal has identified a strong partnership with SDC-funded project "ACC Funds for applied Research" which has already planned a robust and well-funded technical support package to all three participating universities.
- Meanwhile, awareness raising on DRR/CCA is to be conducted through SDC's PADEM project (implemented by SOLIDAR-Suisse) and SOLIDAR is also a member of the PSC of PRRD-4.

G5. Connectedness issues.

- High levels of extreme poverty and malnutrition in rural Bolivia, especially among indigenous communities in the High Plain, force trade-offs between the establishment of resilient agro-ecological practices and rural infrastructure that have a lag time before they deliver benefits and are more costly to maintain, against traditional agricultural practices that produce food more rapidly and at lower cost;.
- High rural-urban migration levels make it challenging to train and keep youths in particular on the land where they are needed to apply DRR/CCA in order to strengthen their resilience and remain committed to agriculture.
- The growing effects of illicit coca production constantly challenges the application of resilient agriculture in remote areas.

G6. Cross-cutting themes.

Gender. PRRD 1-3 included the development and implementation of a specific gender strategy and applied the principles of governance. PRRD-4 was supported by an Additional Budget Proposal (CHF 230,000) equivalent to a separate sub project/component to employ the ATICA Foundation apply a robust gender strategy in all three sub projects of PRRD and which foresees three main outcomes: (a) All tools and methods of social control of public investment integrate a gender focus to facilitate learning and replication of PRRD results; (b) training modules for under-graduates and post-graduates integrate a gender focus; and (c) First Response training modules apply a gender focus. Main results from this approach are positive. Pinto *et al*. (2018) found the following for PRRD 4: that in Component 1 interviewed women operators had experienced significant changes since 2014 within their institutions concerning the inclusion of women in First Response teams, especially at the operational level; and that in Component 2 women were fully active in main activities (27,153), including participation as *yapuchiris* to support women farmers in engaging in climate-smart agriculture (in particular management of frosts). Finally, the SDC web-site reports for Component 3 that 30-40% of participants from EGPP and participating students from the three universities were females.

G7. Capacity building issues.

Across PRRD- 4, the following patterns were reported by Pinto et al. (2018):

- **Strengths in capacity building**: (a) fully recognises and values the combination of local and external knowledge to build DRR/CCA capacity at the community level (such as through the *yapuchiris*), municipal level (UGRs/COEMs) and departmental level (Regional Governments and Sector Agencies); (b) the establishment of inter-institutional committees has helped improve dialogue between national, departmental and municipal stakeholders; (c) capacity building within academia and specialised agencies providing climate-related services has been an efficient and effective way to increase research into DRR/CCA and support informed dialogue on its application; (d) raising awareness on DRR/CCA has contributed to including CC on the public investment agenda.
- **Weaknesses in capacity building**: (a) the risk management strategies appear to have only played lip service to the importance of mitigating the effects of high staff rotation at all levels of government and omitted the need for a specific strategy to reduce political barriers that often prevent mayors, departmental governors and senior ministry officials from working together on issues of mutual interest; and (b) although noted as important, it is unclear why SDC/PRRD did not prioritise a permanent technical team to oversee, guide and support

DRR/CCA initiatives post PRRD-4 from 2016 when Additional Credit Proposals were prepared.

Part H: Other matters arising from the review

H1. Follow-on questions, answers and suggestions arising from interviews by national consultants.

Question 1. *How successful were the exit strategies of each subproject in terms of ensuring the continuation of PRRD initiative?*

- **Answer**. The project has produced meaningful results, as well relevant products for each component, however, the political context has changed significantly since end of 2019, which is likely to affect the sustainability of results d unless mitigation measures are mutually agreed and applied quickly. This situation has made it difficult to establish an effective exit strategy, especially concerning the application of risk mitigation measures and management tools, but also concerning the transferring of national-level instruments to engage DRR/CCA in the national territorial planning system and in public investment.
- **Suggestion**. SDC should consider establishing a more robust knowledge interexchange especially at the national level to share experiences and develop a continuous dialogue with the stakeholders at the local, departmental and national levels (including civil society) to develop institutional memory and develop consensus on the most effective solutions to integrating DRR and CCA in its policies, strategies and plans, in the legal framework and in the field. This should be done with the support of the 'My Resilience' regional Programme, launched in 2021, to stimulate a better understanding of the cost-benefits of managing DRR and CCA as related disciplines, rather than as separate initiatives.

Question 2. *Is there evidence that public investment in DRR/CCA has increased at the national level since PRRD was closed?*

- **Answer.** At least 220 municipalities are reported to be applying DRR and CCA instruments such the Investment Resilience Analysis since 2018 (SDC, 2018), with a particular focus on developing resilient watersheds, dams, irrigation, and rural infrastructure. Indeed, the local territorial planning system has concentrated its efforts on fully integrating this in the production of their latest local economic and social development plans (PDES). At the national level, the MMAyA has also established new investment guidelines to support the integration of DRR and CCA in public investment, with a particular focus on supporting agricultural risk management. The Ministry of Development Planning (MPD) has also confirmed interest to adopt and apply DRR and CCA tools promoted by PRRD 4 in the main municipalities of each Department where there is a need for these tools to establish effective land use and development planning.
- **Suggestion.** SDC should encourage the 'My Resilience' project to support categorization of municipalities according to their level of development and capacities. to determine which ones can and should replicate PRRD's DRR and CCA tools and instruments in their development planning (and, if possible, monitoring).

Question 3. *Has a permanent technical team on DRR/CCA been established (such as ministerial, departmental and municipal focal points)? If yes, is it providing adequate support and guidance to the DRR/CCA agenda? If not, how is technical oversight and guidance on DRR/CCA being managed at the national and departmental levels?*

- **Answer**. The process of training personal and introducing DRR to civil servants was successful in the UGR of Cochabamba and Santa Cruz. At the national level, VIDECI has established a new technical capacity on DRR, but this is less evident in MDRyT and other ministries and not enough has been done to emphasise that DRR can also support CCA and thus support the establishment of more sustainable and resilient communities.
- **Suggestion.** 'My Resilience' should evaluate which of PRRD's interventions, in particular relating to Component 3, should be used as good practices to develop an effective countrywide local public awareness campaign on the economic and social benefits of DRR and CCA to reduce vulnerability to disasters, especially those linked to the effects of climate variability and change that are on the increase (droughts and flash floods.

Question 4. *Is there evidence of replication of DRR/CCA initiatives promoted by PRRD in the departments not covered by the project? Similarly, have the number of municipalities engaged in DRR/CCA increased in the departments where PRRD was active?*

- **Answer.** Incorporation of DRR and CCA tools on public investment projects at the national level (MMAyA, 2021) does not appear to have led to any replication in other departments and municipalities beyond the municipalities where the project has intervened. However, there is

evidence some department-level governments are showing an interest to adopt and apply these tools which will mean more scope for more municipalities to apply DRR and CCA.

- **Suggestion.** 'My Resilience' should support the production and regular updating of risk maps and carry out advocacy campaigns to support the replication of PRRD DRR and CCA tools in departments where PRRD has not be active and which are a priority according to their level of vulnerability.

Question 5. *What is the current thinking in SDC on advancing the lessons and good practices on DRR/CCA in Bolivia to other countries in the Andean region? other regions of Latin America?*

- **Answer.** For phase 4 Managing risk reduction and climate change adaptation are very complex and require adequate financial resources and a trained workforce to apply it effectively. However, the main challenge for PRRD has been its focus primarily on the response sector, which should have involved more sectors (for example, health, education, economy) and also should have focused more attention on prevention of disasters and vulnerability.
- **Suggestion.** To operationalize DRR/CCA PRRD's main interventions, such as agricultural early warning systems, the inclusion of methods for agricultural insurance, and so forth more analysis should be done to compare such systems with others in the Andean region in order to understand how such innovations would be better internalized at the national and sub-national levels.

Question 6. *Are there any internal SDC documents available, such as an internal review of SDC cooperation in the Andean Region for the SDC Cooperation period 2016-2020, or a final evaluation/ex-post evaluation of PRRD?*

- **Answer**. PRRD provides a good example to support learning on how to integrate DRR and CCA into development and land use planning, but SDC does not appear to conduct joint systematisation of its projects and programmes that support either DRR (through SDC's Humanitarian budget) or CCA (increasingly through the GPCCE) in the Andean region, or indeed elsewhere in LAC and other parts of the world. Moreover, the evaluation of DRR by SDC states, "there is no clear guidance nor a systematic approach to integrate the two concepts" (SDC, 2020).
- **Suggestion.** To conduct joint systematisation exercises on DRR/CCA programmes funded by SDC (and, if possible, with other EU donors such as Germany) and joint seminars to identify good practices and common approaches that encourage intersectoral action on promoting resilience at the municipal and departmental levels (supported by effective environmental management) as a means to fully mainstreaming DRR and CCA programs in national and sub-national development policies, strategies and plans.

H2. Missing documents. Final independent evaluation of PRRD (if conducted). Internal Review of SDC cooperation in the Andean Region for the SDC Cooperation Strategy 2016-2020 (if conducted).

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1 A note on Bolivian attitudes to the UNFCCC process.

Bolivia has distinctive views on the causes of climate change: "Bolivia presents its intended contribution consistent with its vision of holistic development, according to the provisions of the State Constitution, Law No. 071 of The Rights of Mother Earth and Law N° 300 of Mother Earth and Integral Development to Live Well, guided by the 2025 Patriotic Bicentennial Agenda and its 13 pillars, as well as national plans for medium and long-term. ... Bolivia understands Living Well as the civilizational and cultural horizon alternative to capitalism, linked to a holistic and comprehensive vision that prioritizes the scope of holistic development in harmony with nature and as structural solution to the global climate crisis." (Government of Bolivia, 2016).

Part I: Bibliography

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Other sources consulted:

SDC (2014a) *Credit Proposal for Sub project/Component 1 of PRRD-4: Strengthening the National First Response and Emergency Preparedness System for an effective and timely response [to disasters and incidents]*.
SDC (2014b) *Credit Proposal for Sub project/Component 2 of PRRD-4: Strengthening the Resilience of Public Investments and Infrastructure Systems*.
SDC (2016) *Additional Credit Proposal for Sub project/Component 2 of PRRD-4, covering the period 01/01/2017 to 31/12/2018*.
SDC (2014) *Credit Proposal for Sub project/Component 3 of PRRD-4: Promoting the use of knowledge and vocational trainings to build a culture of resilience among professionals and population*.
SDC (2014) *Additional Credit Proposal for all three projects of PRRD-4: Strengthening of the cross-cutting component on gender in the three [sub] projects of PRRD-4 through instrumental coordination and complementation*.

Part J: Acronyms and abbreviations

CEDRIG	Climate, Environment and Disaster Risk Reduction Integration Guidance
COE	Centre for Emergency Operations (*centro de operaciones de emergencia*)
COED	Departmental Centres for Emergency Operations
COEM	Municipal Centres for Emergency Operations
CONCERTAR	Governance Programme for Sustainable Territorial Development
EGPP	School for Pluri-national Public Administration and Management (Ministry of Education)
GESTOR	Natural Resources Management and Climate Change Project
ICS	Incident Command System
INDECI	National Institute for Civil Defence
INSARAG	International Search and Rescue Advisory Group
MDP	Ministry of Development Planning
MDRyT	Ministry for rural development and lands
MMAyA	Ministry for Environment and Water
MOPSV	Ministry for public works, services and housing
MPD	Ministry of Development Planning
MR	Ministerial resolution
MRMU	Municipal Risk Management Units

NFR-EPS	National First Response-Emergency Preparedness System
PADEM	Municipal Development Support Programme
PDS	Economic and social development plan
PMS	Programme to Improve Local Services
PROMER	Rural Markets Project
SAR	Search and Rescue
UGR	Risk management unit (*unidad de gestión de riesgos*)
VIDECI	Vice Ministry for Civil Defence
UN-OCHA	United Nations-Office for the Coordination of Humanitarian Affairs
NSA	State Service for Autonomies

Annex 13.8: Sustainably Managing Andean Forests (ANFOR)

Project highlights.

7F-07368: **Andean Forest and Climate Change (ANFOR)**. Mobilised stakeholders in Bolivia, Colombia, Ecuador and Peru to consolidate successful forest management, conservation, adaptation and mitigation measures and strategies; devised new forms of collaboration among scientists, governments, private sector and civil society; promoted replication and up-scaling of forest restoration, conservation and management actions.

Part A: Basic data

A1. Project number & name. 7F-07368 Andean Forest and Climate Change (ANFOR)

A2. Sources.
Process of PRF development: (a) draft PRF prepared using documents listed in the bibliography; (b) draft PRF reviewed by national consultant **Marina Marill** who also conducted the remore and face-to-face interviews listed in Annex 13.22; (c) the PRF was revised in light of field findings.

- **Phase 1 (Nov 2011 to Dec 2019)**: 'Exchanging knowledge and experience to protect Andean forest ecosystems' - www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2011/7F07368/phase1.html?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Phase 2 (Sep 2019 to Mar 2022)**: 'Andean Forest and Climate Change Programme (ANFOR) – Phase II' - www.eda.admin.ch/deza/en/home/projekte/projekte.html/dezaprojects/SDC/en/2007/7F05409/phase4.html

A3. Dates & financial data.

- **Phase: 1: Nov 2011 to Aug 2019** - SDC budget: CHF 8,072,000 (includes CHF 272,000 start-up credit for Nov 2011 to Jan 2014). The implementation phase was from May 2014 to Apr 2018 (with a budget of CHF 6,000,000). It was extended to Aug 2019 with an additional credit of CHF 1,800,000 and with final expenditure continuing until Dec 2019).
- **Phase 2: Sep 2019 to Aug 2021 (extended to Mar 2022)** - SDC Budget: CHF 2,050,000.

A4. Location(s). Bolivia, Colombia, Ecuador, Peru (strategic partner countries), plus Chile/CONAF (to provide South-South Cooperation on applying NAMAs). Argentina and Venezuela were included, but have not been active participants.

A5. SDC Geography. Latin America and Caribbean

A6. SDC Domain. GP CC
Fund Centre: GP CC
Region: Global/Andean Region

A7. Partners.

- **National Partner in Bolivia**: Ministry of Environment and Water (MMAyA).
- **National Partner in Colombia**: Institute of Hydrology, Meteorology and Environmental Studies [*Instituto de Hidrología, Meteorología, y Estudios Ambientales*, IDEAM), and signatories of the 'Pact for the Forests of Antioquia'.
- **National Partner in Ecuador**: Ministry of the Environment (MAE) and Imaymana Foundation.
- **National Partners in Peru**: MINAM, SERFOR, INAIGEM and CEDES.
- **National Partner in Chile**: CONAF.
- **Sub-national partners**: Sub-national governments at the departmental/provincial and municipal levels linked to project intervention sites
- **International partners (at start of ANFOR)**: (a) UN-REDD (focus on strengthening policy and institutional capacities on REDD+ in participating countries); (b) The Forest Carbon Partnership (FCPF, supported by SECO and contributing to the REDD+ readiness in Chile, Peru, Colombia and Bolivia); (c) Inter-American Development Bank (IADB, as a delivery partner of the FCPF in some of the countries, will also play a key role, particularly in Peru,

where IADB administers the preparation grant for the Forest Investment Programme (FIP) funds).

- **International partners (listed in SDC, 2020)**: WEI, CIFOR, IAM, WRI, WWF Chile, FAO, World Bank.
- **International partners (listed in HELVETAS & CONDESAN, 2020)**: World Resources Institute (WRI); Center for International Forestry Research (CIFOR); *Iniciativa Andina de Montañas* (IAM).
- **Contracting partners**: HELVETAS Swiss Intercooperation, CONDESAN.

Part B: Purpose, relevance and approach

B1. Purpose.

Phase 1 (to Aug 2019):

- **Overall goal**. "To enhance the management and conservation of forests in the Andes through consolidation and up scaling of successful policies and tools required to implement new conservation mechanisms, while improving adaptation and mitigation strategies for climate change in the Andean region. New forms of collaboration and networking between the scientific community, donor agencies, national programs, the private sector, civil society and governments shall improve the transfer of knowledge."
- **Specific objective**. "To enhance capacities and scale up policies, practices and incentive schemes in the region for the conservation and sustainable planning of Andean forests, while improving the livelihoods of Andean farmers so that they can cope with climate change." (SDC, 2020: 1). To "contribute to improving adaptation and mitigation capacities in the face of climate change by consolidating and scaling-up successful policies, practices, tools and incentive schemes in the Andean region relevant to the sustainable management of Andean forests" (from Spanish in HELVETAS & CONDESAN, 2020: 6). To achieve this the following outcomes were expected:
  - **Outcome 1**. Monitoring systems and research applied at different levels generate relevant information for the sustainable management of Andean forests integrating mitigation and adaptation processes to combat climate change.
  - **Outcome 2.** Andean forests managed in intervention sites through the application of successful strategies that integrate adaptation and mitigation processes to combat climate change.
  - **Outcome 3**. National, sub-national and local initiatives for the sustainable management of Andean forests in progress, strengthened with policies, tools and incentive schemes to integrate adaptation and mitigation processes to combat climate change.
- **Approach**. The programmatic approach over phase 1 focused on securing two main milestones: (a) clarifying exactly how the Programme can add value (clear and articulated offer of services and support to reducing deforestation as a means to strengthening resilience and opening up opportunities for mitigation); and (b) gaining political recognition that ANFOR represents a legitimate 'facilitator' for establishing effective forest governance in the Andean forests of main partners (Bolivia, Colombia, Ecuador, Peru), based on a common vision of work (in the intervention sites) and a collaborative alliance designed to continue main actions and encourage new partners and actors to join this alliance.

Phase 2 (Sep 2019 to Aug 2021, with a foreseen extension due to Covid-19):

- **Overall goal**. "In a context of climate change and increased pressure on Andean forest ecosystems, the goal of the programme is 'to enhance the conservation and management of Andean forests in the tropical Andes through consolidation and up-scaling of successful policies and tools required to implement innovative conservation mechanisms, while improving adaptation and mitigation strategies for climate change in the Andean region' [Phase 1 Goal]. The second phase will seek to further improve enabling conditions fostering collaborative actions for the consolidation, replication and scaling up of good practices and knowledge management for a more sustainable management of Andean mountain forest landscapes and the resilience of people and ecosystems in the Andean region." (SDC, 2019: 2).
- **Specific objective**. To consolidate, share and scale-up validated best practices on how to safeguard mountain forest ecosystems to further shape national forest policies aiming at enhanced resilience of Andean Mountain Forest ecosystems and increased human wellbeing and, through informed regional and global dialogue, contribute to the effective implementation of these policies.

- **Outcome 1**. Generation, socialization and use of knowledge, influencing policies for the consolidation, replication and scaling-up of good practices of Andean Mountain Forest management at the national regional and global scales.
- **Outcome 2**. Strengthening of policy and finance mechanisms for the consolidation, replication and scaling-up of good practices of Andean Mountain Forest management at national and regional scales.

- **Approach**. The final phase 2 of ANFOR centres on improving enabling environment (including knowledge management) and the stepping up of collaborative actions that lead to the expansion of sustainable management of Andean Mountain Forest landscapes and enhanced resilience of the people and the forest ecosystems upon which they depend.

B2. Relevance to partners.

Andean countries.

- The Andean region is one of the most vulnerable to climate change and environmental degradation in the world. For example, Andean forests cover approximately 35 million ha (around 25% of the Andean region), but are disappearing at a rate of 6-21% by country in the region (2010 - see ANFOR undated).
- ANFOR implementation started in the lead-up to CoP 21 in Paris, when the various countries needed support in standardising their iNDC commitments. Relevance remained high because to comply with their NDCs these countries need to meet important commitments which include reducing emissions through forest cover management and restoration (under the theme Land Cover Change and Land Use). The conservation of forests complies with NDC adaptation commitments to conservation/restore forest ecosystem services (especially water) to enhance resilience.
- ANFOR supported the development of the policy and regulatory framework to conserve and sustainably use forests, but which do not specifically mention Andean forests and their ecosystem services (in particular specific regulations to generate and apply incentives for Andean forest conservation).
- ANFOR responded to the needs of most Andean countries which were transferring powers to sub-national governments, thus contributing to various national decentralisation processes (including in the forest sector).
- ANFOR supported efforts by the Andean Community (*Comunidad Andina*, CAN) to implement regional cooperation programmes linked to the environment, and contributed to bringing the Andean countries together to conserve biodiversity (MFA Finland, 2014; Mikkolainen & Pasquis, 2014) and manage disaster risk (CAN, 2017).

Switzerland. SDC (2014: 3-4) notes that ANFOR "forms part of SDC's Global Programme Climate Change (GPCC) and is an essential element of GPCC's strategic approach to address climate change in land-use and forestry through regional support mechanisms. ANFOR is expected to take advantage of the considerable experience made in the South-East Asia region through the ASEAN Social Forestry Network (ASFN) supported by GPCC since 2009, and the African Forest Forum (AFF) active in sub-Saharan Africa which is supported since 2011. With ANFOR being the third regional program in its portfolio, GPCC and its partners in the three regions will be able to demonstrate joint results in international events and strengthen new and innovative approaches to tackle climate change policy and implementation in homogenous regions."

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 2: Zero hunger**, especially Target 2.4 (*By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality*).
- **SDG 6: Clean water and sanitation**, especially Target 6.6 (*By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes*) and Target 6.b (*Support and strengthen the participation of local communities in improving water and sanitation management*).
- **SDG 13: Climate action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*).
- **SDG 15: Life on Land**, especially Target 15.1 (*By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under*

international agreements) and Target 15.4 (*By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development*), Target 15.5 (*Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species*).

B4. Relevance to other development objectives.
OECD: Forestry policy; Environmental policy and administrative management; Bio-diversity
Convention on Biological Diversity, Aichi Targets 2011-2020: in particular Target 5 (By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced), Target 14 (By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable) and Target 15 (By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification). SDC (2014: 3) notes that the "Andean forests contain a unique biodiversity, including approximately 45,000 species of vascular plants and 3,500 species of vertebrates."

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Capacity-based mitigation (CM). Ecosystem-based mitigation (EM) .
Adaptation: Capacity-based adaptation (CA). Ecosystem-based adaptation (EA).

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:
Mitigation. SIGNIFICANT (1).
Adaptation. PRINCIPAL (2), but variously by sub-activity between 1 and 2.

Part C: Narrative overview

Background and purpose. The natural ecosystems of the tropical Andes are extremely diverse biologically. They protect catchments (often as cloud forests), sustain water cycles and regulate water supplies for some 70 million people downstream, while also supporting the lifeways of many peasant communities and indigenous peoples locally. And they contain a high density of carbon (60-230 t/ha) in trees and peat. Yet these forests are subject to high levels of degradation and deforestation, mainly from farming, livestock and forest fires, and less than a quarter of the original forest cover remains. Worse, the extent of deforestation in the Andes and the Amazonian lowlands is such that catastrophic drying trends and tipping points at regional scale are becoming active. Finding ways to stabilise land use and ensure the protection of remaining Andean forests is therefore a top priority, whether considered from the point of view of biological or cultural diversity, human development, and either adaptation to or mitigation of climate change. Progressive conservation and sustainable management mechanisms emerging in the region have the potential to respond to these needs.
ANFOR was designed to make the best-possible use of these mechanisms by promoting effective policies and scientifically validated tools. The **design quality** is good, in particular because it built on lessons from previous SDC experience in the forestry sector and also involved an extended 'pre-phase' which mobilised a wide range of stakeholders in what turned out to be the four main partner countries (Bolivia, Colombia, Ecuador, Peru) - Argentina and Venezuela did not participate and Chile only participated in selected activities. The aims were realistic and in line with the needs of the participating countries, which sought to consolidate and scale up successful forest management and conservation measures and develop new ones, while improving CCA and CCM strategies in the Andean region. New forms of collaboration and networking between the scientific community, donor agencies, national programs, the private sector, civil society and governments were all envisioned to improve the sharing of knowledge along these lines. Thus the first phase of ANFOR sought three main outcomes:

- **Monitoring systems and research** were to be applied to generate relevant information for the sustainable management of Andean forests integrating mitigation and adaptation processes to combat climate change.
- **Andean forests would be managed at target sites** through the application of successful strategies that integrate adaptation and mitigation processes to combat climate change.

- **National, sub-national and local initiatives** would be undertaken to promote the sustainable management of Andean forests, strengthened with policies, tools and incentive schemes to integrate adaptation and mitigation processes to combat climate change.

Performance was generally been in line with planned outputs and outcomes, although this required an injection of CHF 1,800,000 in additional funding and an extension to end of August 2019. The main achievements included:

- 39 policy, planning and management instruments were elaborated, each recognising and valuing the benefits of restoring, conserving and sustainably managing Andean forest landscapes and their ecosystems;
- 70 applied research projects/studies were carried out on Andean forests, which fed into the policies and the platforms of other forestry initiatives such as GPFLR, IAM and Initiative 20x20;
- 41,414 ha of Andean forests had been placed under sustainable management through direct interventions, in particular at learning sites in Colombia, Ecuador, Peru and Chile;
- 10,391 people had participated in ANFOR trainings and events, including 59 journalists with the intention of visualising ANFOR's main objectives and promoting the case for the restoration and conservation of Andean forests as major ecosystem service providers;
- payment for ecosystem services (PES) remuneration mechanisms were established in several of the learning sites, in particular BanCO_2 in Colombia, which has been used as a model for learning and promoting similar mechanisms in the region;
- the learning site at Choco in Ecuador gained official recognition as a UNESCO Biosphere Reserve in 2018; and
- Chile was helped to leverage over USD 63 million from the climate funds, plus USD 16 million of government resources for Andean forest restoration to support CCA.

ANFOR did face challenges, however, and these have affected performance. The most significant was the absence of a regional institution, which could act as platform through which knowledge, learning, projects and funding could be managed to support a regional approach to the restoration, conservation and sustainable management and use of Andean forest ecosystems. Establishing regional arrangements with real functions and powers (as opposed to non-binding dialogue) in specific areas among rivalrous nations is notoriously hard, whether one considers the EU, ASEAN, ACTO or CAN, but the result in this case was that insufficient informed dialogue took place on developing regional and cross-border cooperation in forest conservation. It meant that the transformational potential of ANFOR was lower at the regional level than at the local/sub-national level, where ecosystem/community adaptation is already taking place.

These local impacts and transformation were aided by the project's design which allowed its contextual alignment to remain intact. This in turn was conducive to systemic change among local stakeholders as well as new opportunities to scale-up sustainable forest management practices. Indeed, HELVETAS and CONDESAN (2020) estimated that the area (41,414 ha) of Andean forests placed under sustainable management through ANFOR contributed indirectly to the conservation of over 3.6 million hectares of Andean forests by 2021. This is consistent with the common finding in tropical forest areas that local people, once empowered over land tenure and given management responsibility, and with local accountability for decisions, tend to be reliable forest conservators. The practical implication is that minor but progressive policy changes and a certain amount of encouragement and resourcing for local stakeholders, can result in very large areas of forest and very large amounts of carbon (and biodiversity) being conserved.

The second phase of ANFOR had as one of its central themes the replication and up-scaling of Andean forest restoration, conservation and sustainable management. The chances of national governments engaging more proactively in supporting this process are growing since all participating countries are more aware of the importance of restoring and conserving Andean forests. In the case of Peru, this has led to MINAM's support for a major publication on all its forest types in 2021 (including three categories of Andean forests). This policy direction was reinforced by the Glasgow Leaders' Declaration on Forests and Land at UNFCCC CoP 26 in November 2021, which suggests that ANFOR contributed to decisions by Chile, Colombia, Ecuador and Peru to pledge their commitment to halting deforestation by 2030. This confirms that capacity-based adaptation and mitigation is progressing well at the level of national policy in these Andean countries.

Overall scores: Design quality - 6; Effectiveness - 6; Impact - 6; Sustainability - 5; Transformative potential - high for adaptation and mitigation.

Part D: Design quality

D1. Theory of change.
Through the consolidation and up scaling of advanced conservation mechanisms, significant improvements in the conservation and sustainable management of Andean forests will be reached, improving the livelihoods of Andean farming communities and concurrently addressing climate change.

D2. Assumptions underlying the theory of change.
The logical framework in the Credit Proposal for Phase 1 (2014) provides a long list of assumptions. The main can be summarised as follows:
Assumption 1. That there would be continuing political willingness among participating countries to support a regional network for effective environmental monitoring and evaluation (i.e. that relevant knowledge would remain in demand by national governments).
Assumption 2. That local actors would be willing to adopt forest conservation and sustainable management practices that support adaptation and mitigation, and to cooperate in identifying and sharing knowledge on good practices through a regional network.
Assumption 3. That the reform processes of participating countries would continue to promote local responsibility for restoration, conservation and sustainable use of Andean forests.

D3. Plausibility of assumptions and links.
Assumption 1 is plausible to the extent that knowledge sharing would be through a network of cooperating institutions that were not anchored in a regional body with a strong political mandate. With this proviso, all assumptions are plausible since there was a favourable political climate for addressing climate change through forest management in the UNFCCC process before CoP 21 in Paris, and that relevant commitments were made in the NDCs of the participating countries.

D4. General quality of the project design (Score 6).
Stakeholder consultation. A strong element in all the SDC project designs evaluated in Peru and Bolivia (see PRFs for 7F-05409 PACC, 7F-05448 Biocultura, 7F-07312 PRRD, 7F-08632 PIA-ACC, 7F-09699 CALAC) is that they each used a dedicated inception phase (an 'Opening Credit' or 'pre-phase') for stakeholder analysis, for field reconnaissance, and for identifying potential economic, policy, planning and legislative incentives to promote project aims. Each pre-phase is also used to fine-tune the project's components according to needs and opportunities, allowing for a flexible approach to the phasing of SDC programmes which permits contextual alignment to be retained over time. In the case of ANFOR, the pre-phase collected baseline data on vulnerable Andean forest ecosystems, considered how findings and good practices already identified by key partners such as CONDESAN could be integrated into policies and land-use plans, and generally to achieve a high level of consultation with stakeholders (including high-level dialogue that, for example, led to cooperation between Peru and Ecuador on their transboundary forestry commitments).
Risks. SDC (2014: 7) assessed the main risks to ANFOR as being: "1) information produced by the project is not used in decision making processes, 2) project monitoring network is not efficient, 3) national and local governments fail to participate effectively in the implementation of activities at the intervention sites, 4) intervention sites are effected by mining, road and electrical projects causing conflicts and 5) applied conservation mechanisms do not produce expected benefits - in particular for the rural poor. To mitigate these and other related risks, the project will place special emphasis on an adaptive management. This process will be fuelled by a result-based monitoring and evaluation System. Courses of action will constantly be discussed with the stakeholders. In the light of new ideas, roles will be clarified and mutual commitments formulized." This analysis might have added the risk noted above that the absence of a strong treaty or institution to promote regional cooperation on forest management left ANFOR to make a series of bilateral arrangements, with some countries not likely to cooperate (as in fact Venezuela and Argentina did not). This would moreover be attempted in the context of generally weak collaboration between agencies responsible for forests and climate change in different countries, and in places also fragmented or competing responsibilities for lands and forests among ministries within the same government.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.

Component 2 supported sustainable management of Andean Forests that are conducive to enhancing CCA and CCM, while Component 3 focused on developing policies, tools and initiatives that support CCA and CCM. All the main achievements of ANFOR (see F1) were relevant to mitigation, since all contributed directly to the protective management of Andean forests, or to governance changes likely to have that effect indirectly, or to the appreciation of their economic and social value among the public and policy makers, thus promoting domestic investment in conservation.

E2. System change (high transformative potential).

The only specific case identified in which ANFOR induced systemic change was in Peru, where the programme seems to have influenced MINAM to include Andean forests in its National Programme for the Conservation of Forests to Mitigate Climate Change (Ministerial Resolution No. 135-2019). However, the mitigation roles of ANFOR interventions more generally are not perhaps fully appreciated because of mistaken belief that to qualify as a mitigation action the conservation of ecosystem carbon must meet the definitions of REDD+ used in international agreements. This is so only if payment is sought via one of the financing mechanisms that have been established to pay for REDD+, and in fact REDD+ arrangements are just a way to facilitate international financing with which to encourage and enable countries to achieve urgent net GHG emission reductions (plus biodiversity and other co-benefits). But countries are of course perfectly able to take such actions in their own interests or in the spirit of global or bilateral cooperation (with each other or with Mother Earth, to reference the Bolivian idea), and the carbon conserved always has the same biophysical significance per tCO_2e (except that because of tipping points and mid-century deadlines it declines in value with its date of sequestration).

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness (score: 6).

Effectiveness.

The immediate achievements of ANFOR included:

- 73 collaborative alliances/partnership agreements leading to the elaboration of 39 policy, planning and management instruments, including two in Colombia, 24 in Ecuador, 11 in Peru and one in Bolivia, each recognising and valuing the benefits of restoring, conserving and sustainably managing Andean forest landscapes and their ecosystems;
- 70 applied research projects/studies were carried out on Andean forests, which generated 513 reports and papers and fed into the policies and the platforms of other forestry initiatives such as GPFLR, IAM and the 20x20 Initiative;
- 41,414 ha of Andean forests had been placed under sustainable management through direct interventions, in particular at learning sites in Colombia, Ecuador, Peru and Chile; and
- 10,391 people had participated in ANFOR trainings and events, including 59 journalists with the intention of visualising ANFOR's main objectives and promoting the case for the restoration and conservation of Andean forests as major ecosystem service providers.

Impact (score 6).

All the achievements of ANFOR listed above have adaptation significance in contributing to policy, law, practice and understanding that promoted efforts to conserve, manage sustainably and/or restore ecosystems that offer protective services to human populations, thus reducing climate change impacts and strengthening systems against them. Moreover, ANFOR was the first regional programme that sought to confront deforestation and degradation of Andean forest ecosystems through actions that promote adaptation and mitigation, and thereby to establish more effective governance over these forests (HELVETAS & CONDESAN, 2020: 6).

Regional alliances were formed and activated, in particular to support the elaboration and publication of the Andean Regional Research Agenda on Andean Forests and Climate Change, which promoted collaboration and produced inter-institutional agreements among leading academic authorities in the Andean region. This alliance facilitated the establishment of the Regional Research Scholarship Programme, which launched its first Call for Research Proposals and the results of which were consolidated during Phase 1 of ANFOR. The knowledge gained was used to raise awareness on Andean forests and build the case for a collaborative framework to guide and launch renewed calls in Phase 2. The latter were designed to guide policy reforms in support of the restoration, conservation and sustainable use of Andean forests to combat the effects of climate change.

Also at the regional level, courses were designed and launched to support the restoration of mountain ecosystems. These included a virtual course for journalists on sustainable development in mountain ecosystems and climate change and participation of representatives from four Andean countries in the CONAF international course in Chile on the restoration of high Andean landscapes. Finally, 'south-south' regional dialogue was facilitated among national and sub-national actors, on the scaling up of the restoration, conservation and sustainable management of Andean forests in collaborative agendas on combatting climate change, which would be developed further in Phase 2. An additional sense of potential impact is given by considering ANFOR's work at the country level:

- **In Colombia**, partners in the Pact for the Forests of Antioquia established the Andean Forest Observatory in the Antioquia region of Colombia in 2016, led by the Botanical Garden of Medellín. The creation of this 'Ecological Observation System' has been instrumental in concluding agreements among several government and non-government actors to participate and support the Observatory. One of the main achievements of the latter has been to validate restoration practices and a remuneration mechanism for ecosystem services (MERESE) called 'Urban BanCO_2', which is being considered as a model for replication of payment for ecosystem services (PES) in the region (Torres, 2020).
- **In Ecuador**, local governance capacity of the Association for the Andean Choco Reserve was strengthened in 2017 leading to forest landscape restoration (FLR) initiatives and work on securing a declaration from UNESCO recognising it as a Biosphere Reserve.
- **In Peru**, development of a governance platform for the Regional Environmental Commission of Apurimac is taking decisions on FLR based on 'learning sites' where 'communities of practice' can continue the process of restoration of ecosystem services. Another sign of Peruvian 'buy in' to the value of its own forests is the publication by MINAM of a book (Castaño, 2021), which includes chapters on the main Andean forest types and acknowledges ANFOR/SDC in supporting its production.
- **In Chile**, ANFOR supported the process to leverage over USD 63 million from the climate funds, plus USD 16 million of government resources for Andean forest restoration to support CCA.

Also to be considered an impact of ANFOR, at least to some enabling extent, is the willingness of Colombia, Ecuador and Peru to sign the 'Glasgow Leaders' Declaration on Forests and Land Use' at CoP 26 in Nov 2021, in which signatories pledged to "halt and reverse forest loss and land degradation" by 2030 (UNFCCC, 2021). As a result, Phase 2 of ANFOR has assumed a new level of strategic importance in the three countries concerned given that the declaration explicitly aligns with the objectives of ANFOR: nations commit to halt deforestation and land degradation by 2030, and to restore land degraded by land-use changes linked to agriculture, commercial activities and the effects of climate change such as flooding, droughts, fires, etc. Bolivia did not sign the pledge, because of its distinctive policies on forest, land and international transactionalism (see PRF for 7F-07312 PRRD and 7F-08632 PIA-ACC), although Ecuador did so despite its similar national constitution.

One arguably less positive point is that despite ANFOR's role in making it possible for Andean institutions to generate abundant data on the status, composition, vulnerability, knowledge gaps annd conservation needs of Andean forests, there is no firm evidence so far that Andean deforestation rates are declining outside the pilot and learning sites. On the other hand, one would not expect information to be much use on its own in conserving forests, and other factors are needed as well. Thus, HELVETAS & CONDESAN (2020: 15) reported that "with the process of advocacy and support for the creation of policies and management instruments, 3,600,067 hectares of Andean forests in the region have been supported with standards, methodological guidelines, and guidelines for their management and conservation."

Sustainability (score 5).

A number of platforms, alliances and commissions for dialogue and multi-stakeholder coordination were established through ANFOR. These continue to operate through local implementation agreements and policies that have integrated FLR and sustainable management in the 'learning sites'. Four applied research projects have also been approved for implementation in Ecuador, Peru and Colombia in 2020-2021. These should consolidate new organisational and planning capacities in the learning sites, including enforcement of new legal regulations to protect, promote and manage forest resources and their ecosystem services. Moreover, a family of financing mechanisms for conservation, based on 'payments for ecosystem services' (PES, MERESE, or MRSE) is in operation to support forest management in the learning sites. This kind of arrangement has a long history in many countries, especially for

safeguarding water catchment services, but those now being applied under ANFOR include BanCO_2 (Antioquia, Colombia), REGENERA (Apurímac, Perú), FAQCH4 and FORSAN (Piura, Perú) and FSEH (San Martin, Perú).
ANFOR's main partner countries will need new and additional funds in order to develop the institutional capacity to carry forward and scale up the Phase 1 initiatives in Phase 2 and beyond, to host and lead public access to the database on Andean forests, and to undertake research on the roles of forests and agroforests in CCA and CCM (a priority identified by HELVETAS & CONDESAN, 2020: 24). These needs are acute because of the impact of the COVID-19 pandemic on public resources, but it is unclear how far ANFOR has been able to facilitate access to new funding by these partner governments.
Finally, the absence of a regional institution with a specific mandate from participating governments, or some equivalent on-going arrangement, to take forward all of the initiatives, knowledge and relationships created or facilitated by ANFOR raises questions of sustainability. The fact is that governments are typically reluctant to pool their sovereignty in regional organisations without very clear advantages that they could not obtain in any other way. A case for this must be carefully crafted according to the wishes and attitudes of each participant, taking into account all their peculiarities and bearing in mind that some things that appear obviously beneficial to outside observers may have hidden political costs that are of paramount importance to national stakeholders (see H3.2 for the case of the ASEAN Centre for Biodiversity). To get around this strategic issue, ANFOR focused on creating alliances through networking and information exchange. Which if any of the resulting networks will survive ANFOR's departure will depend on factors beyond its control, although relationships and habits of cooperation can be self-sustaining if they are rewarding enough to the participants.

F2. System change (high transformative potential).
HELVETAS & CONDESAN (2020) identified signs that ANFOR has been inducing change towards improved Andean forest ecosystem management in the following areas.

- **Evidence of system change within government**:
  - Integration of Andean forests into national forest plans, including the National Restoration Plan of Ecuador, the Deforestation Control Strategy in Colombia, and the National Program for the Conservation of Forests for Climate Change in Peru.
  - Integration of ANFOR-generated knowledge within national CCA strategies, including co-management for ecosystem diversity in Ecuador and forest management for key hydrological functions in Peru (Cerrón *et al*., 2019; Ariza & Cuvi, 2020; COSUDE, 2021).
  - Inclusion of ANFOR-supported forest restoration work in Apurimac in the Latin American Network of Model Forests (see ANFOR, 2021).
  - Contributions to the integration of DRR and CCA policy in participating countries.
- **Evidence of system change in community resilience**:
  - Farmers and their organisations have been mobilised to apply methods that have enhanced their role as guardians of their natural resources.
  - Adaptive practices have been documented to support political advocacy for their upscaling at national and regional level, especially in Colombia, Ecuador and Peru.
- **Evidence of system change in the education sector**:
  - Development and teaching of a post-graduate course on climate change and sustainable development at UNSAAC (Cusco), has enabled the university to capture outside expertise on CCA to enrich and promote wider learning on CC
  - Participating universities in Apurimac, Cusco, Zurich and Geneva are networked and continue to conduct research on CCA.
- **Evidence of system change in promoting ecosystem and livelihood co-benefits**:
  - Institutionalisation of new PES arrangements in ANFOR's 'learning sites' has motivated almost 4,000 families to restore forest landscapes.
  - Increasing use of knowledge from 'learning sites' and other ANFOR sources in forest planning and management.
  - New lines of forest research using the ANFOR Research Scholarship Fund include 15 projects on social and environmental dynamics related to climate change, and a study that contributed to the declaration of Ecuador's Chocó Andino de Pichincha Biosphere Reserve in July 2018.

In addition, a parallel project supported updating of the National Climate Change Strategy in Peru, ensuring inclusion of science-based risk monitoring to inform policy dialogue on adaptation (see PRF for 7F-05409 PACC).

On the other hand, few clear connections were visible in the project documents between SDC-funded research in the different countries. For example, no mention is made of PACC in Peru even though it supported research at UNAMBA university in Apurimac. Similarly, there is no mention of a connection between ANFOR and PIA-ACC in Bolivia despite both projects supporting applied research in the Andean region of Bolivia (including the mapping of Andean Forest types). Likewise, between ANFOR and PRRD in Bolivia, even though ANFOR has shown that FLR is a cost-effective means to reducing vulnerability and enhancing resilience. The absence of explicit reference to these synergies is surprising in a regional programme orchestrated and funded by a single donor, and is suggestive of powerful horizontal barriers to knowledge flow within SDC.

Part G: Other aspects of design and performance

G1. Efficiency issues.
Based on findings reported by HELVETAS & CONDESAN (2020), SDC (2020) and the ANFOR web-site, the project appears to have been moderately efficient overall.
Apparent strengths included:

- At an average cost of CHF 91,000 per project, the Call for Research Proposals was a cost-effective way to engage researchers in gathering important information to support decision making, and seemed particularly effective at stimulating a field of research that was previously very under-funded.
- An investment of CHF 2.5 million in Chile helped leverage around USD 16 million to implement Chile's National Strategy for Climate Change and Plant Resources and also facilitated access to USD 63 million from the Green Climate Fund and USD 15.6 million in total from the Forest Carbon Partnership Facility, the Global Environment Facility and REDD+.
- Partnerships established during Phase 1 were very effective in stimulating dialogue among the participating countries (including Chile).

Apparent weaknesses included:

- Challenges of coordinating several countries and project sites and many stakeholders (including 21 partners in the FLR theme) resulted in the need for additional funds and time in Phase 1.
- Financial leverage was questionable, since the ratio between finance leveraged and spent was lower than hoped at 1:1 in the main participating countries, and ANFOR had little success in obtaining additional support from the private sector, which in the land-use sector remains focused on monoculture plantations (see also G2).
- Value for money was questionable, since total Phase 1 expenditure benefited only 3,911 families directly and exposed only 10,391 people to some level of training, at a respective cost of CHF 2,000 and CHF 725 each.
- Although research synergies occurred through links with parallel SDC-funded projects (7F-05409 PACC in Peru and 7F-08632 PIA-ACC and 7F-05448 Biocultura in Bolivia), opportunities to save costs through a regional approach to training, publication and research direction were not fully exploited.

A final point is that the ANFOR orientation and steering committees struggled to take a regional approach due to the divisions of nationalism and the lack of a regional institution with responsibilities relevant to forest ecosystem management and anchored in a binding international treaty. This "context weakens opportunities for collaboration and joint action between countries to address the continued loss of Andean forests." (SDC, 2020: 2).

G2. Coherence issues.
South-South Cooperation. As reported in G1, ANFOR has been successful in stimulating cross country dialogue including important linkages with Chile to develop learning through a combination of triangular cooperation with SDC/Helvetas/CONDESAN and S-S between Chile/CONAF and main partner countries and their forestry departments. However, Chile has been far more successful in leveraging funding from the climate funds and REDD+ than the others.
Disaster risk reduction. The countries of the Andean Community adopted an Andean Strategy for Disaster Risk Reduction in 2017, but this does not explicitly address the role of forests in environmental security so has limited strategic or preventative relevance to climate change. OECD guidance on integrating DRR and CCA is summarised in H3.3 in the PRF for 7F-05409 PACC in Peru, and opportunities relevant to ANFOR are identified in H3.3.

Coherence with other donor activities.
SDC (2014) mentions potential synergies between ANFOR and other projects and actors, including regional and national forest initiatives supported by SDC itself, and the Forest Action Plan Andean Region in Chile, national REDD_+ initiatives, and the GEF/CONDESAN project on Multiplying Benefits of Andean Ecosystems. It attaches a list of relevant initiatives supported by other development partners, including: USAID (Silvacarbon, with synergies in monitoring and evaluating carbon stocks, and a potential role in capacity building national monitoring systems); various carbon funds and facilities managed by the World Bank; the Forest Investment Program of the Inter-American Development Bank; Germany (GIZ, with synergies in monitoring carbon stocks, climate change risk management and work at the intervention sites); CARE International; GEF (with synergies in forest conservation research; and Finland (through the sustainable forest management programme for Andean forests).
HELVETAS & CONDESAN (2020: 47) also stress the role of other actors, such as in designing work at the Apurímac learning sites (the 'Water for Abancay and Communities forever' with SUNASS and the EU's EUROCLIMA+ Programme), and coordination with the Sustainable Forest Management Component of the 'ProAmbiente II' project in preparing a GCF proposal. In ANFOR Phase 1 SDC (2020: 6) describes the exit strategy of ANFOR as being based on "opportunities for consolidating and positioning its achievements with a view to scaling up. The program will strengthen its work with regional platforms that are active and already involved in activities for forests, forest restoration and climate change, such as the Andean Mountain Initiative and the 20x20 Initiative. It will also respond to stakeholder demand for access to a regional exchange of knowledge generated and successful experiences achieved for replication and scaling up. The program will partner with the 20x20 Initiative to catalyse the creation of a country portfolio of restoration projects in Peru, Ecuador, Colombia and Chile, in collaboration with government agencies and WRI's 20x20 Initiative."
Finally, for ANFOR Phase 2, SDC (2019) foresaw partnerships and synergies with the Global Partnership for Forest Landscape Restoration (GPFLR), the 20x20 Initiative, the BioCarbon Fund Initiative for Sustainable Forest Landscapes (BioCF-ISFL), the ASEAN-Swiss Partnership on Social Forestry and Climate Change, the African Forest Forum, SDC's bilateral programme, the Andean Mountain Initiative, the Inter-American Development Bank's FOMIN initiative, UN-REDD, the World Bank, CIFOR, and the World Resources Institute. All of this suggests an openness to collaboration that goes beyond merely listing development partners that happen to be working in the same sectors in the same countries at the same time.

G3. Replicability issues.
ANFOR has placed emphasis on the importance of replication of its main activities linked to forest restoration and management, by supporting a combination of field interventions, applied research and a communication strategy designed to advocate the cost-benefits of Andean Forest ecosystems in providing eco-system services to sustain development and enhance resilience to climate change. Part of the advocacy campaign has been to train journalists (59 persons) to develop a reporting network on the role of mountain ecosystems and climate change. strong evidence to indicate CCA research and actions are being replicated. There is a general acceptance that replication of ANFOR's main activities need to be stepped up in Phase 2, however, and its two outcomes focus on replication and scaling up good practices at the national, regional and global scales. But the importance of improving access to the Climate Funds to optimise the replication and scaling-up process seems to have been largely overlooked. Among all the potential partners listed by SDC (2019) for ANFOR Phase 2 (see G1), there was no mention of replicating, for example the Chilean experience of leveraging finance from the climate funds, nor of how ANFOR 2 will establish synergies with BioCF-ISFL even though Colombia is already participating in the initiative and Switzerland is one of the main contributors to this Fund. Rather the synergies are apparently seen mainly as ways to inform partners (such as GPFLR) or to foster south-south collaboration and strengthen regional networks, which are indirectly valuable in many ways but do not specifically target replication.

G4. Partnership issues.
HELVETAS & CONDESAN (2020) report that 73 collaboration agreements had been signed between ANFOR and social entities for the exchange of goods and services. Since ANFOR delivered most of its planned outputs and is in the process of achieving its expected outcomes, the quality of these partnerships can be assumed to have been satisfactory. Highlights include:

- that agreements with SERFOR, the Apurímac regional government and the Quito metropolitan district helped to legitimise the PES (MARESE) arrangements at the learning

sites, and to integrate Andean forests into national plans and strategies linked to forest management and CCA;
- that agreements with national and international cooperation and research institutions facilitated and strengthened collaborative research and improve the visibility of the knowledge products generated;
- that agreements with civil society (foundations, corporations, cooperatives, NGOs, CSOs) clarified their roles, especially in the learning sites, which avoided duplication of work/overlaps (e.g. in the cases of the Imaymana Foundation in Ecuador, CEDES/Apurimac in Peru, and the botanical gardens of Medellín and Masbosques in Colombia in the context of BanCO_2).

Regional partnerships do not appear to have been based on formal commitments, however, and were instead based on *ad hoc* arrangements to support the implementation of ANFOR. Hence they did not do as much as they might in strengthening the institutional framework for Andean forests at regional level, or contributing to correcting the lack of a regional institution for forest management founded on a binding international treaty. This leaves non-binding statements like the Glasgow Leaders' Declaration on Forests without regional force

G5. Connectedness issues.
Migration into and out of the Andean forest region has long been important as landless peasants seek to colonise new land after exhausting the soils of their previous plots. Similarly, in deforested areas where restoration times are measured in decades and there is no immediate hope of employment, there is a high level of outward migration, especially among youth.

G6. Cross-cutting themes.
Gender/social equity. HELVETAS & CONDESAN (2020) report that over 4,000 women received training under ANFOR, or about 38% of all participants in capacity building activities. It is unclear how many women and members of other vulnerable groups actively participated in decision-making. Although monitoring covers gender-disaggregated indicators, it does not measure the quality or impact of the support on women and other vulnerable groups such as youth. As a result, it is not clear as to how far women and other vulnerable groups are receiving the training that they need to advance CCA in the learning sites, or whether the research is fully taking into account the specific needs of men and women.
Governance. ANFOR relies heavily on developing community-based law enforcement approaches in the learning sites., but this seems not to be done in cooperation with the law enforcement authorities (which are the only legal entities who can take offenders to court). Thus prison sentences and fines imposed by courts are not being used to defend Andean forests. Similarly, there appear to be few links with the forest fire brigades, despite the observation by SDC (2020: 5) that "large fires are evidence of the lack of capacity to deal with these emergencies."

G7. Capacity building issues.
ANFOR provides capacity building exercises at all levels from regional training events in Chile to localised forest restoration and sustainable management training in the learning sites. A key aspect of capacity building is to develop informed decision-making linked to policies, strategies and plans, however, and there is no sign that capacity building has been assessed for gaps (including gender, governance issues) to support fine tuning and identify follow-on capacity building needs. Capacity building dedicated to developing a formal institution to manage Andean forestry data, promote synergies and leverage funding is also not evident (even in Phase 2).

Part H: Other matters arising from the review

H1. Follow-on questions, answers and suggestions arising from interviews by national consultants.
Question 1. *Why did ANFOR not link up with SDC's bilateral projects that are highly relevant to ANFOR and which are operating in the same departments in particular: a) the scientific networks established in Peru under PACC (especially with UNAMBA in Apurimac) taking into account one of ANFOR's main learning sites in Peru is Apurimac Department, where it has worked with many stakeholders (including the Regional Government, the Regional Environment Commission, the association of communities of Saywite, Choquequirao and Ampay, SERFOR, etc.; b) PIAACC which is dedicated to conducting applied research throughout the Andean region of Bolivia; c) PRRD, which offers opportunities for developing synergies between CCA and DRR through forest restoration and sustainable management approaches?*

- **Answer**. SDC funds bilateral and global programmes and projects at different times and with different objectives, that often make synergies between projects difficult to achieve. For example, ANFOR only had one year to develop synergies with PACC before it commenced closure in 2017. Nevertheless, in the final year some training courses were combined with PACC (on investment projects). However, SDC's projects are encouraged to disseminate information on their interventions and promote networks through which a coordinated intervention strategy can be applied in the territory where they depend on the same local partners (regional governments, universities). This does not always materialize because due to the different levels of receptivity of stakeholders and end beneficiaries to support and develop effective coordination. Indeed, the institution and social fabric is important to acquire and transmit learning. For example, due to internal problems within UNAMBA it was not possible to explore the application of applied research in ANFOR's learning site in the San Ignacio de Kiuñalla peasant community (Huanipaca District, Abancay Province, Apurímac Region), where ANFOR is promoting protection and recovery of springs and the valuation of ecosystem services, and where applied research could support systemic changes to water management.
- **Suggestion**. SDC should ensure each programme/project operating in the Andean region linked to CCA (and DRR) has a communication specialist who is required to develop a communication network dedicated to identifying synergies dedicated to optimising transformational potential in territories and national and sub-national governments of mutual interest.

Question 2. *ANFOR appears to have achieved significant outcomes in Chile – namely the leveraging of almost USD 79 million from international climate funds and REDD+ as well as USD 16 million from the Chilean government to support its forest restoration and carbon sequestration programmes. Why was the learning linked to this not used as a central theme of ANFOR in Peru, Ecuador, Colombia and, where relevant, in Bolivia?*

- **Answer**. Unlike Chile, Peru, Ecuador and Colombia have Amazon regions where they have prioritized cooperation funds to promote the restoration, conservation and sustainable use of Amazon Forests with the support of international donors. SDC is one of the first donors to commit funding to not only restoring and managing Andean forests, but raising awareness on their importance to sustaining coastal cities and agriculture. As a result, more time is needed before climate and other donor funding is used to target Andean Forest restoration. For example, Chile already has developed a national inventory on its forests and mainly promotes the development of forest plantations which are an easier way to capture international funding to support sustainable forest management control illegal deforestation and exploring carbon trading schemes.
- **Suggestion.** MINAM, SERFOR and other partners in the Andean region acknowledge the importance of the Andean Forest programme in safeguarding water sources for cities, factories and farms through which payments for ecosystem services (PES) arrangements could be developed, while communicating the global environmental benefits of forest restoration in terms of carbon sequestration and soil conservation. This would increase the profile of Andean forests and the need for forest carbon inventories across the region to open the way for mitigation finance to be captured and used for sustainable forest ecosystem management.

Question 3. *One of the major achievements of ANFOR appears to be the creation of a remuneration mechanism for ecosystem services (MERESE) in its learning sites, especially in Colombia (Urban BanCO_2). Is there evidence that these mechanisms are attracting political interest to be replicated, or is there competition from other donor projects working on the same concepts, such as EUROCLIMA+ which is also promoting MERESE and includes FORASAN in Piura, which is also an ANFOR partner? (See EUROCLIMA+, 2020).*

- **Answer**. There is strong evidence that MERESE, is gaining increased political interest as a viable remuneration mechanism for protecting ecosystem services and that ANFOR and programmes such as EUROCLIMA+ are contributing to this. But lesson learning has not been adequately coordinated between the participating countries and programmes such as EUROCLIMA+, partly due to a lack of leadership within the region, and partly due to inadequate coordination between donors which operate at different sites and on different timescales. As a result, there has been little formal exchange of lessons learned and good practices, nor coordination on the policy, legal, regulatory and institutional changes in each country that relate to PES. This lack is particularly important in cross-boundary forest ecosystems such as in the north of Peru and southern Ecuador where ANFOR is operating.

- **Suggestion.** ANFOR should stimulate policy dialogue on the need for public investment and scientific research to stimulate the development of common standards on applying MERESE in the Andean region and support its replication.

Question 4. *Currently, there is no formal regional body in place in the Andean region responsible for overseeing data, research, synergies, projects, etc. in the Andean Forest region (unlike for Amazon forests). What should be done to address this problem by SDC and its partner countries that would strengthen the Andean region's capacity to capture climate finance at the Andean level rather than at the national or sub-national level which is currently the case for ANFOR in practice? For example, is there scope to establish an Andean Forest Department in CIFOR?*

- **Answer.** The Secretariat of the CAN would be a viable option, given it had a Directorate General for Environment until 2016 and has provided support in key areas such as the Observatory for the Amazon region, which facilitated the development of the Atlas of Ecological Systems of the Tropical Andes. Moreover, there are clear indications the four member countries of the CAN are looking to resuscitate a common environmental agenda. For example, Colombia has been pushing for the establishment of an 'Andean Charter' (UEC, 2021). Since Colombia, Ecuador and Peru all signed the Glasgow Declaration on Forests and Land Use, there is an added incentive to consolidate and apply such a regional charter. However, interviewees confirm that the main problem is how to operationalize a common agenda while each country decides what to prioritize according to its own forest and land use classifications. This has implications, for example, on forest monitoring and observatory issues, which has already been experienced in the Amazonian region , where in spite of the Amazon Treaty to cooperate on this issue, differences remain. For example, SERFOR is working with the German Development Bank (KfW) on a program to be launched in 2022 to produce a national forest inventory covering nine Andean Departments. However, no regional platform for forests and ecosystems is foreseen, which suggests it will be difficult to scale up the inventory to a regional one in the interests of enhancing adaptive sustainability throughout the Andean Forest regions supported by actions such as MERESE.
- **Suggestion**. SDC, KfW and SERFOR should review opportunities for synergy in the interests of developing dialogue through ANFOR to develop a regional platform on forests that supports the operationalization of the Andean Charter, through which common problems can be addressed and regional coordination developed on implementing the Glasgow Declaration by 2030. This should be accompanied by moves to pool scientific research and knowledge to support the sustainable management of forests and enhance resilience to climate change (thus enhancing the sustainability of ANFOR).

Question 5. *How could GPCCE strengthen SDC's portfolio going forward taking into account DRR will move out of Humanitarian Assistance to GPCCE?*

- **Answer.** The best way forward is to increase the opportunities for more interaction between the DRR and CCA in order to promote good practices and more effective advocacy in support of policies that help to prevent climate-related disasters. Currently, reform efforts focus on policies, but not enough on their implementation, through such mechanisms as technology transfer, generation of climate disaster prevention and response groups, and platforms to provide feedback on processes and experiences.
- **Suggestion.** ANFOR projects should enhance dialogue on valuing the conservation of Andean forests as an integral part of DRR. This would help to show that nature-based solutions play an important and often cost-effective role in reducing vulnerability and enhancing resilience, thus offering an informed alternative to hard engineering solutions. In this sense the concept of forests as 'natural infrastructure' should be recognized as a viable means to reducing risks and generating adaptation to climate change. GPCCE should support not only the development of a regional forest inventory, but also use it to map high risk areas where climate variability and change are likely to have major long-term impact on vulnerable communities (rural and urban), and that this should be linked to SDC's supporting scientific research on development of climate services in the Andean region (CLIMANDES programme), through which the cross-cutting approach of climate change and disaster risk reduction could be strengthened to underpin sustainable development in the Andean region.

Question 6. *It appears that one of the main tools used by ANFOR to identify forest landscape restoration (FLR) sites is ROAM. However, to inform decision-making on which sites to select GIS software is needed to map the landscape. GIS software is costly and therefore unlikely to be accessible at the local level. Has SDC found solutions to this, such as using online open-source alternatives such as Open Foris Collect Earth?*

- **Answer**. The methodology was introduced by IUCN , but MINAM has experienced the same problem concerning software costs when it did the mapping of Peru's Amazonian forests and Dry forests. There is therefore, consensus that free, open-source software and geographical databases must be used if forestry restoration, inventories and monitoring are to be sustained over the long-term. This is particularly important for Andean countries such as Peru taking into account the large number of forests they have. For example, SERFOR has successfully used ROAM to identify the restoration of ecosystems at the district level covering 2 million hectares. Each of the sites has maps, but the cost to monitor the restoration program, develop forest inventories (which will also help develop carbon inventories), remains the main challenge.
- **Suggestion.** ANFOR partners, SDC and KfW should jointly assess the Open Foris software to determine if it is a viable option to guarantee the continuity and sustainability of forest ecosystem restoration programmes. The issue of financing, capacity building, as well as institutional strengthening to apply the software should also be assessed and monitored by Forestry Departments and ANFOR to identify good practices and lessons on the degree to which it has a positive impact in addressing the climatic and ecological emergency.

Question 7. *One of the main challenges of FLR is that it is not integrated into relevant policies, or receives the national and sub-national funding it deserves. How far do you feel ANFOR has succeeded in integrating FLR that includes Andean Forest landscapes into relevant sector policies linked in particular to forestry, agriculture and land-use planning sectors?*

- **Answer**. There is significant evidence to confirm FLR is being adopted as a national and sub-national priority and that new financial instruments as well as general public investment is being channelled to forest restoration. For example, in Peru a National Strategy for the Restoration of Ecosystems and Degraded Forest Lands has recently been endorsed for the period 2021 to 2030, which will be implemented through the PROREST programme managed by SERFOR. Moreover, the forest restoration policies in Apurímac have provided the best evidence so far in Peru that FLR has been integrated into sub-national development planning and is securing new public investment to support its implementation. Indeed, prior to ANFOR there was almost no investment or intervention to restore and conserve Andean forest ecosystems in the department. Most significant, however, in this particular case is the growing awareness of the added value of forest ecosystem restoration in terms of the co-benefits that it generates. These include reducing the risks of mud-slides, flash floods and prolonged droughts. Similarly, there is strong evidence of FLR being adopted in other Andean countries. In Ecuador a (National Plan for the Restoration of Forest Ecosystems (2019-2030) Ecuador), in Colombia (where new financial instruments are being established to fund ecosystem restoration in Antioquia and other departments, and in Chile where FLR policies have already been put into effect.

Question 8. *Once FLR has been established the people living there will need to improve their livelihoods (as foreseen in the Main Credit Proposal 2014, p.6). Has ANFOR supported the development of sustainable economic generation activities based on NTFPs as one of the incentives to maintain the local community's commitment to protecting their forest resources? If yes, please provide examples.*

- **Answer**. The program supports various economic generating initiatives and these are recognized by main stakeholders and end beneficiaries as an important to conserve their forest ecosystems. For example, beekeeping, eco-tourism promotion, agro-forestry and silviculture to promote sustainable livestock development, have been applied. ANFOR has also helped promote and replicate these activities by internalizing them as part of the forest restoration strategies and plans mentioned above. For example, in Peru., SERFOR and ANFOR have worked with local beekeeping organizations to develop inclusive value chains and to sustain these activities by supporting the development of community funds to continue the restoration process, such as the REGENERA initiative.
- **Suggestion.** the program should do more to develop information exchange on these activities throughout the region to support learning on how to enhance their sustainability and which economic actions are positively impacting on adaptation to climate change. In particular, more should be done to promote collaborative approaches to their analysis and monitoring.

Question 9. *Some important governance issues appear to have been overlooked. For example, should the law enforcement and judicial system be included in the training to support law enforcement and rights linked to the forest restoration, conservation and restoration process?*

- **Answer**. Governance is promoted at the local level, but the problems of land grabs and trafficking, forest fires and illegal logging for wood or fuel remain major challenges, especially in highly vulnerable communities. Community surveillance with the intervention of the law enforcement authorities has not been promoted and tested, partly because of the lack of resources and capacity of the latter. However, SERFOR is committed to addressing these challenges by adopting an approach that includes forest governance in all its processes, including in the development of the national forest inventory, based on the active participation of all stakeholders at all levels.
- **Suggestion.** ANFOR and SDC should adopt this approach so that control and surveillance of forest restoration and protection is fully included in the agendas of the environmental roundtables established throughout the region at the national and sub-national levels (and at the regional when such a roundtable is in place). Moreover, the issue of forest governance should be fully integrated into the development planning system since the presence of the State and its institutions is not solid, so the reinforcement of governance in order to generate a culture of compliance with environmental regulations, and communicate a clear message to transgressors that their behaviour will meet the full force of the law.

Question 10. *SDC funds a lot of research, publications and communications (over 500 in ANFOR 1), but in most cases they are intended to be fed into other programmes to support advocacy for change. Do you feel this is really happening, or would you advocate a more robust and dedicated communication strategy to bring about change that can be measured at the political, economic, socio-cultural and environmental levels?*

- **Answer**. SDC-funded projects are required to develop dedicated spaces and platforms to promote dissemination of its programmes to the general public. However, Swiss Cooperation does not have a dedicated knowledge management program that enables it to join up with other actors to generate advocacy programmes for change in political, technical and scientific spaces, as well as through CSOs.
- **Suggestion.** SDC should review its information management and seek to establish better synergies between its program communication staff, so that the projects generate consensus on how important messages on CCA should designed and targeted at decision-makers, the general public, industry, etc. and how SDC can support this through the donor community and its main government and non-governmental partners.

Question 11. *Looking forward, what should SDC's portfolio in the Andean region do to ensure its cooperation is less fragmented and builds stronger alliances with other donors such as the EU that have global programmes on CC?*

- **Answer**. There is consensus on the need to strengthen the 'Green Table' throughout the region in order the environment objectives are linked up to the green agenda governing the economy and industry). In some Andean countries, such as Peru, this is already happening under the leadership of MINAM in which the donor community is already present.
- **Suggestion.** SDC is already supporting initiatives linked to the green agenda (such as CALAC+), but should do more to develop dialogue on establishing a Regional Green Table. The secretariat of CAN is an existing regional institution that can and should establish this, through which politicians, industry, civil society and environmental institutions are invited to forums, events, workshops and studies to develop the green agenda so that forest ecosystems are valued in the wider fight to combat climate change and sustain the economy. To support this, sponsorship of green proposals linked to Swiss and EU interests should be explored to put forest restoration, conservation and sustainable use fully on the green agenda in support of adaptation and mitigation to CC.

Question 12. *How can SDC improve the communication of its achievements within the Andean region and other mountainous regions (such as the Himalayas) to improve global dialogue and awareness of the achievements, and the next steps of the PBA?*

- **Answer**. there is consensus more needs to be done to improve communication between different regions of the globe where SDC is supporting forest restoration and management.
- **Suggestion.** It would be important to improve the information on the web that is better communicated, as it generates some confusion as to what SDC is doing and how it articulates with the public and its international, national and subnational partners. For example, the projects have several phases that are not easy to comprehend, especially when the programme is renamed. Moreover, it is not possible to compare and contrast SDC's progress between countries in one region, or in other regions.

H2. Missing documents.
External evaluation of ANFOR, Phase 1 (conducted end of 2019/early 2020).

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1 Contextual changes, difficulties and lessons from Phase 1 implementation (source: SDC, 2020: 4-6).

SDC's appraisal of main difficulties faced during the project period:

- A mayor challenge is undoubtedly the limited level of integration and liaison at the Andean level. It has not been easy to make strategic use of regional channels to present the Program's results and position the issue.
- The focus on extractive activities and existing political and financial crises in Latin American countries – exacerbated by the Covid-19 pandemic threaten many efforts to conserve Andean forests.
- There is only minimal promotion of options to encourage productive activities alternative to livestock farming. Alternatives need more support if they are to become opportunities for local development.
- Lack of strategic measures for forest fire prevention, it requires a coordinated work from different fronts.

SDC's conclusions for the next phase.

- Focus the efforts for replication and scaling.
- Define an exit strategy for knowledge management and capitalization of evidence in research and learning sites.
- Increase the visibility of the level of degradation and deforestation of Andean forests.
- Develop and promote opportunities for portfolios of impact investment projects in Andean forests.
- Define mechanisms and opportunities for replication or scaling.
- Promote institutional arrangements for the sustainability of processes from the work of the partners in the territory and at the national level.

Andean forest context, 2014	Andean forest context, 2019
Global level. Since 2011, the FAO has held campaigns to foster greater mountain forest protection. The activities for mountains became stronger, minimizing at the same time the role of forests. Globally, major mechanisms such as the Forest Carbon Partnership Facility (FCPF) supported preparatory actions with countries until 2020, focusing on the protection of the Amazon. Chile and Costa Rica are the most advanced countries in the region in terms of sustainable forest management. The Andean forests did not feature greatly in the measures and programmes.	**Global level**. The Paris agreement on Climate Change of 2015 has strengthened the role of forests in tackling climate change. The countries have committed to reduce emissions and stop deforestation, and have stepped up their efforts to stick to their commitments. However, there is only little effect on deforestation so far and protection efforts focus mainly on forest in the Amazon. The ecosystemic value of mountain forests is evident, as is their vulnerability. Further deforestation of Andean mountain forests will have serious consequences for water regulation, biodiversity, carbon sequestration and disaster management. The attention to the importance of these forests and their role in tackling climate change has increased. It remains crucial to expand the scope of instruments and incentives for sustainable forest management, not only to capture carbon but also to further develop ecosystem services schemes. Despite this efforts, forest fires have increased in number and intensity in several regions of the world
Regional level. Latin American and Caribbean countries launched the 20x20 initiative managed by WRI. The 20x20 Initiative	**Regional level**. In the Andes, the role of forests in water regulation is well known. Andean forests are classified as fragile ecosystems. The Andean

brings together national and regional commitments and hopes to raise US$365 million of private funding to restore forests and ecosystems, improve agricultural productivity and reduce poverty. In 2011, the Andean Community CAN launched the Tropical Andean Ecosystems Atlas, excluding information from Chile and Argentina. The atlas gathered information from the GLORIA and IMHEA monitoring network and available data on Andean forests.	forest network publishes articles about transects of the entire chain that identify key evidence of the effects of climate change which, together with the pressure of urban growth, agriculture, logging and other activities hastens forest degradation and loss. The programme organizes on-line discussions and courses in the Andes, which encourages young people to participate and provides opportunities to collaborate through networking.
National level. Communications and inventories lack clear figures on the classification and area of Andean forests. Ecuador has implemented the Forestry Partner Programme that provides incentives for effective conservation action. This is replicated in Peru, but does not include areas in the Andes. Peru and Colombia are also working to have mechanisms and procedures recognised in law, for payments for forest environmental services. Civil society in the countries is promoting voluntary initiatives in REDD mechanisms, and UN REDD has started national programmes for greater access to international funds for forest conservation. Bolivia has enacted the Mother Earth Law and Joint Mechanism that highlights the value of forests beyond carbon sequestration.	**National level**. Countries have created national forest restoration strategies that include action in Andean forests. The 20x20 initiative develops investment portfolios with the countries for securing contributions from the private sector. There are also compensation incentive schemes that promote the conservation of these forests. They need to consolidate more socio-economic data in order to scale up. At the country level, reducing deforestation is one of the main measures for achieving the commitments made in the Paris Agreement. This is reinforced by the climate funds for forest conservation that are available, but continue to mainly focus on the Amazon. Large forest fires are evidence of the lack of local capacity to deal with these emergencies.
Sub-national level. Sub-national authorities recognize the eco- system services of native forests, but they do not give priority to native forest conservation and promote activities such as extensive cattle ranching or plantations with exotic species. There have been successful conservation projects in some areas, but they have not been systematized.	**Sub-national level**. Sub-national authorities have restoration and reforestation plans and recognize the value of native species. They are interested in promoting forest conservation because of the role of forests in ecosystem services. More young people take part at this level and they stress the need to communicate the value of Andean forests and the economic opportunities for developing their goods and services.

Lessons learned by ANFOR, 2014-2019: factors contributing to success or failure:

Thematic approach

- The Andean forest programme is the first regional programme to address climate change in Andean forest ecosystems.
- Incorporating Andean forest landscapes into differentiated policy instruments has been a challenging thematic approach, from defining the concept of Andean forests in the different countries to highlighting the importance of ecosystem goods and services for the rural and especially the urban population.

Main innovations

- Using a stakeholder network for designing and jointly implementing activities in course is a design and intervention criterion that has entailed effective liaison and the leverage of the programme's actions at different scales.
- The programme worked at several levels and with several stakeholders to actively encourage them to incorporate the information it has produced.

- By developing a regional research agenda, the programme was able to organize studies, highlight the work of the Andean forest monitoring network, and conduct regional synthesis studies.

Partnership(s)

- As Andean forests must be included in national budgets and appropriately reflected in national policies, the program's partnership with national programs and its participation in technical roundtables and in other areas of governance has been key for bringing Andean forests to the fora and to influence local action.
- Networking has enabled the programme to promote alliances with entities with roles that complement its work, such as WRI's 20x20 Initiative. The programme has helped use practical experience to improve the 20x20 Initiative's instructions and investment proposals as well as to explore investment opportunities in Andean forests.
- In Chile, Ecuador and Peru, the link and joint work with the ECOANDES Project and Sustainable Land Management Program financed by the GEF stand out. These connections made it possible to consolidate actions in the short term and to leverage resources.
- The program partners are institutionally strong, and this has been key to the speed and success of activities in each area.
- To link up with the private sector, the programme needs to have an internal discussion to define key aspects and define the degree of involvement and chances of scaling up potential actions.

Communication

- In Phase 1, the programme printed various multimedia formats, but in order to give them value, the partners themselves must feel ownership, the municipalities for example, and the communities themselves.
- It is clear that budget distribution must give a greater share to communication, to promote implementation and scale up validated experiences.

Harmonization and Alignment

- The program's alignment and harmonization with already existing activities and its synergy with public and private institutions led to concrete actions with local and national ownership.
- Strengthened local or sub-national platforms and government agencies facilitated decision-making for implementing concrete actions for managing and conserving Andean forests.

H3.2 Issues facing regional environmental institutions: the case of the ASEAN Centre for Biodiversity (source: Caldecott & McNally, 2008 in Caldecott, 2017: 154-155).

"The ACB was explicitly designed as a small but strategic institution to help the ASEAN member countries cooperate on biodiversity issues that can only, or can best, be addressed at the level of the region (i.e. all of ASEAN, or ASEAN and its neighbours) or sub-region (i.e. more than one member country). These include such challenges as: managing trans-frontier reserves and migrating wildlife populations; addressing trans-frontier wildlife and timber trade issues; conserving river-system, river-basin, coastal and marine ecosystems; addressing root causes of forest fire and smoke pollution; promoting understanding of governance and legislative features that encourage and enable conservation; establishing common professional competency standards for conservation tasks such as managing protected areas and resisting alien and invasive species; and protecting members' common interests in biosafety, bioprospecting and resisting biopiracy.

"Thus the ACB was not designed as a regional conservation agency, which might be expected to deploy resources to resist conservation problems in particular locations. This is a different role, and one best performed by individual governments with the support of international NGOs and official donors. By contrast, the ACB was designed to use the experience of member countries in attempting specific conservation tasks, to identify common themes, lessons learned and best practices, and then to ensure that all the members have access to this information. Similarly, the ACB was not designed do research on biodiversity, which is the province of each member country's own research community and its international partners, but rather to add value to collective knowledge holdings. It was designed to do this by ensuring that biodiversity information is shared among the members, and by using the information resource to help them meet their own particular needs, whether this is to fulfil treaty obligations on biodiversity

reporting, or developing policy on matters of special interest to each country, or training staff. From this it can be seen that ACB was designed as an institution to manage knowledge on behalf of the ASEAN member countries collectively, and to build capacity within each one where this can best be done by sharing skills and pooling knowledge.

"Such a role was always likely to generate contradictory expectations. The conservation needs of the ten ASEAN countries are considerable, and the demand for resources to address them in most cases exceed national budgets and aid flows. Besides which, there are always important issues that fall between, or are not yet being addressed by, existing budget lines and projects. The case for a regional conservation funding agency is therefore unanswerable, but ACB was never intended to be it. The GEF might reasonably have financed such an institution with global biodiversity funds, and another opportunity may now be approaching with financing for climate change adaptation and mitigation. But the ACB was designed with the much more limited intention of filling a key strategic gap in the ability of member countries to learn from each other (and to an extent from the international community) and to build common positions around solutions to biodiversity challenges and opportunities.

"The net result is tension between countries that seek practical, problem-solving field activities in their own territories, and an institution with a different and more strategic purpose. This is analogous to a situation in which there is public demand for a curative medical system, while what has been established is a preventative health service. All may agree that 'prevention is better than cure', but the demand for curative intervention will remain. The problem is that both are needed, but in the case of biodiversity, ASEAN still only possesses one of them."

H3.3 Opportunities for ANFOR to build coherence between CCA and DRR.

Opportunities linked to the regional DRR strategy and national CC policies, strategies and plans:

- making available to ministries and agencies at the national level information and incentives to integrate CCA and DRR across their portfolios, and report back on progress centrally;
- making use of ministries and agencies with a presence at the local level and responsible for implementation to ensure that national directives on CCA and DRR are integrated with local development plans;
- reinforcing the mandate of ministries and agencies to enforce existing regulatory measures and provide incentives in support of CCA and DRR, such as land-use management and environmental protection; and
- building on international momentum on CCA policies to also bring domestic attention and resources to the reduction of climate-related disaster risks, and specifically risk prevention measures.

Opportunities linked to ANFOR's Calls for Research Proposals and applied research in its learning sites (especially in Colombia, Ecuador and Peru):

- providing support/incentive mechanisms to encourage owners of data to make climate information easily accessible for users at all levels;
- using convergent risk assessment methods across sectors to support coherent decision-making on CCA and DRR on the ground;
- generating comprehensive information related to current vulnerability and exposure, and layer this with information on future hazards, which is inherently uncertain and requires careful interpretation; and
- ensuring there are channels for locally collected data on vulnerability to contribute to the wider understanding of vulnerabilities.

Opportunities linked to ANFOR's support on integrating Andean Forest ecosystem restoration in local and department/provincial plans to support decentralised planning:

- supporting local governments in implementing national directives on CCA and DRR by providing incentive and review mechanisms (e.g. funding allocations and approvals of local development plans) as well as guidance, tools and checklists;
- understanding local CCA and DRR priorities and capacity constraints, recognise challenges to continuity in building capacity, and tailor efforts accordingly;
- providing tools and strengthen the capacity of stakeholders – especially at the local level (e.g. by working with local universities) – to use climate information including projections in a way that supports robust decision making on CCA and DRR; and
- facilitating peer learning on good practices to common challenges (e.g. erosion) among local governments.

Opportunities linked to ANFOR's support to Chile in leveraging climate finance:

- linking Andean vulnerability studies to risk assessments/maps and economic analysis (e.g. cost-benefit, cost-effectiveness of restoring and sustainably using Andean forests that justify budget allocation for CCA/DRR;
- improving transparency in national and sub-national public spending (e.g. budget and expenditure tracking) to identify areas for improvement in coherence between CCA and DRR, and review the results to future financial decision-making;
- establishing ex-ante financing plans, including approaches for financial protection that ideally take stock of potential public disaster costs (including future climate impacts) and identify financing options for response, recovery and rehabilitation.

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Part J: Acronyms and abbreviations

ACB	ASEAN Centre for Biodiversity (also, elsewhere, African Centre for Biodiversity)
ACTO	Amazon Cooperation Treaty Organization
ASEAN	Association of South-east Asian Nations
BioCF-ISFL	BioCarbon Fund Initiative for Sustainable Forest Landscapes
CAN	Comunidad Andino
CATIE	Tropical Agriculture Research and Higher Education Centre
CIFOR	Centre for International Forestry Research
CONAF	National Forest Corporation of Chile
CONDESAN	Consortium for Sustainable Development of the Andean Ecoregion
EAGRD	Andean Strategy for Disaster Risk Reduction
ENCC	National Strategy for Climate Change
ENCCRV	National Strategy for Climate Change and Plant Resources (Chile)
ERCC	Regional Strategy for Climate Change
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAQCH4	Fund for Water in Quiroz-Chira
FCPF	Forest Carbon Partnership Facility
FORSAN	Regional Fund for Water in the Department of Piura (Peru)

FSEH	Fund for Ecosystem Water Services (Peru)
IADB	Inter-American Development Bank
IAM	Andean Mountain Initiative
IDEAM	Institute for Hydrology, Meteorology and Environmental Studies (Colombia)
IDECI	National Institute of Civil Defence
INAIGEM	National Institute for Research on Glaciers and Mountain Ecosystems (Peru)
FLR	Forest landscape restoration
GCF	Green Climate Fund
GPFLR	Global Partnership for Forest and Landscape Restoration
MADS	Ministry of Environment and Sustainable Development (Colombia)
MAE	Ministry of Environment of Ecuador
MERESE	Mecanismos de Retribución por Servicios Ecosistémicos (aka MRSE)
MINAM	Ministry of Environment (Peru)
MMAyA	Ministry of Environment and Water (Bolivia)
NAMA	Nationally Appropriate Mitigation Action
NTFP	Non-timber forest product
PES	Payment for ecosystem services
REDD+	Reducing (GHG) emissions from deforestation and (forest) degradation, with internationally-agreed forestry, biodiversity and social safeguards.
RLABM	Latin American Network of Model Forests
ROAM	Restoration Opportunities Assessment Methodology (IUCN tool)
SERFOR	National Forestry and Wildlife Service (Peru)
SUNASS	Superintendencia Nacional de Servicios de Saneamiento (Peru)
UNAMBA	National University of Micaela Bastidas of Apurimac
WRI	World Resources Institute

Annex 13.9: Risk Management in Africa (R4)

Project highlights.

7F-07807: **Rural Resilience in Southern Africa (R4)**. Offering integrated risk management in the form of insurance, credit, savings, and market and climate information to small farmers, R4 increased their biophysical resilience by promoting conservation agriculture, crop diversification and use of adapted seeds, and their livelihood resilience by encouraging and enabling savings and risk sharing, while lowering barriers to careful investment.

Part A: Basic data

A1. Project number & name. 7F-07807 - 1: Ensuring food security for smallholder farmers with microinsurance and microcredit. 2: Rural Resilience in Southern Africa/R4 Initiative.

A2. Sources.
Process of PRF development: this PRF was prepared by the core team using documents listed in the bibliography (which were obtained from SDC in several batches in Sep 2021 and Jan 2022) and with input by those listed in Annex 13.22.

- **R4 Initiative (2011-2017)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2011/7F07807/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **R4 Initiative (2017-2021)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2011/7F07807/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html.

A3. Dates & financial data.

- **Prior** 'Weather Index Based Crop Insurance/R4' project (Jan 2011-Dec 2012 according to SDC, 2012). The accumulated budget from previous phases given in SDC (2017a) is CHF 279,155 suggesting that the prior project was a feasibility study that was only picked up 18 months later.
- **R4 Phase 1** ('Ensuring food security for smallholder farmers with microinsurance and microcredit', Jul 2014-Jun 2017, based on SDC, 2017a and Annex 5 of SDC, 2017b). Budget CHF 6,685,000 for Phase 1. Partner contributions: CHF 12,167.080 (equivalent).
- **R4 Phase 2** ('Rural Resilience in Southern Africa/R4 Initiative', Jul 2017-Jun 2021): CHF 9,900,000.

A4. Location(s). Malawi, Zambia, Zimbabwe.

A5. SDC Geography. Africa.

A6. SDC Domain. South Cooperation: East and Southern Africa

A7. Partners.

- **Implementing organisations**: World Food Programme, country offices Malawi, Zambia (Zimbabwe UN Country Team).
- **Main National Partners**: Insurance Companies ["For R4, WFP partnered with Blue Marble and Old Mutual for the design and provision of weather index insurance to farmers" - Brewin *et al*., 2021], NGOs ["(SNV, CIMMYT, AQZ, CTDO, etc.)" - Brewin *et al*., 2021], Micro-finance companies, District government offices.
- **Main International Partners**: WFP R4 Global Team, Swiss Re.

Part B: Purpose, relevance and approach

B1. Purpose.
Prior project. "Conceived under the 0.5% Water Initiative and with exclusive refence to a Syngenta Foundation weather index crop insurance product sold in Kenya ...". (SDC, 2012a).
Phase 1 (Jul 2014-Jun 2017): "**Main objective of the project/programme**: R4 Rural Resilience Initiative aims to contribute to building resilience of rural populations by enabling adaptation to climate risk of most vulnerable people through a community oriented, risk management focused, and market-based approach." (SDC, 2017a).
Phase 2 (Jul 2017-Jun 2021): "**Overall goal**: Building resilience of rural populations in selected countries of Southern Africa by enabling adaptation to climate risk of most vulnerable people

through a community oriented risk management focused and market based approach." (SDC, 2017c).

B2. Relevance to partners.
Partner countries:

- **Malawi**: Most smallholder farmers are resource poor with very limited capacity to contain shocks arising from climate change (H3.1). "By aiming to build the capacity of communities to manage climate and other risks through a diversified portfolio of measures including the use of weather-index micro-insurance, Annual Yield Index Insurance, and financial services such as VSLs, IRMP is aligned with the National Agriculture Policy" (Brewin & Maganga, 2021: 10).
- **Zambia**: the "agricultural sector is the socio-economic backbone of the rural population, with 60 percent being dependent on the sector as the main source of income and livelihood. Many of the farmers are poor and engage in low-productivity rain-fed subsistence farming resulting from inadequate resources for the purchase of inputs, use of inappropriate farming practices and failure to fully develop the irrigation potential." (H3.1).
- **Zimbabwe**: "Zimbabwe's economy is highly reliant on agriculture which, along with forestry, employs 70% of the population (directly or indirectly). Agricultural production is largely rainfed and sensitive to fluctuating weather patterns. Increasingly frequent and intense extreme weather events" (H3.1).

Switzerland. Cooperation between Switzerland and regional programmes in Southern Africa to contribute to enhanced food security for smallholder farmers is well established, and the Swiss International Cooperation Strategy 2021–24 is transitioning towards a two-country programme with focus on Zimbabwe and Zambia.

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 2: Zero hunger**, especially Target 2.3 (*By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment*), Target 2.4 (*ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters*).
- **SDG 13: Climate action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.b (*Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries*).

B4. Relevance to other development objectives.
OECD: Agricultural development, services and marketing; Humanitarian Assistance, Food Security.

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Nil.
Adaptation: Capacity-based adaptation (CA).

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. NOT (0)
- **Adaptation**. SIGNIFICANT (1)

Part C: Narrative overview

The R4 Initiative takes its name from its being designed to offer **integrated risk management (IRM)** services in the form of insurance, credit, savings, and market access and climate information, thereby addressing the four dimensions of risk *reduction*, *taking*, *transfer* and *reserves*. The initiative was initially called the "Horn of Africa Risk Transfer for Adaptation (HARITA) project, developed in Ethiopia 2009 as a partnership between Oxfam America, the Relief Society of Tigray (REST), Ethiopian farmers, and several other national and global partners. HARITA transitioned into the R4 Initiative in 2011, and expanded its partnerships to include the World Food Programme, with the aim of adapting lessons learnt in Ethiopia to other countries. The programme has scaled solidly, from 200 Ethiopian farmers in the original 2009

HARITA pilot in Tigray, to over 24,000 in Ethiopia (in 81 villages) and 2,000 in Senegal in 2014." (Greatrex *et al*., 2015: 14). "As of 2020, R4 reached nearly 180,000 farming household (55 percent women), benefitting approximately 900,000 people in Bangladesh, Burkina Faso, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Senegal, Zambia and Zimbabwe ... The initiative is also currently expanding into the Latin American and the Caribbean (LAC) region" (Choularton *et al*., 2021: 2).

The insurance component became notable early on for reaching a relatively large 29% of the population on average, and up to 38% in some villages (Madajewicz *et al*. 2013). Attracted by this reputation, SDC involvement was conceived in 2011-2012 as a weather index crop insurance project (SDC, 2012a, b), and this later gave rise to the first of two successive SDC contributions to WFP (see e.g. FDFA & WFP, 2016) to support the roll-out and scale-up of the R4 Rural Resilience Initiative in Southern Africa (H3.2):

- Phase 1 (2014-2017), which focused on testing the replicability of R4 model and tailoring it to the needs of smallholder farmers in Malawi and Zambia (SDC, 2017a-c); and
- Phase 2 (2017-2021), which aimed at scaling-up activities in Malawi and Zambia, while testing and adapting model components in Zimbabwe (Marimo *et al*., 2019).

SDC is described as the primary donor for R4 in these three countries, but the interventions occurred alongside inputs by a number of other donors, including the governments of Flanders, the UK, the US, Norway, Korea, Sweden and Germany, and the multilateral funds GCF and IFAD. The WFP name for the R4 Initiative in Malawi is *Integrated Risk Management and Climate Services Programme* (IRMP), which aims “To reduce food and income insecurity among vulnerable smallholder households in the context of increasing climatic risks and climate variability over the project cycle, through delivery of integrated resilience interventions” (Brewin & Maganga, 2021: vi).

The R4 initiative is “at the interface between humanitarian aid and development cooperation, R4 is recognized as a very interesting initiative proposing concrete and innovative approaches and collaboration between a range of public, private, and civil society partners to address risks, manage resources and enhance resilience of rural communities.” (SDC, 2017b: 1). The present review concurs, and assessed **design quality** as 6 (very good), while the Phase 2 performance scores were 5 (good) for **effectiveness**, 4 (moderate) for **impact**, and for **sustainability** a range from 2 (very weak) in Zimbabwe to 5 (strong) in Malawi and Zambia**.** The R4 initiative aims to benefit small-holder farmers and their farming systems by increasing biophysical resilience through agroecological practices (conservation agriculture, crop diversification and use of adapted seeds), as well as livelihood resilience by encouraging and enabling both savings and risk sharing, while also lowering barriers to careful investment. The **transformative potential** for adaptation of this multi-pronged approach is considered high.

Part D: Design quality

D1. Theory of change.

“In Sub-Saharan Africa ... the poor typically live on marginal lands characterized by low and or erratic rainfall, fragile and often infertile soils, insufficient access to credit, insurance and financial institutions, and poor labour and market access-all of which combine to increase their exposure to risks. Consequently, crop yields are typically at or below subsistence levels and susceptible to frequent natural and man-made disasters, often resulting in depletion of strategic assets and erosion of coping capacity. Increased incidence of shocks and stressors driven by climate change and various other pressures operating at the global and local scales ... is exacerbating the inability of the poor to improve their well-being in the short and long term. In Southern Africa, agriculture plays a critical role in sustaining rural livelihoods and food security. However, most agricultural production systems are rain-fed, and, therefore, highly exposed and susceptible to the impacts of weather and climate fluctuations and extremes, including dry spells, droughts, heat stress, floods, and cyclones, all of which are increasingly more common and intense due to climate change. The impacts of these changes are disproportionately felt by the poor, and among them, women. Enhancing the capacity of these communities and households to cope with and adapt to uncertainty, through interventions that build resilience across scales, is the best bet for achieving development results.” (Marimo *et al*., 2019: 1).

The R4 approach is to address four key dimensions of risk to which target beneficiaries (small-holder farmers in rural Southern Africa) are exposed. **Risk reduction** enables farmers to improve their natural resource base and management (including asset creation, conservation agriculture and/or promotion of appropriate agricultural practices and seed varieties, and in Malawi “agricultural extension messaging based around the PICSA model, which involves

climate forecasting and appropriate crop selection and farm management practices" – Brewin & Maganga, 2021: vi; see H3.3), with climate services as a helpful tool and improved access to markets also helping to reduce price risks. **Risk transfer** enables vulnerable farmers to purchase insurance (weather-index insurance) against their labour on risk reduction activities, with pay-outs triggered by pre-specified patterns of the index rather than actual yields (thus eliminating the need for in-field assessments) and rapid compensation for weather-related losses reducing the compulsion by farmers to sell their productive assets and resort to other negative coping strategies, like taking children out of school (see also H3.4 on African Risk Capacity). **Risk reserves** depend on individual or group savings, through which a household can build up a financial base that can be used to invest on the livelihood or serve as a buffer in case of idiosyncratic shocks. **Risk taking** involves ('prudently') increased investment, livelihoods diversification and microcredit. Acting together, these measures will increase environmental, financial and social resilience among target beneficiaries, who would otherwise continue to be extremely vulnerable to shocks of all kinds.

D2. Assumptions underlying the theory of change.
Assumption 1. That environmental security among target beneficiaries can be increased through 'conservation agriculture' practices (i.e. ripping or loosening the soil and planting with correct timing relative to the rains, crop diversification, composting/mulching, and erosion-control through vetiver planting and livestock management).
Assumption 2. That financial security among small-holder farmers in rural Southern Africa can be increased through access to weather-index crop insurance, community-based savings schemes, and micro-credit facilities.
Assumption 3. That an integrated package of risk management guidance, offers and services in which uptake of environmental and financial security measures (plus information services and improved market access) are all contingent upon one another will be attractive to target beneficiaries, leading to widespread participation and increased security for all.

D3. Plausibility of assumptions and links. Assumption 1 is plausible and universally applicable, although the details (of actions and their effectiveness, impact and sustainability) will depend on local ecological conditions and the competence, knowledge and sympathy with which agroecosystems are adjusted for increased resilience. Assumption 2 is plausible but (as is demonstrated by different results in the three countries) depends upon the reliability of the technical, administrative and financial systems involved. Assumption 3 is also plausible and universally applicable, in the sense that complex systems require holistic management, but this depends on managers maintaining an integrated approach and not focusing on easy, short-term fixes at the expense of more complex tasks, including education to ensure adequate levels of comprehension and uptake among beneficiaries[27].

D4. General quality of the project design.
Stakeholders and consultation. Although the R4 Initiative is a package of generic measures involving apex financial, governmental and inter-governmental institutions, it is modelled on and adapted from earlier and ongoing work in sub-Saharan Africa, including since 2011 leadership by WFP and integration with its programmes. As a set of participatory of actions oriented to the grass-roots and adapted to local conditions[28], it can be assumed to have been crafted through adequately inclusive dialogue and experience with stakeholders.
Risks. SDC's (2017b) logframe assumes at outcome level political/administrative stability and willingness to continue with the programme in the three target countries, along with a number of process assumptions at output level (weather data available and reliable, basis risk[29], labour

[27] "**R4 is a complex project**. The concept of weather insurance and risk needs to be explained to rural farmers constantly and in ways they will understand. Innovation is required in the utilisation of tools, and communication platforms accessible to farmers." (SDC, 2017c: 5).

[28] "**Flexibility in comprehensive risk management approach**. While smallholders in sub-Saharan Africa face similar risks, they are typically confronted with different challenges and opportunities dictated by the context. This is why a flexible approach is better suited when it comes to improving the resilience of vulnerable populations." (SDC, 2017c: 5)

[29] "**Basis risk is the potential mismatch between the index triggered pay-outs and the actual losses suffered by policy holders**. It is an inherent problem to index insurance and derives from the diverse microclimates found within relatively small geographic areas, the losses from risks not covered under insurance (e.g. pests), as well as contract design issues. Addressing basis risk requires a fundamental rethinking of how the insurance windows are structured and the set-up of mechanisms such as farmer saving programs or a basis risk fund to protect farmers during basis risk events." (SDC, 2017c: 4-5).

constraint in participating households, poor financial literacy). Its risk assessment mentions no high-probability risks and three high-impact (medium-probability) risks: from higher-than-anticipated drought frequency (to be mitigated through contingency funding and the promotion of climate-sensitive agricultural practices); from environmental impacts arising from FFA actions (judged to be minimal because of the scale of works); and mismatch between farmer expectations and index results (to be mitigated through "Considerable financial education efforts to keep farmer expectations realistic.").
Score: 6.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness. Not applicable.

E2. System change. Not applicable.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.
Phase 1.

- **2015: visibility**. In Paris during UNFCCC CoP 21, UN Secretary General Ban Ki-moon showcased R4 as an efficient strategy to cope with the consequences of climate change. R4 was mentioned as one of the top five index insurance initiatives globally by Greatrex *et al*. (2015), who presented insights from five case studies addressing the challenge of insuring poor smallholder farmers and pastoralists in the developing world.
- **2015-2016: weather index insurance product launch in Malawi and Zambia**. This targeted an initial 500 farmers in each country. The insurance product was designed with farmers and agricultural experts to protect against major droughts based on rainfall index highly correlated to local yields. During the 2015-2016 season the southern Africa region experienced an ENSO drought that affected Malawi more than Zambia. This triggered a pay-out of $3,083 for all the 500 insured households in Malawi. The number of households insured against weather has further increased in both countries to 2,446 in Malawi and 2,835 in Zambia.
- **2016-2017 integrated risk management (IRM) services and effects**. IRM services under R4 include **insurance**, **credit**, **savings**, and **market access** and **climate information**. The results claimed include that participants have more livestock, are more productive and are able to save more than other farmers. Food consumption surveys suggest that food security is higher in the project areas than in other areas, while crop diversity has increased beyond maize to include cassava, sweet potatoes, millets and sorghum. Zambian R4 farmers who used 'Conservation Agriculture' (CA) techniques (timely ripping and planting, and crop diversification) suffered less from drought and coped better with the different climate shocks. A Malawian smallholder was enabled by R4 to plant trees, propagate vetiver grass, reclaim gullies, enclose livestock, garden, compost, use a rain gauge, and to buy a bicycle through the Village Savings and Loans group (VSL).

Phase 2.

- The MTR found: (a) that in **Zambia**, land per household under 'conservation farming' doubled from 1 to 2 ha on average, households paying insurance premiums and using credit to invest in agriculture increased from close to zero to almost 50%, while household assets and marketable surpluses also increased); (b) that in **Zambia** and Malawi, resilience to drought increased spells and VSLs were increasingly being used; and (c) that in **Malawi** and **Zimbabwe** nutritious crops such as fortified sweet potato and cassava, and aquaculture ponds as a source of protein, had all been promoted and taken up (Marimo *et al*., 2019).
- "R4 project in **Zambia** has been able to reach at least 18,083 small holder farmers (SHFs) in the targeted districts. WFP **Malawi** has massively scaled up the implementation of Integrated Risk Management (IRM) project (formerly R4), reaching out to 70.000 households in eight districts (Balaka, Mangochi, Machinga, Zomba, Phalombe, Blantyre, Chikwawa and Nsanje). Out of these, SDC funding covered a total of 22,100 households. In **Zimbabwe**, R4 started in 2018 and has reached 6,000 households in two districts (Masvingo and Rushinga) working with different partners such as SNV (financial education and market access), CIMMYT (agro-practices) and FFA (Food Assistance for Assets) partners. Additionally,
  - "Farmers benefiting from R4 have been able build their resilience to climate change through the adoption of climate-smart agriculture (incl. conservation agriculture); yet, it has been noted that farmers allocate a rather high amount of time for land preparation.

- "The R4 project has helped facilitate access to climate information as part of a community early warning system that helps smallholder farmers to plan their farming activities and take anticipatory risk reduction measures.
- "Access to financial information has served as entry point for linkage of SHFs to financial institutions for increased investment opportunities; hence, the R4 access to finance component has largely focused on small-scale savings, access to credit and community-based savings. R4 has assisted SHFs to access cheap money through the savings clubs and formal institutions but this also exposed them to being targeted by thieves due to huge amounts of cash involved forwards pay-out time.
- "The weather index insurance offered under the R4 project in Zambia is enabling SHFs to quickly recover and get back to production when rains fail [which is becoming increasingly frequent with climate change].
- "R4 participants have managed to maintain food security and increase resilience capacity through maintaining assets, production, savings and ability to deal with shocks. M&E assessments in the last two years have been mostly quantitative and hence there is a need to include qualitative indicators focused at the community level as compared to the quantitative ones that focuses at changes at the household level only." (SDC, 2021: 4).

Impact.

- The MTR found that information gaps made it hard to demonstrate either value addition of the whole IRM package at household level or technical capacity building and mainstreaming in host country institutions, while partner coordination was weak in **Malawi** and **Zambia**. Along with a lack of defined minimum standards for effective participation, these weaknesses were barriers to scaling up (Marimo *et al*., 2019).
- "Resilience building is a complex, long-term process which requires the careful layering, sequencing and prioritizing of activities. Hence, issues identified such as late insurance pay-outs (due to economic context in Zimbabwe) can substantially decrease the resilience outcomes achieved by farmers." (SDC, 2021: 5).

Sustainability.

- The MTR found that risks to continuity of R4 beyond donor support included, for all three countries: the lack of a business strategy for scaling up the insurance component; the lack of a convincing business case for the private sector to take over after subsidies; inadequate resourcing of government agriculture extension; and insufficient financial and technical institutional government capacity strengthening (Marimo *et al*., 2019).
- Sustainability is a key concern in Phase 3. Weather-index insurance has worked well in **Zambia**, where it has been integrated into Government of Zambia programmes and rolled out to a million farmers, so the R4 strategy is basically about strengthening the national system. In **Malawi**, “IRMP is strongly aligned with relevant Government of Malawi policies, and there is strong evidence that core components such as PICSA are being adopted by government with a view to rolling out at a national level as a result of WFP and UNDP’s efforts.” (Brewin & Maganga, 2021: vii). In **Zimbabwe** none of it is sustainable without donor funding because of base risks, political instability, a deeply damaged culture of trust in insurers, government and money, and currency exchange issues. In Zimbabwe insurance covers only small grains (sorghum, millet), but not maize which is the staple and has important cultural overtones (but would be expensive to insure) or livestock, and only drought and not floods, pests and diseases.
- Interviewees noted that options for addressing sustainability issues are under discussion with WFP and include making more numerous and smaller pay-outs to discourage misappropriation risk attracted to large ones, and making in-kind pay-outs (e.g. food card) rather than cash (because of the eroding value of cash in Zimbabwe – which also limits village savings and loans arrangements). There is an awareness that major climate change issues make some kind of risk transfer mechanism essential, but the best option is still being sought. If this is to be insurance-based, then it has to be commercially viable and the system must be trusted, so private companies and government must work together to ensure this. R4 was designed as a layered and integrated package, which looks good on paper but is challenging to implement in practice. There is also the issue that WFP appears divided in its sense of purpose between humanitarian relief and addressing root causes.

Overall scores: Effectiveness (5); Impact (4); Sustainability (2 in Zimbabwe, 5 in Zambia and Malawi).

F2. System change.
"R4 is an integrated risk management approach aimed at helping individuals and communities better equip against climate shocks and steadily build resilience. More frequent droughts, flooding and other extreme weather events are disproportionately affecting the poor, diminishing their ability to sustain livelihoods in the short to long-term and further entrenching their poverty. The overall aim of R4 is to reduce smallholder farmer households' vulnerability and food insecurity caused and intensified by climate change and associated hazards." (Marimo *et al*., 2019: 1).
The R4 initiative aims to benefit small-holder farmers and their farming systems by increasing biophysical resilience through agroecological practices (conservation agriculture, crop diversification and use of adapted seeds), as well as livelihood resilience by encouraging and enabling both savings and risk sharing, while also lowering barriers to careful investment. The transformative potential for adaptation of this multi-pronged approach is considered high.

Part G: Other aspects of design and performance

G1. Efficiency issues.

- "In 2015, R4 reached 32,288 farmers in Ethiopia, Senegal, Malawi and Zambia. This number increased in 2016 to 40,000 farmers. All of them have subscribed to weather index insurance products. The total sum insured amounted to over US$ 2.2 million in 2015 which has risen to over US$ 5 million. This first implementation phase is judged efficient as the programme had planned to reach 4,000 households by 2016/17 season, but has actually reached 5,281 households with weather based insurance." (SDC, 2017c).
- The MTR (Marimo *et al*., 2019) concluded that, while it was hard to compute and compare costs and benefits for all parts of the R4 IRM package, with insurance excluded "the cost of R4 is comparable and even lower to that implemented by the NGO Consortium on Resilience under the [Resilience Malawi Vulnerability Assessment Committee] (RMVAC) Response." Mixed results on insurance led the MTR to conclude that "the full value of insurance can only be determined with time series data that matches its costs and benefits." The fact that the insurance cover on offer was affordable and quickly rewarded by events, leading to rapid uptake of the cover, suggests that the approach is attractive to target beneficiaries. The MTR concluded that "the insurance component works well when certain conditions are met, namely: (a) a broad network of stakeholders is involved, including farmers working together to collect and verify information used for claims; (b) affordable and staggered insurance premiums are available; (c) insurance pay-outs are made to beneficiaries regularly; and (d) insurance that covers other hazards in addition to drought are made available." Whether these insurance products can be priced at a profitable level for the insurance companies is another matter, and raises huge questions about the role of insurance and reinsurance in a changing world where past risk profiles are an increasingly poor guide to future risks.
- "No economic sustainability study for the project was ever done. While the MTR (2019) aimed to carry out a cost-benefit analysis of the integrated resilience model, WFP was unable to provide the information needed by the consultants. This included not having data on how many project participants were reached by all components. Additionally, the aim was to establish which combination of the resilience building components is the most efficient. Phase III will make improvements in their M&E system and another cost-benefit analysis should be incorporated in one of the SDC-commissioned studies under Partial Action (PA) 2." (SDC, 2021: 4).

G2. Coherence issues.

- "Despite efforts made in developing a joint work-plan and organizing a partner's orientation and inception meeting, partners did not have a full understanding of what other partners were doing due to limited understanding of how the integrated approach works. This resulted in minor misunderstandings in the field, overlapping of activities and weakened integration of the different components. More so, the beneficiaries understood the different R4 components as stand-alone initiatives without any relationship to each other. ... [Corrective efforts by the WFP R4 team resulted in beneficiaries being] able to grasp the integrated risk management approach and how the different components were related and, how they will eventually lead to resilience strengthening." (WFP & SDC, 2021: 20).
- Despite all the efforts made in improving coordination, once the programme expands to Rushinga, another layer of complexity will also be added, together with potential additional

partners. A lot still needs to be done to strengthen coordination and ensure that the gains we have made in Masvingo are not lost with expansion of activities."

- "The programme promotes synergies with SDC funded projects on seed systems, vulnerability assessments, and humanitarian support in the region. Active partners in the programme include Swiss Re, Oxfam America, IRI/Columbia University, Food and Agriculture Organization (FAO), Insurance regulatory authorities. The Public Private Development Partnership with the insurance companies and micro-insurance companies will be strengthened." (SDC, 2017a: 2).
- Multiple donors in related fields (including community savings and lending, credit, insurance, climate Services, conservation agriculture, access to markets, social cohesion, and livestock activities) are listed by Marimo *et al*. (2019: 5-5): Flanders, UK, USA, Norway and Germany for Malawi; USA and GCF for Zimbabwe; and South Korea, GCF, IFAD and Sweden for Zambia (see also SDC, 2021: 4).
- "R4 is an integrated model in which no one partner implements all components. While this approach provides advantages of ensuring cooperating partners with specialised expertise implement relevant components, weak coordination of the partners undermines integration of the components. These challenges were experienced in all countries. Joint work plans, sharing of beneficiary databases and activity schedules and an increased role of WFP in facilitating and ensuring a coherent implementation of the project across partners are required. In Zimbabwe, joint review meetings of the partners have helped increase coordination albeit with challenges. Of concern is that participation in the quarterly meetings is predominantly by junior staff which can lead to lack of accountability and follow through on agreements reached." (Marimo *et al*., 2019: 15).

G3. Replicability issues. The R4 mid-term review was tasked with "testing the replicability of R4 model" (Marimo *et al*., 2019: 2), and came to the conclusion (pages 13-14) that the main barriers for 'scaling up' (which is not quite the same as replicability but sheds light on it) were centred on (a) **a lack of evidence of R4's added value** (citing "a missed opportunity for constructing a knowledge management, learning and documentation system which is evidence based; and using the concrete evidence from R4 to secure Government buy-in, uptake and scaling up and out of the various components of R4"); (b) **weak engagement of government** (and lack of effective coordination at national and district levels, due to the "top down bureaucratic management style" of governance in all three countries); and (c) **an absence of minimum standards for implementation** (including guidelines or non-negotiables on design and implementation of R4's integrated approach). The MTR also found (pages 14-15) that **insurance companies had no models for continuing to provide weather index insurance** to smallholder farmers beyond the project life, and that the **loss of institutional memory** was an ever-present risk due to high rates of staff turnover among all countries and cooperating partners.

G4. Partnership issues.

- "While partner coordination was strong in Zimbabwe, it is weak in Malawi and Zambia and needs to improve to enhance implementation of the integrated model." (Marimo *et al*., 2019: 3).
- "The leadership and coordination role of the government is recognized in all three countries. However, there is currently insufficient financial and technical institutional capacity strengthening of government to take up this role by WFP." (Marimo *et al*., 2019: 4).
- "Overall, R4 in Zambia and Malawi has successfully established partnerships with insurance organisations structured as social enterprises that are offering at subsidised service agreements. They have social objectives as part of their mandates enabling them to reach out to smallholder farmers, a market segment often ignored by traditional insurance companies." (Marimo *et al*., 2019: 17).
- "R4 adopted a multi-stakeholder approach that engages private (corporate), social enterprises, government (at national, district and community levels), multi-lateral institutions, donor organizations, NGOs and beneficiary communities at different levels. MOUs that define roles and responsibilities of partners, e.g. as related to microfinance institutions and insurance, are the modus for engagement of these partners. ... Since these various partners are all linked to R4 through WFP, there are concerns the government is not being prepared to play such a similar role. In Zambia and Malawi, the absence of effective coordination platforms at national level and some extent district levels is undermining the sustainability of R4." (Marimo *et al*., 2019: 17).

G5. Connectedness issues.

"Rural communities are faced with an increasingly complex food security risk environment. Environmental degradation, resource scarcity, climate change and price volatility, together with other risk drivers exacerbate the challenges to achieving food and nutrition security, especially in those most deprived and vulnerable areas of Malawi and Zambia. With climate change impacts having increasing relevance in this equation, especially in terms of the frequency and intensity of shocks, the challenges faced by food insecure farmers have also increased and need a more comprehensive response. Strategies for reducing and mitigating risks are therefore essential to overcoming hunger, achieving food security and enhancing resilience. From a global policy perspective, 2015 marked a significant milestone. The Paris Agreement recognizes the fundamental priority of ensuring food security and ending hunger by addressing the impacts of climate change on food systems and livelihoods. R4 is seen as a leading example of how to help the most food insecure people address increasing climate risk and limit losses and damage building on safety nets. The 2015 El Niño event resulted in widespread drought in the region, specifically for Malawi (Balaka); this meant a considerable late start to the season triggering pay-outs for the early window (Dec 11 to Jan 10) of the R4 insurance product." (SDC, 2017c: 4).

G6. Cross-cutting themes.

Gender:

- "In 2020 the World Economic Forum ranked Malawi 116 out of 156 countries in terms of gender equality. Rates of early marriage are high, and women lack land rights and access to education, health and financial services, justice and access to protection against sexual and other forms of violence." (Brewin & Maganga, 2021: vi). "Women play a considerable role as IRMP beneficiaries, and they also hold key leadership positions in farmer groups, radio listening groups, and VSLs, and they have benefited from all aspects of the programme. This is in part due to good capacity for gender-sensitive implementation among WFP, government stakeholders and the implementing partners at district levels. On the whole, the extent to which young people were able to engage in the programme was lower than that of women due to limited access to land, although some partners trialled off farm activities which were more suited to their needs and deserving of scale up." (Brewin & Maganga, 2021: viii).
- "The gender and HIV mainstreaming plan was developed to guide country offices in mainstreaming activities. WFP and its partners have gender focal persons to manage gender related issues and mainstreaming. Gender and HIV issues are very relevant in this region especially in the locations where the projects are being implemented. Some of the mainstreaming activities implemented include: a) 4 community-based organisations (CBOs) supported and trained on HIV mainstreaming, b) condom distribution and HIV testing and counselling conducted during community meetings and food distributions, c) 98 people tested (77 percent) and HIV/AIDS sensitization campaigns conducted. There is an equal participation of men and women in savings and credit activities. The promotion of more gender sensitive credit lending methodology favour women. While 43% of the farmers clubs' executives are women, more than the half (56%) of saving groups members are women. The same can also be said of the training/capacity building benefitted across gender." (SDC, 2017c: 3).
- "In the last two phases, while anecdotal improvements in women's economic empowerment and resilience were recorded, the existing M&E system failed to capture qualitative, gender-transformative changes (or lack thereof) within households and communities. To shed more light on the findings of the MTR, two specific gender analyses (one SDC and one WFP commissioned) were finalized in early 2021 with the goal to inform the next phase and final phase of SDC funding (2021-2025). These resulted in these main recommendations to improve gender transformative programming in the R4 Programme: (a) Neither R4 in Zambia nor in Zimbabwe considered intra-household power dynamics as a result of their activities. (b) It was found that Village Savings and Loans Associations do not automatically lead to economic empowerment since men/husbands tend to have and continue to maintain control over the household income.(c) Access to markets is gendered with men being perceived as the main bread winners supposed to engage with markets. Additionally, women have less mobility which prevents them from travelling to markets where potentially high earnings can be made. (d) M&E should go beyond quantitative indicators and include qualitative ones including information on gender transformation and power relations in general. (e) GBV is prevalent in both project contexts; while the project has thus far failed to address this

adequately via e.g. referral pathways and/or gender-transformative approaches." (SDC, 2021: 2-3).

Governance. "Governance principles are mainstreamed in R4 through strong beneficiary feedback mechanisms (e.g. toll-free hotlines); community participation in targeting and inclusion of vulnerable households (e.g. female-headed households and households with chronically-ill members). However, larger governance-related factors driving vulnerability have thus far been insufficiently addressed. Hence, SDC commissioned a Gender, Governance and LNOB analysis for R4 In Zambia [Chingarande & Zimbizi, 2021] which highlighted key political-economy and governance factors driving vulnerability in the country such as inflation, upcoming-elections and shrinking civic space for citizen participation. With Zimbabwe and Zambia being classified as fragile, Phase III will need to be more contextually adaptive." (SDC, 2021: 3).

HIV/AIDS. None of the sampled countries has an action plan for mainstreaming HIV and AIDS. As a result, mainstreaming HIV and AIDS in R4 remains ad hoc in Zambia and Malawi. In Zimbabwe, HIV and AIDS is mainstreamed in the FFA with regards communication on prevention, testing and treatment. Beyond the FFA, HIV mainstreaming is not present.

G7. Capacity building issues.

"Transferring capacity to local stakeholders is essential for the sustainability of R4. This includes insurance companies, district government authorities, and NGOs." (SDC, 2017c: 5).

"As a climate services and risk management program, IRMP has a strong information dissemination and capacity building focus (as opposed to food distribution or cash distribution). Outputs are therefore not measured in terms of amounts of food / cash / vouchers distributed but in terms of the number of beneficiaries reached through different communication channels and risk management mechanisms." (Brewin & Maganga, 2021: 2).

Part H: Other matters arising from the review

H1. Follow-on questions. These mainly concerned sustainability and are addressed in relevant text above.

H2. Missing documents. Not applicable.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: National context statements from 2021 NDCs.

Malawi. "Malawi is a small, landlocked country in the south-eastern part of Africa. The country's economy is driven by agriculture, which accounts for 28 percent of GDP, around 80 percent of the country's exports and almost 65 percent of total employment. Poverty is stubbornly high at 50.7 percent. In 2018, 3.3 million Malawians were food insecure, largely as a result of climate shocks. Vulnerability to climate shocks is highest in Malawi's Lower Shire Valley, which accounts for 80 percent of the most vulnerable districts." (Brewin & Maganga, 2021: vi). " Economic modelling has estimated the direct overall costs due to climate change impacts equivalent to losing at least 5% of the country's gross domestic product (GDP) each year. Malawi's land and natural resources are heavily utilized and prone to environmental degradation, and therefore also highly vulnerability to climate change. Malawi's land resource base is particularly under threat from increasing human and livestock population pressures, and the expending agricultural production to marginal areas. Overdependence on traditional biomass (wood, charcoal) and other fossil fuels to meet the country's growing energy needs are threatening Malawi's climate as forest resources are being depleted as carbon sinks. ... Malawi's economy is largely based on agriculture, with the sector supporting about 80% of rural people's livelihoods and contributing about 30% to gross domestic product (GDP) and 80% of export revenues (GoM, 2020). The performance of the other sectors is dependent on agriculture which is largely rainfed and hence highly vulnerable to climate change and climate variability. Malawi's GDP was estimated at 6,917 USD million in 2018, representing an average GDP per capita of 381 USD, one of the lowest in the world and also in Africa." (Rep. of Malawi, 2021: vii and 5-6).

Zambia. "In 2010, Zambia's Gross Domestic Product (GDP) grew by 7.6 percent compared to 3.5 percent in 2000. This economic growth rate was largely driven by agriculture, infrastructure developments including increased metal production following a rebound in copper prices on international markets and provision of various tax incentives in the agricultural and mining sectors. Zambia's agricultural sector is the socio-economic backbone of the rural population, with 60 percent being dependent on the sector as the main source of income and livelihood. Many of the farmers are poor and engage in low-productivity rain-fed subsistence farming resulting from inadequate resources for the purchase of inputs, use of inappropriate farming

practices and failure to fully develop the irrigation potential. These challenges are exacerbated by increased frequency of extreme weather events such as rainfall variation, floods and droughts caused by climate change, and in the last two years, effects of the Covid pandemic. About one sixth of the rural population depends heavily on forests and non-forest resources for their livelihood and contribute approximately 20 percent to rural household incomes. However, charcoal and fuel wood production including clearance of forest land for agriculture and settlement expansion has resulted in high rates of deforestation and increased greenhouse gas emissions. The country's annual deforestation rate was estimated at 276,021 hectares per annum. It has been projected that climate change impacts could slow the development process of the country and could cost Zambia approximately USD $13.8 billion loss in GDP. In order to prevent economic losses resulting from impacts of climate change, the Government of Zambia (GRZ) has integrated climate change concerns in its policies, programmes, plans and strategies to support a low carbon and climate-resilient development pathway and the attainment of the middle-income status envisioned in the country's Vision 2030. Zambia aspires to become a prosperous low carbon and climate resilient middle income country by 2030 as enshrined in its Vision 2030." (GoZam, 2021: 9-10).

Zimbabwe. "Approximately 80% of the rural population's livelihoods are dependent on rain fed agriculture making them highly vulnerable to climate change induced weather extremes, variability and climate change impacts. This makes climate change adaptation in the agricultural sector a national priority, demanding policy direction at the highest level. ... Zimbabwe's economy is highly reliant on agriculture which, along with forestry, employs 70% of the population (directly or indirectly). Agricultural production is largely rainfed and sensitive to fluctuating weather patterns. Increasingly frequent and intense extreme weather events, including tropical cyclones, droughts, mid-season dry spells, floods and localised heavy downpours are also having a negative impact on other sectors of the economy. Sectors affected directly and indirectly include energy, infrastructure and industry, due to the many interconnections between different sectors' climate vulnerabilities. In addition, Zimbabwe's position as a landlocked country at the heart of Southern Africa makes it highly vulnerable to direct or indirect climate-related impacts on neighbouring countries, and more generally elsewhere, that may lead to transboundary or 'spill-over' effects. These may be related to: (a) trade of agricultural commodities, as manifested in global food prices through integrated supply and distribution chains; (b) trade of non-agricultural commodities, e.g., raw materials supply, manufacturing industries; (c) infrastructure and transport, e.g., energy supply, energy infrastructure and regional transportation networks; (d) migration and displacement of people, e.g., through changing tourism flows and mass migration (either forced or voluntary); and (e) spread of diseases and invasive species. Zimbabwe's Vision 2030 seeks to transform Zimbabwe to an upper middle-income economy by 2030, with a per capita Gross National Income of over US$5 000 in real terms. The National Development Strategy (NDS1), 2021-2025, supports Vision 2030, targeting an annual GDP growth rate of above 5% and the creation of at least 760,000 formal jobs over the five-year period. NDS1 aims to increase agriculture production, especially by smallholder farmers, which will increase Zimbabwe's prosperity, food security and resilience against climate change." (GoZim, 2021: 4).

H3.2: About R4 (from WFP, 2021)

Since 2011, R4 has broken new ground in the field of climate risk management by enabling vulnerable households to access index insurance products by participating in risk reduction activities. Resource-poor and food insecure households are faced with a wide range of shocks, including climate variability, extreme weather events, conflict, and socio-economic crises. While vulnerable communities have a greater likelihood to suffer heavy losses from these shocks, they often lack access to efficient and effective formal risk management and social protection mechanisms. WFP's vision is to end global hunger by helping reduce risk and vulnerability to shocks and achieving sustainable food security and nutrition. WFP recognizes that in order to achieve its objective, it is essential to rely on a comprehensive set of integrated risk management strategies and tools that address both the climatic as well as non-climatic factors contributing to people's vulnerability.

WFP has been the first UN agency to develop a microinsurance scheme integrated in a broader strategy to manage climate risks in chronically and transient food insecure areas, prone to recurrent droughts and floods. The R4 Rural Resilience Initiative (R4) is an integrated climate risk management approach that aims to help communities build resilience, incomes and wellbeing in the face of increasing climate variability and shocks. The initiative combines four risk management strategies: reducing the risk of climate-related shocks through nature-based

solutions and improved agricultural practices; transferring the risk of catastrophic events to private insurance markets; enabling better risk retention of households and communities through the promotion of group savings and integration with social protection systems; and promoting prudent-risk taking through a combination of financial education, livelihoods diversification, and easier access to credit to enable better investments.

H3.3 The PICSA model

What is PICSA? "PICSA is a participatory agricultural extension and climate services approach that is used by extension workers and other intermediaries to work with farmers starting long before the rainy season to help them assess their current livelihood activities, examine probabilities and risks associated with the climate and weather in their area, and consider different options for crops, livestock, and other livelihoods under their local weather conditions. Its implementation involves two stages: the training of trainers (i.e. extension officers), and the training of farmers." (WFP, 2020: 11).

How does PICSA work? "Agricultural extension officers interact with farmers through farmer groups of the area and each farmer begins the process by mapping and allocating the resources available around their households/land (as seen in figure 3 below); they develop seasonal calendars; receive historical information of their area which help them have a better understanding of the local climate conditions; and this helps them develop practices under their local climate conditions. They are also involved in a participatory budgeting plan on their practices to help them select appropriate enterprises for the season (i.e. when to buy which variety of seeds, which livestock type to raise when to hire labour, how much production can be expected, how much will it be for own consumption, how much to sell at a minimum price to reap a profit from crops, livestock, etc.). Farmers acquire the skills and a set of tools to improve their decision-making around their food security and livelihoods through the Participatory Integrated Climate Services for Agriculture (PICSA) and capacity building efforts from extension officers (as shown in figure 4 below). Other dissemination channels for the provisioning of such information and agriculture and livelihoods advisories include radio programmes and ICT-based platforms (i.e. SMS, 'Mlimi Hotline', 'Beep4Weather') to reach smallholder farmers." (WFP, 2020: 13).

H3.4 The African Union's African Risk Capacity Group.

The African Risk Capacity (ARC) Group was established by the African Union to help African governments improve their capacities to better plan, prepare and respond to extreme weather events and natural disasters (ARCG, 2021a), as well as the outbreak of highly deadly epidemics (like the Ebola, Lassa and Marburg fevers and meningitis[30]). It is headquartered in Johannesburg and partnered by Germany (KfW, BMZ), Sweden (SIDA), the USA (USAID), the Rockefeller Foundation, WFP, Switzerland (SDC project 7F-08569), Canada, France (UFD), IFAD, the UK (FCDO) and the EU. The SDC contribution through the Global Programme on Food Security (SDC/GPFS) was formulated in a series of credit proposals (SDC, 2012c, 2016, 2019) for a first engagement in three phases, the initial two of which were Rio Marked 'PRINCIPAL (2)' for adaptation and the third 'SIGNIFICANT (1)' for adaptation (all being marked 'NOT (0)' for mitigation). The total SDC contribution is hard to calculate from disparate SDC sources but seems to have amounted to about 10 per cent of the USD 100 million or so contributed to the ARC by all donors in 2017-2021. The SDC web-site summarises SDC's role in each phase:

- **Phase 1 (Design Phase, Dec 2012 to Oct 2016)**:
  - **SDC role**: "The ARC ... will offer insurance coverage for governments of African countries transferring risks to the international financial market and complementing national or regional micro-insurance schemes as supported by other SDC organisational units. With this project the SDC will co-finance the design phase implemented by the World Food Programme and after that the Specialized Agency of the African Union in its task to enable more countries to join the ARC."
  - **Progress**: "The ARC design phase started in January 2011. Up to now USD 10 million have been mobilized for the design of the ARC and six African countries have signed pre-agreements with the ARC for their participation in the risk pool."

[30] Covid-19 cannot be covered because the pandemic is already underway, and although further viruses will be added when more donor funding becomes available Covid-19 and its variants would be covered later as the mortality ratio and the financial health losses are relatively low for the pre-dominantly young sub-Saharan African population. The huge economic losses result in Africa from the Covid-19 lock-downs and the interrupted global value chain transactions, but not from the direct health effects (ARC, 2021).

    - **Source**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2012/7F08569/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Phase 2 (Dec 2016 to Aug 2021)**:
    - **SDC role**: "SDC co-finances the expansion of this insurance scheme to new countries, including the development of contingency plans that will allow insurance pay-outs to countries in case of drought or floods related catastrophes. ... ARC plans to engage with Governments for capacity-building activities in the next four years with the aim of adding 4 to 5 new countries per year. Over the next five years, ARC will define its pathway to become self-sustaining."
    - **Progress**: "Africa Risk View (ARV) platform improved for better performance and to include new hazards and products. ARV platform is continually disseminated through the provision of training and technical support to member states. Robust contingency plans developed in collaboration with member states through the provision of training and technical support. 2014 first insurance pool launched with 5 countries, with Niger, Senegal and Mauritania receiving first pay-outs in early 2015 for experienced drought, reaching the people in need. ARC Ltd insurance risk pool continues to grow."
    - **Source**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2012/7F08569/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Phase 3 (Final Phase, Dec 2019 to Dec 2022)**:
    - **SDC role**: "The exit strategy for the Global Programme Food Security (GPFS) is to encourage the Humanitarian Aid Department [of SDC] to assume the leading role in the SDC partnership with ARC, as ARC will remain highly relevant by offering increasingly valuable solutions for AU member states in disaster risk management and risk transfer. The funding of Africa Disaster Risks Financing and the Replica Plus+ contributes directly to the commercial viability of ARC Ltd. phasing out earlier ARC's still high donor dependency." [Note: the 'Replica' mentioned here is a mechanism to build on ARC's government-led risk management infrastructure by "switching to a largely ex ante system embedded at the sovereign level, thereby freeing up scarce humanitarian funds for complex risks that cannot be easily managed by governments nor financed by insurance-like instruments." (ARCG, 2021b)].
    - **Progress**: "Since inception of the risk pool in 2014, ARC has issued 41 drought insurance policies to 10 AU member states, worth USD 580 million and covering 58 million vulnerable people with USD 59 million in pay-outs as of 30.1 1.19 [Nov 2019]. ARC has designed an Outbreak & Epidemics insurance product for launch by mid of 2020 and a flood insurance product in 2021. ARC has proved its value as unique and innovative disaster management infrastructure in Africa that integrates early warning through risk modelling, contingency planning and risk transfer into one ecosystem. ARC Ltd could not yet break even, as its insurance portfolio growth is behind schedule and premium collections from AU member states remain challenging."
    - **Source**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2012/7F08569/phase3?oldPagePath=/content/deza/en/home/projekte/projekte.html

The ARC is of interest in an investigation of the R4 initiative in 2011-2021 because it is an established disaster risk mitigation and transfer system with a built-in private sector reinsurance element covering 13-14 African Union countries. It therefore resonates and synergises with the approach explored by R4 and offers scaling up to continental level. This is fact already underway with SDC support for a second engagement: project 7F-10890.01 (Contribution to the Multi-Donor Trust Fund of the Africa Disaster Risk Financing Programme ADRiFi, Dec 2021 to Nov 2025, budget CHF 8,500,000 - SDC, 2021b); and project 7F-10484.01 (African Risk Capacity Programmes in Zambia and Zimbabwe, Nov 2021 to Oct 2026, budget CHF 7,300,000 which is expected to be repeated in a second phase - SDC, 2021c). The financing of the ARC

going forward is complex, however, with SDC & ARC (2021) listing the following committed contributions:

- **Germany**: USD 50 million loan to ARC Ltd, USD 12 million in premium subsidies, and unspecified funding for Replica Plus.
- **UK**: USD 50 million loan to ARC Ltd, a USD 1.5 million ten-year impact evaluation, and unspecified ADRiFi premium finance.
- **Canada**: USD 30 million in climate change core funding for the ARC Agency until Dec 2022.
- **Switzerland**: CHF 11 million (from SDC/GPFS) for climate change and epidemic-related core funding of the ARC Agency via WFP in the three phases of project 7F-08569, CHF 2 million (from SDC HQ Africa Division and GPFS in Nov 2020 for premium subsidy, CHF 0.9 million (from SDC African Divisions) for premium subsidies via ADRiFi managed by the African Development Bank, and CHF 14.6 million from SDC ESA (i.e. project 7F-10484 phases 1 and 2) for premium subsidies and capacity building for ARC engagement with Zimbabwe and Zambia.
- **France**: USD 9.6 million as climate change funding for the ARC Agency (to be reviewed in 2021).
- **Rockefeller Foundation**: USD 8.9 million until 2021.
- **USA**: USD 6 million as climate change funding for the ARC Agency until 2020, and unspecifed funding of Replica Plus.

This picture suggests that Switzerland is likely to maintain its share of total ARC financing at about 10 percent overall. Because of the strategic importance of the ARC mechanism, it is described further below.

How the African Risk Capacity Works (from ARCG, 2021c).

Overview

The ARC Group is transforming the way African governments plan, prepare, and respond to natural disasters. By building national capacities, harnessing state-of-the-art technologies to respond, and forging access to innovative finance mechanisms, the organisation offers comprehensive and sustainable solutions to disaster risks. It comprises two entities:

- **The ARC Agency** is a Specialised Agency of the African Union that: provides capacity building to ARC Member States in preparation for taking out a policy; provides general oversight and supervision of the development of capacity building services; and facilitates the development of country contingency plans and monitors their implementation should a disaster event trigger a pay-out.
- **ARC Insurance Company Limited** (ARC Ltd) is the financial affiliate of the Group responsible for carrying out commercial insurance functions of risk pooling and risk transfer in accordance with national regulations for parametric weather insurance.

Through its capacity building and risk pooling services, ARC's objective is to strengthen the continent's Disaster Risk Management systems through innovative solutions that take into account the continent's challenges. By capitalising on local and international expertise, and considering the diversification of weather risk across Africa, the ARC offering enables countries to manage their risk as a group in a financially efficient manner in response to probable but uncertain risks. These techniques, while not new, can be applied by African countries in innovative ways to lower the cost of response to disasters before they become humanitarian crises and provide better service to those affected.

Background

Although their exact timing and magnitude are uncertain, most weather events are predictable. Agricultural production in many parts of Africa is affected by natural climate variability and is significantly compromised by climate change which is resulting in higher incidence of drought, floods and tropical cyclones, erratic rainfall, damaging high temperatures. Drought accounted for an average 36% of all responses between 2002 and 2009. In 2009, the World Food Programme (WFP) assisted 53 million people in sub-Saharan Africa, spending USD 2.5 billion – 63% of WFP's global expenditure that year. By comparison, the Consolidated and Flash Appeal for 2009, which covered all sectors, required over USD 6 billion for Africa, of which approximately USD 4.5 billion was received. As an example, initial analysis by ARC suggested that a widespread catastrophic drought in sub-Saharan Africa at the time would cost upwards of USD 3 billion in emergency assistance. Without doubt, this would put an unprecedented financial strain on African countries and donor countries' aid budgets.

Before the introduction of the ARC mechanism and in the absence of parametric insurance, responding to natural disasters was largely reactive and relied on international flash appeals to secure funding after a disaster, making it untimely and inequitable, with much of the costs borne

by farmers. Under these conditions, governments are forced to reallocate funds from essential development activities in their national budgets to crisis response. Only then can relief be mobilised towards the people who need it most – and it is often too late. In the process, lives may be lost, assets depleted, and development gains reversed – forcing more people into chronic hunger, malnutrition and destitution across the continent.

Contingent funds linked to early warning systems and appropriate contingency plans linked with credible national response mechanisms offer the best solution for delivering more effective and efficient responses to weather shocks in the short term, and can facilitate longer-term investments in increasing food security, disaster risk reduction and climate resilience. By shifting from the old paradigm of a reactive approach to responding to disasters, Africa can move towards better management of its risks that is more economical, more efficient, and saves lives and livelihoods. ARC was founded to catalyse a better risk management system for Africa and provide the capacity building support required to implement such a system.

How it Works

As an insurance risk pool, ARC's objective is to capitalise on the natural diversification of weather risk across Africa, allowing countries to manage their risk as a group in a financially efficient manner to respond to probable but uncertain risks. These techniques, while not new, can be applied by African countries in innovative ways to lower the cost of the response to disasters before they become humanitarian crises, and provide better services to those affected.

Key elements:

- The initial capital came from participating countries' premiums as well as one-time partner contributions.
- ARC works with countries to calculate country premiums and allocate pay-outs to member countries based on predetermined and transparent rules for payment.
- Countries select the level at which they wish to participate by selecting the amount of risk they wish to retain and financing they want from ARC for risks of varying severity.
- Operations plans, which show the use of a potential pay-out, are meant to optimise ARC disbursements and are a prerequisite for participating in ARC risk pools. These take into account existing mechanisms, priorities and needs of each participating government, and are evaluated by the ARC Board's Peer Review Mechanism according to standards set by the Conference of the Parties.
- The pool reinsures itself as well as benefits from investment income such that it builds and protects the capital available for coverage to member governments.

Early Intervention

ARC pay-outs arrive in the national treasury within 2-4 weeks of harvest so that the first assistance can reach needy households within 120 days – the time period at which asset depletion at the household level begins. Experts from the University of Oxford and the International Food Policy Research Institute (IFPRI) conducted a cost-benefit analysis (CBA) to examine the economic advantages and disadvantages of establishing a risk pooling facility as an early response mechanism to severe drought in sub-Saharan Africa. A further analysis by the Boston Consulting Group shows the potential benefit of ARC outweighs the estimated cost of running ARC by 4.4 times compared to traditional emergency appeals for assistance, as a result of reduced response times and risk pooling. This means one dollar spent on early intervention through ARC saves four and a half dollars spent after a crisis is allowed to evolve.

Risk Pooling and Risk Transfer

The ARC risk pool combines the risk of a disaster occurring across several countries to take advantage of the natural diversity of weather systems across Africa. That pool then takes on the risk profile of the group rather than the risk profile of each individual country, combining the uncertainty of individual risks into a calculable risk for the group. Since it is unlikely that droughts will occur in the same year in all parts of the continent, not every country participating in the pool will receive a pay-out in a given year. Because a continental risk pool's exposure to covariant drought risk would be significantly smaller than a given country's or region's exposure, an ARC pool could manage drought risk with fewer funds than if each country financially prepared for its own worst case drought scenario individually. Indeed, preliminary findings indicate potential savings of 50% from diversification of drought-related losses across Africa, i.e. a 50% reduction in the contingent funds needed if the risk is pooled among nations and managed as a group rather than borne by each country individually. Approaching the market as a group will therefore significantly reduce the individual premiums required to maintain the solvency of the facility. These are savings that can then be invested in longer term development projects and resilience-building activities.

How do Countries Participate in ARC?

As an insurance-based proposition, ARC is not appropriate for managing risks that happen every year. Countries that participate in ARC will be participating in an index-based insurance mechanism for infrequent, severe drought events. In order to participate in ARC, countries must undertake several processes, including customizing the Africa RiskView software, signing MOUs for in-country capacity building, defining a contingency plan for ARC pay-outs, and determining risk transfer parameters. When countries have satisfactorily completed this process, they will receive a Certificate of Good Standing from the ARC Agency Governing Board, and will pay a premium to ARC Ltd, after which they will be members of the risk pool.

How a Country Gets a Pay-out

Members of the ARC risk pool receive a pay-out when the rainfall deviation is sufficiently severe such that the estimated response costs – estimated by Africa RiskView – cross a certain pre-defined threshold. When that threshold is crossed, qualifying risk pool members receive a pay-out within 2-4 weeks of the end of the rainfall season, thereby allowing them to begin early intervention programmes before vulnerable populations take negative coping actions. The pay-out threshold is determined by the risk transfer parameters selected by each country. Specifically, governments select the deductible/attachment point (the risk the country wants to retain and manage using other resources), the limit (the maximum pay-out a country can receive in the case of an extreme drought), and the ceding percentage (the percentage of the total modelled risk the country wishes to transfer to the pool) to customise their participation profile. These parameters will determine the premium amount and potential pay-out levels by each member of the risk pool. The ARC currently offers a maximum coverage of US $30 million per country per season for drought events that occur with a frequency of 1 in 5 years or less.

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Part J: Acronyms and abbreviations

ADRiFi	Africa Disaster Risk Financing Programme
AQZ	Aquaculture Zimbabwe
CDTO	Community Technology Development Organization.
CIMMYT	International Maize and Wheat Improvement Centre
FFA	Food for Assets
GCF	Green Climate Fund
GBV	Gender-based violence
HARITA	Horn of Africa Risk Transfer for Adaptation

IFAD	International Fund for Agricultural Development
IRI	International Research Institute for Climate and Society
IRM	Integrated risk management
IRMP	Integrated Risk Management and Climate Services Programme
LNOB	Leave No One Behind
PICSA	Participatory Integrated Climate Services for Agriculture
SHF	Small-holding farmer
SNV	Netherlands Development Organisation
VSL	Village Savings and Loans
WFP	World Food Programme

Annex 13.10: Hydroelectricity in the Hindukush

Project highlights.

7F-07817: **Water and Energy Security through Microhydels in the Hindukush**. Seeking to harness through mini-hydro the energy of flowing water to substitute for wood and fossil fuels, and to increase irrigation for crops and reforestation, it had problems of access and security, and exceeded local capacity to use a raft of innovative approaches (networked power, community-owned companies, pre-paid cards for electricity bills).

Part A: Basic data

A1. Project number & name. 7F-07817 - 1 & 2: Water and Energy Security through Microhydels in the Hindukush (Pakistan).

A2. Sources.
Process of PRF development: (a) a draft PRF was prepared using documents listed in the bibliography; (b) the draft PRF was discussed with and/or reviewed by knowledge holders listed in Annex 13.22; and (c) the PRF was revised in light of comments and additional documents received.

- 2011-2015: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2011/7F07817/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- 2015-2019: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2011/7F07817/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html.

A3. Dates & financial data.

- **Phase 1: entry** (Apr 2011-Mar 2013), budget CHF 1,200,000 (SDC, 2010); main (Apr 2011-Mar 2013), budget CHF 1,160,000 (SDC, 2011); extension to Dec 2013, budget CHF 1,560,000 (SDC, 2014); no-cost extension to Sep 2014 (SDC, 2014). **Final: CHF 1,560,000**.
- **Phase 2** (Oct 2015-Sep 2018), budget CHF 4,060,000 (SDC, 2015); no-cost extension to Jun 2019 (SDC, 2019). **Final: CHF 4,060,000**.

A4. Location(s). Pakistan, Hindukush - Chitral District in Khyber Pakhtunkhwa province: in Yarkhoon (Yarkhun) Union Council the settlements of Miragram, Bang Bala, Bang Payeen, Zhupu, Sultanabad, Urkhan. Pardan, Eimith, Miragram II, Lashdan, Dewsar, Shikhang, Wasum and Patrangaz); and in Laspur Union Council the settlements of Sor Laspur, Shalendeh, Dhar, Ballen, Brok, Harchin and Raman.

A5. SDC Geography. South Asia: Pakistan

A6. SDC Domain. South Cooperation Asia
Sector/strategic domains: Renewable energy generation, energy and water resources conservation
Domain of intervention/component of Cooperation Strategy: Water Governance

A7. Partners.

- **Phase 1**: **Implementing partner**. The Aga Khan Rural Support Programme (AKRSP) "has over 27 years of experience in designing and implementing community infrastructure projects, such as irrigation channels, farm to market roads, bridges and hydel units, which are then maintained by the local communities, with appropriate training and oversight provided by AKRSP. So far, AKRSP has implemented more than 4,300 such infrastructure schemes, more than 90% of which are well maintained." (SDC, 2010: 1). **Financing partners**. "The total project cost is estimated at approx. CHF 1.6 million over a two-year implementation period. The proposal seeks a grant of CHF 1.2 million towards the capital cost of the project, The remaining funds of CHF 400,000 will be financed from carbon revenue expected from the World Bank's CDCF, under the ERPA, and/or loan investment which is expected from Acumen Fund, Pakistan. In addition, the following sources are available: PPAF and Community Equity investment (up to 5% of the total project cost). The communities will provide land free of cost for this project and provide local material and share in unskilled labour for construction of these projects." (SDC, 2010: 4).

- **Phase 2**: AKRSP, PPAF, Acumen Fund, Germany (GIZ/KfW), World Bank (CDCF), HSI [?], SRSP [?]. **Other partners**: Line agencies of the KP government (Provincial Disaster Management Authority, Forest Dept., Wildlife Dept. and Irrigation Dept.) and village councils.

Part B: Purpose, relevance and approach

B1. Purpose.

- **Goal (SDC, 2010)**: "Quality of life improved and resource-base degradation reduced of marginalized communities in two remote mountain valleys of the Hindukush in Pakistan".
- **Purpose (SDC, 2010)**: Two marginalized mountain communities in Hindukush mountain valleys enabled to harness renewable energy for their productive uses and social development, while also contributing to reducing CO_2 emissions into the atmosphere."
- **Outcomes (SDC, 2010)**: Energy and water security for the population. Reduced pressure on forests. Reduced workload on women. Improved health, education and hygiene. Income and enterprise from diversified and value-added livelihoods. Carbon income; and Reduced emissions.
- **Outputs (SDC, 2010)**: (1) A 800 KW hydropower unit built, operated and transferred to the community at Yarkhoon. (2) A 500 KW hydropower unit built, operated and transferred to the community at Laspur. (3) Two community-based power utility companies (associations) created with legal, management, and business systems in place at both Yarkhoon and Laspur owned by the communities. (4) Certified Emission Reductions (CERs) generated and traded. (5) Productive uses of energy promoted through interface with UNDP/GEF funded project.
- **Outputs (SDC, 2015)**: (1.1) Business interest groups invest into water- and energy-linked trade and production ventures and value chains building on project investment. (1.2) The agricultural production is increased through adoption of environment friendly livestock and crop systems on the subsistence farms. (1.3) Village authorities & village organizations stimulate environment friendly livestock and crop systems on the subsistence farms. (2.1) Community-based Power Utility Companies operate on a commercial basis. Output 2.2: Efficient performance of installed micro Hydels [= mini HPs) and transmission and distribution systems. (2.3) The villages protect the new hydro-infrastructure and their settlements against landslides and flash floods. (2.4) The villages protect their catchments against erosion and ecological destruction.

B2. Relevance to partners.

Pakistan. "The initiative is fully coherent with the KP Government's [2014] Integrated Development Strategy for thematic and geographic development projects and its new policy for promoting renewable energy sources through its Pakhtunkhwa Energy Development Organization (PEDO) which foresees the construction of 356 micro hydels ranging from 50 KW to 500 KW in seven districts of KP. On a provincial level, the devolution process will be further strengthened by an increase in the district's technical and financial autonomy in line with the [2013] Strategic Development Partnerships Framework of the KP government." (SDC, 2015: 6). Pakistan's 2016 NDC observes that "Only a fraction of the small hydel potential of about 3,000 MW for power generation in the shape of micro and small-scale hydro plants has so far been realized" (GoP, 2016: 12), and hydroelectricity is seen as one of "the three distinct renewable energy options believed to be viable for Pakistan" (p. 17). The updated 2021 NDC (GoP, 2021) amplified this approach by anticipating that by 2030, 60% of the country's electricity will be generated from renewable energy resources including hydropower, the latter with an estimated potential of around 60,000 MW, of which only about 14% is currently exploited. It explains that "small hydro are contributing 128 MW, while 877 MW are under implementation and 1500 MW are available for development. Medium to large hydro project of 9,827 MW are installed." (p. 28).

Switzerland. "Access to water and its efficient and socially equitable use was identified as one of the key thematic thrusts of SDC's new program orientation in Pakistan. Through other ongoing SDC interventions, SDC has a long experience of working in KP [through 'Water for Livelihood', 'Livelihood Programme Hindukush', 'Citizen Action for Peace and Development', and 'Rule of Law' with UNDP)." (SDC, 2015: 6). [*It is not clear why 'access to water and its efficient and socially equitable use' is cited in the relevance case for an MHP electricity project*].

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 7: Affordable and clean energy**, potentially Target 7.1 (*By 2030, ensure universal access to affordable, reliable and modern energy services*).

B4. Relevance to other development objectives.
OECD/DAC: renewable energy, water & sanitation

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Technology-based mitigation (TM).
Adaptation: Nil.

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. SIGNIFICANT (1)
- **Adaptation**. PRINCIPAL (2)

Part C: Narrative overview

A major constraint on "economic diversification out of traditional subsistence farming practices" (SDC, 2010: 1) in the remote Hindukush valleys of Pakistan is the absence of reliable local sources of electricity. In this location, an excellent way to correct this is through small-scale hydroelectricity (hydel) generation, or 'micro/mini hydropower' (MHP[31]). This is because flowing water is an abundant resource locally and harnessing it can substitute for the use of fuel wood and fossil fuels, both of which have harmful environmental consequences: the former for local ecosystems upon which water catchment services depend; the latter for the further driving of climate change.

In the context of a "new Hindukush regional programme of SDC" mentioned in SDC (2015, Annex 8 - Operations Committee Protocol), it was decided to work with the Aga Khan Rural Support Programme (AKRSP), which had several decades' of experience in designing and implementing community projects, including MHP ones[32], which were then maintained by the local communities with training and oversight by AKRSP. It was proposed to add an SDC-financed component to an ongoing AKRSP programme of MHP delivery in the Hindukush, in the SDC case focusing on 25 settlements (population ca 20,000) in two valleys in the heart of the Hindukush: Laspur and Yarkhun in Chitral District, Khyber-Pakhtunkhwa (KP) Province. "The project was framed to transform the traditional community-owned approach to manage [MHPs] into modern utility companies. The project followed an ambitious, market-based financing plan, raising 20% equity, 50% donor funding (SDC), and 30% loan financing (Acumen Fund), to be offset later, from the carbon income and tariff collection." (Hunzai *et al*., 2019: 5).

Two MHPs would be built by AKRSP's Engineering Department: one of 500 kW in Raman village, and one of 800 kW in Pawoor village. Their generation capacity was to be folded into the AKRSP system for generating certified emission reduction (CER) credits under the Clean Development Mechanism (CDM, see H3.1), which was expected to yield an additional income stream for community owners. In the event, however, "CDM revenues were not accrued as projects were commissioned after the end of ERPA with the World Bank. The delay in construction completion of the projects (prior to CDM expiry period) and collapse of Carbon Market have impacted on additional carbon income/revenue generation for the project, as designed initially." (Hunzai *et al*., 2019: 7).

Following AKRSP practice, communities would be mobilised and organised to participate in the construction, operation and maintenance of the new MHP facilities, and a community-owned Power Utility Company (PUC) would be set up at each location. The first phase proceeded slowly, with unexpected delays, and it was extended to bring the MHP units into operation in April 2015, and to establish the PUCs. Phase 2 concentrated on completing the works begun in Phase 1, while also exploring "the scope on outsourcing the management support of both power stations to a competent external firm based on profit-orientated business concepts" and "the feasibility of integrating both new and existing micro-hydels in each valley into two separate valley-grids which could be connected to ... the main town of Mastuj" (SDC, 2015: 6).

Although AKRSP had extensive experience with community based micro-hydels in Pakistan before the launch of this project, most of these involved installations of 50 KW (and a maximum of 100 KW). This SDC co-financed project was AKRSP's first experience with 500 and 800 KW installations, and this posed new challenges of design, volume, security, organisational set-up and finances , all of which had to be solved from scratch. The establishment of the two

[31] 'micro' hydro usually refers to generators in the 5-100 kW range, 'mini' to the 100+ kW to 1 MW range.

[32] Although this was said to be "the first time AKRSP [had] installed medium sized MHPs in remote areas", according to the management response prefaced to Hunzai *et al*. (2019).

companies, the mixed financing model, and the use of a micro-grid approach and prepaid cards were all innovations, in which the authorities and other donors showed great interest, but for which there was no prior experience in Pakistan.

The final evaluation (Hunzai *et al.*, 2019) found that most of the technical work had been done, but with a number of essential items still missing (mainly in the water intake systems) and several repairs needed (e.g. to transformers, distribution lines, sensors, expansion joints and valves). Moreover, although the two PUCs had been established, AKRSP still retained a majority of the shares and had no plan to transfer ownership to the communities "as this handing over is tied to repayment of the loan component." (p. 6, a reason that might have been hard to convey convincingly to local people), and no operation and maintenance manuals or systems were in place.

The MHPs were nevertheless producing electricity, and the final evaluation found that the supply far exceeded local demand, with a use rate of 12% in Pawoor and 18% in Raman. This was partly due to uptake resistance, despite it being much cheaper than bought alternatives (i.e. not necessarily including family-collected fuel-wood), and only about a quarter of households were using electricity for cooking, thus relieving pressure on natural forests and woodlots to some extent. But the new electricity supply had "drastically reduced the household workload of women and girls" (p. 7) in those few houses that used it, even though they also heavily rationed its use (possibly a result of gendered issues: "male household heads monitor the meters on daily basis and instruct the women to reduce the usage of electricity", p. 11), a high school in Laspur had electric heaters and a computer laboratory powered by MHP, and medical supplies could be kept frozen in the local Aga Khan Health Unit.

A range of supplementary activities would also be undertaken according to the SDC project designs. Phase 1 provided for a channel to provide pumped irrigation water to about 60 hectares of farmland (SDC, 2011; Annex 2). Phase 2 described output-level budget lines (Annex 3) for increasing agricultural production through environmentally-friendly livestock and crop systems (CHF 514,000) and for protecting catchments against erosion and ecological destruction (CHF 276,000), and there is also mention (Annex 4) of "amended regulations on ecological land-use in watersheds" (SDC, 2015). The design text further claims the intention of disaster risk reduction (DRR) - which would normally mean protecting against excessive grazing and wood-harvesting, and where necessary restoring, catchment ecosystems both natural and farmed - sustainable agriculture, ecotourism and enterprise development, with a special focus on women and poor households.

It is in the purpose and effect of ecosystem-oriented DRR and the meaning and promotion of sustainable agriculture that much justification for the project's claims to be a water security and adaptation project lie. The final evaluation did find that "water security has increased as it can be lifted using surplus energy to irrigate the adjacent barren lands" (Hunzai *et al.*, 2019: 6), although "construction of the irrigation channels has not yet been considered" (p. 12). But the simple delivery of water from unsecured aquifers and catchments is not a meaningful indication of security but only of labour saving (which is of course a useful benefit for the women and children who previously had to carry the water). The final evaluation also found the DRR measures to be "satisfactory, though never enough, given the scale of the problem" (p. 11), but in practice limited to "covering the power channel with slabs to secure them from falling stones and debris; slope plantation above/below the power channel", and the building of "a DRR model house in Pawoor to serve as a standard to achieve energy efficiency and reduce fatalities in case of floods and earth quakes" (pp. 11-12)

This evaluation finds the **design quality** poor (score 2), due mainly to the low visibility of a coherent theory of change and a weak chain of causality. **Effectiveness** was judged to be weak-moderate (score 3.5) in the area of delivering hydroelectricity at village level but very weak (score 1.5) in terms of climate change response. **Impact** almost likewise (score 4 to allow for incremental growth in electricity uptake, and 1.5 for climate), and **sustainability** was found to be weak for electricity supply (score 3) and negligible for climate change (score 1). **Transformative potential** in the sub-system of village household energy use and micro-enterprises was moderate, but it was very low in the area of the climate response.

The minor mitigation significance of generating electricity through MHPs accounted for the project being classified in principle as 'Technology-based mitigation (TM) in the preliminary assessment, which agrees with the SDC classification of the project as being 'significant' for mitigation (i.e. a secondary design objective, especially due to the now-defunct CDM dimension). No adaptation significance was found in the preliminary assessment or in the detailed review, so why the project was classified by SDC as a 'principal' adaptation project (i.e.

with adaptation as the primary design objective), and why as a water sector project with 'water security' in its title, is unknown.

Part D: Design quality

D1. Theory of change.
A major constraint on "economic diversification out of traditional subsistence farming practices" (SDC, 2010: 1) in the remote Hindukush valleys of Pakistan is the absence of reliable local sources of electricity. In this location, an excellent way to correct this is through small-scale hydroelectricity ('hydel') generation, or 'micro/mini hydropower' (MHP). This is because flowing water is an abundant resource locally and harnessing it can substitute for the use of fuel wood and fossil fuels, both of which have harmful environmental consequences: the former for local ecosystems upon which water catchment services depend; the latter for the further driving of climate change.
It was decided to work with the Aga Khan Rural Support Programme (AKRSP), which had several decades' of experience in designing and implementing community projects, including MHP ones, which were then maintained by the local communities with training and oversight by AKRSP. It was proposed to add an SDC-financed component to an ongoing AKRSP programme of MHP delivery in the Hindukush, to build two MHP units to serve some remote communities. These would also be folded into the AKRSP system for generating certified emission reduction credits through the CDM. Following AKRSP practice, communities would be mobilised and organised to participate in the construction, operation and maintenance of the new MHP facilities.
The expected outcomes of the project were never straightforwardly expressed as being only to provide reliable, clean electricity to people who would otherwise be without it, and therefore focusing on the technical, organisational and financial requirements to build, operate and maintain the units. Rather, the Phase 1 Credit Proposal included a list of other effects: enhanced water security, reduced pressure on forests, reduced workload on women, increased incomes from diversified and added-value livelihoods, and an income from the sale of carbon emission reduction credits. By Phase 2 these had been elaborated further to include businesses investing into water- and energy-linked ventures, environmentally-friendly livestock and crop systems, and community actions to protect MHP facilities against landslides and flash floods while also protecting and restoring catchment ecosystems. As a result, it is hard to specify the change desired and to construct the theory of change involved. Sections D2 and D3 are based on the simplification that the aim was to provide MHP-generated electricity which would be extensively used in various ways by people in the target communities, with various effects including new enterprises, new financial flows, and reduced environmental impacts.

D2. Assumptions underlying the theory of change.
Assumption 1. That it would be technically feasible to build MHPs in the target locations, and socially feasible to involve local people in their operation and maintenance.
Assumption 2. That the financing arrangements (50% grant, 20% equity, 30% loan) would allow electricity to be offered to households at a cash price much lower than alternative energy sources (i.e. purchased but not family-collected fuel wood, fossil fuels, other renewable suppliers).
Assumption 3. That cost-savings resulting from the purchase of MHP-generated electricity (and rewards from the sale of certified emission-reduction credits under CDM) would drive rapid uptake.
Assumption 4. That the availability of low-cost MHP electricity would stimulate the development of micro-enterprises that would transform socioeconomic conditions.
Assumption 5. That a shift in energy use from fuel-wood to MHP electricity would significantly reduce pressure on forest and other ecosystems.

D3. Plausibility of assumptions and links.
Assumption 1 is plausible, considering the AKRSP's experience in the area with similar projects.
Assumption 2 is not plausible in the absence of a detailed analysis of how energy is obtained and at what price and socioeconomic cost, by whom, and how the whole issue is perceived locally.
Assumption 3 is compromised by the fact that asking villagers to pay in cash for energy (and to service loans) that they previously obtained through family labour is not an attractive prospect

unless accompanied by a raft of educational and socioeconomic reforms, including changes to gendered and age-based relationships.
Assumption 4 is not plausible in the absence of a detailed analysis of how microenterprises and other investment opportunities might be formed or exploited in practice in these locations.
Assumption 5 is not plausible in the absence of the above detailed analyses and of measures to incentivise and link environmental protection and restoration through education, social mobilisation &/or paid work programmes.

D4. General quality of the project design.
Stakeholders & consultation. "Community participation will be ensured at all levels of the project cycle through taking on board the village and women organizations (V/WOs) of the respective area. The V/WOs involved in identification and feasibility and this engagement will continue during implementation and extend to evaluation." (SDC, 2010: 3)." The ownership of the project by the communities is very high and the availability of the power raised high expectations which need to be addressed carefully." (SDC, 2015).
Risks. The security situation was acknowledged by SDC (2010) as a source of risk (potential impacts are given only as "restricted mobility"), to be mitigated by avoiding urban areas, keeping in touch with the authorities, and keeping a low profile. Community-level risks of unrealistic work plans, maintenance problems and elite capture were all considered very low because of local experience, community self-reliance, and participative equality and community agreements. The risks of flash floods, heavy snow (the villages are above 3,000 m) and drought were all acknowledged and would be designed for to the extent possible. For Phase 2 (SDC, 2015), three risk categories were identified: (a) **contextual risks** (i.e. the volatile security situation and minor conflicts around ownership of land, power distribution and personal interest, to be mitigated by an active involvement of the local communities and community institutions, local bodies and local *Jirga* in all decision making processes); (b) **institutional risks** (i.e. due to the remoteness of the project sites and the low priority of project interventions in the development agenda of the KP government, to be off-set through close coordination between all the project stakeholders, sound monitoring, active community involvement and reliable technical assistance during all stages of the project); and (c) **project risks** (i.e. natural hazards, to be addressed by developing risk assessment strategies with the local administration and embedding them in project implementation).
Score: 2, due to the low visibility of a coherent theory of change and the weak chain of causality.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.
Effectiveness
The final evaluation (Hunzai *et al.*, 2019) found the following (score 3.5 for MHP electricity supply, 2.0 for climate change response).

- That after extensive delays two working MHP plants had been built, and 'high effectiveness' was claimed since 'good quality' electricity (presumably meaning a reliable, steady supply) was available, affordable (i.e. at 'reasonable cost') and sufficient to meet foreseeable demand; the quality of work was found to be 'satisfactory' since the civil works, electro-mechanical equipment and distribution system at both MHPs had been operational for 18 months with no major problem.
- That two power utility companies (PUCs) had been established, but that shares had not been transferred to community ownership; also that AKRSP has invested little in developing them and their capacity as business institutions operating in remote off-grid markets, and "as things stand today, a 'cluster organisation' of Village and Women's Organisations (V/WOs) is claiming ownership and demanding accountability. Community members must be educated in the procedures, bylaws, and other governing systems of public limited companies." (pp. 1-2);
- That essential works and repairs on the MHPs remained to be done.
- That the mechanism for selling CER credits, which would have provided community owners with a sense of reward and beneficial ownership, had evaporated with the end of the World Bank's ERPA scheme and due to a weak carbon market.[33]

[33] The communities had been convinced by AKRSP to take up bank loans against CER credit earnings, but once it became clear that the carbon market approach had failed, the SDC grant was increased for the second phase.

- That uptake of MHP electricity was well below 20% at both sites because of social (and gendered) resistance to making the cash payments required for electricity[34], even though women and children were benefitting from MHP electricity in the 25% of households that used it, some entrepreneurs had established businesses (e.g. a guest house in Laspur, a steel works and carpentry in Yarkhun, an electric goods store in Laspur), and some indirect social benefits were coming from the use of surplus electricity to pump water to some farms (although no irrigation channels had been completed) and in heating schools and refrigerating medicines.
- That very minor 'DRR' works had been carried out, mainly to protect the MHP plants themselves.

Impact.
It was noted about half-way through the project that its "true impact can only be measured some 5 years after the final installation of the generators and commissioning of the two MHPs (approx. from 2020) in an *ex post facto* evaluation mission." (SDC, 2014: 2). This may be true, but signs towards the project's end did not encourage high expectations of impact for either the MHP electricity supply, although here there was expected to be some incremental growth (score 4), or for the climate change response (score 2).

Sustainability.
It was noted about half-way through the project that its "sustainable operation solely depends on the collected revenues created through the sale of electricity. The underlying assumptions (e.g. plant factor, sold energy, tariff) are themselves based on secondary assumptions (e.g. development of productive use, availability of household savings to purchase equipment, additional savings to pay the electricity bill) for which ... no evidence could be provided." (SDC, 2014: 7). The final evaluation concluded that, because of what was seen as an inevitable transition from subsistence farming to electricity-hungry modernity, the results of the project could be "sustainable in the long-term [but] the evaluation notes weakness in the financial assumptions, some technical gaps, poor initial arrangements [and weak systems generally] in the operation and maintenance department, and low institutional capacity of PUCs" (p. 2). A new strategy was called for in Phase 2, with SDC (2014: 8) citing prohibitive costs of (bought) fuel-wood and diesel and government policies all making conditions increasingly "supportive of community based MHPs and distributed power generation", while MHP investments were proliferating, and a private manufacture and service market had emerged. This led to the recommendation "for all stakeholders to create a Chitral Hydropower Development Forum (CHDF), with a mandate to pool knowledge, experience and resources and a clear division of labour among all stakeholders." This was not followed up, but it could have been a useful element to encourage shared learning and collective bargaining. The final evaluation made unsupported observations (p. 2) that the MHPs have stirred up a degree of ecological activism and has had " a positive impact on ecology, such as reducing the burden on forest cover, mainly agroforests and DRR aspects of community life". Apart from these, and leaving aside the report's several optimistic speculations about what might happen in future, sustainability was found to be weak for electricity (score 3) and negligible for climate change (score 1)

E2. System change.
Hydroelectricity and reforestation do seem to belong together in KP province, since reforestation is a high government priority and new forest plantations need irrigation. Steep rivers flowing year-round nearby offer scope for hydroelectricity to be used to pump water to the planted forests, which would be absorbing carbon and stabilising slopes and catchments. This could be significant for mitigation and adaptation, but to do this properly and at landscape scale would be hard and very costly. Meanwhile, the contextual changes noted in E1 that are making conditions in the Hindukush increasingly supportive of community-based MHPs and distributed power generation, including Pakistan's 2021 NDC intentions, and the specific context of the AKRSP's programme for rural electrification using community-based MHPs, all place the SDC project within a process of change that will presumably result in complete electrification of the Hindukush communities in due course.
Although there were a number of innovative aspects to the project in the Pakistan context (see G1), from a mitigation perspective the key point is that SDC funded two of the larger MHP installations for a total of 1.3 MW, out of the AKRSP programme's 15 MW. From the performance findings it is hard to see the SDC component as a leader or model for the broader process (the points in G2 and G3 notwithstanding). Attribution is speculative and transformative

[34] Before the introduction of prepaid cards, electricity consumption was 80-100%.

potential for rural electrification of the project itself must be seen as moderate. The whole MHP programme in the Hindukush will no doubt result in some GHG substitution, but the quantities are likely to be small in these very remote areas, and in the absence of a direct, programmed link to environmental education, avoided deforestation and ecosystem restoration it is hard to see much potential for transformative change in either the mitigation or adaptation dimension.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness. Nil.

F2. System change. Not applicable.

Part G: Other aspects of design and performance

G1. Efficiency issues.
"Late decision to go for higher quality electromechanical equipment led to re-design of important structures (e.g. powerhouse, tailrace, penstock) and late start of the corresponding international procurement. The time required and possible delays involved in international procurement appear to have been substantially underestimated by AKRSP as compared to the local procurement. The same is valid for other parts of the project (e.g. transmission & distribution). Also the time required for organizing and streamlining of the complex investment project and financing structure with different funding sources (grants, loan, CDM, community contribution) was underestimated. In addition, donor funds were made available with almost 6 months delay, resulting in an almost one year delay in construction due to upcoming winter." (SDC, 2014: 5).
There were practical difficulties to working in Chitral which affected efficiency. Foreigners and even local staff often could not receive security clearance to access the sites. This meant for example that the KRSP-hired international agricultural advisor never received official permission to visit the sites, and the contract had to be cancelled. Moreover, the area's remoteness meant that there were very few spare parts or people with necessary specialised mechanical kills in KP province, and spare parts and experts had to come from as far away as Lahore.
Project innovations also posed challenges. Although AKRSP had extensive experience with community-based micro-hydels in Pakistan before the launch of this project, all of these involved installations of 100 KW or less and this SDC co-financed project was AKRSP's first experience with 500 and 800 KW installations. The latter posed new challenges of design, volume, security, organisational set-up and finances, all of which had to be solved from scratch. The establishment of the two companies, the mixed financing model, and the use of a micro-grid approach and prepaid cards were all innovations, in which the authorities and other donors showed great interest, but for which there was no prior experience in Pakistan.

G2. Coherence issues.
"The participative methodology and conflict sensitive programme management approach applied in **Phase 1** have given Switzerland a good reputation amongst the poorer social groups in Chitral who see SDC as a credible advocate of their expectations vis-à-vis local and/or regional authorities. SDC's hands on approach and experience with the two largest micro hydels of the CDM project by AKRSP has taken on the character of a leading model and based on the findings of the SDC commissioned external review, has the potential to become the best practice example for the other schemes within the AKRSP CDM programme. SDC has become the driving partner among the other donors of the programme and will continue to actively aim for better donor coordination. As AKRSP is also the implementing partner of the KP Government for the construction of some of the micro hydels foreseen by the government, the potential of applying lessons learned and setting up best practice examples for the other schemes in the area through AKRSP is unique." (SDC, 2015: 6).
"In Chitral, various projects on energy and water management are being implemented and supported, among others by HSI, GIZ, PPAF, and KFW. Their experiences will be considered and synergies will be sought where possible in project and linked baselines, especially also with other SDC interventions in KP. Synergies and complementary actions will be further fostered and explored in close collaboration with the other donors of the AKRSP's CDM program and SDC's upcoming Water Governance Programme in KP, currently under preparation. Coordination and dialogue with the provincial and district authorities by SDC on a six monthly basis will help to steer the program. At the policy level, SDC has initiated bilateral talks at the federal/national level on water governance issues." (SDC, 2015: 8).

G3. Replicability issues.
MHP technology is replicable in principle, and the final evaluation found that "the Project is considered a role model, an innovative and pioneering project and its business model is being scaled up by the government of KPK with donors like Asian Development Bank" (Hunzai *et al*., 2019: 3). But some aspects of the project (the mixed grant-loan-equity financing, the PUC model, the exceptional location and its distinctive cultural features) made for difficulties in this case and with local variations may do likewise elsewhere. Thorough pre/feasibility studies of local conditions and circumstances are always going to be needed, with MHP technology being only one element of the replication, especially if a rural electrification project is to be presented as part of the climate emergency response and a solution to water security, gender inclusion and other issues.

G4. Partnership issues.
None noted beyond what seems to be a good relationship with AKRSP as key partner.

G5. Connectedness issues.
None noted beyond the effects of the collapsed carbon market and the risk analysis.

G6. Cross-cutting themes.
Gender. "Gender equality aspects were found to be strong in project participation. Women are included in the governing Boards of both MHPs, which are registered as legal companies or Community based Electricity Utilities (GENCOS/DISCOS). The project outcomes are intended to be more favorable to women and children, in terms of reduced workload, opportunities and extra hours for social, economic and educational activities. However, to support the general statements collected during the field visits and meetings respective baseline surveys and impact monitoring should be implemented and included in the operation concept." (SDC, 2014: 3). "Women will be equal partners when consulting and studying on Outcomes 1 & 2. The participatory approach ensures attendance in decision making organizations, committees, associations. All reporting will be based on gender segregated information." (SDC, 2015, Annex 7).
Governance. "The community ownership of the project is broad, facilitated by strong involvement of VOs/WOs and LSOs, and equity participation by over 90% of the project beneficiaries. Community participation in project implementation and management has been formalized through the creation of legal utilities, with dedicated committees for implementation, procurement and financial audit. The shareholders have elected Board of Directors, which include both men and women leaders. However, women are not included at the committee level. The decision-making processes are democratic, transparent and participatory. The interaction between local communities and local elected government is dormant at present, mainly because the district governments have been abolished for a considerable period now in Pakistan, and their functions have been taken over by the Deputy Commissioners or their equivalents. The provincial and district administration and elected National and Provincial Assembly members are generally supportive of community initiatives, especially MHPs, because it fills a key gap in public services. This creates an incentive and closer relationship between the district administration and the project, to work in support of each other, which means real reforms." (SDC, 2014: 3).

G7. Capacity building issues.
"Capacity building of stakeholders will ensure conflict sensitive planning, implementation and M&E at project level." (SDC, 2015: 8). "Some technical capacity building of the Chitral District Government will be included under the outputs for business development. Further collaboration and capacity building of the KP Government partners will be further developed in the upcoming Water Governance for KP Programme." (SDC, 2015: Annex 9). References to capacity building in the final evaluation report are all positioned in the future (e.g.: "AKRSP is likely to be responsible for capacity building and handholding of PUCs for another year, to enable them to run the enterprises at their own" - Hunzai *et al*., 2019: 27).

Part H: Other matters arising from the review

H1. Follow-on questions.
Question 1. *Why was the project was classified by SDC as a 'principal' adaptation project, and why as a water sector project with 'water security' in its title?*
Answer. Most probably because Renewable Energy wasn't and is still not a SDC topic (it's actually a SECO topic but usually not for community-based infrastructure, more private sector and bigger investments over 1 MW)

Question 2. *Are there any updates on the project after the final evaluation, and if so what did they find that could shed light on its mitigation and adaptation roles?*
Answer. The project ended 2019 and the SDC office has been closed mid 2020. After closure, we heard that the 2 communities sued AKRSP, but why exactly and for what I do not know. It must be linked with the bank loans.
Question 3. *What lessons have been learned by SDC about how this kind of project can best fit into a strategy of sustainable and climate smart development in the Hindukush or similar areas?*
Answer. As SDC decided to stop the IC [Institutional Cooperation?] program in the Hindukush this question has not been addressed.

H2. Missing documents.

- International Finance Corporation (IFC) Assessment of AKRSP MHP.
- Sustainability Plan Yadgar and Shandur (2018) (Revised SDC Comments).

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: The Aga Khan Rural Support Programme (AKRSP) and renewable energy.
In 2009, the AKRSP began a seven-year Clean Development Mechanism (CDM) program for rural electrification which was to develop 90 community-based MHPs with a total capacity of 15 MW. This was registered as CDM project number 1713 (http://cdm.unfccc.int/Projects/DB/DNV-CUK1204739473.81/view; SDC, 2014: 2), with an 'amount of reductions' given in the validation report as 87,477 tCO_2e/year (DNV, 2009). This would add up to 612,342 tCO_2e Certified Emission Reductions (CERs) over the first seven years for which AKRSP had signed an Emission Reduction Purchase Agreement (ERPA) with the World Bank. The total program cost was estimated at USD 18 million and the main funding partners of AKRSP for the 40 units that were under construction at the time were KfW, the Acumen Fund, and the World Bank through the Pakistan Poverty Alleviation Fund (PPAF), and SDC (SDC, 2015: 5).

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Part J: Acronyms and abbreviations

AKRSP	Aga Khan Rural Support Program
CER	Certified Emission Reduction

CDCF	Carbon Development Community Fund
CDM	Clean Development Mechanism
CHDF	Chitral Hydropower Development Forum
DRR	Disaster risk reduction
ERPA	Emissions Reduction Purchase Agreement
KfW	Kreditanstalt für Wiederaufbau
KP	Khyber Pakhtunkhwa, formerly NW Frontier Province
LSO	Local Support Organization
MHP	Micro/mini hydropower
PPAF	Pakistan Poverty Alleviation Fund
PUC	Power Utility Company
VO	Village Organization
WO	Women Organization

Annex 13.11: Adaptation in the Indian Himalayas (IHCAP)

Project highlights.

7F-08037: **Indian Himalayas Climate Adaptation Programme (IHCAP)**. Addressing destabilised glacial and permafrost systems across the Himalayas, the project promoted knowledge exchange on climate change and adaptation between states and with national government, built state government capacity for vulnerability assessment and adaptation planning, and facilitated training in glaciology and groundwater catchment management.

Part A: Basic data

A1. Project number & name. 7F-08037 - 1: Himalaya Climate Adaptation. 2: Indian Himalayas Climate Adaptation Programme.

A2. Sources.
Process of PRF development: (a) a draft PRF was prepared by the core team using documents listed in the bibliography and with input by remote interviewees listed in Annex 13.22; (b) the draft PRF was reviewed by the national consultant **Pankaj Kumar**, who conducted interviews listed in Annex 13.22; and (c) the PRF was revised by the core team in light of field findings.

- IHCAP, 2011-2015: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2011/7F08037/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- IHCAP, 2016-2021: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2011/7F08037/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html
- https://www.weadapt.org/knowledge-base/sdc-climate-change-environment-network/indian-himalayas-climate-adaptation-programme
- http://dest.hp.gov.in/?q=indian-himalayas-climate-adaptation-programme-ihcap
- National Mission for Sustaining the Himalayan Ecosystem (NMSHE, part of the National Action Plan on Climate Change, NAPCC), Departnent of Science and Technology, Ministry of Science and Technology, Government of India:(http://glaciology.in/about-ihcap/)
- University of Zurich (https://eclim-research.ch/ihcap/)
- University of Geneva (https://www.unige.ch/environnement/en/research/ihcap/)

A3. Dates & financial data.
Phase 1 (2012-2015): Budget CHF 3,720,000 (disbursement CHF 3,354,922).
Phase 2 (2016-2019 - expenditure continued to March 2021 in the SDC spreadsheet): budget CHF 2,840,800

A4. Location(s).
Phase 1 (2012-2015): India, Himachal Pradesh.
Phase 2 (2016-2019): India, 12 Himalayan States (Ladakh, Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, West Bengal, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Assam]

A5. SDC Geography. South Asia: India

A6. SDC Domain. Global Programme Climate Change and Environment.

A7. Partners.

- **Phase 1 (2012-2015)**: Meteodat GmbH, University of Zurich, University of Fribourg, University of Bern, University of Geneva, Himachal Pradesh Council for Science and Technology, Himachal Pradesh Centre for Climate Change (HPCCC), GB Pant Institute for Himalayan Environment and Development (GBPIHED).
- **Phase 2 (2016-2019)**:
  - Contract partners: Foreign academic and research organisation; Swiss Academic and Research Institution; Other Academic Research North; Research Organisation of South East; University of Geneva; Swiss Universities or FHS.
  - IHCAP Programme Management Unit (PMU), University of Geneva (for direct mandate)

- Other partners: Government of India Department of Science and Technology; Ministry of Environment, Forests and Climate Change; Departments/Nodal Agencies of Himalayan States; other National, regional and international organisations (such as ICIMOD).
- Coordination with: 3SCA[35], PACC[36], GLOF Yarkant River China[37], Glaciares+[38], SMD4GC[39], CC&E and DRR network, ICIMOD, GIZ, DFID, UNDP.

Part B: Purpose, relevance and approach

B1. Purpose.

Overall goal of Phase 1 (2012-2015) and Phase 2 (2016-2019): "The resilience of vulnerable communities in the Himalayas [is] strengthened and knowledge and capacities of research institutions, communities and decision-makers are connected and enhanced." (SDC, 2011, 2012a, b, 2015).

Outcome 1 (*Knowledge increased on impacts of and vulnerability to climate change of the Himalayan socio-ecological system*). Important elements of this outcome entail collaborative research and knowledge sharing on climate change hazards, impact, vulnerability and risks assessment and adaptation between institutions at national, regional and global levels.

- **Phase 1 (start: participatory and scientific studies of glaciology and hydrology)**: "Scientists, policy makers and communities have enhanced capacities and a better understanding of climate change dynamics and scenarios on snow, glaciers and water flows for formulating adaptation policy and practice." (SDC, 2011).
- **Phase 1 (end: technical cooperation among state institutions)**: "Operational cooperation among state level stakeholders is functional for climate adaptation planning and implementation" (Moors *et al*., 2015).
- **Phase 2 (start/end: knowledge management for awareness of vulnerability**): "Knowledge increased on impacts of and vulnerability to climate change of the Himalayan socio-ecological system" (SDC, 2015; Stumm *et al*., 2019).

Outcome 2 (*Capacities of academic and public institutions to address climate change in the Indian Himalayan Region are enhanced*). This outcome envisages strengthening State level processes for integrating science in to climate adaptation planning and later implementing climate change adaptation measures by building capacities, facilitate access to finance for adaptation projects and demonstrate science- policy practice.

- **Phase 1 (start: environmental education and adaptation choice awareness)**: "Local communities and decision makers understand climate change vulnerabilities and impacts and develop and apply suitable adaptation measures." (SDC, 2011).
- **Phase 1 (end: scientific studies of glaciology and hydrology)**: "Stakeholders better understand and further develop their understanding related to the scientific dimension of climate change dynamics and scenarios on snow, glaciers and water flows." (Moors *et al*., 2015).
- **Phase 2 (start/end: technical capacity building in apex institutions)**: Capacities of academic and public institutions to address climate change in the Indian Himalayan Region are enhanced (SDC, 2015; Stumm *et al*., 2019).

Outcome 3 (*Awareness is increased, policymakers are informed and knowledge is disseminated in Indian Himalayan Region, Hindu Kush Himalayas and beyond*). This focuses on sharing new knowledge, understanding and experiences at national, regional and global levels to bridge the knowledge and science-policy-practice deficit.

- **Phase 1 (start: policy development and adaptation mainstreaming)**: "Key sectoral policies of the Himalayan States are coordinated, strengthened and adaptation policies are mainstreamed for improved action." (SDC, 2011).

[35] 7F-08954: *Strengthening State Strategies for Climate Action (3SCA)* was launched in 2016 in Uttarakhand, Sikkim and Madhya Pradesh, to strengthen capacities of state level departments and relevant institutions to plan and undertake specific interventions in climate sensitive sectors impacting large sections of vulnerable communities in these states.

[36] 7F-05409: *Climate Change Adaptation Programme (Perú)*.

[37] 7F-07733: *Climate Change Adaptation in China: Monitoring and Early Warning of Glacier Lake Outburst Floods in the Area of the Yarkant River*.

[38] 7F-07833: *GLACIARES+: Risk management and Productive use of water from melting glaciers* (Perú).

[39] 7F-08758: *Promoting Sustainable Mountain Development for Global Change (SMD4GC)*, 2013 to 2018 (various countries, e.g. in Africa - http://arcosnetwork.org/uploads/2017/06/SMD4GC_Flyer.pdf).

- **Phase 1 (end: policy development and adaptation mainstreaming)**: "Himalayan States review and integrate Climate Change aspects in their development policies, plans and practises." (Moors *et al*., 2015).
- **Phase 2 (start/end: awareness-raising)**: Awareness is increased, policymakers are informed and knowledge is disseminated in Indian Himalayan Region, Hindu Kush Himalayas and beyond (SDC, 2015; Stumm *et al*., 2019).

B2. Relevance to partners.

India.

- "The National Action Plan on Climate Change (NAPCC) provides a sharper focus on required interventions. Currently, NAPCC is implemented through eight National Missions, outlining priorities for mitigation and adaptation to combat climate change." (GoI, 2016: 7). One of eight key NDC commitments for 2021-2030 is: "6. To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, **Himalayan region**, coastal regions, health and disaster management." (GoI, 2016: 29).
- In more detail: "**Himalayan Ecosystem**: The Himalayas form the most important concentration of snow covered region outside the polar region. It is highly sensitive to global warming. The detailed glacier inventory of Indian Himalayas indicates presence of 9579 glaciers in the Himalayas, some of which form the perennial source of major rivers. The **National Mission for Sustaining the Himalayan Ecosystem** (NMSHE) addresses important issues concerning Himalayan Glaciers and the associated hydrological consequences, biodiversity and wildlife conservation and protection, traditional knowledge societies and their livelihood and planning for sustaining of the Himalayan Ecosystem. Government has also launched **National Mission on Himalayan Studies** to complement NMSHE with the objective of building a body of scientific and traditional knowledge along with demonstrating replicable solutions to the problems in thematic areas including natural resource management, capacity building, long-term ecological monitoring etc."
- (GoI, 2016: 25). Stumm *et al*. (2019): "IHCAP phase 2 ... is well embedded in the national context and is very relevant for the national and state governments, as well as for academic institutions and non-governmental organisations. The programme has been launched in partnership with DST with the aim to contribute to NMSHE to strengthen climate science and capacities for climate change adaptation planning in IHR on national level. IHCAP phase 2 addresses also the demands from the state governments for capacity building and technical support to prepare adaptation projects, which is essential for the implementation of the State Action Plans on Climate Change (SAPCC). The demands were based on the need for new knowledge on climate science, availability and access to data and information, increased capacity at sub-national level and efficient science-policy-practise connect." (page 4).

Switzerland. "The programme offers SDC a unique opportunity for generating and disseminating 'globally relevant' local knowledge, developing solutions for addressing climate change impacts on communities in the Indian Himalayan region and deepening international understanding on the issues. The programme is positioned within the framework of programmes supported by additional development funds approved by the Swiss Parliament in the frame of '0.5 GNI Bill'. It will contribute directly to climate change objectives: (i) Adaptation measures are integrated at national, regional and local levels; and (ii) Authorities and communities are aware of climate change impacts and their capacities for resilience and risk prevention are increased. The bill lays a special emphasis on mountain resources as they are an early indicator of climate change impacts. The proposal contributes positively to the Global Programme on Climate Change (GPCC), towards realization of the specific mandate of 'Managing the Unavoidable'. It undertakes this by demonstrating possibilities for achievement of climate resilience in development programmes, and alongside complements and supplements the ongoing climate adaptation programme in. India. ... The programme will draw from Swiss and local knowledge; expertise and experiences on climate science and impacts on mountain ecosystems and water. The proposed programme will feed the results and learning into the global policy dialogue and global research on climate change." (SDC, 2011: Summary).

General. Capacity to understand, plan for, monitor, etc. montane glacier behaviour under climate change is of widespread relevance for adaptation (see H3.1): preparedness for disasters both acute (e.g. GLOFs, land-slides) and slow-acting (e.g. drought and failure/alteration of river flow/irrigation systems, including famine and permanent mass population movements).

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 13: Climate Action**, especially: Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*), and Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 15: Life on Land**, especially Target 15.4 (*By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development*).

B4. Relevance to other development objectives.

- **OECD Sector**: General Environment Protection, Water Supply & Sanitation.
- **Sub-Sector according to the OECD DAC categorisation**: Environmental policy and administrative management, Water resources conservation (including data collection).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Nil.
Adaptation: Capacity-based adaptation (CA).

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. NOT (0)
- **Adaptation**. PRINCIPAL (2)

Part C: Narrative overview

Background and purpose

Global heating is destabilising glacial and permafrost systems across the Himalayas, jeopardising local and downstream lives (from landslides and floods) and livelihoods (from irregular and declining water supply). In the Indian Himalayan Region (IHR) this applies across an immense area of complex terrain inhabited by diverse peoples, with downstream consequences for a billion people or more (see H3.1). It calls for several strategies, including: (a) **scientific research and knowledge management** to build understanding of biophysical processes, how they operate in the IHR in a changing climate, their consequences at all spatial scales, and the options for mitigating risk and vulnerability in the short and long terms; (b) **outreach, training and technical capacity building** to enhance the quality of state and national government policies, plans and investment strategies to reduce risk and vulnerability in the short and long terms, both by addressing their root causes and increasing early warning and response capabilities; and (c) **participatory strengthening of local ecological and social systems** across the IHR to resolve root causes of deforestation, erosion, lack of groundwater recharge, etc.

The IHCAP project was initially designed with all three dimensions in mind, and the project designers envisioned a smooth integration of science-led community, state and national policy and action, which is elegantly captured in the overall goal but raises questions about the relationship between science and traditional ecological knowledge, and between the three main levels of Indian governance, and how these would work out in practice. By 2015, the project had largely shed its community orientation in favour of working with academic and government institutions. Thus, the review of Phase 1 (Moors *et al*., 2015) mentions 'community' relevantly 14 times in 25 pages while the review of Phase 2 (Stumm *et al*., 2019) does so only once in 16 pages. Consistent with this is that "Community level capacity building was not attempted under the Phase 1, which needs to be integrated in the overall capacity building approach in future." (Moors *et al*., 2015: 13). In practice, therefore, rather than meeting community needs (e.g. land tenure and participatory action on local environmental security) the project that emerged during Phase 1 focused on the needs of apex institutions (e.g. scientific research and state planning). It therefore strengthened the Indian academic research and state planning sectors, first in one state (Himachal Pradesh) in Phase 1, and then in 12 (with Manipur responding most positively) in Phase 2. The review of Phase 2 (Stumm *et al*., 2019: 12-16) recommended giving priority to the following areas:

- **Climate adaptation actions**: early warning systems for state and city governments[40], including a unified framework for early warning system need assessment, choice of technology appropriate to the biophysical environment, use of advanced and automated systems, and integration of technology to supplement and complement the efforts of national institutions.
- **Knowledge generation on permafrost**: Indo-Swiss collaboration to expand permafrost, snow and glacier observation networks including on-site and remote sensing observations to inform hazard assessments (since permafrost is often at the beginning of cascading hazard chains).
- **Capacity building**: training for government officials on disaster risk reduction; processing and analysing of data and knowledge to produce e.g. maps, data projections and scenarios for use in designing and prioritising adaptation actions; promoting interdisciplinary approaches to do justice to the complex issues in the IHR; and improved institutional memory strategy.
- **Knowledge portals and networking**: a common platform that will help the states manage their current data and "create a sense of competition across the states"; "long-term knowledge portals"; and a platform for networking amongst trained fellows.

Effectiveness and impact

Highlights of **overall effectiveness/impact in Phase 1** included: good knowledge exchange; good networks and trust; effective dialogue on climate change and adaptation between state and national governments; some knowledge exchange between states (interviewees noted knowledge exchange involving Manipur and neighbouring states Nagaland, Mizoram, Assam); but less so for local implementation. Outcome 1 yielded good results from vulnerability assessment training; weakness on gender; Outcome 2 showed delayed glaciology training due to institutional/administrative issues, and the non-delivery of Level 3 training; while Outcome 3 produced good results with the media training; questionable results from policy briefs. Highlights of **overall effectiveness/impact in Phase 2** included increased knowledge on vulnerabilities and risks, water security and other CCA issues. Outcome 1 yielded trained people in glaciology and groundwater catchment management (with interviewees noting that these people later mapped some 8,000 'springsheds' (water catchments that feed springs) in the Himalayan states (see: Siddique *et al*., 2019; Gupta & Kulkarni, 2018), and that ACWADAM also extended its work to the Eastern and Western Ghats); Outcome 2 produced state government people trained in vulnerability and risk assessment, who are using their new knowledge in CCA action planning; and Outcome 3 involved participation at national and state level conferences and workshops, and international events. The overall scores for effectiveness and impact were 5 for each.

Sustainability and transformative potential

Outcome 1 sustainability indicators included that for catchment studies and workshops there was at least some influence via *NITI Aayog* (National Policy Commission) and the Himalayan University Consortium which was institutionalised via ICIMOD. Those for Outcome 2 included that the state governments learned how to conduct **State Vulnerability Assessments**, and to prepare enhanced **State Adaptation Action Plans**. And those for Outcome 3 sustainability indicators included that a number of **significant net effects of IHCAP participation** have been identified in the Himalayan states. These add up to an important set of outcomes that appear strongly sustainable, yielding an overall score of 6. In summary, therefore, IHCAP was a low-cost (at about CHF 6.5 million) and effective project within its target system of academia and both national and state government levels, and is judged to have had strongly sustainable effects and high **transformative potential** for adaptation within that system. Transformative effects beyond it would depend on the consequences for local ecological and social systems, and whether enhanced knowledge and planning capacity would translate into action to resolve root causes of deforestation, erosion, lack of groundwater recharge, etc.

Part D: Design quality

D1. Theory of change.

Global heating is increasingly destabilising glacial and permafrost systems across the Himalayas, jeopardising local and downstream lives (from landslides and floods) and livelihoods (from irregular water supply and water scarcity). The original credit proposal (SDC, 2011)

[40] **State and city initiatives outside the IHR include**: the state of Odisha (early warning system for the Mahanadi Basin), the state of Gujarat (heat action plan), the city of Surat (riverine flooding), the city of Kolkata (storm water management), and city of Chennai (monitoring water logging in smart city development area).

offered the following rationale for the project. "Communities living in the Indian Himalayan Region (IHR) feel climate change impacts due to the cascading effects of variability and shifts in ecosystem - water, forest and agro-biodiversity and increased frequency and intensity of extreme weather events and natural hazards." The same source noted the strategic importance given by the Government of India (GoI) to sustainability of the Indian Himalayas, and that GoI is seeking international partnerships to strengthen its scientific research capacity in the field of glaciology, hydrology and climatology in order to develop effective adaptation strategies. The design flowed from this approach, by focusing on training Indian scientists and state government officials to understand key biophysical features of the Himalayan part of the cryosphere (Outcome 1), to use this scientific knowledge better to identify risks and plan for their management (Outcome 2), while also raising awareness of the issues among the broader community of Himalayan, state and national stakeholders.

D2. Assumptions underlying the theory of change.
The following assumptions relate to the project as implemented during the period of review (i.e. 2015 onwards).
Assumption 1. That building capacity for conducting quality scientific research on glaciology and in related disciplines will lead to better-informed adaptation planning decisions.
Assumption 2. That building capacity for vulnerability and risk assessment among state government officials will lead to more effective DRR and preparedness planning.
Assumption 3. That increased understanding and awareness of montane ice dynamics and their hydrological implications under climate change conditions, as well as vulnerability, risk and risk reduction options among national and state policy makers and the general public, will tend to encourage better adaptation planning.

D3. Plausibility of assumptions and links.
The three assumptions in D2 are plausible.

D4. General quality of the project design.
Stakeholders and consultation. Phase 1 directly involved 51 Indian researchers, 127 Himachal Pradesh state government officials, outreach to other Himalayan state governments (which were described by SDC, 2015: 1 as "keen for similar orientation and training programme in their states"), and "activities such as media training (120 journalists) and policy platforms including Parliamentarian Forum [which] resulted in informed dialogue and consultations on climate change and sustainable mountain development in IHR" (SDC, 2015: 1). While it is not clear what consultations occurred before Phase 1, adequate involvement of apex institution stakeholders seems to have occurred during Phase 1 to validate Phase 2.
Risks. SDC (2011) assessed the main risks as: (a) inaccessibility of glacial retreat and water data due to geopolitical sensitivity and transboundary; (b) political sensitivities in certain areas (e.g. Jammu & Kashmir); and (c) partners not having the capacity (or being unwilling) to cooperate with each other. These were to be mitigated through dialogue with all parties and by selecting the most willing and able states and institutional partners. SDC (2015) presented a risk management analysis that emphasised: (a) the challenges of working with multiple state governments and their respective agencies, to be off-set by obtaining suitable letters of authority; (b) lack of data sharing and access to certain geographical regions for Swiss experts, to be off-set by relying on Indian partner institutions to collect data; (c) various other risks that were considered minor, including changing personnel, priorities and budgets within the Indian government system.
Score: Clarity of purpose and explanation is somewhat compromised because the overall goal of the project, which remained constant in 2011-2019, came to diverge from the outcomes during implementation, and the project documents are generally lacking in clarity on the specific chains of causality involved. But the design was good within its target system of national and state government, and academia. **Score**: 5.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness. Not applicable.

E2. System change. Not applicable.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.

Effectiveness and impact (score 5 for each).

Phase 1. Highlights of **overall effectiveness/impact** included: good knowledge exchange; good networks and trust; effective dialogue on climate change and adaptation between state and national governments; some knowledge exchange between states (interviewees noted knowledge exchange involving Manipur and neighbouring states Nagaland, Mizoram, Assam); but less so for local implementation (Moors *et al*., 2015). Outcome 1 yielded good results from vulnerability assessment training; weakness on gender; Outcome 2 showed delayed glaciology training due to institutional/administrative issues, and the non-delivery of Level 3 training; while Outcome 3 produced good results with the media training; questionable results from policy briefs. Key achievements of IHCAP Phase I are also listed by Barrott (2021) as follows:

- 51 young Indian researchers including 12 women researchers were trained in glaciology and related areas.
- 127 representatives from the state government of Himachal Pradesh were given provided orientation and training in climate change adaptation planning and implementation.
- A state-of-the-art integrated framework for vulnerability, risks and hazards assessment was developed and applied in Kullu district, Himachal Pradesh.
- 13 collaborative studies conducted between experts from India and Switzerland on topics such as climate baseline, cryosphere assessment and risks and hazards assessment in Kullu district; based on the studies, 25 research publications have been published in scientific journals and presented at national and international conferences.
- 120 journalists were sensitized to climate change adaptation in the Indian Himalayan Region through four media workshops, resulting in about 30 published news articles on climate change adaptation issues.
- Rs. 43.86 crore [Rs 438.6 million = CHF 5.4 million] were mobilised under the National Adaptation Fund for Climate Change (NAFCC) through technical assistance provided for climate-resilient agriculture in Himachal Pradesh and Jammu and Kashmir.
- 143 Himalayan researchers' understanding of environmental challenges strengthened including on climate change impacts.
- Over 26,000 individuals were contacted through pre-arrival, on-platform and post-departure activities in support of the Science Express Climate Action Special train.

Phase 2. Highlights of **overall effectiveness/impact** included increased knowledge on vulnerabilities and risks, water security and other CCA issues (Stumm *et al*., 2019). Outcome 1 yielded trained people in glaciology and groundwater catchment management (with interviewees noting that these people later mapped some 8,000 springsheds in the Himalayan states, and that ACWADAM also extended its work to the Eastern and Western Ghats); Outcome 2 produced state government people trained in vulnerability and risk assessment, who are using their new knowledge in CCA action planning; and Outcome 3 involved participation at national and state level conferences and workshops, and international events.

Sustainability (score 6).

Outcome 1 sustainability indicators included that for catchment studies and workshops there was at least some influence via *NITI Aayog* (National Policy Commission) and the Himalayan University Consortium which was institutionalised via ICIMOD (see H3.2). Those for Outcome 2 included: that the state governments learned how to conduct **Climate Vulnerability Assessments** (CVAs, see below 1), which supported revision of **State Action Plans on Climate Change** (SAPCCs, see below 2). Outcome 3 sustainability indicators included that Manipur state government had adopted media fellowships and plans to continue funding them (with some interest too in Tripura and Nagaland). Participating in IHCAP had a number of important **consequences for the Himalayan states** (see below 3).

1. Climate Vulnerability Assessments.

State CVAs were prepared using a common framework by the governments of the 12 Himalayan states in partnership with the Government of India's Department of Science and Technology. Aims included: (a) to develop the first comparable maps for the IHR using a common framework, thus helping in decision-making at the national and sub-national level; and (b) to develop climate vulnerability assessment capacity at the state level in the Himalayan region. The CVAs identified priority sectors and locations within each state where the drivers of vulnerability were most amenable to being addressed through specific adaptation actions. As a result, for the first time ever multiple states developed climate vulnerability maps using a

common framework. The state governments used the methodology and their new capacities in a variety of contexts and purposes, including the following.

- **Jammu and Kashmir** in the western Himalayas used the CVA to prioritise climate-smart agriculture[41]. The project is being funded by the Ministry of Environment, Forest and Climate Change.
- **Nine of the Himalayan states** are using CVA results and methodology to support the preparation of their SAPCCs, which all state governments are in different stages of revising.
- **Mizoram** in the eastern Himalayas has launched a state-wide public awareness campaign on climate change, its impacts and possible adaptation measures using its CVA as the basis for this.
- **West Bengal** has developed a decision support system for prioritising springshed management project sites in the Darjeeling hills for which the CVA map forms an input layer.
- **West Bengal** took advantage of CVA training to develop its own block-level maps for the Darjeeling Himalayan region.

2. State Action Plans on Climate Change.

The SAPCCs aim to mainstream CCA into development planning at state level. They were prepared by the state governments following and linked to India's National Action Plan on Climate Change (NAPCC). They are also linked to the vulnerability assessment, capacity building and public awareness parts of the NMSHE. They include aspects such as the climate profile, vulnerability assessments, sectoral CC strategies and CC action plans. Their focus is largely on adaptation, and they allow for adaptation activities to be organised through the existing plans and projects of various government agencies, the key sectors being Agriculture and Allied, Forest and Biodiversity, Water Resources, Energy, and Sustainable Habitat.
Support to the SAPCC process from IHCAP focused on: CVA preparation; building the capacity of government officials at multiple levels on adaptation planning and implementation; and media workshops and fellowships for promoting reporting of climate change impacts and responses.
Since the SAPCCs identified many necessary activities among which the state governments found it hard to prioritise, implementation has been constrained by limited public resources and capacities. In practice, therefore, the SAPCCs are also used for developing adaptation project proposals with which to seek funding support from government and other agencies.

3. Consequences of IHCAP participation for the Himalayan states.

The governments of the Himalayan states changed their approaches to CCA significantly as a result of their participation in IHCAP:

- **Two state governments** (Jammu and Kashmir, West Bengal) adopted an evidence-based approach to identifying locations for adaptation projects.
- **Ten state governments** (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Jammu and Kashmir, West Bengal) used the latest vulnerability assessment methodology.
- **Three state governments** (Mizoram, Tripura, Jammu and Kashmir) have institutionalised capacity building activities relevant to CCA through memoranda of understanding between the climate change nodal departments and state training institutions.
- **Three state governments** (Manipur, Mizoram, Nagaland) have systematically engaged local media in enhancing public awareness on climate change issues.
- **Three states** (Himachal Pradesh, Jammu and Kashmir, West Bengal) benefited from the incremental mobilisation of public funds equivalent to about CHF 10 million for climate change adaptation activities.

F2. System change. The project provided multi-stakeholder platforms for exchange of knowledge and policy influence. Partnerships fostered by the project paved the ways for furthering work on CCA on springshed conservation in India. Capacity building at various levels and partnerships with the state climate change cells yielded many key outcomes, especially in the understanding of climate change concepts and incorporating this understanding in planning processes. All in all, the impact and sustainability effects summarised in F1 are so pervasive

[41] Climate-smart agriculture is understood to mean: "using approaches that proactively facilitate environmentally sustainable agricultural development and promote adaptation and resilience to a changing climate through (a) development/rehabilitation of the natural resource base and more sustainable and efficient use of natural resources (b) minimizing environmental impacts such as pollution; (c) contributing to low-carbon economic development; (d) minimizing the vulnerability of human and natural systems to extreme climate events due to climate change, and (e) building capacity of farmers and other stakeholders to adjust and respond to the effects of climate change" (Danida, 2014).

and strategic that high transformative potential for adaptation is recognised. The only drawback is that involvement at community level had to be indirect, and that not every local and regional institution with an interest in CCA could be involved in practice.

Part G: Other aspects of design and performance

G1. Efficiency issues.
"The information available on the programme's budget is limited. However, the strategy included suitable cost sharing with DST for some programme components. Additionally, the programme managed to leverage funds from NMSHE. The majority of activities were planned and carried out timely, except for few training and meeting events which were delayed at the time of the review. For the Indian-Swiss research collaboration, time and effort was invested, which didn't yield results." (Stumm *et al*., 2019: 6). "The programme [was] large and complex, involving many stakeholders and requiring a fair amount of coordination and communication. The PMU handled this big task remarkably efficient[ly], [but] would have benefitted from a simpler programme or expanded team." Ibid.).

G2. Coherence issues. Internally, "the programme components operated largely as independent entities with some lack of cohesion. Reasons might be the limited link between programme topics, the large variety of involved partners and the communication strategy that didn't foresee interactions between programme components. The programme may would have benefited from a more focused and streamlined approach, utilising synergies between the programme components." (Stumm *et al*., 2019: 6).

G3. Replicability issues. The replication of vulnerability assessments from one to 12 states, even with varied uptake and consequences (e.g. led by Manipur), suggests that it met a need and helped the state governments deliver on what they perceived to be their CCA (or at least DRR) mandates. The fact that vulnerability assessments have proved equally useful in Africa (e.g. 7F-08531) confirms that all countries require the capacity to perform competent vulnerability assessments, as well as understanding and choice awareness among their options for climate change adaptation and mitigation).

G4. Partnership issues. "Indo-Swiss collaborative research and knowledge sharing in climate science related projects could not be established. As [a] suitable alternative strategy, SDC engaged the International Centre for Integrated Mountain Development (ICIMOD) with a mandate to involve Swiss researchers to support ICIMOD's Himalayan University Consortium (HUC) Initiative in knowledge building and networking activities in the Hindu Kush Himalaya (HKH) region."

G5. Connectedness issues.
The Phase 2 review put it succinctly: "IHCAP is embedded in a global context where mountains have been recognized as regions most vulnerable to climate change" (Stumm *et al*., 2019: 1), as did the Phase 2 credit proposal: "The Indian Himalayan Region (IHR) is the 'ecological reservoir' of the entire Hindukush Himalayan region due to its rich biodiversity and the ecological services it provides from its forests, snow, ice and river water. With a geographical coverage of over 0.54 million km^2 and 51 million people living in these areas, the region is facing important challenges with respect to climate change. The impacts of climate change affect not just the mountain region but also livelihoods of [more than a billion] people living downstream." (SDC, 2015: 1). The whole region is affected by variable (and with climate change increasingly unstable) monsoonal and ENSO weather systems, and locally by the potential for GLOFs due to melting glaciers and land-slides in a seismically active region with an unconsolidated and fragile geology.

G6. Cross-cutting themes.
- "The research networks will include components of socio-economic vulnerability due to climate change impacts, in particular, the vulnerabilities of women and the disadvantaged social groups, strategies to mainstream gender aspects and undertake economic analysis to assess the cost of adaptation action or inaction. ... The recommendations from the Review [Moors *et al*., 2015] to integrate gender in the training programme for adaptation planning will be addressed." (SDC, 2015: 5-6)."
- The project's strong focus on gender was appreciated. Other disadvantaged social groups such as representatives of lower casts, indigenous people, etc. may also be relevant." (SeSi+, 2015).

- "The programme didn't plan nor had any gender-specific results. For some trainings, the diversity, inclusion and gender-balance of participants was promoted." (Stumm *et al*., 2019: 6).
- For capacity building and training programmes, at interview ICIMOD shared that they ensured gender balance, even if it required them to put extra effort (see also ICIMOD, 2020).

G7. Capacity building issues.
The Phase 1 review identified the need, endorsed by the GoI Department of Science and Technology, for a "comprehensive capacity building strategy outlining the needs of different stakeholders required for facilitating effective [Adaptation to Climate Change] at the local level" (Moors *et al*., 2015: 10-11). The Phase 2 review confirmed that although the programme had provided useful training in the areas of glaciology and vulnerability assessment, there remained a strong need across all departments within the state governments for increased training in the area of DRR "which should include planning, safeguard, management and rehabilitation" (Stumm *et al*., 2019: 13). The consequences of attention to capacity building in Phases 2 and 3 are summarised in F1.

Part H: Other matters arising from the review

H1. Follow-on questions. These focused on the content and usefulness of the state-level vulnerability assessments and adaptation action plans, and on the consequences for the Himalayan states of participating in IHCAP, and the answers are integrated in the text.

H2. Missing documents. None noted.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: Himalayan vulnerabilities
a) Overview.
"The earliest indicators of climate change impacts are invariably experienced in mountain areas. Melting of snow and glaciers impacts, macro and micro climatic systems, which in turn have spiralling impacts on water, food and livelihood security. This is critical in the context of the Indian Himalayan Region (IHR), as the region is a repository of enormous freshwater resources. Nearly 17% of IHR is under permanent snow cover and glaciers, and about 30 - 40% under seasonal snow cover. The run-off of the Himalayan Rivers are the main source of livelihood for 40 million residing in the mountains as well as for over 500 million people living in the downstream by providing for irrigation, drinking water, and agriculture.
"The IHR spreads over more than 0.54 million km' that equals 16.2% of India's total geographic area and accounts for one-third of India's forest cover. About one-fourth of the population lives below the poverty line in the IHR: Nearly 80% of the people living in the mountain region rely on natural resources for their livelihood, making them vulnerable to variability in climate, cropping pattern shifts, uncertain crop productivity, reduced water availability and shifts in tree line. The IHR is showing signs of susceptibility to climate change impacts. Limited studies on glaciers have shown retreat of these glaciers due to combination of factors from geomorphological changes to climate variability. There is growing empirical evidence of change in composition and distribution of natural resources - water, forest and agro-biodiversity. At the same time there is increase in frequency and intensity of extreme weather events and natural hazards in mountain region. These changes result in multiple impacts on the food, water and livelihood security of the rural community, especially women, increasing their burden and drudgery in resource collection (water. fuel, fodder, etc.). Women in the mountain region are knowledge holders of managing natural resources, and potentially play a significant role in developing and implementing innovations towards climate resilient development." (SDC, 2011: 2).
b) Example of a lake outburst and debris flow disaster.
"Heavy rainfall in June 2013 triggered flash flooding and landslides throughout the Indian Himalayan state of Uttarakhand, killing more than 6000 people. The vast majority of fatalities and destruction resulted directly from a lake outburst and debris flow disaster originating from above the village of Kedarnath on June 16 and 17. Here, we provide a systematic analysis of the contributing factors leading to the Kedarnath disaster, both in terms of hydrometeorological triggering and topographic predisposition. Topographic characteristics of the lake watershed above Kedarnath are compared with other glacial lakes across the north-western Himalayan states of Uttarakhand and Himachal Pradesh, and implications for glacier lake outburst hazard assessment in a changing climate are discussed. Our analysis suggests that the early onset of heavy monsoon rainfall (390 mm, June 10–17) immediately following a 4-week period of

unusually rapid snow cover depletion and elevated streamflow was the crucial hydrometeorological factor, resulting in slope saturation and significant run-off into the small seasonal glacial lake. Between mid-May and mid-June 2013, snow-covered area above Kedarnath decreased by around 50 %. The unusual situation of the lake being dammed in a steep, unstable paraglacial environment but fed entirely from snowmelt and rainfall within a fluvial dominated watershed is important in the context of this disaster. A simple scheme enabling large-scale recognition of such an unfavourable topographic setting is introduced. In view of projected 21st century changes in monsoon timing and heavy precipitation in South Asia, more emphasis should be given to potential hydrometeorological triggering of lake outburst and debris flow disasters in the Himalaya." (Allen *et al*., 2016).

c) Knowledge needs in climate adaptation policy.

"Mountain ecosystems around the world are recognized to be among the most vulnerable to the impacts of climate change. The need to develop sound adaptation strategies in these areas is growing. Knowledge from the natural sciences has an important role to play in the development of adaptation strategies. However, the extent of and gaps in such knowledge have not been systematically investigated for mountain areas. This paper analyses the status of knowledge from natural science disciplines and research needs relevant to the national and subnational climate adaptation policies of 1 US state (Washington) and 7 countries (Austria, Bhutan, Colombia, Germany, Nepal, Peru, and Switzerland), in particular the elements of those policies focused on mountain areas. In addition, we asked key individuals involved in drafting those policies to answer a short questionnaire. We found that research needs mainly concern impact and vulnerability assessments at regional and local levels, integrated assessments, and improved climate and socioeconomic data. These needs are often related to the challenges to data coverage and model performance in mountainous areas. In these areas, the base data are often riddled with gaps and uncertainties, making it particularly difficult to formulate adaptation strategies. In countries where data coverage is less of an issue, there is a tendency to explore quantitative forms of impact and vulnerability assessments. We highlight how the knowledge embedded in natural science disciplines is not always useful to address complex vulnerabilities in coupled human and natural systems and briefly refer to alternative pathways to adaptation in the form of no-regret, flexible, and adaptive management solutions. Finally, in recognition of the trans- and interdisciplinary nature of climate change adaptation, we raise the question of which knowledge production paradigms are best able to deliver sustainable adaptations to growing environmental stressors in mountain regions." (Muccione *et al*., 2016).

H3.2 The Himalayan University Consortium (HUC)

The International Centre for Integrated Mountain Development (ICIMOD) was funded by SDC through IHCAP and direct support to strengthen the Himalayan University Consortium (HUC) through studies of ice and snow, training courses and seed and seedling grants. The goal of HUC is to achieve a position where regional academic institutions are capable of generating high-quality knowledge, capacity, and skills for sustainable mountain development in the Hindu Kush Himalaya (HKH) region, through outcomes that include "enhanced collaboration and networking among Himalayan universities leading to increased capacity of professional women and men for sustainable mountain development through mountain-specific education." (ICIMOD, 2021). It has 60 Full Members comprising universities within the HKH region (i.e. in Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan) and 17 Associate Members based elsewhere but with a strong interest in the region and mountain issues. The latter include universities in Australia, Austria, Central Asia (Tajikistan and Kyrgyzstan), England (Walker Institute, Reading), Mongolia, the Netherlands, Norway, Scotland (University of the Highlands and Islands), Switzerland (the Centre for Development and Environment, Bern), Thailand, and the USA (Arizona, Colorado, Yale). Key topics of interest include the restoration of springsheds in the mid-hills (an important legacy of IHCAP), and thematic working groups continue these and many other lines of enquiry and action[42]. The resulting mass of knowledge is maintained and organised as far as possible through the public-access HimalDoc database, which as of 2019 contained 27,000 documents and had recorded six million downloads (ICIMOD, 2019).

[42] ICIMOD Thematic Working Groups exist on: Air Pollution and Health, Cultural Heritage, Genetic Biodiversity, Livelihood & Poverty Reduction, Online Training, Climate Change, Disaster Risk Reduction & Resilience, Forests, Wildlife & Rangelands, Mountain Agriculture, Trans-Himalayan Cultures & Environmental Humanities, Cryosphere, Energy, Human Mobility & Non-Traditional Food Security, Mountain Tourism, and Water.

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Part J: Acronyms and abbreviations

ACWADAM	Advanced Center for Water Resources Development and Management
CVA	Climate Vulnerability Assessment
ENSO	El Niño Southern Oscillation
GLOF	Glacier lake outburst flood
HKH	Hindu Kush Himalaya
HUC	Himalayan University Consortium
ICIMOD	International Centre for Integrated Mountain Development
IHCAP	Indian Himalayas Climate Adaptation Programme
IHR	Indian Himalaya Region
NAFCC	National Adaptation Fund for Climate Change
NAPCC	National Action Plan on Climate Change
NMSHE	National Mission for Sustaining the Himalayan Ecosystem
SAPCC	State Action Plan on Climate Change

Annex 13.12: Assessing Vulnerability in Africa (RVAA)

Project highlights.

7F-08531: **Regional Vulnerability Assessment and Analysis (RVAA)**. This encouraged SADC member countries to share knowledge and prepare standardised national vulnerability assessments, while creating platforms to support responses to acute food insecurity crises. The focus was on analysis of vulnerability and threat, rather than promoting adaptation through climate-smart farming[43] or community-based security improvements.

Part A: Basic data

A1. Project number & name. 7F-08531 - Regional Vulnerability Assessment and Analysis (RVAA).

A2. Sources.
Process of PRF development: (a) a draft PRF was prepared by the core team using documents listed in the bibliography and with input by SDC interviewees listed in Annex 13.22; (b) the draft PRF was reviewed by the national consultant **Dominica Chingarande**, who also conducted interviews listed in Annex 13.22; and (c) the PRF was revised by the core team in light of field findings. A Joint Final Evaluation of RVAA was underway during the latter half of 2021, but no copy of its report was made available to the present evaluation.

- Phase 1 (2013-2017): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2013/7F08531/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- Phase 2 (2017-2022): https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2013/7F08531/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html.

A3. Dates & financial data.

- Aug 2013-Mar 2017 (Phase 1): SDC budget CHF 6,060,000, plus CHF 8,100,420 from DFID (now FCDO).
- Aug 2017-Mar 2022 (Phase 2) : SDC budget CHF 7,300,000, Swiss disbursement to date CHF 6.839.354. FCDO is an additional co-financier ("The UK's support to the programme [£4.5 million or *ca* CHF 5.8 million] was approved in March 2017. Interim funding was provided from June to August 2017 to support key ongoing activities. In August 2017, SDC's support was approved and a programme trust fund established by WFP." [DFID, 2018]).

A4. Location(s). Southern African Development Community (SADC)

A5. SDC Geography. SADC Member States: Angola, Botswana, Comoros, Democratic Republic of Congo (DRC), Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, United Republic of Tanzania (Tanzania), Zambia, Zimbabwe.

A6. SDC Domain. South Cooperation: East and Southern Africa.

A7. Partners.

- **Main National Partners**: National Vulnerability Assessment Committees (NVACs) in the SADC Member States.
- **Main International Partners**: SADC Secretariat, SADC Programme Management Unit.
- **International Cooperating Partners**: FAO, WFP, ARC (African Risk Capacity - www.africanriskcapacity.org/food-security-risk-management/), UNICEF, OCHA, OXFAM, World Vision and FEWSNET (Famine Early Warning Systems Network - https://fews.net).
- **Service Providers**: (a) Phase 1 - CARDNO Emerging Markets; (b) Phase 2 - World Food Programme (WFP) for technical assistance and Landell Mills for institutionalisation services.

[43] Promoting 'climate-smart farming' means "using approaches that proactively facilitate environmentally sustainable agricultural development and promote adaptation and resilience to a changing climate through (a) development/rehabilitation of the natural resource base and more sustainable and efficient use of natural resources (b) minimizing environmental impacts such as pollution; (c) contributing to low-carbon economic development; (d) minimizing the vulnerability of human and natural systems to extreme climate events due to climate change, and (e) building capacity of farmers and other stakeholders to adjust and respond to the effects of climate change" (Danida, 2014: 3).

Part B: Purpose, relevance and approach
B1. Purpose. "Reduce impact of food related disasters through forecasting, prevention, mitigation, and recovery from adverse effects of natural disasters" (SDC, 2017). The purpose has also been stated as "Enhanced regional and national response to climate change, poverty and livelihood vulnerability." (SADC, 2012).
B2. Relevance to partners. **SADC members**. **Relevance to SADC conditions [see H3.1]**. "At least half of SADC Member States experience chronic food insecurity. Poor staple and micronutrient food availability and access leads to various forms of widespread malnutrition. Amongst children under five, wasting rates in 2015 were above 5 percent in seven member States and stunting rates were above 40% in four countries and above 20% in 12, including some middle income countries." (SDC, 2017: 4). "The SADC region is highly vulnerable to climate change and plagued by weather extremes, high levels of poverty, food insecurity and malnutrition. More than 60% of the region's population, and up to 80% in some countries are dependent on agriculture, over 95% of which is rain fed. Levels of stunting already exceed 20% (the level considered unacceptable by the World Health Organisation) in 12 countries and 40% on 5 countries. On average nearly 9% of the region's population, that is 25.5 million people out of a total population of 292 million, were identified as food insecure between 2010/11 and 2014/15." (DFID, 2018: ii). **Relevance to SADC Vision 2050 and SADC Regional Indicative Strategic Development Plan (2020-2023)**: Strategic Objective 5 on Disaster Risk Management in support of regional resilience; Outcome 2, Intervention 3 on mechanisms for identification, assessment and monitoring of disaster risks including data and information management development and implementation; Outcome 3 on Strengthened Planning for disaster risk assessment and preparedness , investments in climate and disaster risk readiness capacities in early warning mechanisms, planning and management promoted. These are aligned to the objectives of the RVAA which include facilitation of knowledge and capacity, policy and communication; instilling institutionalisation of the RVAA at Member States level working with National Vulnerability Assessment Committees and ensuring budget allocation towards Vulnerability Assessment Committees. **Switzerland**. Cooperation between Switzerland and regional programmes in Southern Africa to contribute to enhanced food security for smallholder farmers is well established. To date the focus has been on reinforcing policy at the national level of seven selected countries of the Southern African Development Community (SADC) in order to facilitate the development and implementation of regional standards on these issues. In line with the new Swiss International Cooperation Strategy 2021–24, however, the programme is transitioning towards a two-country programme with focus on Zimbabwe and Zambia. It is not clear, therefore, to what extent it will be possible going forward for SDC to continue developing the unique role of regional-level cooperation in Africa.
B3. Relevance to SDGs. (https://sdgs.un.org/goals) • **SDG 2: Zero hunger**, especially Target 2.4 (*ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters*), Target 2.b (*Correct and prevent trade restrictions and distortions in world agricultural markets*) and Target 2.c (*ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility*). • **SDG 13: Climate action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*), Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*), Target 13.b (*Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries*).

B4. Relevance to other development objectives.
Sector (SDC spreadsheet): Disaster prevention and preparedness, Disaster Risk Reduction, Environmental policy and administrative management.
Component of Cooperation Strategy (SDC, 2017): Food Security.

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Nil.
Adaptation: Capacity-based adaptation [CA].

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. NOT (0)
- **Adaptation**. PRINCIPAL (2)

Part C: Narrative overview

Widespread dependency within the Southern African Development Community (SADC) region on rain-fed subsistence farming makes the population very vulnerable to variability in rainfall timing and quantity, which is naturally high (being strongly affected, for example, by ENSO) and is being made worse by climate change (see H1). Generally weak communications, transport and market infrastructure inhibit the free flow of goods and services that could correct local shortages, and politically-driven market distortions and barriers are a further aggravating factor. These issues can be relieved and corrected by encouraging and enabling the analysis and correction of structural vulnerabilities, and by the forecasting and sharing of knowledge on emerging regional, national and local challenges and opportunities related to food production and distribution.

To address these needs, SADC established in 1999 a Regional Vulnerability Assessment Committee (RVAC) to lead the development of a Regional Vulnerability Analysis and Assessment (RVAA) programme among SADC Member States. From 2006 National Vulnerability Assessment Committees (NVACs) began being established in SADC Member States, thus creating the institutional architecture of the programme during its first phase (2006-2011 - see H3.2). The NVACs then became responsible for gathering information, organising knowledge, and preparing reports on national circumstances for synthesis and circulation by the SADC Secretariat, facilitating action by national governments and their development partners. The potential of the RVAA system was recognised by SDC and the UK's DFID (now FCDO), which agreed to co-fund the RVAA system from 2012 (DFID) and 2013 (SDC), thus yielding Phases 1 and 2 of the SDC RVAA project (2013-2017 and 2017-2022 respectively, equivalent to phases 2 and 3 of the RVAA programme itself). In addition to co-financing the RVAA programme since 2013, SDC is part of the RVAA Programme Management Committee (MANCO), which is also comprised of the SADC Secretariat Programme Coordinator, the FCDO programme representative and service providers (WFP and Landell Mills)." (SADC *et al*., 2021: 3). Support to regional partnerships has also been rendered from other UN agencies and NGOs at various levels. From various sources including interviews the focus of activity can be described as having evolved in the following way:

- **RVAA Phase 1 (2005-2011)**. The focus was a shift from food aid as a ‘one size fits all’ response to hunger and vulnerability. The Programme sought to inform broader approaches to tackling food insecurity including safety nets and social protection. During this period, progress was made in terms of establishing VACs in Member States and developing VAA tools at regional and national levels. However, less progress was made in the VAA analysis influencing policies and programmes and in institutionalizing the VAA system.
- **RVAA Phase 2 (2012-2016)**. To consolidate the gains of the first phase of the RVAA Programme and address its shortfalls, a second phase was implemented from 2012 to 2016. During this phase, progress was made on expanding the scope of VAA to urban areas and chronic poverty issues (including gender, HIV and AIDS and climate change), and on influencing policies and programmes. The programme was also effective in creating institutions and providing information for decision makers to address acute food insecurity at the national level. A total of 14 NVACs were established and were able to develop policies options for humanitarian responses. Guidelines for integrating urban vulnerability; nutrition, gender and HIV; and markets in VAA were developed and piloted in a few countries. Member State governments and their development partners also responded adequately to the needs of the most affected households and managed to avert disasters due to timely vulnerability

assessments. However, institutionalization of vulnerability assessments in SADC and national government structures remained largely not achieved for all Member States. Therefore, more work needed to improve the ability of VACs to influence wider poverty reduction and other sectoral policies.

- **RVAA Phase 3 (2017-2021)**. To sustain both the quality of acute vulnerability assessment and broadening the remit of NVACs to look at the causes of chronic vulnerability and address the challenges of institutionalization, capacity development of NVACs, and protect the gains of the previous phases, especially in: assessing acute hunger; broaden the scope of assessments to provide an analysis of the causes of chronic vulnerability and poverty, especially climate change/adaptation; strengthen the existing VAA process; and, further institutionalize VAA systems into the administrative and financial structures of Member States and the SADC Secretariat. This phase focuses on assessing and responding to chronic vulnerability and contributing to climate resilient livelihoods and institutionalization of the VAA process.

Key elements of vulnerability assessment and analysis (VAA) reports include meteorological and crop projections, household economic analysis, and food and nutrition security surveys, and recommendations for short term and long term interventions. Quality assurance and improvements are driven by the RVAC while the NVACs coordinate the annual VAAs themselves in addition to special studies on selected topics such as nutrition, climate change and related themes. The NVACs are multi-sectional committees led by relevant government ministries with wide ranging memberships, including government departments, NGOs and international organisations involved in poverty reduction and development. A 2011 review of the RVAA programme concluded that "VAA systems across the region have averted and mitigated a number of food crises ... and now routinely provide the basis for government initiatives to build the resilience of rural livelihoods" (SDC, 2017: 4), while the RVAA system was subsequently and widely acknowledged as the main system to track, report and respond to food insecurity in the region (SADC *et al*., 2021).

MANCO is responsible for providing direction for operational and programme management issues, so SDC has a formative role in the programme even though its basic intentions, modalities and institutional architecture had been established by SADC prior to SDC involvement. This makes it hard to attribute specific gains to SDC, although the strong performance of the programme and its transformative potential at national and regional level suggests an investment of considerable merit. The co-financier observes, for example, that "the programme is considered to offer good value for money and in particular with the planned future activities, there are positive indications that this will drive efficiency gains to improve sustainability." (DFID, 2018: viii).

Without access to the final joint evaluation report, **design quality** was scored 5 (good), while **effectiveness** and **impact** were scored 6 (very good) and **sustainability** was scored 4 (moderate, due to reservations over fragile domestic financing). **Transformative potential** was considered high in terms of improving early warning and mobilising emergency aid, but lower for increasing system resilience. The latter must be considered the 'acid test' of CCA, but this does raise questions about the respective roles of ‘palliative’ and ‘preventative’ investment in adaptation - the former responding to the consequences of vulnerability, the latter correcting the causes of vulnerability. The same would apply to the larger, continent-wide risk-sharing system ERC described in H3.4.

Part D: Design quality

D1. Theory of change.

Widespread dependency within the Southern African Development Community (SADC) region on rain-fed subsistence farming makes the population very vulnerable to variability in rainfall timing and quantity, which is naturally high (being strongly affected, for example, by ENSO) and is being made worse by climate change (see H1). Generally weak communications, transport and market infrastructure inhibit the free flow of goods and services that could correct local shortages, and politically-driven market distortions and barriers are a further aggravating factor. These issues can be relieved and corrected by encouraging and enabling the analysis and correction of structural vulnerabilities, and by the forecasting and sharing of knowledge on emerging regional, national and local challenges and opportunities related to food production and distribution.

To do this, SADC established in 1999 a Regional Vulnerability Assessment Committee (RVAC) to lead the development of a Regional Vulnerability Analysis and Assessment (RVAA)

programme among SADC Member States. From 2006 National Vulnerability Assessment Committees (NVACs) began being established in SADC Member States, thus creating the institutional architecture of the programme during its first phase (2006-2011). The NVACs then became responsible for gathering information, organising knowledge, and preparing reports on national circumstances for synthesis and circulation by the SADC Secretariat, facilitating action by national governments and their development partners.

D2. Assumptions underlying the theory of change.
Assumption 1. That structural weaknesses within, and contingent vulnerabilities and variable stresses on food production and distribution systems in, SADC countries can be understood and corrected by national governments collecting more information and managing knowledge more effectively, and by taking informed action while sharing the results with each other through SADC institutions.
Assumption 2. That the involvement of development partners to focus on capacity building within the national and regional institutions that are responsible for managing knowledge on improving the adaptive performance of food system will result in overall improvements to the well-being of SADC populations and enhanced resilience to food system stressors including those linked to climate change.

D3. Plausibility of assumptions and links. Both assumptions are plausible in principle. Some structural imperfections are likely to be diverse and more or less persistent among the SADC Member States, while the manifestations of environmental variability and change are likely to be diverse and sometimes overwhelming. Nevertheless, on average, across the 16 SADC countries, it is reasonable to expect these measures to result in food systems becoming more robust over time.

D4. General quality of the project design.
The SADC Member State governments are the key stakeholders and own the RVAA programme by virtue of their participation in SADC itself (since 1992), the formation of the RVAC (in 1999), and in most cases establishment and operation of NVACs (since 2006). Adequate direct and indirect consultation through the SADC Secretariat can be assumed to have supported the design of Phase 1 of the RVAA programme (2006-2011) and, subsequently, Phase 1 of the SCD RVAA project (2013-2017). As a capacity-building project designed to work with and through existing SADC institutions, moreover jointly with DFID, no design quality or performance aspects can easily be attributed to SDC in particular. There are no obvious flaws in reasoning or presentation, however, so a generic score of 5 may be given.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness. Climate smart agriculture is defined as seeking to reduce GHG emissions as well as promoting resilience to, strengthening against, preparing for, etc. climate change impacts. Mitigation effectiveness would therefore be expected to the extent that 'climate smartness' in these terms is promoted through the RVAA programme, which is likely to vary among countries but in a knowledge-sharing system may spread.

E2. System change. Promoting cooperation and structured awareness-raising among regional governments about the consequences and costs of climate change is likely to harden their collective position in international negotiations in seeking decisive action on mitigation, as well as support for adaptation. Thus an important indirect contribution to system change with mitigation consequences is likely at global and regional level.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.
Effectiveness.

- The SDC/DFID project aimed to support the SADC Secretariat's Disaster Risk Reduction Unit (DRRU) in the Office of the Executive Secretary through the Deputy Executive Secretary for Regional Integration, in strengthening RVAA capacity through three components that are implemented across all SADC Member States where NVACs have been established - currently 14 of 16 and not including Mauritius and Comoros (SADC *et al*., 2021: 9): (a) **a technical capacity component** to build the capacity of each NVAC to produce high-quality assessments; (b) **an institutionalisation component** to promote the integration of each NVAC within its own government's administrative and financial structures; and (c) **a communications and advocacy component** to increase the access, use and uptake of VAA information and products.

- "The Programme produces outputs at the regional and national level. At the regional level, the Programme provides capacity building and other technical support to Member States' NVACs, and synthesises and analyses national VAA outputs into regional reports and policy briefs. The annual regional synthesis dissemination reports provide an overview of the livelihood and food security situation in the SADC Region. The reports present a regional summary and include results and details at country level on food security and vulnerability, malnutrition, and crop production, among other issues. To strengthen VAA in the Region, the RVAA Programme develops technical guidelines and special studies that provide in-depth research on priority areas, such as guidelines on e.g. Urban Vulnerability, Integration of Nutrition, HIV and Gender in Vulnerability Assessment and Analysis, and Climate Change and Livelihoods. ... The RVAA programme has been effective in creating platforms and fora for providing information for decision makers to address acute food insecurity at the national level." (SDC, 2017: 9).
- Information generated by NVACs is required to play an important role in informing policy and programming. While information on acute food and nutrition vulnerability is frequently generated, little information has been generated on chronic food and nutrition vulnerability." (SADC *et al*., 2021). This is an area where improvements are being sought in the RVAA Strategic Plan 2017-2022, which focuses on: (a) consolidating and protecting the gains made by the programme; (b) broadening and deepening the scope of the RVAA to include chronic vulnerability, poverty reduction, resilience, gender, HIV and Aids, nutrition and climate change; (c) strengthening the existing vulnerability assessment and analysis process; and (d) contributing to the institutionalization of these processes in national systems (including full funding and ownership) within the SADC region (SADC *et al*., 2021: 7-8).
- "No impact assessments of the 2012-2016 Strategic Plan have been conducted. However, it is clear that significant numbers of vulnerable households benefited from the food security interventions that have responded to assessments conducted by the NVACs at reasonable cost. It is estimated that three annual acute vulnerability assessments for Namibia, Malawi and Zimbabwe in 2015 were conducted at a cost of USD 705,000, but influenced corresponding relief programmes with budgets close to USD 300 million. While a solid platform has been built for acute vulnerability analysis over the lifetime of the RVAA programme, gaps and weaknesses in a number of areas including institutional and capacity issues constrain further evolution and development. Vulnerability analysis to date has been largely limited to rural acute food entitlement deficits. Throughout the project phase member states have not been able to utilise the annual budgets requested due to limited in-country capacity to spend. This could be due to countries not having human resources dedicated to vulnerability assessments." (SDC, 2017: 4).
- In 2019 a comprehensive mid-term review of the RVAA programme (summarised in SADC *et al*., 2021) found: (a) that the technical capacity strengthening component was compromised by the increasing complexity of the subject matter and content of the national VAAs; (b) that the institutionalisation component was compromised by escalating demand for services, despite "considerable financial contributions to VAC budgets in Zambia, Botswana, Zimbabwe and Namibia; (c) that "VAC assessment findings have influenced large scale resource allocation to improve the potential of humanitarian interventions to reduce vulnerability", but they had limited influence on government actions due to the "lack of a clear and coherent advocacy agenda"; and (d) that weaknesses were identified in coordination and therefore in synergy, and in monitoring and evaluation and therefore in knowledge management capacity.
- These findings are to be expected in climate-change relevant knowledge-management and response programmes, since knowledge of climate change and its consequences are increasing exponentially, but capacity to document and monitor impacts is lagging behind, along with the resources needed to manage them. The mid-term evaluation put forward a set of thirteen recommendations, which included: (a) streamlining of regional support services and revision of the programme Theory of Change to identify high impact priority areas so that there is focus on a small number of key lines of support in both the technical and institutionalisation workstreams; (b) a review of modalities for support provision by service providers to ensure that support is tailored for each member state context and that the programme provides coherent, integrated and value adding support; (c) repackaging of support into a coherent and tangible service offer around strategic planning and monitoring and evaluation; and (d) basing the communications and advocacy strategy on the use of

guiding documents about the causes and consequences of rising vulnerability levels, and the nature and urgency of the problem.

- Interviewees stress that RVAA is now a cornerstone of data across all the 14 SADC Member States involved in the programme. Highlights include: (a) That a regional synthesis report is produced annually. (b) That 14 out of 15 Member States have established vulnerability assessment committees and link vulnerability analysis and assessment to policy options for humanitarian responses; (c) That a set of guidelines for urban vulnerability assessments incorporating nutrition, gender and HIV have been developed. (d) That at the end of 2020, the programme commissioned a consultancy for the development of the RVAA sustainability plan (2022-2030) which involved development of an action plan to operationalise the implementation of the RVAA programme by the SADC Secretariat post donor technical and financial support. (e) That at SADC secretariat level, the programme is well institutionalised, through the council of Ministers responsible for Disaster Risk Management as well as other technical structures responsible for decision making. (e) That the RVAA system has demonstrated strengths in facilitating and developing interagency and multisector processes for vulnerability assessment. (f) That VAA systems across the region have averted and mitigated a number of food crises, millions have benefitted from Member State food security interventions responding to vulnerability assessments conducted by the NVACs, and VAA assessments are increasingly contributing to government initiatives to build the resilience of rural livelihoods through a broader range of measures.
- SADC *et al*. (2021) noted that Covid-19 had affected implementation of the mid-term review recommendations and of the programme as a whole. A series of reflective exercises were underway on how to improve programme delivery and a final evaluation of the RVAA programme as a whole is underway at time of writing (5 Oct 21).

Impact.

SADC Member States had been using different instruments to measure vulnerability[44], and the intervention was meant to bring uniformity and comparability across them. SDC (2017) confirmed that the RVAA system had demonstrated strengths in facilitating and developing inter-agency and multi-sector processes for vulnerability assessment. Vulnerability assessments are regularly used for targeting and responding to acute food insecurity crises. The RVAA programme has been effective in creating platforms and fora for providing information for decision makers to address acute food insecurity at the national level. Examples of VAA utility include:

- In 2016, VAA results informed SADC's regional drought appeal of US$ 2.5 billion to the regional and international community for support to the affected population identifying 40 million people in need of relief. In response to the appeal, initial pledges of US $300 million and €60 million were made by the USA and EU respectively. The UK's humanitarian response of more than £150 m was also informed by VAAs.
- VAA results have been used to inform a broad range of policies since 2014. The information generated by NVACs is used widely by various stakeholders that include Governments (Ministries, departments and institutions), NGOs (International and Local), UN Agencies (WFP, FAO and UNOCHA among others) and Researchers and Academia. The web scoping exercise carried out by 9 NVACs provided an indication of this broad reliance on NVACs' outputs.
- NVAC outputs have mostly been used for emergency or relief purposes to support vulnerable populations. Cited interventions include vulnerable group feeding, school feeding, social transfers e.g. cash transfers and food for work interventions, livestock feed subsidy among others. The SADC RVAA Policy Impact study 2012- 2016 details use of VAC data by the African Risk Capacity (ARC) for development / risk management activities.
- An institutionalisation index was developed and VAA procedures were integrated within SADC's institutional framework through establishment of the Regional VAA Steering Committee that meets and reports to SADC authorities at least twice a year. SADC in 2016 established a regional El Niño response and coordination team comprised of the secretariat, UN agencies and representatives of the members states. This team has been essential in

[44] These included the Household Economy Approach (HEA), Famine Early Warning Systems Network (FEWSNET), the Integrated Food Security Phase Classification (IPC) acute, IPC chronic, Comprehensive Food Security and Vulnerability Analysis (CFSVA), Household Vulnerability Index (HVI) and Individual Household Model (IHM).

communicating, coordinating the response and mobilising resources required for the affected in the region.

Sustainability.

- SDC (2017) observed that all SADC member states contribute resources to VAC operations, through a combination of cash and in-kind government inputs and support from their own development partners, that seven member states (Botswana, DRC, Lesotho, Malawi, Namibia, Zambia and Zimbabwe) had met at least 60% of their annual acute vulnerability assessment costs from in-country sources, and that NVAC annual assessment costs would be fully covered by domestic budgets by end of the next phase (2017-2021). At a regional level, the budget for the SADC Secretariat and the programmes and policies that it implements are largely (76%) donor funded.
- The mid-term review in 2019 noted that self-sufficient domestic financing remained a challenge and the final evaluation is expected to seek to rationalise expectations to match realistic resource levels (albeit that SADC governments would have good reason to expect international resources for climate change adaptation to be on an upward trajectory considering international commitments since the 2009 Copenhagen UNFCCC CoP).
- At the end of 2020, the programme commissioned a consultancy for the development of the RVAA sustainability plan (2022-2030) which involved development of an action plan to operationalise the implementation of the RVAA programme by the SADC Secretariat post donor technical and financial support.
- The Committee of Ministers responsible for DRM has instructed Member States to continue developing NVAC capacities, institutionalising VAA through legislative, policy and institutional coordination arrangements, and ensuring the use of VAA for policies and programmes to build resilience and investment to sustain VAA systems at both regional and national levels.
- A final observation relevant to sustainability is that all the vulnerability studies are available publicly and that a vulnerability atlas based on a multisectoral database (agriculture, environment, education, health, etc.) has been developed with support through 7F-08531 (see: https://www.sadc.int/news-events/news/sadc-member-states-launch-online-vulnerability-atlas/, https://rvaaatlas.sadc.int).

Overall performance scores: Effectiveness (6); Impact (6); Sustainability (4).

F2. System change.

- **Regional cooperation**. It is not clear to what extent SDC will continue to prioritise **regional-level cooperation** such as that with SADC, which has a particular role that differs from (and cannot be substituted by) that of bilateral actions, in particular in promoting **inter/multi-governmental knowledge sharing and learning**, **common quality standards**, and an **experimentalist approach to problem solving** (i.e. one in which stakeholders, having agreed a common over-arching goal, try out their own solutions in ways that are transparent to others). These distinctive roles are valuable and replicable, and so may be relevant to other geographies where SDC is winding down its bilateral programme and seeking a regional role instead, such as in Latin America.
- **Local networking**. Another key function which a regional organisation may have is to **facilitate networking** among farmers and communities, to encourage and enable the rapid spread of crop varieties, irrigation techniques and other ways of managing productive and protective environments (e.g. under the headings of climate-smart farming and community-based ecosystem management). This is a powerful tool in the climate response with abundant potential for benefits and co-benefits. There are often tensions, however, between national and local interests, which a regional intergovernmental organisation like SADC may be ill-equipped to address since the member states themselves may be unresponsive to local needs, wishes and knowledge (this issue was in fact noted by interviewees). Building knowledge management capacity within national governments and facilitating knowledge sharing among them is a key part of the climate response and has transformative potential at national level, but the nations themselves are systems made of local components that also need to be involved if system-wide transformation is to be possible.
- **Thematic integration**. The RVAA programme focuses on assessing and analysing vulnerabilities in food systems, partly in relation to climate change factors, and this approach the lies on the interface of several major themes of Swiss cooperation. For example, SDC (2020: 15) lists as essential to systems change joint actions between the SDC programmes on: (a) **food security** (i.e. "more effective, sustainable and resilient food systems"); (b) **water** (i.e. "water effectiveness and water governance in agriculture); (c) **climate change and**

environment (i.e. "on the linkages between climate change and food security, principally in terms of climate resilience of agriculture - prevention or risk transfer mechanisms, services for climate-smart agriculture - or on the reduction of GHG emissions generated by the agricultural sector and food systems"); (d) **health** ("on nutrition as a determinant of health, the promotion of the One Health approach and newly on the links between COVID-19, agriculture and food security and nutrition"); (e) **migration and development** ("with a focus on food insecurity as a cause of migration and rural-urban migration"); and (f) **humanitarian aid** ("the various collaborations with the World Food Programme and other humanitarian actors, for example on DRR, climate risk financing and resilience-building for food security"). This kind of multidimensional programming requires a kind of joined-up thinking that is not always easy for large aid institutions to sustain.

- **Vulnerabilities and solutions**. A final point is that the transformative potential of the RVAA programme for adaptation is weakened by the fact that it is focused on the analysis of vulnerability and warning of weakness and threat, rather than on identifying and disseminating solutions to climate change challenges. Such solutions include climate smart farming and environmental security techniques, and community-based ecosystem management approaches. The RVAA therefore targets transformation of the sub-system of early warning and emergency aid, rather than the broader one of preventing climate change impacts through mitigation and system strengthening.
- **Matching to CIF signals of transformation**. Achievements of RVAA programme can be matched in the following areas to examples of interim signals for system change in promoting climate resilience listed by CIF (2020, 2021):
    - "new decision-making or advisory bodies for resilience put in place" - **RVAC, NVACs, institutionalisation effects of the RVAA programme**;
    - "integration of resilience considerations into (cross)-sector planning processes" - **VAA reports and responses to them (see F1.b)**;
    - "enhanced institutional/community capacity for adaptation and resilience" - **technical capacity building effects of the RVAA programme**;
    - "enhanced climate and hazard warning information systems under design" - **VAA reports and responses to them - see F1.b]**.

There are also **advanced signals of long-term, self-sustaining outcomes** materialising, in the form of "increased budget allocations directed towards climate resilient initiatives; sector projects routinely screen & incorporate climate resilient approach; climate information routinely applied in strategic long-term planning; enhanced understanding drives new stakeholder behaviours/ decisions; increased access to and availability of resilience finance via intermediaries; resilience plans and processes are implemented and effective". The transformative potential of the RVAA programme for adaptation is weakened by the fact that it is focused on the analysis of vulnerability and warning of weakness and threat, rather than on identifying and disseminating solutions to climate change challenges. Such solutions include climate smart farming and environmental security techniques, and community-based ecosystem management approaches. The RVAA therefore targets transformation of the sub-system of early warning and emergency aid, rather than the broader one of preventing climate change impacts through mitigation and system strengthening. The transformative potential of the RVAA programme must be considered high (score 5), but only for the sub-system that it specifically targets.

Part G: Other aspects of design and performance

G1. Efficiency issues.
"The programme stayed within required programme management cost at 9%, even during the first year where this could be expected to be higher due to start-up costs and slow implementation." (DFID, 2018: viii). "The programme management oversight of WFP appears to be thorough and robust and there is close management oversight of central expenditure and of the operations of the regional offices." (DFID, 2018: viii-ix).

G2. Coherence issues.
In the limited area of VAA, coherence among partner governments can be assumed to be ensured through (a) co-funding by SDC and DFID; (b) participation of SDC in MANCO; (c) the role of the SDC Secretariat; (d) participation of SADC Member States and their own development partners in NVAA reporting.

G3. Replicability issues.
The availability of an institutionalisation index enhances replicability. There are numerous regional inter-governmental organisations for which lessons learned from cooperation with SADC may be relevant, both in general terms (i.e. the inherent strengths and weaknesses and unique opportunities offered by such organisations) and specifically in terms of the RVAA approach (i.e. all countries require the capacity to perform competent VAA, as well as understanding and choice awareness among their options for climate change adaptation and mitigation).

G4. Partnership issues.
The central role of partners and partnerships among SADC and non-SADC governmental, intergovernmental and non-governmental institutions is mentioned throughout the stakeholder analysis of SADC et al, (2021: 2-3) and RVAA programme outputs such as SADC (2020). Problems are rarely reported, but include the observation by SDC (2017: 5) that the institutional structure of NVACs had a strong influence in VAAs: "Zimbabwe's strong institutional structure has resulted in strong coordination and commitment from partners [while] weak institutional structures associated with under-staffing within NVAC secretariats, presented challenges ... in a number of countries (e.g. Botswana, Swaziland, Lesotho and Namibia)." The same source also calls for a broadening of NVAC partnerships "to secure an appropriate range of support to back-stop analyses (research-cum-training) as well as to enhance the policy relevance of VAC outputs through local, regional, pan-African and global policy analysis networks." At interview it was noted that the SADC Secretariat had the problems that the institutionalisation consultant (Landell Mills) took the view that they were not answerable to the secretariat but only to SDC.

G5. Connectedness issues.
SADC *et al.* (2021: 4): "The trend of increased food insecurity recorded over the last five years suggests that food insecurity is not simply a transitory phenomenon caused by short term, climatic shocks. The persistently high numbers indicate a deeper problem that goes beyond the impact of natural hazards to more structural underlying causes of vulnerability. Additionally, it is expected that the COVID-19 pandemic further exacerbated the high levels of food and nutrition insecurity in the region. This requires more complex and broadened vulnerability assessment and analysis (VAA) in the light of climate change, poverty reduction and resilience building." This paragraph draws attention to the embeddedness of the SADC countries in a global economic system with increasing volatility of commodity prices including foodstuffs, a global geopolitical system marked by increasing rivalries (e.g. between the West and China) and sources of discord (e.g. religious extremism), a global ecological system where signs of instability at local, national and continental scale are escalating rapidly, and even a global biotic system where novel zoonotic and other diseases are multiplying, all on top of local and national resource depletion.

G6. Cross-cutting themes.
Gender equity.

- The end of phase 1 report (SDC, 2017) highlights that "Women's limited access to productive assets such as land in southern Africa has direct implications on household food security. In addition, food insecurity reduces women's ability to voice, choice and control. For example, a study carried out in Botswana and Swaziland showed that women with insufficient food have a 70% higher probability of lacking control in sexual relationships; 50% higher risk of engaging in intergenerational sex; an 80% higher risk of selling sex for money or resources and a 70% increase in unprotected sex. SADC has developed guidelines for mainstreaming gender, HIV and nutrition in national vulnerability assessments. Countries that have managed to pilot these transverse themes include Botswana, Lesotho, Madagascar, Mozambique, Swaziland and Zimbabwe." (pages 2-3). It also noted that "guidelines have been developed for urban vulnerability assessments and incorporating nutrition, gender and HIV in routine national assessments. Five member States have already piloted integrating nutrition HIV and Gender into their annual assessments with promising but mixed results."
- "Efforts to mainstream gender in VAA in previous phases are now showing fruit, with assessments gender disaggregating population figures." (DFID, 2018: viii).

G7. Capacity building issues.
SADC *et al.*, (2021: Annex 8) lists the completion of technical capacity assessments as milestones for three countries in 2017 and for 14 NVACs in 2018, with the completion of technical and organisational capacity building plans completed and implemented as milestones

in 2019 and 2020. It is not clear why these assessment and planning exercises were not done at the beginning rather than at the end of the SDC/DFID programme support, when they would presumably have been rather more useful.

Part H: Other matters arising from the review

H1. Follow-on questions.

- Remains pending**:** To what extent lessons have been learned by SDC from engagement with SADC and are these are seen as useful in other regional contexts?

H2. Missing documents.

Report of the Joint Final Evaluation of the RVAA.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: SADC context: climate change risks (from SADC et al., 2021 based on SADC, 2020). Climate change risks for the SADC region are serious and exacerbate the factors affecting vulnerability. SADC countries are especially vulnerable to climate change because of dependency on subsistence agriculture, with over 95% of regional agriculture being rain fed. The Intergovernmental Panel on Climate Change (IPCC 2014) has identified rising trends for the African continent in annual mean, maximum and minimum temperatures during 1950-2000. And by the end of the 21st century, temperatures are projected to increase by 3-6° C under the IPCC high emission scenario. Important transboundary water resources are affected by climate change, and major rivers could become regional sources of tension.

- **Angola**: Over the years the country has experienced multiple shocks and challenges including drought in the southern provinces, service and product price increases, increasing malnutrition rates as well as urban-rural migration, particularly of youth. Between October 2019 and February 2020, an estimated 562,000 people were in IPC 3 or higher in the southern provinces of Cunene, Huila and Namibe. As per satellite imagery, about 1.7 million people were exposed to drought/lack of rain in Angola, of whom 1 million may experience food insecurity during the 2020/2021 period. In February/March an assessment was conducted in the two municipalities in the Bie Province.
- **Democratic Republic of Congo**: Apart from agricultural constraints, the country faces armed conflicts and natural disasters (floods) which cause population movements mainly in the eastern part of the country (5 million people are internally displaced in DRC). On top of this volatile security situation, a prolonged humanitarian crisis is affecting food security, nutritional status, epidemics of measles, cholera, and malaria in addition to Ebola virus disease. Chronic food insecurity is increasing and correlated with malnutrition and shocks that disrupt access to food markets. According to the Integrated Food Security Phase Classification (IPC), about 13 million people suffer from acute food insecurity and would be classified in phase of food crisis and acute livelihoods. A basic well-being survey showed that around 1 in every 2 households in DRC are affected by food insecurity, 16.4% of which severely so. About 52% of households allocate more than 65% of their monthly expenses to the purchase of food.
- **Botswana**: Rainfall distribution was very poor during the 2018/19 rainfall season and temperatures above normal. The number of people permanently and temporarily destitute was 38,300, which was 9.3% higher than the previous year. The Government assisted with food baskets, cash and clothing. The percentage of children underweight increased to 4.3%. The government continued with direct feeding in localities with high rates of total underweight (10% and above); and with the introduction of special food baskets to children at all mobile shops in needy districts.
- **eSwatini**: Delayed onset of the rainfall season and dry spells in November and December 2020 led to a delayed start of the farming season, negatively impacting on food production. Unusually high commodity prices further restricted food access and exacerbated the already compromised food availability in most poor households, further heightening their poverty levels. An estimated 335,000 people in rural areas are in IPC 3+, which constitutes 38% of the rural population of Eswatini. Furthermore, the impact of COVID-19 has been felt across economic sectors. Loss of employment due to the lockdown has resulted in reduction of incomes, impacting negatively on households' ability to purchase food and farm inputs.
- **Lesotho**: Between October 2019 and March 2020, about 30% of the rural population – 433,410 people –required humanitarian assistance, compared to 18% in 2018. In addition, 13.3% of the urban population – 75,000 people –also required humanitarian assistance,

compared to 9.2% in 2018. In 2020 the country experienced numerous shocks and stressors including severe drought in October/November 2019 – rains were received in December at the end of the planting period; high food prices; COVID-19 and the lockdown, which also caused job losses adding to already high unemployment as well as restricted movement for individuals and entrepreneurs; especially to and from South Africa to access some commodities. Several assistance interventions are ongoing. However, food insecure people are likely to increase further due to decreased livelihoods opportunities like remittances, loss of employment, decreased income from livestock sales as well as increased commodities prices. Poorer households are anticipated to employ coping strategies that are not acceptable if immediate action is not taken.

- **Madagascar**: The country experienced multiple crises such as drought, floods and epidemics. Southern Madagascar has experienced drought conditions, significantly affecting the harvest and disrupting food stocks and household livelihoods. According to African Risk Capacity (ARC), in April 2020 the drought affected 1,468,717 people in the 8 districts of the south. According to the April 2020 IPC update, between April and July 2020, 554,000 people (24% of the population in the most vulnerable southern districts) are expected to be in "crisis" and "emergency" situations "(IPC phase 3+) of acute food insecurity. The districts of Ampanihy and Tsihombe are the most affected, with 25% of households expected to be in phase 3 (crisis) and 5% in phase 4 (emergency).
- **Malawi**: is currently experiencing a slow down in economic activity due to both the domestic and global impacts of the COVID-19 pandemic. Despite Malawi receiving above-normal rains across the country. However, most southern districts experienced early cessation of rains, which affected late planted crops. Fall army worm and African army worm was also observed. Overall, the food situation in the country is improved from last year, with most districts having less than 3% of households that currently food insecure. The most recent nutritional standardized monitoring and assessment of relief and transition (SMART) survey conducted in July 2019 shows that the overall national prevalence of global acute malnutrition was low at 0.5%, which falls within “acceptable” levels according to WHO classification. The impact of COVID-19 may reserve this trend. Once finalised, the MVAC VAA report will inform the humanitarian response during the 2020/2021 consumption season. To shield vulnerable people from the impact of COVID-19, the Government has conducted cash transfers (four months upfront) to 291,235 rural households, who received at K7,000 (USD 10) per month from March to June 2020.
- **Mauritius**: has recently been reclassified by the World Bank as a high-income country. Mauritius remains a net food importer. It imports 77% of food requirements, exposing it to international pressures, such as fluctuating freight prices, exchange rate fluctuations and sourcing concerns. About 40% of the country’s land is used for crop cultivation, of which about 90% is sugarcane, with the remaining land planted with tea, tobacco and a small number of food crops. With climate change, rainfall patterns have changed, leading to longer periods of dry season and huge rainfalls during short periods. These extreme weather events put further pressure on the agricultural sector, thus exacerbating food insecurity in Mauritius. The COVID-19 pandemic and lockdown has led to the country’s first recession in 40 years, mainly due to the halt in tourism, which accounts for 25% of gross domestic product.
- **Mozambique**: About 80% of Mozambicans reside in the rural areas and depend on agriculture, livestock, hunting, forestry and timber harvesting - activities often affected by the effects of climate change (drought, irregular rainfall, floods, etc.) and pest infestations, as well as crop and animal sicknesses. The population residing in urban and peri-urban areas relies on informal trade activities, a sector hard hit by the COVID-19 lockdown. Mozambique’s Technical Secretariat for Food Security and Nutrition (SETSAN) was unable to carry out regular assessments in February-March 2020 due to the COVID-19 lockdown. Instead a pilot study on the status of acute food insecurity in the context of COVID-19 was undertaken in the cities of Maputo and Matola in April 2020. It found that currently, 15% of people living in the two cities are in IPC Phase 3 (crisis), meaning 365,000 people need humanitarian assistance.
- **Namibia**: Although the country had a good harvest in 2020 it is affected by poor global and local economic performance; prolonged drought in parts of the country as well as the continued effects of the COVID-19 lockdown (price increases, job losses, reduced access to food, reduced access to remittances, etc.). Based on the IPC projections of October 2019, an estimated 354,000 Namibians are in IPC Phase 3 (crisis). These figures are expected to rise

especially in urban settlements due to the COVID-19 impact. Assessments are currently underway to estimate food insecurity between January 2020 and March 2021.

- **South Africa**: Despite the disruptions brought about by the COVID-19 pandemic, the country can meet its national food requirements. Drastic measures to manage COVID-19 included a 21-day national lockdown to curb the spread of coronavirus in the country. The country has been battling economic challenges for nearly ten years, such as the sluggish growth, deteriorating public finances, mass unemployment and power outages. The household income pressure caused by the national lockdown has become a reality of many South African households. This has a negative impact on affordability and accessibility of food. Indications are that the economic impacts of COVID-19 have dramatic effects on the well-being of families and communities. About 3,370,177 households faced food access problems in 2018, of which 1,664,770 were male-headed and 1,705, 406 female-headed.
- **United Republic of Tanzania**: For the 2019/2020 consumption year, the country experienced some shocks likely to reduce food production, (COVID-19 pandemic and lockdown; Heavy rains which led to floods, destruction of transportation infrastructure, property loss and water logging in some areas of the country; Outbreak of crop pests such as *Quelea* (birds) and fall armyworm (larvae of the moth *Spodoptera frugiperda*) in some areas of the country). Generally, food availability is sufficient and stable countrywide. Rice and maize yields are expected to increase by 6% from last year. Food stocks and accessibility are expected to increase at household level in the 2020/21 consumption year. Prices of major staple food commodities, i.e. maize, rice and beans, have been declining since June 2020. Good rainfall performance and availability of pasture has also contributed to livestock population increase.
- **Zambia**: Preliminary 2018/19 assessment findings indicated that about 19% of the rural population –1,724,614 people - would require urgent assistance to protect their livelihoods and reduce food consumption gaps. About 16% of the rural population was already in IPC Phase 3, marginally able to meet minimum food needs but only by depleting essential livelihood assets or through crisis-coping strategies. An estimated 3% were in IPC Phase 4 and facing large food gaps. In the three most affected districts, the number of households in IPC Phase 4 was expected to increase as people resort to selling their livestock (a livelihood asset). In the projected period - October 2019 to March 2020 - an estimated 2,330,182 people were estimated to be in IPC phase 3 and 4.
- **Zimbabwe**: In 2019 poor rainfall and extended dry spells exacerbated poor economic performance and the limited availability - or unaffordability – of agricultural inputs for most communal farmers. The Fall Armyworm, livestock diseases and Tropical Cyclone Idai also impacted livelihoods and agricultural production. Cash shortages remained the most prevalent shock experienced by households (81.5%) followed by changes in cereal prices (78.8%) and drought (75.9%). Most households (53%) were consuming borderline to poor diets – an 8% increase from 2018. The 2019 national global acute malnutrition is 3.6%, an increase from 2.5% in 2018. The highest prevalence is in Mashonaland East (4.4%) and lowest in Midlands (2.3%). There was also an increase in the proportion of households with at least one member living with HIV/AIDS: from 12% in 2018 to 27% in 2019. Between January and March 2019, an estimated 59% of the rural households were cereal insecure – about 5.53 million people. Assistance required amounts to 818,323 tons of maize, costed at USD 217.66 million. The COVID-19 lockdown has affected most urban households' livelihoods and is likely to worsen the food and nutrition security status. Furthermore, households with livelihood options such as petty trade, vending, casual labour, skilled trade and own businesses were likely to experience the most impact of no trade during the lockdown period.

E3.2 RVAA Stakeholders (from SADC *et al*., 2021).

Steering Committee (STEERCOM). The RVAA STEERCOM is the supervisory authority of the programme and as such provides high-level oversight, guidance and strategic direction to RVAA programme work. It is comprised of Permanent Secretaries of lead Member State Ministries that house VAA secretariats/coordination units.

Regional Vulnerability Assessment Committee (RVAC). The RVAC is responsible for technical co-ordination of VAA programme activities and advises the programme Steering Committee on technical and strategic issues. The RVAC has an interest in being informed about progress towards achieving results including programme successes and key challenges, as well

as insights and inputs into future implementation modalities, strategic orientations and partnerships.

SADC Secretariat. The SADC Secretariat is responsible for oversight of programme quality and is the custodian of the RVAA Monitoring and Evaluation Framework.

National Vulnerability Assessment Committee (NVAC). NVACs are inter-agency, multi-sectoral committees that are established under the leadership of national governments in member states (MS). They are responsible for the planning and implementation of VAA processes at country level. They are also called upon to account for the programme's performance and achievement of results as outlined in the RVAA logframe. Additionally, they have a stake in determining whether RVAA programme delivery mechanisms are appropriate and effective.

SADC Member States (MS). Member States have a direct interest in knowing whether RVAA programme activities are aligned with national priorities, harmonised with the action of other partners and meet the expected results.

RVAA Programme Management Committee (MANCO). The programme management committee (MANCO) is responsible for providing direction for operational and programme management issues. It is comprised of the SADC Secretariat Programme Coordinator, the FCDO programme representative, the SDC programme representative and service providers (WFP and Landell Mills).

International Cooperating Partners (ICPs) & Key Stakeholders. ICPs are key partners for the implementation of the RVAA programme while at the same time having their own interventions. They bring complementary support to the programme and have an interest in ensuring that the VAA processes are robust and relevant to the needs of the region. ICPs currently comprise representatives of FAO, WFP, ARC, UNICEF, OCHA, OXFAM, World Vision and FEWSNET.

Donors. The RVAA programme is jointly funded by the UK Foreign [and] Commonwealth Development Office (FCDO) and the Swiss Agency for Development and Cooperation (SDC).

Service Providers (WFP & Landell Mills). Two service providers have been appointed to support the implementation of the RVAA programme. The United Nations World Food Programme (WFP) is the technical assistance service provider (TSP) and Landell Mills is the institutionalisation service provider (ISP).

Part I: Bibliography

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SDC (2020) *Global Programme Food Security Programme Framework 2021–24*. SDC (Bern).

Part J: Acronyms and abbreviations

DFID	Department for International Development (of the UK, now FCDO)
ENSO	El Niño Southern Oscillation
FCDO	Foreign and Commonwealth Development Office (of the UK, formerly DFID)
LM	Landell Mills (a UK consultancy firm)

NVAC	National Vulnerability Assessment Committee
RVAA	Regional Vulnerability Analysis and Assessment
SADC	Southern African Development Community
VAA	Vulnerability Analysis and Assessment
WFP	World Food Programme (of the UN)

Annex 13.13: Adaptation Research in Bolivia (PIA-ACC)

Project highlights.

7F-08632: **Applied Research on Adaptation to Climate Change (PIA-ACC)**. This engaged with Bolivian universities to support research on disaster risks, on managing water, land and biocultural diversity, and on food security, sovereignty and inter-cultural modelling. This increased the capacity of the university system to address CCA issues, but lacked synergy with other SDC activities in the country (e.g. 7F-05448 Biocultura, 7F-07312 PRRD) and region (e.g. 7F-05409 PACC, 7F-07368 ANFOR), and with government institutions.

Part A: Basic data

A1. Project number & name. 7F-08632 – Applied Research Programme on Adaptation to Climate Change Programme (*Programa de Investigación Aplicada para la Adaptación al Cambio Climático*, PIA-ACC)

A2. Sources.
Process of PRF development: (a) draft PRF prepared using documents listed in the bibliography; (b) draft PRF reviewed by national consultant **Mario Zenteno** during four days in La Paz and four in Cochabamba; (c) the PRF was revised in light of field findings.
7F-08632 (Angewandte Forschung zur Anpassung an den Klimawandel, Jun 2013 to Jun 2019):
https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2013/7F08632/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html

A3. Dates & financial data.
- **Phase 1**: 01/03/2014-31/12/2017 (extended to 30/09/2019); Total Budget: CHF 9,730,000 of which SDC Budget contribution is: CHF 5,450,000 (original) Revised to CHF 4,770,000 (2016).
- **Phase 2**: (01/10/2019 to 30/06/2023 SDC Budget CHF 1,800,000.

A4. Location(s). Bolivia

A5. SDC Geography. Latin America and Caribbean

A6. SDC Domain. South Cooperation LAC
SDC Theme: Climate Change – Adaptation (2014-2023).

A7. Partners.
- **Phase 1**: **Main national partner:** Vice Ministry for Science and Technology. **Sub-national partners**: Higher University of San Simon in Cochabamba (UMSS) and Higher University of San Andres in La Paz (UMSA).
- **Phase 2**: **Main national partners**: Vice Ministry of Science and Technology, Pluri-national Authority of Mother Earth and the Executive Committee of the Bolivian Universities (CEUB), Secretariat for Research, Science and Technology (SINCYT) and institutes and university research centres belonging to the Bolivian University System (SUB). **Sub-national partners**: Higher University of San Simon in Cochabamba (UMSS) and Higher University of San Andres in La Paz (UMSA), and Wildlife Conservation Society (back-stopper).

Part B: Purpose, relevance and approach

B1. Purpose.
Phase 1:
- **Purpose**. To enhance the resilience of at least 500,000 vulnerable households in the Andean Region to the effects of CC.
- **Specific objective**. Through applied research projects conducted by Bolivian universities UMSS and UMSA rural development actors in the Andean region develop their knowledge, capacity and apply new technologies to strengthen the resilience of the population to CC.
- **Outcome 1**. Increase in knowledge on CCA through the application of an inter-scientific and holistic research agenda covering water management (GIA), land and biocultural diversity management, food security and sovereignty, disaster risk reduction and social management of climate change.

- **Outcome 2**. Scientists and research centres applying the research agenda have strengthened their capacity, monitoring and dissemination of knowledge on CCA in particular through associated organisations for research projects (OAPIs) operating at the local level.
- **Outcome 3**. The Bolivian university system (SUB) has developed its own efficient administrative and financial system to sustain research on CCA.
- **Approach**. Supports a programmatic approach to developing (inclusive) research capacity on CCA.

Phase 2:

- **Purpose**. To contribute to improving the well-being of the population in the western area of Bolivia by increasing their resilience to the adverse effects of climatic change.
- **Specific objective**. Scientific and technological knowledge is available and applied to support resilient life systems of the poor and vulnerable to climate change, based on the strengthening of research capabilities within the system of the Bolivian University System, the execution of applied research projects and influencing public policy reform.
- **Outcome 1**. SUB's capacity has been strengthened and financing mechanisms are in place to fund applied, holistic and interdisciplinary research projects for CCA with a territorial and strategic focus.
- **Outcome 2**. University research processes have been coordinated and strengthened with specialised national and regional actors and networks on CCA.
- **Outcome 3**. CCA has been integrated into university research policies and in sub-national and national public policies.
- **Approach**: continuation of a programmatic approach to deepening capacity and knowledge on CCA through scientific research but with a strong territorial focus to support the aggregation of data and encourage more integrated approaches to applying the CCA agenda, which are supported and guided by a Scientific Advisory Committee and Strategic Committee.

B2. Relevance to partners.

- **Constitution**. Phase 1 was aligned with the new Constitution (2009) that states the rights of all to live in a healthy environment, protected and without risks and more specifically the Framework Law for Mother Earth and Integrated Development to Live Well (2012), which includes CCA to enhance resilience of vulnerable groups so long as it does not negatively affect the natural regenerative capacity of Mother Earth (Art. 32). Phase 2 continues to support the principles of the new Constitution and Framework Law 300 for Mother Earth, but placed more emphasis on compliance with Art. 32.3 (Climate Change - Promote the recovery and application of practices, technologies, knowledge and ancestral knowledge of the nations and rural native indigenous peoples, and the intercultural and Afro-Bolivian communities for the development of effective response measures to the impacts of climate change in harmony and balance with the systems of life, prioritizing the sovereignty and food security of Bolivians).
- **Government**. The project is relevant to the Vice-Ministry for Science and Technology, which is responsible for the implementation of the National Plan for Science, Technology and Innovation of the Bolivian University System (SUB), which envisages the creation of an interdisciplinary collaboration mechanism to support scientific research networks – prioritises universities to develop applied research networks on CCA. However, main partners lack capacity to operate these networks, especially because the university system (SUB) is poorly connected and lacks resources to apply research in line with the country's legal framework (especially the Law on Mother Earth which requires local knowledge holders to be fully integrated into applied research in rural areas in the Andean region).
- **Universities**. The project is relevant to UMSS and UMSA as they are the two main public universities conducting research in Bolivia (33% of all research centres are based in these two universities). For example, UMSA has successfully been registered as part of the Climate Technology Centre and Network (CTCN) an operational arm of the UNFCCC Technology Mechanism, hosted by the UN Environment Programme and the UN Industrial Development Organization (UNIDO). meanwhile The UMSS has carried out a review of the Guidelines for the Formation and Operation of the Research Networks of the SUB, to propose one specifically on climate change.
- **Regional partners**. The project is relevant in the Andean Region: originally it was foreseen to form synergies with PACC Peru financed by SDC, which has promoted similar research in the Peruvian Andes, through UNSAAC (Cusco) and UNAMBA (Apurimac) where students

received funding to carry out research on CC. However, the documents provided by SDC do not mention synergies were established between PACC and PIA-ACC in Phases 1 and 2. Similarly, there appears to have been no formal synergies established in Phase 2 of PIA-ACC with other regional partners of SDC who are supporting the implementation of regional projects such as ANFOR, in particular the NGO CONDESAN which is supporting the application of the Monitoring Network of the Impact of Climate Change on the Biodiversity of High-Andean Ecosystems (GLORIA Andes), launched in 2008 with support from Austrian Cooperation (Science Academy of Austria). See also CONDESAN (2021) and SDC (2018).

- **Switzerland**. The project is relevant to SDC's country strategy for Bolivia, which prioritises support to the "poor and particularly vulnerable groups – especially young people and women" and its geographical priorities: "focused on rural and peri-urban areas in the highlands and in the Andean valleys." (SDC website for Bolivia). Nonetheless, relevance of SDC would be higher had there been greater emphasis: a) within SDC-Bolivia to establish formal synergies with BioCultura and PRRD on DRR and CCA (which is now commencing a fifth phase called My Resilience); b) with the Andean regional hub in Lima, Peru, which has managed the above-mentioned PACC programme in Peru and is currently implementing the Andean Forests programme in Bolivia, Chile, Colombia, Ecuador and Peru.

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 1: No poverty**, especially Target 1.1 (*By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day*) and Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*).
- **SDG 2: Zero hunger**, especially Target 2.4 (*ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters*), Target 2.b (*Correct and prevent trade restrictions and distortions in world agricultural markets*) and Target 2.c (*ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility*).
- **SDG 4: Quality education**, especially Target 4.7 (*By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development*) and Target 4b (*By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries*).
- **SDG 13: Climate action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*), Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 17: Partnerships for the Goals**, especially Target 17.9 (*Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation*).

B4. Relevance to other development objectives.

- **Sendai Framework for Action**, which recognises the importance of coherence between CCA and DRR in the pursuit of sustainable development. OECD (2018) identified three main types of coherence: (1) Strategic: Aligned visions, goals and priorities on CCA and DRR in national development plans and strategies, providing a framework for pursuing operational coherence; (2) Operational: Policy frameworks and institutional arrangements supportive of the implementation of aligned objectives on CCA and DRR; and (3) Technical: Strengthened technical capacities to assess the risks and opportunities, to identify and prioritise CCA and DRR measures and to finance them.

- **Convention on Biological Diversity** (using research to develop agro-ecological approaches to CCA in agricultural communities), but is not explicitly mentioned.

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Nil (possible indirect effects noted).
Adaptation: Capacity-based adaptation (CA) oriented to Ecosystem-based adaptation (EA). Developing science-based capacity to adapt to CC, based on applied research that combines local and external knowledge and technologies.

B6. Relevance/approach within the climate response based on SDC classification. (see H3.1).
Rio Marks given in the SDC project spread-sheet:
Mitigation. SIGNIFICANT (1), with some variation between 0 and 2.
Adaptation. PRINCIPAL (2), with some variation between 1 and 2.

Part C: Narrative overview

Background and purpose.
Phases 1 & 2 of PIA-ACC respond to the IPCC declaration that the Bolivian Andes belong to one of the most ecologically endangered regions in Latin America. Estimates are by 2030 average temperatures will be 2C warmer than in 2000 and by as much as 6C in 2100. The general trend shows a decrease in precipitation in arid regions as well as an increase in humid zones and an increased frequency of extreme weather phenomena such as droughts, frost and hail. Plagues too and new plant diseases are more common. This situation is not aided by negative trends in land use and deforestation due to increasing energy demand and extension of the agricultural frontier. This situation has attracted resources to strengthen applied research on climate change in the country. However, it crucial that applied research on CC establishes the connection between internationally recognized scientific methods and local knowledge to strengthen resilience of the village communities who are most vulnerable to the growing effects of CC. In the light of this situation SDC prioritised CC as one of its three priorities in its Cooperation Strategy for Bolivia 2013-2016, in particular building on previous projects with UMSS (in particular the Directorate for Scientific Research and Technology, DICyT) and UMSA (in particular the Department for Research, Postgraduate Study and Social Interaction, DIPGIS) and by supporting them enhance their applied research capacity in CCA. Phase 2 builds on lessons learned from phase 1 to 2019, in particular the need to apply a formal agreement to improve inter-university cooperation on applying and coordinating applied research in the Andean region, adopting a more strategic and territorial approach to applied research and engage local knowledge holders fully in the applied research process in line with the provisions in the Law No. 300 (2012) - The Framework Law of Mother Earth and Integral Development for Living Well.
Performance and transformative potential.
Phase 1. Overall performance was positive and important lessons were learnt to support the design of Phase 2, in particular supporting strategic and territorial approach to applied research to influence policy and planning decisions (especially at the municipal and university levels). The ProDoc for Phase 2 of PIA-ACC highlights performance in Phase 1 as follows. Outcome 1 (increase knowledge on CCA) - 67 research projects realised (13 on water management, 21 on land management and biocultural diversity, 21 on food security and sovereignty, 8 on DRR and inter-cultural modelling, of which 9 obtained additional funding to continue. Outcome 2 (build capacity of scientists and research centres on applied research) - 320 researchers from 14 universities, 25 research institutions and 111 OAPIs participated in applied research projects. In addition, 2816 actors from over 100 institutions participated in knowledge management events, production of over 80 publications and 3 policy briefs. 5 conferences were also held (including 2 specifically for local knowledge holders). Outcome 3: (SUB establishes a mechanism to sustain applied research on CCA) – adoption of the National Plan of Science, Technology and Innovation of SUB (PNCTI) at the XVI National Meeting of Science and Technology in March 2017.
Phase 2 (based on the latest six-monthly report to June 2021), indicates important advances have been made with main stakeholders on agreeing to adopting new data recording protocols to support better monitoring of research indicators. This has been supported by establishing a better online repository for research documents to facilitate the management of the main research themes on CCA. However, the research agenda was greatly affected by the Covid-19

pandemic in 2020. The report highlights the pandemic especially hit the education sector (prevented site visits and group meetings). This has been compounded further in 2021 by elections and changes of the heads of OAPIs.
Transformational potential. PIA-ACC demonstrates: a) a high level of contextual alignment with (i) the needs of the SUB to enhance coordinated approaches to applied research on CCA; (ii) the Framework Law 300, which the BioCultura programme was instrumental in bringing about in 2012, taking into account it establishes CCA/resilience as a priority to reduce poverty and recapture harmony with nature; (iii) local knowledge holders to ensure applied research fully captures their holistic approach to observing nature and application of their own autochthonous technologies which continue to be adapted to local conditions. However, it appears there is a low level of contextual alignment with the specific research needs of BioCultura, PRRD, or indeed PACC Peru (even though the latter is mentioned in PIA-ACC Phase 1); b) a satisfactory level of systemic change within: (i) the university sector thanks to the approval of the PNCTI and its implementation from 2017. However, PIA-ACC 1 did not succeed in securing the percentage of Direct Tax on Hydro-carbons (IDH) reserved for research by 2019 and this has been hampered further by the pandemic in Phase 2 (ii) the government sector, where there is evidence applied research has induced policy reforms, especially at the municipal level; (iii) the local community level by engaging the full participation of knowledge holders through the participation of the OAPIs; c) applied research on CCA is dedicated to establishing the long-term adaptive sustainability of vulnerable communities to CC in the Andean Region. However, the latest six-monthly progress report suggests PIA-ACC's transformational potential is not being optimised due to the lack of an effective communication strategy between its research projects (based on communication units) in order to compile research finding to support advocacy for change beyond academia, citing in particular decision-makers in government, especially at the highest levels of government. It appears a major challenge is that the applied research projects are being conducted by researchers on five main themes linked to CC, which means they have different academic backgrounds, which has impeded them from adopting the holistic approaches to research of their peers in the local communities/OAPIs. This beckons the question as to how far the PNCTI can be applied in local contexts in the Andes where the effects of CC cannot be resolved by sector approaches to research.
Local networks: Phase 2 mentions the importance of placing more emphasis on the development of local networks to support applied research adopt the need for a holistic approach to tackling adaptation. However, there is no mention of working with indigenous networks promoted by PRRD, in particular the networks of Yapuchiris (experimental farmers) - see Quispe (2018).
Design quality (5); **Effectiveness**: (5); Impact (4); Sustainability (5); **Transformative potential**: high.

Part D: Design quality

D1. Theory of change.
Phase 1: Through applied research projects by Bolivian universities, rural development actors in the Andes will develop the knowledge, capacity and technologies needed to establish resilient Andean communities.
Phase 2: By strengthening applied scientific research through an interdisciplinary, holistic and participatory approach, the Bolivian University System (SUB) will be able to promote greater social interaction and advocacy on the policy reforms (especially academic, administrative and institutional) needed to establish resilience to climate change among the population living in vulnerable areas of the Andean region of Bolivia.

D2. Assumptions underlying the theory of change.
Assumption 1: That the research activities selected and funded by the project will contribute additional knowledge relevant to strengthening Andean communities against climate change impacts.
Assumption 2: That increased relevant knowledge will strengthen advocacy in favour of policy reforms in support of adaptation by Andean communities.
Assumption 3: That well-informed advocacy will lead to policy reforms in support of adaptation by Andean communities.

D3. Plausibility of assumptions and links.
Assumptions 1 and 2 are **plausible**, but assumption 3 is compromised by limited political openness at the national level to adopt policy reforms. This was to be off-set through a communication strategy embedded in the project design (especially in phase 2).

D4. General quality of the project design (Score 5).
The design of Phase 1 was built on lessons learned from SDC's work experience supporting and working with the education/university sector. Moreover, the evaluation of Phase 1 (see IAB & SRL, 2018) also found that PIA-ACC was designed to support a large number the applied research projects that had already been conceived and/or established lines of research, but lacked resources. This, together with close alignment with Bolivia's legal and policy framework (especially the Constitution and Law 300 for Mother Earth) and the specific interests of the Vice-Ministry to develop a more holistic approach to research on CCA, has contributed to establishing a robust design that responds to the needs and interests of all stakeholders and end beneficiaries, but which has retained a flexible approach to allow applied research to adapt to different local contexts in the Andean region. For these reasons the Final Evaluation of Phase 1 (May, 2018) ranked its relevance 9/10 - Very Good (see IAB & SRL, 2018).
The design of Phase 2 provides evidence of a causal chain for developing three main intended effects, namely: IE 1. University research system strengthened to carry out holistic, interdisciplinary applied research projects for ACC; IE 2. University articulated with research processes, actors, and national and regional CC networks, and the IE 3; Incidence in public policies; technologies and knowledge disseminated for adaptation to CC. The third effect assumes that by including government bodies (APMT and VCyT) PIA-ACC can promote the adoption of evidence and research results to guide policy development on CCA within the university system. However, interviews confirm this is beyond SUB's role and should instead be focusing more on developing this through the CEUB.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.
The project indirectly supports CCM through applied research that leads to new adaptation measures that capture carbon. However, because Law 300 prohibits the monetarisation of Mother Earth's resources such as carbon sequestration, applied research has mainly focused on adaptation which is a priority for the government (to achieve balance and harmony with nature as it changes over time).

E2. System change.
No systemic change is foreseen by PIA-ACC to advance CCM.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.
Effectiveness (Phase 1, score 4).
The Final Evaluation of Phase 1 (November 2018) concluded the project achieved around 71% of what it intended to achieve under its three main components to 2018. It's strategic effectiveness (including the quality of its three main incomes to 2018) scored 6.7/10. Its main findings are as follows.

- **Outcome 1 (increase knowledge on CCA)**. Two-thirds (67%) of research had been completed, but around 30% was still on-going, because two years was too short. Overall, it found research was mainly conducted by undergraduates for their thesis. In the majority of cases reviewed it found they had difficulty understanding and applying the holistic approach proposed by PIA-ACC. As a result, around 30% of the research did not meet the priorities of the end beneficiaries. However, this finding appears to have raised new dialogue within UMSS/DICyT and UMSA/DIPGIS on applied science on CCA: "for whom to investigate". This situation appears to have stimulated systemic change within UMSS and UMSA on the way applied research should be conceived; namely not for the interest of the student/university, but the end beneficiaries who as "users" will continue to apply the research within their holistic vision of man working with nature. Main achievements following the final evaluation and SDC's decision to extend Phase 1 to 2019 in order to finalise the research that was still on-going are summarised in the ProDoc for Phase 2. They are: 67 research projects realised (13 on water management, 21 on land management and biocultural diversity, 21 on food security and sovereignty, 8 on DRR and inter-cultural modelling, of which 9 obtained additional funding to continue.

- **Outcome 2 (capacity building of scientists and research centres on applied research)**. More than three-quarters (77%) of capacity development activities had been completed. In most cases these activities appear to have provided principal and associate researchers as well as undergraduates with a good understanding on how to identify and formulate applied research projects. However, in practice the evaluation found: a) interaction between students and teachers needed strengthening (such as through video conferences); b) there are gaps in the training, in particular on the provision of the tools and methods needed to apply the holistic, intercultural and applied research approach foreseen by PIA-ACC; c) most of the applied research was conducted individually, preventing connectivity and aggregation of research between researchers working on similar themes. This finding appears to have stimulated the participating universities to review the content of their training courses. The ProDoc for Phase 2 summarised final achievements in Phase 1 to 2019 as follows: 320 researchers from 14 universities, 25 research institutions and 111 OAPIs participated in applied research projects. In addition, 2816 actors from over 100 institutions participated in knowledge management events, production of over 80 publications and 3 policy briefs. 5 conferences were also held (including 2 specifically for local knowledge holders).
- **Outcome 3: (SUB establishes a mechanism to sustain applied research on CCA)**. Both participating universities had exceeded their levels of counterpart funding originally planned, facilitating the production of the National Plan for Science, Technology and Innovation 2017-2026 (PNCTI) calling for new institutional structures and financial mechanisms for CCA research (including generation of own resources, receiving a percentage of the Hydro-Carbon Tax and from external sources including international cooperation). The Plan received approval at the XVI National Meeting of Science and Technology in March 2017. However, endorsement of the PNCTI by the National Congress of Universities was still pending at the time of the Final Evaluation. However, the Prodoc for Phase 2 mentions that although the DICyT had granted the Plan could commence implementation (guided by a consultancy), securing funding from the IDH had not been agreed upon and is therefore one of the tasks of PIA-ACC in Phase 2.

Effectiveness (Phase 2, to 2021, score 6).

The six-monthly progress reports state the Covid-19 pandemic has had a major impact on the education sector. However, some important achievements have materialised:

- **The first six-monthly progress report for 2020**: (a) confirmed that UMSA had officially established the Scientific Commission for CC to act as an advisory body and provide strategic guidance on strengthening capacity and identification of research projects and advocacy regarding policies, plans, programmes and projects linked to CCA; (b) launched the call for proposals for applied research covering five themes linked to CCA, which must have a territorial and holistic focus and involve alliances between different research institutes within UMSA, UMSS, or SUB and with OAPIs at the community/municipal level. The five themes for CCA were: integrated water management, land management and ecosystem services, food security, DRR and social management). In addition, a special Call for Proposals was made by UMSS to support applied research on reducing the impact of the Covid-19 pandemic in Bolivia;
- **The second progress report for 2020** confirmed that 32 research projects had been received, of which the following seven were approved for funding due to clear evidence of research alliances between institutes within UMSA or between universities in the SUB (most covering a two-year period):
    - *Revaluation of the cultivation and use of tarwi (Andean lupin) as a strategy to enhance resilience to climate change and improve access to protein in local production systems covering four municipalities in the Bolivian Altiplano*.
    - *Promotion of the multiple uses of native species found in quinoa-producing areas of the Bolivian Altiplano to enhance resilience to climate variability and change*.
    - *Enhancing adaptation and mitigation of farmers in the Northern Altiplano using innovative bio-intensive technologies innovations and agro-ecological approaches*.
    - *Enhancing resilience through dialogue on local soil management knowledge and practices to sustain agricultural production, food, nutrition and health in the Micaya community, Municipality of Colquencha*;
    - *Applying unconventional methods to reduce the concentration of metallic ions and organic pollutants from contaminated water bodies of rural communities in the Municipality of Viacha*.

- *Strengthening the production of bio-fortified wheat in the inter-Andean valleys of the Department of La Paz to enhance mitigation and adaptation to climate change*.
- *Studying the diversity of microorganisms in soils of wild quinoa (*Chenopodium quinoa*) and its potential to improve resistance to abiotic stresses through the application of bio-inputs*.

- **The special call for Proposals linked to the pandemic** produced 22 proposals of which four were approved on the following topics:
  - *Sequencing the genome of Coronavirus SARS-CoV-2 for molecular epidemiological studies in Bolivia*.
  - *Establishing an epidemiological surveillance and monitoring methodology based on the quantification of SARS-CoV2 in wastewater from the municipality of La Paz.*
  - *Managing biosafe waste and its use for the generation of value-added products through chemical processes*.
  - *Developing and validating the molecular diagnosis of Covid-19 by capillary electrophoresis: highly resolutive method*.
- **UMSA held the first virtual Research, Innovation and Social Interaction Fair** "INVESTIGA UMSA 2020" from 21-30 September 2020, to promote the dissemination and transfer of results of research, innovation and social interaction projects developed by researchers from research institutes and undergraduate students of the UMSA (included applied research under PIA-ACC 1).

Impact (score 4).

The latest progress report on PIA-ACC 2 (June 2021) suggests the new more territorial focused research is likely to have far greater positive impact at the local level than the fragmented research conducted under PIA-ACC 1, which the Final Evaluation (2018) concluded was too dispersed and in many cases had qualitative deficiencies (lack of a holistic approach and, therefore, not sufficiently in line with the needs of the local communities concerned). This is substantiated by the strong focus on enhancing food security using local varieties and agro-ecological practices that are already ancestral practices, but which need research to determine how they can be scaled up sustainably. However, as stated in B2, the lack of synergies with other highly relevant projects (BioCultura, PRRD, PACC Peru, among others) is surprising given these projects are all covering themes under investigation by PIA-ACC (especially food security and DRR). Similarly, as pointed out by the Final Evaluation in 2018, PIA-ACC 1 has not established strong links with key government institutions linked to research on agriculture and natural resources, in particular the National Institute of Agriculture and Forestry Innovation (INIAF) which has nine multi-centres researching agro-ecological production in the country, or with the Ministry for Rural Development and Lands (MDRyT) to support the upscaling of the research by improving rural services. This suggests that although PIA-ACC 2 has paid greater attention to developing alliances within academia, it is still excluding key national players such as INIAF who also need to fully mainstream CCA into its vision and mission[45] before adapted agriculture can be upscaled as a central theme by the MDRyT/Vice-Ministry for Rural and Agricultural Development.

Sustainability (score 5).

On the positive side, PIA-ACC has made an important contribution to strengthening the institutional capacity of the SUB (especially UMSS and UMSA) to integrate research on CCA into its institutional structures and by building alliances between institutes and between universities breakdown the promotion of research in isolation. Similarly, the fact PIA-ACC 2 has included a special Call for Proposals to support research on managing and combatting the effects of COVID-19 also shows the high level of flexibility of PIA-ACC in adapting to new challenges where applied research is needed, but which can still be supportive of the establishment of resilient communities. Moreover, the promotion of virtual activities such as research fairs to communicate its research on CCA during the pandemic demonstrates PIA-ACC can also promote innovative activities in a pandemic that raise awareness on the climate emergency and the role applied research can play when conducted with the participation of local communities to reduce vulnerability and enhance resilience to CC. Finally, research into local varieties of highly resistant crops such as tarwi (lupin beans) and quinoa is likely to strengthen the country's capacity to retain sovereignty over its genetic resources and thus food security. However, challenges remain, in securing the following sustainability criteria in the ProDoc for Phase 2, which relate to the implementation of the PNCTI: (a) institutional measures - full

[45] https://www.iniaf.gob.bo/webiniaf/index.php/headers/mision-y-vision

adoption of “strategic research partner alliances” (EST) to determine the identification and continuation of CCA research topics after Phase 2 of PIA-ACC; (b) regulatory measures – UMSS and UNSA S&T Directorates improve and apply administrative and financial regulations to capture a percentage of the IDH in order to strengthen the research funds in UMSA and UMSS in which CCA research is to be sustained (to reduce dependency on international funds especially from SIDA and SDC). This is particularly challenging due to the demands to divert public funding to resolving the pandemic and post-pandemic rehabilitation given the Andean Region has been severely hit by the pandemic; and (c) continuous development measures – management capacity of Research Departments move to mutual cooperation approaches with other departments and universities to stimulate inter-action and inter-learning and which lead to new synergies on applied research into CC.

F2. System change.

The PIA-ACC project provides clear evidence that one of its main objectives is to bring about systemic change within the national university system (SUB) aided by the application of a New National Action Plan for ST&I (PNCTI) that establishes CCA as an important research topic and, moreover, requires an important shift in the way it is applied. Phase 2 provides strong evidence it has learned from Phase 1 by focusing on the gaps that still exist in delivering effective applied research into CCA, which is needed to bring about change at the policy, institutional and community levels (especially in terms of establishing resilient food security and sovereignty). Moreover, to deliver change its strategic approach focuses heavily on: a) establishing a stronger territorial approach to applied research; b) developing inter-active processes that facilitate long-term partnerships and synergies to develop between researchers, government institutions and local knowledge holders grouped in OAPIs and which establishes informed dialogue on policy, institutional and community reforms; c) supporting first and foremost the country’s two main universities for research on CCA (UMSS and UMSA) to become, in effect, the flag bearers for change in the SUB; d) establishing a financial mechanism that reduces dependency on any one source, but rather from multiple sources (the universities themselves, from international cooperation and from taxes – IDH) to sustain applied research after PIA-ACC 2. Similar to SDC’s BioCultura programme, the following developments indicate systemic change is underway at the following levels in Bolivia:

- Institutionalisation of new decision-making powers within the SUB to include research on CCA and to apply it through inter-active processes at the territorial level and with the goal of establishing resilience to climate change that conforms with the holistic principles applied by indigenous communities in the Andean region and which is required by Law 300.
- Integration of applied research on CCA in the planning process, especially the PNCTI, but also to influence the formulation and application of Integrated Territorial Development Plans and Climate Change Adaptation Plans (although this is not explicitly evident in the ProDoc and progress reports to 2021).
- Increased capacity at the community level (OAPIs) to consolidate and up-scale their holistic approaches that incorporate CCA and, at the same time, allow researchers and research institutions gain access to local knowledge and technologies that enhance resilience (especially on soil and water management and use of agro-biodiversity that not only supports food security, but also nutrition and food sovereignty).
- Instigated a new form of policy dialogue to advance evidence-based decision-making on how research on CC - a priority theme of the government - should be funded, promoted and applied by the higher education sector.

However, as stated in the Final Evaluation of Phase 1 of PIA-ACC (see also F1.2), the absence of INIAF and MDRyT in PIA-ACC 2, suggests similar systemic change within these institutions is not being coordinated at the same time which, it is argued, is needed to support the development and application of a fully coordinated and holistic approach to establishing adapted life systems among the most vulnerable in the Andean Region. PIA-ACC is therefore judged have moderate transformative potential of PIA-ACC for knowledge systems that support adaptive life systems in the region.

Part G: Other aspects of design and performance

G1. Efficiency issues.

Implementation of PIA-ACC through UMSS/DICyT, UMSA/DIPGIS and the Wildlife Conservation Society (as backstopper) has proved to be an efficient mechanism to implement the calls for proposals for research projects and instigate change within UMSA, UMSS and the SUB. In terms of spending against budget, PIA-ACC 1 recorded a 64% progress rate to end of 2017.

The Final Evaluation (2018) scored 7.7/10 for efficiency under Phase 1. The Final evaluation did not conduct a benefit-cost ratio, but is foreseen in the ProDoc at the end of Phase 2.

G2. Coherence issues.

Coherence at the national level appears to have been only moderately satisfactory. Even though Law 300 establishes clear mandates for the APMT and MMAyA on applying CCA, the Final Evaluation (2018) found efficiency and effectiveness of PIA-ACC 1 could have been higher and had Phase 1 placed more emphasis on developing synergies not only between researchers in academia, but also directly with national government partners and non-government organisations (NGOs) who are engaged in research linked to CCA. In particular, it mentions the absence of coordinating research with INIAF and MMAyA. For this reason, the Final Evaluation found this explains why efficiency at the planning and overall implementation level has been successful, whereas the practical aspects of the applied research projects have generally been less successful, because they did not establish the interdisciplinary cooperation with INIAF to fully support the holistic approach proposed in the ProDoc as well as the potential to upscale these approaches through institutions such as INIAF. In addition, the Final Evaluation and SDC (during formulation of Phase 2) appear to have by-passed the fact SDC is funding other projects – BioCultura - that could and should have been engaged in the development of this holistic approach and which would have added value to Phase 2. In conclusion, although PIA-ACC 2 has a strong territorial focus and promotes interdisciplinary processes within the university system, it appears its research projects have mainly focused on covering areas not covered by BioCultura, or PRRD, to avoid overlaps (rather than coordination and cooperation). Similarly, there is no evidence of linkages having been established with universities in the region such as UNSAA (Cusco) that developed similar research capacities under PACC in Peru.

G3. Replicability issues.

National level. PIA-ACC 2 places a lot of emphasis on establishing a suitable funding mechanism for CCA research at the university level that can be replicated to ensure all universities in the SUB can engaged in research partnerships on CCA. In particular, the ProDoc aims to replicate UMSA's funding model, which is the only one to have captured funds from the IDH. Similarly, PIA-ACC is actively engaged in replicating successful holistic approaches to CCA research, based on multidisciplinary partnerships. However, taking into account the MMAyA is the main government institution overseeing the application of CCA policy in Bolivia (through the Pluri-national Authority for Mother Earth - APMT) the absence of direct participation of the MMAyA and APMT, as well as INIAF (at least as an observers), may restrict the opportunities for replicating success stories and good practices identified through holistic approaches to applied research on CCA.

Global level. The replication of the holistic approach to applied research on CCA in other countries in the Andean region is unlikely, because the National Universities System (SUB) does not have a mandate to develop such approaches within its own system, let alone in the Andean region. However, engagement of UMSS and UMSA in international research and formational networks does provide opportunities to benchmark and promote more rigorous research results in the Andean region. However, in this case knowledge management and backstopping services of SDC need to be better aligned to comply with the ProDoc's aim of: "strengthening of interdisciplinary, holistic and participatory scientific research capacities of the Bolivian university system, accompanied by social interaction to gain an impact on public policies that contribute to sustainably increasing the capacity for resilience to climate change of the poor population in vulnerable areas" (SDC, 2020: 31).

G4. Partnership issues.

A common theme of the SDC projects reviewed in Bolivia and Peru (PRRD, BioCultura, PACC) is the development of partnerships. In the case of PIA-ACC the partnerships are designed to strengthen the case for scaling up research into CCA within the SUB, led by UMSA and UNSS. However, despite moving from a Directorate in Phase 1 to the establishment of a Strategic Committee in Phase 2, the same actors are involved (Vice-Ministry for S&T, the APMT, SNICT/CEUB, UMSA, UNSS and SDC). Thus, although the Strategic Committee is designed to place more emphasis on improving inter-sector dialogue and advocacy for mainstreaming CCA in national and university policy frameworks as well as oversee the establishment of a funding mechanism to sustain university research on CCA, key players are missing in this Committee. For example, by not including INIAF, the scope for developing coordinated strategic and territorial partnerships to research adapted agricultural systems has been reduced, which is likely to reduce the scope for upscaling of the applied research by the MDRyT.

Also evident is the omission of developing research partnerships with other SDC-funded projects not only in Bolivia (PRRD, BioCultura), but in the Andean Region. For example: (a) universities in Peru that have been supported by SDC on similar research under PACC - UNSAA (Cusco) and UNAMBA (Apurimac), or ANFOR, which is conducting an analysis of gaps in research, information and work priorities linked to CCA in the Andes to improve knowledge management and enhance infirmed decision-making on establishing adaptive sustainability (2021); (b) Peru's National Institute for Agricultural Research (INIA), or Ecuador's National Institute for Agriculture and Livestock Research (INIAP), both of which are researching (with INIAF) the development of adapted verities of Andean crops (supported by IICA); (c) at the Andean level, such as with the International Potato Centre (CIP) in Lima; and (d) at the international level, in particular international NGOs and the Food and Agriculture Organisation (FAO), that have a long history of agriculture-related research in the Andean Region.
A final observation is that the Consortium for the Sustainable Development of the Andean Eco-region (CONDESAN) was not involved with PIA-ACC. This institution is SDC's chosen partner for research in the Andes and has been involved in SDC projects ANFOR (7F-07368) and Climate Change Adaptation in Mountains (7F-10208). This was despite CONDESAN's particular areas of focus: in identifying knowledge gaps, improving understanding of the impacts of climate change, and systematising successful adaptation strategies and practices in the region; in strengthening regional science-policy dialogue platforms through the Andean Mountain Initiative (includes links to ICIMOD/Himalayas); and in promoting exchanges of experiences and capacity building on the challenges and opportunities for adaptation to climate change in the Andes (CONDESAN, 2021).

G5. Connectedness issues.
Specific to PIA-ACC:

- **Lack of harmonised procedures among universities**, meaning that cooperation and coordination within the SUB remains challenging. A Contribution Agreement is foreseen with SUB/CEUB, but appears challenging to implement, because the SUB is known to be bureaucratic and PIA-ACC 2 must end by 2024 when SDC pulls out of LAC. This situation is also compounded by the delays in applying the research projects due to the COVID-19 pandemic in 2020-2021.
- **Limited perception of benefit by target communities**, who continue to find that the results and recommendations of the applied research projects are not aligned to their needs and capacities, or else they do not have the resources to continue, adopt or upscale them.

Specific to SDC in Bolivia and/or the Andean region:

- **Lack of a robust coordination strategy with other SDC projects** in the Andean Region risks dispersing Swiss resources rather than establishing a robust network of resilient communities that can serve as "life system centres" that can be scaled up through local, departmental/provincial and national policies and plans.
- **Food insecurity and poor nutrition** continues because of a combination of intensifying effects of climate variability and change and structural weaknesses that have excluded large section of Bolivian/Andean society from the fair distribution of resources. Although the new Constitution and ground-breaking legislation, such as Law 300, have been adopted, breaking down the culture of exclusivity, which has created the highest levels of inequality in the world) is a long-term process that cannot be resolved through research alone.
- **The Covid-19 pandemic** has caused major social and economic ramifications on the Bolivian/Andean population. Taking into account Bolivia has fiscal deficits there is a high risk the university sector will not receive adequate resources for CCA from the IDH. Moreover, to obtain this funding, the Ministry of Hydrocarbons and Energy is likely to advocate the need for the opening up of protected areas to 'responsible' oil and gas prospection based.
- **Water resources** in the Andean Region of Bolivia (especially in Potosi Department) have experienced long-term contamination from bad mining practices until 1990s.
- **Unstable political climate**, which has caused staff rotation in government institutions, universities and in the OAPIs.

G6. Cross-cutting themes.
Gender. The Final Evaluation (2018) states the main achievements were: a) the guidance material for funding and executing applied research projects successfully integrated a gender focus; b) The competitive fund mechanism for research projects succeeded in awarding research projects to female as well as male researchers. However, Phase 1 appears to have been conceived more as an introductory process to promoting gender equity within the UMSS

and UMSA. For example, the Final Evaluation stated, “PIA-ACC is considered by the S&T Directorates as a project of “induction to the gender approach”, an aspect that will also be assumed as part of the strengthening of the university's research systems.” Phase 2 places more emphasis on gender equity by: a) the tasks of the Backstopper (will include an initial induction and subsequent training in a gender approach for personnel of the Research Departments and for related researchers; (b) specific gender and intercultural indicators have been introduced in the Logical Framework. To achieve the indicators, appropriate practices and strategies will be introduced; (c) mandatory gender and intercultural criteria will be included in the Regulations for the Call for Research Projects, which also include the participation of female researchers and beneficiaries, so that each research project contributes in turn to cross-cutting themes; and (d) mechanisms will be applied to facilitate gender inclusion and governance, such as the OAPIs mechanism, among others.

Governance. The results of the Phase 1 indicate that the project demonstrated important advances in the field of interculturality and governance.

G7. Capacity building issues.

The End of Phase Report (SDC, 2019: 5) found that PIA-ACC made important contributions to building capacity:

- **Political-Institutional**: strengthening of planning capacity has not only enabled the implementation of integrated nature-based solutions at the local level (through PTDI CGTI and PEI), but facilitated dialogue on aligning municipal regulations to support their implementation. These include regulations to support the creation of protected areas, protection and conservation of ecosystems, apply water and soil management, protection of water sources, application of food security strategies integrating CCA, legalisation of local institutions and organizations through statutes, among others to promote change at the local level.
- **Economic-Productive**: strengthening of local community capacity to run local income generating enterprises. 20 productive enterprises have resulted, in particular supporting the processing of agro-biodiversity products, wool and meat production from camelid farming, beekeeping, biocultural tourism, etc.
- **Socio-Cultural**: strengthening of over 133 local practices to promote social co-existence (local fairs, ritual practices and reciprocity) to support CCA based on ancestral practices and knowledge.
- **Ecological-environmental**: strengthening the capacity of the National Service for Protected Areas (SERNAP) has enhanced the national protected areas system through the creation of three new conservation areas and the introduction of adaptation measures to reduce the impact of CC on the System.
- **Departmental level of government**: strengthening of the GADs for Tarija and Chuquisaca has resulted int the identification and approval of PTDI that incorporate specific actions to address CC and which have facilitated a major increase in public investment in CCA to develop resilient life systems (over Bs. 500 m.).
- **National level of government**: strengthening of the FPMT mechanism and its guidelines and tools has enabled the State to sanction funding for projects promoting the conservation and sustainable use of natural resources and this is being monitored and controlled by the MMAyA, although no projects had been funded to support CCA to October 2019 (see also section F1 above). The Ministry for Foreign Relations is also reported to have presented the BioCultura approach to CCA in six international multi-lateral events.

Part H: Other matters arising from the review

H1. Follow-on questions, answers and suggestions arising from interviews by national consultants.

Question 1. *SDC’s approach to CCA in the Andes relies heavily on the establishment of public, private and community-based partnerships (PPC) to mobilise resources and deliver change - the establishment of resilient rural communities. Is this approach part of a common strategy to implement the SDC project portfolio in the Andean region given similar approaches are observed in PACC (Peru) and PRRD (Bolivia)?*

- **Answer**. The establishment of PPCs is a central theme in PIA-ACC 2 and builds on lessons learned from PIA-ACC 1 where such partnerships were found to be lacking to support and upscale applied research in the rural sector. However, interviewees agree that the main challenge is not establishing the partnerships, but rather how to make them operational, so

that applied research can be sustained, and its results used by the private, public and or community-based organisations involved.

- **Suggestion**. More emphasis should be given to aligning CC research projects funded by SDC to directly support not only the PNCTI, but the application of the National Economic and Social development Plan to ensure PIA-ACC is more visible and proactive in advocating the importance of applied research to establish sustainable and resilient rural communities based on the application of good practices, the combination of autochthonous and new technologies and multi-sector approaches and developments.

Question 2. *If the answer to Question 1 is 'yes', how does SDC facilitate regular cross-fertilization between its projects to avoid fragmentation and to optimise learning on CCA and opportunities to combine it with CCM? If not, what needs to be done to ensure knowledge and data management is captured and made available to stimulate effective cross-party policy dialogue to ensure SDC applies a more coordinated approach to its cooperation on CC in 2021-2024 in LAC (and with other strategic hubs for CC – New Delhi and Beijing – plus SDC HQ) taking into account SDC is pulling out of bi-lateral cooperation in 2024?*

- **Answer**. there is still a differentiated research agenda on CCA in Bolivia, in the Andean region and in SDC's portfolio in general. Although, SDC is one of the few donors to emphasise the importance of linking applied research to CCA and capturing important knowledge and information on local practices and technologies in a more sustainable manner (given the universities are permanent institutions that will remain in the country), SDC-funded research remains fragmented, because of the "project approach". This suggests SDC's Regional hub advisors and country office representatives are not focused on developing a strong programmatic approach to research on CCA in the Andean region, especially in areas of mutual interest between the Andean countries (such as between high Andean indigenous communities, on water management in transboundary areas, etc.), which can and should be shared more effectively with SDC programmes supporting research on CCA in other regions. This suggests that the potential for cross-fertilisation across the SDC portfolio is not being exploited to optimise learning and reflection.
- **Suggestion**. PIA-ACC should comply with the inter-learning agenda for both universities, as well, strengthen the backstopping role of the Wildlife Conservation Society (WCS) to align UMSS and UMSA CC research projects. Meanwhile, SDC should take stock of its research projects linked to CCA and DRR and conduct a combined systematisation of their performance to identify how a programmatic approach could be developed in the Andean region and linked to key programmes on CCA and DRR such as the My Resilience, Resilient Andes and the Andean Forests programme, among others.

Question 3. *The combination of the political crisis in 2019 and the COVID-19 pandemic (2020-2021) has caused staff rotations, changes in political priorities and new economic challenges. How far is Phase 2 of PIA-ACC prepared and able to mitigate the risks associated with these developments?*

- **Answer**. PIA-ACC has responded well to the pandemic by enabling the funding of research dedicated to reducing the impact of the of the Covid-19 pandemic. This showed that SDC's portfolio is able to react to major events as they unfold, while continuing to support the achievement of programme objectives. It also seems to have stimulated innovation by allowing researchers to propose studies of links between CCA and the pandemic, such as safeguarding water resources as vectors of Covid-19, or improving nutrition to enhance resilience to the pandemic. Moreover, these developments have provided lessons on how a rapid response can be applied to research on CCA, which was agreed at CoP 26 supports an 'all-hands-on-deck' approach to tackle the pandemic.
- **Suggestion**. SDC should review and adopt its fast-tracked approach to research on the impact of Covid-19 and use it as an important lesson to justify the rapid mobilisation of research on CCA as a response to another emergency: the growing effects of climate change on the most vulnerable. To support this, SDC should promote a robust communication strategy to hammer this message home, both in Bolivia and in the Andean region as a whole given it is one of the vulnerable regions in the world to the effects of climate change.

Question 4. *Can the PIA-ACC model be replicated as a viable approach to developing resilient communities in other regions of Bolivia and also in Ecuador and Peru? If yes, what needs to be done to replicate the model and scale it up during Phase 2? If not, what needs to be done to ensure it can be replicated and up-scaled?*

- **Answer**. UMSA has a long history of engaging in international research networks in the Andean region and has led research projects and initiatives with international peers. However, UMSS has been less active internationally, preferring instead to develop expertise in areas where Bolivia has a competitive advantage, such as on the application of agroecology through which it has compiled significant research. The problem with PIA-ACC is that it has not paid enough attention to supporting UMSA and UMSS develop a leading role in the Andean region. As a result, PIA-ACC still appears to too isolated from research and knowledge developing elsewhere in the Andes through which it can capitalise its own research agendas on CCA (including its integration into the national and sub-national planning process to support the development of resilient rural communities).
- **Suggestion**. SDC should ensure PIA-ACC develops a more effective funding mechanism for applied research that adds value to the programme and stimulates the internationalisation of research on CCA. This would facilitate dialogue on how research agendas can lead to the scaling up of climate action in Bolivia and in the Andean region. This approach should be embedded in the SUB and supported by long-term alliances with international research centres and educational establishments. This could be stimulated through the newly-launched resilient Andes programme, to support multisectoral research and climate action. Considering SDC and SIDA (Sweden) are two of the main donors supporting research on CCA in the Andean region, the universities of both countries should have greater access to funding to support this approach.

Question 5. *Ineffective knowledge management appears to be exacerbated by the absence of effective monitoring, on SUB's capacity to apply a financing mechanism for coordinated applied, holistic, and interdisciplinary research projects for CCA with a territorial and strategic focus that link up specialised national and regional actors and networks on CCA. What needs to be done to ensure that knowledge management is achieved by stimulating an effective dialogue to ensure that SDC applies a more coordinated approach to its cooperation in CC?*

- **Answer**. The strength of PIA-ACC is that its applied research with a territorial focus does stimulate participatory knowledge management, which can be socialized and coordinated at the local level through community-based organisations such as the OAPIS and even at the municipal level where the municipal government is supportive of learning and applying CCA. There is evidence this appears to be strengthening local spaces to manage knowledge and develop networks at the municipality level. In some cases this has helped to link up support from national and international actors, such as a Memorandum of Understanding between 12 universities in Bolivia to advance research on different technological approaches to CCA or, more specifically, in the case of the applied research on *tarwi* (lupin seeds) to enhance resilient food security has been linked to a Helvetas-managed project that has provided a new space for inter-project learning. However, capturing good practices and lessons from PIA-ACC's research activities conducted in the field through effective monitoring and evaluation of PIA-ACC at the national level remains weak. As a result, strategic steering committee members (AMPT and the CEUB) are not gaining adequate access to the knowledge being generated at the local levels with respect to the development of holistic and interdisciplinary research on CCA. This explains why there is limited evidence on internalizing CCA (such as in the CTCN).
- **Suggestion**. PIA-ACC should have a dedicated person (focal point) in UMSS and UMSA to supervise the development of research networks to link up each research project so that key elements of learning at the grassroots and municipal levels are captured and systematized to inform APMT and CEUB on the areas of research that are of strategic importance to applying and upscaling CCA in vulnerable Andean communities. Meanwhile, to support the UMSS and UMSA improve knowledge management on CCA and CCM themes, PIA-ACC should explore alliances with other donors, in particular ASDI (Sweden) to support funding on continuing the systemic changes needed to develop both capacity and teaching on CCA under the coordination of the CEUB and another a research institute from the Andean region, such as UNSAAC (Cusco).

Question 6. *How can SDC communicate better its achievements to induce change at the highest level of government in the Andean region taking into account the PIA-ACC approach could be applied to ensure CCA has been integrated into university research policies and in sub-national and national public policies to enhance the resilience of vulnerable communities in the Andean region?*

- **Answer**. although the backstopping services of WCS has proved to be a good strategy to promote the harmonization of priorities, apply gender equality, good governance and

interdisciplinary approaches in the research projects funded by PIA-ACC backstopping is not an efficient way to : a) generate and apply an effective communication strategy through which the dissemination of knowledge/technologies is channelled to decision-makers, users and other interested parties, b) stimulate the development to CCA networks at both national and Andean/international levels, and 3) achieve incidence on public policy reforms.

- **Suggestion**. The establishment of regional research networks should be pivotal to improving and evaluating externally funded research projects (based on applying agreed common standards for such evaluation to facilitate coordinated responses) and developing an effective and realistic exit strategy through which the transfer of capacities for fundraising of proposals on CCA research is achieved. Moreover, it is recommended that funding is decentralised so that flexible, on-demand approaches to CCA research promoted during the pandemic are prioritised and upscaled.

H2. Missing documents.
Budget Proposal for Phase 3 (used instead the ProDoc for Phase 3 (2014-2019), before extensions.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1 A note on adaptation relevance in the Bolivian context.
Government of Bolivia (2016) sets CCA and CCM (and therefore related scientific research) in the context of 10 'structural solutions' that it asserts are needed to abate the climate crisis:

1	Adoption of a new model of civilization in the world without consumerism, war-mongering, and mercantilism, a world without capitalism; build and consolidate a world order of Living Well that defends and promotes the integral rights of our peoples, undertaking the path of harmony with nature and respect for life.
2	Construction of a climate system based on responsibility to Mother Earth, the culture of life and the full realization of humanity in their holistic development, humanizing the economy, surpassing the simplistic approach to decarbonization of the economy.
3	Protection of the Rights of Mother Earth in an articulated and complementary manner to the rights of peoples to their development.
4	Defence of universal common goods such as the seas and oceans, water, atmospheric space, as well as the technological monopoly, promoting people's access to the common heritage.
5	Elimination of patents on technologies and recognition of the human right to science and technology of life.
6	Effective implementation by governments of the human right to water.
7	Establishment of the International Court of Justice Climate and Mother Earth to enable countries to fulfil their international commitments to climate change in a context of respect for the rights of peoples and of Mother Earth.
8	Allocate the resources of the military machinery of the imperial powers and the war-mongers to finance the activities of the peoples against climate change.
9	Eradication of commodification of nature and carbon markets promoting business climate millionaires, which do not solve the problem of the climate crisis.
10	Decolonize natural resources environmental colonial biased views that see the peoples of the South as forest rangers of Northern countries and communities as enemies of nature.

H3.2: Indigenous approaches to building resilience (source: Arévalo & Aguilar, 2014; Quispe, 2018).
Surveys on the *yapuchiris* (experimental farmer-trainers) and their level of influence on climate change adaptation in Cochabamba confirmed that local knowledge is a key factor: “The survey identified a total of 34 different practices that the farmers used to manage climate risks. At least a few risk reduction practices were used by 72% of the surveyed farmers. This included all of the *Yapuchiris* and 82% of farmers accompanied by *Yapuchiris*. On the other hand, only 15% of farmers not accompanied by *Yapuchiris* used any such measures. We also looked at the source of the knowledge about these practices The survey found that 57% of the climate risk reduction practices were adapted from ancestral knowledge, 20% from knowledge from external institutions, 12% from farmer exchanges and 11% from farmers’ own initiatives.” (Arévalo & Aguilar, 2014).

H3.3: Andean cultures (source: Warren Olding).
Modern Andean states are based on ideas of governance that differ from traditional norms. Official development plans typically depend on five-year political cycles that often have disruptive and corrupting effects on society. This conflicts with the approach of the Andean cultures which take a more holistic 'life systems' or 'life plan' approach and seek harmony within society and with nature. Moreover, because life plans embody community rather than individual interests, there is discord with the 'human rights approach' which is based on the primacy of the individual rather than the community. The 'modern' (post-colonial) view is that it is the role of the state to make laws and regulations on CCA, but the 'traditional' (indigenous) view is that the communities (*ayllu* and *markas*) have this role because life plans must adapt to change. The new constitutions of Bolivia and Ecuador recognise pluri-culturalism and life plans (respectively under the headings of 'living well' and 'a whole life'), and generally validate the recovery of indigenous identity from the after-effects of colonial rule. All this is relevant to PIA-ACC because the role of technical assistance through state institutions must be delivered sensitively to indigenous views on governance and the purpose of governance, on the roles, rights and responsibilities of individuals and communities, and on the recognition of local knowledge holders as 'applied scientists' in their own right.

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Part J: Acronyms and abbreviations

APMT	Pluri-national Authority for Mother Earth
CTCN	Climate Technology Centre and Network
CEUB	Executive Committee for Bolivian Universities
FPMT	Pluri-national Fund for Mother Earth
DICyT	Directorate for Science and Technology (UMSS)
DIPGIS	Department for Research, Postgraduate and Social Interaction (UMSA)
IDH	Direct Tax on Hydrocarbons
INIAF	National Institute of Agricultural and Forestry Innovation
IPCC	Intergovernmental Panel on Climate Change
MMAyA	Ministry for Environment and Water
MRDyT	Ministry for Rural Development and Lands
OAPI	*Organizaciones Asociadas a los Proyectos de Investigación* (Associated Organisation for Research Projects)
PEI	Institutional Strategic Plans
PBCC	BioCultura and Climate Change (Phase 3)
PDES	Economic and Social Development Plan
PIA-ACC	*Programa de Investigación Aplicada para la Adaptación al Cambio Climático*
PNCTI	National Plan for Research, Technology and Innovation
PPC	Public-private and community partnerships
PRRD	Programme to reduce the risks of disasters in Bolivia (7F-07312)
PPC	Public, private and community-based partnerships
PTDI	Integrated Territorial Development Plans
PGTC	Community Land Management Plan
SdV	Life system
SUB	*Sistema Universitario Boliviano* (Bolivian university system)
SNICT	National Secretariate for Science, Research and Technology
UMSS	Higher University of San Simon (Cochabamba)
UMSA	Higher University of San Andres (La Paz)
UNAMBA	National University of Micaela Bastidas of Apurimac
UNSAAC	National University of San Antonio Abad (Cusco)
WCS	Wildlife Conservation Society
CCA	Climate Change Adaptation

Annex 13.14: Pastures and Pastoralists in Ethiopia

Project highlights.

7F-09038: **Sustainable water and pasture management among Ethiopian pastoralists**. Rehabilitated degraded rangelands, restored aquifers and water sources, and diversified pastoralists' sources of income, while promoting cooperation between customary and government institutions and NGOs; it improved environmental and food security in various ways, but also attracted in-migrants that compromised its sustainability.

Part A: Basic data

A1. Project number & name. 7F-09038.01 - three titles are used for the first phase of this project:

- Sustainable Natural Resources Management for Enhanced Pastoralist Food Security in the Borana Zone, Ethiopia (SDC, 2016).
- NRM in Borena Zone - Ethiopia (SDC, 2021).
- Sustainable water and pasture management to alleviate the plight of Ethiopian pastoralists (SDC spreadsheet and web-site).

A2. Sources.
Process of PRF development: draft PRF prepared by core team using documents listed in the bibliography.

- **Sustainable water and pasture management to alleviate the plight of Ethiopian pastoralists (2015-2021)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2014/7F09038/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Sustainable Natural Resources Management (NRM) for Enhanced Pastoralist Food Security in the Borana Zone, Ethiopia (2022-2027)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2014/7F09038/phase99?oldPagePath=/content/deza/en/home/projekte/projekte.html.
- **Ethiopia: Pastoralists Take Charge of Natural Resource Management (Helvetas, 2016-2020)**: www.helvetas.org/en/nepal/what-we-do/how-we-work/our-projects/Africa/Ethiopia/ethiopia-shepherd-communities

A3. Dates & financial data.

- Phase 1 (Inception, Jun 2015 to Feb 2016): opening credit CHF 153,920 (SDC, 2016).
- Phase 1 (Main, Sep 2016 to Aug 2020): main credit CHF 6,600,000 (SDC, 2016).
- Phase 1 (Extension, due to Covid, to replenish the Contingency Fund, and to establish an additional Component 4 on governance, Jul 2020 to Dec 2021): CHF 1,900,000 (SDC, 2020a).
- Phase 1 (Second Extension, Dec 2021 to Sep 2022): CHF 870,000 (inferred from SDC web-site).
- Phase 1 (all): Total budget CHF 9,523,920 (SDC web-site).
- Phase 2 (Jan 2022 to Dec 2027): CHF 11,400,000 (SDC web-site)..

A4. Location(s). Ethiopia: Borana Zone (see H3.1).

A5. SDC Geography. Ethiopia (Horn of Africa)

A6. SDC Domain. South Cooperation: East & Southern Africa.

A7. Partners.

- **Implementing organisations**: Helvetas Swiss Intercooperation (HSI) and Welthungerhilfe (WHH).
- **Main international partners**: School of Agricultural, Forest & Food Sciences (*Hochschule für Agrar-, Forst- & Lebensmillelwissenschaften*, HAFL).
- **Main national partners**: Community Initiative Facilitation & Assistance Ethiopia (CIFA), Managing Risk for Improved Livelihoods (MARIL), Peace Development Centre (PDC, new in 2020).
- **Government partners**: Oromia Pastoralist Areas Development Commission (OPADC), Bureau of Finance & Economic Cooperation (BoFEC), Yabello Pastoral & Dryland Agriculture

Research Center (YPDARC), Disaster Prevention & Preparedness Agency (DPPA), Pastoral Development Office (PDO)

Part B: Purpose, relevance and approach

B1. Purpose.
Phase 1 (2015-2021):
Overall goal: "To improve the food security and resilience of pastoralist communities in the Borana Zone through sustainable and context-specific natural resources management (NRM) practices, along with enhanced income diversification strategies" (SDC, 2016: 2). The wording was later modified to "Pastoralist and agro-pastoralist communities have improved food and nutrition security, and improved resilience through context-specific and sustainable NRM practices as well as enhanced income diversification strategies." (SDC, 2020b: 2).

- **Outcome 1**. Pastoralists have increased access to pasture and water resources from rehabilitated and/or improved rangelands (SDC, 2020b: 2).
- **Outcome 2**. Pastoralist women incomes are increased while women diversify their livelihoods (SDC, 2020b: 3).
- **Outcome 3**. Natural resources management interventions are better coordinated, harmonised, and knowledge management is improved to properly document and scale up promising practices (SDC, 2020b: 3).
- **Outcome/component 4 (from 2020)**. Local governments and customary institutions collaborate to exercise accountable and inclusive governance and provide effective services related to natural resource management and conflict prevention (SDC, 2020b: 4). **Outputs**: (4.1) Local government and customary institutions are capacitated to plan, implement and monitor local plans in a complementary and participatory manner NRM related development; (4.2) Local Government and Customary Institutions are equipped to better prevent and resolve intra- and inter-community conflicts (SDC, 2020a: 3).

B2. Relevance to partners.
Ethiopia. "The proposed project is aligned with GoE's key strategies addressing NRM directly or indirectly, namely: (1) the Growth and Transformation Plan; (2) the Country Programming Paper to End Drought Emergencies; (3) the Climate Resilient Green Economy Strategy; and (4) the SLMP, whose SDC-supported expansion into pastoral areas will be fed by first-hand experience from Borana. While supporting the GoE in the development of Sustainable Land Management Program in Moisture Stressed Pastoral Areas (SLM-MSPA), the project focuses on influencing national policies with field-based evidence while advocating for pastoralist needs and priorities. The proposed project is also aligned with the Sustainable Development Goals (SDGs), target 2.3, to which GoE is fully committed [see B3]". SDC (2016: 6). iTUNE (2021) confirmed its continuing relevance to multiple GoE policies.
Switzerland. "The proposed project is aligned with the Swiss Cooperation Strategy Horn of Africa 2013-16/17 (CSHoA), feeding into Outcomes 1-2 of the Food Security & Rural Development pillar and into Outcome 1 of the Good Governance & Peacebuilding pillar. It has strong synergies with another SDC-funded flagship programme in the pastoral areas of Ethiopia (the GIZ-implemented project 'Strengthening Drought Resilience in the Somali Region'), and it ... is aligned with the SDC-funded Partnership Programme between the UN FAO and the Intergovernmental Authority on Development (IGAD), as well as with IGAD's Drought Disaster, Resilience & Sustainability Initiative (IDDRSI)." (SDC, 2016: 5-6)
General. Overgrazing, desiccation, groundwater failure, desertification, etc. are such widespread and worsening issues that proven ways to relieve pressure on pastures and groundwaters are important, especially if they can also generate co-benefits in terms of improving gender equity and social inclusion and generally encourage social and ecological sustainability.

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 1: No Poverty**, especially Target 1.4 (*By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance*), and Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*).

- **SDG 2: Zero hunger**, in particular Target 2.3 (*By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment*) and Target 2.4 (*By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality*).
- **SDG 5: Gender Equality**, especially Target 5.5 (*Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life*), and Target 5.a (*Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws*).
- **SDG 6: Clean Water and Sanitation**, especially Target 6.5 (*By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate*), and Target 6.b (*Support and strengthen the participation of local communities in improving water and sanitation management*).
- **SDG 13: Climate Action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), and Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 15: Life on Land**, especially Target 15.3 (*By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world*).
- **SDG: Peace, Justice and Strong Institutions**, especially Target 16.6 (*Develop effective, accountable and transparent institutions at all levels*), and Target 16.7 (*Ensure responsive, inclusive, participatory and representative decision-making at all levels*).

B4. Relevance to other development objectives.
Phase 1 (2015-2022):
SDC web-site. Topics: Agriculture & food security; Conflict & fragility; Climate change and environment. Sub-topics: Agricultural land resources; Household food security; Conflict prevention; Disaster risk reduction DRR.
Phase 2 (2022-2027):
OECD/DAC. Sector: Agriculture, General Environment Protection, Water Supply & Sanitation. Sub-sector: Agricultural development; Environmental policy and administrative management; Water resources conservation (including data collection).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Nil ("but possibly some net carbon storage through revegetation").
Adaptation: Ecosystem/community adaptation [EA]

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:
- **Mitigation**. SIGNIFICANT (1)
- **Adaptation**. SIGNIFICANT (1)

Part C: Narrative overview

Borena (or Borana, Oromo: *Boorana*) is a zone of the Oromia Region of Ethiopia, both zone and region having been created shortly after the adoption of the 1995 Constitution. It is bordered on the south by Kenya, on the west by the Southern Nations, Nationalities, and Peoples (SNNP) Region, on the north by West Guji and Guji, and on the east by Dawa Zone Somali Region. The people of the Borena Zone have long and successfully practiced their own customary system for rangeland management, including traditional practices for dry and wet season grazing, managing dry season grazing reserves through the *kallos* system for weak animals and milking cows that cannot travel far in search of pasture (Demissie *et al*., 2019).
Productivity in these rangelands has dwindled since 2000 because of 'bush encroachment' by *Acacia* trees and other inedible plants, overgrazing, soil erosion, demographic pressure, recurrent drought, competition for territorial grazing land, and the weakening of traditional

rangeland management systems. Borana pastoralists have therefore become poorer, with fewer cattle per household and increasing food insecurity. Traditional male-dominated decision-making and a negative perception of girls' education make women in these communities especially vulnerable to poverty.
The NRM-Borana intervention aims to improve matters by reversing some changes and facilitating the adjustment of NRM practices to new ecological conditions (e.g. by rehabilitating degraded rangelands and restoring local access and control over natural resources), and by diversifying pastoralists' sources of income (e.g. through new crops and livestock fattening, breed improvement, and hay-making activities by women farming groups), while also promoting cooperation between customary and government institutions and NGOs, and enabling government to scale up best NRM practices.
Design and performance. Phase 1 of the project was adequately designed, although with some issues over detail and clarity (score 4). It made impressive progress across its four components (respectively on rangeland/water source rehabilitation, gender equity, coordination and knowledge management, and governance). Its **effectiveness** and **impact** were therefore assessed as good (score 5), but in-migration to the project area - attracted by the success of the project - was a serious issue and **sustainability** was therefore assessed as moderate (score 4).
Transformative potential for mitigation. Rehabilitating rangeland is likely to result in net reduction of GHG emissions because of carbon accumulation in recovering soils and the root systems of vegetation. The amounts concerned cannot be estimated in the absence of any baseline or proxy on carbon storage processes, and of detail and clarity on what was proposed or actually done to the ecosystems concerned. But any participatory, environmental-education/local empowerment-based action is likely to contribute to system change, in this case by improving the management of a high-emitting, degrading ecosystem to create a more stable one with fewer system-wide GHG emissions. The lack of focus on mitigation in Phase 1 of this particular project, and the corresponding uncertainties in net emission effects, means that its transformative potential for mitigation is assessed as low.
Transformative potential for adaptation. There is evidence of a participatory, environmental-education/local empowerment-based action that is contributing to system change, in this case from a vulnerable, degrading ecosystem managed by a poor and fragile society to a more robust ecosystem managed by a careful and more prosperous one. There are also signs that Phase 2 will be more closely aligned with Government of Ethiopia efforts to build resilience and reduce vulnerabilities, while seeking to show clear links between resilience and household food security. All of this, combined with measures to strengthen the position of women in society, greater cross-border, governance and conflict programming, and attention to links between the 'One Health' approach and both CCA and CCM (see H3.2) adds up to transformative potential for adaptation that is assessed as high.

Part D: Design quality

D1. Theory of change.
"The relationship between people, livestock and natural resources (NRs) determines the sustainability of pastoralism as a livelihood system. Pastoralists used to maintain a subtle ecological balance between the size and composition of their herds, the number of people depending on them, and the available natural resources. Yet, inequalities of access/control over NRs, population pressure (both human & livestock) and inappropriate land use (compounded by environmental degradations) have disrupted this balance, forcing increasing numbers of pastoralists into poverty traps. Research findings indicate that in Borana, savanna areas declined from 45% to 9% between 1976 and 2012, while areas subjected to bush encroachment increased from 22% to 61%. On the other hand, incoherent approaches to water development, along with weak linkages between water development actors, have resulted in inappropriate water developments which worsen rangeland degradation. These factors, alongside the weakening of traditional water resources management systems and increasing water-related conflicts, have reduced pastoralists‘ access/control over water resources. These degradations will have far-reaching consequences if not addressed through long-term interventions which consider NR and livelihood aspects in their strategies. [This project therefore] aims at improving the food security and resilience of (agro-) pastoralist communities in the Borana Zone through sustainable and context-specific NRM practices, alongside enhanced income diversification schemes." (SDC, 2016: 5). These 'sustainable and context-specific NRM practices' are implied by the list of outcomes in SDC (2016: 8):

- **at community level**, rehabilitating rangelands and water points (presumably through the participatory, ecologically-informed management of grazing and vegetation in general and on water catchments and around groundwater access points in particular, starting immediately);
- **at government level**, coordinating interventions and sharing knowledge (presumably on how to manage grazing and vegetation to promote ecological sustainability and groundwater recharge, starting immediately) [a governance component and Outcome 4 were added during 2020]; and specifically
- **at project level**, identifying cross-border issues of common interest for Northern Kenya and the Borana Zone of Ethiopia (in "the upcoming phases"), and finding ways to increasing income among pastoralist women by diversifying their livelihood sources. [This item was listed in SDC, 2016 as integral to the community level but it is one that implies introducing new values and changing traditional social arrangements which are context-specific by their nature; it was elevated in the course of Phase 1 to Outcome 2.]

The 'impact hypothesis' of the project stated by SDC (2016: 8) is: "(1) IF communities, together with [Customary Institutions] and [Local Government] bodies, ensure the sustainable management of the prevailing [natural resources] within the territory, THEN their food security will be improved through direct consumption of their outputs, or through the additional income generated by NRM activities, thereby improving their livelihoods. (2) IF the capacity of [Local Government] partners improves thanks to a direct participation in project implementation, THEN the chances of project sustainability will be maximized while building [the Government of Ethiopia's] credibility to directly manage other donors' funds.

D2. Assumptions underlying the theory of change.
Assumption 1. That communities and local government will be receptive to environmental education and new ideas on how to manage grazing and vegetation, and how to diversify livelihoods based on NRM, and will then and therefore collaborate to make the necessary changes to prevailing practices.
Assumption 2. That improved management of grazing and vegetation, and diversified livelihoods based on NRM, will result in locally-perceived benefits for livelihoods and food security, thus consolidating changes and gains introduced by the project.
Assumption 3. That participation in the whole process will help to build local (and national) government capacity to manage and replicate similar projects using resources from an increased range of domestic and foreign sources.

D3. Plausibility of assumptions and links. The assumptions in the 'impact hypothesis' are plausible if they are re-stated (as in D2) to clarify the chain of causality involved.

D4. General quality of the project design.
Stakeholders & consultation. "This is a new project with no previous phases. A set of activities (including rangeland, gender, conflict & stakeholder analysis, baseline study [see H3.3] and ProDoc drafting) were conducted during the Inception Phase. Prior to that, the SDC Humanitarian Aid supported *Action Contre la Faim* and *Vétérinaires sans Frontières Suisse* to undertake short-term livelihood recovery projects in this region. The lessons and recommendations of these (now phased out) interventions have influenced the design of this project through a capitalization exercise." The consortium partners Helvetas Swiss Intercooperation (HSI) and Welthungerhilfe (WHH) will work with three local partners (CIFA, HAFL and MARIL) and "have signed a consortium agreement submitted to the SDC together with their bid ... As the project is also partly implemented through [Government of Oronia National Regional State, GoO] partners, the latter have actively participated in design. While GoO is enthusiastic and motivated to take up its role in implementation, its financial management and implementation capacity remains weak. As a result, the project will address this deficit during Phases 1-2." (SDC, 2016: 7). Consultation with the overarching customary institution in Borana (the *gada*) is described as an intention [see H3.4].
Risks. "Borana is prone to both natural (e.g. drought) and man-made disasters (e.g. ethnic and resource based conflicts) whose frequency-and intensity has not stopped to increase. However, as the project is partnering with the [Disaster Prevention & Preparedness Commission], early warning information will be produced and disseminated in a timely manner to allow swift response. At the same time, the project has an in-built contingency fund to respond to crisis as appealed by GoE. There could be a medium-level risk arising from misunderstanding, capacity gaps and discord between consortium, GoO and NGO partners. As a mitigation measure, project partners will communicate proactively and regularly, creating transparency through leadership, the introduction of a feedback culture, the sharing of reports and capacity building.

To reduce fiduciary risks at GoO level, all financial transfers during Phase 1 will happen through [HSI], which bears an overarching oversight role. As such, the SDC will not use GoO channels initially, a decision to be reviewed based on the results of capacity-building." (SDC, 2016: 10). The same source has a more detailed risk analysis in Annex 5, which identifies the following as high-probability and/or high-impact risks: (a) droughts and flash floods (also a high risk mentioned by HSI & WHH, 2016, which specifies off-setting through planning and implementing "all NRM activities with the inbuilt aim to enhance communities' resilience to climate-induced disasters", putting "special emphasis on the DRR contingency plans and on making sure that [early warning systems] are in place", and "setting aside contingency fund [see below] as a reserve to ensure timely and effective response."); (b) outbreaks of human, livestock and crop disease; (c) increasing ethnic and resource-based conflicts and political unrest; (d) limited political space to work on policy advocacy, conflict resolution/mitigation and promotion of human rights; (e) ineffective enforcement of NRM laws; (f) forced settling of pastoralists by government (also a high risk mentioned by HSI & WHH, 2016, which specifies off-setting by closely following government development plans "and take necessary amendment accordingly"); (g) financial inflation; (h) high rates of government staff turnover; (i) insufficient local government capacity; (j) misuse of SDC funds and project assets; and (k) nepotism in recruitment processes. All are associated with reasonable mitigation measures.

Contingency fund. "All target areas are lowland, drought-prone woredas of Borana. This may easily jeopardize development gains if no timely response mechanism is put in place. For the project to respond swiftly, cheaply and efficiently in case of a crisis, a contingency fund capped at CHF 550,000 per phase is hereby proposed from South Cooperation and under a separate agreement to be signed with implementing partners. Should the scale of the response exceed CHF 550,000 for a given phase, then additional funding will be sought from the SDC Humanitarian Aid. In case of no major humanitarian need (though such probability is low), the contingency fund will be spent for development interventions subject to the SDC‘s prior approval. The disbursement condition follows the humanitarian response architecture of the GoE. In Ethiopia, the Government alongside humanitarian partners develops annual Humanitarian Requirement Document which guides the overall humanitarian response actions and coordination mechanisms as well as priority districts. The geographic coverage of this funding will only be limited to the five project implementation woredas and the timeframe considered is the 4 years of Phase 1." (SDC, 2916: 9).

Overall assessment of design quality. There are issues of clarity, logic and detail with the design, but the level of participation was adequate, risks manageable and foreseeably mitigated by using experienced contractors and partners, along with a substantial contingency provision.

Score: 4 (moderate).

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.

Rehabilitating rangeland is likely to result in net reduction of GHG emissions because of carbon accumulation in recovering soils and the root systems of vegetation. The amounts concerned cannot be estimated in the absence of any baseline or proxy on carbon storage processes, and of detail and clarity on what was proposed or actually done to the ecosystems concerned. Summarising the external evaluation, SDC (2020b) comments that "While the review found the NRM-Borena to be a good example of a project aimed at combating climate change, there were limitations to adopting more climate resilient technologies and innovative alternative climate resilient working systems to sustain project results. Improving access to energy in underserved areas, and the use of low-emission technologies could address the development needs of vulnerable populations while promoting a transition to green, low-emission and climate resilient development." Considering the GoE's ambitious policy commitments to climate smart development (see H3.5), much more could be done to explore the mitigation aspect in this project. An intention to do so is not explicit in the 'exit strategy and scaling up' remarks and considerations for phase 2 in SDC (2020: 6-7). These are made "pending the finalisation of the new Swiss Cooperation Programme for the Horn of Africa" and focus on food security, sustainable agriculture and conflict, and therefore implicitly on climate change adaptation. However, Awuor *et al*. (2021) explain the links between climate change mitigation and food security in the Horn of Africa, with details on the agriculture, livestock, health, governance and migration domains, as well as an account of links between the 'One Health' approach and both CCA and CCM; this will hopefully exert a strong influence on Phase 2 of project 7F-09038 (see H3.2).

E2. System change. Any participatory, environmental-education/local empowerment-based action is likely to contribute to system change to some extent, in this case by improving the management of a high-emitting, degrading ecosystem to create a more stable one with fewer system-wide GHG emissions. The lack of focus on mitigation in Phase 1 of this particular project, and the corresponding uncertainties in net emission effects, means that its transformative potential for mitigation is assessed as low.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.
Details from (from SDC, 2020b: 2-4, summarising SDS & SEHAHUT (2019).
Effectiveness
Goal:

- 29% of households reported that they are food secure (i.e. with no food shortage throughout the year), compared to the baseline (10%), but below the phase target of 50%.
- 77% of households had suffered a shock (i.e. loss of main income, crop failure, livestock loss, sickness of a breadwinner, or unaffordable costs that had to be paid out) in the last 12 months.
- Of the households reporting improved food security, 73% attributed the improvement to better income from production (livestock and crops) due to the NRM-Borena project interventions, particularly better access to forage.

Outcome 1 (*Pastoralists have increased access to pasture and water resources from rehabilitated and/or improved rangelands*):

- The project supported rehabilitation of 1,873 ha of rangelands at eight sites across five districts, thus increasing access to pasture almost in line with targets. [Details of 'rehabilitation' are not provided, and why this affects 'access' is not explained.]
- The project built and/or rehabilitated various water sources, thus increasing livestock access to drinking water on track to achieve the end of phase target. [Details of the works are not provided.]
- Yabello TVET College tested options for carpentry use of wood from 'bush encroaching' species (*Acacia drepanolobium*, *A. melliphera* and *A. reficiens*), which are otherwise managed by felling and burning.
- **An indirect and unintended effect** of the improved access to rangeland and water sources was to attract new settlers from neighbouring sites, particularly during the dry periods.
- **Update from iTUNE (2021: vi)**: "The percentage of households ranking depletion and deterioration of forage base as a major constraint of access to pasture has increased from 62% at baseline to 91% at end line. Similarly, the percentage identified access to livestock drinking water in pasture areas a major constraint for access to pasture increased from 71% at baseline to 86% in this final evaluation."

Outcome 2 (*Pastoralist women incomes are increased while women diversify their livelihoods*):

- The project established 19 women groups, and 372 members benefited from various activities resulting in some increase in income (but well below the phase target which was therefore considered overly ambitious).
- The household food security of 120 women members of farm groups improved through production of different crop varieties (i.e. teff, maize, haricot bean, and wheat), as well as the group's self-reliance.
- The women farming groups managed to buy 26 bulls, and the subsequent sale of 18 bulls resulted in a net profit for three of the groups.
- Linkages created in the milk market between 70 pastoralist women and five private milk collection centres significantly reduced daily travel and costs incurred by single women and created sustainable market access.
- Enhanced "collaboration and coordination among local government representatives and customary institutions, together with the engagement of in literacy courses through flexible schedules contributed to changes both in practice and attitude (i.e. able to operate cell phone, recording of individual/group transactions, increased confidence, eager to continue their own studies while sending more children, particularly girls, to the school) and is expected to be further scale-up in a possible next phase."
- **Update from iTUNE (2021: vi)**: "The project achieved 13.4% of its target for the number of women group members who earn additional average cash income of Birr [ETB] 9,000 annually" but this figure had increased since the mid-term review in 2019 and the project

established 19 women's groups (in crop, vegetable and poultry production, livestock fattening, milk marketing and bee keeping).

Outcome 3 (*NRM interventions are better coordinated, harmonised, and knowledge management is improved to properly document and scale up promising practices*):

- The project achieved better coordination, harmonization, and an enhanced knowledge management system to properly document and scale up promising practices of NRM interventions.
- One outstanding finding was the involvement of Gada leaders in the government-NGOs forums through regular meetings to foster the participation of customary institutions.
- 240 people (10% female), from government sector offices, customary institutions, government projects and NGOs, attended regular coordination meetings at the Zone level, which contributed to bridging the gaps between customary institutions and government sector offices, and encouraged the exchange of lessons learnt.
- 176 representatives (15% female) from customary institutions and government structures attended the coordination meetings at *kebele* level during which the participants assessed the status of different development interventions in their respective *kebele*, and the necessary collective actions to be taken.
- **Indirect and unintended effects** of project interventions could be observed, such as a more equitable utilization of rehabilitated rangeland between poor and better-off households through hay making at household level and machine supported bale preparation. This compared to the traditional communal grazing system which, by default, favours the more wealthy households. Similarly, some pastoralist households who engaged in cash-for-work activities were able to build their livestock asset base through purchasing considerable numbers of shoats in addition to covering their household food consumptions.
- **Update from iTUNE (2021: vi)**: "The project managed to achieve only two of the plans to document eight best [participatory rangeland management, PRM] practices, while it realized none of its plan for adoption of PRM guidelines, strategies, and policies."

Outcome 4 (*Local governments and customary institutions collaborate to exercise accountable and inclusive governance and provide effective services related to natural resource management and conflict prevention*):

- The Peace Development Centre (PDC) conducted participatory action research on shared NRM governance by customary institutions and local government and their respective roles in relation to peace building and conflict prevention (confirmed by iTUNE, 2021).
- Activities were included to build local government capacity and to strengthen local governance effectiveness and efficiency, social accountability, participation, transparency, non-discrimination, and rule of law.
- **An indirect and unintended effect** observed was that the disaster risk management warehouses built by the project were also used as shelters by internally displaced people (IDP) during inter-ethnic conflicts.

Impact. "The percentage of food secured households increased from 10% at baseline and 4.3% during the mid-term review to 28.7% in this final evaluation. However, the achievement was below the project target of 50% for phase 1." (iTUNE, 2021: vi). There is abundant evidence, including in Ethiopia and to some extent in this project, that empowering women in the ways mentioned can have significant and irreversible effects on social well-being, promoting greater equity, inclusion and potentially environmental sustainability. This journey seems to have started well in the Borena target communities.

Sustainability.

- SDS & SEHAHUT (2019) saw that "this project gave due considerations for neglected customary institutions and strengthening them through creating coalition with the concerned government bodies and carried the responsibility of governing and managing the rehabilitated rangelands and water structures" (p. 31). They attributed this to intensive stakeholder involvement and contrasted it with other projects that had gone along with the GoE's pastoral development policy in ignoring the strong traditional management arrangements that already existed. The same source highlighted some progress on hay-making but noted other issues that were undermining sustainability, notably: drought, unpredictable rainfall and lack of drought-tolerant crops (including trees for woodlots); technical issues (e.g. with water pumps); demotivation; inflation; and security.
- iTUNE (2021: 30) concluded that "The soil and water conservation works has changed the land as grasses and other plantations recovered dramatically. The community has benefited

from the improved rangeland in getting pasture for their livestock and women are benefiting economically by practicing bee keeping. Since the community is enjoying the benefits from the improved natural resources, it is highly likely they will sustain the project interventions related to environmental protection. Development agents said that the community would continue such activities as they witnessed the importance."

- Phase 1 focused on piloting and learning from already existing good practices of sustainable NRM at grassroots level. "The fact that the project interventions are in line with the government plans and the strong sense of ownership that has been generated by the communities and government sector offices bode well for sustainability and increased scaling-out. The establishment of a multi-sectoral platform at the Zone and *woreda* levels as key players in advocacy, technical support, and addressing emerging issues were seen as beneficial to sustain relevant interventions." (SDC, 2020b: 5). The attraction of new settlers to the project sites to take advantage of better grazing and water there is a serious sustainability issue, and it is not clear how this is being addressed.

Overall assessment: **effectiveness** - 5 (good); **impact** - 5 (good); **sustainability** - 4 (moderate).

F2. System change. See E2. There is evidence of a participatory, environmental-education/local empowerment-based action that is contributing to system change, in this case from a vulnerable, degrading ecosystem managed by a poor and fragile society to a more robust ecosystem managed by a careful and more prosperous one. There are also signs in SDC, 2020b: 6) that Phase 2 will be more closely aligned with "the new 'Ten Years Development Plan' of the Government of Ethiopia with a focus on identifying key challenges, and developing a pathway for resilience building to reduce vulnerabilities and recurrent emergencies", while adopting "a conceptual framework to show the clear causal relationship between resilience and household food security". All of this, combined with measures to strengthen the position of women in society, greater cross-border, governance and conflict programming, and attention to links between the 'One Health' approach and both CCA and CCM (see H3.2) adds up to **transformative potential** for adaptation that is assessed as high.

Part G: Other aspects of design and performance

G1. Efficiency issues.

- "The external evaluation found overall project achievement with regard to activities to be highly satisfactory, in particular considering the multifaceted challenges during the implementation period. The project utilized existing resources, including government structures, private sector actors, and active community participation, to maximise synergetic effects, and further enhance project efficiency by minimizing costs. The project utilized 72% of the allocated budget as of 31 December 2020. Analysis of cost-benefit showed project cost per beneficiary to be ca. CHF 86 (calculated from the total budget utilized as of 31 Dec 2020) which is comparable to other similar projects. The project was efficient in engaging stakeholders throughout the project phase, including in the design, planning, implementation, monitoring and evaluation of its activities. In terms of respective budget utilisation by outcomes, Outcome 1 utilized 87%, Outcome 2 utilized 81%, and Outcome 3 utilized 71%, and Outcome 4 4% (by December 2020)." (SDC, 2020b: 4-5).
- "While the project implementation modality clearly outlined coordination mechanisms at different levels, it did not, however adequately address linkages to cascade the decisions by the Steering Committee to woreda and kebele levels, which occasionally slowed down project implementation. A key strength perceived by stakeholders was the engagement of Region level stakeholders in the coordination mechanism, including implementing partners and customary institutions." (SDC, 2020b: 5).

G2. Coherence issues.

"Synergies will be sought with donors and projects working in pastoralist contexts including, the USAID-funded Pastoralist Risk Improvement through Market Expansion (PRIME) project and the Land Administration to Nurture Development (LAND) project, the EU-funded Resilience Building in Ethiopia (RESET) project ... [and] As the project is at the Southern border of Ethiopia, it will build strong linkages with the SDC-funded Kenya Resilient Arid Lands Partnership for Integrated Development (K-RAPID) project implemented in Northern Kenya. The two initiatives will share experiences and good practices based on the dynamics of border areas. This will be achieved during Phase 1 by allowing project and Government staff to conduct cross-border field visits and to participate in selected strategic steering moments on both sides. On this basis,

cross-border issues of common interest will be taken up by the SDC at regional level (e.g. IGAD)." (SDC, 2016).

G3. Replicability issues. The project approach has marked similarities to that of RESET II and other CBRM grazing/water and local (and particularly female) empowerment projects in sub-Saharan Africa. Its main features (women farmer groups, restoration of traditional NRM systems under customary authority, greater cooperation with local and central government) are highly replicable, but could be improved with attention to ecological factors to sustainability issues arising from in-migration, and clarity over climate change aims in Phase 2.

G4. Partnership issues. "The NRM-Borena project is implemented by a consortium of organizations and local implementing partners with diverse experiences. As consortium lead Helvetas provided expert support for Market System Development for livestock and other economic opportunities. Welthungerhilfe worked on WASH related activities, CIFA focused on rangeland management, but also on WASH and selected livelihood activities, and PDC on governance related issues." (SDC, 2020b: 5).

G5. Connectedness issues."Over the course of the first phase, several contextual challenges impacted heavily on project implementation and the overall achievements of results. In particular, recurrent droughts, invasions of desert locust, and the global COVID-19 pandemic in 2020, in addition to ongoing conflicts between government forces and unidentified armed groups, constrained overall project implementation." (SDC, 2020b: 2).

G6. Cross-cutting themes.

Gender.

- "Borana pastoralists are patriarchal societies where key decisions are largely made by men. The participation of women in customary institutions (CIs) managing NRs such as water and grazing land is thus limited. In addition, harmful traditional practices (e.g. female genital mutilation, levirate marriage[46]) along with resistance towards girls‘ education have kept women in poverty traps and increased their vulnerability. This project will address gender issues pertaining to the governance, access and control of NRs by fostering women participation in the decision making processes of CIs and the LG. While Phase 1 will focus on immediate gender needs through income generating activities, subsequent phases will strive to address strategic gender needs." (SDC, 2016: 9).
- "In addition to the gender relevant achievements reported under Outcome 2, the project supported capacity building of various government sector offices in their roles to better coordinate and improve management of gender-based violence issues at One-Stop Centres, which serve women from all districts of the Borena Zone. The support contributed to the bridging of gaps between various sectors, and clarify role confusions in order to jointly deal with gender violence issues in a coordinated and collaborative manner. Different sharing events at Zone, woreda and kebele levels for women farming groups on agronomic practices, such as livestock fattening, hay making, and breed improvement, motivated women beneficiaries to do more and also contributed to a change in attitude of the wider agro-/pastoralist community towards the role of women in household economic diversification activities. The production of a documentary video in local language with English subtitles, in which local community members and other stakeholders gave their testimonies, documents, the changes the project interventions have brought to their lives and livelihoods. According to success stories gathered by the project, the income of women increased significantly due to insight acquired through their participation in awareness raising for income diversification, cooperative management and skills improvement, access to loan services, and market linkages with private sectors operating in different towns of the project woredas." (SDC, 2020b: 4).

Conflict.

- "Conflict-Sensitive Programme Management (CSPM) will be a continuous learning process integrated into project activities at all levels. As first step, the analysis conducted during the Inception Phase identified the need to provide project staff and partners with basic CSPM training. The project will thus regularly assess connecting and dividing factors within/between GoE and communities, while monitoring actors and conflict dynamics." (SDC, 2016: 9).

[46] "the brother of a deceased man is obliged to marry his brother's widow" (https://en.wikipedia.org/wiki/Levirate_marriage).

- "CSPM achievements with regard to general governance are reported under the specific Outcome 4, added in 2020 during the no-cost extension (see Hatcher & Boss, 2019, which starts with the premise that *"peaceful and inclusive societies are essential for sustainable development and thus for the effective sustainable management of natural resources."*, page 4). The project applied basic CSPM approaches in dealing with ongoing conflicts in the target sites and reinforced the gender orientation in livelihood diversification. Based on do-no-harm principles, the approaches to rehabilitation of rangeland and water points contributed to a reduction in conflicts among and within communities, by actively and transparently engaging communities of target sites and government offices." (SDC, 2020b: 4).

G7. Capacity building issues. Explicit references to capacity building in SDC (2021) are limited to: "Capacity building activities were included to build local government capacity and to strengthen local governance effectiveness and efficiency, social accountability, participation, transparency, non-discrimination, and rule of law", and "the project supported capacity building of various government sector offices in their roles to better coordinate and improve management of gender-based violence issues at One-Stop Centres, which serve women from all districts of the Borena Zone" (both on page 4). Details are required.

Part H: Other matters arising from the review

H1. Follow-on questions. Details were obtained (SDS & SEHAHUT, 2019: case studies) on some of the specific rangeland rehabilitation activities involved, including 200 ha at Gayo, and on water-source and pond rehabilitation at Gayo, 'key-hole gardening', solar pump installation at Dhas kebele. Drivers of bush encroachment were clarified ("expansion of invasive species and soil erosion driven by overgrazing", as were various other matters. Options concerning in-migration remained unclear in iTUNE (2021), but focused on the new Component 4 which aimed to harmonise "local governments and customary institutions in exercising accountable and inclusive governance and providing effective services related to natural resource management and conflict prevention".

H2. Missing documents. Not applicable.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: The Borana Zone (Reid *et al*., 2013).
"The Borana administrative zone is a lowland area situated in the south of Oromia Regional State in Ethiopia. The zone is divided into ten *woredas*, which are predominantly arid and semi-arid rangelands dominated by tropical savannah vegetation with open grassland and perennial woody vegetation. Pastoralism is the predominant livelihood activity and most people in the Borana zone are pastoralists or agro-pastoralists, with livestock holdings determining levels of household wealth. The main livestock kept in the area are cattle, sheep, goats and camels. The main agricultural crops are maize, teff, sorghum and haricot beans (Riché et al. 2009).
"The average annual rainfall in Borana ranges between 350 and 900 mm, with considerable spatial and temporal variability in quantities and distribution. Rainfall usually occurs in a long rainy season from March to May, and a shorter rainy season from September to November. The average annual temperature ranges between 19 and 26°C. Rainfall variability results in great variation regarding where the best forage is found (Riché et al. 2009). To cope with this, most communities practice mobile livestock management, where animals are usually only kept at the homestead (*wara*) on a seasonal basis to provide milk for children and older household members who do not migrate with the herd.
"The study sites are currently located in medium and high drought probability zones [Government of Ethiopia,], and Riché *et al*. (2009) identify drought as the 'main climate-related hazard affecting pastoral and agro-pastoral communities in Borana'. Drought and extreme heat events are negatively affecting the availability, productivity and quality of pastures and farmland, which leads to livestock emaciation and death, reduced disease resistance and livestock productivity (in terms of milk and meat), more livestock being sold on the market, and lower livestock prices thus reducing household income. Not everyone is affected in the same way, but reduced food availability (mainly meat and milk) has particularly affected the health of children under five years, pregnant women and old people. Riché *et al*. (2009) argue that 'The magnitude and rate of current climate change, combined with additional environmental, social and political issues, are making many traditional coping strategies ineffective and/or unsustainable' in the Borana zone. Weiser (2012) also describes how pastoralist communities in the study sites have been in a state of crisis, because their present coping capacities have not been sufficient to

cope with widespread, severe & recurrent droughts, such as those experienced in 2008 and 2010/11."

H3.2: Climate Change Mitigation Entry Points in Food Security in the Horn of Africa (Awuor et al., 2021).

The Agriculture Sector

"In the HoA, a large proportion of livelihoods and income rely on livestock production and dryland farming. Given major challenges namely droughts, floods, soil erosion and land degradation, potential opportunities for promoting CC mitigation and low carbon development are presented below.

"Adoption of Climate-Smart Agriculture (CSA) practices e.g. conservation agriculture technologies, like stone mulching and minimum tillage, allow for biomass accumulation in the soil. These interventions also promote carbon sequestration in soil and plants. It is important to carry out re-seeding of rangelands using adaptable local varieties/ improved varieties of grasses for pasture. Apart from providing livestock feed, these grasses provide cover to the soil, thereby reducing soil erosion. In addition, the grasses build and retain carbon stock above and below ground. Key entry points for SDC to promote CC mitigation in the HoA include support towards commercial production of fodder and livestock feed. In addition, SDC should support the strengthening of effective traditional rangeland governance and management strategies, e.g. in Borena zones in the HoA, and advocate for the incorporation of these measures into district/county government policy formulation, institutionalisation and implementation as feasible.

"Another opportunity lies in the infusion of renewable energy in agricultural value chains. SDC should build on the use of solar energy in the irrigation systems installed by the Kenya RAPID project. SDC should capitalise on this, and support the expansion of solar energy in water abstraction, water treatment and distribution as feasible. In addition, SDC should support the use of solar energy in poultry production, and value addition to agricultural products e.g. milk, meat, vegetables and cereals. This would reduce reliance on diesel power, thus reduce the emission of carbon dioxide into the atmosphere. At the same time, it would enable communities and business owners to take advantage of the abundant sunshine found in the HoA. As SDC promotes the adoption of solar technologies, it should mitigate the potential future challenge of improper disposal of redundant solar equipment by engaging the solar equipment companies in a buy-back and/or waste collection endeavour in the long term.

"There is an opportunity to increase tree cover in the HoA, and contribute to carbon sequestration in soil and plants. SDC can support interventions on the commercial establishment of tree nurseries, e.g. through KKCF. SDC can also support agroforestry, targeting economically beneficial native and other tree species suitable in the HoA, including multi-purpose tree species. Examples include trees that provide browse for livestock, e.g. goats and camels, trees with medicinal products, fruit trees, and trees that provide gums and raisins e.g. Gum Arabica. It is recommended that SDC partners with the World Agroforestry Centre (ICRAF), the Kenya Forestry Research Institute (KEFRI), to provide technical advice, material inputs including appropriate tree seeds and seedlings, and capacity development on the establishment of tree nurseries, tree growing and management, and sustainable harvesting of economic products from trees. Agro-forestry is best combined with related livelihood activities, e.g. apiculture, as an additional layer to achieving resilience and acting as a buffer in forest protection.

"SDC should also implement the regional approach and support the ecosystem and/or basin conservation by promoting agroforestry, afforestation and reforestation in the highlands/watershed areas to minimise flooding in the ASAL low lands in HoA. This would reduce the loss of carbon through soil erosion during flooding.

The Livestock Sector

"Proper and timely livestock offtake could promote better herd size management, thereby contributing towards the mitigation of CC in the livestock sector. This is by contributing towards the appropriate reduction of livestock numbers, and the attendant levels of methane gas emitted by them. SDC can promote timely livestock offtake by supporting market systems in livestock value chains. For example, the efficient and sustainable operation of slaughterhouses and abattoirs in HoA counties/districts will provide ready markets for livestock. Consequently, the competitive prices offered for livestock will provide incentives for pastoralists to sell livestock to the slaughterhouses and/or abattoirs, thereby off taking livestock and consequently improving the management of herd sizes. Slaughterhouses and abattoirs should be located at strategic points in all the HoA counties/districts and countries to help reduce livestock movement across borders. In addition, the slaughterhouses and abattoirs should be constructed together with

feedlots to improve the meat value chain in livestock. SDC should also lobby the national and district/county governments to use appropriate economic instruments e.g. provide conditional subsidies to slaughterhouses and abattoirs in the HoA during the early onset of droughts, to facilitate enhanced purchase, slaughter and processing of livestock and their products from communities before livestock body conditions deteriorate considerably. SDC should also promote the cyclic economy in agro-pastoral systems, by promoting the use of crop residues as livestock feed, and livestock waste products as fertilizer for crop production.

"Infusing renewable energy in livestock value chains can contribute to CC mitigation. For example, switching from the use of diesel to solar power in meat and milk processing can reduce the emission of carbon dioxide into the atmosphere. In addition, proper disposal of livestock waste e.g. appropriately burying or incinerating remainders of carcasses after slaughter could help contain the emitted gasses. SDC could support the proposed abattoir in Isiolo County to incorporate renewable energy and appropriate waste disposal technologies into its design, construction and operation.

"The promotion and use of biogas energy in peri-urban and urban areas where some pastoralists migrate to in search of jobs when drought conditions worsen, is an important entry point for CC mitigation in the livestock sector. SDC should capitalise on Switzerland's niche in fostering effective partnerships, and partner with the Swedish International Development Agency (SIDA) to learn and adopt interventions on the production of biogas using animal dung, and use of biogas energy for cooking and lighting among SDC's target communities in peri-urban and urban areas. SIDA is implementing this intervention under the Integrated Management of Natural Resources for Resilience in Arid and Semi-Arid Counties (IMARA) project. SDC could contribute towards scaling out such interventions and their results in its areas of operation.

The Health Domain

"Energy and WASH are critical issues in the region with a direct impact on health. Adoption of clean energy improves the quality of life, and more so for women and children. Traditionally, women tend to play more roles in the kitchen. Continued use of firewood and charcoal could be detrimental to their health in the long run. Mitigation opportunities in water treatment and supply may benefit from the use of solar-powered systems. To some extent, this is being implemented through various projects like Kenya RAPID. The Promotion of Climate-Friendly Cooking Project being undertaken by the Ministry of Energy and the Netherlands Development Organisation (SNV) promotes solar lighting and energy-saving cookstoves for households in peri-urban and urban centres. Collaboration to upscale adoption of these technologies will potentially reduce demand for charcoal and consequently minimise deforestation. At a community level, alternative energy options, such as community mobile solar cooking systems, could be assessed and promoted. However, there is a need to undertake a feasibility assessment to determine their sustainability under the displacement and nomadic pastoralism contexts.

The Governance Domain

"The current work through the LSS and Kenya RAPID supporting sub-county development in Isiolo is a good starting point to create an enabling environment for CC adaptation and mitigation. Regionally, harmonising interventions/programmes to country contexts would be a more appropriate way to achieve more impact. Such programmes can only thrive where there is an enabling environment. For example, despite the availability of country-specific NDCs within the region, the low achievement of the targets is partly linked to misaligned policies and partly by financial constraints (Bhandary, 2021). The process of aligning such policies is best informed by experience and knowledge gained through sharing and learning. In the current projects, for example, there are very few cross-border interactions and knowledge sharing. Learning by interaction creates opportunities for tapping into the experiences to build regional programmes. The majority of interventions in policy advocacy have mainly looked at CC from an adaptation lens, which answers to the immediate needs. However, long term thinking infusing mitigation in policies in the region is a gap and an opportunity to engage stakeholders in the region.

The Migration and Protection Domain

Refugee settlements act as a market for goods and services. An assessment by SDC to determine business opportunities for solar energy systems in refugee camps can be extended to waste management (incorporating biogas) for community energy use and waste recycling, especially among peri-urban and urban communities, to promote a cyclic economy. The outcome of such an assessment, especially if there is a strong business case, can be packaged and sold to the private sector for implementation.

Links between One Health Approach and Climate Change Adaptation and Mitigation

The Swiss One-Health Partners in the HoA define One Health as "any added value in terms of better health and well-being for humans and animals, financial savings and improved environmental services achieved from closer cooperation between practitioners and scholars concerned with human, animal, and environmental health and related outcomes, beyond what can be achieved by working alone" (Zinsstag *et al*., 2015).

One Health is a collaborative, multi-sectoral, and transdisciplinary approach working at the local, regional, national, and global levels to achieve optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment (CDC, 2018). The One Health approach supports global health security by improving coordination, collaboration and communication at the human-animal-environment interface to address shared health threats such as zoonotic diseases, antimicrobial resistance, food safety and others. The concept of One Health is the unity of multiple practices that work together locally, nationally, and globally to help achieve optimal health for people, animals, and the environment (ibid).

SDC is implementing the One Health approach through the HEAL and JOHI projects. These projects have environmental components which provide good entry points for CC adaptation and mitigation. For example, the HEAL project could implement re-greening of rangelands through tree-growing and reseeding of rangelands, thus contribute to CC mitigation. The planned One Health clinics could also install and use solar energy systems to power their premises and electrical equipment, thus contribute to reducing GHG emissions.

The One Health projects contribute to CC adaptation through access to, and use of disaster early warning information via the multi-stakeholder community platforms. These platforms also provide a good entry point for access to and use of community weather forecasts, which are reportedly more reliable, in project interventions. The HEAL Project is also implementing adaptive management strategies and has built-in contingency funds, used to respond to climatic shocks e.g. drought, and flood-related human and livestock diseases such as cholera and RVF among others. These interventions go a long way in helping communities to adapt to the impacts of CC.

H3.3: Some findings of the baseline survey (from SDC, 2016: Annex 19).

Major constraints of access to pasture: Access to migratory pasture is getting increasingly restricted for different reasons: it is reported to experience the highest rate of over-stocking, deterioration of the forage base associated with very low forage biomass yields and forage quality, as well as bush- and settlement encroachment. It receives the highest constraint rating (100%) of chronic shortage of cattle and sheep to forage. Under these circumstances, migration to distant rainy season pasture is for a majority of Borana pastoralist communities more associated with risks than with benefits. As a result, restricted migration patterns are being adopted within Olla pasture. With less number of livestock migrating to distant rainy season migratory pasture, the pressure on Olla and Kalo pasture is increasing. As traditional pastoralist migratory patterns are crumbling, the way forward is the intensification of the vast Olla pasture rangeland resource through the adaption of appropriate rangeland rehabilitation measures, followed by intensive rotational grazing Systems. Besides other improved rangeland management practices, the expansion of Kalo pasture and their intensification need to be applied.

Access to water sources: Findings from this survey revealed that only 18.3% and 10% of households reported ta use water for drinking from protected sources during dry and wet/rainy seasons respectively. Distance was the main factor for using water from unprotected sources (66%), followed by unavailability of protected water sources (29.6%) and expensive water fees at protected sources (8.9%). Only 2.1% and 5.3% of households access drinking water sources within 500 meters during the dry and wet/rainy seasons respectively. The average time spent ta collect water, including round trip to and from water sources and queuing time, was 30 minutes or less tor 8.3% of households during the dry season and 36.3% during wet/rainy season.

Livestock holding and stock composition: About 98% of the households keep at least one livestock species and almost 80% of them keep three or more ruminant species, showing a high degree of livestock diversification. Cattle, goats, sheep, camels, poultry and donkeys are raised by 90%, 90%, 83%, 24%, 29% and 41% of the households respectively. The average household herd size is respectively 11.0, 7.4, 6.3, 2.4 and 3.8 for cattle, goats, sheep, camels and poultry. Cattle are playing the most important role for cash income and household food and nutrition security. However, cattle productivity is rather low, in terms of birth rate (35% on average) or milk production (mean daily milk off-take per milking cow: about one litre in the peak season). The average death rate is 17%, but varies significantly by location. Cattle belong to the

Ethiopian Borana breed, but some dilution with highland breeds and genetic erosion has been reported. Small ruminants are kept by a majority of HH as a source of cash income, and for milk production in the case of goats. Small ruminants have a bw fertility rate and a very high mortality rate (59% for sheep and 43% for goats) due to diseases (CCPP and coenurosis). Camels are highly appreciated because of their drought tolerance, low water requirement, ability to browse on the leaves of bushes and trees and potential higher milk production. However, camel productive and reproductive performances in the surveyed households were found to be very bw.

Animal feeding: The production system is still predominantly pastoralist, using extensive and semi-sedentary grazing systems, herd splitting and strategic mobility to track the best quality forage and water, as an adaptation mechanism in an environment where rainfall is highly variable. Rangeland constitutes the main source of forage, and thus forage availability varies across the seasons, with best availability in the two rainy seasons. Communal grazing close to the villages, including the communal enclosures (*kalo*), provides about 80% of the feed sources for all ruminant species.

Crop production: About 43% of the surveyed households grow crops while more than half (57%) of them do not grow crops. The average cultivated land was more than 1 ha for 37.5% of households, between 0.75 and 1 ha for 45% of households and between 0.5 and 0.75 ha for 17.5% of them. From those households growing crops, 81% used to grow for reducing food purchase (that means they grow for domestic consumption). Among those H households H that dc not grow crops, fear of risk of crop failure due to unfavourable weather condition was the main reason for not being engaged in crop production reported by 68.8% of respondents. Maize and haricot bean are grown as major crops while others as minor and rare crops. Among those households engaged in crop production, majority (95.8%) of them grow maize, with 62.5% as major crop and 31% as minor crop. All HH engaged in crop production exercise weeding, and 85.4% of them practice hoeing. Nearly 40% of HH apply manure, which is not far below the national application rate.

Livelihoods diversification for food security: The Borana pastoralists are considered to be among the main cattle suppliers for Ethiopian domestic consumption and international export trade. Respondents of the household survey estimated that 67% of their income comes from the sale of livestock. Many pastoralists reported that they are only selling their livestock when they need the money, during the dry season, or in case of droughts, when the animals are in poor condition. Livestock marketing is further impaired by the long distance to access markets, the fact that livestock markets are not predictable, the lack of market information, and a lack of direct linkages between buyers and sellers impaired by illegal brokers. Livelihood diversification in general and livestock diversification in particular are adaptation strategies to climate change adopted by pastoralists. It is clear from this survey that the interest tor camel is growing in Borana. Until recently, camel production was neglected by research and development agendas.

Average annual income per household: Income from sale of crops reaches 4,181 Birr per household during cropping season (average of 21 crop growing households). The average annual income from other alternative sources, excluding livestock earnings, (38 respondents) was reported to be ETB 6,645. Overall, a household earns an average of ETB 5,187 per year.

H3.4: The Gada System of the Borana Oromo (Annex 14 in SDC, 2016).

"The Borana Oromo has a very prominent traditional system of governance - the *Gada* System. This System is not only well developed and well preserved among the Borana Oromo but also a viable socio political system to date, comparable to no other region in Oromiya. It is an indigenous system of government where leaders are elected to position of authority through the will and active participation of the people they represent. Leaders are not only elected to position of authority to maintain the laws and the rules of the land but also made accountable for every decision they make during their tenure as councillors of their own constituency and leaders of the society. In the Borana Gada system, the structures of governance are open to all men, and decisions are made through open discussions. All clans and age classes are represented in the Gada councils. For people who have studied the System and worked with the Gada Councilors, it is absolutely clear that Gada is a functioning democracy.

'The Gada has been instrumental in introducing conscious changes, whether they are administrative, social, or economic among the Borana communities. The Gada and Gumi Gayo Assembly (held every 8 years) make decisions at a higher level on local resource use and determine the management of grazing and water resources. Changes are introduced based on a customary knowledge system and are disseminated to the public through clan representatives. Customarily, the Borana have residential and territorial organization around water and rangeland

use, which includes *Olla*, *Ardaa*, *Reera*, *Dheda*, and *Madda*. Water sources are known as *Madda*, and those who use the same *Madda* form one organizational unit which is administered by the *Aba Madda* ('father of the Madda').
"*Madda* and *Reera* territorial customary organizations are equivalent to *kebele* or peasant associations (PA) of the government administrative structure. *Madda* is essentially an area of grazing which is defined in terms of right of access and responsibility for the upkeep of particular wells. Therefore, *madda* makes decisions regarding resource management in general. Similarly, the *dheeda* is responsible for monitoring and allocating grazing areas to different users and seasons at a lower level, while *olla* has the same function at the village level. However, disregarding these local institutions, the GoE established its own administrative structures. Although PAs initially emerged with full support and participation of communities in the south to facilitate land reform, eventually they became instruments of the state to control the local people."

H3.5: Ethiopia's climate policies and strategies.
"In 2011, Ethiopia adopted a Climate-Resilient Green Economy (CRGE) Strategy to respond to the challenges of climate change (Government of Ethiopia, 2011a, b; 2018a, b, c). This sets out a national framework for blending climate finance with development finance to maximise the effective delivery of climate-relevant objectives, across sectors and regions. It has components on Green Economy and Climate Resilience, of which the former is most relevant here.
"The Green Economy component of CRGE aims to achieve economic development while ensuring environmental sustainability (Government of Ethiopia, 2011b). Economically, it focuses on achieving rapid growth in a resource-efficient way whilst taking advantage of the country's renewable energy (RE) resources. Environmentally, it seeks to cap GHG emissions at a low level while promoting carbon recapture through reforestation and afforestation, and reducing emissions from forest degradation. Boosting agricultural productivity, strengthening the industrial base, and fostering export growth have been prioritised as vehicles for reaching these goals, including the avoidance of contradictions among them. It is therefore based on four pillars:

- improving crop and livestock production practices for higher food security and farmer incomes, whilst reducing carbon emissions;
- protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks;
- expanding electricity generation from renewable sources of energy for domestic and regional markets; and
- leapfrogging to modern and energy-efficient technologies in the transport, industry and construction sectors.

"Around 150 potential climate change mitigation options across seven sectors were analysed based on their relevance, feasibility and potential for cutting emissions at a reasonable cost. More than 60 initiatives were then prioritised. These aim to help the country achieve its development goals while limiting GHG emissions. Implementation of the CRGE strategy follows a sectoral approach by establishing CRGE focal units in each sector at the national level, and it is expected to ensure a resilient economic development pathway while decreasing per-person emissions. Sector-specific strategies have been further developed with targets for emission-reduction and adaptation activities. Agriculture, forests and energy are among the priority sectors for government climate change-related investments.
"The 2011 CRGE strategy was later integrated into the national five-year development plan for 2015-2020, known as the Second Growth and Transformation Plan (GTP-II; Government of Ethiopia, 2016), and its follow-on ten-year perspective plan for 2020-2030. This demonstrates the long-term policy commitment of the Government of Ethiopia to building a green economy with carbon-neutral growth.
"The mitigation aims in Ethiopia's first NDC (Government of Ethiopia, 2017) essentially recapitulate those of CRGE and GTP-II. These include using a multi-sectoral approach based on the four pillars of the green economy component of CRGE. All major sectors are covered, which the NDC lists as "Agriculture (livestock and soil), Forestry, Transport, Electric Power, Industry (including mining) and Buildings (including Waste and Green Cities)." Relative to the 2017 NDC, the 2020 update (Government of Ethiopia, 2020) recalculates and increases the emission baseline, foreseen BAU emissions in 2030, emissions after abatement, and estimated abatement costs, the latter to USD 294 billion. Of particular relevance to Ethiopia, and stressed in the NDC update, is that "the widespread use of biomass for energy services, in particular cooking, is an important source of emissions for which international GHG accounting rules lack

clear direction" (page 5). Moreover, the high cost estimates for abatement, of which at least 80% must be sourced internationally, leads the Government of Ethiopia to reserve the right to vary its priorities according to available resources." (Caldecott *et al*., 2021: 60-62).

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Part J: Acronyms and abbreviations

BoFEC)	Bureau of Finance & Economic Cooperation
CIFA	Community Initiative Facilitation & Assistance Ethiopia
CRGE	Climate-Resilient Green Economy
DPPA	Disaster Prevention & Preparedness Agency
ETB	Ethiopian Birr (ETB 100 = € 1.78 on 1 Jan 2021).
FDR	Federal Democratic Republic
GoO	GoO Government of Oromia
HAFL	*Hochschule für Agrar-, Forst- & Lebensmillelwissenschaften* (School of Agricultural, Forest & Food Sciences)
HSI	Helvetas Swiss Intercooperation
IEK	Indigenous environmental knowledge
MARIL	Managing Risk for Improved Livelihoods
NRM	Natural resources management
OPADC	Oromia Pastoralist Areas Development Commission
PDC	Peace Development Centre
PDO	Pastoral Development Office
WHH	Welthungerhilfe
YPDARC	Yabello Pastoral & Dryland Agriculture Research Center

Annex 13.15: Green Gold in Mongolia

Project highlights.

7F-09484: **Sustainably managed pastures and healthy animals: Mongolia's 'green gold'**[47]. Consolidated multi-phase projects on animal health (7F-06231), and on pasture health and governance (7F-03461); enabled pastoralists to manage and monitor their own herds and rangelands, and to become stronger in protecting and advancing their own collective interests in ways that are strongly adaptive to changing biophysical circumstances.

Part A: Basic data

A1. Project number & name.
7F-09484 - Sustainably managed pastures and healthy animals: Mongolia's 'green gold'. This consolidates and ends two long-running projects (7F-03461 and 7F-06231), all three of which are combined here.

A2. Sources.
Process of PRF development: a draft PRF was prepared using documents listed in the bibliography and later revised in light of comments and additional documents received. A Contribution Narrative covering all three projects was presented at the evaluation's Core Learning Partnership meeting on 13 Dec 2021.

- **7F-09484 Sustainably managed pastures and healthy animals: Mongolia's 'green gold' (2017-2021)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2015/7F09484/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html.
- **7F-03461 Pasturelands - Mongolia's 'Green Gold' (2013-2016)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2004/7F03461/phase4.html?oldPagePath=/content/deza/en/home/projekte/projekte.html.
- **7F-03461 Pastoral Ecosystem Management (2010-2012)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2004/7F03461/phase3?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **7F-06231 Animal Health Project contributes to Mongolia's livestock health (2012-2016)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.par_projectfilter_copy_page3.html/content/dezaprojects/SDC/en/2008/7F06231/phase2.html?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **7F-06231 Sustainable Livestock Management Project (2008-2011)**: https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.par_projectfilter_copy_page3.html/content/dezaprojects/SDC/en/2008/7F06231/phase1.html?oldPagePath=/content/deza/en/home/projekte/projekte.html

A3. Dates & financial data.

- **7F-09484 - Sustainably managed pastures and healthy animals: Mongolia's 'green gold' (Jan 2017-Sep 2021)**: CHF 8,676,000.
- **7F-03461 - Pasture Ecosystem Management: Green Gold, Mongolia (started 2004)**:
  - 'Pastoral Ecosystem Management' (Phase 3 Jan 2010-Dec 2012): CHF 6,100,000
  - 'Pasturelands - Mongolia's "Green Gold"' (Phase 4 Jan 2013-Dec 2016): CHF 10,580,000
- **7F-06231 - Animal Health project in Mongolia (started 2008)**:
  - Sustainable Livestock Management Project (Jul 2008-Dec 2012): CHF 4,970,000
  - Animal Health Project contributes to Mongolia's livestock health (Jan 2012-Dec 2016): CHF 6,935,000

A4. Location(s). Mongolia. "According to credit proposal focus during third phase was on 7 western *aimags*: Arkhangai, Bayankhongor, Govi-Altai, Uvs, Khovd, Bayan-Ulgii, Zavkhan, and in total some 40 *soums*." (SDC & SECO, 2014: 150-151).

[47] The contribution narrative *Mongolian pastoralists and grasslands* (Annex 10 Part A) explores the project's significance for CCA and the significance of the 'living resource user group' approach.

A5. SDC Geography. Asia, Far East; Mongolia

A6. SDC Domain.
- **7F-09484 (2017-2021)**: SC: Asia/MENA-D (variously).
- **7F-03461 (2004-2016)**: SC: East Asia
- **7F-06231 (2008-2016)**: SC: East Asia (presumably)

A7. Partners.
- **7F-09484 (2017-2021)** - Contract partners: Ministry of Food, Agriculture and Light Industry (MoFALI), National and aimag federations of PUGs. Other partners: Agency of Land Affairs (ALAGC), National Agency for Meteorology and Environment (NAMEM), Veterinary and Animal Breeding Agency (VABA). Coordination and synergy with: SRB (Strengthening Representative Bodies): Capacity development of Local Parliaments; SLPIII (Sustainable Livelihood Programme): Capacity development of local authorities and LDF allocation for rangeland management; EU/FAO: Support to employment creation in Mongolia; WB: Mongolia Livestock and Agricultural Marketing Project; AVSF/EU: Promotion of ecological cashmere and yak wool.
- **7F-03461 (2004-2016)**: Contract partners Foreign academic and research organisation; Other International Organization; Swiss Academic and Research Institution; Agroscope; Other OI; Research Organisation of South East; SDC Field Office; ART (Agroscope Reckenholz-Tanikon Research station), USDA-ARS (US Department of Agriculture-Agricultural Research Service), The extension and marketing components will be tendered adding two partners.
- **7F-06231 (2008-2016)**: Contract partners: International or foreign NGO; Other international or foreign NGO North; SDC Field Office. Other partners: Swiss competence centres, private veterinarians, private meat industry, other donor agencies, NGOs, WB, FAO, EU.

Part B: Purpose, relevance and approach

B1. Purpose.
7F-09484 (2017-2021): **Overall goal**. To improve the livelihoods of herder households through sustainable rangeland management, better marketing and a conducive legal and policy environment.
- **Outcome 1**: Sustainable rangeland management is ensured through up-scaled pasture user groups and rangeland use agreements.
- **Outcome 2**: Income of herder households is increased through collective marketing and improved quality of livestock products thanks to improved veterinary services.
- **Outcome 3**: Conducive legal and policy environment for effective animal health system and sustainable rangeland is developed.

7F-03461 (2004-2016): as for 7F-09484 (minus veterinary services).
7F-06231 (2008-2016): **Overall goal**. To improve the animal health system and make it more effective.
- **Outcome 1**: Mongolia has solid and well organized Veterinary Services according to the World Organisation for Animal Health standards with well trained female and male personnel.
- **Outcome 2**: Mongolian authorities are capable to control brucellosis and foot-and-mouth disease (FMD).
- **Outcome 3**: The formal education for the bachelor of veterinary medicine at the School of Veterinary Medicine and Biotechnology of the Mongolian State University of Agriculture is based on a state-of-the-art curriculum and is taught by competent male and female teachers.

B2. Relevance to partners (7F-09484 and 7F-03461 only).
Mongolia. "The project aligns with the 2015 adopted Green Development Policy and the State Policy on Food and Agriculture. The Government policy recognises the importance of traditional pastoral systems to ensure food security. The legal provisions are oriented towards increased productivity through intensification, better quality, improved animal health system and by maintaining herd sizes in balance with the natural environment. The action plan of the newly appointed Government (2016)10 confirms the alignment of the project with national priorities. After meetings with newly appointed key political actors it is possible to say that topics such as Rangeland and Animal Health are even higher in the agenda of the current Government than it was the case in the previous one. Alignment is ensured as well with the newly appointed local Governments at provincial/*aimag* level." (SDC, 2016: 4). Government of Mongolia adaptation targets include: "Maintain the ecosystem balance by strengthening the legal environment and

pastureland management; Sustainable use of pastureland by increasing the forage cultivation and water supply for livestock; Enhance the disaster prevention system against drought and dzud." (GoM, 2020: 6).
Switzerland. "The project is aligned with the current SDC Country Strategy 2013-2017, as it contributes towards equitable and sustainable development and fits into the Agriculture and Food Security (AFS) domain by combining sustainable natural resource management with strategies for improved production, productivity and marketing. An increased poverty and gender equality focuses are taken into account, through the introduction of multi-dimensional poverty monitoring and the systematic gender equality mainstreaming. The project maximizes synergies with the SDC governance domain in local rangeland management, capacity building of local authorities and elected Local Parliament members and the use of local development funds for rangeland management." (SDC, 2016: 4).
General. Land degradation and desertification from grazing pressure and climate change are extremely widespread and growing problems worldwide, "especially in drylands, where most rangelands occur, and where 73% are degraded" (Butscher & van der Werf, 2021: 1).

B3. Relevance to SDGs. (https://sdgs.un.org/goals).

- **SDG 2: Zero Hunger**, especially Target 2.4 (*By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality*).
- **SDG 13: Climate Action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), and Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 15: Life on Land**, especially Target 15.3 (*By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world*).

B4. Relevance to other development objectives. (SDC project web-site)

- **7F-09484 (2017-2021)**: Agriculture & food security; Employment & economic development; Agricultural land resources; Agricultural co-operatives & farmers' organisations; SME development; Agricultural policy
- **7F-03461 (2004-2016)**: Agriculture & food security; Agricultural development; Agricultural services & market; Agricultural research; Agriculture value-chain development.
- **7F-06231 (2008-2016)**: Agriculture & food security; Agricultural development; Agricultural policy.

B5. Relevance of the approach in principle to the climate response (for 7F-09484 in light of prior knowledge of 7F-03461, but 7F-06231 was not assessed as it was not found in the SDC climate project spread-sheet):
Preliminary assessment in the Inception Phase:
Mitigation: Capacity-based mitigation (CM) [*oriented to*] Ecosystem-based mitigation (EM).
Adaptation: Capacity-based adaptation (CA) [*oriented to*] Ecosystem-based adaptation (EA).

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **7F-09484 (2017-2021)**: Mitigation. NOT (0); Adaptation. SIGNIFICANT (1).
- **7F-03461 (2004-2016)**: Mitigation. SIGNIFICANT (1), but variously between 0 and 1; Adaptation. PRINCIPAL (2).
- **7F-06231 (2008-2016)**: Not found in SDC spread-sheet (but not likely to be relevant to the climate response).

Part C: Narrative overview

Project 7F-09484 consolidated and concluded two long-running projects in Mongolia, one to promote sustainable management of pasture ecosystems or 'Green Gold' (7F-03461), and one to complement its sustainable livelihood effects by improving the system for protecting the health of livestock (7F-06231)[48]. The CCA relevance of the 'Green Gold' interventions offers a

[48] Multiple parallel projects are characteristic of the SDC programme in Mongolia. During the evaluation period these included projects on urban waste management, governance and accountability, gender-base violence,

key contribution story, and was highlighted as such in Switzerland's UNFCCC Biennial Update Report 4 (FOEN, 2020: 126). The sequence of 'Green Gold' projects, which began in 2004, responded to the over-grazing and degradation of the country's grasslands that resulted from a tripling of the number of livestock due to pastoralists responding to private opportunities following the collapse of the Soviet Union in 1991. This was damaging the capacity of soil ecosystems to store carbon, while also undermining the resilience of pastoral systems in the face of droughts, erosive wind and rain storms, and *dzud* cold snaps which are a particular threat in Mongolia and require livestock to have adequate food continuously available near places where they can also shelter[49].

The first phases of project 7F-03461 were featured as Case Study 10 in SDC & SECO (2014: pages 18, 37, 150-154), where it was concluded that "The project has been effective both in achieving its stated aims and in building increased community resilience to the consequences of climate change (CC adaptation effectiveness score 6, *very strong*). In addition, through improved rangeland practices (covering 21.7 million hectares of pastureland, or some 20% of national land area) the project is also contributing to carbon sequestration [see H3.4], exemplifying an intervention with considerable climate change co-benefits and important adaptation and mitigation synergies." Subsequent phases continued the same approach, and the net effect by 2016 was to have addressed target issues in the following ways (SDC, 2016):

- by raising awareness on rangeland degradation among political leaders and herders;
- by building knowledge and capacity to promote science-based rangeland management in 11 of Mongolia's 18 rural *aimags* (provinces), covering 40% of the country;
- by introducing a rangeland health monitoring system for use by government agencies;
- by supporting the establishment of 1,300 pasture user groups (PUGs), which organise to take community action on rangeland management and arrange access to basic livelihood services;
- by establishing a national federation of PUGs as an interlocutor of government in developing rangeland laws, representing 35,000 herder households through *aimag* federations and *soum* (district) PUG associations; and
- by facilitating 700 rangeland use agreements (RUAs)[50] between PUGs and local authorities, with each RUA essentially involving the competent authority formally recognising the rights of herders, which would then be registered in a national database by the Agency of Land Affairs (ALAGC), in exchange for their participation in efforts to ensure sustainable rangeland management.

Meanwhile, the two phases of 7F-06231 had addressed related issues of animal health:

- by supporting the drafting of a new animal health law and the fulfilment of international requirements on animal diseases and on the veterinary control system;
- by raising awareness of decision makers on how and why to strengthen the veterinary service through training, international exposure and technical assistance;
- by building capacity among Mongolia‘s animal health specialists to participate in international forums (especially with China and Russia with which transfrontier exchange of animals and animal products is most likely);
- by developing new control strategies for brucellosis and foot and mouth diseases and the responsiveness of the authorities to disease outbreaks (including diagnosis and monitoring of mass vaccination campaigns); and
- by comprehensively reforming the veterinary education system through new curricula and the increased use of clinical and practical teaching methods.

Both precursor projects ended in 2016 within the evaluation period, when they were replaced by 7F-09484 which was due to end in late 2021 (after extension). The focus of the present evaluation is on updating an appreciation of the whole 'Green Gold' project in its later phases

internal migration, vocational training and education, air pollution, energy efficiency (thermo-retrofitting of public buildings) horticulture, artisanal mining, water and sanitation, and enterprise development. To say how these all fit together, and whether they represent an holistic or fragmented approach, would require evaluation at the level of the entire country programme.

[49] A *dzud* occurred in Mongolia in the winter of 2015-2016, for example, with average temperatures of -25 C (day) to -38 C (night) across the country.

[50] "Rangeland User Agreement: herder organizations sign an agreement with the local government to respect the environment and the regeneration of the natural resources, among others by: grazing within certain boundaries, managing rotational grazing and stocking density within carrying capacity of boundaries of rangelands, and not overloading degraded rangelands." (SDC, 2020: 1).

and into its consolidation and exit phase from the point of view of the climate change response. Mongolia's climate is becoming hotter and drier, with droughts and the loss of surface and soil waters combining with intense grazing pressure to accelerate desertification (see H3.1, H3.2). In these circumstances, the level of grazing that pasture ecosystems can sustain is declining, so preventing over-grazing is a shifting goal and arrangements to prevent it must be highly adaptive if they are to be relevant for long. The key effect of the 'Green Gold' programme was to encourage and enable pastoralists to manage and monitor their own herds and rangelands, and to become stronger in protecting and advancing their own collective interests in ways that are strongly adaptive to changing biophysical circumstances. The whole process was assessed as showing very high **design quality** (score 6), very strong **effectiveness** (score 6), **impact** (score 6) and **sustainability** (score 6), and **transformative potential** that was judged to be very high for adaptation and high for mitigation.

Part D: Design quality

D1. Theory of change.

"With more than 65% of rangeland affected by degradation[51] and 70 million animals[52], Mongolia is at a crossroad of its development path. Although classified as middle income country, poverty rates in rural areas ate still high (26.4%). After years of economic expansion, the GDP growth dropped to 1% in 2016. Highly dependent on the mineral sector, Mongolia‘s economy is poorly diversified and unable to take advantage from its huge animal wealth due to poor marketing and animal diseases which are poorly addressed. The country is regularly affected by natural disasters which are exacerbated by climate change. More than 80% of its territory is rangeland belonging to the State and representing the major livelihood source for herders. There is an urgent need to curb rangeland degradation by introducing sustainable rangeland management systems in order to maintain this public good and to ensure increased incomes in the rural areas." (SDC, 2016: 1).

"Overgrazing, overstocking, absence of regulatory framework, lack of awareness of policy makers, under-representation of herders at decision making levels and climate change are aggravating factors for rangeland degradation. Herders are reluctant to reduce the number of animals. There are weak economic incentives for livestock products and possession of high number of animals increases the social status of herders. The absence of functioning value chains based on quality criteria and the persistence of animal diseases, which are poorly addressed, hamper the marketability of livestock products. Herders‘ organisations (NGO‘s, cooperatives) are still weakly organised. Their economic capacities (capital, storage, transport, etc.) and business skills are insufficient to interact professionally with processors. They are consequently unable to negotiate good marketing conditions for their products and are therefore missing out on economic opportunities." (SDC, 2016: 3).

The four phases of 7F-03461 addressed these key issues: by raising awareness on rangeland degradation among political leaders and herders; by building knowledge and capacity to promote science-based rangeland management; by introducing a rangeland health monitoring system; by supporting the establishment of 1,300 pasture user groups (PUGs); by establishing a national federation of PUGs; and by facilitating 700 rangeland use agreements (RUAs) between PUGs and local authorities. Meanwhile, the two phases of 7F-06231 addressed related issues of animal health: by supporting legislative development and fulfilment of international obligations; by promoting a stronger veterinary service through training, international exposure and technical assistance; by building capacity among Mongolia‘s animal health specialists; by developing new control strategies for animal diseases; and by reforming the veterinary education system.

Thus, with these precursors, the focus and aim of the single phase 7F-09484 was to promote the completion and consolidation of sustainable rangeland management, strengthened herder organisations, improved linkages between cooperatives and processors and improved animal health systems. The resulting 'impact hypothesis' for the new project was that: "thanks to

[51] "The national rangeland health assessment conducted in 2017 informed that 57% of rangeland is degraded (65% in 2015), with 13% (7% only in 2015) degraded to an unrecoverable level, putting the natural resource base for the 2nd pillar of the national economy in danger." (SDC, 2020: 1).

[52] 86% sheep and goats, 6% cattle, 6% horses and 2% camels (plus some yaks). For planning and management purposes, "all livestock are converted into virtual sheep heads numbers based on their pasture consumption (e.g.: the consumption of 1 horse = the consumption of 7 sheeps, 1 cattle = 6 sheeps)." (SDC, 2020: 1). In 2020, Mongolia had a record 71 million livestock, equivalent to 119 million head of sheep, grazing 1,100,000 km^2 of rangelands (70% of total land area), but the total carrying capacity of the Mongolian rangelands was estimated at only the equivalent of 80 million head of sheep (SDC, 2020: 1).

sustainable rangeland management systems, implemented collectively by organized herders (through PUGs) and backed by local authorities (through RUAs) rangeland health is maintained providing the backbone of the livestock sector. Thanks to improved marketing through linkages between cooperatives and processors and better quality of animal products through improved animal health, income of herder households is increased and contributes to improved livelihood. Sustainable rangeland management and improved animal health are increasingly rooted in the legal provisions and in the Government action plan enabling conducive policy in the livestock sector." (SDC, 2016: 5).

D2. Assumptions underlying the theory of change.
Assumption 1. That healthy rangeland ecosystems and soils, without which a livestock sector based on open grazing could not exist, can be maintained effectively with social cooperation, and where necessary restored.
Assumption 2. That pastoralists can be organised in PUGs, are willing to accept environmental knowledge and networking with others, and are willing to seek control over the management of their own herds and pastures.
Assumption 3. That PUGs will be recognised individually and collectively by government, their role in the sustainable management of herds and pastures formally accepted through RUAs, and their interests and voices allowed to influence dialogue over relevant policy and legislation.
Assumption 4. That an empowered, enabled and networked pastoralist population will accept improved veterinary support, and innovations and opportunities to add value to their products, and will then defend these gains.

D3. Plausibility of assumptions and links.
Assumption 1 is plausible, to the extent that target areas have not been catastrophically degraded to the point at which they cannot recover (13% of rangeland area in 2017), and that most other areas have lesser degrees of damage to vegetation, water tables and especially soils (which was likely the case when the project was designed).
Assumption 2 is plausible, based on experience from many other 'community organising and empowering' projects (e.g. community wildlife user groups in Africa in the 1980s, Forest User Groups in Nepal in the 1990s).
Assumption 3 is plausible, to the extent that political circumstances are favourable and the outcomes are supported by public pressure and the policies of other development partners active in the country (as they were in Mongolia [and Nepal] from the early 1990s).
Assumption 4 is inherently plausible.
Score: 7 ('perfect').

D4. General quality of the project design.
Stakeholders & consultation. After such a long engagement with such widespread participation, adequate stakeholder consultation in design is assumed. Annex 13 of SDC (2016) concludes that "Considering the time available (single phase) and the positive experiences made both previous projects self-implemented Project Coordination Units (PCUs), the SCO recommends to pursue similar project design for this last phase." The implication is that the focus is on continuity and building on success, illustrated by multiple references in SDC (2016) to continued arrangements for the PCUs (p. 7), the PUGs (p. 11), policy dialogue (p. 13), TA for legislative development (p. 19) and female leadership promotion and awareness and training programmes (p. 31).
Risks. SDC (2016) identifies the following 'high' risks (in likelihood and/or impact): changes in political leadership after the 2016 election[53] (to be off-set mainly by explaining the project to the incoming administration): high rates of staff turnover (to be off-set by compensating "a loss of capacities with information and if necessary additional training"); economic crisis and lack of public funds (to be off-set by realistic planning); drought and flood (to be off-set by "rotational grazing and reserve management" and "careful selection of areas for hay and fodder harvest"); dzud (to be off-set by basic winter preparedness training for PUGs, including forage and hay making areas in RUAs, and using matching funds to finance winter shelter, warm clothes and fuel reserves); and animal epidemics (to be off-set through collaboration among national and

[53] The June 2016 election was won in a landslide by the then-opposition Mongolian People's Party, formerly socialist but now social-democratic centralist, which repeated the victory in June 2020. SDC (2016, Annex 1) notes that "All contacts with the newly elected Government representatives so far confirm strong Government commitment and support for the ptoject."

local authorities, PUGs and cooperatives to disseminate information, early warning and control measures).
Score: 7 ('perfect').

Part E/F: Evidence for strategic [climate] effectiveness and system change

E1. Strategic effectiveness.
Effectiveness (score 6, 'very good').
SDC (2017: §2) summarises that "as of June 2017, Green Gold facilitated formation of 1,300 PUGs involving 42,000 herder households, 70% of which established RUA with the local authority. As a result, since 2004, about 4.2 million hectares of degraded rangelands have been rested and freed from livestock grazing for regeneration. The PUG system consists of Pasture User Groups of herders, Soum Associations of PUGs (APUGs), Aimag Federation of APUGs and National Federation of PUGs. With the support of Green Gold Project, capacity of main government agencies dealing with rangeland management issues, the National Agency of Meteorology and Environmental Monitoring (NAMEM) and State Agency of Land Affairs, Geodesy and Cartography (ALAGC), and State Reserve Rangeland Administration (SRRA) has been upgraded to strengthen national rangeland health assessment and monitoring system.
"In order to contribute to better livelihood of herder households and ensure operational and financial sustainability of the PUG system beyond project duration, Soum and Aimag Federation of PUGs have been creating marketing cooperatives. This initiative is supported by local authorities and the Ministry of Food, Agriculture and Light Industry (MoFALI) with the recent policy direction to promote membership based and participatory herders' marketing cooperatives. As of June 2017, about 70 cooperatives have been formed and functioning at the Soum and Aimag Federation of PUGs. Turnover and membership continue to increase constantly. However, in most of the cases the cooperatives lack technical knowledge to ensure quality control of raw materials, and the basic infrastructure such as storage and transportation means which would create better income and added value at the primary level.
"The establishment of the PUGs went so far in parallel with the initiation of community based credit and saving systems (Matching Funds). Over the years, the Matching Funds (MFs) grew and the interest rates were increasingly used to cover organizational costs of the PUGs. In the aimags such as Bayan-Olgy, Zavhan, and Hovd, the Matching Funds are being transformed into Credit and Savings Cooperatives (CSCs). The transformation of MFs to CSCs enables their sustainability, promotes transparency and bears the potential to be able to cover the personnel and organizational costs of the PUG system. Starting 2017 [the Green Gold Animal Health Project] has been building the capacity of the National Federation of PUGs to facilitate the transformation of the PUGs Matching Funds into CSCs."
Increments across many indicators of achievement were included in the updated logframe for the Jan-Sep 2021 extension (SDC, 2020).
Impact (score 6, 'very good').
The aggregating continuity of the above effects over four phases indicates a high level of impact.
Sustainability (score 6, 'very good').
"Allocation of Local Development Funds (to support rangeland management and co-financing of PUGs' organisational costs are increasing. Replication of the PUG/RUA approach by local government without project support is happening. ... 70 PUG-based cooperatives involved in collective marketing of raw materials as well as micro-credit services were supported. Cooperatives are increasingly distributing benefits to their members and co-financing PUGs. More than 200 capacitated PUG and cooperative leaders are able to train herders in different skills (rangeland, organizational, financial, facilitation, leadership, marketing, etc.), and do increasingly run for local elections. Links between cooperatives and processors in selected value chains (yak/camel wool, meat, skin/hide, etc.) enabling better market access of animal products were established. New products such as baby camel wool and yak wool were launched and received positive feedbacks from international traders and companies." (SDC, 2016: 3).
Overall score: 6 ('very good').

E2. System change.
There is no evidence that the rate of rangeland degradation actually declined as a result of the Green Gold projects, since the data from rangeland health reports are inconclusive, especially on the extent of moderate degradation but also in the trend in severe degradation (MFA, 2015; Densambuu *et al*., 2018; Butscher & van der Werf, 2021). The problem and potential for irreversible harm remains severe, with mounting pressures from land desiccation, but the

danger of wholesale disintegration of the national pastureland seems likely to have receded with the organisation of tens of thousands of pastoralists into PUGs, the recognition of their use rights through RUAs, and major changes in national legislation, policy, monitoring capacity, etc. In these circumstances a steady and favourable widening of the gap between what *would probably have happened* and *what did happen* is expected, especially in the event of a severe deterioration of climate. This would likely be very hard to document before many years had passed, however, and then only by comparing outcomes with similar rangeland systems where similar measures were not taken[54]. Even so, the evaluation concludes that the participatory rangeland management introduced by Green Gold is likely to result in system-wide savings in GHG emissions over time, and also, even more so, in a system-wide increase in the strength of Mongolian society relative to foreseeable effects of climate chaos.

Part G: Other aspects of design and performance

G1. Efficiency issues.
The request for an additional credit of CHF 0.9 million to extend the project to Sep 2021 was based on the need: to implement activities delayed in 2020 due to COVID-19[55], including the capitalisation (lesson-learning) process that was launched in 2020 and the completion of an end-of-project evaluation; to ensure the international commercialisation of Mongolian livestock products; to respond to a GoM request for replication of the animal health traceability system to meat and milk products; to ensure policy and advocacy to the new parliament and government after the Jun 2020 election; to ensure the documentation of community-based water managament; and to complete a scoping study on agro-ecology to assess Switzerland's support after SDC exit/transition in 2024 (follow-up of strategic workshop held in October 2020). (SDC, 2020: 1).

G2. Coherence issues.
"Synergies with the SDC governance domain projects will be favoured to promote replication and sustainability. Synergies will be particularly meaningful with the Strengthening of representatives Bodies (SRB) project (implemented by UNDP and Parliament Secretariat) aiming at capacity development of local parliaments, including the topic of sustainable rangeland management and using Green Gold models; and with Sustainable Livelihood Programme (SLPII, WB co-financed) improving capacity of local authorities and local budget process and execution in all rural provinces, thus LDF allocation and uses can be optimised for livestock sector. Close collaboration will also be ensured with the EU/FAO (Support employment creation in livestock and vegetable), the WB LAMP-project (Livestock and Agricultural Marketing) and finally with the EU financed AVSF project (promotion of ecological cashmere and yak wool)." (SDC, 2016: 5). "Many results have been even overachieved and influenced other donors' operations" (SDC, 2020: 1, and Annex 4

G3. Replicability issues. Because it addresses fundamental and universal issues of resource management, access management and sustainability, the 'living resource user group' approach pioneered by SDC in Mongolia through the 'Green Gold' projects is extremely replicable in numerous contexts (see H3.5).

G4. Partnership issues.
"Ministry of Food, Agriculture and Light Industry and relevant agencies in rangeland and animal health such as the National Agency for Meteorology an Environment, Agency for Land Management, and Veterinary and Animal Breeding agency are supportive and wilfing to collaborate, and co-finance project activities. During the recent Government restructuring, after the June 2016 elections, the former Ministry of Food and Agriculture became the Ministry of Food, Agriculture and Light Industry expanding its responsibility to include light industries and SME's. This is a favourable development as it allows all main agricultural project partners to come under one roof. All contacts with the newly elected Government representatives so far confirm strong Government commitment and support for the project. The good collaboration experienced by the two former projects is therefore likely to be continued. A favourable attitude comes also from the newly appointed provincial leaders." (SDC, 2016: 5).

[54] cf the mangroves of Bangladesh and Myanmar, which had very dissimilar fates during British rule and now have very dissimilar capacities to prevent damage from typhoons and storm surges.

[55] There were almost no Covid-19 cases in Mongolia before Jan 2021, so the delays were presumably due to border closures, quarantine requirements, flight disruptions, etc.

G5. Connectedness issues.
Mongolia's climate is becoming hotter and drier, with droughts and the loss of surface and soil waters combining with intense grazing pressure to accelerate desertification (see H3.1, H3.2). "COVID-19 related restrictions hit Mongolia's economy hard, especially affecting herders' livelihoods, with the collapse of raw cashmere prices and meat exports halting." (SDC, 2020: 1). Mongolia has so far experienced three waves of Covid-19 infections, peaking with increasing amplitude in Apr-May, Jun-Jul and Aug-Sep 2021, and is the third-most affected Asian country after Japan and South Korea (WHO, 2021; JHU CSSE, 2021). Economic effects are noted in H3.3, which also mentions climatic and weather events as major potential sources of economic unpredictability.

G6. Cross-cutting themes.
Gender:

- "Through promotion of female leadership, 27% of the PUG leaders are women, despite the unfavourable traditional context." (SDC, 2016: 3). Annex 1 in the same source refers to increased gender sensitivity in the project logframe: "Output 3.1 in the logframe added an indicator: 'RUAs are signed by both husband and wife'. Output 2.2 added an indicator 'Female leaders of cooperatives; T0 (2016): 17%; T4 (2020): 25%'".
- "The percentage of female leaders of PUGs, AFEDs and APUGS is only 18% compared to 40% female leaders of cooperatives, which is mainly explained by the traditional daily organisation of herder families. It is clear that targeted efforts in engaging women in PUGs system are still constantly needed, and probable that the target in this regard will not be achieved." (SDC, 2020: 8).

G7. Capacity building issues.
The design documents are not explicit in terms of a capacity building strategy, although SDC (2016) mentions that "an assessment on the needs and the supply of veterinarians and technicians" (p. 4), and the general sense is one of continuing existing approaches (e.g. "The project intends to continue organizing herders in PUGs, training them in sustainable rangeland management, and facilitating collaborative agreements with local authorities through the establishment of RUAs." - SDC, 2016: 5), and building on opportunities arising from the momentum of the engagement (e.g. "The project maximizes synergies with the SDC governance domain in local rangeland management, capacity building of local authorities and elected Local Parliament members and the use of local development funds for rangeland management." (SDCV, 2016: 4).

Part H: Other matters arising from the review

H1. Follow-on questions. Not applicable.

H2. Missing documents.

- Synthesis evaluation of the whole SDC programme in Mongolia, ca 2015-2021.
- "An external evaluation should be planned for 2019." (SDC, 2016: Annex 13).
- An end-of-project evaluation, a study on community-based water managament, and a scoping study on agro-ecology are all mentioned as outputs of the Jan-Sep 2021 extension of the project (SDC, 2020).
- "The planned final evaluation of the project, postponed several times due to COVID-19 restrictions and rescheduled for May-June 20212. In case of COVID-19 related restrictions still hampering the evaluation to be held, it is foreseen to transform it into an ex-post evaluation in 2022 or 2023, with the same already recruited team." SDC, 2020: 1).

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: Landcover change and desertification processes in northern China and Mongolia.
"Fighting land degradation of semi-arid and climate-sensitive grasslands are among the most urgent tasks of current eco-political agenda. Northern China and Mongolia are particularly prone to surface transformations caused by heavily increased livestock numbers during the 20th century. Extensive overgrazing and resource exploitation amplify regional climate change effects and trigger intensified surface transformation, which forces policy-driven interventions to prevent desertification. In the past, the region has been subject to major shifts in environmental and socio-cultural parameters, what makes it difficult to measure the extent of the regional anthropogenic impact and global climate change. This article analyses historical written sources, palaeoenvironmental data, and Normalized Difference Vegetation Index (NDVI) temporal series

from the Moderate Resolution Imaging Spectroradiometer (MODIS) to compare landcover change during the Little Ice Age (LIA) and the reference period 2000-2018. Results show that decreasing precipitation and temperature records led to increased land degradation during the late 17th century. However, modern landcover data shows enhanced expansion of bare lands contrasting an increase in precipitation (P_{total}) and maximum temperature (T_{max}). Vegetation response during the early growing season (March-May) and the late grazing season (September) does not relate to P_{total} and T_{max} and generally low NDVI values indicate no major grassland recovery over the past 20 years." (Kempf, 2021).

H3.2: Sandstorms and desertification in Mongolia.

"As global temperatures continue to increase and human activities continue to expand, many countries and regions are witnessing the consequences of global climate change. Mongolia, a nomadic and picturesque landlocked country, has battled with ongoing desertification, recurring droughts, and increasingly frequent sandstorms in recent decades. Here we review the abrupt changes in the climate regime of Mongolia over the recent few decades, by focusing on atmospheric events, land degradation and desertification issues, and the resulted sandstorms. We found that between mid-March to mid-April 2021, the country encountered violent gusts of wind, the Mongolia cyclone, and the largest sandstorms in a decade, causing extensive damages nationwide and trans-regional impact in East Asia including northern China, Japan, and most parts of South Korea. A multitude of factors have contributed to this current ecological crisis. Since 1992, the country has transformed to a market economy with high economic growth driven by mineral and agricultural exports. Overgrazing along with intensified human activities such as coal mining has contributed to the widespread land degradation in Mongolia, while climate change has become a major driving factor for recurring droughts. Annual mean air temperature in Mongolia increased by 2.24 °C between 1940 and 2015, while annual precipitation decreased by 7%, resulting in a higher aridity across the country. A positive feedback loop between soil moisture deficits and surface warming has led to a hotter and drier climate in the region, with over a quarter of lakes greater than 1.0-km^2 dried up in the Mongolian Plateau between 1987 and 2010. Increased temperatures, decreased precipitation coupled with land degradation have resulted in a persisting drying trend, with more than three-quarters of land in Mongolia being affected by drought and desertification. The 2021 East Asia sandstorms drew international attention to ecological issues that have culminated for decades in Mongolia. Collaborative efforts from policy makers, local residents, and scientists from both its local and the global research community are urgently needed to address the grand and rapidly aggravating ecological challenges in Mongolia." (Han *et al*., 2021).

H3.3: Overview of Mongolia's economy, 1991-2021.

"Over the past 30 years, Mongolia has transformed into a vibrant democracy, tripling its GDP per capita since 1991. Primary school enrolments are at 97%, coupled with impressive declines in maternal and child mortality (45 per 100,000 live births in 2017 and 15.6 per 1,000 live births in 2019 respectively). With vast agricultural, livestock and mineral resources, and an educated population, Mongolia’s development prospects look promising in the long-term assuming the continuation of structural reforms.

"Due to the severe and widespread economic impact of the COVID-19 pandemic, the Mongolian economy contracted by 5.3 percent in 2020, its worst contraction since the early 1990s. A sharp decline in global demand for key commodities and border closures with China were among the key external factors that crippled the mining-led economy. Domestically, the services sector was hit hard by containment measures, which helped Mongolia avoid the worst possible health effects of the pandemic. While a series of generous government relief and stimulus packages in the form of tax relief and income support helped mitigate the impact of COVID-19 on households and businesses, it took a significant toll on the budget. The fiscal gains of the past three years have rapidly eroded with the overall budget deficit rising sharply to 9.5 percent of GDP. Consequently, government debt as a share of GDP has increased again in 2020, reversing the downward trend of recent years. Inflationary pressures remained subdued in 2020, mostly driven by weak domestic demand and lower oil prices.

"The economy is projected to recover in 2021 as the authorities continue efforts to control the pandemic, stimulus measures prop up domestic demand, the adverse impact of the global economy recedes, and businesses and consumers adjust to the new norm of living with the pandemic as vaccines are rolled out. However, the recovery is subject to risks, including further waves of COVID-19 cases domestically and globally, possible financial instability, and weather-related shocks.

"Mongolia's official national poverty rate has fluctuated since 2010. The poverty headcount rate declined sharply from 38.8% to 21.6% during the economic boom in 2010-2014. However, between 2016 and 2018, poverty reduction was uneven, declining in rural but not in urban areas. Growth in rural areas was faster and favorable to the poor, contributing to reducing rural poverty from 34.9% in 2016 to 30.8% in 2018, supported by rising livestock prices and expansion of poverty-targeted social protection programs.
"By contrast, the urban poverty rate remained unchanged at 27% from 2016 to 2018, mainly driven by stagnant wage growth in the poorest population group. Consequently, poverty is increasingly concentrated in urban areas. In the coming years, fiscally sustainable labour and poverty-targeted social protection policies coupled with a positive economic outlook will be key to reducing poverty.
"To ensure sustainable and inclusive growth and to reduce poverty, Mongolia will also need to strengthen governance; build institutional capacity to manage public revenues efficiently; allocate its resources effectively among spending, investing, and saving; and ensure equal opportunities to all its citizens in urban and rural areas." (World Bank, 2021).

H3.4: Climate change mitigation in pasture lands.
Citing an Asian Development Bank study, SDC & SECO (2014: 18) noted that "grassland management has the potential to sequester carbon to the extent of 0.11-1.50 tCO_2/ha per year, [which] can be achieved by controlling grazing intensity through regulation of the animal stocking rate, by enhancing rotational grazing, and by limiting grazing time by season over the year." SDC (2016: 33) noted that "there is evidence that reduced stocking rates will curb rangeland degradation in Mongolia. The former SDC project 'Linking herders with carbon markets' [7F-07809, Case Study 23 in SDC & SECO, 2014] quantified how much carbon emissions could be saved through reduced stocking rates. However, the same project came to the conclusion that considering the current context of the value chains and the carbon market price, the reduction of livestock per area would not be economically viable for herders and that the herders would need to be compensated for their losses from public funds. Alternatives through the introduction of grazing fees and or the limitation of stocking rates per area would be possible but would need changes in the current legal framework." The sources thus agree on the mitigation value of protectively managed grasslands, but with low carbon prices on international markets there is little scope for sales to reward carbon conservation. In these circumstances, public investment in mitigation through ecosystem management and community participation is needed to complement private investment in other sectors, if total GHG emissions are to be reduced quickly.

H3.5: The Living Resource User Group (L-RUG) approach.
The 'Green Gold' programme applied key principles of sustainable, participatory living resource management, and in particular the use of L-RUGs, to close down of an open-access exploitation system that had arisen because of the failure of traditional forms of regulation. There are many parallels to this, most obviously between the PUGs and RUAs in Mongolia and the almost-identical system of Community Forest User Groups (CFUGs) and Operational Plans in Nepal, which was set up and authorised by a succession of laws and policies in 1995-2005. There, CFUGs were encouraged to take over the management of large parts of Nepal's forest estate as community forests, each to be managed by a CFUG with the support of the state (and various development partners in the interim, including SDC through projects 7F-07309 and especially 7F-03128; SDC & SECO, 2014: 244-254). The result in Nepal was a stabilisation and possible reversal of deforestation, just as for pastureland degradation in Mongolia [Note 1]. These L-RUG systems are not unique, however, since they have clear parallels with community conservation systems in Africa inspired by the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe in the 1980s, which evolved into the communal conservancies system in Namibia in the 1990s, and similar arrangements elsewhere, including charcoal production in Village Land Forest Reserves in Tanzania (SDC project 7F-07802 in 2011-2022) and the Community Resource Management Area (CREMA) system in Ghana since 2008 [Note 2]. The key message is that helping local people to control the resources upon which they depend, and adding environmental education. livelihood options and technical support where needed, is a replicable and cost-effective way to conserve almost any ecosystem along with its biodiversity, ecosystem services and stored carbon.
Note 1. Evidence that rates of pastureland degradation declined or recovery increased as a result of the Green Gold in Mongolia is not yet definitive, but both effects are expected to be proven eventually alongside measurably increased carbon storage and a strengthening of

Mongolian society against climate change impacts. Exactly the same can be said of Nepalese forests as a result of the community forest programme. In both cases the systems are too complex to measure easily, and regenerative changes are slow and in themselves complex.
Note 2. In CREMAs, landscapes are defined by social boundaries within which (often for traditional reasons) there is social cohesion and a basis for collective action, matched where possible to ecological boundaries, legally defined, and authorized through devolved powers to manage all local natural resources in the interests of CREMA members, with revenues obtained and shared locally from their sustainable use. The observed effects have included increased conservation awareness, wildlife species returning and populations increasing, forest re-growth, reduced bushfires, and new livelihood opportunities.

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Part J: Acronyms and abbreviations

ALAGC	Agency of Land Affairs, Geodesy and Cartography
APUG	Association of Pasture User Groups at soum (district) level
CCA	Climate change adaptation
CCM	Climate change mitigation
CSC	Credit and Savings Cooperative
LDF	Local Development Fund
L-RUG	Living Resource User Group
MoFALI	Ministry of Food, Agriculture and Light Industry
NAMEM	National Agency of Meteorology and Environmental Monitoring
PUG	Pasture User Group
RUA	Rangeland User Agreement
SRRA	State Reserve Rangeland Administration
VABA	Veterinary and Animal Breeding Agency

Annex 13.16: Community Resilience in Myanmar

Project highlights.

7F-09567: **Strengthening Community Resilience to Natural Hazards, Rakhine State**. Built capacity in disaster risk assessment, planning and emergency preparedness at communities and schools, through participatory exercises and by strengthening early warning systems.
7F-09439: **Malteser: Strengthening Disaster Resilient Communities and Local Risk Management to Minimize Loss and Damage in Rakhine State**. Built capacity of local disaster management authorities and communities through training and participatory exercises in disaster risk assessment, planning and emergency preparedness, while also promoting community adaptation planning and infrastructure creation both physical and ecological through mangrove restoration activities.

Part A: Basic data

A1. Project number & name.
7F-09567: Strengthening Community Resilience to Natural Hazards (DRR), Rakhine State
7F-09439: Malteser: Strengthening Disaster Resilient Communities and Local Risk Management to Minimize Loss and Damage in Rakhine State.

A2. Sources.
Process of PRF development: the draft PRF for the DRR project 7F-09567 was prepared using documents listed in the bibliography. In the process it was found that the DRR and CCA project 7F-09439 had operated in a similar location and period. This offered a way to examine the added value of CCA and its mainstreaming within DRR.

- **7F-09567 (Strengthening Community Resilience to Natural Hazards (DRR), Rakhine State, Jun 2016-Mar 2018)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2016/7F-09567/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html.
- **7F-09439 (Malteser: Strengthening Disaster Resilient Communities and Local Risk Management to Minimize Loss and Damage in Rakhine State, Oct 2015-Dec 2017)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2015/7F09439/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Malteser International CCA in Rakhine State**: www.malteser-international.org/en/our-work/asia/myanmar/rakhine-adapting-to-climate-change.html
- **Action Against Hunger (ACF) in Myanmar**: www.actioncontrelafaim.org/en/missions/myanmar/

A3. Dates & financial data.

- **7F-09567 (Jun 2016-Mar 2018)**: SDC budget CHF 631,237; Swiss disbursements CHF 647,796; overall budget € 1,202,356.86 (all sources).
- **7F-09439 (Oct 2015-Dec 2017)**: SDC budget CHF 529,477; Swiss disbursements CHF 479,481; overall budget CHF 1,105,927 (all sources).

A4. Location(s). Myanmar: Sittwe District, Rakhine State (formerly Arakan Province, and still often referred to as Arakan), south of Bangladesh on the Bay of Bengal.

A5. SDC Geography. Myanmar, Rakhine State
Both projects: Funds Centre - EEA - Region: South Asia.

A6. SDC Domain.
7F-09567: Humanitarian aid (SDC sector list: equally Humanitarian Assistance & DRR and Climate Change).
7F-09439: Humanitarian aid (SDC sector list: some Humanitarian Assistance & DRR, mostly Climate Change).

A7. Partners.
7F-09567. Contract partner: Action Against Hunger. Coordination with: DIPECHO/MCCR project (May 2016); Myanmar Consortium for Community Resilience (MCCR); IOM-led Consortium 'Program for Improved Disaster Management and Resilience against Natural Disaster in Rakhine State'; Ministry of Social Welfare, Relief and Resettlement (MoSWRR).

7F-09439. Contract partner: Malteser International. **Other partners**: German Government (BMZ) [co-donor]; Community Empowerment and Resilience Association (CERA) [implementing partner].

Part B: Purpose, relevance and approach

B1. Purpose.
Project 7F-09567 (ACF). The aim was "to reduce human, social, economic and environmental losses, in coastal and urban areas, resulting from disasters" (SDC web-site). The project therefore sought to target the causes of inadequate resilience among communities, public institutions and schools in coastal and urban areas in Rakhine State, these being: (a) limited DRR awareness, understanding, resources and capacity at all levels; (b) a lack of investment in critical facilities for mitigating, preparing and responding to disasters; and (c) a high frequency of hazard exposure and vulnerabilities in the target townships. It built on a recently-ended project funded through the DIPECHO IX Action Plan (implemented in Sittwe Township from May 2014 to Dec 2015) and a WASH Flood Recovery project funded by ECHO in Minbya Township. Active Village Disaster Management Committees (VDMCs) and School DMCs in the 16 communities where ACF worked under DIPECHO IX were to be the main drivers to cascade and share new knowledge to communities and schools. Participation as advocates of DRR by religious and community leaders, who also partnered with ACF in the previous project, was considered essential.
Project 7F-09439 (Malteser). The aim was "to contribute [to] reducing losses and damages caused by natural disasters and the adverse effects of climate change in Rakhine State". The project therefore aimed to link DRR and CCA: (a) by strengthening communities against disasters through adaptation planning, training and mangrove restoration; (b) by building or rehabilitating disaster-resistant infrastructure to make evacuation points more accessible;l and (c) by strengthening the capacities of local authorities responsible for emergency response coordination. Although this was the first phase supported by SDC, the project had started with funds from the German Government (BMZ) in 2013, the results of which had been encouraging.

B2. Relevance to partners. Both projects.
Myanmar. The *Myanmar Action Plan on Disaster Risk Reduction* (MoSWRR, 2012, 2017), the *Myanmar Climate Change Strategy and Action Plan* (MoNREC, 2016) and *Myanmar's Nationally Determined Contributions* (NDC) to Paris Agreement goals (GoM, 2021) stress high and increasing vulnerability of the country to natural disasters, and all list similar priorities: to improve forecasting and early warning (including community-based systems linked to drought and flood action plans, smartphone-based systems, flood and cyclone forecasting tools, enhanced international cooperation, monitoring sea level rise, and marine weather observations) and disaster preparedness (including implementing the Disaster Management Law of 2013, ensuring practical emergency and response actions are in place and agreed across ministries and other agencies, building cyclone shelters, distributing life jackets and boats, establishing post-disaster rapid response networks and mainstreaming gender into addressing and dealing with climate hazards and loss and damage). See also H3.1.
Switzerland. "The proposed project is in line with the strategic orientation and priorities of the Swiss Cooperation Strategy for Myanmar 2013-2017. Climate change and DRR is a transverse theme that implies in particular, 'promoting sustainable use of soils, water and forests to alleviate negative impacts of disasters [...]; supporting broader disaster resilient development measures such as adequate construction; and fostering local risk management capacities." (SDC, 2015: 4; SDC, 2016: 5). At the same time, this type of DRR intervention is a conflict-sensitive entry point into the complex intercommunal issues in Rakhine State." (SDC, 2016: 5).

B3. Relevance to SDGs (https://sdgs.un.org/goals).
Both projects:

- **SDG 11: Sustainable Cities and Communities**, especially Target 11.5 (*Significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations*) and Target 11.b (*By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels*).

- **SDG 13: Climate Action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*) and Target 13.3 (Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning).

Project 7F-09439 (Malteser) only:

- **SDG 14: Life Below Water**, especially Target 14.2 (*By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans*).
- **SDG 15: Life on Land**, especially Target 15.2 (*By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally*), Target 15.9 (*By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts*), and Target 15.b (*Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation*).

B4. Relevance to other development objectives.
7F-09567: OECD - Disaster prevention and preparedness.
7F-09439: OECD - Disaster prevention and preparedness; Environmental policy and administrative management.

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
7F-09567: Mitigation - Nil; Adaptation - Capacity-based adaptation (CA).
7F-09439: Not assessed.

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:
7F-09567: Mitigation - NOT (0); Adaptation **-** PRINCIPAL (2), but varying between 1 and 2.
7F-09439: Mitigation - SIGNIFICANT (1), but varying between 0 and 1; Adaptation - SIGNIFICANT (1)

Part C: Narrative overview

Background to both projects.
Projects 7F-09567 (ACF) and 7F-09439 (Malteser) had their origins in 2013-2015, in the period shortly after Myanmar had achieved the restoration of democracy under a new constitution and elections in 2010-2011. Post-election reforms had promoted a liberal democracy, and the 2015 election ratified this direction of travel. Hence there was considerable optimism surrounding political circumstances of Myanmar. Two important factors that the designers of both projects would have had to consider concern the social and ecological integrity of their area of operation.

- Inter-communal tension and oppression of Muslim (Rohingya) people in Rakhine State had been reported since the 1970s and violence had flared up again in 2012[56]. Sittwe is the capital of Rakhine State and is located in northern Rakhine, in the midst of the zone of tension and potential violence between ethnic Rakhine Buddhists and Rohingya Muslims.
- Rakhine State (like everywhere else in the Bay of Bengal) was known to be vulnerable to severe natural hazards, especially from cyclones[57] (typhoons, hurricanes) and their storm surges. Moreover, environmental security in Rakhine State was known to have been greatly weakened by a history of damage to forests both coastal (e.g. mangrove) and inland (e.g. riparian, catchment).

Malteser International had been working on climate change adaptation (including mangrove restoration) in Rakhine State since 2005, and with BMZ on the precursor to 7F-09439 since 2013, while ACF (the partner of 7F-09567) had worked with the EU in Sittwe from May 2014 to Dec 2015. Both NGOs were therefore well aware of the risks in Rakhine State. This awareness was also expressed in the SDC credit proposal for project 7F-09567: "In addition to being prone to various natural hazards (such as cyclone, storm surge, flood, earthquake and tsunami) the situation in Rakhine State is aggravated by the impact of chronic inter-communal tensions."

[56] https://en.wikipedia.org/wiki/Conflict_in_Rakhine_State_(2016–present).

[57] There were three natural disasters in Myanmar and Rakhine State during the projects: cyclone Roanu in May 2016, floods and landslides due to monsoonal rains in June 2016, and cyclone Mora in May 2017.

(SDC, 2016: 2). Similar references are made in the credit proposal for project 7F-09439 (SDC, 2015).

7F-09567 (ACF, Jun 2016-Mar 2018):

The project focused on improving disaster preparedness, which was known to be undermined by weak public understanding of risks and risk reduction, aggravated by chronic inter-communal tensions including a recent history of widespread fatal violence. It therefore sought to build capacity for disaster preparedness and recovery by harnessing the achievements of recent projects: DIPECHO IX in Sittwe (May 2014 to Dec 2015); and a Water, Sanitation, and Hygiene (WASH) Flood Recovery project funded by ECHO in Minbya. The international NGO Action Against Hunger (ACF) had been involved in both projects and had established 16 Disaster Management Committees (DMCs) at village, school and township level. Most of these DMCs were to be entry points for the new project, which was to be implemented by ACF with SDC co-financing.

Reviewing the whole implementation period (i.e. 23 months from June 2016 to March 2018), the Operational Final Report of the project (ACF, 2018) concluded that all 12 communities and two schools had undertaken DRR and preparedness activities, met all main targets of the project, and undertook risk assessments, prepared disaster management plans, and implemented at least one small-scale disaster mitigation measure. The report stresses that ACF continued to work alongside the communities in both urban ('Buddhist') and rural ('Muslim') areas, "despite the August 2017 incidents and their repercussions". It also notes, however, that state institutions were markedly less receptive and harder to mobilise, so project activities that relied on linkages between townships, communities and schools (advocacy sessions, joint meetings) were less successful although some measure of cooperation with local government was obtained. Some useful lessons were learned that ACF intended to use in future programming and which were in principle available to SDC (see H3.2).

The project started well in June 2016 until July 2017, although fatal clashes between insurgents and the military began in Rakhine State in October 2016 (three months after the SDC-ACF contract was signed). An upsurge of violence in Rakhine State in August 2017 caused the project to be suspended for three months The original contract between SDC and ACF was for Jun 2016-Dec 2017, but there was a three-month no-cost extension duration to the end of Mar 2018 (ACF, 2017, 2018). ACF (2017) is a letter annexed to SDC (2017) and refers to a missing narrative attachment. But SDC (2017), summarises the situation as follows: "Due to the attacks of 25th August 2017 and the following security and working conditions ... the ACF has suffered an important delay in its implementation. Project activities had to be suspended for nearly three months." The Aug 2017 attacks turned out to be the beginning of a process of violent ethnic cleansing by Buddhist Rakhine factions supported by the army against Muslim Rohingya people, hundreds of thousands of whom fled into Bangladesh (and some thousands of Hindu people were also displaced internally). The project continued in these unfavourable circumstances until December 2017 when it was given a three-month, no-cost extension prior to SDC disengagement.

Overall assessment: **design quality** - moderate (score 4); **effectiveness** - good (score 5); **impact** - good (score 5); **sustainability** - low (score 3); **transformational potential** - moderate for adaptation, nil for mitigation.

7F-09439 (Malteser, Oct 2015-Dec 2017):

"Since 2013, Malteser International, CERA and MERN are implementing a German Government (BMZ) funded Disaster Risk reduction (DRR) and Climate Change Adaptation (CCA) project." (Malteser, 2018: 5). Results of this previous project included that the share of community members who believed disaster impacts could be reduced, and who knew when and where to evacuate, had increased from below half to about 80% in both case. This was put to the test during floods due to cyclone Komen in Aug 2015, when no casualties or injuries occurred in the project area, since people were prepared and warned of the coming cyclone via megaphones. The Early Warning and Search & Rescue Task Forces, trained by Community Empowerment and Resilience Association (CERA) and Malteser International, also ensured that each villager, including pregnant women, elderly and people with disabilities, were taken safely to the evacuation centre (see H3.3).

"With SDC funding, Malteser International and its partner CERA successfully scaled up and intensified activities in central parts of Rakhine State. "The project reached around 22,941 people, of which 11,846 were women, in 22 villages in two townships. 1,453 volunteers, either from Village Adaptation Committees (VACs) or School Disaster Management Committees (SDMCs), directly received trainings. 2,190 people participated in simulation exercises. A

considerable amount of mangroves was planted during the project. 72,080 mangrove plants were planted on [22.66 ha] of land in 20 villages in coastal areas.
"A township level forum on 19 September 2016 facilitated by Malteser International brought together community representatives and representatives from local authorities to present the community adaptation plans developed during the project and strengthen the links between community representatives and local authorities. Interestingly, many of the community representatives were obviously very empowered and outspoken during the workshop, contributing to vital group work. Malteser International engaged both communities, the Muslim as well as Rakhine community in Rakhine State on the neutral topic of Disaster Risk Reduction. During a Training of Trainers on DRR, Malteser International brought together participants from both communities and representatives from various authorities in the DRR, health and security sector in Maungdaw township. The best practice case study [compilation (Marr & Chaw, 2017)] highlights the need for community trust and tangible action for effective DRR. There are opportunities to further build community resilience and for improved cooperation.
"The 25 August 2017 attacks by the militant group ARSA on security posts and the consequent military operation causing more than 650,000 people crossing the border to Bangladesh disrupted the project implementation and made community members afraid of traveling to Sittwe for trainings. CERA was, however, able to maintain the trust with the communities and was able to resume activities after a few weeks of suspension and humanitarian assistance in Maungdaw and Buthidaung. During a project evaluation and handover workshop in January 2018, the 22 community adaptation plans were handed over to the Relief and Resettlement Department, which include the list of trained Village Adaptation Committee (VAC) members, with whom the Relief and Resettlement Department will work for disaster preparedness and disaster relief." (Malteser, 2018: 5).
Overall assessment: **design quality** - high (score 5); **effectiveness** - excellent (score 6); **impact** - excellent (score 6); **sustainability** - moderate (score 4); **transformational potential** - very high for adaptation, high for mitigation..
Later events.
ACF stayed on in Myanmar, and describes the later situation thus: "In Myanmar, chronic poverty further complicates a humanitarian crisis caused by natural disasters, a lack of nutritious food, armed conflict and mass displacement of people. Since August 2017, worsening violence in Rakhine State has forced more than 650,000 Rohingya refugees to flee to Bangladesh. The local government in Rakhine State has imposed regulations and restrictions on movement on humanitarian agencies, making it difficult to assess the current needs of the local population. Myanmar is also among the countries with the highest numbers of Covid-19 cases and deaths in Southeast Asia." In 2020 ACF in Myanmar was mainly focused on healthcare systems and pandemic response (www.actionagainsthunger.org.uk/our-impact/where-we-work/asia/myanmar), and ACF was also working with Rohingya refugees in Bangladesh (www.actioncontrelafaim.org/Myanmar).
Malteser International also stayed on in Myanmar, and although its work has been affected by the continuing state of emergency, as of 2021 it continued to employ "more than 350 national staff in Rakhine, Shan and Kayin states, where our work aims at ensuring communities have access to primary health care services. We also offer comprehensive WASH and disaster risk reduction/climate change adaptation solutions, and provide relief after disasters. We strive to enable and empower the most vulnerable communities in marginalized areas through a participatory and sustainable approach." (https://www.malteser-international.org/en/our-work/asia/myanmar.html).

Part D: Design quality

D1. Theory of change.

- **The projects share a common starting position**, that Myanmar in general and Rakhine State in particular are prone to weather-related hazards (cyclones/typhoons, storm surges, floods) and seismic hazards (earthquakes, tsunamis). The ability to recover from disasters is limited everywhere in Myanmar by widespread poverty, poor social and economic infrastructure and governance issues, and in Rakhine State also by chronic inter-communal tensions. The ability to manage disaster risk in Rakhine State is inadequate at both community and institutional levels, being limited by poor awareness and understanding on risk reduction. Their theories of change then diverge.
- **Project 7F-09567 (ACF)**: The project targeted: (a) limited DRR awareness, understanding, resources and capacity at all levels; (b) a lack of investment in critical facilities for mitigating,

preparing and responding to disasters; and (c) a high frequency of hazard exposure and vulnerabilities in the target townships. Two outcomes were defined: (1) "Target communities and institutions are aware of and have the capacity to manage disaster risk in line with the national, regional and international policy, legal standards and frameworks"; and (2) "Target schools are better prepared for and have increased capacity to manage risk in line with the Comprehensive School Safety Framework." (SDC, 2016: 5-6).

- **Project 7F-09439 (Malteser)**. The project aimed: (a) to strengthen communities against disasters through adaptation planning, training and mangrove restoration; (b) to build or rehabilitate disaster-resistant infrastructure to make evacuation points more accessible; and (c) to strengthen the capacities of local authorities responsible for emergency response coordination. Only one outcome was defined: "The capacity pf local authorities and the population to adapt to climate change is strengthened and their resilience to disasters increased" (SDC, 2015: 5).
- **Differences between the projects**. Both projects identified the vulnerability of settlements to disasters and both aimed to raise awareness of dangers and how to escape from them, but 7F-09439 also proposed to strengthen the settlements themselves, through adaptation planning (i.e. identifying and correcting physical weaknesses) and by actively replanting mangroves as the primary ecosystem buffer against storms and storm surges. This is a key difference that makes 7F-09567 only a DRR project, and 7F-09439 a DRR and CCA project. It explains why the mainstreaming of CCA into DRR requires the causes of a system's vulnerability (i.e. its weakness) to be addressed (i.e. by strengthening the system), something that 7F-09567 claimed to do, but that 7F-09439 actually did do.[58]

D2. Assumptions underlying the theory of change.

7F-09567 (ACF):

- **Assumption 1**: Rakhine State is prone to natural disasters, and vulnerability to them is aggravated by poverty, ignorance, weak social organisation, inter-communal tensions and governance problems.
- **Assumption 2**.: The chances of surviving disasters can be enhanced through awareness raising, preparedness training and the organisation of self-help committees as well as emergency communication systems and escape routes and refuges, which are identified as key matters to address in a DRR project.

7F-09439 (Malteser):

- **Assumption 1**: Rakhine State is prone to natural disasters, and vulnerability to them is aggravated by poverty, ignorance, weak social organisation, inter-communal tensions and governance problems, as well as by a history of environmental degradation and weak investment in physical security infrastructure.
- **Assumption 2**.: The chances of surviving disasters can be enhanced through awareness raising, preparedness training and the organisation of self-help committees as well as emergency communication systems and escape routes and refuges, while the level of damage and danger arising from any particular intensity of disaster can be reduced through planning and investment in the strengthening of ecological infrastructure (in this context, mangroves) and physical infrastructure such as hardened refuges, which are all identified as key matters to address in a DRR/CCA project.

D3. Plausibility of assumptions and links.

The assumptions are aligned with the overlapping but divergent natures of the two projects, and plausible within each approach. The approach of 7F-09439 was clearly the more complete of the two, since it sought to correct past ecological degradation as a key factor that undermines Rakhine State's resistance to disaster impacts. Both projects were compromised, however, by their inability to undo the effects of decades of environmental abuse (e.g. deforestation since 1885), social injustice (e.g. ethnic oppression since the 1970s) and misgovernance (e.g. military dictatorship since 1962).

[58] The lack of attention to root causes of vulnerability in a DRR project (7F-09567) designed in 2016 is surprising, when the key role of coastal ecosystems in environmental security in that very region had been fully documented after the 2004 Indian Ocean tsunami and the 2007-2008 Bay of Bengal cyclones Sidr and Nargis. However, a recent study found that "SDC has contributed more effectively to humanitarian response (34%) than to prevention (28%) [and] this is echoed in voices of key informants", a finding that "again underscores the reality that DRR is not seen as a prevention mechanism for SDC as much as it is seen as a [Humanitarian Assistance] 'task'." (Morinière *et al*., 2020: 24).

D4. General quality of the project design.
Consultation. Both projects relied for their design on stakeholder consultations and participation going back several years in the target townships and other communities of Rakhine state, and managed by the NGO partners ACF and Malteser International, with their local counterparts and colleagues.
Risks
7F-09567 (ACF). Risks inherent to the project design include the possibility that would be inadequate continuity of support and advocacy from religious and community leaders, inadequate continuity of effective DMC engagement in some or all communities, and chronic inter-communal tensions that would undermine cooperation. Annex 7 of SDC (2016) rates the risk of **natural disasters** in Sittwe Township as *high* (for storm surge), *medium* (for cyclones and tsunamis), and *low* (for flood, landslide, ecosystem fire, earthquake), and in Minbya Township as *high* (for flood), *low* (for cyclone), *low/medium* (for ecosystem fire), and *low/high* (for earthquake), reflecting their different physical and ecological situations. It rates the risk of **political and social unrest** as *medium/high* and of **conflict and/or inter-communal tensions** as *high*. Other risks assessed concerned delays in GoM permissions (*low/high* depending on the level of government), reluctance by GoM staff to work in Muslim communities (*medium/high*), staff recruitment and retention (*low/high* depending on skill level and location), community priorities not given to DRR (*medium* in urban and *high* in rural areas), reluctance by community and religious leaders to involve women and vulnerable groups (*medium* in urban and *high* in rural areas), and fraud (*low*).

Table 1: Potential risk: Conflict and/or inter-communal tensions (from SDC, 2016: Annex 7)

Risk rating	High risk in both rural (Muslim) and urban (Rakhine) areas.
Potential impact to project implementation	• Lack or difficulty of access in project areas and to project beneficiaries. • Restrictions in staff movement due to safety and security issues. • DRR activities are scaled down or temporarily suspended.
Preparedness and mitigation strategies	• ACF regularly monitors and analyses conflict drivers, triggering factors and power dynamics. • ACF, in strict adherence with its charter and the humanitarian principles, will continuously raise awareness of communities on these principles through integrating project inception workshops. • ACF has local security plan in place and regularly updated. • Conflict sensitivity approach and Do No Harm principles are considered an integral part of the project activities. • ACF will continue to strengthen acceptance from the communities, particularly with community leaders, to establish information-sharing and early warning mechanisms around issues of conflict and INGO activities. • ACF will continue to maintain continuous dialogue with the Government at all levels. • ACF will regularly gather formal and informal updates within the network of humanitarian actors. • ACF will regularly share updates with SDC, communicate challenges, and possible adjustments to the project strategy and implementation schedule.

7F-09439 (Malteser). "Overall, the project is considered to have a moderate risks level. Major risks include [disasters and] the fragile peace process, [as well as] the volatile situation due to intercommunal violence and the difficult environment for international NGOs in Rakhine State. Indeed, there is in Rakhine State a general mistrust toward international aid agencies [which are] perceived as giving preferences to Muslim communities. In March 2014, extremist elements ... attacked the premises of Malteser International, the UN and other international organisations. ... [Risks will be mitigated] through careful planning and appropriate timing of activities. As the achievement of the project objective is subject to external factors, Malteser International conducts a risk analysis on a bi-annual basis as part of project reviews." (SDC (2015: 7)

Conclusions on design quality. Assessment of these projects must somehow take into account that neither fully anticipated the scale of social risk in Rakhine state (although 7F-09567 was perhaps closer to the mark), and that 7F-09439 was better targeted on CCA. It is concluded that each design was adequate to its own approach, but that in neither case was the approach entirely adequate to the context. Nevertheless, the CCA perspective of this evaluation requires that the greater completeness and CCA targeting of 7F-09439 is reflected in a higher design quality score (5) than for 7F-09567, which is seen as moderate (score: 4).

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.
7F-09567 (ACF). Nil, since no ecosystem restoration was attempted, and no measures to limit or reduce GHG emissions were mentioned or implicit.
7F-09439 (Malteser). Notes on mangrove restoration work from Malteser (2018):

- "100% of the communities actively participated in the trainings of the village adaptation committees and implemented their plans by either constructing small-scale infrastructures or planting mangroves. 90% of the communities contributed to small-scale infrastructures and 86% of the communities contributed to their mangrove plantations." (pager 9).
- "Both community representatives and authorities stressed the need for an increased mangrove forest coverage in coastal areas as well as access to sufficient cyclone shelters for the whole population." (pages 10-11).
- "Myanmar is known to be a hierarchical society. It was therefore surprising and encouraging to see that many of the community members trained by Malteser and CERA were very confident and outspoken during the township level forum. They were very outspoken when presenting their community adaptation plans and actively contributed during the working groups. At the same time, several township administrators were very open and receptive to the suggestions by participants. Especially the idea of accelerating mangrove reforestation township wide was taken up." (page 12).
- "Through the eleven stories in this report, villagers give a first-hand account on the most significant changes that DRR has brought to their lives. The stories tell of the value of feeling prepared, of better working together, of greater inclusion and empowerment, of improved livelihoods. Villagers' stories tell of changes towards a more proactive mindset, of better links with local authorities, and of better organization within villages. They tell of better care and inclusion of persons with disabilities, and of women's empowerment. They show appreciation of mangrove forests and of coastal resource management more generally." (page 15).
- "A total of 72,080 mangrove plants on an area of 226,624 m^2 in 19 villages were procured and planted by CERA and the communities. For better sustainability of the mangrove plantations, 7 mangrove nurseries in six villages were established. In addition, to reduce the need for firewood in the villages and thus protect the mangrove forest in the long term, energy efficient cooking stoves were introduced. Ahead of the plantation, CERA conducted two-days mangrove nursery and plantation trainings for 304 participants from 19 villages. The trainings focused on how to establish and maintain mangrove nurseries as well as how to plant which types of mangrove species including protection and maintenance. The mangrove nurseries and mangrove plantations were established by the communities themselves. The procurement of mangrove seedlings and materials was taken over by CERA. Furthermore, CERA supervised and guided the establishment of mangrove nurseries and plantations." (page 21).

Performance scores (7F-09439 only): **Effectiveness** - 6; **impact** - 6; **sustainability** - 4.

E2. System change.
7F-09567 (ACF). Nil (since no ecosystem restoration was attempted, and environmental awareness-raising was limited to immediate disaster preparedness and response measures).
7F-09439 (Malteser). See E1. But Malteser (2018) records that by asking people 'How important do you think it is to plant mangroves to prevent climate change?' the baseline response was that 97% of people said it was 'important' or 'very important', and that this had increased to 100% by the final survey. More interesting was that there was a greater increase in the 'very important' answers The point is that almost everyone in these villages *already knew* that mangroves were vital (to environmental security, fisheries, etc.), and the project merely gave them a way to express this knowledge and to put it into effect through organised mangrove planting activities. Similar observations are made wherever coastal communities are associated with mangroves, since protecting and planting mangroves to a sufficient extent can transform the environmental and livelihood security of coastal communities (see H3.4). If a project

facilitates this then it has transformative potential regardless of whether it introduces the idea *de novo* or simply encourages and enables it to be applied where this would not otherwise have happened. Since mangroves are a high carbon-density ecosystem (see H3.5, H3.6, H3.7), high transformative potential for mitigation is assessed.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.
7F-09567 (ACF):
Effectiveness and impact

- **Outcome 1**: *Target communities and institutions are aware of and have the capacity to manage disaster risk in line with the national, regional and international policy/legal standards/frameworks*.
- The project sought to build capacity through participatory exercises in disaster risk assessment, planning and emergency preparedness within and between communities and schools, and a total of 12 VDMCs and 48 Task Forces were in fact trained. This process allowed development of Community Disaster Risk Reduction and Management Plans which were consolidated by the VDMCs and submitted to community validation. In Sittwe and Minbya, community workshops to establish the community-managed Early Warning system were also conducted and outputs were consolidated and served as the basis for a strengthened early warning system for all target villages. Disaster simulation exercises were organized in four villages (2 in rural and 2 in urban area, 3 in Sittwe and 1 in Minbya). All targets were achieved, but no formal baseline capacity assessment was done and not all of the indicators of progress could be measured (ACF, 2018).
- It proved easier to mobilise and motivate village-level DMCs than township-level ones, and some evaluation shelters and other infrastructures were constructed but maintenance arrangements could not be completed due to the breakdown of working conditions, which for security reasons became difficult from Oct 2016 and were severely curtailed from Aug 2017 (and also being suspended by Cyclone Mora in May-Jun 2017).
- **Outcome 2***: Target schools are better prepared for and have increased capacity to manage risk in line with the Comprehensive School Safety Framework*. Comparable efforts and similar results with more complete achievements were listed for the two target schools in the same period, again curtailed due to the breakdown of working conditions.

The achievements listed for outcome indicators are impressive, and **effectiveness** is assessed as good (score 5). Impact depends on the use of plans and the retention of skills and networks established by the project, and people are likely to remember these things during the regular typhoons and floods to which coastal Rakhine state is subject (also, ACF remained in the country to remind them), so **impact** is also assesses as good (score 5).

7F-09439 (Malteser):

- **Outcome**: *The capacity of local authorities and the population to adapt to climate change is strengthened and their resilience to natural disasters is increased*.
- The project sought to build capacity of local authorities involved in DRR, such as township administrators, the Relief and Resettlement Department, the Department for Meteorology and Hydrology, and fire brigades. Local authorities from Sittwe, Ponnagyun, Rathedaung, Pauktaw, Myebon, and Maungdaw were reached from all relevant government departments and agencies via three capacity building workshops (Malteser, 2018).
- "The community-based activities of the project were implemented in 22 out of 18 proposed villages in hazard prone areas in Sittwe and Ponnagyun townships in Rakhine State. The selection criteria included disaster-proneness, coastal location, suitability for mangrove afforestation, interest of the community to participate in planned activities, coordination with the government, and acceptance of the community to humanitarian and development aid. Malteser International and its partner CERA reached around 23,041 people in 22 villages (target group1), of which 11,846 were women. The initial target was 20,000 people in 18 villages. 1,453 volunteers, either from Village Adaptation Committees (VACs) or School Disaster Management Committees (SDMCs), directly received trainings. 2,190 people participated in simulation exercises." (Malteser, 2018: 8).
- Progress on the planting of mangroves is summarised in E1 because of the relevance to mitigation, but in fact the restoration of coastal ecosystems including mangroves is of even greater and more direct significance as an adaptation measure. This is because a primary consequence of global heating is a warmer ocean that drives more severe and/or frequent

cyclonic storms, and mangroves are incomparably effective at absorbing the energies of wind and water during such storms.

- "The community DRR and adaptation plans include small-scale measures to reduce the identified risks and to explore adaptation options. Small-scale infrastructures in 20 villages were constructed. Infrastructures include concrete pathways, pathways, small culverts, slab culverts, retaining walls of river bank. The list of small-scale infrastructures is shown in the below table. In every village, the community not only contributed with their workforce to construct the small- scale measures. Communities also contributed with own resources to the financing of the infrastructures. On average, communities financially contributed 21% to the infrastructures." (Malteser, 2018: 24).

The achievements listed for outcome indicators are at least as impressive for 7F-09439 as for 7F-09567, with the bonus of mangrove planting to raise the assessment of **effectiveness** to 'excellent' (score 6). The same case for impact applies to social consequences of planning and learning in both projects, but in 7F-09439 there is the added effect of planted (mangrove) infrastructure so **impact** is assessed as excellent (score 6).

Sustainability (both projects). For infrastructure, ACF (2018: 11) states for 7F-09567 that "Unfortunately, due to time constraints and limited technical resources at the end of the project, the Maintenance plan has not yet been formalized and approved by the community", while Malteser (2018) refers only to the maintenance of mangroves and fences. Neither project changed laws, institutions, budgets, etc. in ways that are likely to have survived social breakdown in Rakhine State in 2017-2020 or the failure of democratic legitimacy and peace throughout Myanmar thereafter. It is hard to consider small projects caught up in a large social catastrophe as sustainable, but impacts were likely and the continued presence of ACF and CERA may have helped. Nevertheless, the fragmentary assurances of sustainability in ACF (2018: 5, 16, 18) do not match the assurances in Malteser (2018: 21) that seven mangrove nurseries and tens of thousands of planted mangrove seedlings can offer. Hence **sustainability** is assessed for 7F-09567 as weak (score 3), and for 7F-09439 as moderate (score 4).

F2. System change.

Both projects certainly helped people survive storms and floods, since the techniques used are demonstrably sound and effective. A social system in which people are more aware of danger than before, and better organised to cope with disasters, has certainly been made stronger, and a project that helps in this way has some transformative potential, so the **transformative potential** of 7F-09567 for adaptation is considered to be moderate. But this cannot be as high as for a project that also strengthens the ecological system that supports the social one, and the adaptive significance of coastal ecosystem restoration in the Bay of Bengal is so high that the **transformative potential** of 7F-09439 for adaptation is considered to be very high.

Part G: Other aspects of design and performance

G1. Efficiency issues.

No efficiency issues endogenous the project were seen, but as noted elsewhere the projects were paused for security reasons before resuming progressively prior to SDC's eventual withdrawal.

G2. Coherence issues.

7F-09567: "ACF has maintained its coordination with relevant emergency clusters (Shelter, Early Recovery), UN agencies and other organizations working on DRR, particularly CERA, IOM, ACTED and ADPC throughout the project. ACF has continuously taken part in the monthly Rakhine DRR working group meetings in Sittwe, including ACF, Plan, SCF [Save the Children Fund], Malteser [www.malteser-international.org/en/about-us/what-we-do/emergency-relief.html], UN-Habitat, and UNHCR. ACF regularly takes part in the different coordination meetings at state level, such as the Rakhine Coordination Group, the Inter-Cluster Coordination Meeting, the Inter-Agency Service Providers Meeting in the Sittwe camps, as well as ad hoc meetings on specific topics (pre-monsoon Disaster Contingency Planning, etc.)." (ACF, 2018: 16).

7F-09439: "Currently several INGOs and UN agencies have DRR programs in Rakhine State: IOM, ACF, ACTED, Oxfam, Plan. Malteser International regularly attends coordination meetings (including the recently established DRR Working Group), and exchange lessons learned with other actors by organizing visits of project sites and inviting them to /participating in workshops." (SDC project web-site).

G3. Replicability issues.
7F-09567 (ACF). The process tested by ACF since 2011 in Sittwe (i.e. conflict-sensitive community-based DRR in 16 communities and 12 schools), involving community forums (DMCs) through which to apply inclusive and educational risk assessment and planning processes, had proved effective enough to be replicated in the SDC project. This way of organising, mobilising, motivating and educating communities in diverse localities has been known to be effective for decades, so can be considered highly replicable. However, replication of such initiatives without a dimension to address root causes of vulnerability is inherently insufficient for CCA purposes, and the greater replicability potential lies in 7F-09439 where the more complete approach of restoring key ecosystems as well as organising and empowering communities is universally replicable and necessary.

G4. Partnership issues. None noted.

G5. Connectedness issues. Both projects were impacted (and indeed ended) by the breakdown of civil society in Rakhine State from 2016 and in Myanmar more generally following the 2021 military coup.

G6. Cross-cutting themes.
7F-09567 (ACF):
Gender equity and social inclusion (GESI). Safeguarding indicators included that the 12 village-level DMCs had 41% female and 22% elderly representatives overall, and at least one person (1%) with disabilities.
Ethnic profiling. Footnote 10 of ACF (2018) states that it follows international NGO conventions in defining rural residents as [Rohingya] 'Muslim' and urban residents as 'Rakhine Buddhist'. This must be a gross over-simplification at best.
Conflict management. "Throughout the project ACF's actions will be guided by the do-no-harm (DNH) framework. ... DNH should be seen as one of the foundations and a minimum standard for DRR programming, in both stable and sensitive contexts. This includes organizing capacity building sessions on conflict sensitivity, e.g. understanding factors that drive violence and how to reduce or eliminate them." (SDC, 2016: 8).
7F-09439 (Malteser):
Gender.

- "Malteser International ... recognises that the people most at risk are central to all DRR activities. Special attention is given to promoting gender equity and the full participation of children, older people, people with disabilities and other marginalised groups." (Malteser, 2018: 6).
- Data on workshop attendance (page 16), project outreach activites (page 8) and VAC membership (page 17) were gender disaggregated and showed around 50% female participation, while "villagers' stories tell of changes towards a more proactive mindset, of better links with local authorities, and of better organization within villages. They tell of better care and inclusion of persons with disabilities, and of women's empowerment." (page 15; see also H3.3).
- "The project ensured that each committee had equal representation of men and women – an idea that women appreciated, as they saw the training as relevant and important for their lives. By ensuring that women were equally represented in committees (search and rescue, early warning, first aid, and environmental maintenance), women realised that they had a unique and important role to play." (Marr & Chaw, 2017: 29; see also case studies 'Confident women' and ' The chance to speak up' in the same collection).

Ethnic profiling. Malteser (2018: 4) states as a matter of principle that it operates "without distinction of religion, race or political persuasion", and that it "engaged both communities, the Muslim as well as Rakhine community in Rakhine State on the neutral topic of Disaster Risk Reduction. During a Training of Trainers on DRR, Malteser International brought together participants from both communities and representatives from various authorities in the DRR, health and security sector in Maungdaw township." (page 5).

G7. Capacity building issues. None noted.

Part H: Other matters arising from the review
H1. Follow-on questions. These focused on issues such as the usefulness of the risk analyses and mitigation measures, the responsiveness to social breakdown and ethnic cleansing, and the weight that should be given in a DRR project to the lack of attention to the root causes of environmental vulnerability. The answers are integrated as far as possible within the text.
H2. Missing documents. For project 7F-09567: annexes to ACF (2018), especially: Annex A (*Explanatory Note of Consultancy for project impact assessment of DRR Project*); correspondence between ACF and SDC around times of strategic decision-making (i.e. Oct-Nov 2016, Aug-Sep 2017, Nov-Dec 2017).
H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.
H3.1: Current policy, practice, future targets and challenges in Myanmar, from MoNREC (2016: 33-35). **Disaster risk management** Myanmar is committed to disaster risk reduction and has disaster management systems and procedures at national, state/division, district, township, ward and village levels. Its National Disaster Preparedness Central Committee has a Disaster Risk Reduction, Preparedness, Rehabilitation and Reconstruction Action Plan. The central Disaster Emergency Relief Fund has been is established at the central level to provide immediate relief in the case of disaster. Both the Myanmar Action Plan on Disaster Risk Reduction (MAPDRR) and the 2013 Disaster Management Law focus on better risk information, preparedness planning, awareness and early warning, improved management and better data for early warning systems. Myanmar formed a Disaster Risk Reduction Working Group in 2008 during Cyclone Nargis's early recovery phase. This group is increasingly active and has a diverse network of more than 60 agencies working to increase capacity for disaster risk reduction (DRR) in Myanmar. The government developed MAPDRR to address disaster risk. It has seven components: • Policy, institutional arrangements and further institutional development • Hazard, vulnerability and risk assessment • Multi-hazard early warning systems • Preparedness and response programmes at national, state/region, district and township levels • Mainstreaming DRR into development • Community-based disaster preparedness and risk reduction, and • Public awareness, education and training. The action plan complements the National Disaster Prevention Central Committee's Disaster Risk Reduction, Preparedness, Rehabilitation and Reconstruction Action Plan and Standing Order. The MAPDRR period is now complete and the government plans to update or develop a new plan to address DRR. Early warning system projects include assessing the hydrological impact of climate change on river systems and developing flood and drought early warning systems to reduce the vulnerability of local communities to extreme weather events. Myanmar is working with international exerts to develop end- to-end early warning system capacities. The annual Monsoon Forum provides updates on forecasted data, but technical and financial constrictions limit the extent to which Myanmar can collect, analyse and use data. It needs assistance to increase capacity in this area. The government has plans to set up an emergency operation centre to upgrade capacities to respond to disasters and to focus on township planning for adaptation. **Required responses** Myanmar's exposure and sensitivity to current and projected weather patterns and climate fluctuations makes it extremely vulnerable to the impacts of climate change. These are likely to become more severe in future. Communities and businesses that are located in at-risk regions and reliant on climate-sensitive economic activities are particularly vulnerable to the impacts of climate change. Myanmar is in a process of social and economic transformation, and climate change could challenge the social and development gains that it has already achieved. The government must now develop a roadmap to guide Myanmar’s strategic responses and actions to address climate-related risks and opportunities over the next 15 years and beyond. Current policy initiatives on DRR, health and social protection need to be strengthened so vulnerable

communities and sectors can prepare and recover from current and future climate-induced shocks. There is also a need to improve information and awareness on climate change and its associated impacts so vulnerable communities and sectors can respond effectively to current and future climate change impacts. Resources need to be mobilised and allocated to help communities and sectors prepare and recover from climate-induced risks.
By 2030, Myanmar's communities and economic should be able to respond to - and recover from - climate-induced disasters and risks and build a healthy society. This is aligned with the national development vision of 2030; national and sectoral policies; SDG 3: “good health and wellbeing for all at all ages” and SDG 13 “take urgent action to combat climate action and its impact”. This objective can be achieved by ensuring a number of actions are taken. (1) Climate change needs to be integrated into disaster management, health and social protection policies, plans, programmes and regulations. This will strengthen the policy direction for disaster preparedness, risk reduction and recovery and support climate change-responsive institutions in the health and social protection sectors. (2) Capacities and awareness of climate change and its associated impacts should be improved at the level of communities, government, civil society and private sector. This will enable vulnerable communities and sectors to respond effectively to current and future climate change. It includes improved access to disaster forecasting knowledge and technology and surveillance and monitoring systems for improved climate risk management. (3) Climate resilient infrastructure and systems, including healthcare and social protection systems, including through civil society and public-private partnerships must be developed. Financial mechanisms to mobilise and allocate resources to help communities and sectors prepare for and recover from climate-induced risks should be enhanced. (4) SDG 13's target to “promote mechanisms for raising capacities for effective climate change related planning and management, in [Least Developed Countries], including focusing on women, youth, local and marginalized communities.” This strongly implies that specific gender considerations need to be included.

H3.2: Lessons learned by ACF from project 7F-09567 (ACF, 2018: 17-18).
Gender and age vulnerability to disasters
Although the external consultant who came to visit the project in March 2018 never submitted his final report, he did provide ACF with some informal written feedback on his observations. Having attended the simulation exercise organized on March 9 in Zaw Ma Datt village (Sittwe urban), he sent to ACF field team a short field visit report, detailing his observations of the day, including comments and constructive remarks for improvement. Below is the transcript of this report regarding the presence of women and children in the simulation exercise, and then more generally on the disproportionate vulnerability of women and children to disasters as compared to men.
“The overwhelming majority of the participants (evacuees) were women and children. Depending upon the socio-economic context and cultural practices of a community, it may be likely that a real-life evacuation would also consist mainly of women and children. On the other hand, perhaps males are more reluctant to get involved in such project activities. The minor participation of adult males in the simulation exercise is similar to all the other simulations the evaluator has observed - regardless of the country, religion, or nature of the hazard. Several years ago there was a statistic, from an apparently reliable source, that for every one man killed in a natural disaster, 14 women and children were also killed. Unfortunately, it has proven difficult for this evaluator to locate another or updated source of information that disaggregates the victims of natural disasters. The evaluator is uncertain of the difficulties in researching this data when the 14x number of a decade or so ago was so easy to locate at that time. Regardless, the evaluator believes that those knowledgeable with DRR accept the fact that women and children are generally more likely to be victims of a natural disaster than men.”
The increased vulnerability of women and children to disasters was analysed and integrated by the project team throughout the project: all VDMCs/SDMCs included several women and girls, to ensure that those could bring significant input in the various activities conducted by the VDMC (risk assessment, disaster plans) and that those would integrate specific vulnerabilities of women and children. Similarly, the VDMC Task Forces were mixed. As such, the MHPSS TF [Mental Health and Psychosocial Support Task Force] comprised both men and women, recognizing that cultural norms can make it difficult for a man to provide PSS [Psychosocial Support] to women, and vice versa. The same remark goes for the First Aid Task Force.
Fire tower in villages
The evaluator also suggested to encourage communities to build “fire towers” in communities, as observation points to best see and be seen by all community members.

"In other Myanmar villages the evaluator has observed where the community has constructed what is best described as a 'fire tower' in the middle of the village, as it is the primary early warning observation point to spot any fire in the village and warn the residents through a fire bell. A tower would be able to provide significant height to a warning flag, as well as be used as a platform for the megaphone and siren to give them better coverage of the village. One village told this evaluator in another project, that they also raise the alarm from the tower in case of any nearby tiger sightings, so as to take care of the livestock and children. This evaluator did not really believe that particular area was tiger country, but in the spirit of good humor one goes along with the "tale" of the tiger." This recommendation was integrated by the project team into the project's lessons learnt, and will be part in future projects of the small-scale mitigation measures that can be suggested to the communities in the Action Plans, whether to be supported by ACF or to be built directly by them.

Treatment of dead victims during and after emergencies in the communities

"The most difficult job for a CBDRR and S&R [Search and Rescue] team is the treatment of the dead victims of an emergency, especially those found during the evacuation and storm itself. That scenario should be covered in the VDMP as it should not be an ad hoc decision made during the crisis. Dead bodies should not be taken to the evacuation centre, but they do need a dignified and culturally sensitive temporary location until the crisis has passed and the community can begin the process of identification, grief, mourning and burial." This remark echoes other observations made by the project team. More generally, the topic of death carries with it a strong cultural taboo in Rakhine and Muslim communities. As a matter of example, it was noticed that the communities were very reluctant to use stretchers during simulation exercises to transport 'wounded' persons, as this reminded them of the transport of dead bodies. They preferred to carry the wounded in their arms, despite the sensitization that was done by the team. Therefore, integrating the issue of the treatment of dead bodies in the topic of the trainings and in the VDMPs, though it is an important and necessary notion, is to be done carefully and with a culturally sensitive approach. This will be integrated in the activity design of ACF's future DRR projects.

Simulation exercises

Finally, the evaluator provided a suggestion regarding the opportunity of introducing an "element of surprise" in the planning of the simulation exercise.

"[...] in future simulations, an 'element of surprise' should be added to the evacuation scenario that the local community is unaware of. The element would consist of the addition of a "disruptor" or potential point of chaos, to see how the CBDRR team reacts. This disruptor could be a tree fallen across the evacuation route. Or the batteries on the megaphone go dead and no one knows where the replacements are. Maybe one of the evacuees has the equivalent of an emotional breakdown and reacts in a physically dangerous manner to him/herself or others, while being evacuated, and disrupts the orderly flow of residents making their way to the shelter. The evaluator would not suggest anything that is too difficult as the purpose of the exercise is to reinforce the training received by the community, but a little unanticipated confusion would help emphasize the point that in a real evacuation, there is always the potential of unforeseen problems that must be resolved successfully and quickly." [The] ACF project team took note of this observation. Indeed, the simulation exercises were very thoroughly organized and planned by the team, who even organized a rehearsal whenever possible. Introducing an element of surprise, which would be known only of the project team (and maybe of one or two key members of the community) was considered a very interesting notion. This idea could unfortunately not be introduced in the other simulation exercises, as they had already taken place or were taking place in the following days. However, ACF will include it in the planning of his upcoming WASH/DRR activities (see above 4.3 Synergies with other actions), which involve simulation exercises.

H3.3 Lessons learned by Malteser International from project 7F-09439 (Malteser, 2018: 28-29).

- **Tangible action and trust**. A key lesson learnt, which the publication "Reducing disaster risk through trust and tangibles" highlights, is that the mix of tangible action and establishing trust with communities was important for the effectiveness of the project.
- **Timing and trust.** Most of the visited communities appreciated CERA's flexible manner of working with them, particularly concerning timing. They appreciated that CERA would only conduct community meetings at the right time of the day that suited the community. CERA's flexibility and relaxed attitude helped to establish respect and trust, something that is difficult for outside organisations to achieve in Rakhine State. In the context of Rakhine, flexible

schedules, coupled with a relaxed manner and work flow in line with the community spirit may be amongst the keys for this project succeeding.

- **Tangibles**. Mixing hardware and software. The overwhelming majority of community members valued the construction of 'hardware' and small-scale mitigation like village pathways, jetties or retaining walls as a significant change, for various reasons, including for their practical use in their daily lives. Communities also explained that by providing a tangible, useful and valuable "hardware" element in their villages, they could see that CERA had demonstrated their commitment. This helped to establish trust. Once this trust was established and village members could see that CERA had displayed commitment to the village, community members were happy to participate in other trainings, activities or "software" elements of the project.
- **Disaster-resilient WASH infrastructure**. Regarding the approach used in this project, there is room for follow-up action to increase community resilience. Communities that can prepare for disasters, but cannot access potable water or do not have basic sanitation facilities (using open defecation), remain vulnerable to health hazards. Malteser International and CERA have incorporated a disaster-resilient WASH infrastructure component in upcoming DRR work.
- **Multiple benefits of mangroves**. Planting mangroves was found to be a good practice for disaster risk reduction as well as climate change adaptation in Rakhine State. Mangrove forests provide several benefits, and communities appreciated them for (a) their role in preventing riverbank and seashore erosion, (b) increasing fish, prawn and crab by providing a place for them to breed, (c) providing a protective barrier to reduce the impact of storm surges, and (d) the fresh air they provide.
- **Strengthening connections between authorities and villages**. One good practice was that the project has created connections between relevant government departments and the village level - in some cases, for the first time. Moreover, some villages noted that they had more contact with government representatives and greater confidence to speak with government authorities, rather than just follow instructions or receive advice. This new two-way communication was appreciated by both sides.
- **Including vulnerable groups**. All interviewed community members easily identified vulnerable people in times of a disaster. People listed elderly people, pregnant women, children and people with disabilities as needing additional assistance before and during a disaster. Initial changes in attitude towards people with disabilities were evident.
- **Stronger participation of women and young people**. Most of the communities are very interested in disaster preparedness and working with CERA. They are excited to participate in simulation exercises and other community-based activities. Women and young people, however, are particularly active and tend to share their learnings with other community members proactively. For this reason, Malteser International and CERA put special attention to include women and young people in their activities (at least 50%) and assign important tasks to more active members.
- **Inclusion of religious leaders**. To get buy in and trust from the communities, it is important to include religious leaders into the project. CERA usually coordinated with both township and village authorities as well as religious leaders to organise activities. In the communities, monks then often offered their facilities as trainings venues. In emergencies, monks do offer monasteries as shelters for the community.
- **Volatile situation in Rakhine State**. As one can see from the events unfolding in Rakhine State in October 2016 and August 2017, the situation in Rakhine State is still very volatile. Anti-UN and INGO sentiments contribute to an insecure and difficult working environment for aid agencies.

H3.4: Comparison case: Danish support (2018-2023) for Climate Adaptation in Coastal Communities of Myanmar: Improved Management of Coastal Forests (Caldecott *et al.*, 2021).

Objective: "Resilience to climate change among vulnerable and marginalised groups increased through sustainable management of mangrove forests.".

Outcome: "Coastal communities' resilience to climate change is strengthened through the presence of healthy mangrove forests and access to more sustainable livelihood opportunities.".

Overview. This is a Danish Climate Envelope project mainly in Rakhine State, within the Denmark-Myanmar Country Programme 2016-2020. Myanmar ranks 7th in mangrove forest area (485,000 ha), with 34 out of global 70 mangrove tree species. Since the 1970s there has

been rapid mangrove clearance for rice and shrimp ponds, plus degradation by timber and fuelwood extraction - wood provides 89% of fuel used in Rakhine (Arakan) State. Mangrove loss has been most extreme in the Ayeyarwady (Irrawaddy) Delta, with the area declining from 296,000 ha in 1980 to 25,000 ha in 2007; in Rakhine around 2,000 ha or 1-2% was lost annually in 1980-2015 (the area estimates in the 1980s are between 200,000 and 300,000 ha, loss rates are patchy and measurements inconsistent).
Healthy mangroves are highly productive ecosystems, and their loss erodes food security and aggravates widespread poverty The loss of mangroves is also severely reducing flood and storm protection for coastal peoples (e.g. Cyclone Nargis in the Ayeyarwady Delta 2008, which devastated areas where mangroves had been removed, and powerful cyclones that hit Rakhine in 2004, 2006, 2010, 2015, 2017). The rationale for Climate Envelope funding rests mainly on increased climate resilience, but also the fact that mangrove forests can store high quantities of carbon, especially below the surface in the form of their root systems and accumulated organic debris, to the extent that soil carbon can account for up to 90% of the total carbon storage. Although mangrove forests represent only 0.7% of all tropical forest cover, their continuing loss is contributing up to 10% of the global forest emissions.
The Forest Department has jurisdiction but is grossly under-resourced, so any effort to restore and sustainably manage mangrove forests must involve FD, but it needs to be done in partnership with the local communities, and facilitated by civil society organisations and other service providers, as necessary, to help develop the partnership. Thus the key points of the strategy are: (a) Coastal communities are recognised as key actors. (b) Experienced CSOs are mobilised to help coastal villages organise themselves for mangrove planting. (c) Forest Department has clear responsibilities to approve Community Forestry applications, to provide tree seedlings, to advise on how to manage the community forest, while assisting with land tenure issues, illegal tree-felling and conflict resolution, and (to supervise sustainable harvests and trade in forest products. (d) Primary field site in Rakhine, (e) Secondary field site Tanintharyi. (f) Full-time international TA. (g) Paid work for vulnerable households in mangrove raising, planting and tending (with various criteria to help targeting), with benefits to the wider community coming from environmental security and livelihood resources.
The project is clearly designed, with a number of conceptual and practical strengths, but there are some questionable assumptions that may jeopardise the start. If communities can be motivated to participate fully, however, and to relax pressure on the mangrove for daily needs (e.g. for fuel wood) quickly enough, the project would likely contribute over several years very significantly to increasing the environmental and livelihood security of the communities affected. By so doing, it would also be likely to conserve and sequester significant amounts of carbon, all within a highly replicable package. Overall scores: 4 (moderate) for design; 5 (good) for anticipated performance (potentially 6).

H3.5: Economic values of mangroves (Salem & Mercer, 2012).
"This paper presents a synthesis of the mangrove ecosystem valuation literature through a meta-regression analysis. The main contribution of this study is that it is the first meta-analysis focusing solely on mangrove forests, whereas previous studies have included different types of wetlands. The number of studies included in the regression analysis is 44 for a total of 145 observations. We include several regressions with the objective of addressing outliers in the data as well as the possible correlations between observations of the same study. We also investigate possible interaction effects between type of service and GDP per capita. Our findings indicate that mangroves exhibit decreasing returns to scale, that GDP per capita has a positive effect on mangrove values and that using the replacement cost and contingent valuation methods produce higher estimates than do other methods. We also find that there are statistically significant interaction effects that influence the data. Finally, the results indicate that employing weighted regressions provide a better fit than others. However, in terms of forecast performance we find that all the estimated models performed similarly and were not able to conclude decisively that one outperforms the other." [See table].

Average values for mangrove goods and services in South-east Asia	
Mangrove goods and services	**Median value (USD/ha/year)**
Forestry products	627
Fisheries products	576
Coastal protection	3,604

Water & air purification/waste assimilation	5,801
Recreation and tourism	1,079
Total	**11,687**

E3.6: Mangroves and carbon (Donato *et al*., 2011)

"Mangrove forests occur along ocean coastlines throughout the tropics, and support numerous ecosystem services, including fisheries production and nutrient cycling. However, the areal extent of mangrove forests has declined by 30–50% over the past half century as a result of coastal development, aquaculture expansion and over-harvesting (Alongi, 2002; Duke *et al*. 2007; FAO, 2007; Polidoro *et al*., 2007). Carbon emissions resulting from mangrove loss are uncertain, owing in part to a lack of broad-scale data on the amount of carbon stored in these ecosystems, particularly below ground (Bouillon *et al*., 2009). Here, we quantified whole-ecosystem carbon storage by measuring tree and dead wood biomass, soil carbon content, and soil depth in 25 mangrove forests across a broad area of the Indo-Pacific region - spanning 30° of latitude and 73° of longitude - where mangrove area and diversity are greatest (Giri *et al*., 2011). These data indicate that mangroves are among the most carbon-rich forests in the tropics, containing on average 1,023 Mg [*tonne*] carbon per hectare. Organic-rich soils ranged from 0.5 m to more than 3 m in depth and accounted for 49-98% of carbon storage in these systems. Combining our data with other published information, we estimate that mangrove deforestation generates emissions of 0.02-0.12 Pg [*billion tonnes*] carbon per year - as much as around 10% of emissions from deforestation globally, despite accounting for just 0.7% of tropical forest area (van der Werf *et al*., 2009)."

H3.7: Restoring mangroves in Indonesia (Caldecott, 2020).

"A shady avenue of six-metre *Rhizophora* mangrove trees stretches into the distance, all clinging with stilt roots to either side of a mud dyke. A tidal canal, swarming with crabs, runs along the right side of the dyke as we head north towards the Java Sea. To the left is a hectare or so of prawn pond, planted with mangrove trees across the middle, and completely lined by them. The dyke is punctured here and there by tubes that at high tide feed water and baby prawns from the canal to the pond. Each is guarded by a filter to keep out predators, but allows the prawns into their new habitat. Here they will grow until it's time for them to be harvested.

"In every direction the landscape is the same: water swirling with life, ponds full of prawns, milkfish or seaweed, ditches, dykes and above everything, curving bundles of stilt roots growing out of brown trunks surmounted by glossy dark green leaves drooping with the weight of hanging daggers. These narrow spikes are the propagules or fruit-roots of the trees: about 50 cm long, intensely sharp, maturing steadily in the Javanese warmth until ready to fall into mud or water, where they swiftly take root or else drift away on the tide to settle elsewhere.

"There are three of us walking through this cool, green, watery environment in June 2006. Nyoman Suryadiputra leads us. He's head of the Indonesian Programme of Wetlands International, a charity that conserves and restores the parts of the world where water and land meet and mix. Petra Meijer, following, is Dutch, from a land largely below sea level, and is based at the Malaysian office of the same organisation. Then there's me. My job is to find out for UNEP how to re-create a mangrove swamp without moving all the people to the slums of Jakarta and letting nature take its course. Nyoman is showing us.

"The local people had owned and occupied this landscape for many decades, living by fishing in the Java Sea. With the booming Indonesian economy of the 1980s and early 1990s, and increasing demand for prawns in the supermarkets of the world, the trend became established to clear mangroves for prawn ponds. This happened throughout South-east Asia, but Indonesia was particularly hard hit. The problem with this is that mangroves are incredibly productive ecosystems. Because they can tolerate conditions in salty mud, mangroves grow on tidal mudflats and along the fringes of lagoons and creeks in coastal areas. Here the mixing of nutrients from sea and land supports a seething mass of breeding and maturing fish, molluscs, sea cucumbers and crustaceans.

"The result is that these swamp forests can yield an annual harvest per hectare of 100 kilos of fish, 20 of shrimp, 15 of crabmeat, 200 of mollusc and 40 of sea cucumber. More than seventy other uses for mangrove products have been reported worldwide, ranging from palm sugar and honey to tannin and water-resistant poles. For these reasons, mangroves support the livelihoods of millions of coastal fisherfolk, and a decent area of such forest spreads its harvestable products far out to sea and up and down the coast. Thus, fishing peoples may depend on distant mangroves, even though they may not see the connection between them and the silvery

masses of fish in their nets, or the prawns crowding around the lights of their traps at night. Therefore, destroying a mangrove swamp to make a prawn pond privatises its productivity for the benefit of the pond-owner, but deprives many other people of their livelihoods. This took a while to be understood, by which time millions of hectares of healthy swamp had been destroyed, a few people had become rich, and ordinary fisherfolk were suffering badly (or had given up and moved to the cities). But the prawn ponds eventually proved unsustainable, because of disease and input prices, and many were abandoned, isolated from the tides, their mud oxidising to acid sulphates in the harsh sunlight." (pages 83-85).

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"As recently as 1998 all the greenery and controlled, useful flooding that we were looking at eight years later was just bare mud and stagnant water. The ponds had been artificially fertilised for years, and thrashed by mechanical aerators. But then the captive prawns began dying of the white rot, and because the economy had collapsed no one could afford the chemicals and fuel any more. Then Nyoman's team chose the place for restoration. At the village of Desa Pesantran, they began working with a small group of men who were already thinking along the same lines, calling themselves Mitra Bahari ('Ocean Partners').

"Not far along the coast, at Desa Nyamplung Sari, Wetlands International also started working with an all-women's group, Bunga Melati ('Jasmine Flower'), creating a kind of gender symmetry in the project. The women proved more effective at building businesses to use the products of the mangroves, but the men were better at the grubbier job of planting the mangroves themselves. Within a year of Wetlands International making contact with Mitra Bahari, its members were out enthusiastically tending *Rhizophora* seedlings in nurseries, growing them to the 'four-leaf' stage, and planting them around and inside their ponds. Every one of those hundreds of thousands of new trees has a place in the record book of the village group, maintained day-by-day back to 17 December 1999.

"There is great vigour in *Rhizophora*, and if you plant them along both sides of a dyke, within a year or two not only will the banks be hardened against erosion, and so will no longer need much maintenance, but the stilt roots will quickly close off the walk-way between the lines of trees. Fortunately lopping them off seems to do no harm, and this is what people do. As the mangroves thrived, the local people became safer from storms and poverty, making a good living selling prawns, fish and seaweed, and carefully tending their trees, canals and traps. The resulting landscape is not a natural mangrove swamp, of course, but it is a productive and sustainable environment supporting thousands of people, fruit-bats, herons, etc. No wonder Nyoman was pleased to show it off." (pages 85-86).

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"By December 2004, mangrove cover in the twelve countries most affected by the tsunami was well below half its original extent. With ever-more people, settlements, resorts and roads being packed into the coastal zone around the Indian Ocean, the sense of vulnerability and hazard was greatly increased by the tsunami. Now the hunt is on for effective ways to put back mangrove-protected landscapes that are inhabited and used by millions of people. Many international organisations and government agencies all realised this at the same time, and within a couple of years of the tsunami many million mangrove propagules had been shoved into the mud and sand of Aceh's shorelines.

"Not a lot of them are still alive, though. The reason is that mangroves need care and attention. They need to be planted in the right places. They can be washed away if not protected from strong currents, or covered by sand, or die of sun-bake if left unshaded when too young. Predators can kill them — for instance crabs, which have to be decoyed away using bamboo stems, which they palpate (feel and taste), identify as inedible, and move away from. Seedlings need to be grown in protected nurseries for some months before being planted in their ecologically correct locations, and, above all, post-planting community care is needed for maximum seedling survival and full establishment.

"In other words, local people are needed as active partners, not just as hirelings for public works, and they need to know and care about what they are being asked to do. This is where the 'Ocean Partners' and the 'Jasmine Flowers' of Java can help. Facilitated by Wetlands International, and funded by Spain and UNEP, coastal people from Aceh have already been spending time with them, learning how to plant and care for mangroves, and returning to their homes bearing knowledge and inspiration, new enthusiasts for the swamps.

"All around the Indian Ocean, the great tsunami riveted attention on the role of coastal ecosystems in disaster risk reduction. One result was that in 2006 the Mangroves for the Future initiative was set up. Co-chaired by the World Conservation Union and the UN Development

Programme, it links countries in and around the Indian Ocean (Bangladesh, Cambodia, India, Indonesia, the Maldives, Myanmar, Pakistan, the Seychelles, Sri Lanka, Thailand and Vietnam) with various international organisations and charities. Its key aim is to promote the idea that coastal ecosystems are vital, and that more should be invested in protecting and restoring them: building knowledge, empowering communities, securing livelihoods, and increasing resilience to natural hazards and climate change." (pages 88-89).

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Part J: Acronyms and abbreviations

ACF	*Action Contre la Faim* (Action Against Hunger)
ACTED	Agency for Technical Cooperation and Development, an humanitarian-relief NGO which opened its mission in Myanmar in 2008 to respond to humanitarian needs following Cyclone Nargis.
BMZ	*Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung* (Federal Ministry for Economic Cooperation and Development)
CCA	Climate change adaptation
CERA	Community Empowerment and Resilience Association
DIPECHO	Disaster Preparedness European Commission Humanitarian Office (the Disaster Preparedness [Programme of the] European Commission Humanitarian [Aid and Civil Protection] Office)
DMC	Disaster Management Committee
DRR	Disaster Risk Reduction
ECHO	European Commission Humanitarian [Aid] Office
NGO	Non-governmental organisation
IOM	International Office for Migration, UN Migration, formerly (1951-) the Provisional Intergovernmental Committee for the Movement of Migrants from Europe (PICMME).
MCCR	Myanmar Consortium for Community Resilience
MERN	Myanmar Environment Rehabilitation and Conservation Network
MHPSS	Mental Health and Psychosocial Support
Malteser	Malteser International (Order of Malta Worldwide Relief)
MoSWRR	Ministry of Social Welfare, Relief and Resettlement
VAC	Village Adaptation Committee
VDMC	Village Disaster Management Committee
WASH	Water, Sanitation and Hygiene

Annex 13.17: Cleaner Air in Latin American Cities

Project highlights.

7F-09699: **Climate and Clean Air in Latin American Cities Plus (CALAC+)**. Partnered with CCAC (see 7F-08933), mobilised authorities, public opinion, investment and technologies to reduce soot pollution from public bus fleets (through filters and substitution by electric vehicles) and other diesel engines in Santiago, Bogotá, Lima and Mexico City.

Part A: Basic data

A1. Project number & name. 7F-09699 - Climate and Clean Air in Latin American Cities (CALAC) and Climate and Clean Air in Latin American Cities Plus (CALAC+).

A2. Sources.
Process of PRF development: (a) a draft PRF was prepared using documents listed in the bibliography; (b) the draft PRF was reviewed by the national consultant **Marina Marill**, who conducted interviews listed in the following table; and (c) the PRF was revised in light of field findings.

- **CALAC (2013 to 2015)**: no data.
- **CALAC+ Phase 1 (Nov 2016 to Jul 2021)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2016/7F09699/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **CALAC+ Phase 2 (Aug 2021 to Jul 2025)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2016/7F09699/phase2?oldPagePath=/content/deza/en/home/projekte/projekte.html

A3. Dates & financial data.

- **CALAC+ Phase 1**: SDC Budget CHF 5,600,000 (Includes: Opening credit of CHF 50,000 for Nov 2016 to Sep 2017; Second Credit of CHF 2,800,000 for Sep 2017 to Aug 2020, but later extended to Jul 2021).
- **Phase 2: Sep 2019 to Aug 2021 (extended to Mar 2022)** - SDC Budget: CHF 3,200,000.

A4. Location(s). Chile (Santiago), Colombia (Bogotá), México (Mexico City), Peru (Lima).

A5. SDC Geography. Latin America and Caribbean

A6. SDC Domain. GP CCE
SDC Theme: Climate Change and Environment.

A7. Partners.

- **National Partner in Chile**: Ministry of Environment.
- **National Partner in Colombia**: Ministry of Environment and Sustainable Development (MADS).
- **National Partner in México**: Secretariat for Environment in Mexico City.
- **National Partner in Peru**: Ministry of Environment (MINAM).
- **Sub-national partners**: although not mentioned in key project documents, except for México, public transport bus fleets are run by the metropolitan municipalities of Santiago, Bogotá, Mexico City and Lima, so these must be assumed to be close sub-national partners of the project..
- **International partners**: Climate and Clean Air Coalition (CCAC), Association Vert, and the Swiss Federal Office for the Environment (FOEN).
- **Contracting partner**: Swisscontact.

Part B: Purpose, relevance and approach

B1. Purpose.
CALAC.

- **Purpose**. To reduce ultrafine particles and mitigate climate change by applying diesel particulate filters (DPFs) in urban public transport buses in Santiago, and in Bogotá to test DPFs in retrofit buses.
  - **Component/Outcome 1** (a follow-up project responding to a high DPF failure rate in Santiago's bus fleet): Black carbon emission reductions and benefits of Santiago's DPF program are fully achieved by optimized enforcement, improvement of DPF maintenance practice and further development of DPF policy.

- **Component/Outcome 2** (testing of DPFs in Bogotá's bus fleet): black carbon emissions of the integrated public transport system are significantly reduced by the application of DPF.
- **Component/Outcome 3** (City alliance for DPF): alliance with pioneering cities (Buenos Aires, Sao Paulo, Lima, Mexico City) has been strengthened to apply DPF programs measure ultrafine particles.

CALAC+.

- **Purpose**. To pursue a zero black carbon vision towards healthier and more sustainable cities, by means of fostering a shift towards soot-free urban buses and off-road machineries.
- **Overall objective**. To reduce harmful air pollutants, to protect human health and to mitigate climate change through the deployment of soot-free engines in public transport Systems and off-road machineries in Latin American cities.
- **Specific objective**. To provide decision makers with expertise to inspire and secure public commitment for future-oriented investments in the cities' transport sector.
  - **Outcome 1**. Soot-free buses: the emissions of ultrafine particles and black carbon from the public transport system are significantly and sustainably reduced. **Main actions**: providing technical and other support to improve the legal frameworks, environmental and transport regulations, investment planning and institutional capacities, to encourage and enable the establishment of soot-free technologies[59].
  - **Outcome 2**. City 'policy incubator' for new transport technologies: effective clean air policies in major cities of Latin America are designed with the support of a 'policy incubator' to support the development of smart policies for a future implementation of clean and cost-efficient technologies according to the circumstances, capacities and realities of the participating cities. **Main actions**: providing technical and other support to help cities expand their vision to reduce black carbon emissions and to facilitate (via a public competitive tender) public, private and private-public investments in the transport sector.
  - **Outcome 3**. Global knowledge management centre. **Main actions**: sharing experience of proven policies, actions and cost-effective technologies to reduce fuel consumption, air pollution, and carbon emissions from vehicles in cities. Collating experiences and sharing good practices and lessons among existing networks, and setting up a roster of experts to support Latin American, south-south and trilateral cooperation.
- **Approach**. Supports a programmatic approach in which a central theme is for CALAC+ to work with the emerging voluntary alliance of Latin American cities committed to take rapid action as vehicle for impact on two fronts: public health and climate (i.e. to develop inclusive research capacity on CCA).

CALAC+ 2.

- **Overall objective**. To reduce harmful air pollutants and GHG emissions in Latin American cities through the deployment of clean soot-free engine technologies in urban public transport and non-road mobile machinery to mitigate climate change and to protect human health.
  - **Outcome 1**. **Cleaner urban transport**: emissions of ultrafine particles, black carbon and greenhouse gases from the public transport system are significantly and sustainably reduced. **Main actions**: improve bus fleets in the four countries (according to particle number measurement standards, technical assistance for bus renewal programmes, guidelines for the management and operation of electric buses, national Euro VI standards for heavy-duty vehicles) to achieve a reduction of SLCPs (336 tonnes of black carbon) and reduce GHG emissions (7.0 million tCO_2e), while also helping the country partners to mobilise funds on the order of USD 4 billion for the purchase of cleaner bus fleets.

[59] This was also expected to contribute to the 'Diesel Initiative - soot-free urban bus fleets', a project of the Climate and Clean Air Coalition (CCAC), the leading global platform uniting UN agencies, governments, civil society and private sector, committed to improve air quality and protect the climate by reducing the short-lived climate pollutants (SLCPs), especially black carbon, methane (CH_4), HFCs and tropospheric (near-ground-level) ozone. Of these, molecule for molecule the HFCs are by far the most powerful drivers of global heating, but methane is also a powerful GHG and is produced in larger quantities directly as well as being a real global threat in the form of potentially vast emissions from warming Arctic ecosystems. By contrast, black carbon and tropospheric ozone are mainly of significance by endangering human health locally (CCAC, 2021).

- **Outcome 2**. **Policy incubator for non-road mobile machinery** (NRMM)[60], such as construction machinery): proposed policies and regulations for the reduction of emissions of ultra-fine particulate matter, black carbon and GHG from NRMM in urban areas are in place. **Main actions**: establish a set of measures (i.e. institutionalisation of inventories; regulation monitoring and enforcement of emission standards; technical guidelines for procurement; strategy for retrofitting and renewing NRMM; environmental labelling) to achieve the reduction of 40,000 tCO_2e and 108 tonnes of black carbon, while also helping the country partners to mobilise funds on the order of USD 155 million for soot-free NRMM investments (in particular the installation of DPFs).
- **Outcome 3**. **Regional and global cooperation**: proven cost-effective policies, actions and technologies are systematised and shared regionally and globally to facilitate their broader adoption. The CCAC Transport Hub will serve as one of the main channels through which the programme's experiences can be transferred to other countries and regions active in the CCAC on the sector. **Main actions**: put climate and clean air on the agenda of the Pacific Alliance, both at the political and technical level.

- **Approach**. Continuation with improvement to the cost-benefit tools (HETRANS, HEMAQ, HEBASH and CALMAC) developed in the previous phase to enhance ownership of CALAC+ by the partner countries and dissemination and training through the platforms provided by CCAC.

B2. Relevance to partners.
Partner countries. Air pollution is a major health issue in the target cities and improving urban air quality is one of the most pressing development priorities for the governments and municipalities concerned. This is based on OECD findings that the number of premature deaths per year due to outdoor pollution will triple by 2060. SDC support to Santiago and Bogotá through CALAC (2013-2015) had demonstrated the effective use of diesel particulate filters (DPFs) by the urban mass-transport bus systems Transantiago in Santiago and Transmilenio in Bogotá, including the drafting of public policies to encourage DPF installation. Thus CALAC+ offered Chile and Colombia the opportunity to scale-up proven technologies, and to explore the introduction of new technologies to improve the quality of fuel and reduce soot emissions. CALAC+ is also relevant to Lima and Mexico City, which had observed progress in Santiago and Bogotá and hoped to gain similar benefits. CALAC experience had shown that best government practice in controlling vehicle emissions starts from two fundamental and scalable factors: the definition of quality standards for fuel, and the incorporation of emission standards for new vehicles and engines. But to improve air quality over time it was also decided to add a third element to CALAC+: the definition of vehicle 'seniority' (age-related wear and tear) standards combined with government programmes that allow modification or replacement of vehicles that emit more than the defined emission standards, and for the strict verification and enforcement of such regulations.
Switzerland. CALAC and CALAC+ build on Switzerland's commitments to the CCAC, which it joined in 2013 and which are directly linked to reducing SLCP and other GHG emissions.

B3. Relevance to SDGs. (https://sdgs.un.org/goals)
- **SDG 3: Good Health and Well-Being**, especially Target 3.9 (*By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination*).
- **SDG 11: Sustainable Cities and Communities**, especially Target 11.2 (*By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons*) and Target 11.6 (*By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management*).
- **SDG 13: Climate Action**, especially Target 13a (*Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the*

[60] **Non-road mobile machinery** comprises any mobile machine, item of transportable industrial equipment, or vehicle that is not intended for carrying passengers or goods on the road and has a petrol or diesel engine. Examples include chainsaws and similar power tools, generators, bulldozers, pumps, construction machinery, industrial trucks, fork lifts and mobile cranes (CLEC, 2019).

needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible)

- **SDG 17: Partnerships for the Goals**, especially Target 17.9 (*Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation*).

B4. Relevance to other development objectives.
OECD: Environmental policy and administrative management; Biosphere protection.
UNFCCC. Reducing emissions of SLCPs not only contributes to the SDGs but can also help achieve the global climate goal to keep warming well below 2° Celsius. (CCAC, 2017).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Capacity-based mitigation (CM), but with the proviso that efforts to improve urban air quality are not necessarily directly relevant to climate change mitigation.
Adaptation: Nil.

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:
Mitigation. PRINCIPAL (2).
Adaptation: NOT (0).

Part C: Narrative overview

Background and purpose.
In Latin America diesel engines are responsible for 99% of black carbon (soot) emissions, mostly from vehicles but non-road mobile machinery (NRMM) is also an important source. Soot is a relatively unimportant SLCP but is the major constituent of ultrafine (PM 10 and especially PM 2.5) particles that are absorbed through skin and lungs and harm human health. Emissions of soot are typically worst from old and poorly-maintained diesel engines. Phasing out old power units, putting skill and effort into maintaining newer ones, setting, testing and enforcing rigorous emission standards, and installing filters to reduce residual particulate emissions are all known to be effective ways to minimise black carbon emissions which are of particular value in urban environments where people are concentrated and dilution of pollution is often limited.
Fossil fuel power units are also an important source of GHG emissions, but here there are fewer ways to cut emissions without replacing the power units themselves with electric systems. The efficiency with which fuel is converted into work can be enhanced to some extent, since GHG emissions per unit time or distance of operation can be reduced through speed limits and enhanced equipment design or maintenance. The last is a point of overlap with the aim of reducing soot emissions, since phasing out old vehicles and promoting proper maintenance will help with both, as well as with reducing the release of unburned hydrocarbons from inefficient motors. But to reduce GHG emissions beyond this requires catalytic conversion of GHGs other than CO_2 (EST, 2020), principally targeting oxides of nitrogen (NOx) - nitrogen monoxide or nitric oxide (NO) and nitrogen dioxide (NO_2). Without catalytic conversion, the GHG emission gains available from more efficient engines are limited, although the public health and well-being gains from cleaner air can be spectacular. Thus, one must ask when reviewing a 'climate and clean air' project such as CALAC from a climate change perspective, exactly what are the relative roles of the two goals in the expectations of designers, partners, potential replicators, and those responsible for the expenditure.
In any case, it is known that to achieve significant and sustained improvements in air quality, where this is compromised by dirty machine exhausts, requires an intricate combination of measures, all of them necessary, all pushing in the same direction, and none undermined by corruption (see H3.1). These include political will, capacity building, introduction of new technology and training in its use, institutional, regulatory and fiscal changes and other incentives including testing and enforcement, and public education measures. The task can be broken down into higher and lower priority parts, although each part requires all the elements, and the CALAC, CALAC+ and CALAC+ 2 series of interventions aimed and aims to support municipal administrations in delivering those parts dealing with public bus fleets and NRMM in each targeted city.

Performance.
Highlights of CALAC/CALAC+ project included the following points.

- The project induced dialogue in target cities on the costs of soot pollution to public health, raising awareness on the role of NRMM in producing soot, especially in the construction sector. It also drew attention to opportunities for knowledge exchange with other cities in the global south that faced and have overcome similar problems; in this case the less advanced city was Bogotá, and the more advanced one was Santiago.
- Diesel particulate filters (DPFs) able to capture almost all ultrafine (PM 2.5) particles were fitted to many public buses in Santiago and Bogotá, and later in Lima and Mexico City, preventing soot emissions that would otherwise have made air quality even worse that it was.
- Awareness was also raised at a public and policy level on the costs of non-road mobile machinery (NRMM) emissions and the benefits of reducing them and at least some regulatory action was taken to address the issue in all four target cities.
- More to the point from a climate change perspective, studies conducted through the project persuaded the city authorities in Santiago, Bogotá and Mexico City to begin rapid procurement of electric buses, many of which would presumably replace diesel buses in due course (rather than just adding to fleet numbers).
- Although planned alliances with other cities did not materialise on schedule, the project later facilitated regional technical dialogue on ultrafine particulate pollution with a view to replication work, but meanwhile it had been realised that no firm evidence of improvement in ambient air quality had yet been achieved and that real change would require the spread of electric and hydrogen-fuelled private cars and lorries.

Transformative potential
It was considered likely that all four participating cities would maintain a momentum of change, since CALAC+ had made a convincing case that emissions could be reduced and air quality could be improved at reasonable cost using accessible technologies that were already being taken up. But GHG emissions from each city system have multiple sources only some of which are affected by events in the public transport services and among NRMM. These are nevertheless significant factors in total emissions, and cleaning them up would be a useful contribution to system-wide mitigation efforts. The CALAC series of interventions probably accelerated the development of policies, plans, legislation and regulations to promote no-soot, low carbon public transport fleets and NRMM in the target cities. These changes probably influenced regulatory action against dirty diesel engines and public procurement in favour of electric buses. There was little sign of voluntary uptake of these specific changes outside the target cities, but the diffusion of 'how to' knowledge among public institutions and appropriate technology available from the private sector is associated with a world-wide shift towards no-soot, low carbon equipment in all cities that can afford to use it, driven by public health and to a lesser extent climate change concerns. The CALAC project series can nevertheless be assessed as having some transformative potential, but partly because air quality is such an important 'gateway topic' for green activism.
Overall scores: Design quality - 5; Effectiveness - 4; Impact - 4; Sustainability - 5; Transformative potential - moderate for mitigation.

Part D: Design quality

D1. Theory of change.
The core objective of CALAC was "to reduce ultrafine particles [specifically soot] and mitigate climate change by applying diesel [particulate] filters (DPFs) in urban public transport buses." (Grütter, 2015:4). Soot is of little relevance to climate change so the objective (and with it the title) of the project might be seen as misleading. The credit proposal for CALAC+ leads by arguing that "Air pollution is an important impediment to sustainable development in cities, and short-lived climate pollutants [SLCPs] such as black carbon represent a major trigger for climate change. Supporting increasing voluntary efforts, CALAC+ will assist clean air strategies in five Latin American cities by fostering normative and technological changes and share lessons at the global level. Capacity building will use the comparative advantage of Swiss experience and the private sector's interest to increase its stance in urban clean air issues." (SDC, 2016: 1). While the first point is inarguable, the second presents soot is belonging to a class of SLCPs that are collectively important drivers of climate change, which is true but not entirely to the point. The plan then is to rely on *voluntary* efforts to reduce pollution, but does this mean that cities will regulate their companies, or that companies will regulate themselves? The point here is that the CALAC interventions were founded on an unclear statement of the initial theory of change,

making it hard to establish a chain of causality afterwards, especially when considered from a climate change mitigation perspective. But the logic is clearer in the text of the credit proposal (Box 1), since here the emphasis is on soot rather than climate (aside from a passing reference) and on the Swiss track-record of promoting electric and other low-emission power systems (as also documented by SDC & SECO, 2014). This prefigured a later clarification of the intervention logic.

Box 1: Context of the CALAC+ initiative

"Between 2013 and 2015, GPCC had implemented the Climate and Clean Air in Latin American Cities (CALAC) Programme in Santiago de Chile and Bogotá, which had direct, verifiable incidence in their actions to reduce the black carbon from their respective Rapid Bus Transport systems. In Santiago de Chile, half of the fleet (3200 buses) is today running with Diesel Particle Filters which capture between 95% and 99% of ultrafine particles. In Bogotá, the Office for Environment reported a reduction of 25-35 tons of ultrafine particles of its transport vehicles per year, which represents a 14%-20% reduction of the city's annual total soot output. These remarkable results have generated major interest in a number of other Latin American cities such Lima, Mexico City and Quito - and have attracted major attention at the global level. To remediate precarious clean air situations and climate risks, the authorities of many Latin American metropolis and major cities are demanding further technical assistance in order to step up their efforts for designing, adopting and applying strategies for improved access to more integral, sustainable low-carbon and soot-free urban public transport systems, which also includes a more suitable planning of public investments.

"Since the early 1990s, Switzerland has been among the leading countries in the reduction of combustion generated ultrafine particle emissions - essentially by retrofitting existing mobile and stationary emission sources. In addition, Switzerland has promoted public over private transport, and has vast experience in fostering the use of clean forms of transportation and fuel technologies including gaseous, hybrid and electric vehicles. Since 2013, Switzerland has been engaged in the Climate and Clean Air Coalition (CCAC) comprising 50 country partners, 16 [INGO] and 45 NGO partners committed to conduct an effective global campaign to spread solutions to the problem of short-lived climate pollutants (SLCP). Within the coalition, Switzerland is strongly engaged in the Heavy-Duty Diesel Vehicles and Engines Initiative of CCAC (HDDI), which brings together national and local governments, NGOs and industry to reduce black carbon emissions from heavy-duty vehicles and engines."

Source: SDC (2016: 2).

On this basis, the theory of change is that the project would encourage and enable city administrations to consider evidence that ultrafine particles from city buses and NRMM power unit exhausts are a major source of dangerous air pollution that could be filtered into harmlessness affordably and with available technology and/or in the case of buses replaced by electric systems. These changes would have major public health benefits and at least some co-benefits in the form of reduced GHG emissions in line with the countries' NDCs. Once persuaded of the merits of the approach, those administrations would be supported in formulating appropriate policies and regulations to promote a system-wide transition towards a cleaner environment, while the project would also facilitate knowledge exchange among the target cities and beyond, as a way to encourage the spread of similar ideas and approaches.

D2. Assumptions underlying the theory of change.

Assumption 1. That a sufficiently favourable cost-benefit ratio can be demonstrated for DPF installation in public buses and NRMM power units that city administrations will wish to adopt appropriate procurement and emission regulation policies in the target cities, and will not be prevented from doing so by factors beyond the project's control.

Assumption 2. That enough DPFs can be installed and/or enough diesel power units replaced by electric ones to have an appreciable effect on air quality in the target cities, or the reasonable expectation of such an improvement in the near future.

Assumption 3. That the quantitative co-benefits in GHG emission reductions from cleaner power units and especially from electric buses would make a significant contribution to meeting NDC mitigation commitments or global mitigation goals.

Assumption 4. That 'how to' knowledge on the policies and regulations needed for a clean air transition, and awareness of the technologies available to achieve it, will be shared and influential in other city administrations, resulting in further uptake and replication.

D3. Plausibility of assumptions and links.
Assumption 1 is plausible based on Swiss experience reported in SDC & SECO (2014) and from CALAC itself (and many other locations and circumstances worldwide).
Assumption 2 is weak since it is unclear that the role of soot emissions from public buses and NRMM relative to other sources had been established quantitatively (and was anyway not likely to be a dominant factor in determining ambient air quality in urban settings).
Assumption 3 is plausible in principle, and the GHG emission potential was calculated later to be on the close order of several $MtCO_2e$ although the models themselves are questionable as they do not clearly account for the emission costs of manufacture or power generation, or the extent of diesel substitution.
Assumption 4 is plausible in principle since any set of measures with a highly favourable cost-benefit ratio that is also in line with policy and public opinion in many places is likely to spread to wherever public resources are sufficient to apply it.

D4. General quality of the project design (Score 5).
Stakeholder consultation. The CALAC credit proposal describes the project as "based on local demand and well embedded in national and international policies and processes" (SDC, 2016: 9), while the CALAC+ credit proposal cites demand for support from the city administrations of Santiago de Chile and Bogotá, and later from those of Lima and Mexico City (SDC, 2017: 3) A degree of stakeholder consultation can therefore be assumed. The CALAC evaluation does note, however, that for Component 3 on city alliances "The exploration of interests seems a bit queer as this in fact would be a pre-condition for realizing this component. As presented the component seems to be supply or consultant driven." (Grütter, 2015: 13). The impression is one of sensible suggestions by consultants being gone along with by apex institutions, rather than of a popular call for action being articulated through the SDC proposals.
Risks. The risk analysis in SDC (2017: 21) identifies the four most serious risks in declining order of weight: (a) weak inter-institutional cooperation (to be off-set by working with "multidisciplinary and inter-institutional teams"); (b) weak capacity for policy development (to be off-set by not trying to move too fast); (c) reputational risk from a narrow focus on (potentially Swiss-sold) DPF technology rather than investment in "more integral sustainable low-carbon transport solutions" (to be off-set through cost-benefit analyses and by stressing Switzerland's broader contributions)l and (d) political resistance by interest groups affected by pollution abatement efforts (to be off-set by identifying 'winners' and 'losers' and applying locally-appropriate solutions). In addition, a political and socio-economic instability in the countries involved during the CALAC+ period manifested in riots in Santiago (2019), political protests in Bogotá (2019-2020), drug wars in México, and political crisis in Lima (2020).

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.
Effectiveness (score 4).
CALAC.

- CALAC induced dialogue in target cities on the costs of soot pollution to public health, raising awareness on the role of NRMM in producing soot, especially in the construction sector.
- CALAC drew attention to opportunities for knowledge exchange with other cities in the global south that faced and have overcome similar problems; in this case the less advanced city was Bogotá, and the more advanced one was Santiago.
- DPFs were fitted to half of the bus fleet in Santiago, and much of the fleet in Bogotá where MADS claimed that 35 tonnes of particulate emissions had been captured (SDC, 2016).
- Planned alliances with other cities did not materialise, in particular with Sao Paulo and Buenos Aires (both centres of bus manufacture), for unknown reasons.
- “The major problem encountered is that reports and know-how is too much Swiss focused. Whilst the Swiss DPF experience is valuable, other cities and countries have also significant experience with DPFs. This refers e.g. to the outcome 1 (know-how update on DPF) and outcome 4 (future policy). Lessons learned from such experiences could be helpful for a cost-effective enforcement. The issue of Euro VI introduction should also be assessed less ad-hoc and Swiss-centred and should include the elements of diesel fuel quality, bus manufacturing trends in Latin America and the cost-effectiveness of measures. In the area of maintenance

of large bus fleets Switzerland might contribute to some experience specifically concerning DPFs but has probably limited relevant experience concerning the establishment and management of a maintenance system for large bus fleets under severe operational constraints." (Grütter, 2015: 21).

CALAC+.

Based on SDC (2021a, 2021b) and Cataño *et al*. (2021) the main achievements of CALAC+ included the following.

- **Outcome 1 (soot-free and low-carbon buses)**. (a) Technology to reduce emissions was introduced to the urban bus fleets in Santiago, Bogotá, Lima and Mexico City. (b) The efficiency and life cycle of electric buses used in Santiago was evaluated, contributing to a decision to increase the electric bus fleet in Santiago from 300 to 450 buses. (c) This development encouraged Bogotá to increase its electric bus fleet from 360 to 480 electric buses, México to start the procurement of electric buses in 2020 and Lima to increase its fleet of buses applying DPFs compliant with Euro VI standards (to be running from 2021).
- **Outcome 2** (**policies for urban NRMM**): (a) Awareness was raised on the costs of NRMM emissions and the benefits of reducing them in all four target cities (aided by applying CALMAC, HEMAQ and HEBASH 'tools' for assessing emissions and their benefits). (b) Chile and Colombia enacted new regulations on NRMM. (c) In Chile, the Ministry of Public Works began installing DPF in its NRMM. (d) Both Mexico City and Lima began to incorporate NRMM into their air quality plans.
- **Outcome 3** (**global knowledge network**). Information was shared widely but there is no evidence that it had any effect anywhere.

Impact (score 4).

- Models were developed based on the changes to the bus fleets obtained or anticipated, showing expected soot and CO_2 emission savings and health benefits with good cost-effectiveness, but as of 2021 there was no evidence of changes that can be attributed to the project in ambient air quality (PM 2.5 concentrations) in the target cities or for reduced GHG emissions.
- CALAC+ supported the setting-up of a regional technical committee on nanoparticles (extremely ultrafine particles) to support knowledge exchange and informed decision-making and in particular to promote replication work in other cities (including Conception and Temuco in Chile, Medellín in Colombia, Guadalajara and Jalisco States in México, and Arequipa in Peru, and others in CCAC countries, such as Quito and Cuenca in Ecuador and La Paz in Bolivia). (c) It was concluded that to obtain real change in air quality, more would need to be done to promote the introduction of electric and hydrogen-fuelled private cars and lorries in all cities concerned.
- The end beneficiaries (34 million inhabitants of the four cities involved) are not represented in CALAC+'s organigram (via CSOs), thus potentially reducing the scope for public watchdogs to monitor how far the DPF's are being adequately maintained, prioritise cleaner buses and NRMM in air pollution hotspots, provide feedback on air quality and its impact on the most vulnerable (children, senior citizens, asthmatic society).

Sustainability (score 5).

It was considered likely that all four participating cities would maintain a momentum of change, since CALAC+ had made a convincing case that emissions could be reduced and air quality could be improved at reasonable cost using accessible technologies that were already being taken up. Further policy and regulatory changes would be encouraged through the successor project CALAC+ 2[61], to consolidate progress, and to develop common agendas between the cities involved and CCAC and other global platforms such as the BreatheLife Initiative. Meanwhile, lessons were learned by the public and experts from the clean air experienced during the 2020 Covid lockdowns and the reversal afterwards (as also noted in many other cities, but with no obvious lasting effects since it appears that city-dwellers prefer employment with dirty air to unemployment with cleaner air).

[61] Presumably including efforts to improve fuel quality, which are mentioned repeatedly in the project documentation (e.g. Grütter, 2015: 9; SDC, 2016: 4; SDC, 2017: 2; SDC, 2021: 5; Cataño et al., 2021: 25). It is worth noting, however, that Component 5 (Air Quality Management in the Kathmandu Valley) of the Danish-funded Environment Sector Programme Support in Nepal, had a similar aspiration but "research found that emissions were due more to the condition of the vehicles than to the quality of the fuel, so this effort was discontinued" (Caldecott *et al*., 2017: 350). It may be that fuel quality is therefore something of a 'red herring'.

E2. System change (moderate transformative potential).
The GHG emissions from each city system have multiple sources only some of which are affected by events in the public transport services and among NRMM. These are nevertheless significant factors in total emissions, and cleaning them up would be a useful contribution to system-wide mitigation efforts. The CALAC series of interventions probably accelerated (to an unknown extent) the development of policies, plans, legislation and regulations to promote no-soot, low carbon public transport fleets and NRMM in the target cities. These changes probably influenced regulatory action against dirty diesel engines and public procurement in favour of electric buses, which could have a real effect on net GHG emissions, depending on the emissions associated with their manufacture, disposal of obsolete equipment, and the source of the electricity used.
There was little sign of voluntary uptake of these specific changes outside the target cities, but the diffusion of 'how to' knowledge among public institutions and appropriate technology available from the private sector is associated with a world-wide shift towards no-soot, low carbon equipment in all cities that can afford to use it, driven by public health and to a lesser extent climate change concerns. More positive results might have been achieved by helping poorer cities than the capitals of Chile, Colombia, México and Peri to start their transition processes, or by taking a much more holistic approach to city planning for low-carbon development, for which there are several models in Latin America (CALAC+, 2020: 2) and elsewhere (C40 Cities *et al*., 2019), But the CALAC series can nevertheless be assessed as having moderate transformative potential, albeit partly because air quality is an important 'gateway topic' for green activism. This is because action is popular with the public, solutions are not hard to find, evidence of direct harm to public public health is easy to obtain, and key aspects of ambient air quality are easy to monitor with simple equipment. Once sensitised to environmental issues, the public and youth will often become interested and engaged with other topics such as biodiversity loss and climate change, and this can have a transformative 'greening' effect on city and national politics.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness. Not applicable.

F2. System change. Not applicable.

Part G: Other aspects of design and performance

G1. Efficiency issues.
Points on efficiency from SDC (2017, 2021) include the following:

- The start-up of Phase 1 was slow as links were built with the project's main partners in four countries, but once established coordination worked well despite changes to key focal points in Peru, México and Colombia.
- The Regional Steering Committee was able to facilitate dialogue, learning and collaboration at the policy and technical levels, and to coordinate with other donor projects.
- Expenditure in CALAC+ was almost 90% of the SDC budget and physical progress around 70% of planned outputs (excluding maintenance of DPFs).
- The level of co-funding provided was low (CHF 105,000), which is partially explained by the Covid-19 pandemic causing several events to be scrapped in favour of remote workshops and meetings covered by Helvetas/SDC funding.
- The cost-benefit analysis tools (HEMAQ and HETRANS) were presumably quite cheap to develop yet proved to have very high utility in validating investment in low-emission public transport and NRMM.

G2. Coherence issues.
The project prioritised coherence between its main partners in Chile, Colombia, México and Peru, and between CALAC+ stakeholders and the international community participating in the CCAC (in particular its 'Diesel Initiative') and with the EU-funded EUROCLIMA+ programme. It also shared lessons with the International Council on Clean Transportation, the C40 Cities Alliance, OECD, the Latin American Association for Sustainable Mobility, and BreatheLife, as well as through international platforms on fuel quality in which the partner countries participate. Cataño *et al*., (2021: 2) concluded that: "For all the countries, the actions of the program were coherent with respect to the context presented by each target city, this was because the CALAC+ Program has been adequately aligned with the guidelines established by each of the cities in terms of reducing emissions. ... The external coherence of CALAC + with respect to

other interventions presented problems of duplication of efforts in some cases but these were corrected as there was an increase in the interaction of CALAC + with the other initiatives involved in reducing emissions."

G3. Replicability issues.
Replicability at the global level was a key purpose to be advanced by sharing experience of cost-effective policies, actions and technologies that reduce fuel consumption, air pollution and carbon emissions from urban transport and NRMM in the CALAC+ countries with the CCAC's Transport Hub through which all members of the CCAC would be encouraged to adopt good practices. No dedicated communication strategy was put in place to ensure the of targeting key audiences with these messages.

G4. Partnership issues.
Partnerships are central to the CALAC interventions, within each city (because each air quality issue and solution has multiple moving parts), between cities (because of the notion that progress in one city could inspire progress in other cities), and through CCAC (because of the added communication value of an existing partnership network). Thus the credit proposal for CALAC+ 2 foresees that "globally CALAC+ will boost coordination with the CCAC Transport Hub, which presents an ideal platform to share the programme's experiences with other CCAC partners and other regions where the CCAC supports similar work, in particular in South-East Asia and Sub-Saharan Africa, linking with CCAC activities such as its Soot-Free Bus Fleets project and the Global Industry Partnership on Soot-Free Clean Bus Fleets. CALAC+ will particularly advocate for the inclusion of NRMM in the CCAC's new transport engagement strategy, given the growing interest among CCAC partners on the topic and the high potential for experience sharing. CALAC+ will also continue collaboration with the regional platform for Low Emission Development Strategies LEDS-LAC, the Latin American Association for Sustainable Mobility (ALAMOS), the WHO/PAHO and the regional electro-mobility platform (MOVE)." (SDC, 2021: 7).
On the other hand, it is not clear how active the metropolitan municipalities of the target cities have been in the key CALAC partnerships. The CALAC+ credit proposal notes that "considering the proposed intervention logic, partnerships must be reached at national government level together with sub-national and local levels" (SDC, 2016: 4), and lists potential partnerships as including the public transport systems in Santiago (Transantiago) and Bogotá (Transmilenio), and a number of municipal institutions in Mexico City (Passenger Transport Network, Mobility Secretary, Environment Secretary), Quito (Municipal Transport Company, Mobility Secretary, Environment Secretary) and Lima (municipal authorities for Traffic and Transport Management). SDC (2017: 4) states that "alongside the municipal authorities, the urban public transportation systems *Transantiago* (Santiago de Chile), *Transmilenio* (Bogotá), the *Passenger Transport Network* (Mexico City) and the *Metropolitano* (Lima) will be strategic allies." But almost all other references in these documents and in SDC (2021) are to country rather than municipal partners, perhaps because the arena for the discourse is that of bilateral, government-to-government cooperation..

G5. Connectedness issues.
- The changing climate is exposing cities close to deserts, including Santiago, Lima and Mexico City, to dust storms that further degrade air quality.
- The Covid-19 pandemic has caused and is likely to continue causing operational delays, while reducing opportunities for exchanges through which on-the-spot learning can take place.
- Key changes that the CALAC interventions sought and seek require compliance with and enforcement of regulations, but all four target countries have a history of inadequate investment in enforcement coupled with a reputation for corruption[62].
- Political and economic instability constantly risks affecting operations and performance, including strikes and protests among workers in the public transport sector.

G6. Cross-cutting themes.
Gender/social equity. There are few substantive references to gender in the credit proposals for CALAC+ (SDC, 2016, 2017), even though the four target countries have unimpressive ranks according to the Global Gender Gap Index 2020: México 34th, Colombia 59th, Bolivia 61st and

[62] In 2020, the Corruptions Perceptions Index ranked Chile 25th (down five since 2012), Perú 94th (no change since 2012), and Mexico and Bolivia both 124th (down three places since 2012) out of 180 countries (https://www.transparency.org/en/cpi/2020/index/)

Chile 70th of 156 countries (WEF, 2021). The credit proposal for CALAC+ 2 seeks to correct this by asserting that "Gender mainstreaming will be strengthened in phase 2, mainly in issues associated to the access to public transport as well the balanced participation of actors in capacity building events. In order to strengthen capacities, the participation of more women representatives in the different activities will be promoted." (SDC, 2021b: 7). It also applies the 'Checklist for scoring the SDC Gender Policy Marker in the SAP, where it reports that the project fails to meet the criteria for targeting gender because it lacks a gender analysis and any explicit gender equality objective backed by a gender-specific indicator. It observes, however, that "CALAC+ core team has a gender balance in its composition. CALAC+ 2 will pay special attention to the promotion of gender equality among the different stakeholders. The technical and communication materials developed will use a gender balanced language and will be disseminated through different dissemination networks, professional and general with the local actors of the Program. There is evidence that transport is not gender neutral, and that women move differently: they make more trips, shorter journeys and at more dispersed times during the day. CALAC+ will therefore verify that this issue is addressed under the concept of barrier-free access, so as to ensure the comfort and peace of mind of women users with adequate access." (SDC, 2021b: Annex 10).

Governance. the CALAC+ credit proposal applies the 'Checklist for scoring the SDC Governance Policy Marker in the SAP'. It reports that governance is significantly targeted on the chief grounds that governance analyses have been done and the project design amended accordingly. It adds that CALAC+ "will work in a cross-cutting manner with the authorities of the intervention countries on the issues of climate and environmental governance. This cross-cutting nature takes into consideration capacity building, ownership, technical discussion and the involvement of the private sector and academia." SDC (2021b: Annex 11)

G7. Capacity building issues.

- **Political-Institutional**. There is a strong demand for capacity building to improve the regulation of emissions from NRMM. This demand grew in response to the NRMM inventories in all four countries in CALAC+, which revealed the scale of the problem. All four countries requested continued technical assistance from SDC on regulating NRMM. In the case of reducing soot and other emissions from public transport fleets, all four countries have expressed their interest to develop capacity to meet challenges relating to poor fuel quality, removing old bus technology, and limitations in applying effective emission controls. However, it is unclear how far the project is contributing to building capacity in the transport section of the metropolitan municipalities involved in each of the four countries.
- **Economic-Productive**. New tools have built capacity to analyse cost-effectiveness and identify the benefits of moving to low-emission transport systems and NRMM, but still need support in applying them to meet NDC targets and public health goals.
- **Socio-Cultural**. The project has not, except in an *ad hoc* manner, strengthened academic research, or private sector capacity on DPFs (especially on monitoring emissions and maintenance-related topics). This has been recognised and will be addressed in Phase 2. Meanwhile, there is no evidence of building capacity at the civil society level, especially concerning the creation of watchdogs.
- **Ecological-environmental**. By building the capacity of the respective environment ministries to develop and apply new emission standards, CALAC+ has contributed to strengthening their capacity to deliver more effective climate and environmental governance across the transport sector. However, building effective reporting capacity on emission reductions and their benefits is not evident.
- **International-governmental**. The project has contributed to building relations between the four participating countries and the regional and international community through which common agendas have been set, especially in relation to CCAC's 'Diesel Initiative'. Diffusion of information and progress on establishing inventories and applying DPFs to NRMM is also likely to stimulate new networking on developing low emission NRMM through which further capacity building is likely in areas of mutual interest.

Part H: Other matters arising from the review

H1. Follow-on questions, answers and suggestions arising from interviews by national consultants.

Question 1. *CALAC+ pursues the double benefit of reducing short-lived climate pollutants by 444 tonnes of black carbon and 7.4 million tonnes of CO2eq of greenhouse gas emissions from the transport sector. However, can you clarify what timeframe this relates to?*

- **Answer**. The deadline established year 2025, when the project is scheduled to end. The goals are cumulative until 2025, and each participating country is expected to integrate this monitoring into their transportation plans. In Chile they are working on reducing emissions further through the introduction of hydrogen-powered cargo transport, (supported by German cooperation). Peru's commitment is to reduce carbon dioxide emissions by 40% to 2030, but these actions are conditional on international cooperation. However, the main challenge for CALAC+ to report on its targets is that emissions of the transport sector in each participating country are not effectively monitored, quantified and classified under similar standards. As a result, it is difficult to compare progress in each country. This could affect the ability of CALAC+ to meet its targets by 2025.
- **Suggestion**. CALAC+ should conduct a study to determine the scope for standardising emissions monitoring in the participating countries and, at the same time, identify a strategy to obtain technical support and finance to establish a network of emissions monitoring stations in selected cities as an incentive to adopt similar standards.

Question 2. *Is there any preliminary data available yet to determine how far CALAC+ has contributed to a reduction in BC and GHG emissions?*

- **Answer**. So far, the project has developed two lines of action: a) an estimate of the level of emissions of the public transport fleet in Peru; b), an inventory of non-road mobile machinery in each country. However, the data collected so far on bus fleets cannot be disclosed to the evaluation until it is made official. Meanwhile, data concerning off-road mobile machinery has only recently started compilation.
- **Suggestion.** In the interests of stimulating political and private sector interest in establishing official GHG emission data reports, it is recommended CALAC+ links its monitoring to the NDCs to show the program's contribution to meeting national emissions reduction targets.

Question 3. *Do you agree that although the reduction of emissions of BC and GHG in public transport and NRMM is important, its true impact may be compromised unless a significant reduction in emissions is also achieved and enforced in the private bus sector, which has traditionally opposed upgrading its fleets as this reduces their competitiveness against the public bus sector?*

- **Answer**. there is consensus that participating governments are not doing enough to provide incentives to the private bus sector to switch quickly to cleaner private bus services. However, in Colombia, incentives are being reviewed to promote the entry of diesel buses that are compliant with Euro-6 emission standards. In Peru, public and private bus fleets are expected to improve following the adoption of new regulations that require all buses to comply with Euro 6 standards by October 15, 2024. (Currently new and used bus imports are required to comply with Euro 4 standards). Similarly, México has established as a norm that requires all vehicles that are granted licenses to operate designated bus routes must have particle traps that comply with EURO 5 and 6 standards.
- **Suggestion.** CALAC+ should review and propose a mix of incentive packages to encourage the private sector to switch rapidly to clean bus fleets by end of 2025. This should be accompanied by a communication strategy using CALAC+ cost-benefit software to demonstrate the economic benefits over time of switching to cleaner more efficient buses equipped with Euro-6 technology. México has already identified economic incentives to support the introduction of 200 minibuses that comply with Euro-6 standards, or Euro-5 if they have EPA-07 extensions, which could be used as a case study in this regard.

Question 4. *Do you agree that despite the achievements of CALAC+ its long-term success will depend heavily on effective law enforcement and incentives to achieve low emission/zero emissions in the future and, if agreed, this will require a) training and new resources for the law enforcement authorities and b) new fiscal and financial incentives to switch to greener vehicles?*

- **Answer**. There is strong consensus that effective law enforcement is needed to secure compliance with new emission standards. In Peru, this needs to be strengthened in coordination with the Urban Transportation Authority (ATU)), in particular concerning the application of the proposed National Electromobility Plan.
- **Suggestion**. CALAC+ should seek synergies with donors such as EUROCLIMA+ to coordinate a review on how government health and transport policies can be strengthened to apply more effective law enforcement of emission levels at least in sites with high levels of air pollution and identify fiscal and financial incentives to bring down emission levels of all road and off-road vehicles.

Question 5. *SDC is supporting the introduction of DPFs in China. Why have no synergies been established between the two projects to exchange information and data on progress in its application, maintenance and monitoring of emissions?*

- **Answer.** First CALAC had different objectives concerning its support to the Santiago and Bogotá public transportation systems. which meant there was little scope for information exchange in China, which has been promoting diesel filters. Second, SDC cooperation in China was provided in the form of technical assistance through the International Council on Clean Transportation (ICCT) under the framework of the CCAC. Nonetheless, synergies with China are foreseen during CALAC+ on the development of electromobility.
- **Suggestion**. Before synergies are developed with China, CALAC+ should be aware that some of the participating countries are skeptical of synergies with China, given CALAC+ is only providing technical assistance; not funding for electric buses or EURO-6 compliant diesel filters. As a result, there is a fear China may use such synergies to promote cheaper Chinese diesel filters and electric powered buses that are not fully compliant with EPA or VERT certification. As a result, CALAC+ should first build trust before synergies are established and, second, conduct a study to determine ways of promoting preferential access to EPA and VERT compliant products sold out of Switzerland and the EU, given that access to certified parts and vehicles is crucial to reducing emissions. For this reason, CALAC+ and SDC should review the possibility of developing synergies with SECO to identify potential cooperation on providing preferential access to EURO-6 filters and electric vehicles produced in Switzerland and the EU.

Question 6. *Are there any data on how far the four participating countries have officially adopted and are applying the CALAC+ tools - CALMAQ, HETRANS, HEMAQ and HEBASH? Have any of the members of the CCAC adopted any of these tools?*

- **Answer**. The introduction of these tools has been highly popular and are being used to support and justify the implementation of public transport and off-road vehicle policies. For example, HETRANS and HEMAQ are being applied in Colombia and in Peru and CALAC+ has plans to present them to the CCAC as well as promote their expansion through the Swiss Federal Office for the Environment (FOEN), which has reviewed and given positive feedback on these tools. However, México is using modified programs for both these tools. . Meanwhile, it is too early to report on the level of take up of CALMAQ and HEBASH.
- **Suggestion.** SDC should design a communication strategy to promote the expansion of these tools in large cities within the participating countries and with other donors engaged in the promotion of clean transportation, such as EUROCLIMA+. The strategy should emphasise the cost-benefits of switching to cleaner transport systems and target this information to the needs of decision-makers at the government and metropolitan levels, providing ways improved access to such technologies can be exploited (coordinated with suggestions linked to Questions 8, 9 and 10).

Question 7. *How far have the Ministries of Environment, or equivalent, developed an effective reporting capacity on emission reductions and their benefits in the public transport and NRMM sectors?*

- **Answer**. there is evidence this capacity has been improving in recent years. For example, Peru, at the COP-26 confirmed they are developing emissions reporting to strengthen the application of maximum permitted limits, that are planned to enter into force in 2022. In addition, MINAM has established a portal (INFOAIR), that will present annual air quality evaluations for Metropolitan Lima and Callao from the end of 2022 to support reporting on the recently approved Action Plan for the Improvement of Air Quality in Lima and Callao (2021-2025). In another example, México is already publishing information on actions and achievements on air quality in the government's website every two years, although the data is reserved for scientists and research institutions linked to universities and the public sector.
- **Suggestion**. CALAC+ should discuss with national partners how each country should have access to each other's data on air quality to support analysis on lessons learned and good practices and to promote dialogue on the potential for establishing a common agenda on reporting to international bodies such as ICCT and to their own populations.

Question 8. *How far has the combination of the political crises in Chile, Colombia and Peru in 2019-2020 coupled with the COVID-19 pandemic (2020-2021) caused delays that are likely to prevent the reaching of objectives by 2023?*

- **Answer**. The countries have not changed their plans, and country goals remain intact. The pandemic has caused some delays in the design and/or implementation of some of the activities although this has been mitigated by switching to virtual meetings and trainings.

However, delays have been experienced in the procurement of EURO-6 filters due to the lack of a dedicated procurement specialist in CALAC+ to support, guide and oversee the procurement process.

- **Suggestion**. CALAC+ should employ a procurement specialist to oversee the purchase of demonstration products and provide guidance to national counterparts on how to access Swiss and EU markets for diesel filters and electric vehicles, charging systems, etc.

Question 9. *How could knowledge management be improved and why has the project not established an effective communication strategy targeting different audiences to actively engage/ speed up the transition to a low/ zero carbon public transport system and NRMM sector?*

- **Answer**. Phase 2 intends to improve communications by establishing more active international platforms through which it can engage new partners from Europe and Asia, as well as promote greater participation in the CCAC. In addition, the cost-benefit tools (HETRANS and HEMAQ) have and will continue to be promoted to communicate the benefits of switching to cleaner transport technologies that are compliant with EU standards.
- **Suggestion**. More should be done to showcase clean technologies in the transport sector, such as through TV and radio spots, using phone apps and poster campaigns and demonstration events in public places.

Question 10. *Is a consultant envisaged to identify fiscal measures and financial incentives that could be applied in each of the four participating countries to support the transition to a low carbon transport system (all vehicles)?*

- **Answer**. CALAC+ does envisage contracting specialists in this field to identify tax reforms, fiscal incentives and financing schemes to support the retrofitting and/or upgrading of public transport and off-road equipment, as well as purchase electric/hydrogen-powered vehicles. For example, Chile, México and Colombia have already requested regulatory impact analyses, and the Ministry of Environment and Sustainable Development in Colombia has requested support from CALAC+ to develop environmental labelling of vehicles.
- **Suggestion.** CALAC+ should review whether the environmental labelling of public transport and off-road vehicles could be harmonized in all participating countries, so that fleet and off-road equipment inventories can determine more easily the number of dirty vehicles that need to be upgraded or removed from service on an annual basis as well as support this through the drafting of laws and regulations that support a common environmental classification to labelling.

Question 11. *How can SDC communicate better its achievements within the CCAC to enhance the dialogue and global knowledge on CALAC+ achievements?*

- **Answer**. The results of CALAC have been presented to CCAC members. However, CALAC+ has not devised a communication strategy so far designed to enhance the participating countries showcase their results and lessons to the CCAC.
- **Suggestion**. CALAC+ should systematize and disseminate its results and good practices to the CCAC by 2023, with the aim of attracting interest and investment in its plans and achievements.

Question 12. *How effective has the coordination been with other donors working on low emission transport systems in Latin America, in particular with EUROCLIMA+ funded by the EU? How could this be improved?*

- **Answer**. Later this year, CALAC+ together with the support of SDC GIZ, MINAM, the Ministry of Transport among others present a report on air quality in Peru, in relation to black carbon levels. Similar exercises are planned in other CALAC+ partner countries. However, coordination between donors remains challenging.
- **Suggestion.** Donors' actions must be coordinated better through the national partners to avoid duplication with EUROCLIMA+ and other donors engaged the promotion of a cleaner transport systems. For this reason, all environmental ministries should ensure their departments or directorates for climate change and transport are better aligned on this matter.

H2. Missing documents.
The credit proposal for CALAC (2013).

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1 Air Quality Management in the Kathmandu Valley (source: Caldecott *et al*., 2017)

In the context of Kathmandu in the late 1990s, air quality was being degraded by a number of factors but dirty brick-kilns and dirty vehicle were identified as the key problems. Kilns could be regulated much more easily than vehicles, since they were licenced, large and immobile, and could be inspected easily and if necessary closed down. On the other hand, cleaning up the kilns while allowing continued growth of dirty vehicles would have been unsatisfactory, and Danida attempted the complex task of cleaning up the vehicle fleet by facilitating the substitution of cleaner technologies, monitoring outcomes, and supporting the necessary enforcement, training and technical upgrades. It then became feasible for government to embark on a more ambitious regulatory programme.

Multiple changes were needed at the same time, if any one of them was to work well. These included: (a) a lobbying group on behalf of electric vehicles (EVs) to influence policy; (b) training for battery technicians, mechanics and EV drivers; (c) a Clean Vehicle Promotion Fund; (d) fuel quality research; (e) technical advice on vehicle emission standards; (f) police equipment and training to enforce emission regulations; (g) an air quality monitoring system (AQMS) for the Kathmandu Valley (with multiple stations to monitor particulates, benzene, and nitrogen and sulphur oxides); (g) public information systems; (h) reporting on air quality and its health implications; (i) a permanent working group on air quality involving all five municipalities of Kathmandu Valley; and crucially (j) the use of the AQMS as a management tool to guide policy and regulatory change.

The component demonstrated that although multiple processes have to happen at once (involving battery and power-unit technology, battery charging, exchange, reuse and recycling, electricity supply and distribution, training, targeted investment incentives, institutional cooperation, etc.) electric vehicles can take off within an urban economic system, and with other things going on as well (legislation, monitoring, enforcement, awareness-raising, etc.) they can have an important role alongside an integrated AQMS that actually demonstrates improving air quality (in this case a 10% reduction in PM 10 concentration in residential areas. The principle that it can be done, and the combination of things that are needed to make it work, provide an extremely replicable model for use in other urban situations.

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Part J: Acronyms and abbreviations

ALAMOS	Latin American Association for Sustainable Mobility
ATU	Urban Transportation Authority (Peru)
BDPF	Bogotá Diesel Particulate Filter application (component 2 of CALAC)
CCAC	Climate and Clean Air Coalition
CALAC+	Climate and Clean Air project in Latin American Cities Plus
CALMAC	Emissions calculator for NRMM
CDMX	Ciudad de México
DPF	Diesel particulate filter
EU	European Union
EURO/VI	European Union emission standards for heavy vehicles/machinery
FOEN	Federal Office for Environment (Switzerland)
HEBASH	*Herramienta para evaluación de Beneficios Ambientales y en Salud Humana derivados de cambios en la calidad del aire* (Tool for the evaluation of Environmental and Human Health Benefits derived from changes in air quality - a way to assess the benefits arising from changes to air quality).
HEMAQ	*Herramienta para análisis del Impacto Económico y Ambiental de la Migración hacia Normas de Emisiones para Maquinaria Off-road* (Tool to analyze the Economic and Environmental Impact of Migration towards Emission Standards for NRMM - a way to assess the cost-effectiveness of regulatory scenarios).
HETRANS	*Herramienta para análisis del Impacto Económico y Ambiental asociada a la Migración hacia Normas de Emisiones Euro VI, Vehículos Eléctricos y Etiquetado Vehicular* (Tool for analysis of the Economic and Environmental Impact associated with the Migration towards Euro VI Emissions Standards, Electric Vehicles and Vehicle Labeling - a way to assess the cost-effectiveness of these).
HFC	Hydrofluorocarbon
IADB	Inter-American Development Bank
ICCT	International Council on Clean Transportation
LEDS	Low-emission development strategy
LTS	Long-term strategies on climate change
MADS	Ministry of Environment and Sustainable Development (Colombia)
micron	micrometre (µ), one-millionth of a metre (PM 2.5 refers to 2.5 µ diameter particles, PM to 10 µ diameter)
MINAM	Ministry of Environment (Peru)

nanometre	nm, one-billionth of a metre or one-thousandth of a micron (a nanoparticle is 1-100 nm, or up to a tenth of micron in diameter)
NRMM	Non-road mobile machinery
SEDEMA	Secretariat of Environment for Mexico City
SFU	Santiago Follow-up (component 1 of CALAC)
SLCP	Short-lived climate pollutant

Annex 13.18: Green Growth in Egypt (IGGE)

Project highlights.

7F-09748: **Inclusive Green Growth in Egypt**. An energetic engagement with influential stakeholders in business and government to promote understanding of climate and other environmental risks and small-enterprise investment opportunities in building a 'greener' (more circular, less wasteful, more efficient, cleaner) economy; tested CEDRIG utility; potential influence from Egypt being president of UNFCCC CoP 27 in 2022.

Part A: Basic data

A1. Project number & name. 7F-09748 - IGGE: Inclusive Green Growth in Egypt.

A2. Sources.
Process of PRF development: (a) a draft PRF was prepared using documents listed in the bibliography; (b) the draft PRF was discussed with knowledge holders listed in Annex 13.22; and (c) the PRF was revised in light of comments and additional documents received.

- **IGGE: Inclusive Green Growth in Egypt (Sep 2019 to Dec 2023)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2017/7F09748/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Inclusive Green Growth in Egypt (Jan 2024 to Aug 2028)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2017/7F09748/phase99?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Inclusive Green Growth in Egypt (UNIDO project number 170146, Dec 2017 to Mar 2023)**: https://open.unido.org/projects/EG/projects/170146

A3. Dates & financial data.

- Phase 1 (Sep 2019-Aug 2023), budget CHF 5,060,000 (SDC, 2019a)
- Phase 1 back-stopper (Sep 2019-Aug 2023, budget CHF 10,650 (SDC, 2019b)
- Phase 1 (rescheduled because the start was delayed to Jan 2019-Dec 2023), budget unchanged (SDC, 2019c).
- Phase 2 (planned, Jan 2024-Aug 2028), budget CHF 5,000,000 (SDC web-site).

A4. Location(s). Egypt; Luxor and Qena governorates, Upper Egypt (UNIDO, 2019)

A5. SDC Geography. Africa; North Sahara; Egypt.

A6. SDC Domain. South Cooperation East & Southern Africa; South Cooperation: Middle East and North Africa (MENA) Division.

A7. Partners.

- **Implementing agency**: United Nations Industrial Development Organisation (UNIDO).
- **Lead stakeholder**: Ministry of Trade and Industry (MoTI).
- **Other collaborating stakeholders**: Ministry of Environment, Governorate authorities, Federation of Egyptian Industries, Investors and Business Associations, NGOs.

Part B: Purpose, relevance and approach

B1. Purpose.
SDC (2019). **Overall goal**: "To contribute to a Micro, Small and Medium Enterprises (MSMEs) environment that is more conducive to entrepreneurship, growth and job creation in the green economy."

- **Outcome 1**: Vulnerable communities, especially young women and men gain access to capacity building opportunities and to jobs thanks to green growth approaches for start-ups and MSMEs in five [clusters and] value chains (see H3.1).
  - **Output 1.1**: MSMEs (20% women led) in the 5 target value chains are trained to implement green growth models.
  - **Output 1.2**: Financial and non-financial services offered by Government and non-Government institutions in the 5 target value chains are upgraded in line with green growth models.
  - **Output 1.3**: Young people (aged 15-35, 50% of which are women) in the target governorates are trained to access green jobs, based on market research and MSMEs' consultations.

- **Outcome 2**: The Government of Egypt includes evidence based inclusive green growth elements in its policies and legislation, and develops incentives for them.
  - **Output 2.1** Enhance awareness of relevant stakeholders, including private sector, civil society, MoTI and MoE on the green growth model and needed legislative, regulatory and financial improvements.
  - **Output 2.2**: Strengthen capacity of MoTI and other relevant stakeholders such as MoE and affiliated institutions on how to include evidence based green growth elements in relevant Government's policies and strategies.

B2. Relevance to partners.
Egypt.

- "The proposed project is in line with Egypt's Vision 2030 [Government of Egypt, 2016], which contains the country's overarching Sustainable Development Strategy. The Strategy mentions the creation of 3 million jobs in the manufacturing sector by 'focusing on sectors where Egypt can generate jobs and increase its share of local value-added', with a [key performance indicator KPI] of reducing the unemployment rate to 5% by 2030. With respect to waste, the Strategy recognizes 'the urgent need to deal with solid wastes in terms of resources management rather than wastes management. Wastes constitute an essential resource for reuse and recycling operations in addition to their role in providing new job opportunities in what is known as green jobs.' With respect to renewable energy, the Strategy includes as an objective 'maximizing utilization of domestic energy resources', with the relevant KPI being to reach 16% of solar in the fuel mix for electricity production by 2030." (UNIDO, 2019: 17-18).
- The same source highlights the relevance of promoting SMSEs in the agricultural waste and efficiency sector to the following reports and initiatives: (a) the 2014 CEDARE Green Economy Scoping Study for UNEP; (b) the 2015 UNEP National Action Plan for Sustainable Consumption and Production in Egypt; (c) a GoE economic reform plan backed by the World Bank, the International Monetary Fund and the African Development Bank; (d) a concessional loan scheme for SMEs launched in 2016 by the Central Bank of Egypt; (e) the Industry and Trade Development Strategy 2016-2020 by the Ministry of Trade and Industry; and (f) the establishment of an Agency for Development of MSMEs responsible to the Cabinet.
- Although giving more attention to adaptation (4.5 pages) than to mitigation (2.5 pages), the Egyptian NDC lists among its key National Objectives and Priorities to "create an enabling infrastructure for the development of MSMEs and provide substantial support to vocational education and training." (Government of Egypt, 2017: 4). The NDC also lists policies for sustainable development that focus on promoting renewable energy and especially energy efficiency as "the cornerstone to be targeted by policy makers to decouple demand on energy and economic growth." (page 10).

Switzerland. "The intervention is in line with the Swiss Cooperation Strategy 2017-2020, under the domain "inclusive sustainable economic growth and employment" and contributes to outcome 2.2 "Increased resilience of the economy through a more competitive private sector generating more and better jobs". It complements the SECO program with a poverty alleviation perspective and is coherent with the SONAP guidelines 2018-2021 which promote more collaboration with multilateral organisations." (SDC, 2019: 4).
General. UNIDO (2019) also stresses that the proposed project is aligned with the priorities of the United Nations Partnership Development Framework (UNPDF, 2018-2022), "as it contributes directly to inclusive growth, economic empowerment and employment (UNPDF outcome 1) as well as to resource efficiency, environmental protection and green growth (UNPDF outcome 3)".

B3. Relevance to SDGs. (https://sdgs.un.org/goals)
The Project Document (UNIDO, 2019) claims relevance to SDGs 2, 7, 8, 9, 12 and 17, while the IGGE Factsheet[63] lists SDGs 5, 8, 9, 12 and 13). The following are based on the present independent assessment.

- **SDG 1: No Poverty**, especially Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*), Target 1.b (*Create sound policy frameworks at the national, regional and international levels, based*

[63] https://open.unido.org/api/documents/24324963/download/UNIDO%20IGGE_Factsheet.pdf

on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions).

- **SDG 5: Gender Equality**, especially Target 5.5 (*Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life*), and Target 5.b (*Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women*).
- **SDG 6: Clean Water and Sanitation**, especially Target 6.3 (*By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally*), and Target 6.4 (*By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity*).
- **SDG 7: Affordable and Clean Energy**, especially Target 7.2 (*By 2030, increase substantially the share of renewable energy in the global energy mix*), Target 7.3 (*By 2030, double the global rate of improvement in energy efficiency*), Target 7.a (*By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology*).
- **SDG 8: Decent Work and Economic Growth**, especially Target 8.2 (*Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors*), Target 8.3 (*Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services*), and Target 8.10 (*Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all*).
- **SDG 9: Industry, Innovation and Infrastructure**, especially Target 9.3 (*Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets*), and Target 9.b (*Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities*).
- **SDG 12: Responsible Consumption and Production**, especially Target 12.4 (*By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment*), and Target 12.5 (*By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse*).
- **SDG 13: Climate Action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*), and Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).

B4. Relevance to other development objectives.
Phase 1: Employment & economic development; Climate change and environment; Vocational training; Business support & economic inclusion; Environmental policy (SDC web-site).
Phase 1 OECD/DAC: Commercial policy and administration; enterprise and other services (SDC CC project spread-sheet).
Phase 2: Employment & economic development; SME development; Business support & economic inclusion; Employment creation (SDC web-site).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Capacity-based mitigation (CM, "borderline and indirect").
Adaptation: Nil.

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. SIGNIFICANT (1)
- **Adaptation**. SIGNIFICANT (1)

Part C: Narrative overview

SDC (2019: 3) defines the 'green economy' in terms of commitments and achievements with the following characteristics "(i) Economic growth: a green economy achieves growth, through an efficient use of natural resources and minimization of pollution and environmental impacts. It is also an economy which ensures that natural assets continue to provide resources and environmental services on which our well-being relies. (ii) Social dimension: the social dimension is addressed by prioritising green growth opportunities in terms of their potential to generate jobs, thus allowing the benefits of these new opportunities to be shared in a socially-inclusive manner. (iii) Environmental sustainability or improvement: at the heart of the green economy is the environmental sustainability in a way that does not come at the expense of improved human well-being." The environmental issues described in H3.2 mean that "inclusive green growth is, now more than ever, the way forward for Egypt." (UNIDO, 2019: 5). Based on the latter source, and in the Egyptian context, IGG means a kind of growth that:

- **balances water demand with water supply**, giving priority to efficiency first, reuse next, and development of new sources of water last;
- **minimises the discharge of pollutants into the country's waterways**, giving priority to pollution prevention over treatment;
- **maintains the fertility and productivity of the soil**, giving priority to organic-based inputs over chemical inputs, and enhancing the efficiency of agricultural practices;
- **creates a sustainable waste management system**, giving priority to waste prevention first, reuse and recycling next (moving in the process to a circular economy), destruction next, and disposal as a last resort;
- **manages all hazardous wastes safely**, in a manner that protects human health and the environment;
- **promotes transition from non-renewable fossil fuels** to renewable sources of energy; and
- **minimises the emission of pollutants into the country's air**, giving priority to pollution prevention over treatment.

Realising synergies among sustained, inclusive and green growth requires innovating technologies, products and services, and new business models. On a micro level, enterprises that aim to bring about both green and inclusive innovations need technical, financial, human and organisational resources. On a meso level, institutions need specialized assistance to be able to provide financial and non-financial business development services (BDS) that cater for the needs of early-stage and mature enterprises in the green economy. On a macro level, policy makers and other stakeholders involved in policy design and implementation need support in improving framework conditions for private sector development in the green economy. The project will address all these levels, ultimately leading to a conducive environment for MSMEs and job creation in the green economy.

The SDC's IGGE project (7F-09748) was designed as a contribution to UNIDO with which to implement its own IGGE project (170146), equivalent to 99% of the cash budget of UNIDO's budget (or 85% of the total including in-kind costs). The project intervenes in only a few "of all innovative green business models identified by UNIDO, [to] focus on innovative business models that promote the use of untapped agricultural waste and other untapped profitable green resources." Much of the justification for the project, however, lies in the expectation of less tangible leadership, leverage and multiplier effects on entrepreneurship, awareness-raising and capacity building in promoting the green economy in general terms.

The project has started well and was assessed as having good **design quality**, **effectiveness**, **impact** and **sustainability** (score 5 in all cases). It was thought likely to have a small but influential and replicable influence in favour of reducing system-level GHG emissions and raising awareness of climate change impacts, risks and risk-reduction opportunities, and therefore to have moderate **transformative potential** for both mitigation and adaptation. These impacts and influences may well magnify over time and synergise with other initiatives to result in significant net emission reductions and a more resilient society in future.

Part D: Design quality
D1. Theory of change. The Theory of Change as stated by UNIDO (2019: 20) is that: "By supporting MSMEs directly and indirectly to improve productivity, innovation and growth, by enhancing the employability of young women and men in targeted sectors, and by mainstreaming green growth approaches into government policies and strategies, more MSMEs will be created in the green economy and existing MSMEs in the green economy will grow. In turn, these MSMEs will create new jobs and will hire adequately educated people. All this assumes that the MSMEs are cooperative and responsive to innovative support schemes, that young women and men are interested in the jobs offered, and that the Government effectively supports the process, including by advancing its Vision 2030, and mobilizes adequate resources." The end of project vision statements (pages 20-21) make clear that the current project is a pilot activity and that at least one follow-up project or phase is required to consolidate progress and allow replication. The SDC web-site for this project number also describes a planned Phase 2.
D2. Assumptions underlying the theory of change. **Assumption 1**. That business successes using agricultural wastes as raw materials can be facilitated with project support, and can be made to yield environmental (e.g. GHG emissions) and social (e.g. gender equity) co-benefits . **Assumption 2**. That by demonstrating business successes using agricultural wastes as raw materials, the idea of circularity will spread and validate further mainstreaming of the approach by government. **Assumption 3**. That multiplying business successes and mainstreaming efforts will create a virtuous cycle that will accelerate the uptake of green economy principles and practices throughout Egypt.
D3. Plausibility of assumptions and links. **Assumption 1 is plausible**, considering that there are agricultural wastes with potential to be used in ways that have commercial potential in Egypt, and that project resources and conditions can be used to leverage environmental and social co-benefits. **Assumption 2 is plausible**, the more so as there are also other initiatives in Egypt that offer synergy and added influence, such as a USD 360 million Inclusive Growth for Sustainable Recovery loan programme (World Bank, 2021). **Assumption 3 is plausible**, since promoting innovation and small business enterprise to make better and more profitable use of wastes while reducing environmental impacts and enhancing employment is a good way to help accommodate a growing population[64], and is likely to become an important feature of Egypt's economy.
D4. General quality of the project design. **Stakeholders & consultation**. UNIDO (2019) describes formulation activities that included dialogue with: (a) local BDS, businessmen, investors and the civil society, who demonstrated "high interest in promoting and adopting green production models and their willingness to invest in green opportunities" (page 15); (b) "local and central Government, private sector, civil society, international organizations" (page 33); and (c) potential public and private donors (Italy, Norway, South Korea, EBRD, PepsiCo) (page 21). **Risks**. • UNIDO (2019: 51-53) identifies the following among higher risks: (a) worsening economic conditions (offset by entrepreneurship education and capacity building among local business development services); (b) worsening security conditions (offset by careful monitoring); (c) bureaucratic delays (offset by liaison efforts); (d) lack of cooperation between farmers and micro entrepreneurs (offset by trust building); (e) government policy shifts (offset by alignment with long-term strategies, careful documentation of endorsements, involving senior officials and private sector actors). • The World Bank estimated a high level of risk for its own Inclusive Growth programme: "The major risks to the operation's ability to achieve its development objective include: (a) macroeconomic challenges associated with uncertainty surrounding the recovery from the Covid-19 crisis, higher global volatility around emerging markets, high inflation, high interest

[64] Egypt's population has tripled to over 105 million since 1970 and has a yearly growth rate of 1.9% (https://www.worldometers.info/world-population/egypt-population/); controlling this is a key national objective and priority (Government of Egypt, 2017: 4).

rates, and the large public debt-to-GDP ratio; (b) challenging social conditions on the ground; (c) governance and institutional challenges that may impede the continued implementation of structural reforms; (d) the high degree of cross-sectoral coordination needed for implementation of private sector-led job creation; and (e) the potential spill-over effects of regional and geopolitical challenges. These risks, if materialized, could affect the Government's ability to implement the reforms or make development outcomes less successful." (World Bank, 2021: 6).

Overall conclusion on **design quality**: 'good' (score: 5).

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.

Main source: UNIDO (2021; see also H3.3).

Effectiveness.

Outcome 1: *Vulnerable communities, especially young women and men gain access to capacity building opportunities and to jobs thanks to green growth approaches for start-ups and MSMEs in five [clusters and] value chains*. From UNIDO (2021: 11-16)

- **A 'Value Chains and Cluster Assessment' framework was developed**, including 11 elements and 33 aspects that characterize healthy, functioning and competitive clusters and value chains (see H3.1).
- **The competitiveness of the green Value Chains and potential clusters was determined**, based on inputs from 16 market experts and the consultant and taking into account the timeframe required to impact the elements and aspects against which the clusters and Value Chains were assessed (see IGGE, 2021a, b).
- **Key weaknesses and strengths of nine Value Chains and potential clusters in Luxor and Qena were identified**, most of them constrained by weak market linkages and limited access to raw materials, suppliers and/or technologies, and most reliant on renewable and/or recyclable inputs.
- **Barriers for Luxor and Qena green start-ups' and MSME's competitiveness were recognised**, including access to finance and awareness about financial instruments, limited access to suitable supply, technology and principal firms, market data, technical know-how, specialized services, and qualified labour, as well as poor marketing, weak business linkages and networking, and gaps in policies and regulations.
- **Service gaps in green clusters and VCs were highlighted**, including limited penetration or lack of specialized financial services, lack of business linkages and networking services, maintenance services, as well as technical and business advisory services.
- **Additional Value Chains and potential clusters that could be supported by the project were identified**, including fruit and vegetable processing and packaging, and medicinal and aromatic plants and herbs.
- **Mutually reinforcing competitiveness between the assessed clusters and Value Chains was observed**, including solar energy technologies and increased recognition of the value of agriculture and industrial wastes.
- **Meta-level influencing factors were highlighted through analysis of social and cultural values**, and their impact on the target sectors, clusters and Value Chains in the Luxor and Qena Governorates.
- **The national policy, legislative and regulatory framework was analysed**, identifying a total of 51 gaps and barriers including key ones in the areas of waste management, renewable energy and sustainable agriculture and food production, allowing potential interventions to be defined and prioritised (especially in favour of waste management).
- **A rapid employment and labour market analysis (ELMA) was done**, to explore challenges and opportunities in the employment and labour market, allowing the project to define priority skills and qualifications, the capacities of education and training facilities, and entry points for new/upgraded technical skills programmes.

Outcome 2 (and strategic cross-outcome progress): *The Government of Egypt includes evidence based inclusive green growth elements in its policies and legislations, and develops incentives for them*. From UNIDO (2021: 16-19).

- **IGGE engaged with policy makers on Circular Economy concepts**. An online training on circular economy was delivered in Oct 2020 to 25 senior stakeholders, focused on biological cycles and the core elements, technicalities and policy implications of the Circular Economy approach, and follow-up trainings are being developed.

- **IGGE used the Climate, Environment, Disaster Risk Integration Guidance (CEDRIG) instrument**, to identify potential risks from climate change, environmental degradation and natural hazards, and the implications of planned interventions for GHGs emissions and the environment (Saleh *et al*., 2021).
- **IGGE conducted a context analysis and multi-stakeholder workshop**, informed by the CEDRIG process, to identify the vulnerability of the Luxor and Qena governorates to climate change challenges and disasters and environmental shocks, and to consider the implications. Key outputs included an increased understanding of key hazards and their most severe consequences for IGGE, increased awareness of other potential threats, and an appreciation of the main negative impacts that IGGE could have (e.g. on depletion and salinisation of ground water, pollution of water and air, and competition for farmland), and how to manage them.
- **IGGE applied a participatory multi-stakeholder approach to building institutional cooperation**, harnessing the effects of the Circular Economy and CEDRIG workshops (which involved a total of 176 market actors from 53 commercial, 46 governmental and four global institutions), and participation by many others in various project interventions under Outcome 1, to assess capacity building needs and plan the project's future engagements and synergies with other actors in the sustainable development space.

This is an impressive array of foundational, influential and educational activities in the mobilisation phase of IGGE. The extent of stakeholder engagement in particular implies achievement at outcome level and therefore early signs of impact and, because the impacts of educational changes are typically irreversible, a degree of sustainable influence can be assumed. The mitigation impacts foreseen in the UNIDO (2019) logframe (duplicated in SDC, 2019) include: "CO_2 and other GHG emissions prevented in Luxor and Qena governorates: baseline: 53,110 tCO_2e; target: 8,000 tCO_2e", to be validated by a 'GHG emissions data bank' and presumably coming at least partly from a target of 100,000 tonnes of agricultural waste being used differently (against a baseline of 663,878 tones), but also perhaps from "value addition in the green economy unleashed". Such a small reduction target seems well achievable in an Egyptian economy that emitted over 310 MtCO_2e in 2016[65], but multiplier effects can be expected.

Overall performance: **effectiveness** - good (score 5), **impact** - good (score 5), **sustainability** - good (score 5).

E2. System change.

UNIDO (2019: 12) argues convincingly that "the upgrading of the selected green sectors by the project will provide communities and businesses with sustainable/affordable supply of material and basic services (hygiene, energy and food production) as well as jobs thus also improving human well-being and social equity. Furthermore, the project will have a positive impact on the environment. By, for example, unleashing the potential of renewable energy and the conversion of waste to feedstock for innovative businesses, the project will contribute to increasing the efficiency of the country's natural resources utilization while reducing health and climatic hazards resulting from unsafe disposal of waste and emissions of green-house gases and particulate matter. In turn, this would contribute to a relative decoupling of the country's natural resource use and environmental impacts from the growth process." It can be added that the subject areas of educational impact organised by IGGE are central to the general process of building a 'greener' (more circular, less wasteful, more efficient, cleaner) economy in Egypt. Moreover the participants targeted by IGGE are specifically chosen from among market influencers in the realms of business and government administration. This combination of factors leads to the assessment that the whole process must have at least a moderate level of transformative potential for mitigation.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness. The activities summarised under Output 2 in E1 are as relevant to building capacity for adaptation as they are for mitigation. These specifically include those concerning the promotion of Circular Economy concepts, the use of CEDRIG to identify climate risks and adaptation options, and the exploration with stakeholders of the implications of findings guided by using CEDRIG. The impression, however, is that during the mobilisation phase the emphasis was on identifying viable MSMEs and finding ways to kick-start them, so strictly

[65] https://ourworldindata.org/greenhouse-gas-emissions

speaking effectiveness and impact would be lower (score 4) when viewed through an adaptation lens than for mitigation, although sustainability would be the same (score 5).

F2. System change. See E2. Despite an operational focus on mitigation, there is parallel attention in project activities to awareness raising, avoiding and managing the effects of climate change, thus contributing to greater resilience at system level. For the same reasons of influence noted in E2, it is therefore concluded that the whole process must have at least a moderate level of transformative potential for adaptation.

Part G: Other aspects of design and performance

G1. Efficiency issues. As of 31 Dec 2021, 31% of the budget had been spent against 76% of the timeline (https://open.unido.org/projects/EG/projects/170146). The establishment of a field office in Luxor governorate was delayed by Covid (UNIDO, 2021: 21). [Another effect of the Covid-19 pandemic was that it "magnified the pre-existing weaknesses in Egypt's agri-food sector" (UNIDO, 2021: 10)].

G2. Coherence issues. "Coordination and synergies with SECO projects (IFC MSME TA Facility, MCICP, Women in Finance, NSWMP) and with other development partners such [as] GIZ, World Bank, USAID, and EU." (SDC, 2019: 2).

G3. Replicability issues. The concepts and approaches to be piloted are replicable within Egypt and beyond.

G4. Partnership issues. The mobilisation phase involved "intensive engagement of and co-creation efforts with the project's 176 partners and stakeholders representing 46 governmental and intermediary institutions, 53 firms and 4 global actors" (UNIDO, 2021: 5). "The IGGE project is adopting a multi-stakeholder collaborative approach to ensure early buy-in and ownership from the project's partners and stakeholders and high responsiveness of the planned interventions to their needs. The main Government counterpart is the Ministry of Trade and Industry (MoTI). Additional key government partners are the Industrial Modernization Centre (IMC), the Micro, Small and Medium Enterprises Development Agency (MSMEDA), the Ministry of Environment (MoE) and the Luxor and Qena Governorates. The collaboration with the key government partners is two-fold: (a) At the strategic level, to ensure full alignment with the government vision, plans and strategies, and the engagement of the key government partners in the development of evidence-based policy measures. (b) At the technical level, to jointly address the internal and external barriers for green MSMEs through leveraging existing technical advisory and training services offered by the key Government partners, expand their scope to increase inclusion of enterprises and industries from Upper Egypt, and tailor them to the needs of the target green sectors, clusters and VCs. ... In addition to this, IGGE project is collaborating with additional stakeholders (national and sub-national government entities, academia and research institutions, banking institutions, business development service providers - BDS, industry representative bodies, NGOs, MSMEs, principal firms and global actors)" (UNDO, 2021: 9-10).

G5. Connectedness issues.
Export issues. "The exchange rate adjustment in 2016 helped improve the trade deficit, but export competitiveness remains weak and exports are well below those of comparator countries. The number and sectorial variety of exporting firms is critically low (only 9 percent of manufacturing firms export directly) with wide spatial disparities in the firms' engaged in exporting. There are a range of factors affecting the performance of the private sector, like trade barriers due to policy and facilitation weaknesses, and commercial justice limitations that increase investment risks and uncertainty, but a particular challenge concerns the large role played by state-owned and state-connected enterprises in the economy." (World Bank, 2021).
Dam issues. There is a potential strategic conflict of interest between Egypt (and Sudan) and Ethiopia over the upstream damming of the Nile river, which may compromise water flow (and water quality, timing, sediment loads, etc.) into and through Egypt. For example: "Recently, the tensions among Egypt, Sudan, and Ethiopia over the Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile have escalated, particularly after Ethiopia announced that it had started filling the GERD's reservoir, an action contrary to Egypt's mandate that the dam not be filled without a legally binding agreement over the equitable allocation of the Nile's waters. Egypt has also escalated its call to the international community to get involved. Already, the United States has threatened to withhold development aid to Ethiopia if the conflict is not resolved and an agreement reached." (Mbaku, 2020). On the other hand, Wheeler *et al*., (2020) concluded

that water users in Egypt need not experience difficulties from either the High Aswan Dam (in Egypt) or the GERD, but that the "management of multi-year droughts will require careful coordination if risks of harmful impacts are to be minimized." Since this is no small requirement, it shows the need for effective international water diplomacy in a region where peaceful solutions can be hard to find.

G6. Cross-cutting themes.
Gender. "According to the Global Gender Gap Index 2016, Egypt ranks 132nd out of 144 countries, specifically it ranks 132nd in economic participation and opportunity, 138th in labour force participation, and 112th in education attainment. To address the limited participation of women in productive activities, gender mainstreaming will be applied throughout the whole intervention. The selection of the local outreach partners (BDS or NGOs with technical expertise) will be done in a way to ensure that the partners have a track record of engaging women in their activities. Business opportunities, technologies and production sectors that favour women entrepreneurship and employment will be prioritized. ... In the reporting phase, indicators related to gender will be disaggregated to highlight project relevance and results on women. Gender results and indicators will be regularly reported in project Progress Reports and to the project Steering Committee in order to take needed measures and ensure maximum positive effect for women inclusion." (UNIDO, 2019: 22-23).
The emphasis on gender equity is similar to that in the World Bank's Inclusive Growth programme's "Pillar 3 – Fostering Women's Economic Inclusion: Removing regulatory barriers hindering female labour participation; prevent and address Gender Based Violence and enhance access to finance for women." (World Bank, 2021: 4). Here, however, some rather specific measures are listed among the key results expected: (a) "Nationwide awareness of the regulatory changes to increase female labour force participation incentives; [b] Development and Implementation of [gender-based violence standard operating procedures, GBV SOPs] to implement the code of conduct based on global best practices and including grievance redress mechanism and evaluation mechanisms for reporting violations and Development and Implementation of GBV SOPs for One Stop Centres including clear referral path based on global best practices and including grievance redress mechanisms; and [c] an Increase in the number of women benefiting from available [non-bank financial institution, NBFI] financing from 2.07 million to 2.2 million and Increase in the amount of loans available for women from EGP 11.8 billion to 12.5 billion."

G7. Capacity building issues. Capacity building is integral to all aspects of the project.

Part H: Other matters arising from the review

H1. Follow-on questions. Not applicable since UNIDO (2021) was obtained.

H2. Missing documents. Not applicable since UNIDO (2021) was obtained.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: The five target green clusters and value chains (from UNIDO, 2019: 15-17).
"**Sugarcane (more efficient use of wastes)**. Sugarcane produce is collected and sold for processing to sugar factories in Luxor and Qena. Residues from the agricultural production (sugarcane straw), which account for the biggest amount of agricultural wastes generated in the two governorates as described earlier, can be converted into animal feed (some sporadic activities already exist), or, at higher levels of value addition, into cellulose used as input for packing material for food and starch industry, into glucose used as input for food and pharmaceutical industries. Various activities revolve around the sugar factories in Luxor and Qena. These include traders in various types of waste , which serves multiple sectors, such as agriculture (filter mud), as well as industries (ethyl alcohol, yeast). Moreover, sugarcane bagasse can be re-used in several ways. It is burned on-site as alternative fuel in the same factories, but could also be sold to other energy-intensive factories, such as cement factories, to satisfy their energy needs. Sugarcane bagasse is also used as inputs for pulp and paper production, but could also be used for medium-density fibreboard production for furniture making. The factory of Armant (Luxor) alone generates around 62,000 tons of unused bagasse annually."
"**Tomato (reduced waste and more efficient processing)**: a major crop in Luxor, mostly transported out of the governorate for food processing in the Delta for paste, sauce, and ketchup production. Locally few activities focus on drying for export and paste production. Large amount

of the crop loses value in the harvest season and is left in the field along with large losses in transportation (reaching 35%). This represents an opportunity as tomato waste and leftovers could be used for animal feed supplements, as feedstock for juice production, and converted into special biochemicals for food and pharmaceutical industries.
"**[Date-palm] (diversified uses)**: palm trees and dates account for a major part of agriculture activity in the target governorates with several horizontal and vertical activities that have developed value chains. The former include turning palm tree waste to packing boxes for fruits and vegetables, palm tree grooming, treatment and the production of animal feed from palm tree waste. The latter include collection, date drying, syrup making and trade/marketing. Moreover, date palm residues could be used for production of accessories, and wood panels. Palm tree fronds could be sourced to produce biomass pellets that can used as alternative fuel for energy-intensive industries. Date seeds oil could be used as feedstock for cosmetics, and fibres for food and pharmaceutical industries. Finally, second grade dates could be used for fructose production, as well as syrup and dips.
"**Animal manure (biogas and biofertiliser)**: chicken litter and cattle manure can be converted, through biogas digesters, into biogas for agriculture, homes, poultry and livestock farms as a replacement for butane tanks. In addition to providing households and farms with a sustainable source of energy, animal manure, mixed with crop waste, can be converted, through both aerobic and anaerobic digestion, into affordable bio-fertilizers.
"**Solar PV and solar thermal energy (reduced costs, increased competitiveness)**: this project will focus on smaller-scale applications in agriculture, which can increase the sector's competitiveness and resilience by providing farmers with a sustainable source of energy. Solar PV applications include: PV-powered pumping for desert irrigation, PV-powered lighting and ventilation systems. Solar thermal energy can also be used in drying of locally produced fruits and vegetables, which are in-demand products locally and regionally, as well as thermal applications in animal agriculture.

H3.2: Major environmental issues facing Egypt (from UNIDO, 2019: 4-5).
"The environmental issues that are currently facing Egypt all stem for the most part from pressures created by the **rapid increase in population** which the country has witnessed over the last seventy years. In 1950, Egypt's population was about 22 million. Today, it is almost 100 million. Continued rapid growth is expected; at 2%/year, Egypt has one of the highest population growth rates in the region. This population growth is taking place in a country which has little land to support it. 99% of the population lives in 3.5% of the country: the Nile valley and Delta.
"**Water is the environmental sector where this population pressure is most obvious**. The country's renewable supply of primary fresh water stands at nearly 57 billion m3/year, 97% of which is provided by the Nile, the rest by rainfall and desalination. In recent years, the country has also been extracting about 4 billion m3/year of fossil groundwater from a non-renewable deep aquifer which it shares with Libya, Chad and Sudan: groundwater levels in this aquifer are already facing drops of 70-80 metres. On the demand side, the increases in population, together with changes in usage patterns, especially in urban areas, with growth in industry, and more intensive agriculture, have seen the demand for water soar. By 2017 it was estimated to be 87.9 billion m3/year. Agriculture is the biggest user of water, at 86%, with municipalities using 11.5% and industry another 2.5%. Current growth trends will all tend to drive demand ever higher. The gap between demand and primary supply is mostly being filled through reuse of the country's water: water in the agricultural drainage systems, groundwater which is actually river water or drainage water that has percolated down into shallow aquifers, treated municipal wastewater. Nevertheless, these ever increasing pressures have turned Egypt into a water-scarce country. If current trends continue, together with potentially reduced river's flow due to climate change, the country will be close to entering a phase of absolute water poverty by 2025.
"**The growing scarcity of water is made even more critical by growing water pollution**, making the reuse of water difficult, even dangerous, unless pre-treated. Agriculture is contributing high levels of contamination with agricultural chemicals, especially nitrogen-based fertilizers, driven by excessive use of these chemicals, as well as to high levels of salinity because of poor irrigation practices. As for municipal wastewaters, while 90% of urban wastewaters are collected, only a little more than half are treated; only some 10% of rural wastewater are even collected. The same holds for industrial wastewaters, some 70% of which are not treated. Both municipal and industrial wastewaters, treated and untreated, are mostly discharged into the agricultural drainage system, with the risk of biological and chemical contamination of waters potentially reusable in agriculture. Water contamination is worst in drainage canals. Pathogenic microorganisms have been ranked the highest risk in terms of

severity of effects to public health and the environment, followed by organic compounds. Pesticides and heavy metals are ranked third.

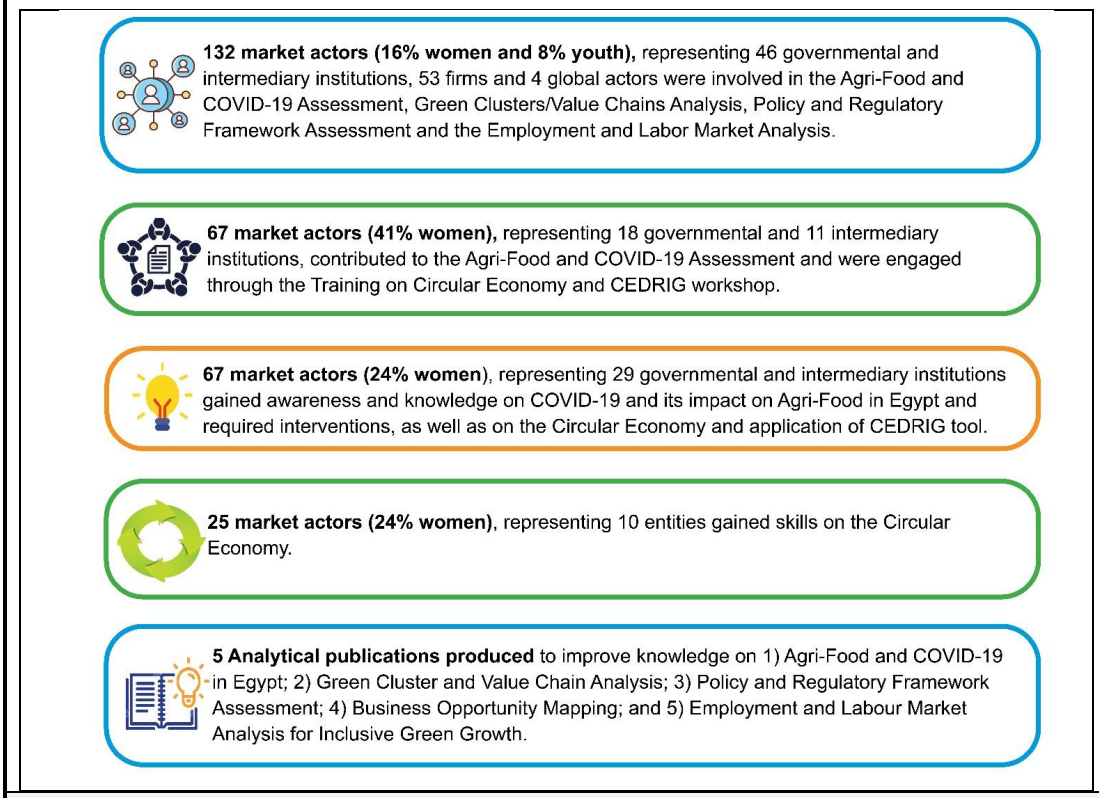
"**Egypt's rapid population growth is also putting pressure on the land**. Despite increases in agricultural output, there are continuing gaps between the demand for foodstuffs and national supply, especially with respect to staple foodstuffs such as wheat and maize (corn). For decades, successive governments have been converting marginal land into agricultural land; some 30% of the country's agricultural land has been reclaimed since the 1930s. The current government plans to continue with land reclamation, although there are a number of significant challenges with this: the costs are very high; access to sufficient water is technically challenging; the source of the water – fossil groundwater – is non-renewable. Offsetting these gains is the loss of good agricultural land to urbanization, a trend which can be expected to continue. Governments have also been increasing agricultural productivity, which explains the very high usage of fertilizers, much of the important increases in water use, but also the losses in soil fertility due to salinization and waterlogging caused by inefficient irrigation practices, improper field drainage systems and excessive groundwater extraction leading to seawater intrusion. Loss of agricultural land in the Delta region is also predicted, due to sea level rise caused by climate change.

"**The growth in solid wastes is another consequence of rapid population growth**. Agricultural waste, the biggest contributor to solid waste (34%), is covered in more detail elsewhere in this document. Focusing on municipal solid waste (MSW), it is estimated that generation has increased by more than 36% since 2000. Not only has the quantity of waste been growing, its make-up has been changing as a reflection of changing production and consumption patterns. Despite government efforts, the country's MSW management system is still quite limited. As a result, on average only about 50 to 60% of current waste is collected (with wide variations from place to place). 10-15% of this is recycled, 7% is composted, and 7% is disposed of in open dumpsites. The waste which is not collected accumulates on the streets and ends up in irrigation and drainage canals. These accumulations as well as the wastes in dumpsites are often burned, resulting in harmful air emissions. They also attract disease-bearing vectors. Hazardous wastes (medical wastes, used oil, e-wastes, etc.) are often mixed in with general municipal waste or recycled in an improper fashion. With current economic growth models, the amounts of MSW requiring management will only increase.

Ninety-six per cent of the energy which powers Egypt's economic development is derived from fossil fuels. Hydropower makes up most of the remainder, with renewables (wind and solar) making up a mere 2 - 3%. To this should be added some amount of informal primary energy production through the traditional burning of biomass, mainly in rural areas. Burning fossil fuels presents Egypt with two sets of air emissions challenges. The first is the **emissions of the greenhouse gas CO_2**. While Egypt's CO_2 emissions are not large compared to other countries, these emissions dominate the country's ecological footprint, which is unsustainable given that it is nearly 4 times larger than the country's biocapacity. Reliance on fossil fuels is also seen as a huge missed opportunity to use the country's large reserves of renewable energy, especially solar, wind, and biomass.

Burning fossil fuels also generates emissions of traditional air pollutants, in particular particulate matter. The Nile valley and Delta regions have traditionally suffered from desert dust, but the burning by industry and vehicles of fossil fuels has added to this particulate burden, especially small-sized particulates (PM 10 and PM 2.5); these can be inhaled much more deeply into the lungs and thus cause greater harm. The burning of wastes and traditional biomass (the main cause of indoor air pollution) add to the particulate burden. Burning fossil fuels also emits NOx and SO_2. To these major air pollutants can be added source- and process-specific air pollutants: volatile organic compounds (VOCs) from processes and products using volatile organics such as solvents, heavy metals from processing metal ores or manufacturing metal-containing products, and so on. As a result of this air pollution, the Greater Cairo region in particular has very bad air quality: in 2013, its annual mean PM10 levels were nearly 9 times, and its annual mean PM 2.5 levels 7.5 times, higher than the WHO's relevant Air Quality Guidelines.

H3.3: The main results of the mobilisation phase (from UNIDO, 2021: Figure 2, page 5).



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Part J: Acronyms and abbreviations

BDS	Business development services
CEDARE	Centre for Environment and Development for the Arab Region and Europe
DPF	Development Policy Financing
EBRD	European Bank for Reconstruction and Development
ECA	Egyptian Customs Authority
FRA	Financial Regulatory Authority
GBV	Gender-based violence
KPI	Key performance indicator
MoE	Ministry of Environment
MoF	Ministry of Finance
MoIC	Ministry of International Cooperation
MoJ	Ministry of Justice
MoM	Ministry of Manpower
MoPBS	Ministry of Public Business Sector
MoPED	Ministry of Planning and Economic Development
MoT	Ministry of Transport
MoTI	Ministry of Trade and Industry
MSME	Medium, Small and Micro Enterprise
MSW	Municipal solid waste
NCW	National Council for Women
NO_x	Nitrogen oxides (N_2O, NO, NO_2)
PM	Particulate matter (PM 10 having diameters up to 10 microns; PM 2.5 having diameters up to 2.5 microns).
SOP	Standard operating procedures
SO_2	Sulphur dioxide
UNIDO	United Nations Industrial Development Organisation
UNPDF	United Nations Partnership Development Framework

Annex 13.19: A 'gold standard' water regime for Kosovo

Project highlights.

7F-09849: **Integrated Water Resources Management in Kosovo (IWRM-K)**. Building capacity among all relevant institutions through engagement with leadership, planning, technical innovation, legislation, training and public participation to implement the 'gold standard' EU Water Framework Directive by paying holistic and effective attention to surface and sub-surface water systems throughout Kosovo.

Part A: Basic data

A1. Project number & name. 7F-09849 - Integrated Water Resources Management in Kosovo (IWRM-K).

A2. Sources.
Process of PRF development: (a) a draft PRF was prepared using documents listed in the bibliography and with input by SDC interviewees listed in Annex 13.22; (b) the draft PRF was reviewed by the national consultant **Lidija Fajdiga**, who conducted other interviews listed in Annex 13.22; and (c) the PRF was revised in light of field findings.

- **Integrated Water Resource Management in Kosovo (2018-2024)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2018/7F09849/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html
- **Support to Integrated Water Resource Management in Kosovo (planned for 2024-2031)**:
- www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2018/7F09849/phase99?oldPagePath=/content/deza/en/home/projekte/projekte.html
- https://www.youtube.com/watch?v=uAx9y2ECchw
- https://iwrm-k.com/img/manjakos/591636985135.pdf
- https://iwrm-k.com/home

A3. Dates & financial data.

- **Entry phase** (Oct 2018-Apr 2020), budget CHF 766,000 (SDC, 2020).
- **Phase 1** (May 2020-Apr 2024), budget CHF 9,180,202 (CHF 9,946,202 to date).

A4. Location(s). Kosovo, nationwide and specifically the Ibër, Morava e Binçës, and Lepenci river basins.

A5. SDC Geography. South-east Europe

A6. SDC Domain. Eastern Europe: West Balkans. [NB the 'Domain of Cooperation Strategy' is given as 'Water and Climate Change Resilience' in Skat & EAA (2021b).

A7. Partners.

- **Implementation partners**: Skat Consulting Ltd. (Switzerland, a private consulting firm specialising in water supply, sanitation and hygiene, WASH - https://skat.ch) in consortium with the Environment Agency Austria (EAA, an agency of the Austrian government that was privatised into a consulting firm in 1999 - www.umweltbundesamt.at/en/).
- **Main national partners**: Ministry of Environment, Spatial Planning and Infrastructure (MESPI); River Basin District Authority (RBDA); Kosovo Environmental Protection Agency (KEPA); Hydro-Meteorological Institute of Kosovo (HMIK); Department for Environmental Protection and Waters / Water Division (DEPW/WD); Department for Inspection of Environment, Nature, Water, Construction and Planning (DIENWCP). See: https://mmphi.rks-gov.net/en/departamentet/98/misioni-vizioni-dhe-detyrat.
- **Main international partners**: World University Service (WUS, Austria - www.wus-austria.org), Ximpulse (a consulting firm based in Bern, Switzerland - www.ximpulse.ch).

Part B: Purpose, relevance and approach

B1. Purpose (from Skat & EAA, 2019: 16).
The **overall goal** of the IWRM-K over the 12 years of its proposed three phases is to "contribute to the establishment of an integrated functional framework for the protection, sustainable use and equitable allocation of water resources, [thus] contributing to the enhanced socio-economic well-being and the health of the population, to a better status of the environment and to reduced risks of internal and transboundary water-related conflicts.". The **Phase 1 goal** is to achieve a

situation in which “the competent authorities in Kosovo advance an institutional response suitable to the requirements of an Integrated Water Resources Management [IWRM] system that is feasible in financial, economic, and human resources terms.” This is to be done through **three outcomes**:

- **Planning for equity and quality**. The population and environment of Kosovo and its downstream neighbouring countries set the framework for long-term equitable allocation of freshwater resources of good quality (by establishing integrated water resources planning frameworks at river-basin scale, and by prototyping innovative water resources management [WRM] approaches).
- **Regulation and capacity building**. Capacitated authorities at central and local level engage in protecting and managing water resources in an informed and inclusive manner (by improving the regulatory environment and institutional capacity for IWRM, by putting country-wide water monitoring and information systems into effect, and by enhancing relevant knowledge and skills among water professionals).
- **Public involvement and education**. Citizens and civil society organizations actively engage in a dialogue on water-related issues and make a more conscientious use of water resources (by introducing stakeholder participation mechanisms in WRM, and by enhancing public awareness and stakeholder mobilisation on water-related issues).

B2. Relevance to partners.

Kosovo. Although Kosovo has yet to produce an NDC submission as such, it developed a number of relevant documents in the 2014-2018 period (including Rep. of Kosovo, 2014, 2015, 2016, 2018) which, as the following notes make clear, indicate that reforms leading to IWRM are central to the national interest.

- “Examples of adaptation measures include using scarce water resources more efficiently, adapting building codes to future climate conditions and extreme weather events, building flood defences and raising the levels of dykes, developing drought-tolerant crops, choosing tree species and forestry practices less vulnerable to storms and fires, and setting aside land corridors to help species migrate. While climate change represents a huge challenge, it also represents an opportunity for innovation in the management of water resources and sustainable development of a modern economy, especially by means of new growth (e.g. wind and solar energy, development of green infrastructure, (sustainable) production of biofuels, thermal combustion, wastewater recycling, and technologies for carbon-neutral housing, carbon-neutral transportation and industries, etcetera).” (Rep. of Kosovo, 2014: 10).
- “The medium term aim of Kosovo is the integration into the European Union. Therefore, there is a need for creating an adequate legal and institutional framework. According to the ‘National Programme for Implementation of Stabilization and Association Agreement’ (NPISAA, March 2016) a wide range of relevant nature legislation has already been transposed during the last years, amongst others, the Habitats and Birds Directives, Zoo Directive, CITES Regulations, Leg hold Traps Regulation, FLEGT licensing scheme for imports of timber, to name a few. The remaining provisions will be gradually transposed, in line with the progress of Kosovo towards membership in the EU.” (Rep. of Kosovo, 2016: 14). A comparable process of transposition in the water sector is detailed in Rep. of Kosovo, 2015: 63-66).
- “Kosovo has insufficient reserves of water, which in the future will be a limiting factor for economic development. It is estimated that Kosovo has only 1600 m3 water/ year / per capita, while the requests for water are increasing more and more. This is directly linked with the demographic increase, life conditions, industrial capacity and agriculture needs. Furthermore, economical development and the increase of living standards increase additionally higher requests for water. In this aspect is very important that the water has to be used in an efficient manner, measures have to be undertaken in this aspect. This remains a key issue for social and economical development of the country as well as for biodiversity.” (Rep. of Kosovo, 2016: 42).
- “Kosovo has relatively small and limited amounts of fresh water resources. Fresh water resource shortages are most likely to occur in near future dry years if appropriate adaptive actions are not implemented right now. Furthermore, available water resources are unevenly distributed throughout the territory, divided into four river basins: Drini i Bardhë, Ibër, Morava e Binçës and Lepenci. ... River water quality in Kosovo is poor owing to the lack of wastewater treatment plants, disposal of wastes along or near the river banks, poor or no maintenance of river beds. Usually the quality of rivers upstream represents a healthy

aquatic habitat and meets the environmental standards. Some of the main rivers downstream of larger municipalities and industries are heavily polluted that the water cannot be used for water supply or for irrigation purposes. The main rivers in Kosovo belong to the pollution category 2 and 3, while the Sitnica River is categorised as 'dead river'. ... Pressure on the already limited natural water resources is being enhanced by human activities, which are contributing to the depletion and deterioration of resources through increases in water demand in all sectors and pollution along the water courses." (Rep. of Kosovo, 2018: 38-39).

Switzerland.

- "Switzerland has for many years played a crucial role in improving water management and water services in Kosovo. This has positioned [it] in a way to be able to make a major contribution to the reform agenda, including through ensuring higher-level political commitments." (Skat & EAA, 2019: 22).
- Past Swiss cooperation focused on rural and urban water supply and wastewater management, with "very visible and tangible results, in particular regarding water supply where coverage with sustainably managed water supply systems is now approaching 90%. ... Equally important was the Swiss cooperation's political commitment to the water sector, through its engagement as lead donor[66], strong engagement in policy dialogue and funding of the Inter-Ministerial Water Council (IMWC)." (Skat & EAA, 2019: 9).
- "With this new intervention, SDC is shifting its focus of support from water supply to water resource management." (SDC, 2020: baseline for first phase).
- "Under its domain 3 of 'Water and Climate Change Resilience', Swiss cooperation is strongly supporting the introduction of urban wastewater treatment (SECO) and starting its support to water resources management. ... The IWRM-K is in line with the Swiss cooperation strategy for Kosovo (2017-2020) with its overall goal to contribute to the progress of Kosovo on its path towards regional and European integration, fostering a democratic political system, a peaceful and cohesive society providing inclusive access to essential services, the rule of law and a social market economy. ... The IWRM-K falls under domain 3 and its objective that 'the public utilities with their state oversight institutions provide high quality of water and sanitation services and improved governance of water and energy resources, thereby contributing to better living conditions of the population, higher resilience to climate change and an improved state of the environment.' The Program furthermore will contribute to the achievement of SDG 6 and it is in line with the strategic framework of SDC Global Program Water 2017-2020 regarding water governance, water solutions, and young people and gender equality." (Skat & EAA, 2019: 9).

General.

- "All rivers are classified as being polluted and having unacceptable levels of biological oxygen demand as well as lack of dissolved oxygen due to the lack of operating wastewater treatment systems. ... Management of nutrients from agriculture in the Danube watershed is largely uncontrolled and unregulated. ... It is estimated that, from livestock alone, about 19,000 tons of nitrogen are produced each year, much of it leaching into soil and local water bodies. ... If concentrations in the Iber River near Mitrovica are taken as an indicator, total annual pollution levels are more in the order of 400 tons of zinc, 100 tons of lead, and 10 tons of cadmium." (World Bank, 2013: 30, 32, 34).
- "Since 2004, 80 percent of Kosovo municipalities have suffered from water shortages due to hydrological drought and the misuse of water resources, ecosystem degradation and reduction of ecosystem services, increase and new forms of pollution and water-related diseases. ... All major river basins are recognized and reported as moderately or heavily polluted. Water use and pollution are expected to grow with economic development." (World Bank, 2018: 31-32).
- The deterioration of Kosovo's aquatic environments, catchments and floodplains was only partly addressed by projects supported by SDC (on rural water supply and sanitation), Sweden (on groundwater in Drini i Bardhë, and an Environmental Information System), the Global Water Partnership (on Drin transboundary work), World Bank (on irrigation, canals and reservoirs), Germany (on Drin flooding), Western Balkans Investment Framework (on flood risk assessment), and by KfW/SECO and EBRD (on waste-water treatment infrastructure) (Skat & EAA, 2019: 13-15). The latter source also observed that "limited capacity to apply IWRM functions" had persisted "despite a multitude of donor-funded

[66] Sweden was also engaged in water and environment management actions during this period (e.g. MESP & IMWC, 2015).

projects that have aimed to improve these capacities, and the large number of specialized trainings delivered in the country and abroad (p. 10).

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 6: Clean Water and Sanitation**, especially Target 6.1 (*By 2030, achieve universal and equitable access to safe and affordable drinking water for all*), Target 6.3 (By *2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally*), and Target 6.5 (*By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate*)
- **SDG 15: Life on Land**, especially Target 15.1 (*By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements*), and Target 15.9 (*By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts*).

B4. Relevance to other development objectives.
OECD/DAC: Water resources policy and administrative management; Water and sanitation.
Biodiversity: "Water ecosystems are increasingly destroyed; the pollution from domestic and industrial sources as well as the uncontrolled sand and gravel mining in riverbed leads to the degradation of wetlands and rivers resulting in the loss of aquatic plant species and fish species. This has specifically highly negative impacts on water birds; some bird species have already been lost." (Rep. of Kosovo, 2016: 20).

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Nil.
Adaptation: Capacity-based adaptation [CA]

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. PRINCIPAL (2)
- **Adaptation**. PRINCIPAL (2)

Part C: Narrative overview

Despite efforts by multiple donors, analyses by the Government of Kosovo (GoK) and efforts to approximate laws to EU norms over at least the last decade, the water-bearing ecosystems (forested and farmland catchments, rivers, floodplains, aquifers) of Kosovo have continued to deteriorate. Causes include pollution from industrial, urban and agricultural sources and direct ecosystem damage, and the net effect is severe consequences for human health, biodiversity, economic activity and resilience to climate change. The government institutions and civil society organisations changed with opposing this process have been ineffective for multiple reasons of weak leadership, capacity, knowledge, organisation, motivation and public demand.
A leadership breakthrough occurred in 2019 with the election of an anti-corruption, pro-EU government, which was re-elected with a stronger mandate in 2021. Compliance with the EU's Water Framework Directive (WFD), the central requirement of which is that the environment must be protected to a high level, in its entirety, is therefore now the animating principle for wholesale reform of the entire water sector (see H3.1). The latter includes WASH but is much more complete in concept as it embraces all upstream and downstream water sources, users and factors that affect surface and groundwaters and their biodiversity and ecology, as well as adaptation to climate change and resilience to its effects. Integrated Water Resources Management (IWRM) is an approach to integrating and balancing the resulting conflicts of interest, and the various and benefits to different stakeholders over different spatial and time scales.
To set up an effective IWRM system in Kosovo, however, requires multiple weaknesses to be corrected simultaneously in line with an over-arching plan actively supported by government and maintained through democratic accountability, hence with political, technical, institutional and educational dimensions. This is the aim of the IWRM-K project, which is designed over 12 years to encourage and enable creation of a coherent framework for planning and managing water

resources, restructuring of incentives and improving skills among water professionals, and boosting CSO capacity to educate and mobilise the public.
The IWRM-K is near the middle of its first four-year phase, and SDC intends to support it until 2031, subject to achievement of results and fulfilment of government commitments. Besides its long-term approach, IWRM-K has a number of important features, including: (a) that it simultaneously targets all components of the national-level IWRM system (i.e. planning, monitoring, implementation, permitting and inspection, communication and stakeholder participation, and data management); (b) that it emphases local implementation and facilitation (since it is mainly implemented by a strong local facilitation team with international thematic backstopping); (c) that it promises dramatic progress in enforcing legislation; (d) that it seeks synergies with other projects and initiatives; (e) that it provides excellent learning opportunities; (f) that it combines technical with institutional capacity building; ad (g) that it benefits from important government co-funding that will also improve access to resources by partner institutions in fulfilling their roles and responsibilities. Phase 1 of IWRM-K focuses on bringing about adequate institutional capacity, stakeholder involvement and replicable/scalable examples that will enable proper future management of water resources across the country. The chart below provides a simplified representation of the hierarchy of result areas and the implementation logic behind IWRM-K.

Overall goal	A **functional IWRM framework** contributing to: • improved socio-economic wellbeing • preserved water and other natural resources • reduced risks of internal and transboundary water-related conflicts		
4-year goal	**IWRM-oriented institutional response**: financial, economic, and human resources		
Pillars	**Plans & Measures**	**Legislation, Institutions and Knowledge**	**Stakeholder participation and awareness raising**

The three 'pillars' correspond to the outcomes of IWRM-K. The **Plans & Measures** pillar includes preparing a country-level water balance study backed by economic analyses, preparing three River Basin Management Plans (RBMPs), piloting water monitoring within those RBMPs, and piloting the Competitive Grants Scheme (CGS), to target diffuse and point source pollution. The **Legislation, Institutions and Knowledge** pillar comprises all aspects of institutional capacity building (including a post-graduate study programme on IWRM and other training opportunities, and also improving the water monitoring system). And the **Stakeholder participation & awareness raising** pillar includes designing and piloting stakeholder participation mechanisms linked to the RBMPs, and strengthening the role and capacity of CSOs/NGOs (including through targeted grants).

Design quality is judged very good (score 6) and the project is showing evidence of good **effectiveness** (score 5), moderate **impact** (score 4) and very good **sustainability** (score 6). Two years into the first project of a 12-year programme is too early to draw conclusions on long-term effects, but the overall impression is that a foundation is being created that will make system change possible. Specifically, if the considerable ambitions expressed in the Programme Document are achieved, in applying the WFD across all agricultural and industrial sectors and with holistic and effective attention to surface and sub-surface water systems throughout Kosovo, then transformative change will result. This is likely to be more direct and stronger in the area of adaptation (with very high transformative potential) than for mitigation (with moderate transformative potential).

Part D: Design quality

D1. Theory of change.
Current features of WRM in Kosovo include: (a) **deteriorating water quality and availability, insufficient protection against floods and droughts, and missed economic opportunities**, due to a combination of inadequate tools and frameworks for planning, a lack of fair mechanisms for allocating water and responsibilities for managing it, and weak coordinated and capacity for WRM; (b) **weak institutional WRM capacity**, due to a scarcity of skilled water

professionals because of poor training and recruitment, and an underlying political culture characterised by persistent nepotism, corruption and lack of commitment to the core tasks of institutions; and (c) **weak public demand for better services**, due to low environmental awareness and weak capacity among environmental CSOs to articulate citizens' needs and foster their interest in environmental priorities. The whole system can be improved if all three constraints are relieved together, (a) by translating political commitment for reform into a coherent framework for planning and managing water resources, (b) by restructuring incentives and improving skills among water professionals, and (c) by boosting CSO capacity to educate and mobilise the public.

D2. Assumptions underlying the theory of change.
Assumption 1. That the political leadership of Kosovo will actively support sufficient reform of the whole WRM system to bring it into line with the WFD.
Assumption 2. That relevant authorities at national and local level will adopt the necessary changes to incentives, recruitment, training and administration if they are encouraged and enabled to do so.
Assumption 3. That relevant CSOs will respond to encouragement and additional knowledge by becoming more effective at mobilising and educating the public.

D3. Plausibility of assumptions and links.
Assumption 1 is plausible to the extent that Kosovo wishes to accede to the EU and that its leadership is willing to direct the necessary reforms. These matters are considered by Skat & EAA (2019: 21), where it is stated: (a) that "the country values highly potential membership of the EU [and] this is a major driver of reform processes"; and (b) that "the latest elections in Kosovo[67] resulted in a major government change, the first in the past 12 years [which] could bring new energy to the reform agenda ... because of strong anti-corruption campaign promises." But "some important issues and functions of IWRM are beyond the sole responsibility and control of the MESPI and would require the involvement of other sectors (e.g. agriculture, economy, finance)." (Skat & EAA (2019: 22), which adds another level of necessary action for which political leadership will be essential.
Assumption 2 is questionable, since "Many planned improvements would fundamentally depend on the ability of institutions to restructure and improve overall capacity in terms of technical knowledge, finances and more staff. In a situation of limited resources at national level, making a case for increased expenditures might be a great challenge, as decisions-makers often do not see directly the benefits of some of these needs (e.g. monitoring, water information system, permitting and inspection). This may result in a situation where SDC's support either cannot materialize, or that sustainability of the investments is facing challenges." (Skat & EAA, 2019: 22). Moreover, "both institutions and staff normally resist major organizational changes. Improving the system may require new skills (learning), additional workload, higher motivation and other incentives." (Skat & EAA, 2019: 23). And, "reforms [can be] slowed down because certain people benefit from the status quo. Some institutions' staff would not like to cooperate within and outside their institutions even in simple data exchange (which is of critical importance) because they are benefiting from that privately (e.g., through selling data)." (Skat & EAA, 2019: 23). Circumstances have slightly improved with the stabilisation of the new government, but the risk remains that political processes will undermine progress.
Assumption 3 is plausible since the Kosovo public has already shown a willingness to take to the streets to protect its interests. "Examples include recent protests against some of the country's dam development projects that had to be stopped owing to strong public opposition", and "there is a growing demand for better water resources management from the main users/clients of the sector" (Skat & EAA, 2019: 22).

D4. General quality of the project design.
Stakeholders and consultation. "Two scoping studies were concluded to understand specific weaknesses and institutional barriers towards planning, development, protection and management of water resources in Kosovo." (SDC, 2020: baseline for first phase). These are

[67] In the Oct 2019 parliamentary election, the Vetëvendosje party won 29 seats in the 120 seat legislature and its coalition partner LDK 28 seats, with the Vetëvendosje leader Albin Kurti becoming Prime Minister on an anti-corruption platform (en.wikipedia.org/wiki/2019_Kosovan_parliamentary_election). In the Feb 2021 election Vetëvendosje won 58 seats and LDK 15, so Albin Kurti remained prime minister (en.wikipedia.org/wiki/2021_Kosovan_parliamentary_election) and the pro-EU accession and anti-corruption programmes presumably continued.

unreferenced, but annexed to the ProDoc (Skat & EAA, 2019) are three concept papers: on a potential Competitive Grants Scheme; on the relationship between the project and the IMWC; and on potential government contributions to the project. The key institutional stakeholders, beneficiaries and partners were consulted during project preparation, including the Ministry of Environment, Spatial Planning and Infrastructure (MESPI) and its main secondary institutions, the River Basin District Authority (RBDA), the Kosovo Environment Protection Agency (KEPA), the Hydro-meteorological Institute (HMI) and the Environmental/Water Inspectorate(s), and "expressed their interest to engage in an appropriate learning/capacity building process that will be provided by the project." (SDC, 2020: 2). Other relevant institutions are listed and their roles briefly described in the Credit Proposal, including the IMWC, municipalities, NGO/CSOs and private companies. A comprehensive list of relevant stakeholders along with their roles both in the WRM & the Project, as well as their capacities and interest to contribute to and benefit from it is well described (Skat & EAA, 2019: 38-42). This very good understanding of the stakeholder landscape provides the foundation of the complex set of comprehensive project-supported stakeholder participation mechanisms at national and river basin levels. This is particularly articulated in Output 1.1 on thematic working groups and Output 3.1 on stakeholder participation mechanisms and the role of CSOs. Besides this, the overall project design rests on placing the key authorities and stakeholders in the lead position (Skat & EAA, 2019: 19). In short, the project was designed following a 20-year Swiss engagement in the WASH sector in Kosovo, so adequate familiarity with national conditions and interests can be assumed.

Risks. The risk of political/policy change and loss of momentum for reform is addressed in the ProDoc by emphasising the need for the project to present itself as an incentive to reward progress, and to affirm milestones towards EU integration ("e.g. through continued harmonization of legislation, piloting EU-based concepts in planning, utilizing experiences made in other countries when implementing EU Water legislation and concepts", Skat & EAA, 2019: 21). The risk of resistance to reforms by key institutions is addressed in the ProDoc by a series of measures and considerations: (a) by taking a step-wise approach to building capacities, based on benchmarks, milestones and conditionalities; (b) by presenting the case for reform in monetarised cost-benefit forms, thus making the economic implications more visible to decision-makers; (c) by highlighting experience from Switzerland and Austria; (c) by using a sustained combination of backstopping and peer-to-peer support that combines quality assurance and on-the-job training; (d) by offering support to organisational development (e.g. working culture at the work-place, motivation, team-work, leadership); (e) by using "talented young water professionals who would learn and implement the new knowledge within the host institutions"; (f) by deliberately making new information, monitoring and permitting systems both as user-friendly and useful to staff as possible; (g) by making sure that staff benefit in terms of their own careers from participating in project activities; (h) by building self-esteem and a sense of responsibility among staff; and (i) by designing systems in line with the Aarhus Convention (which "is already part of Kosovo's legal system") to be open and transparent so as to reduce opportunities for 'data control'. The risk analysis is comprehensive and clear.

Overall conclusion on **design quality**: 'excellent' (score: 6).

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness.

The Rio Mark of PRINCIPAL (2) by SDC for mitigation is notable since there is little in the project design or early implementation that suggests mitigation to be a key aim of this project, which is primarily an adaptation initiative. But ecological mitigation effects can be anticipated: from catchment and floodplain ecosystem conservation; from downstream effects on rivers, lakes and seas; and from agroecological farming practices that result in reduced use of agro-chemicals and irrigation water, and increments in soil carbon. It is also likely that measures to reduce industrial pollution (including from animal farms) that rely on improving resource efficiency, reduction of energy consumption, better organic waste management, wastewater treatment, and integrated operator-level circular economy-inspired solutions, will result in reduction of energy consumption and GHG emissions.

E2. System change. Two years into the first project of a 12-year programme is too early to draw conclusions, but the overall impression is that a foundation is being created that will make strategic effectiveness and system change possible. Specifically, if the considerable ambitions expressed in the Programme Document are achieved, in applying the WFD across all agricultural and industrial sectors and with holistic and effective attention to surface and sub-surface water systems throughout Kosovo, then transformative change will result. This is likely

to be more direct and stronger in the area of adaptation than mitigation. **Transformative potential** for mitigation: moderate.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness (based on Skat & EAA (2020, 2021a & b).
Effectiveness.

- **Programme agreement**. "Government representatives have generally agreed to the proposed (co-)investments into complementary measures. Based on current developments, the signing of the [IWRM-K] Agreement is expected to take place in the early stages of the following reporting period." (Skat & EAA, 2021b: 5). The agreement was signed on 3 Sep 2021.
- **Overview of progress**. "The reporting period [Jan-Jun 2021] saw a breakthrough of important [IWRM-K]-backed processes, thanks to the earlier careful investments in staffing, procedures, management tools, backstopping and peer-to-peer support, as well as in the necessary specialized expertise and stakeholder mobilization. The overall implementation performance is highly positive, especially when factoring in the unprecedented challenges and uncertainties posed by the protracted Covid-19 crisis. ... Considering the circumstances, the [IWRM-K] can report an overall satisfactory performance rating where (still only) minor problems are expected to arise and small adjustments in implementation and steering may become necessary. The cumulative effects of the ongoing challenges are still within the tolerable limits of [IWRM-K's] built-in resilience. The current achievements encourage optimism for significant results in the upcoming implementation stages." (Skat & EAA, 2021b: 6).
- **Leadership engagement**. "The positive changes in the overall [GoK] commitment to the [IWRM-K] bring about opportunities for further progress. Following a series of consultations with the new MESPI leadership, a milestone coordination meeting organized in June brought together the new Minister and State Secretary and the heads and the key staff of all departments with shared responsibilities over water resource management in Kosovo. Some of the results of this intensified cooperation include: [a] definition of the composition of the technical Working Groups and concrete steps toward their establishment; [b] sharing of historical databases that are of critical importance for different [IWRM-K]-backed plans and studies; and [c] prioritization of [IWRM-K] support to improving (water) permitting procedures." (Skat & EAA, 2021b: 6).
- **Civil society engagement**. "Over a hundred CSOs/NGOs were contacted during the reporting period and took part in an initial survey carried out by the specialized expert team. All these organizations were assessed for their capacity, and interest to take part in the stakeholder participation mechanisms and future IWRM in Kosovo. Very importantly, they shared their experiences from implementation of various past projects and expressed their views on how a well-structured grants programme should look like." (Skat & EAA, 2021b: 15). Field observations confirm that the objectives, thematic orientation and implementation approach to the competitive grant scheme (CGS) has been well elaborated in a specially designed operational manual, and adopted by SDC. The CGS has already been launched with the first call for selection of farmers who will be supported to implement good agricultural practices (e.g., to reduce pollution and improve production), and activities are underway to launch the remaining Funding Lines of CGS.
- **Output 1.1: Integrated water resources planning framework**. (a) A national water balance study is underway with new satellite, gauge and historical data sets combined with historical meteorological and hydrological databases (p. 8). (b) The launching of the River Basin Management Plans (RBMPs) for Ibër, Morava e Binçës and Lepenc is a key milestone as the RBMPs will bring together capacity development and stakeholder participation activities, including "interlinked trainings, peer-to-peer, coaching and on-the-job learning opportunities ... and stakeholder mobilization efforts" (p. 6). (c) Agreement of specifications for technical working or thematic advisory groups to support MESPI (p. 9)[68].

[68] MESPI was also exploring the potential for 'Payments for Ecosystem Services' (PES, Rep. of Kosovo, 2018: 60); in the context of implementing the EU Water Framework Directive and achieving 'good ecological status' for European waters by 2027, PES systems are described as "flexible, incentive-based mechanisms that could play an important role in promoting land use change to deliver water quality targets." (www.cost.eu/actions/CA15206/ and Forest Research, 2021).

- **Output 1.2: Innovative approaches to IWRM**. Design and launch of a survey of at least 250 farming households to obtain information on their environmental and socio-economic characteristics and vulnerabilities (pp 9-10). Under this output, Activity 1.2.2 targets irrigation practices with the aim of demonstrating more efficient use of water at the level of individual small farms and in the context of "applying the principles of precision agriculture and agro-ecological farming" (Skat & EAA, 2019: 28).
- **Output 2.1: Legal and regulatory enabling environment**. (a) “With the recent changes in GoK, there has been a visible shift of priorities of the MESPI toward the improvement of the overall (environmental/water) permitting, as part of a broader transparency exercise.” (p. 11). (b) “Identification, prioritization and approach to the delivery of the necessary support is carried out as part of the Program-backed institutional development/process groups comprising assigned staff of the partner institutions” (p. 11).
- **Output 2.2: Countrywide and basin-scale water monitoring and information systems**. (a) A water quality monitoring system has been designed for the RBMPs. (b) [IWRM-K] has developed the conceptual architecture for a comprehensive roadmap for the further development of the water information management platform for MESPI. (p. 12).
- **Output 2.3: Water resources management knowledge and skills among water professionals**. (a) Design of an IWRM training programme (including master’s course) building on a partnership with the Kosovo Institute for Public Administration (KIPA), and the subsequent training needs assessment targeting diverse stakeholders. (b) Signing of a memorandum of understanding with SHUKOS/Young Water Professionals (YWP) and agreeing a Strategy and Programme of Work for the YWP Group (p. 12-13).
- **Output 3.1: Participatory river basin WRM**. (a) Stakeholder identification and analysis for each river basin. (b) Technical report on IWRM-oriented stakeholder participation models. (c) See Civil society engagement above. (d) Needs assessment for capacity building support for CSOs/NGOs and other stakeholders. (pp. 14-15).
- **Output 3.2: Nation-wide awareness and stakeholder mobilization**. Completion of the IWRM-K’s Communication Strategy and Action Plan, to identify key communications channels and products to mobilize stakeholders toward a shared vision (e.g., a newsletter, social media presence, campaigns) (p. 15).

Interviews confirmed that entire project is very well positioned in the complex local context, which enables it to mobilise resources and responses among stakeholders, and has resulted in good progress. A special impetus resulted from the signing of the programme agreement on 3 Sep 2021. One of the strengths of IWRM-K is the creation of complex but efficient mechanisms for stakeholder involvement throughout virtually all its components. For example, the working groups (of which four have been created so far), with a central Coordination Advisory Group, mobilise over 30 key representatives of institutions in support of key processes like preparing the RBMPs, the water balance study, and the water information and monitoring systems. Stakeholder involvement is now being expanded further. Notable achievements so far include: (a) establishing a complete implementation structure, with a registered company, office, staff and financial, procurement and other administrative procedures; (b) producing a high-quality water balance study; (c) launching the RBMPs and CGS; (d) setting up the working group system; (e) providing Junior Water Professionals to MESPI; (f) agreeing a roadmap for putting the Water Information System into effect; (g) designing and piloting models for stakeholder participation; and (h) designing a communication strategy and launching its action plan. Interviewees stressed the need to pay special attention to the quality of the RBMP process, since this is key to stakeholder participation and capacity development and a lynchpin of the whole project; other demands from this complex project should not be allowed to distract from it. Otherwise, the overall impression after field validation is that the IWRM-K is being implemented at a good pace and the overall performance is satisfactory. Risks and challenges are being addressed well, and observers are optimistic.

Impact and sustainability. The references above to leadership support, inclusive and participatory planning processes, information sharing, capacity building, public education, etc. all suggest potentially high impact and sustainability. Field observations concluded that an important element to the sustainability of the expected IWRM-K results is the government's contribution provided through the Agreement signed on 3 Sep 2021. Aside from direct investments in measures stemming from the RBMPs, and other documents, the Agreement foresees funding for structural improvements of the key MESPI institutions in charge of different functions of the IWRM system. In practice, the partner institutions will be able to access government funds to allow them to meet their growing WRM responsibilities from improved

implementation of legislation and the functioning of the IWRM system. Rather than making them dependent on donor funds, this instrument will enable them to use properly allocated government funds – all this is an important innovation which can be considered when designing other projects.
Overall performance scores: **effectiveness** (5, good), **impact** (4, moderate), **sustainability** (6, excellent).

F2. System change.
The project design is aligned mainly to adaptation. The key analytical and planning documents that are expected to result from the project and to steer Kosovo's future WRM strategy, such as the Water Balance Study and the River Basin Management Plans, will take into account a full range of climate scenarios. Measures to improve WRM will then be climate sensitive and will work toward building the overall resilience of the water, energy and food systems. Moreover, the project is set to support the implementation of practical solutions as described under Output 1.2 ('innovative approaches to improve WRM'), including nature-based solutions, ecosystem-based DRR, ecosystem-based adaptation, and bioengineering techniques. By introducing these conceptual foundations, the entire programme is expected to generate results that will contribute to the overall country's adaptation agenda. Thus, though not always explicitly stated, the project design considers climate change as a cross-cutting issue in addition to the fact that large share of the activities are no-regret/low-regret interventions. The overall impression is that a foundation is being created that will make strategic effectiveness and system change possible. In addition to the points made in E2, the comprehensive nature of the intervention, the strong level of leadership support and the incentive to deliver system change in order to comply with the WFD all suggest potentially high transformative potential for adaptation. **Transformative potential** for adaptation: very high.

Part G: Other aspects of design and performance

G1. Efficiency issues. None noted, although Covid poses a systemic and ongoing threat.

G2. Coherence issues.
The need and opportunity for more effective donor coordination is highlighted, for example: by Skat & EAA (2021b), who note that "enabling intra-institutional cooperation at multiple levels in MESPI for the needs of [Water Information System] operationalization as well as more effective donor coordination" is identified as an issue that requires "closer observation and process facilitation" by IWRM-K (p. 13); and by Skat & EAA (2019), who see the SCO as potentially having "a positive influence also in coordination with other donors and international organizations" (p. 22). The national Water Balance Study (see E1) is designed to input to the World Bank project Fostering and Leveraging Opportunities for Water Security Program (FLOWS[69]), but Skat & EAA (2021b: 8 and footnotes) mention contingency measures by IWRM-K in the event that FLOWS is delayed or cancelled.

G3. Replicability issues. Everywhere is a water catchment for somewhere, and all catchments require the kinds of participatory, ecologically-informed IWRM regime that the WFD requires and that the IWRM-K is seeking to build in Kosovo. All the principles and many of the practices and technical details are therefore universally applicable.

G4. Partnership issues.
The whole IWRM-K is partnership based, so effective partnership building and high levels of partner satisfaction and cooperation at all levels and in all dimensions are therefore essential. One issue is that the project places considerable demands for participation on the limited number of MESPI staff who are responsible for the key functions of IWRM, and who are also in demand by other projects. Another is that the need for regular meetings at multiple levels that is generated by the working group and other systems is also a challenge for staff capacity. The project will need to consider how to limit the number of meetings, workshops, trainings, etc, required, so as to gain the most without overwhelming potential participants.

G5. Connectedness issues. Relative to the low likelihood of climate change being significantly curtailed by global agreement and/or other efforts, and the high likelihood of serious climate impacts from now on, it can be seen that current efforts on adaptation through IWRM in Kosovo are very late.

[69] For FLOWS see: www.worldbank.org/en/results/2020/10/27/developing-a-long-term-and-holistic-approach-to-strengthen-water-security-in-kosovo.

G6. Cross-cutting themes.
Skat & EAA (2019: 41-42) mentions that the Agency on Gender Equality at the Office of the Prime Minister has a potential role in IWRM-K by representing women's interests, while local government Gender Equality Offices offer a contact point for women's groups in rural areas and have key roles in informing, training and mobilizing women at local level. Both are also expected to give feedback on women's perspectives in RBMP and other IWRM related processes. The fact that such institutions exist at all is a good sign.

G7. Capacity building issues. Problems in Kosovo's water sector come largely from weak institutional WRM capacity, due to a scarcity of skilled water professionals because of poor training and recruitment, and an underlying political culture characterised by persistent nepotism, corruption and lack of commitment to the core tasks of institutions (see e.g. D1). Hence capacity building across the IWRM sector is a key IWRM-K objective - a statement that was confirmed at interview by the Deputy Minister, who also observed that:

- it is very important to create a permit tracking system, so that all the information related to the permitting system can be shared, which was not the case so far, depending on only one responsible employee;
- it is expected the whole process will become more transparent., and for that purpose, amendments on the legislation in line with the digitalization should be prepared that might take time;
- employee resistance to new digital solutions is expected, but it is also expected that it will be overcome with the expertise and support from the project.

Part H: Other matters arising from the review

H1. Follow-on questions.

Question 1. *What is the status of understanding of the **requirements and implications of the WFD** and its Common Implementation Strategy within the water institutions*?

- **Answer**. There is a slow upward trend in acquiring new knowledge and skills on the WFD and CIS among key staff within MESPI and its most relevant departments. The conceptual foundations seem to be in place, but it will take time before they are put into practice. The project seems to have a good understanding of current levels of knowledge and skill at MESPI, and what will be needed for MESPI to deliver. Training activities throughout the project design should certainly help Kosovo meet WFD requirements.

Question 2. *What evidence is there for **continued commitment to the reform agenda**, including to the permitting system due to possible sensitivities and opposition to change, but also generally among the water institutions*?

- **Answer**. The current minister brought to MESPI a strong commitment to improve the permitting system. Ongoing internal reforms and staff changes are creating an enabling environment for this, but opposition to it exists. The project responded to new leadership at MESPI by designing activities under the broader IWRM-K implementation framework. Many activities to support the permitting system are underway and areas of resistance are being addressed by such measures as making the procedures more transparent, consolidating permit requests that have accumulated over many years, and deploying expertise to help the ministry improve permitting efficiency. All are aimed at maintaining high-level commitment to the process. For the moment, it seems that the project is tackling these issues with high degree of sensitivity by keeping the necessary objectivity and neutrality.

Question 3. *What is the status of the **integration of technical and organisational capacity building** (e.g., training and coaching), and linking staff performance objectives to the IWRM reform process, as mentioned in the Jan-Jun progress report*?

- **Answer**. The project has followed consultation, planning and procurement procedures to mobilise expertise in support of these processes. The methodology and approach are being updated and will be presented to partners (probably through the Coordination Advisory Group). Thereafter the necessary staff will be organised into institutional development groups which will facilitate training and coaching. A priority of the project is to link departmental and staff performance objectives with the various IWRM functions. Subject to feedback from the institution, the project hopes to expand these activities in line with well-developed plans.

Question 4. *What is the status of **cooperation at multiple levels within MESPI** for the WIS and more effective donor coordination, as mentioned in the Jan-Jun progress report*?

- **Answer**. There is a comprehensive roadmap for putting the WIS into effect, and for upgrading it over time, guided by the MESPI Working Group on WIS. This is a highly

technical process that requires various expertise and creation of linkages with multiple processes (including the water balance study, the RBMPs, and database management). The project team seems to be aware of the ongoing parallel processes which might help them in achieving objectives related to WIS. This involves a national-level programme funded by SIDA. The working groups are key coordination mechanism, as shown in the roadmap document that has been validated by the various working groups themselves and by the higher-level Coordination Advisory Group. The project team is following the roadmap and this should lead to achievement of results in the later stages.

Question 5. *What is the status of the **National Water Balance Study** (including economic analyses), as mentioned in the Jan-Jun progress report*?

- **Answer**. The draft water balance study has been prepared and presented among the key stakeholders – first within the MESPI Working Group on Water Quantity and then to a broader stakeholder group led by the Minister. There are very positive reactions on the quality of the study and the relevance and importance of its findings and recommendations for the future. The study is being prepared as per the original timeline and is expected to be completed as planned. The current focus is on completing the economic analyses, as well as the design of the meteorological and hydrological monitoring system. In parallel, the entire process is being used for comprehensive on-the-job training. An important opportunity that is being considered by the project is the transition of all databases and models developed under the study within MESPI, where with training the staff will be able to use it in their regular activities (such as the permitting of water use). If achieved, this will contribute greatly to the sustainability of these important achievements.

Question 6. *What is the status of the **Political Economy Analysis** (PEA) process, as mentioned in the Jan-Jun progress report*?

- **Answer**. The project is mobilising international expertise to support both analytical and capacity development work. This builds upon preparatory activities comprising mobilisation of staff and stakeholders on PEA, preliminary identification of entry points for PEA in the project design, and a workshop. The idea of having the PEA mainstreamed across the project result areas is acknowledged for its relevance and importance. The project intends to use the PEA framework to collect/generate knowledge and ideas that can be used to guide the next phases of the project. This approach seems well embedded in the project's implementation plans.

Question 7. *What is the status of the River Basin Management Plan processes for Ibër, Morava e Binçës and Lepenc river basins, as mentioned in the Jan-Jun progress report*?

- **Answer**. Preparation of the RBMPs is a key process that brings together the most significant capacity development and stakeholder participation processes. This has started and has already mobilised stakeholders at different levels. The work so far has resulted in a comprehensive Inception Report that will guide the remaining steps to the end of Phase 1. Experts have been deployed and the project's earlier work has helped speed optimal mobilisation, while providing information and expert inputs for the respective RBMPs. The feedback from the project partners is highly positive so far, and the prospects for this key process seem good.

Question 8. *What is the status of the establishment of the **MESPI technical working groups** (on Water Quality, Water Quantity, Monitoring and WIS, Water Economy/Finance), and of a Coordination Advisory Group, as mentioned in the Jan-Jun progress report*?

- **Answer**. All these groups have been created and formalized through a legal act by MESPI. MESPI staff have been mandated with tasks and responsibilities related to RBMPs and other project-supported processes (water balance, WIS, economic analyses, use of government co-funding). This mechanism seems to work well and is designed to maximize the input of different people to the processes/documents in question, to provide a platform for capacity development activities, and to maximize synergies with other initiatives.

Question 9. *What is the evidence of **effective working relations** between MESPI/RBDA and IWMC, as mentioned in the Jan-Jun progress report*?

- **Answer**. The IMWC is a government-level structure bringing together several ministries that have shared responsibilities or interests over water sector management. MESPI is part of this mechanism that is chaired by the Prime minister. With the establishment of the new government, the IMWC has gained importance as a decision-making and coordination mechanism. The work of RBDA as part of MESPI can be affected by the decisions and guidance provided by IMWC. At the moment, the working relations seem to be functional. These are expected to further expand with the anticipated 'evolution' of RBDA into an

independent agency. The IMWC and project implementation are both supported by a special secretariat, which is one of the elements that facilitates the good position of the project in the complex WRM landscape in the country.

Question 10. *What is the status of the **Competitive Grant Scheme** (CGS), or 'challenge fund', as mentioned in the Jan-Jun progress report*?

- **Answer**. The objectives, thematic orientation and implementation approach to the CGS has been well elaborated in a specially designed operational manual. The CGS has been launched with the first call for selection of farmers who will be supported to implement good agricultural practices (e.g., to reduce pollution and improve production). Activities are underway to launch the remaining funding lines of CGS. The CGS concept is well developed and linked to the key project areas and activities. The entire grants scheme is expected to yield tangible results and create multiple capacity development activities.

Question 11. *What is the status of the reactivation and development of the **Water Information System** (WIS), as mentioned in the Jan-Jun progress report*?

- **Answer**. Following extensive expert analyses and consultation, the project has come up with a detailed roadmap for WIS operationalization and upgrade that has been validated at multiple levels. Carefully planned activities are underway and are expected to result in important achievements in the later stages of the project.

Question 12. *What is the status of the SHUKOS/**Young Water Professionals** (YWP) programme, as mentioned in the Jan-Jun progress report*?

- **Answer**. The project seems to have established a very good partnership with YWP. This has been articulated in a MoU that defines the share of responsibilities toward achieving the agreed vision and results. New leaders at YWP are committed to cooperation with the project and seek to make maximum use of opportunities (e.g., trainings, grants). The respective activities seem to be very well designed to contribute to the project's aims.

Question 13. *What is the status of the **nomination of stakeholder-representatives** by CSOs, businesses, academia/research organizations, farmers, etc. to the stakeholder participation bodies in the RBMP process, as mentioned in the Jan-Jun progress report*?

- **Answer**. This is an ongoing process. The project has developed stakeholder participation arrangements that are being put into effect. It has also identified the main (water-related) stakeholders across the country's river basins that are being mobilised primarily for the needs of the RBMPs. These are complex processes that will result in massive stakeholder involvement. Meetings around Kosovo are being used to inform stakeholders of participation opportunities and to find ways to ensure the best possible representation of different interests in the planning process. This has not been done in the country before, so lessons on optimal stakeholder participation in WRM will be useful to the authorities. The project focuses on CSO involvement in the IWRM system, to support which capacity building and grant programmes are being designed.

Question 14. **What is the status of the implementation of the Communication Strategy and Action Plan (CSAP), as mentioned in the Jan-Jun progress report**?

- **Answer**. The project takes communications very seriously and has formulated an action plan that is now being implemented. Outputs so far include a video (www.youtube.com/watch?v=uAx9y2ECchw), the first issue of *Water Newsletter* (https://iwrm-k.com/img/manjakos/591636985135.pdf), a website (https://iwrm-k.com/home), social media activity, and the launch of a photography contest.

H2. Missing documents. None noted.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: Experimentalist Governance and the Water Framework Directive (from Caldecott, 2020: 163-165).

"Years of negotiation among EU Member States produced a series of directives, including the Urban Waste Water Treatment Directive (1991) and the Nitrates Directive (1991). These aimed to tackle the problem of eutrophication, the accumulation of nitrate and phosphorus compounds from sewage and fertiliser pollution, which causes excessive algal growth that can suffocate aquatic life. They also targeted health issues such as microbial pollution in bathing water, and nitrates in drinking water. ... Realising that the world is complex, that local conditions vary, that Member States all have different legal systems, priorities and capabilities, and that a 'one-size-fits-all' approach might not be the best way forward, the EU then developed its Water Framework Directive or WFD (2000). This requires integrated river basin management, and

aims to ensure clean rivers, lakes, ground water and coastal beaches throughout its member states. It is a unique 'gold standard' in the management of water resources. It sets standards for river basin planning, and for the ecological quality and chemical purity of surface and ground waters. For river basins, the aims are general protection of aquatic ecology, and specific protection of unique and valuable habitats, drinking water resources, and bathing water, and all these objectives must be integrated for each river basin.

"The central requirement of the WFD is that the environment must be protected to a high level, in its entirety. For ecological quality, water bodies are supposed to show no more than a slight departure from the biological community which would be expected with minimal human impact – the equivalent, say, of a Canadian lake exposed only to summer campers and duck-hunters. ... As the Member States tried to put the WFD into effect, they quickly developed a Common Implementation Strategy. In this, each country developed its own ideas of what good practice actually meant and how to measure progress, then applied them while studying the results, and compared notes so that they could all learn from each other. Every now and then the European Commission would study progress and lessons learned, and make proposals for everyone to think about. This kind of networked, exploratory peer learning, now called 'experimentalist governance' by academics, has proved to be an immensely powerful approach to managing systems that are too complex and dynamic for top-down rule-making to work very well."

Part I: Bibliography

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Part J: Acronyms and abbreviations

CGS	Competitive Grant Scheme
CIS	Common Implementation Strategy (of the WFD)

CSO	Civil society organisation
EAA	Environment Agency Austria (*Umweltbundesamt*)
EBRD	European Bank for Reconstruction and Development
FLOWS	Fostering and Leveraging Opportunities for Water Security
HMI	Hydro-meteorological Institute
IMWC	Inter-Ministerial Water Council
IWR	Integrated water resources
IWRM	Integrated water resources management
IWRM-K	Integrated Water Resources Management in Kosovo (IWRM-K) project/programme
KEPA	Kosovo Environment Protection Agency
KfW	Kreditanstalt für Wiederaufbau
MESP	Ministry of Environment and Spatial Planning
MESPI	Ministry of Environment, Spatial Planning and Infrastructure (since 2021, aggregating MESP and MIE)
MIE	Ministry of Infrastructure and Environment
PEA	Political Economy Analysis
PES	Payments for Ecosystem Services
RBDA	River Basin District Authority
RBMP	River Basin Management Plan
SCO	Swiss Cooperation Office
WASH	Water supply, sanitation and hygiene
WFD	Water Framework Directive
WIS	Water Information System
WRM	Water resources management
YWP	Young Water Professionals

Annex 13.20: Cattle, Cashews and Tourism in Honduras

Project highlights.

7F-09862: **Gulf of Fonseca Inclusive Economic Development Programme, Honduras (DEIT-Sur)**. Restored cattle pastures and cashew plantations, promoted organic fertiliser use, and organised community groups to re-activate small livestock, cashew and tourism enterprises; poorly focused, over-ambitious, and impacted by organised crime and Covid-19, it made some progress especially on milk production and processing.

Part A: Basic data

A1. Project number & name. 7F-09862 - Inclusive Economic Development Programme Territorial Region 13 Gulf of Fonseca (*Programa de Desarrollo Económico Inclusivo Territorial - Régión 13 Golfo de Fonseca*, DEIT or DEIT-Sur).

A2. Sources.
Process of PRF development: draft PRF prepared by core team using documents listed in the bibliography.

- **Phase 1 (Aug 2017 to Jul 2022)**:
- https://www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2017/7F09862/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html [English]
- https://www.eda.admin.ch/countries/honduras/es/home/cooperacion/proyectos.html/content/dezaprojects/SDC/es/2017/7F09862/phase1.html [Spanish]

A3. Dates & financial data.

- **Phase 1**: Aug 2017 to Jul 2022; Opening budget CHF 150,000 and total budget for Phase 1: CHF 8,350,000.
- **Projected overall duration**: Aug 2017 to Mar 2030; SDC budget: CHF 24,150,000

A4. Location(s). Development Region 13 (Gulf of Fonseca, R13GF), Honduras.

- In case of confusion 'Region 13' refers to a Development Region used for government planning purposes, No. 13 of which surrounds the Gulf of Fonseca and comprises the catchments of the rivers Choluteca, Goascoran, Islas Cayos Pacifico, Negro, Nacaome and Sampile (see H3.1). Honduras has 18 administrative departments with a different numbering system, with 298 municipalities (each with a local government headed by an elected mayor).
- Project 7F-09862 (Phase 1 of which was initially scheduled for Aug 2017 to Jul 2018) is linked to project 7F-10153 (ZA 39 Golfo Resiliente, Jan 2019 to Mar 2021, from the SDC climate change project spreadsheet). There are many Internet references to Golfo Resiliente under the Central American Integration System (SICA), for example: "Within the framework of the implementation of the activities of the preparatory phase of the Resilient Gulf program, which is financed by the Swiss Cooperation in Central America (SDC), executed and led by the Central American Commission for Environment and Development (CCAD), and implemented by Fundación Neotrópica, it has been planned to carry out reconnaissance visits to the area of the Gulf of Fonseca that corresponds to [Honduras, El Salvador and Nicaragua], in order to dialogue with actors and institutions in the area to learn about ideas of various initiatives related to pilot projects. Likewise, bilateral meetings will be held with MARN, to seek support in this phase, and a monitoring meeting between CCAD, SDC and the Implementing Partners of Neotrópica and ASOCAM. The workshop began by revisiting the purpose of the Resilient Gulf Program, 'To promote the resilience of the livelihoods of coastal communities and the mitigation of climate change, through sound environmental governance in the Gulf of Fonseca'." (SICA, 2020). There is no record of project 7F-10153 in the SDC project database and it is assumed to have been subsumed into the extension of Phase 1 of 7F-09862.

A5. SDC Geography. Latin America and Caribbean

A6. SDC Domain. South Cooperation/SC LAC
Fund Centre: South Cooperation: LAC
Phase 1: SDC Theme: Employment and Income (2015-2020).

A7. Partners.

- **Direct participants in R13GF**: Coastal ecotourism, cashew and sustainable livestock value chain committees in charge of governance and increased competitiveness of the value chains.
- **Primary leaders of the inclusive economic development process in Honduras**: Ministry of Economic Development, Ministry of Agriculture and Ranching (National Program for Agri-food Development- PRONAGRO); Honduran Institute of Tourism, National Agrarian Institute, Regional Platform for Economic Development. Local governments and their inter-municipal associations (MAMBOCAURE, NASMAR and MANORCHO).
- **Main partners**: Academia: Economic Development Sectoral Cabinet; AMHON; Private Business Sector; Honduran Institute of Tourism IHT; the National Chamber of Tourism, Gulf of Fonseca CANATUR-GF Chapter; and coalitions with donors in the territory such as: IADB, World Bank, USAID.
- **Implementation contractors**: ActionAid-Techonoserve consortium (ActionAid chosen for its experience in territorial governance and improvement of the business climate; Techonoserve chosen for its expertise in value chains).

Part B: Purpose, relevance and approach

B1. Purpose.

Phase 1 overall objective/goal: To contribute to excluded and vulnerable families in the coastal eco-tourism, cashew and livestock value chains in Region 13 Gulf of Fonseca (R13GF) obtaining sustainable income and employment based on enjoyment of their economic, social and cultural rights, and reduction of environmental impacts.

- **Outcome 1**. Public and private territorial stakeholders in R13GF, improve the business climate and propel value chains for coastal ecotourism, cashews and sustainable livestock, respecting the governance system of the value chains.
- **Outcome 2**. Stakeholders in the coastal ecotourism, cashew and sustainable livestock value chains improve their competitive capacities, integrate young people into the workplace, protect the environment, and respect ILO Convention 169 and the economic, social and cultural rights of their employees and partners.

Approach. Supports a programme approach. DEIT builds on the results of the SURCOMPITE Programme financed by SDC and the Inter-American Development Bank (IADB) since August 2014, which started the process of developing coastal ecotourism, cashew and sustainable livestock value chains, but which needed consolidating under the framework of the Regional Competitiveness Agenda, a Master Tourism Plan and a cashew and livestock development plans.

B2. Relevance to partners.

Government. "The program is aligned with the country policy framework, such as the Country Vision (2010-2038), and the Government Plan (2018-2021) with a focus on the competitiveness of the territories and their policy objectives in terms of sustainable economic development. Likewise, the program is supported by specific policies: State Policy for the Agri-food Sector (2004-2021); National Strategy for Financial Inclusion (2015-2020); National Competitiveness and Innovation Strategy for economic growth and social welfare (2012-2021)." (SDC, 2018: 4). The 2021 NDC (Government of Honduras, 2021: 44) identifies "protection and conservation of protected areas (protection of wetlands and estuaries, management plans for protected areas, biological corridors and marine-coastal zones with declaration)" as a climate change adaptation contribution that is to be developed.

National and subnational partners. The project promotes systemic changes with a focus on inclusive and just markets, improving the competitiveness of value chains. It contributes to the establishment of models of inclusive territorial economic development that increase public-private collaboration in the R13GF, by means of good territorial governance and development of capacities to design and implement an effective territorial local economic development (T-LED) agenda, linked to local regional and central government institutions, that optimizes factor productivity in accordance with the socio-productive vocation/specialization of the territory, and generates inclusive economic development. The program also builds on the expressed willingness of private business in the R13GF to establish partnerships (PPDP) based on a win-win modality.

Relevance to Switzerland. "The program focuses on employment and income, a priority in the Dispatch of the Federal Council to the Swiss Parliament on Development Cooperation 2017-

2020. The program responds to the outcomes of Domain 2 of the Swiss Cooperation Strategy in Central America 2018- 2021, creating employment and income in a scenario of fragility." (SDC, 2018: 4).

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 1: No poverty**, especially Target 1.1 (*By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day*) and Target 1.5 (*By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters*).
- **SDG 8: Decent work and economic growth**, especially Target 8.3 (*Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services*) and Target 8.9 (*By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products*).
- **SDG 10: Reduced inequalities**, especially Target 10.2 (*By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status*).
- **SDG 13: Climate action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*).
- **SDG 14: Life below water**, especially Target 14.1 (*By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution*).
- **SDG 15: Life on Land**, especially Target 15.3 (*By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world*).

B4. Relevance to other development objectives.
OECD: Industrial policy and administrative management. Decentralisation and support to subnational government (incl. accountability).
New York Declaration for Refugees and Migrants, which established the Global Compact for Migration (IMO, 2016), in which one of the principal aims is to 'address all aspects of international migration, including the humanitarian, developmental, human rights-related and other aspects'.

B5. Relevance of the approach in principle to the climate response (preliminary assessment).
Preliminary assessment in the Inception Phase:
Mitigation: not assessed. ['Nil' was given for the similar project 7F-10153 Golfo Resiliente].
Adaptation: not assessed. ['Capacity-based adaptation (CA)' was given for the similar project 7F-10153 Golfo Resiliente].

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:
Mitigation. SIGNIFICANT (1). [The similar project 7F-10153 was marked SIGNIFICANT (1).]
Adaptation. SIGNIFICANT (1). [The similar project 7F-10153 was marked PRINCIPAL (2).]

Part C: Narrative overview

Background and purpose.
Phase 1 of DEIT builds on the work promoted by the SURCOMPITE project financed by SDC and IDB (2014-2017) in R13GF, but which requires follow-up to support the development of cashew, livestock and coastal ecotourism development (Consorcio NIWAMI, 2018). R13GF was selected by SURCOMPITE because over 64% of the population of 781,719 inhabitants live in conditions of poverty, unemployment is estimated to be 19% and over 280,000 people have precarious jobs with salaries under the minimum wage. This situation is one of the reasons for the migration of youth to the United States and Spain, which is creating the disintegration of families and communities. In addition, the R13GF has some of the highest levels of domestic violence in the country.
Performance.
Overall performance can only be assessed according to annual reports, because no external evaluation has yet been done. The latest states 74% of planned activities have been

implemented, producing the following results: (a) 3,1612 families have received technical support in the development of their livelihoods in the three main value chains where the programme is intervening (ecotourism, sustainable livestock and cashew nut production); (b) 3,253 jobs established in the three value chains of which 1,593 in livestock, 1,034 in ecotourism and 626 in cashew nuts; (c) reactivation of 334 micro/small enterprises linked to ecotourism (restaurants, hotels, markets, guided tours); (d) 219 ha restored with cashew trees to reduce erosion in water catchments; (e) market in Germany identified to export 18,000 lb of cashew nuts; (f) the promotion of sustainable livestock through the establishment of 53 demonstration farms promoting silvopastoral practices, pasture conservation (silage), grazing rotation and rainwater harvesting.

Transformative potential.

- **Cashews**. Transformative change for adaptation cannot reasonably be based on developing one cash crop, since this encourages dependency and vulnerability to pests and market changes. Much better would have been a diversified agroforestry approach that emphasises native varieties of trees and crops to develop resilient food security and nutrition, as well as establish better conditions to sustain incomes and improve livelihoods.
- **Livestock**. Cattle ranching has a dire reputation for ecosystem destruction in Mesoamerica, but introducing rainwater harvesting, rotational grazing and silage development supported by an experimental centre ('La Lujosa') to promote the use of 31 species of grasses and 19 species of forage plants could all improve its sustainability and result in better and more resilient milk and beef production. Local associations/networks were particularly evident in the livestock/milk production sector, where seven milk associations had established strategic alliances with Lacthosa, CADELGA and AGROCAL, and these were supporting research, providing technical assistance and facilitating technology transfer to farmers.
- **Ecotourism**. This is normally defined as nature-based tourism that uses but does not damage natural ecosystems and that contributes to their continued protection. Up until 2020 it was considered a sunrise industry with a massive sustained growth in tourist numbers, increasing environmental sensitivity among travellers from many countries, and multiplying examples of well-regulated and highly profitable commercial ecotourism operations in many countries, especially including Costa Rica and Belize in the Mesoamerican region. Although the Gulf of Fonseca is more a mangrove ecosystem than a coral one, hence with less potential for scuba ecotourism than the Caribbean coast (see H3.2), with 400,000 visitors in 2019 there was considerable potential for ecotourism development and this is potentially transformative.

Restoration of vegetation in micro-catchments and pastures, promoting organic fertiliser use, and organising community groups to receive technical assistance and negotiate business cooperation more effectively add up to at least some transformative potential for adaptation. Ecotourism might have added to this had Covid-19 not impacted the trade, but the theme might still be developed and there was a little mangrove restoration work in process to protect the marine ecosystem. A project based on large-scale mangrove restoration for fishery and tourism purposes coupled with real ecotourism projects and diversified agroforestry and silvopastoral systems on land, might have had high transformative potential for adaptation (with some mitigation merit). As things are, the project is considered to have low transformative potential for adaptation.

Overall scores: Design quality - 3; Effectiveness - 4; Impact - 3; Sustainability - 3; Transformative potential for adaptation: low.

Part D: Design quality

D1. Theory of change (Phase 1).

By fostering public-private alliances that take into account the challenges and the potential for small farm families the programme will strengthen territorial governance that leads these alliances to invest in improving the competitiveness of the value chains for coastal ecotourism, cashew and sustainable livestock. Over time the value chains will achieve improved quality and higher volumes, supporting the establishment of a business climate that improves income, livelihoods, social development and environmental sustainability in R13GF.

D2. Assumptions underlying the theory of change.

Assumption 1. Governance in the Gulf of Fonseca/R13GF territory is not affected by organized crime, or the creation of Zones for Employment and Economic Development (ZEDES).

Assumption 2. Economic, social and cultural rights are upheld, especially concerning the creation of inclusive value chains and establishing environmental sustainability.

Assumption 3. The Government of Honduras establishes a supportive legal and policy framework, as well as key services and access to financial resources, to support SME development in ecotourism, livestock production and cashew nut production and processing in R13GF.
Assumption 4. Different territorial stakeholders demonstrate willingness to develop participatory dialogue on the establishment and application of the regulatory framework to support and protect SME development.

D3. Plausibility of assumptions and links.
All of the assumptions are plausible on paper but are undermined in practice by chaotic conditions driven by political instability, organised crime (narcotics and people trafficking) and corruption[70], and the impact of repeated hurricanes. The assumptions also lack adequate risk analysis and measures to both monitor and regularly update mitigation measures to reduce medium and high-level risks identified (such as domestic and gang violence affecting women and other vulnerable groups, economic instability, migration, etc.).

D4. General quality of the project design (Score 3).
The project builds upon the results and lessons learned from the previous SURCOMPITE intervention (funded by SDC and IADB) in the Gulf of Fonseca region and promotes synergies with other SDC programs dedicated to relevant issues such as water governance, vocational training, and economic development. The objective of supporting poor communities by developing value chains that benefit small producers and create jobs is aligned with government development priorities. But the minutes of SDC's Operational Committee for South Cooperation and the Committee of the LAC Division (both annexed to SDC, 2018) list a number of flaws in the design which would need to be corrected even though both committees recommended approval. These flaws included over-ambition and the need for much greater clarity on gender issues, the value chain approach, synergies with other projects, the territorial approach, financial flows, cost-benefit analyses, and the potential effects on migration. Some of these reservations might be interpreted as seeking more relevance at the macro-ecosystem level, which would certainly have been appropriate given the project's orientation to the coastal environment in its overall objective and both of its outcomes.

Part E: Evidence for strategic effectiveness and system change for mitigation

E1. Strategic effectiveness. Not applicable.

E2. System change. Not applicable.

Part F: Evidence for strategic effectiveness and system change for adaptation

F1. Strategic effectiveness.
Effectiveness (score: 4).
No external evaluation has yet been done, but the Annual Reports provide information on progress (DEIT-Sur, 2020, 2021). The 2019 report blamed unexpectedly slow progress on "the prevailing context in the region ... characterized by disjointed efforts, antagonisms, and a lack of credibility in the existing institutional framework. In addition, the entities called upon to articulate the value chains show low managerial, administrative and tax capacities, as well as little clarity regarding the strategies to improve competitiveness and the business climate that promote the generation of new jobs and income." (DEIT-Sur, 2020a: 7). The 2020 report was slightly more positive, recording that some technical assistance processes continued "despite the arrival of Covid-19 and hurricanes Eta and Iota, which created an adverse and complex context for the South DEIT Program" (DEIR-Sur, 2021: 7). These sources reported progress on the three value chains as follows.

- **Cashew**.
  - **2019**. With financial support from DEIT, FEPROCOMAH led the rehabilitation of livelihoods, creating over a thousand jobs (permanent or 'equivalent', benefiting 421 women and 749 men) and managed the reforestation of more than 450 blocks with cashew trees and the preparation of 52 nurseries that will help establish 500 new blocks of cultivation. In the short term, this will improve micro-catchments and, in the medium term, the productive and competitive capacity of the chain, counteracting the 30% reduction in production in 2019. Plans for 2020 included: (a) organic fertilizer

[70] In 2020, the Corruptions Perceptions Index ranked Honduras 157th (down five places since 2012) of out of 180 countries (https://www.transparency.org/en/cpi/2020/index/). For comparison, México ranked 124th, El Salvador 104th, Guatemala 149th and Nicaragua 159th.

development and trials; (b) building marketing capacity of cooperative 'La Sureñita'; and (c) development of solar energy systems for processing cashews,
    - **2020**. Work involved 672 families, and focused on the expansion of productive and restored areas, reactivation of exports, processing of by-products (such as vinegar and anticorrosive oil), land tenure arrangements for women and development of a Competitiveness Framework Agreement (AMC). Specific Covid-19 response protocols were incorporated into plans for reducing infections and the loss of human life.
- **Livestock**
    - **2019**. With financial support from DEIT, FEGASURH provided 462 flood emergency kits, along with essential agricultural supplies to care for sick and weak animals; this ensured milk production even in adverse post-disaster circumstances. With legal and administrative support from DEIT, FEGASURH obtained its legal personality, increased its management capacities and its role of technical assistance to the producers, resulting in: (a) leverage of HNL 1.5 million from EmprendeSur contributed; and (b) recruitment of 22 rural promoters. Plans for 2020 included promoting silvopastoral systems.
    - **2020**. A total of 1,350 families received technical assistance on livestock (with CATIE, SAG and DICTA), management of alternative credit systems, reactivation of processing plants (with FEGASURH), delivery of biosecurity supplies (1,129 families), implementation of a pasture demonstration park (39 species) and forage (19 species) with SAG-DICTA, and diversification in farms, promoting economic initiatives with women and young people. The signing of a trading contract with Lacthosa foresaw increased income of HNL 6 million (a return of USD 3 per dollar invested).
- **Ecotourism**.
    - **2019**. During the closed (breeding) season for Olive Ridley marine turtles, 450 jobs were generated in nest-protection and nestling release operations, under the auspices of URPAGOLF and the Mayor of Marcovia municipality (Choluteca Department). By agreement with the US Forest Service and Aldea Global, the first eight young people were selected for training as tourist guides, forest and biodiversity guardians, and in environmental development and restoration. There are similar agreements that aim to facilitate public and private investment in solid waste management. These initiatives are linked to advertising campaigns by the Regional Tourism Platform, which may have helped visitor numbers to reach an estimated 400 thousand in the Gulf of Fonseca in Easter 2019. DEIT-Sur (2020a: 18) describes the role of the also URPAGOLF as including turtle egg collection, incubation, release of turtles and mangrove reforestation, activities that were to continue in 2020.
    - **2020**. This was most dependent on daily income, and 1,590 families were involved in a strategy based on capacity building, establishing seed funds funds (in coordination with CDE - MiPyME and SEMPRENDE), designing ecotourism packages, building five multiple service centers and coworking, and delivering biosafety kits to 1,517 families. A total of 334 MSMEs (hotels, restaurants, fishermen, San Lorenzo market) were reactivated in Choluteca and Valle departments, generating HNL 350,000 in income from the management of the turtle camps. DEIT-Sur (2020: 28) describes the agroforestry and protection plans for the Sampile river basin as including the restoration of 20 hectares of mangrove (saline) forest in the Iguana Punta Condega protected natural area, to be implemented in 2021 according to the 2021 Operational Plan (DEIT-Sur, 2020b: 20).

Impact (score: 3).

It is too early to report fully on impact, but this is likely to be enhanced through the establishment of synergies with other projects that are reported to be improving territorial governance. At the value chain level these synergies mainly involve the Euro Labour Programme (European Union), the Rural Opportunities Project (Canada/CIDA) and the Surcompite Project (IDB). Specific synergies that support CCA appear to have been forged with other SDC programmes and projects linked to improving water governance at the sub-watershed level, which includes a project supporting watershed associations in the R13GF (Our Goascoran Catchment).

Sustainability (score 3).

The indications are the programme is not applying effective risk management, which could affect the sustainability of its main actions. For example, the annual report for 2020 states that DEIT, “should focus efforts on updating the risk scenarios, reinforcing the implementation of the guiding principles, consolidating the capacity of the new personnel recruited in the Project’s Facilitators Unit (UFP) and strengthening the first-tier organizations, since it is in the families

where the pandemic and the adverse climate effect are having the greatest impact." (DEIT-Sur, 2021: 9).

F2. System change.
Potential for transformative change appears to be limited by two key factors. First, the 2020 annual report mentions integrated planning mechanisms are not developing as planned and, second, this has not enabled the regional planning process to evolve and focus on reforms and new policies that are needed if the competitiveness of the R13GF is to improve, a favourable business climate is to develop, and the effective management of natural resources is to be guaranteed. Moreover, ecotourism according to the latest reports (2020) is struggling due to the combination of the Covid-19 pandemic, pressures to migrate due to prolonged political and economic instability, gang violence linked to narcotics and the growing risks of more violent hurricanes. Indeed, the annual report mentions two major hurricanes - Eta and Iota - that hit Honduras in 2020 alone.
The transformational potential for CCA through the planting of cashew nut trees in water catchments also appears to be low. Indeed, the indications are the programme is dedicating too may resources on developing one cash crop. This could risk establishing dependency on cashew nuts, rather than a diversified agroforestry approach that emphasises a native mix of tree and crop varieties to develop resilient food security and nutrition, as well as establish better conditions to sustain incomes and improve livelihoods. Moreover, if cashew nut production is scaled up as a major source of employment, the risks of a glut of cashew nut production will increase and this will have an adverse effect on farm gate prices for the nuts.
Transformational potential in the third main areas of support - the introduction of sustainable cattle and milk production, is more promising, especially at the community and R13GF levels. For example, there is evidence of an expansion of rainwater harvesting, application of rotational grazing and production of silage development all of which are being supported by the establishment of the 'La Lujosa' experimental centre. This is promoting 31 species of grasses and 19 species of forage plants, which are likely to establish better and more resilient milk and beef production. In addition, to encourage adoption of new grasses, the programme has two model farms showing how sustainable livestock can be achieved with agroforestry and watershed management at seven demonstration plots. Latest reports indicate that the technical assistance provided by the Directorate of Agricultural Science and Technology (DICTA), the Federation of Cattle Farmers in the South of Honduras (FEGASURH) has resulted in the installation of 40 demonstration farms so far that are transitioning from extensive grazing practices to sustainable ones (supported by farm plans). This is being developed in line with the Nationally Appropriate Mitigation Action (NAMA) dedicated to transforming the Honduran livestock sector into a low-carbon economy (NAMA Facility, 2021). The Tropical Agricultural Research and Higher Education Centre (CATIE) is operating as the NAMA Support Organisation.

Part G: Other aspects of design and performance

G1. Efficiency issues.
Efficiency appears to be satisfactory (CONAFI, 2018, 2019, 2020). Accumulated expenditure to end of 2020 is USD 4,141,811, (52% of the funds approved for phase 1). However, due to the pandemic actual annual spending against planned expenditure was USD 2,572,715 (93%), which is very high. However, an important percentage was spent on the humanitarian response to the pandemic (USD 534,115) to cover over 2,500 families in need with food and biosecurity kits, which was designed to prevent contagion and ensure economic reactivation could happen once the COVID-19 situation improved. Over USD 1.37 m. was invested in economic reactivation activities supporting 3,612 families and 3,253 jobs in the three value chains. Estimates are it cost USD 420 for each job created/reactivated. Recovery was reported to have been quickest in the livestock value chain. The development of partnerships established with DICTA-SAG, FEGASURH, CATIE and MANSURPAZ has been the principal reason why reactivation was quickest in the livestock value chain (covering 1,077 cattle farms and 52 demonstration farms). The cost-benefit ratio will not be calculated until the end of phase 1.

G2. Coherence issues.
"The program favours articulation with other donors and with the government through the Dry Corridor Alliance. Furthermore the program is an integral part of the SDC territorial approach in the Golfo the Fonseca region and articulates efforts with other SDC programs, such as: PROJOVEN, which promotes vocational training and labour insertion in the value chains;

R13GF Territorial Water Governance, with which it jointly facilitates private sector participation in the watershed councils for integral water management and FDHAS, to insure that value chains respect the economic and social rights of partners and employees while increasing social auditing of public investment. Furthermore t he project will benefit from the learnings of PROCACAHO and DEIT Mosquitia, with which it interchanges and establishes a shared learning strategy. Synergies are promoted through Swiss concertation as well as participation in the steering and operational committees of the programs." (SDC, 2018: 4).
Coherence is most evident in the livestock value chain where DEIT has been most successful in coordinating with SDC funded projects of strategic importance in R13GF. In particular, coherence with the Territorial Water Governance Program in Region 13 Gulf of Fonseca Phase 2 (see H3.2), is particularly important given its main objective is to support the development of territorial water governance in the three main rivers of RG13GF (Nacaome, Choluteca and Sampile Rivers).

G3. Replicability issues.
Replication at this stage is not evident, although it can be expected that the network of demonstration farms in the livestock value chain, will witness follow-on farmers investing in new grasses and applying improve rotational grazing techniques and water saving technologies to sustain their ranches, especially as the costs involved are manageable. Replication of cashew nut farming is also likely taking into account eight cashew nut processing units are in the process of being formed and it is highly likely the increase in demand for cashew nuts will encourage new farmers to produce cashew trees with the support of DICTA the Federation of Producers and Processors of Cashews. Indeed, the eight processing units are projected to generate HNL 407,000 (USD 16,000) by end of 2021 and create 40 jobs. Replication of eco-tourism with plans to introduce agroforestry and protect catchments is less evident due to the problems of security, the pandemic and lack of services in R13GF. However, beach-based ecotourism supporting the protection of turtle hatcheries in Eden Beach and which is being supported by university research from The Pacific Littoral Regional University, is one area that may stimulate replication. However, obtaining ecotourism certification is costly and without SDC's support it is not clear how local communities can access funding for such ventures.

G4. Partnership issues.
A strength of DEIT is the emphasis given to establishing partnerships between the local communities behind the establishment of SMEs in the three value chains and pertinent government services, although evidence of strong alliances with the private sector especially in the marketing of cashew nuts and ecotourism services are less evident. They and appear to be highly dependent on SDC finance to promote their activities through the press, radio and TV spots, website development, etc. although greater clarity on this will be more evident at the end of 2021. Partnerships in the livestock value chain appear to be more robust, in part because there is an important local market for dairy and meat products. However, certification of sustainable cattle breeding and milk production is not evident in the work plans, which would entice the private sector to assess potential trading agreements.

G5. Connectedness issues.
- Food insecurity and poor nutrition is a consequence of structural weaknesses that exclude a large percentage of the rural population in R13GF and which denies them the fair distribution of resources. Although the programme is planned to end in 2030, it is unlikely DEIT can resolve these barriers to sustainable and resilient development in the region.
- Drug-related violence spilling out from main cities (San Pedro Sula and Tegucigalpa – two of the three worst cities in the world for annual homicides), together with domestic violence and scamming, remain a constant threat to the programme's operations and have increased costs. For example, the eight cashew nut processing enterprises selected have all had to have training on applying strategies to prevent corruption, money laundering and tax evasion.
- The Covid-19 pandemic had major effects in R13GF, and although palliated through the redistribution of considerable resources from DEIT's budget these included: (a) a sudden massive decline in tourism; (b) a switch to teleworking by project staff, especially in April-May 2020, and thereafter careful working with biosecurity measures; (c) limited digital connectivity among producers that limited the use of virtual training processes; (d) an increase in GBV; (e) changes to government procurement regulations affected some planned activities; and (e) restrictions on face-to-face meetings affected some planned activities.

- Tourism may struggle to recover while Honduras remains politically and economically unstable[71]. Hurricanes Eta and Iota hit Honduras in 2020 alone, and climate change is likely to result in ever-more violent and frequent hurricanes. Unstable social and environmental conditions contribute to driving migration, especially to the USA since 2018.

G6. Cross-cutting themes.
Gender. The project design builds on the needs of women and other vulnerable groups identified in the previous SURCOMPITE programme. However, the implementing partner recognises that gender inequality and discriminatory behaviour towards women is a major problem in R13GF[72] and for this reason all three value chains are required to support the development of enterprises that include equality plans. In addition, cross-cutting approaches are applied to ensure gender, psycho-social needs, human rights and environmental management are integrated into planning and implementation of main activities. For example, during the emergency response, at least eight good gender practices were implemented and shared among main stakeholders and end beneficiary organisations. They included: a) virtual self-supporting groups, b) food kits and biosafety for women led by women; c) psychological care online and; d) holding of three forums (managed by SDC) to share experiences of the pandemic in which gender issues and interests were discussed to raise awareness.
The post lockdown recovery packages funded by DEIT were also planned with a gender focus to ensure an important percentage of women would benefit from livestock activities: a) 15% of all jobs created in the livestock chains; b) 21% of the farms supported have women as head of the household. In ecotourism: a) 77% of the reactivated jobs have gone to women and youths; b) 70 restaurants were trained on preventing sexual harassment and gender violence. In the cashew nut component: a) 80% of jobs being reactivated correspond to women although it appears this is mainly covering packaging activities rather than decision-making roles.

G7. Capacity building issues.
- **Political-Institutional**: no evidence.
- **Economic-Productive**: strengthening of local income generating enterprises linked to cashew nut processing (8), ecotourism services (334) and livestock demonstrations (53).
- **Socio-Cultural**: strengthening of social co-existence and gender equality (including during the pandemic).
- **Ecological-environmental**: strengthening the capacity of DICTA and engagement of local universities in the identification of resilient local varieties of grasses to support rotational grazing; Protection of watersheds and development of agroforestry practices in coordination with SDC's Programme on Territorial Water Governance in R13GF; training of environmental protection personnel by agreement with the US Fish & Wildlife Service.
- **Departmental-government**: strengthening of planning within municipal associations and individual municipalities; strengthening of the DICTA and other government services linked to the programme (such as agricultural extension and veterinary services).

Part H: Other matters arising from the review

H1. Follow-on questions. Not applicable.

H2. Missing documents. No external mid-term evaluation.

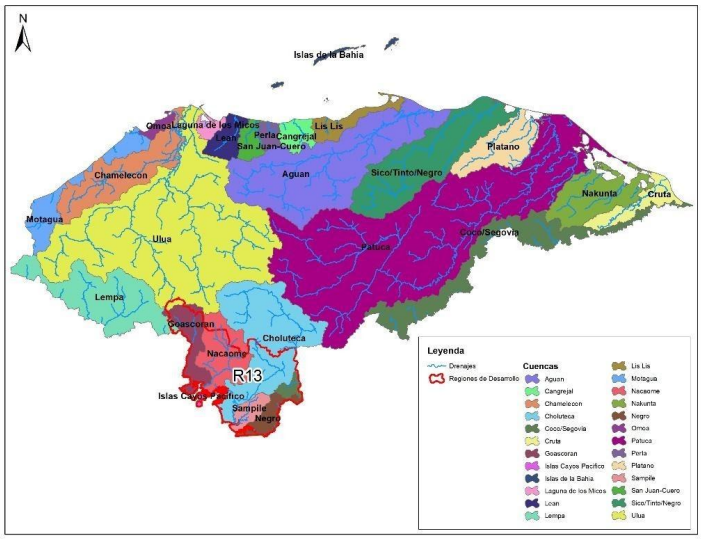
H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1 Water in Development Region 13 (R13) – Gulf of Fonseca (source: Leveron, 2021)
Due to its mountainous landscape, the Honduran territory has a large water supply system, comprised by 25 basins, 133 sub-basins, and a total of 6,845 micro-basins (Hydrographic Regions in Honduras); which drain into two different slopes, the Pacific and the Atlantic watersheds. For the most part, the Pacific watershed in Honduras is located in the southern area, which is known as Development Region 13 (R13) or the Gulf of Fonseca (see figure), and

[71] In such conditions, if possible at all, tourism tends to follow a 'high-security luxury resort' model, in which tourists are isolated and protected from local social and ecological systems. This might only be considered 'ecotourism' if the process is taxed to fund effective support for ecosystem protection and restoration.

[72] Honduras as a whole is ranked 67th of 156 countries (down nine places since 2006) by the Global Gender Gap Index 2020 (WEF, 2021). For comparison, México is ranked 34th, El Salvador 43rd, Guatemala 122nd and Nicaragua 12th.

it contains six basins that are of great importance for the country: Goascorán, Nacaome, Choluteca, Sampile and Negro, and Pacific Keys Islands.
A significant portion of the Gulf of Fonseca lies within the Dry Corridor of the Honduran territory. This area has suffered the longest dry spells of the country, which have affected significantly both their production systems (melon, okra, sugarcane, and shrimp farms, among others) and the access of inhabitants to water. These systems will always be sensitive to water availability, so it is very important to manage water resources appropriately, mainly to ensure water supply in drought periods or heat waves.
This region shows information gaps regarding water resources, a condition that could be generalized nearly across the country. Previously, local entities, water boards, municipalities, irrigation associations, and national authorities made decisions based on qualitative data. This highlighted the need to set up a water governance and planning based on reliable quantitative data for scientifically informed and documented decisions on water resources.



Location of Development Region 13 – Gulf of Fonseca (R13)

The Honduras Water Platform or Territorial Water Governance Programme was implemented in R13GF with SDC support (https://cuencasgolfodefonseca.org). It provides further evidence of the strong partnership approach applied in SDC's portfolio of projects. In this case, partnerships involve: "technicians of the municipal governments, members of local and international NGOs, members of academic entities, technical teams of other SDC-funded programmes and projects (in particular DEIT), members of public and private sector entities, members of social movement agencies , women's networks, representative of indigenous peoples and Afro-descendants and other entities that develop actions linked to the conservation and sustainable use of water resources. Water governance recognises the importance of strengthening both the municipal and national (MyEnvironment and ICF) levels of government linked to water basin management".
With this implementation, 893 micro-basins were covered, in addition to the 1,344 already in the platform. Now, there is information for 2,237 micro-basins, with all the platform's potential available, specifically for the Water Planning Support System (SAPH, in Spanish). This platform combines the information available on climate, soil, hydrometry, and land use/cover with scientific methods to estimate a monthly water balance, thus determining the water availability at the micro-basin level. Thanks to the platform and through local technicians, producers will be able to know – rapidly and free of charge – the location of water sources, characterize water demands and water quality in the micro-basin closest to them, understand how would water availability be affected according to the climate change projections or by changes in land cover. This will allow to make appropriate decisions for production systems to be able to increase their yields, always with an environmentally friendly approach.

H3.2 Mangroves of the Gulf of Fonseca.

Gulf of Fonseca (satellite image by NOAA, 2001).

The dark green coastal strips to the north of the Gulf and relict fragments to the west are mangroves (mostly *Rhizophora mangle*, *Avicennia germinans*, *Laguncularia racemosa* and *Conocarpus erectus*), making mangroves historically dominant over virtually the whole coastline of the Gulf. These mangroves would have supported fishing livelihoods while protecting the coast against storm surges, and a sustainable development project embracing the Gulf would have to involve their protection and restoration. This aspect is missing from the SDC documents on project 7F-09862, and is only a minor feature of 'ecotourism' actions. But despite giving Development Region 13 its name, the Gulf is actually only a small part of R13GF and what happens inland is also crucial to the coastal and marine environment.

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Part J: Acronyms and abbreviations

ACS-USAID	Dry Corridor Alliance Program
AMHON	Asociación de Municipios de Honduras
CANATURGF	Tourism Chamber for the Gulf of Fonseca Region
CATIE	Tropical Agricultural Research and Higher Education Centre
CMCM	Micro-basin Management and Conservation Component
DEIT-Sur	Desarrollo Económico Inclusivo Territorial - Région 13, Golfo de Fonseca
DICTA	Directorate of Agricultural Science and Technology
FEGASURH	Federation of Cattle Farmers in the South of Honduras
GBV	Gender-based violence
GIS	Geographic Information System
HNL	Honduran lempira (HNL 100 = € 3.61 in Dec 2019, € 3.59 in Dec 2021)
IADB	Inter-American Development Bank
INFOP	Institute for Professional Training
MANBOCAURE	Association of Municipalities of Cerro La Botija and El Cerro Guancaure
MANORCHO	Association of municipalities of North Choluteca
MANSURPAZ	Association of Municipalities in the Department of LaPaz
NAMA	Nationally Appropriate Mitigation Action
NASMAR	Association of Municipalities of the South
NOAA	National Oceanographic and Atmospheric Administration (USA)
PRONAGRO	National Program of Agri-Food Development
R13GF	Region 13 Gulf of Fonseca
SICA	Sistema de la Integración Centroamericana (SICA
SURCOMPITE	Economic development program in the Gulf of Fonseca region
ZEDES	Zones for Employment and Economic Development

Annex 13.21: Landscape Fire Management in the Western Balkans

Project highlights.

7F-10341: **Landscape Fire Management Programme in the Western Balkans**. An excellent design and growing regional cooperation to promote community-based landscape fire management to slow degradation of forests so that people, wild species and ecosystems can adapt to new environmental conditions, while safeguarding ecological service functions and reducing the net rate of forest loss and GHG emissions.

Part A: Basic data

A1. Project number & name. 7F-10341: Landscape Fire Management Programme in the Western Balkans

A2. Sources.
Process of PRF development: (a) a draft PRF was prepared using documents listed in the bibliography and with input by SDC interviewees listed in Annex 13.22; (b) the draft PRF was reviewed by the national consultant **Lidija Fajdiga**, who conducted other interviews listed in Annex 13.22; and (c) the PRF was revised in light of field findings.

- **7F-10341: Landscape Fire Management Programme in the Western Balkans (2019-2025)**: www.eda.admin.ch/deza/en/home/projekte/projekte.filterResults.html/content/dezaprojects/SDC/en/2019/7F10341/phase1?oldPagePath=/content/deza/en/home/projekte/projekte.html

A3. Dates & financial data.

- Phase 1 (2019-2025) "Total Budget for Phase I (Jan 2021 – Dec 2024) is estimated at CHF 3,970,655. Operational costs are planned for CHF 3,365,800 with an estimated Executing Agency support (18%) of CHF 504,855 and outside backstopping support to EA of CHF 100,000." (RFMC, 2020: 45).

A4. Location(s). Western Balkans: Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro, Serbia.

A5. SDC Geography. Western Balkans.

A6. SDC Domain. Eastern Europe.
Funds centre: GP CCE.
SDC sector: Climate Change. The SDC project spread-sheet records four actions (.01-.04) variously in the sectors of forestry policy, biodiversity, environmental policy, and disaster risk reduction.

A7. Partners.

- Regional Fire Monitoring Center (RFMC).
- Country Partner Institutions (**Albania**: Ministry of Tourism and Environment; **Bosnia and Herzegovina/Republika Srpska**: Ministry of Agriculture, Forestry and Water Management; **Kosovo**: Ministry of Agriculture, Forestry and Rural Development; **Montenegro**: Ministry of Agriculture and Rural Development; **North Macedonia**: Ministry of Agriculture, Forestry and Water Economy; **Serbia**: Ministry of Agriculture, Forestry and Water Management).
- Programme development partnership between HAFL and SDC (HAFL prepares project document, and helps in identifying and selecting the executing agency, and proposes links between the programme and Swiss research institutions and cantons).

Part B: Purpose, relevance and approach

B1. Purpose.
"Due to a changing climate and unsustainable land use practices, landscape fires have been on the rise in the Western Balkans, while fire management remains generally weak and not adapted for mounting challenges. This initiative will improve capacities in landscape fire management through regional cooperation and strengthen policy and action at national level by articulating the region with multilateral efforts and Swiss know-how and expertise. Local communities, most concerned by landscape fires, will be an integral part of the initiative's approach to facilitate the establishment of long-term strategies for resilient landscapes." (SDC climate change project spread-sheet).

"The current circumstances with the increasing danger due to climate change and change of land use in connection with weak fire protection capacities in the region and insufficient regional coordination are alarming. In order to mitigate the impacts of landscape fires on the environment and society in the six Western Balkan countries, this Programme proposes to create capacities in the region to sustainably manage forest landscapes (prevention, preparedness and suppression), to monitor landscape fire risks at regional and national level and to increase knowledge exchange at regional and international levels." (RFMC, 2020: 7).
Overall goal. To increase the resilience of Western Balkans forests and landscapes against uncontrolled landscape fires to the benefit of the people who depend on these landscapes for their livelihoods and socioeconomic development. "The Programme will also foster on cooperation and policy setting and strategy development in the six countries of the region in order to contribute to the defined national climate change adaptation and mitigation measures as formulated in the NDC of the countries." (RFMC, 2020: 21).

- **Outcome 1: Better Cooperation**. A lasting regional knowledge network on landscape fire management (LFM) contributes to climate change adaptation policies and strategies at national, cross-boundary and international level, based on: (a) national LFM focal points; (b) RFMC as regional cooperation mechanism and knowledge network; and (c) enhanced cooperation between region and the Global Fire Management Center (https://gfmc.online).
- **Outcome 2: Better Capacities**. Capacities are strengthened to allow effective cross-sectoral collaboration for improved LFM at national, regional, and international level within wider landscape approaches, based on: (a) cross-sectoral policy-science-practice interface; (b) knowledge sharing; (c) testing and regional replication of fire prevention, preparedness and suppression measures; and (d) national and regional public awareness campaigns.
- **Outcome 3: Better Policies**. Revised policies and strategies on LFM are in place to support CC adaptation strategies and contribute to sustainable landscape management at national and regional level, based on: (a) regional policy guidelines; (b) adaptation of policy implementation to local circumstances; and (c) CBLFM integrated with sub-regional forest management planning.

B2. Relevance to partners.
Western Balkans:

- Government of **Albania** (2016): sectoral coverage limited to energy and industry (fire and forests not mentioned).
- Government of **Bosnia and Herzegovina** (2020 - see H3.1): fire as a major threat.
- Government of **North Macedonia** (2021 - see H3.2): LULUCF/AFOLU sector as a key mitigation area, participated in Talanoa Dialogue, candidate EU member.
- Government of **Montenegro** (2021 - see H3.3):
  - "Including the LULUCF sector in the target, which has currently not been possible due to the uncertainty of data in the sector. For Montenegro, the LULUCF carries high potential as a carbon sink." (page 1);
  - "Emissions/removals from Land Use, Land Use Change and Forestry (LULUCF) have been estimated in the GHG inventory but are not included in the NDC. This is due to the limited information available on the future development of the LULUCF sector, which is planned to be solved for the next NDC revision." (page 2);
  - "LULUCF: No measures with a realistic chance of being implemented in the coming years have been identified. Therefore, only a BaU scenario has been developed, following the past trend in land use and land use changes, as well as a continuation of the levels of harvesting and forest fires. The LULUCF sector is not part of the target defined in this NDC." (page 11).
- Government of **Serbia** (2017): "Droughts, insect invasions and the occurrence of forest fires have significantly influenced forest ecosystems in R. Serbia. In the long rune, climate change may cause a transformation of entire forest ecosystems, changing the distribution and composition of Serbian forests. By the end of the 21st century, about 90% of today's beech forests will be outside the bioclimatic niches they inhabited in the 20th century and around 50% will be found in the zone where mass mortality is likely to occur." (page 1).

Switzerland. See H3.4 - 'Switzerland: forests and climate'. "Switzerland's activities in the field of sustainable management of forests, grasslands and soil do not only focus on mitigation and adaptation effects, but are also geared towards yielding multiple environmental, economic and social benefits. Natural resources are key for the fight against poverty, especially when forests, grasslands and soils are protected and used as a sustainable source of income for local

communities. Through its bilateral, regional and multilateral development cooperation Switzerland supports multiple sustainable forest management and climate change-related projects".
General. See H3.5. - 'Global fire context'. "Achieving Nationally Determined Contributions (NDCs) under the Paris Climate Agreement would be challenging without improved management of wildfires. Some countries where fires are a significant source of GHG emissions have promised enhancement of forest carbon sinks as a significant climate-change mitigation measure. Many developing countries have included land-use change in their NDCs, but few have noted fires as a source of GHG emissions that they will likely be required to report in the future." (PROFOR, 2020: 10).

B3. Relevance to SDGs. (https://sdgs.un.org/goals)

- **SDG 3: Good Health and Well-Being**, especially Target 3.9 (*By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination especially*) - concerns the respiratory and cardiovascular health effects of particulates pollution.
- **SDG 6: Clean Water and Sanitation**, especially Target 6.5 (*By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate*), and Target 6.6 (*By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes*).
- **SDG 13: Climate Action**, especially Target 13.1 (*Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries*), Target 13.2 (*Integrate climate change measures into national policies, strategies and planning*), and Target 13.3 (*Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning*).
- **SDG 15: Life on Land**, especially Target 15.1 (*By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services*, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements), Target 15.2 (*By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally*), Target 15.4 (*By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development*), Target 15.5 (*Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species*), Target 15.9 (*By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts*), Target 15.a (*Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems*), and Target 15.b (*Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation*).

B4. Relevance to other development objectives.
OECD/DAC: Forestry; Forestry policy and administrative management.

B5. Relevance of the approach in principle to the climate response.
Preliminary assessment in the Inception Phase:
Mitigation: Capacity-based mitigation (CM) for ecosystem-based mitigation (EM).
Adaptation: Capacity-based adaptation (CA) for ecosystem/community-based mitigation (EA).

B6. Relevance/approach within the climate response based on SDC classification.
Rio Marks given in the SDC project spread-sheet:

- **Mitigation**. Rio Marker: SIGNIFICANT (1), but the first of 4 sub-phases is PRINCIPAL (2).
- **Adaptation**. Rio Marker: PRINCIPAL (2).

Part C: Narrative overview

The Western Balkans region comprises six countries of the former Yugoslavia (Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro, and Serbia) which have forest cover ranging from 28% in Albania to 62% in Montenegro, with an average of 47% overall. These forests are increasingly stressed by drought and heat as climate change advances, and in their weakening state are becoming more vulnerable than formerly to insect attack and fire. These and other factors, which include rural abandonment and weak arrangements for planning and

management of forests and fires, both within and between countries, lead to worsening landscape fires across the region. The Landscape Fire Management Programme (LFMP) was developed based on sustained, extensive and inclusive dialogue between the Regional Fire Monitoring Center (RFMC) and national governments and other stakeholders in the region and beyond. It aims to correct key weaknesses in the forest and fire management regime through enhanced regional cooperation, national capacity building, closer links with global and Swiss knowledge-holders and interest groups, and the promotion of community-based landscape fire management (CBLFM). It will be run by an Executing Agency (EA) which will oversee and coordinate all activities in liaison with the RFMC and national partners. The goal is to strengthen the whole forest and fire management system, slowing the degradation of forests so that people, wild species and ecosystems can adapt to new environmental conditions, while safeguarding ecological service functions of intact forests (e.g. in preventing soil erosion, water pollution, landslides and flash floods), and also reducing the net rate of forest loss and emissions of GHGs and particulates from fires. Important gains are thereby possible for both CCA and CCM, health, livelihood and governance co-benefits. The project started only recently so only the design can be assessed, but the design quality is **scored 6** (excellent'), one point less than 'perfect' because of concerns over capacity baselining and legacies of past conflict and genocide.

Part D: Design quality

D1. Theory of change.
Over eight years, "*If facilitation and support is provided appropriately, the required knowledge and information basis is transferred and used, and if international, regional, national and local stakeholders are committed to gain, assume and further develop ownership of the policy and technical processes induced by the proposed three outcomes of the Programme, then the necessary organizational capacities will be in place and institutions strengthened to provide effective, continuous and efficient action for integrated forest and landscape management and control of forest and landscape fire throughout the Western Balkan states*". (RFMC, 2020: 22).
This 'impact hypothesis' integrates a number of conditions (common interests, participatory approaches, policy development, capacity building). "The Programme's desired effect is that different groups of stakeholders involved reach mutually accepted solutions within the proposed time frame of eight years."
"The intervention logic of the Programme on all three levels (national, regional, international) will be characterized by facilitating, promoting, supporting and supervising the activities outlined in the logic framework. Working on national, regional and international levels is crucial to move forward in a coordinated way, where interventions on different levels complement and support each other." In a region where all countries have centralised and/or complex administrative systems, this will be a major challenge and "particular attention must be paid to the coordination of different actions which have to take place simultaneously and on different levels. The LFMP should establish strong and [trusted] networks, [on which it will build] and launch policy dialogues, related to regional concepts to foster better cooperation (Outcome 1) and better capacities (Outcome 2). The Programme will work with pilot activities (LFM lessons learned piloted into the sub-regional forest development plan of Bregalnica and tested) and practical evidence from other cases and feed such structured learning into policy dialogues on regional and national levels." (RFMC, 2020: 27).

D2. Assumptions underlying the theory of change. Extensive consultation, bottom-up and top-down participation, and a generally clear understanding among participants of the risks, vulnerabilities, purpose and need for the activities involved suggest that the assumptions are valid. **Score**: 6.

D3. Plausibility of assumptions and links. See D2. Challenges of cross-border coordination and centralised administrations in three of the countries are recognised. Legacy effects of past conflict are assessed favourably as follows: "In the 1990s, the Western Balkan region suffered from severe conflicts, which ended after intervention by the United Nations and NATO and with the promise of accession to the European Union. In the early and mid-2000s, the prospect of EU accession and the global boom facilitated rapid economic recovery in the region and boosted economic and institutional reforms. However, the global financial crisis of 2007-09 and the European crisis of 2010-13 slowed the pace of economic growth and amplified high unemployment and outwards migration, creating complex political situations and instability in the countries. In addition, various unresolved legacies from past conflicts slowed the pace of reform and progress towards EU accession. More recently, the process of integration was reaffirmed,

and a new dynamic has been installed to solve conflicts amongst WB neighbouring countries, speed up reforms and accelerate economic growth. With the Corona [Covid] pandemic, WB countries face similar new challenges that ask for common political solutions. Climate change and landscape management, including landscape fires, are on the political agenda in all WB countries and are thus best addressed through a regional approach." (RFMC, 2020: 61). But see Risk (d) in E4. **Score**: 6.

D4. General quality of the project design.
The **political ecology** and **political economy** of landscape fire in the region are well explained in RFMP (2020: *Context Addendum*). Issues in LFM and **lessons** from other and previous LFM initiatives are well explored. **Vulnerability** analysis, including disaggregation by poverty, gender, age, disability, minority group, migrants (including IDPs), farmers, with specific measures to promote equity (see intervention level analysis following).

Analysis of intervention levels		
Tiers	**Top-down**	**Bottom up**
National	Concepts for holistic, cross-sectoral national landscape fire management policies and implementation strategies	Pilot / demonstration projects at municipality / communal / forest management unit level
Regional	▪ Guidance for bilateral agreements for transboundary cooperation in landscape fire management ▪ Principles / guidance for multilateral agreements for transboundary cooperation in landscape fire management	Pilot / demonstration projects at municipality level along / across common borders
International	▪ Guidance for multilateral agreements for transboundary cooperation in landscape fire management between regions / multilateral organizations ▪ Development of agreements between regions (Regional Wildland Fire Networks etc.) for inter-regional exchange ▪ Consideration of particular issues affecting fire management in the region (mines) and upscaling of experience internationally	Pilot regional approach in cooperative landscape fire management (based on UN agreements frameworks)

Stakeholders are mapped in some detail, being divided into forest/landscape management, fire preparedness and suppression, and climate change clusters in each of six countries at government level, plus associations of private forest owners (or in Albania communal ones), fire-fighters (variously volunteers and unions, or organised by forest owners in Serbia, but none in Albania or Kosovo), academic institutions (none in Albania or Kosovo), and environmental NGOs. GFMC and Swiss knowledge holders (including potential cantonal links - especially Canton Ticino - and the Swiss Federal Institute for Forest, Snow and Landscape Research) are also specified, as are relevant international organisations (UNECE, FAO, IUCN and others). There is also a network of Aarhus Centres (see H3.6) operating in cities and towns of Albania, Bosnia & Herzegovina, Montenegro and Serbia.
Consultation. The RFMC was established in 2010 and building on 2004-2010 precursor activities "created an atmosphere and spirit of cross-boundary exchange and cooperation in LFM" (RFMC, 2020: 20). An inclusive preparation workshop in Feb 2020 assessed the potential for a regional LFM programme and concluded on the need for enhanced: strategies, policies, laws, and regulations; 'community-based LFM'; early fire detection/warning systems; a regional fire management platform (building on the Macedonian Forest Fires Information System, MKFFIS); public awareness; fire suppression; fuel management strategies across landscapes (forests, orchards, agricultural fields and pastures); science-policy interface on cross cutting issues; and exchanges with regional and international programmes, including experiences in Switzerland. Follow-up included proposals and consultations with the forest/landscape management, fire preparedness and suppression, and climate change clusters in each of six countries at government level (see H3.7).

Risks. Issues in forest management in the region are listed in H3.8 and discussed in H3.9. Identified risks for the project itself include: (a) changes to leadership, political will and institutional staff linked to political transitions; (b) weak state administrative capacity; (c) inability to resolve inter-institutional power struggles; (d) weak and unharmonised procedures for receiving assistance from abroad; (e) lack of effective collaboration at regional level because of historical and/or more recent political tensions between neighbouring countries; and (f) UXO in forest areas. In a region with a history of recent conflict and genocide, these risks seem particularly relevant to a project based on regional cooperation, but the proposed mitigation measures *should* work. Overall conclusion on **design quality**: 'excellent' (score: 6).
Part E: Evidence for strategic effectiveness and system change for mitigation
E1. Strategic effectiveness. Reduced ecosystem fire frequency, extent and damage should contribute to net mitigation through reduced GHG emissions, reduced soot, and reduced net (permanent) deforestation (or increased regeneration). No evidence of performance as yet.
E2. System change. See E1. Transformative potential is considered high because of the ecosystem-oriented, holistic and regional nature of the intervention, which should reduce system-wide GHG emissions.
Part F: Evidence for strategic effectiveness and system change for adaptation
F1. Strategic effectiveness. Enhanced ecosystem protection should improve environmental security by preserving catchment functions and fire-resistant microclimates and biomes. No evidence of performance as yet.
F2. System change. See E2. Transformative potential is considered high because of the ecosystem-oriented, holistic and regional nature of the intervention, which should improve system-wide environmental security.
Part G: Other aspects of design and performance
G1. Efficiency issues. No evidence as yet.
G2. Coherence issues. Close working relationships and maximum synergy will be sought with other development partners working in the region, including those that focus on: (a) forest landscape restoration (IUCN/UNECE initiative and ADAPT Programme of UNFCCC/adaptation Programme); b) new EU Green Deal initiatives (which targets climate neutral Europe by 2050 and focusing on forests as sinks, its restoration and conservation potential), and EU-financed Programmes in the land and forest sector; and (c) World Bank forestry initiatives in the region, on the topic of forest fire management, including two concrete collaborative efforts (i.e. a JICA initiative to replicate the MKFFIS early warning and information system on forest fires, and the Interreg Balkan-Mediterranean Forest Monitoring System for Early Fire Detection and Assessment in the Balkan-Med Area, SFEDA). (RFMC, 2020: 44-45).
G3. Replicability issues. Explicit links with GFMC suggest that the programme will contribute to the global knowledge holding on CBLFM and hence to replication of CBLFM approaches. Regional collaboration on FLM is a necessary growth area in conditions of climate change in other locations (e.g. ASEAN, Central America), but promoting effective regional collaboration on environmental management is notoriously hard to do and effective models can therefore be influential if promoted e.g. through south-south linkage.
G4. Partnership issues. The whole programme is partnership based, so the quality of those partnerships will be a necessary focus for evaluation going forward. The logframe is well supplied with baselines and targets for the *number* of agreements, staff, workshops, expert reports, public awareness campaigns, policy guidelines, CBFLM and regional forestry integrated plans, and challenge funds, but gathering evidence to support judgements on the *quality* of all these (and the impact of their consequences) will be necessary.
G5. Connectedness issues. The Western Balkans are important in the European context in terms of security, stability, trade and transit routes. The importance of this transit route was demonstrated during the 2015-19 refugee crisis, and may be again from 2021 in view of events in Afghanistan. Furthermore, Western Balkan economies are closely associated with the EU and Switzerland. Switzerland constitutes, besides the EU, the most important trade partner, one of the important sources of incoming foreign investment and other financial flows and was and still is one of the main destinations for outward migration. The countries' economic and political

prospects and their future within a European framework is one of the top priorities for EU and Switzerland.

G6. Cross-cutting themes. Elaborate attention is given to gender equity and social inclusion in the programme document, which is a persistently challenging issue in the Balkans (see H3.10 for gender, H3.11 for Roma).

G7. Capacity building issues. "The Programme supports connectors through knowledge exchange, common capacity building, defining jointly agreed policies on provide tools and means for landscape management with particular view on managing forest and landscape fire under changing conditions." (RFMC, 2020: 19). The whole approach is oriented to building capacity, in the sense of correcting weak capacities for fire protection, fire suppression and regional coordination, but these capacities are not explicitly baselined and nor are the specific measures to correct them identified or progress indicators defined.

Part H: Other matters arising from the review

H1. Follow-on questions. Not applicable.

H2. Missing documents. Not applicable.

H3. Other analyses, evidence, perspectives, etc. that may shed light on or be useful to the evaluation.

H3.1: Bosnia and Herzegovina: climate change impacts and vulnerabilities.
The sectors that are most vulnerable to climate change in Bosnia and Herzegovina include: agriculture, water resources, forestry, energy, tourism, biodiversity and sensitive ecosystems, and human health. The most vulnerable sectors are agriculture and water resources management. The biggest impacts are reflected in the risks of drought, floods and fires. Drought has been one of the most significant threats to Bosnia and Herzegovina in the past period, causing great economic, environmental and social costs. Extremely high temperatures and heat stress are some of the biggest problems in agriculture, especially in the sub-Mediterranean part of Bosnia and Herzegovina. This problem has been particularly present in the last two decades, with the major impact on fruit, vegetable and wine production. In 2012, Bosnia and Herzegovina experienced a prolonged period of severe drought, causing losses in agricultural production of about BAM 1.65 billion [1 euro = 1.95583 BAM, Oct 2020], grain and vegetable yields were reduced by about 70%, and energy production was reduced by about 25%. Forecasted changes in precipitation amounts and air temperature will negatively affect the current water resources management system in Bosnia and Herzegovina. Changes can be expected in terms of time of occurrence, frequency and intensity of extreme events – floods and droughts. The largest increase in air temperature is predicted during the growing season (June, July and August), and a slightly milder increase during March, April and May, which will result in increased evapotranspiration and more pronounced extreme minimums of water levels on watercourses. This will result in reduction in the availability of water resources in the growing season when the needs are the highest, in terms of water quantity, but also quality, because in low water periods the potential and real danger of significant degradation of water quality increases. A significant increase in air temperature during the winter season (December, January and February) will result in a decrease in snowfall, that is, a decrease in flow in most watercourses during spring months. On the other hand, the expected more frequent precipitation of higher intensity will cause more intense runoff, often followed by floods. According to the data from the document Recovery Needs Assessment in [Bosnia and Herzegovina], which was developed with the help of the EU, UN and WB, it is estimated that the total consequences of major floods that occurred in May 2014 in Bosnia and Herzegovina amount to BAM 3,982 million, that is, BAM 2,033 million in the Federation of Bosnia and Herzegovina, BAM 1,893 million in Republika Srpska and BAM 58 million in the Brčko District of Bosnia and Herzegovina. (Government of Bosnia & Herzegovina, 2020: 2-3).

H3.2: North Macedonia: adaptation planning.
"The Republic of North Macedonia plans to develop a National Adaptation Plan (NAP) based on nexus approaches in following areas: water, food, energy, health, biodiversity, tourism, forestry, disaster risk reduction, loss and damage, built in infrastructure. The NAP will incorporate cross-sectorial and sector-specific adaptation actions and measures, along with identified adaptation investment priorities based on the review of national and sectorial development policies and plans, and the outcomes of an extensive consultation process, including stakeholders from all sectors and levels of governance, climate-related institutions and agencies, along with private

sector, civil society, academia and women associations and youth NGOs representatives. In addition, the climate change adaptation component will be included within the Disaster Risk Reduction Strategy which is prepared in line with the Sendai Framework for Disaster Risk Reduction. Therefore, the Republic of North Macedonia could include Adaptation component in the subsequent NDC as the mentioned strategic documents would be able to inform it." Government of North Macedonia (2021: 24).

H3.3: Montenegro: adaptation planning.

"In the first half of 2021 the Government of Montenegro (GoM), in cooperation with United Nations Development Programme and Green Climate Fund, initiated the project: “Enhancing Montenegro’s capacity to integrate climate change risks into planning”. The project focuses on improving Montenegro’s institutional capacity for long-term adaptation planning, initially focusing on improving the coordination framework and building the capabilities of those involved in the CC and CCA coordination framework. Then, as the coordination framework is strengthened, actions will be taken to improve the information base by determining climate risks and identifying appropriate measures – investments, projects and programmes. Relying on consultations conducted with national stakeholders and a stocktaking exercise to inform the development of an adaptation process and preparation of the project 'Enhancing Montenegro’s capacity to integrate climate change risks into planning', the GoM concluded that water, agriculture, tourism and health were the initial sectors that the GoM would like to focus on and these have remained priority intervention sectors to this date. The identified sectors were prioritized due to their importance in Montenegro’s development and their high level of vulnerability. An overview of these and additional sectors is presented below:

- **Water sector**: The adaptation activities are focused more on the water sector, as it is most vulnerable to droughts, heavy rains and a high intensity of precipitation. Due to the observed and projected drought, Montenegro can expect a reduction in gross revenues from hydroelectricity sales, and pressure on water use in the summer as a consequences of the higher population density in the coastal region and tourism.
- **Infrastructure & transport**: Adaptation activities in infrastructure to resist extreme heat or precipitation will also promote a modal shift towards a lower fossil fuel intensity in the transport sector.
- **Agriculture**: The mitigation co-benefits of adaptation actions in agriculture are: the enhancement of carbon sinks by an increase in resilient species in areas vulnerable to forest fires; development of micro-reservoirs; the use of renewable energy for cooling and heating; harvest storage; and changes to food processing.
- **Soils**: Actions carried out to prevent soil degradation (e.g. in the CAMP project) reduce land degradation with green-belt barriers and thereby contribute to increasing carbon sinks.
- **Forestry**: Activities, such as the strengthening of the forestry infrastructure and the monitoring of logging, are also contributing to an increase in carbon sinks.
- **Energy sector**: The mitigation co-benefits of adaptation in the energy sector are linked to renewable energies, and accordingly to a decrease in fossil fuel consumption. Also improvements to insulation will reduce the consumption of electricity and wood for heating and decrease cooling needs.
- **Tourism** in Montenegro has increased substantially in the last decade with notable increases in the number of visitors and investments in the tourist infrastructure. As such, tourism has become one of the main sectors of the economy. A report from the World Tourism and Travel Council (WTTC), which analyses and ranks the impact of tourism on GDP, employment, exports and investment, and covers 184 countries, estimated that tourism will make up 28% of GDP by 2028. As such, and in accordance with the GoM’s commitment to sustainable development and environmental protection, the concept of the development of green/responsible tourism on the principles of low-carbon development is considered vital and adaptation measures must be taken to protect this sector.
- Good **public health** depends on safe drinking water, sufficient food, secure shelter and good social conditions, which may well all be affected by a changing climate – and these are particularly important in the context of economies in transition, such as Montenegro’s. It is important to consider that climate change could affect the capacity of health services to deal with emergencies. Adaptation measures in the health sector should focus on the strengthening of existing institutional capacities, information dissemination, resilience of health infrastructure, and monitoring systems to better understand the impacts of climate change on human health in Montenegro.

"Some climate mitigation measures, such as the refurbishment of the coal power plant in Pljevlja and the technological improvements in the aluminium production facility will have substantial co-benefits for the reduction of air pollutants. These co-benefits have not been quantified yet. But as a first step, the GHG and air emission inventory are being prepared in parallel, which thereby ensures consistency among the inventories." Government of Montenegro, 2021: 4-6).

H3.4: Switzerland: forests and climate.

"Agriculture, forestry and other land use contribute 24 per cent to total global greenhouse gas emissions. 9.5 to 10.0 per cent of total global emissions are due to land use change and forest cover loss (IPCC, 2014). By absorbing and storing CO_2 from the atmosphere, tropical forests are therefore of critical importance in mitigating climate change. In addition, stronger ecosystems often provide important climate adaptation benefits for livelihoods and hazard protection. However, Switzerland's activities in the field of sustainable management of forests, grasslands and soil do not only focus on mitigation and adaptation effects, but are also geared towards yielding multiple environmental, economic and social benefits. Natural resources are key for the fight against poverty, especially when forests, grasslands and soils are protected and used as a sustainable source of income for local communities.

"Through its bilateral, regional and multilateral development cooperation Switzerland supports multiple sustainable forest management and climate change-related projects, such as:

- **Forest Carbon Partnership Facility**: Through the Forest Carbon Partnership Facility at the World Bank, Switzerland supports the development and piloting of REDD+ and thus preparations for a results-based payment scheme to sustainably manage and protect forests as important carbon stocks and sinks. Apart of the financial contribution, Switzerland supported the development of Carbon Fund activities with relevant expertise.
- **Andean Forests Programme ('Bosques Andinos')**: Andean forest ecosystems are fragile landscapes and particularly vulnerable to the combined effects of climate change, deforestation and forest degradation. At the same time, forest ecosystems potentially contribute to climate change mitigation, restoration of key ecosystem functions and reduced vulnerability of the people living in forested landscapes. In spite of their paramount im-portance for both human development and ecosystem stability, the Andean forests do not yet receive the necessary attention and recognition in national and international policy processes. Changing this situation is the declared goal of the Andean Forests Programme, which highlights the role of Andean montane forests for adaptation and mitigation of climate change and promotes knowledge development to address information gaps that prevent a more robust set of policies to ensure sustainable management and conservation of the mountain forests. The programme seeks to spark regional political interest in the conservation of Andean forests and shares the experiences made at the global level.
- **Macedonia Nature Conservation Programme**: Switzerland assists Macedonia in the sustainable management of natural resources through practical application of conservation measures such as regional protected areas and integrated forest management in the Bregalnica region. Furthermore, framework conditions are improved and support is provided in implementing national legislation and the Strategy on Nature. By promoting ecologically and sustainably produced products and services, economic benefits for the local population are generated. The aim of the project is to safeguard the natural values and to promote socio-economic development that is sustain- able and inclusive in the Bregalnica region.
- **Support to Forestry and Fisheries Communities in Cambodia**: Switzerland contributes to the initiative Partnership for Forestry and Fisheries implemented by a consortium of four non-governmental organisations, led by WWF Cambodia. The programme supports rural communities to secure their access to forestry and fishery re- sources, to improve income and food security through enhanced production practices, and to advance public dialogue on sustainable natural resource management in four least-developed provinces in the northeast of Cambodia. The aim of the project is to increase the incomes of rural and indigenous communities and households and to improve their resilience to economic and natural shocks by engaging in sustainable community-based livelihood approaches that protect their ecosystems and reduce pressure on their communal natural resource base." (Government of Switzerland, 2020: 128-129).

H3.5: Global fire context

"Worldwide, fires burn an area about the size of the European Union every year (423 Mha yr-1; Giglio *et al*., 2018). The majority of burned area occurs in grasslands and savannas where fires maintain open landscapes by reducing shrub and tree cover (Scholes and Archer, 1997; Abreu

et al., 2017). However, all major biomes burn. Climate controls global patterns of fire activity by driving vegetation productivity and fuel build up as well as fuel moisture (Bowman *et al*., 2009). Humans are the dominant source of ignitions in most flammable ecosystems, but human activities also reduce fire sizes through landscape fragmentation and fire suppression (Archibald *et al*., 2012; Taylor *et al*., 2016; Balch *et al*., 2017)."
'The Western Balkans (WB) ... is one of the most affected regions in Europe by landscape fires. ... The damage caused by LFs in the last ten years is estimated more than 500 M Euro. But considering that this amount includes mainly wooden mass lost and partially extinguishing fees, without post fire management activities, it is realistic to account about 1 billon euro damage caused by LFs. Apart of this, it is very difficult to measure and calculate the costs related to loss of ecosystem services (i.e., biodiversity protection, water cycle regulation, supply of recreational areas, soil protection, carbon sequestration, etc.). The magnitude of these costs and damages can be presumed through the fact that the accumulated total area burned by uncontrolled landscape fires in the WB region only in 2017 was about 215,000 hectares, and in the period of 2011-2018 about 683,000 hectares (3.5% of the total WB area and 7.5% of the total forest area). The outbreak of many insects (i.e. bark beetles) and diseases in the WB forests, besides with climate change, is closely related with LFs. Apart the direct negative influence of the LFs to ecosystem services they are a as well a significant source of Carbon emission. The annual Carbon emission from LFs in WB, in Teragrams (Tg [= Mt]) Carbon, for the period 1997-2016 is 6.31 Tg. [6.31 Mt]" (RFMC, 2020: 7).

H3.6: The Aarhus Convention.
"The UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters was adopted on 25 June 1998 in the Danish city of Aarhus (Århus) at the Fourth Ministerial Conference as part of the 'Environment for Europe' process. It entered into force on 30 October 2001. It establishes a number of rights of the public (individuals and their associations) with regard to the environment. The Parties to the Convention are required to make the necessary provisions so that public authorities (at national, regional or local level) will contribute to these rights to become effective. The Convention provides for:

- **the right of everyone to receive environmental information** that is held by public authorities ('access to environmental information'). This can include information on the state of the environment, but also on policies or measures taken, or on the state of human health and safety where this can be affected by the state of the environment. Applicants are entitled to obtain this information within one month of the request and without having to say why they require it. In addition, public authorities are obliged, under the Convention, to actively disseminate environmental information in their possession;
- **the right to participate in environmental decision-making**. Arrangements are to be made by public authorities to enable the public affected and environmental non-governmental organisations to comment on, for example, proposals for projects affecting the environment, or plans and programmes relating to the environment, these comments to be taken into due account in decision-making, and information to be provided on the final decisions and the reasons for it ('public participation in environmental decision-making');
- **the right to review procedures to challenge public decisions** that have been made without respecting the two aforementioned rights or environmental law in general ('access to justice')." (EC Environment, 2021).

H3.7: Climate change and LFM (Nikolov, 2020).
Final conclusions of the 2020 workshop attended by 50 representatives of relevant institutions from Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, Serbia, GFMC and SDC:

- There is a need for revision of laws and national landscape fire protection systems across the region (using the regional good practices, European experience on institutional harmonization and system integration).
- There is a need for better cross-border cooperation to deal with landscape fires and climate change (exchange of information, joint projects and planning, training, exercises).
- To define the status of the rural abandoned land (agricultural land, pastures etc.) in terms of landscape fire management, since the issue of abandoned land is recognized as an important and significant in all aspects (definition, legal i.e. property rights, land cover changes, ecology, fire potential, institutional competence etc.).

- Due to Regional rural exodus there is a need to create new approaches for landscape fire management (especially in fuel management and fire suppression in places where the population has moved out) – a regional problem – immediate and long-term measures.
- Related with the previous conclusion and the fact that the stubble and agricultural waste burning is one of the major cause of landscape fires there is a need of change in approach and strategy on their burning.
- There is a need for establishment of a regional landscape fire early warning system as a precondition for fire prevention, preparedness and efficient fire suppression (using the experiences of the existing Macedonian Forest Fire Information System – MAKFFIS).
- There is a need for development (in collaboration with the local government) of way for an active involvement of the civil society in the landscape fire protection using the 'community based landscape fire management' approach.
- There is a need for improvement of the collaboration between fire fighters from the forestry sector and professional fire fighters at municipality level in order to ensure a prompt and efficient fire suppression.
- There is a need for well organised volunteer fire protection organizations as a way of civil society engagement.
- To organise activities to exchange good practices on all stages (prevention, preparatory/pre-suppression and suppression) on landscape fire management is also crucial.
- With aim climate change and landscape fire management be properly treated there is a need for adaptation of the management plans and work techniques in all land management sectors (especially forestry and agriculture).
- There is lack of specialized fire trucks and other equipment and tools.
- There is a need for valorisation of forest functions/services, and its inter-relations with investments in protection of forests, including on landscape fires protection.
- There is a need for regional scientific projects in terms to climate change and landscape fire management with involvement of the practice and real problems.
- There is a need for stronger cooperation with international organizations (GFMC, RFMC etc.) and using their knowhow and capacities.

H3.8: Issues in landscape fire management (LFM) in the Western Balkans.
These show the complexity and multisectoral nature of the challenge, and the need for stronger regional cooperation on this issue (RFMC, 2020: 13-14):

- **Institutional set-up**: complex institutional set-up with unclear responsibilities.
- **Rural abandonment**: lack of fuel management, fuel loading, increase of wasteland and unclear LF management responsibility.
- **Cross border fires**: no monitoring and assessment, lack of regional cooperation.
- **Forest management**: lack of inclusion of climate change adaptation in forest management planning.
- **Agricultural burning**: main cause of LF ignition in the whole region when uncontrolled.
- **Access into forest areas (road net)**: insufficient road infrastructure into forest areas.
- **Illegal land use**: illegal logging, illegal landfills raising the risk of LFs and source of ignition.
- **Early warning system**: missing early warning system or inefficient use; lack of transboundary cooperation.
- **Unexploded ordnance (UXO)**: contaminated land, missing mapping of the locations, fire management with high risks.
- **Firefighters**: lack of volunteer and professional firefighters, lack of young people in rural areas.
- **Training**: lack of special LF-fighting training.
- **Equipment**: insufficient equipment for combating LFs.
- **Research**: missing research concerning LF measures and impact.
- **Awareness**: lack of LF awareness in the population and political / authority level.

H3.13: Interview with Marco Conedera, Head of Research at the Swiss Federal Research Institute for Forests, Snow and Landscape, WSL (Laukenmann, 2021).
Which factors are responsible for the current fires in southern Europe?

- When people and infrastructures are affected , it's always tragic. The pictures speak for themselves. But you also have to say: Southern Europe is a fire area. Fire is part of the cycle of nature there. Due to the climatic situation, there is a wet period there in winter and a dry period in summer. The vegetation grows due to the water in winter. When it is dry in summer,

this vegetation automatically becomes incendiary. How these two elements - growing vegetation and summer drought - interact is a little different every year.

According to the European Forest Fire Information System, this year is not yet extreme: In 2017, more than three times as much area burned down in southern Europe as this year.

- One still has to be careful with the classification of the current situation. The year is not over yet. You have to look at that in retrospect.

In 2017 Portugal was affected, now more Greece.

- Many eucalyptus trees had been planted in Portugal. When a fire comes, they are literal torches. In general, traditional agriculture, i.e. extensive olive groves and grazing with sheep and goats, has been abandoned more and more in the Mediterranean region. The well-tended landscape from earlier was laid fallow , so it became richer in biomass, which in the end is very flammable fire material. Many settlements and infrastructures are surrounded by wild vegetation. Often there is no longer a buffer zone. It has also become more complicated to control the fires in extreme weather conditions.

This is also shown by the pictures: Infrastructure, residential buildings, industry, even a coal-fired power station are often affected.

- There is a technical term for this: 'wildland-urban interface', or WUI for short. The WUI describes the interface between forest and infrastructure. In some countries, such as Australia, the WUI is already being used in the planning of infrastructures in order to reduce the risk of fires.

Why not do that in the Mediterranean?

- When it's hot, people want shade. There are tall trees in the garden. You see that not only in the Mediterranean, but also in California. But that's a trap. The vegetation draws the fire into the residential areas and holiday resorts. Most people are not aware of this.

Is there a rethink here?

- A new industry is emerging that assesses such dangers at the interface between vegetation and infrastructure and warns people if, for example, a fire could easily spread to the roof of a building.

If you look at the mountain villages or the Maiensäss in Switzerland, especially in Ticino, then they are usually surrounded by a strip of greenery. Was it created as a buffer zone against forest fires?

- The meadows were mainly created to make hay. But they have the side effect of fire protection for the villages.

The long-term statistics on the area of fire show that this has decreased worldwide in the last few decades, including in southern Europe. How can this be explained?

- This has to do with fire bans on the one hand, and better fire fighting on the other. There are more fire fighting planes and helicopters available. In addition, the fire brigades are better trained tactically. In this way, the burned area can be kept smaller. At the same time, however, there are indications that the fires in southern Europe will be more violent. Southern Europe is thus a good example of the fire paradox: the less it burns, the more violent and uncontrollable the fires. This paradox was recognized after the devastating Yellowstone forest fire of 1988.

How did that happen?

- In the years before 1988, the fires in the national park had been suppressed for a long time. It was not understood that fire was part of the ecosystem. Then, in the hot summer of 1988, lightning strikes triggered several fires. The whole system practically exploded. Then you understood: you don't have to fight against nature. Because fire is part of nature. You have to work with fire.

Does that also mean that you should set fire specifically?

- Yes. It's a tradition in Scandinavia, and it has been done in the US for some time. Discussions about the controlled use of fire are just beginning in southern Europe. This is a current research area there.

Do you burn down the forest and the maquis when it's not so dry and not storming?

- Exactly. If the soil and the lower shrub layer are still moist, but if it is already beginning to dry out, forest areas can be burned down piece by piece in a controlled manner, taking safety measures into account, without endangering people and infrastructure. The only real downside is the build-up of smoke. You can't avoid that. But when the fire season starts, less biomass is available. The risk of large, uncontrolled fires is lower.

Do you start preventive fires in Switzerland too?

- In Switzerland this is not absolutely necessary in order to reduce the amount of fire. In contrast to the maquis in southern Europe, our forests are mostly cultivated. Preventive fire is still discussed as a training object for the fire brigade or as a biotope maintenance. When it comes to fighting fires, we rely more on a prediction of the prevailing fire hazard, on fire bans in the event of a high risk, and on a quick response from the extinguishing system. In Ticino, for example, we have an agreement with the helicopter companies: In the event of the highest risk of fire, they guarantee that the helicopter is ready for take-off within 15 minutes.

Why does it have to be so fast?

- Because a fire spreads exponentially. Every minute counts. And in Switzerland we cannot afford to have entire valley basins burn down. Because here the great danger is not the fire itself, but the erosion, rockfalls and landslides that heavy rain can trigger even years after a fire.

How do you manage to extinguish quickly high up in the mountains?

- In addition to the readiness of the fire fighting teams in the event of the highest fire risk, extinguishing pools in the mountains are important. Because a helicopter has trouble transporting water from the bottom up. However, it can move water back and forth very quickly at the same height. Graubünden has a plan where extinguishing tanks are to be built in the near future, and Ticino is in the process of building the last tanks.

According to the current report of the Intergovernmental Panel on Climate Change (IPCC), climate change has intensified so-called fire weather - a combination of hot, dry and windy - since 1950. In the event of further warming, fire weather will continue to benefit.

- It is a fact that climate change is moving in this direction, i.e. to more frequent and more extreme dry phases, especially in the Mediterranean region. But it is almost impossible to say: at the moment we are seeing the consequences of climate change in the fires in southern Europe. Already in the past there were extreme years with many big ones. Given [that] fires [occur], the strong fluctuations from year to year make it difficult to clearly recognize the handwriting of climate change. At the moment, humans and forest fire management certainly have a greater influence on fires.

So humans are the main factor behind the fires?

- In the Alps and partly in the Jura, fires in summer can also be triggered by lightning when it is dry, especially when combined with coniferous wood on hilltops. This is rather rare in the Mediterranean region. We estimate that 95 percent of the fires in southern Europe are man-made. This happens either indirectly, for example through short circuits in high-voltage lines, or directly, be it intentionally through arson or negligence.

H3.10: Gender equality in the Western Balkans.

"Achieving gender equality in the Western Balkans (WB) countries has been a continual challenge. The objective of EU membership has had a positive impact, in that the WB candidate and potential candidates have largely adopted and amended relevant legislation, now broadly in line with the highest EU and international standards. However, in practical terms, significant limitations remain: gender equality is generally pushed down the agenda, with attention going mainly to the economic and political situation. Women have also been largely excluded from post-war rebuilding processes and from redress as victims of sexual violence. Besides, the low level of implementation of existing laws prevents women from experiencing change and immediate results in their everyday life. According to a 2017 report for the UK's DfID, the biggest challenge for improving gender equality is changing the mentality of both women and men towards traditional gender roles. A 2018 publication by the Friedrich Ebert Stiftung states that the main challenges to gender inequality in the region persist: namely feminised poverty; insecurity in the labour market; a growing share of unpaid care work; wide gender pay and pension gaps; uneven progress on tackling harassment and violence; ensuring access to health, sexual and reproductive rights; and paid maternal and family leave. It also depicts women as *'chronically underrepresented in virtually all facets of public life, including in the region's EU Member States*'. A 2018 policy brief by the Civil Society Forum of the Western Balkan Summit Series further mentions lack of gender mainstreaming among the most pressing challenges that women face in those countries. Although recognised as a necessary tool to improve gender equality, gender mainstreaming has not been widely applied in the region, nor prioritised by the relevant national authorities. The paper also recognises that gender stereotypes are an

underlying cause for almost all other forms of discrimination and a reason for the persistently subordinated position of women." (Lilyanova, 2018).

H3.9: Roma Exclusion in the Western Balkans.
"The Roma are the largest ethnic minority in Europe, as well as one of the most deprived and socially excluded groups. Because of the lack of high-quality data, research on Roma inclusion to inform evidence-based policies is scarce, and accurate data on programs implemented in the Western Balkans are needed. This report aims to fill this knowledge gap and inform policy making by relying on data from the 2011 and 2017 rounds of the Regional Roma Survey (RRS), the most comprehensive survey to date on living conditions and human development outcomes among marginalized Roma households in the Western Balkans, as well as non-Roma neighbouring households. The results show that marginalized Roma in the Western Balkans do not have the endowments and assets they need nor the ability to use the assets they have efficiently and intensively to generate economic gains and climb the socioeconomic ladder. Gaps with respect to non-Roma neighbours are especially wide in education and labour markets, and, in general, there is generally little improvement between the two survey years in access to services and economic opportunities. The report provides policy directions, highlighting gender and discrimination as cross-cutting policy areas. It also suggests a pragmatic approach towards generating evidence-based policies through better monitoring and evaluation and collection of ethnically-disaggregated administrative data. Finally, a comprehensive and integrated lifecycle approach is also encouraged. (Robayo-Abril & Millan, 2019).

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Part J: Acronyms and abbreviations

BAM	Bosnian Mark
CBD	Convention on Biological Diversity
CBLFM	Community-based landscape fire management
CFP	Country Focal Point
CoE	Council of Europe
COVID-19	Coronavirus Disease 2019
CPA	Country project assistant
CPI	Country Partner Institution
CSOs	Country Stakeholder Organisations
DRR	Disaster Risk Reduction
EA	Executing Agency
EC	European Commission
ECCA-30	Regional initiative to bring 30 million hectares of degraded and deforested land in Europe, the Caucasus and Central Asia into restoration by 2030
EUR-OPA	European and Mediterranean Major Hazards Agreement is an Open Partial Agreement
FAO	Food and Agriculture Organisation
FOEN	The Federal Office for the Environment
GDP	Gross domestic product
GFMC	Global Fire Management Center
GPCCE	Global Programme Climate Change and Environment
GWFN	Global Wildland Fire Network
HAFL	*Hochschule für Agrar-, Forst- und Lebensmittelwissenschaften*
IFRC	International Federation of Red Cross and Red Crescent Societies
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
JEU	UNEP/OCHA Joint Environment Unit
JRC	Joint Research Centre
LFM	Landscape Fire Management
LFMP	Landscape Fire Management Programme in the Western Balkans
LFs	Landscape fires
MKFFIS	Macedonian Forest Fires Information System
NATO	North Atlantic Treaty Organization
NDCs	Nationally Determined Contributions
OSCE	Organization for Security and Co-operation in Europe
RCC	Regional Cooperation Council
RCP	Representative Concentration Pathway
RFMC	Regional Fire Monitoring Center
SC	Steering Committee
SDC	Swiss Agency for Development and Cooperation
SVC	Sendai Framework Voluntary Commitments
Themis	Themis Informal Network http://themisnetwork.rec.org/

UNFCCC	United Nations Framework Convention on Climate Change
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNDRR	UN Office for Disaster Risk Reduction
UNECE	United Nations Economic Commission for Europe
UNECE/FAO	The joint UNECE/FAO Forestry and Timber Section
USFS	United States Forest Service
UXO	Unexploded ordnance
WB	Western Balkans
WMO	World Meteorological Organization
WSL	Swiss Federal Institute for Forest, Snow and Landscape Research