Final Report

External evaluation of the RIICE partnership

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Content

List of figures

List of tables

List of text boxes

List of acronyms

AICI – Agricultural Insurance Company of India

CARDI - Cambodian Agricultural Research and Development Institute

CTU – Can Tho University, Viet Nam

DCERD – Dept. of Cooperative Economy and Rural Development (Viet Nam)

DPS – Department of Planning and Statistic (Viet Nam)

ICRISAT – International Crops Research Institute for the Semi-Arid Tropics

IRRI – International Rice Research Institute

GDA - General Directorate of Agriculture (Viet Nam)

GIS – Geographic Information System

GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH

MAFF – Ministry of Agriculture, Forestry and Fisheries (Viet Nam)

MARD – Ministry of Agriculture and Rural Development (Viet Nam)

MEF – Ministry of Economics and Finance (Cambodia)

NIAPP – Viet Nam International Institute of Agricultural Planning and Projection

OECD-DAC – Organisation for Economic Cooperation and Development – Development Assistance Committee

PCIC – Philippine Crop Insurance Corporation

PhilRice – Philippine Rice Research Institute

PMFBY - Pradhan Mantri Fasal Bima Yojana (crop insurance scheme in India)

PPP – Public Private Partnership

PRiSM – Philippine Rice Information System

RIICE - Remote sensing based Information and Insurance for Crops in emerging Economies

SAR – synthetic-aperture radar

SDC – Swiss Development Cooperation

TNAU – Tamil Nadu Agricultural University

ToC – Theory of Change

ToR – Terms of Reference

1 Background and objective

1.1 What is the evaluation all about? The evolution of the RIICE partnership

In this evaluation, we are looking at a collaborative project called “Remote sensing-based Information and Insurance for Crops in Emerging economies” (RIICE). The principal beneficiaries are smallholder rice farmers and actors in the rice value chain in Asia. The partnership brought together partners from public development cooperation (SDC, GIZ), technology partners (sarmap, IRRI) as well as insurance companies (AllianzRe, SwissRe, SCOR) in order to provide better information about rice farming and, on this basis, insurance to small rice farmers, based on satellite data. The partnership was initially implemented in six countries: Bangladesh, Cambodia, India, Indonesia, the Philippines, Vietnam and Thailand. Since Bangladesh, Indonesia and Thailand were not included in phases II or III, the evaluation is focusing on Cambodia, India, the Philippines and Viet Nam.

As per the initial agreement between the involved parties, the partnership aimed at reducing the vulnerability of rice smallholders by:

1. configurating a cheap and better information system and
2. setting-up new rural advisory services like micro-insurance schemes. (Agreement, 2011: p. 14)

RIICE was implemented in three phases:

- *phase 1* (September 2012 to April 2015)
- *phase 2* (May 2015 to June 2017 with an extension from July 2017-July 2018)
  phase 3 (August 2018 to December 2021)

The constellation of partners involved changed over time. The initial partnership consisted of SDC, GIZ, sarmap, IRRI and Allianz. GIZ left the partnership by the end of 2019. AllianzRe terminated their engagement in the partnership at the end of phase 2 in June 2017. SwissRe joined formally in July 2017, but took part in activities since January 2017. SCOR came on board for the insurance development in Cambodia when SwissRe did not provide the required support.

As per the initial Agreement (2011: p. 1f.), the responsibilities of the different parties were:

- SDC, besides its financial contribution, supports politically and institutionally other parties. It facilitates the relations with the relevant ministries in the target countries and seeks synergies with its other agricultural and insurance programs. In both Viet Nam and Cambodia, SDC was also in charge of ensuring operational implementation.
- sarmap builds and provides a remote sensing software product and services (training, workshops and technical trainings) pertaining to the generation of data for risk assessment and

earth resource management.[1] sarmap is responsible for the consortium and the allocation of the financial resources to the three other members (IRRI, Allianz Re; GIZ).

- IRRI provides a rice crop growth model and works with regional partners to put the system running at national levels.
- Allianz Re develops agricultural insurance solutions based on information provided by sarmap, IRRI and GIZ together with national partners.
- GIZ provides technical assistance in establishing agricultural insurance schemes in selected project countries based on data provided by IRRI, sarmap and Allianz.
- National partners, as defined at the outset of RIICE, are national agricultural institutes in the Philippines, Vietnam, Thailand, Cambodia, Bangladesh, Indonesia and India (Agreement, 2011: p.16). National insurance partners were to be selected at a later stage.

With regards to the budget, SDC was core donor; BMZ through GIZ and IRRI provided additional funds or in-kind contributions. Payments to project partners originated from SDC and sarmap. Further contributions came from SDC's private partners: sarmap, Allianz and SwissRe.

1.2 Why evaluate? Purpose and scope of the evaluation

As per the Terms of Reference (May 28, 2021), the reason of this evaluation is "to realize a final global assessment / review of the overall RIICE partnership and project from different angles".

These angles are:

- Confirming or revising the main **successes and failures** with regards to the goals and objectives defined for the whole project and adjusted at each of the three phases. Identifying successful unplanned side effects or outreaches in general and for the participating parties to RIICE and the continuation of this approach and technology beyond the project finalisation.
- Analysing the strengths and weaknesses in terms of **promoting technological innovation and fostering institutional changes**.
- Analysing the strengths and weaknesses in terms of **implementation modality**: public-private partnership, flexible and shared steering and operational implementation.

While those are the areas of interest of SDC ("what we want to know"), the underlying objective of the evaluation ("how we want to utilize the knowledge"), also as per ToR, is twofold.

1. Identification of key lessons learned on the above three angles to **inform future interventions**.

2. Crystalize **internal / external key communication statements** describing / explaining the added value of the RIICE partnership and project in terms of innovation, public-private partnership, risk taking, outreach, sustainability, etc.

Regarding objective 1, our mandate is to generate lessons that can guide the design of new interventions at SDC. Since RIICE is not being continued, the findings are not used for a specific decision-making process. Rather, the evaluation provides a **general learning experience**. The SDC Global Programme Food Security is the primary target group. Organisational units within SDC that work on public private partnerships (Competence Centre for Private Sector Engagement) as well as the Global Programme on Climate Change and Environment) may be a secondary target group. Beyond the actual mandate of the evaluation, findings might also be utilized by all parties who were involved in the partnership and who are part of the evaluation reference group (sarmap, IRRI, SwissRe).

The terms of reference include 21 evaluation questions that cover the 6 OECD/DAC evaluation criteria (effectiveness, efficiency, impact, sustainability, relevance, coherence). In a virtual kick-off event, the evaluation team asked the evaluation reference group to rate the 21 questions to get some guidance on prioritisation. Questions 7, 9 and 13 (in bold below) were prioritized and received greater focus during the assessment.

No	Questions (as in ToR)
1	To what extent were the objectives of RIICE responding to global challenges as well national needs and priorities?
2	In general terms, were the approaches chosen by RIICE appropriate to the expected results, in particular in terms of promoting technological innovation and inducing institutional / system changes?
3	Which more adequate options could RIICE have chosen to produce more relevant results?
4	To what extent is RIICE fitting in the strategic priorities and modalities of SDC Global programme food security, in the mandate of the Global cooperation of SDC and of SDC more broadly?
5	Which other global actors could have RIICE include in its intervention toward increasing its global coherence, impact and sustainability?
6	To what extent are the intended results of RIICE achieved (or are likely to be achieved) at the levels of output, outcome and the overall goals of the intervention?
7	**Which major factors have influenced the achievement or non-achievement of the expected results?**
8	How to consider the fact that both the final duration and budget of RIICE have largely exceeded the initial plans? What can SDC and its partners learn from that?
9	**Was the public-private partnership approach an appropriate choice for RIICE? What strength and weaknesses has it generated during the implementation? In how far were the principles of shared value, shared costs and shared risks applicated?**
10	Which alternative approaches might have led to similar results at lower costs?

11	Was the development intervention implemented on the basis of a result-oriented approach? Was the monitoring system in place to track the impact of the development intervention suitable in terms of its objective?
12	How did the project management as well as steering and decision-making processes function? Were problems identified in good time and were practical, feasible solutions proposed?
13	**Which positive, lasting effects and changes can be identified at different levels (individual, group, institutional, system)?**
14	Which unexpected and unintended positive and negative (side) effects have occurred?
15	Did a specific part of RIICE have a greater impact than another?
16	What are the main positive effects for the RIICE parties? Any critical negative impact?
17	What evidence is there that the achieved effects will continue after the completion of the project?
18	Which major factors might enhance the effects achieved or prevent them from continuing?
19	Can the partner institutions and involved stakeholders continue the activity independently (existence of financial resources) and adjust their strategies to changing conditions? Do they have their own problem-solving capacities (technical capacity)?
20	Did RIICE have a transformative effect on partners and main stakeholders (change agents), and if so, in what way?
21	In how far has RIICE contributed to a post-project continued provision of the new technology / services to the direct partners and to other partners / clients?

Table 1: Evaluation questions (priorities in bold)

2 Approach

2.1 What is our general approach to the RIICE evaluation?

We appreciate the focus of SDC on learning and generating opportunities for the future as part of this evaluation. We employed a **"Generative Evaluation"** approach to make sure that stakeholders use this final assessment to critically reflect on their individual learnings and draw sound conclusions for future opportunities. "Generative Evaluation" entails the following characteristics:

- **Iterative process**: Data collection and data analysis were done in loops. New findings from the analysis led to more data collection.
- **Participation**: RIICE major stakeholders took part in all steps of the evaluation:
    - Reference group provided feedback on crucial steps in the evaluation process (kick-off event; inception report, country workshops to validate findings…)
    - Biweekly call between SDC and Endeva to make sure that we have a direct communication on questions that arise in the process and SDC has continuous updates not only on how the evaluation is process is going, but also on our findings.
- **Inclusivity**: In order to make realistic recommendations for future opportunities, we followed traits from our data collection and broaden our perspective to themes and stakeholders that are currently not necessarily in the core of the RIICE partnership.

- **Workshop elements:** 5 workshops were conducted during the assessment phase of the evaluation. In these workshops (4 country workshops and 1 global workshop), our team shared initial observations with stakeholders for discussion. On this basis, stakeholdersexplored what insights could be harvested and how these results could be leveraged into future opportunities, with or without the involvement of SDC. The workshops were designed following the "generative facilitation" approach. This approach builds on Theory U[2] and combines both cognitive and intuitive exercises to enable a group of stakeholders to identify future opportunities and how to leverage them. Workshops were conducted virtually due to the current Covid-19 pandemic.

2.2 How did we collect data?

Data collection in the RIICE external evaluation was structured using an evaluation matrix. This table includes all evaluation questions, the respective OECD-DAC criteria, means and sources of data collection and further remarks (see appendix).

In terms of work division in a multinational team, we collected data on three levels.

- On the **policy level**, we looked at broader strategic questions of policy preferences and strategy. Most data that informs these questions was collected from members of the reference group and further stakeholders within SDC. Interviews on this level were conducted by the director and project lead of this evaluation.
- On the **partnership level**, we were looking at the process of project management within the RIICE partnership. This was informed by interviews with members of the evaluation reference group and further stakeholders who were part of the partnership in the past. These interviews were conducted by the director and project lead. Further, in each of the four countries, we conducted one "key interview" with a major resource person. These key interviews are conducted like a mini workshop in which the country experts presented their version of the RIICE theory of change and discussed it with the country's major resource person. The desired outcome of these key interviews we twofold: First, we got more clarity on the individual country's programme theory so that influential factors could be compared more easily between the countries, and second, we could identify further interview partners on the country implementation level.
- On the **country implementation level**, we looked at partners and, to some extent, target groups in four RIICE project countries. This level includes the greatest degree of detail. Interviews in the countries were conducted by the country experts in our team.

[2] Theory U is a change management method that was developed by Otto Scharmer, Massachusetts Institute of Technology (MIT, Boston)

2.3 What were our major sources?

In our evaluation, we relied on two major data sources. First, we reviewed **documents** of different kinds: policy documents, project documentation and scientific publications. Second, we collected data from various stakeholders through **guided interviews**. Documents for our desk research were provided by SDC and were completed by documents that we identified and collected during our interviews (see list of documents in the annex).

We started with interviews with the reference group. The program coordinator in each country recommended a list of stakeholders to be interviewed by country. We also added more interviewees as recommended by the SDC team. A full list of interview partners is in Section 6.5 in the annex. Interviews were recorded for further analysis, and a transcript of each interview was written. The transcripts include all questions and paraphrased answers, and more detail was added from the recording whenever this seemed necessary in the analysis. The recordings remain with the evaluation team and will be destroyed upon completion of the evaluation. To maintain confidentiality for our sources, interview transcripts can only be presented to SDC in a pseudonymized way, if necessary.

2.4 How did we analyze the data?

In a first step, all data was brought into a certain format in Word documents. Second, we used a qualitative data analysis software (MaxQDA) to process the material by coding and categorizing. Codes and categories were deduced from the evaluation matrix and completed by further codes and categories that came up in the empirical material whenever they were relevant to our evaluation questions. Findings were presented to stakeholders at country and global levels for validation and feedback.

The report is structured as follows:

- In the findings section, we present our data and use it to answer questions on a rather factual level. The findings section is split in two subsections: The first part discusses what RIICE has achieved in terms of activities, outputs, outcomes and impacts along the PPP's intervention logic. The second part presents our findings with regard to three enabling and inhibiting factors (technology, PPP set-up and overall strategy) and concludes with an outlook on the partnership's sustainability.
- The conclusions section discusses the fact that duration and budget have exceeded the initial plans. It is the evaluators' assessment of the sum of findings.
- Finally, the recommendations section includes suggestions addressed to SDC as regards future involvement with initiatives that are similar to RIICE and beyond.

3 Findings

3.1 Results achieved

This section clusters the answers to the following evaluation questions (questions that were identified as most relevant by the evaluation reference group are in bold):

Questions No	
6	To what extent are the intended results of RIICE achieved (or are likely to be achieved) at the levels of output, outcome and the overall goals of the intervention?
13	**Which positive, lasting effects and changes can be identified at different levels (individual, group, institutional, system)?**
14	Which unexpected and unintended positive and negative (side) effects have occurred?
15	Did a specific part of RIICE have a greater impact than another?
16	What are the main positive effects for the RIICE parties? Any critical negative impact?
20	Did RIICE have a transformative effect on partners and main stakeholders (change agents), and if so, in what way?

The section is based on document analysis and guided interviews that were conducted with key stakeholders. Please note that it does not include a critical assessment of the results achieved – this perspective can be found in the conclusions-chapter.

There are two major ways how to structure and present findings of a complex and long-term endeavor such as RIICE. First, we can assess to what extent the intended results as spelled out in the project's results framework have been achieved (see evaluation question #6). Second, we can ask more broadly about effects that have been achieved (see questions #13, #14, #15, and #16) and thereby go beyond the items that are part of the results framework. We opted for the latter strategy because a) this corresponds to SDC's evaluation questions, b) the results framework does not fully represent the activities, outputs and outcomes in all country cases over the course of 10 years, and c) a more open approach allows us to better address the more future-oriented learning goals of this evaluation's audience.

Findings are presented along the intervention's theory of change (ToC), moving up from the output level to impact.

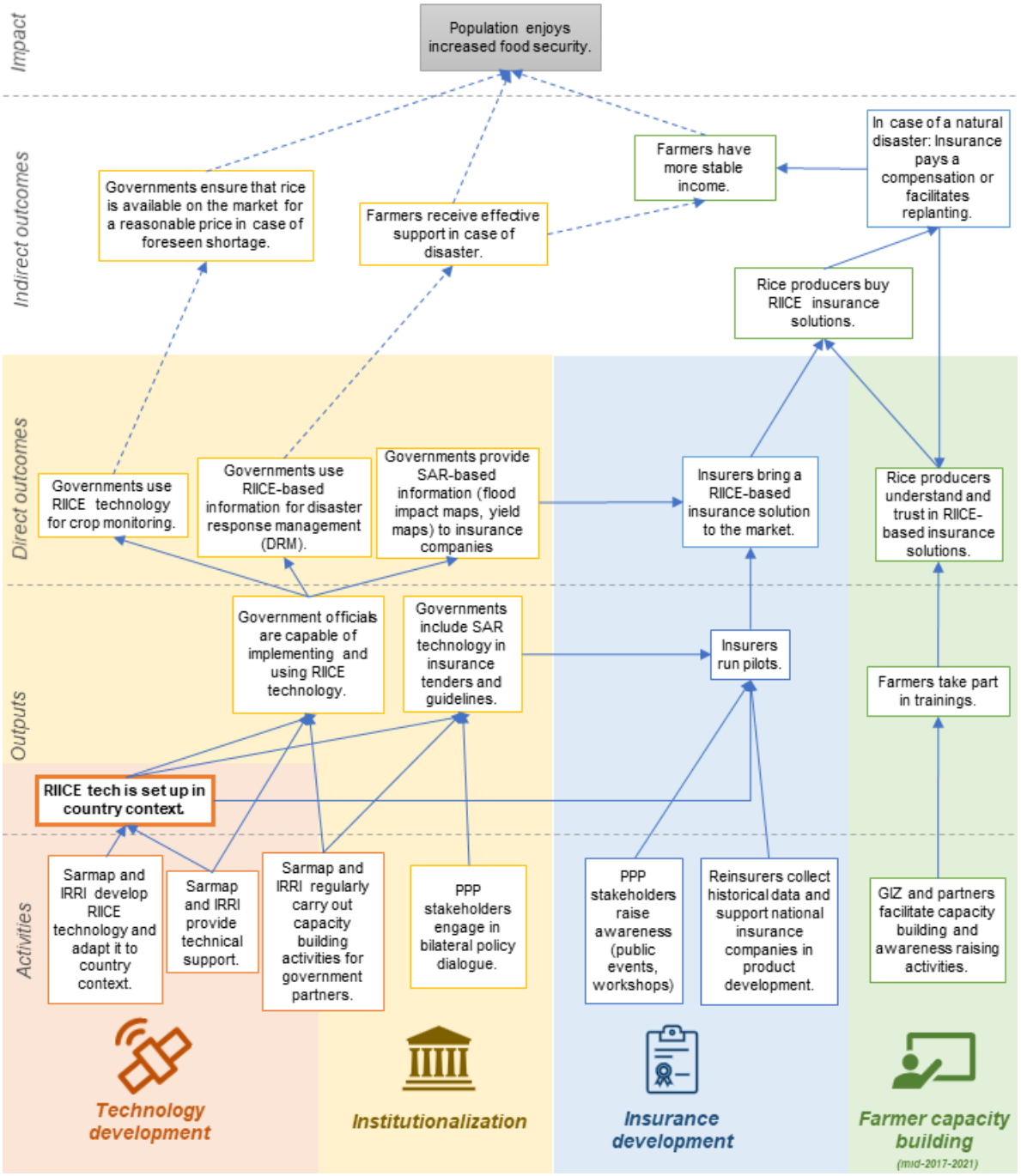

Figure 1: The overall intervention logic of RIICE (own illustration).

Figure 1 shows the overall intervention theory of RIICE. The illustration is based on document analysis and interviews and does not represent the partnership's own visualizations of the program theory. The four major workstreams of RIICE are color-coded. Technology development (in red) is at the core of RIICE: Almost all outputs that are supposed to contribute to the intended impact depend on a successful technology set-up. It is therefore marked in bold. **Error! Reference source not found.** (see below) s ummarizes what the RIICE technology consists of. Institutionalization (in yellow) is the second key

workstream, and it links the technology development to the intended impact on the level of farmers – both indirectly (through insurance development) and directly (through general rice monitoring and through disaster relief management). Insurance development (in blue) is therefore only one pathway to the intended impact that is by itself dependent on the first two workstreams (technology development and institutionalization) and the fourth workstream (farmer capacity development). The right hand side of Figure 1 (in green) shows the fourth workstream, farmer capacity building, which was only realized between mid-2017 and end-2019 as part of the BMZ/GIZ co-funding, and to a smaller extent in 2020-2021 in collaboration with another project in Cambodia. This workstream runs in parallel to the other workstreams up to the level of indirect outcomes: when the technology is set up, when institutionalization has been successful, and when there is an insurance product on the market, only then capacity building can have a direct contribution to the intended outcomes of RIICE. All these aspects are described in greater detail in the following subsections.

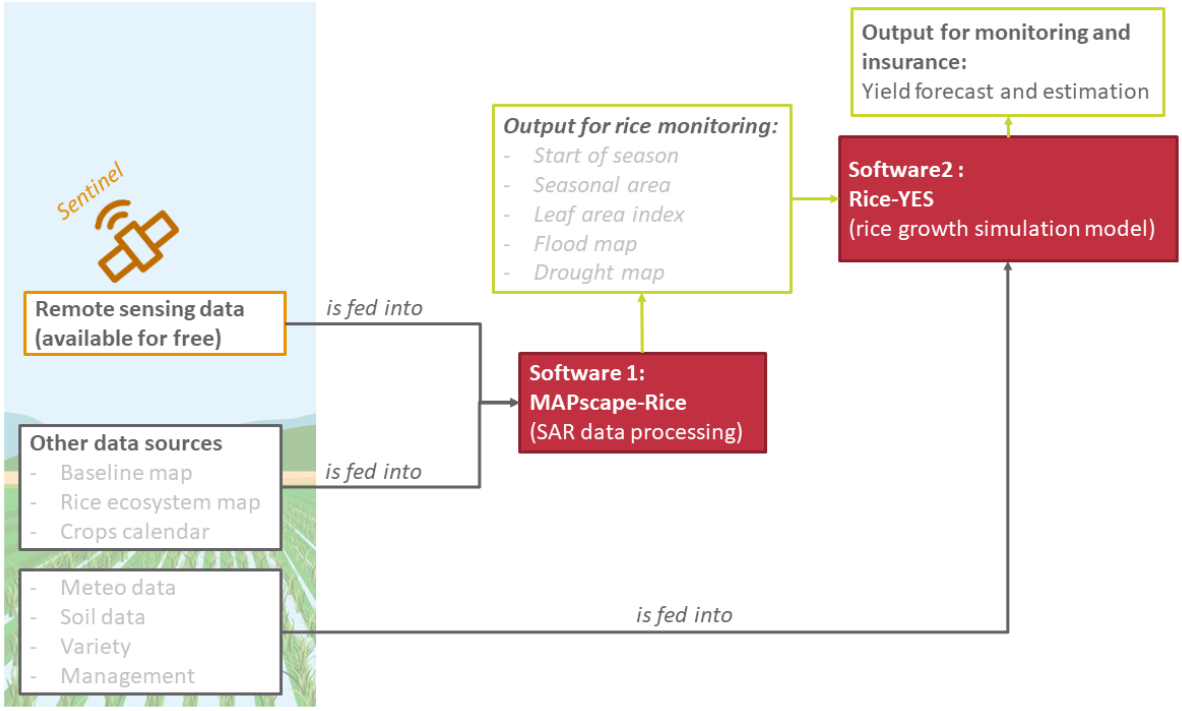

Figure 2: The RIICE technology

3.1.1 Activity level

On the activity level, the PPP has accomplished a lot in each of the four workstreams. The following paragraphs sum up the major accomplishments broadly without going into too much detail. More information on the activity level can be found in the operational reports.

To **adapt the remote sensing technology** to each of the country contexts, members of the partnership implemented extensive pilots in phase I. Technical infrastructure was built on the local level (for calibration) and central level (for aggregation and processing). Many investments had to be made to

develop the operational systems that are necessary for successful implementation. For the insurance component, historical data was needed to allow for an appropriate calculation of premiums. First, the partnership tried to collect existing official rice monitoring data (mainly average yield aggregated at different levels). This process was not found to be smooth since data was not consistent in terms of reliability, in temporal terms, and mainly available aggregated (province). In addition, the insurers involved preferred not to mix yield data with different methodologies than the ones used for loss assessment. Later, since the end of 2019, RIICE successfully retro-processed SAR-based data for 4-5 years.

In order to **institutionalize** the technology within partner governments, the partnership engaged in capacity building and technical support on an operational level. This was accompanied by institutional awareness raising and bilateral policy dialogue to increase acceptance and the actual institutionalization (=using the technology for various purposes such as crop monitoring etc).

Regarding the **insurance development** workstream, activities centered around two major activities. First, stakeholders in the partnership implemented public events and workshops to raise awareness for the topic. Second, they collected and/or computed historical data that is needed to calculate premiums in an insurance solution. According to interview partners, this process was much more time-consuming than anticipated because data was not always available.

Finally, the partnership – GIZ in particular – engaged in **capacity building activities** for farmers during mid-2017 until end-2019. This included raising awareness for crop insurance and financial literacy in more general terms. Local partners in implementation were BASIX in the case of India and Syngenta Foundation in the case of Cambodia.

3.1.2 Output level

The key output of RIICE is that it has succeeded in introducing **cutting edge technology** to its partner countries and demonstrating its **technical viability**. As most of our sources confirmed, using remote sensing for environmental monitoring purposes (i.e. assessing the planting, growth and yield of rice) was still a new idea when RIICE started. Prior to RIICE, many of the stakeholders had not been exposed to a methodology of this kind.

The advantages of using satellite data for crop monitoring are plenty: Results are more accurate, more timely, they cover larger spatial areas and are cheaper if compared to traditional methods. The following paragraphs provide some more detail for each of these findings.

The technology has proven to produce **accurate results** in all four project countries that are studied in this evaluation. The accuracy claim was not only supported by most stakeholders who were interviewed for this evaluation, it is also easily perceptible from the heavy technical documentation. However, different use cases require a different degree of accuracy. Out of the different potential use cases for the technology, insurance seems to be the use case that demands the highest degree of accuracy. An

incorrect data base might lead to farmers not receiving a payout even though their claim is eligible. If this happens on a larger scale, it can lead to negative perception of insurance as a whole and hence would weaken uptake and acceptance, and bring reputational damage to technology and insurance providers from farmer lobby, social media and media attention. As was confirmed by several stakeholders who represent the insurance perspective, an incorrect insurance claim processing therefore is a huge reputational risk for insurers. Even though it is a challenge to create an index insurance, it is the only practicable solution because for the alternative – traditional crop insurance that measures individual revenues – costs for data collection and administration are simply too high to turn it into a sustainable product, especially for smallholders.

Some interview partners argue that in some cases, stakeholders may have an interest to conceal information that can potentially be revealed by RIICE data. The advantage of accuracy in this case may turn into a (perceived) disadvantage. While it was not possible to confirm or disprove this claim in the scope of this evaluation, it should be at least mentioned that conflicts of interest of this kind *can* arise. The instances when stakeholders may benefit from flawed and inaccurate statistics that our informants mentioned in our interviews include:

- Land owners do not register their cultivated areas to avoid tax liability;
- Land owners illegally cultivate land that is, by law, a protected conservation area;
- Politicians overstate the impact of a natural disaster (drought, flood) to increase the amount of disaster relief they receive from the international community.
- Politicians “use” an insurance event to provide preferential support to selected beneficiaries by influencing the on-the-ground claims assessment

RIICE has not just made the forecasts more precise, but also extremely **timely**. Traditional methods of rice monitoring include manual field visits and observations that lead to delayed and often imprecise figures. Remote sensing has the ability to cover large spatial areas with a reasonable to high accuracy and a standardized analysis framework that generates results that are reproducible, timely, and precise. As was demonstrated in an analysis done in Viet Nam by independent consultants Tran Viet Dung and Vu Huy Hoang, a traditional monitoring cycle typically takes about 75 days to complete, while the reporting time using RIICE technology takes one week only (Dung and Hoang 2020: 21-23).

Unlike traditional methods of crop monitoring, RIICE technology is able to **cover larger spatial areas** and therefore able to make a greater impact.

Finally, satellite-based crop monitoring is also significantly **cheaper** than on-the-ground methods of assessment. Again, Dung and Hoang showed for the case of Viet Nam, that costs of rice monitoring would be between 5.600 VND per ha per season (provincial programme) or 9.112-10.012 VND per ha per season (national statistics system) using traditional methods, while the direct monitoring cost for RIICE is 3.040 VND per ha per season, so about half to a third of the traditional cost (see Dung and Hoang, 2020). Therefore, through adoption of RIICE, governments can re-allocate funds from overpriced traditional crop monitoring methods to underfunded but relevant areas. It should also be mentioned that

costs rapidly decrease after an investment period in which infrastructure is built and initial trainings are implemented.

Besides making data more accurate, more timely, and cheaper, RIICE technology has also generated **new kinds of data** that simply have not been available previously. For instance, in India, this new data allowed the PMFBY insurance scheme to apply the "prevented sewage compensation" in 2017.

One disadvantage of the RIICE technology that has come up in several interviews across the country cases is that by replacing the traditional crop cutting experiment with SAR-based monitoring, staff on the ground will lose their jobs. Consequently, switching to the new technology may be unpopular among the public.

Spot on: Capacities built in partner institutions. Who is able to conduct analysis of SAR data as a (direct or indirect) result of RIICE?

- Department of Agricultural Land Resources Management (DALRM) within the General Directorate of Agriculture (GDA);
- Department of Planning and Statistic (DPS) within the Ministry of Agriculture, Forestry and Fisheries (MAFF)
- (to a lesser extent) Cambodian Agricultural Research and Development Institute (CARDI)

- Departments of Remote Sensing (RS) & Geographic Information System (GIS) at Tamil Nadu Agricultural University (TNAU)
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
- Geospatial Technical Center at Acharya N.G Ranga Agricultural University (ANGRAU)

- Philippine Rice Information System (PRiSM)

- Vietnam National Institute of Agricultural Planning and Projection (NIAPP)
- Can Tho University (CTU)

On the institutional level, **capacities** to use RIICE technology have been built in partner countries. This entails technical knowledge within partner ministries and subordinate agencies. The agencies that are now able to conduct analysis of SAR data, collect and process suitable field and ancillary data, and model rice crop yield as a consequence of RIICE are listed in Text box 2. Capacity building was implemented through intensive trainings by sarmap and IRRI. Trainings were not limited to using the software, but also helped participants understand the overall technology, its opportunities, and limitations. Capacity building was further implemented through continuous user support.

Text box 2: Capacities built in partner institutions

Further, RIICE helped to increase **awareness** for the use of remote sensing in crop monitoring within its partner institutions and beyond. However, it remains an open question whether the partnership was also able to establish a high profile not only for remote sensing in general, but for the RIICE technology in particular (i.e. the software applications MAPscape-Rice and Rice-YES). Anecdotal evidence from our interviews suggests that the awareness for the services offered by RIICE may be rather limited outside of the direct partner institutions.

Within its partner institutions, we witnessed some **acceptance and approval** for RIICE technology from relevant stakeholders. Approval was given either in the form of a written statement or by including a

reference to RIICE technology in government tenders for insurance purposes. See Text box 3 for examples.

However, the overall picture remains somewhat inconclusive as we also witness some **resistance** toward RIICE technology. Considering that the technology is being used broadly, for example to cross-check accuracy of rice statistics, it is remarkable that it has taken so long for the participating ministries to publicly embrace the technology through an official statement. The possible reasons for this resistance are explained further down in the report (see section 3.2).

Spot on: Official recognition of RIICE technology in partner countries

In Cambodia, by the end of RIICE phase II as well as in 2021, MAFF issued an official letter endorsing the RIICE technology. This letter supports using the technology in a complementary way to more traditional methods of crop monitoring.

In India, Tamil Nadu government included RIICE as one of the technologies that could be for the assessment of losses and payment of claims in their official tender document in Tamil Nadu. On a more general note, PMFBY guidelines recommend the use of cutting-edge remote sensing and geospatial technologies, without mentioning RIICE explicitly.

In Viet Nam, the legal framework for the use of SAR-based data in crop insurance has been secured in 2018 with the Agriculture Insurance Decree No. 58. This decree explicitly recognized remote-sensing data as a source for index insurance and loss assessment. However, local insurance companies were not ready to bring a RIICE-based product to the market, so the official endorsement could not be fully utilized at that point.

In the Philippines, even though the project was discontinued in phase II, RIICE got institutionalized in the form of PRiSM, the Philippines Rice Information System run by government agency/research institute PhilRice, and is valued across the government and third-party stakeholders. However, RIICE-supported technology has not entered agricultural insurance schemes or guidelines even though area-yield data has been provided to the public insurer PCIC at no cost for several years.

Text box 3: Official recognition of RIICE technology in partner countries

RIICE technology has been used as a source of information on crop damage and loss for claim settlement in India, Cambodia and Viet Nam. In Cambodia, the technology was also used to bring a new insurance product to the market in 2020/2021 (see section 3.1.3 on outcomes). While the cooperation in Tamil Nadu was discontinued due to reasons that will be discussed below, the commercial launch of a RIICE-based insurance product in Cambodia was delayed by the COVID pandemic.

3.1.3 Outcome level

Moving further up the results chain, partner governments have in fact been **using** RIICE technology to a greater or lesser extent for **crop monitoring purposes and disaster relief management,** i.e. to check the accuracy of data that is collected in more traditional ways. The degree of usage surely differs (see Text box 4): While in the case of India, Tamil Nadu Agricultural University was no longer part of RIICE after mid-2018 and after successful implementation of a SAR-based crop insurance scheme in phases I and II, both Cambodia and Viet Nam are regularly using RIICE as a validation and comparison tool. In the case of the Philippines, finally, the spin-off PRiSM has fully deployed operationally the RIICE technology (MAPScape-Rice, RICE-YES) sarmapand shares the data with the Department of

Agriculture as well as third party stakeholders that have an interest in the rice information or the disaster relief management products.

One outcome that is key to the insurance workstream, as per the intervention logic, is that **governments provide SAR-based information to insurance companies**. Findings with regard to this outcome are mixed. In the case of India, the outcome was clearly reached in 2016. In Cambodia, similarly, governments did pass on data to the insurance company FORTE and thereby facilitated the introduction of a SAR-based insurance solution. In Viet Nam, data has been provided to local insurers Bao Viet, Bao Minh and others. Further progress in Viet Nam depends on the willingness of the government to continue their collaboration with sarmap and IRRI after the phasing out of RIICE. In the Philippines, for reasons discussed above, the outcome could not be reached.

Spot on: Using RIICE technology in agricultural insurance (outcome level)

In Cambodia, implementation of the crop insurance component only started in phase III because before that, developing an agricultural insurance programme was not a priority for the national authorities. Insurance provider FORTE, the only Cambodian crop insurer, has been working to expand their portfolio to an area-yield index in addition to a weather index. This work has not yet moved beyond pilot phase.

In India, a SAR-supported insurance product was offered successfully in Tamil Nadu during phase II. Even though attempts were made in other states as well, further SAR-supported insurance products have not emerged as a direct outcome of RIICE.

In the Philippines, RIICE aborted its mission in 2015 after some dry-tests when the government signaled that they did not wish to license a SAR-supported crop insurance product. However, toward the end of phase III, the Philippines government expressed interest in using RIICE technology for insurance after learning about the Cambodian case.

In Viet Nam, there are two different insurance schemes. In An Giang province, a crop insurance pilot was implemented in 2018-2020 by local insurer Bao Minh.The pilot never reached a commercial roll-out because when it was about to start, the national scheme also started. The national scheme was implemented in 7 provinces at first and can be rolled out to more provinces any time when more budget is available. Both schemes were designed in collaboration with Swiss Re and used RIICE.

Text box 4: Using RIICE technology in agricultural insurance (outcome level)

When it comes to unexpected results, our interviews have revealed that the success of RIICE technology has, in the case of the Philippines, **inspired and motivated others to use remote sensing**, geospatial data, and technology in general to be a fundamental part of the project design. For instance, government agencies for other crops (but with a similar mandate) have started to explore the use of remote sensing to map and monitor crops such as corn or sugar cane, and there is increased interest in flood and drought monitoring in cropping areas. In India, the experience in Tamil Nadu laid the foundation for AICI to launch a first remote sensing based insurance product for rice crop for West Bengal in partnership with India's National Remote Sensing Centre (NRSC) in 2020. Both AICI and NRSC are today well aware of the RIICE technology.

A little further up in the intervention logic, on the level of indirect outcomes, it is assumed that governments are **using the rice monitoring data to predict and prevent shortages**, e.g. by buying

rice on international markets. For the four project countries, it was beyond the scope of this evaluation to make a causal attribution from RIICE activities to this kind of policy.

As regards **agricultural insurance**, however, causal claims for RIICE are more straightforward. In the case of India (Tamil Nadu), when targets were met on the level of output and direct outcomes, the indirect outcome of farmers buying a RIICE-based agricultural insurance solution was achieved. When a flood hit Cuddalore disctrict in June 2017, 621.382 rice farmers were compensated and therefore had a more stable income (see Text box 5).

3.1.4 Impact level

Ultimately, the project set out to reduce vulnerability of smallholder farmers through three major pathways of impact (see Figure 1 for visualization): First, through improved food security policies, based on more accurate and timely information on rice crop area, growth cycles, yield forecast and estimation, second, through improved disaster relief management, and third, through more efficient and transparent crop insurance programmes.

All three pathways of impact are quite different in nature and therefore **require different methods of assessment**.

- For the impact on national food security that was generated through **general crop monitoring**, this evaluation could not generate any substantial evidence. While it is plausible to assume that SAR technology can have this kind of impact, it can only be assessed if it is implemented consistently on a large scale and requires insights into sensitive government intelligence which went beyond the scope of this evaluation. As per end-2021, except for the Philippines, no authorities in partner countries have formally decided to adopt RIICE as an official source for statistics.
- The impact that unfolds through **disaster relief management** can only be assessed when disaster strikes. There are two major cases when this happened in the RIICE context. In both of these cases, RIICE has contributed to the governments' ability to react to a disaster in a timely and effective manner.
- Measuring the impact on farmers through **insurance solutions** is rather straightforward. For RIICE, this kind of impact was demonstrated in Tamil Nadu. Given that the implementation of the insurance workstream was delayed or even discontinued in the other partner countries, there are no more similar instances.

Spot on: Making an impact through RIICE-based disaster relief management in India.

After a flood hit rice farmers in Cuddalore district in June 2017, a report on the flood affected areas based on SAR-data was shared with the Directorate of Economics and Statistics, Government of Tamil Nadu. This report acted as a complementary source of information and the basis for distributing relief funds within the farmer communities. The report and its inputs acted as a primary tool for taking policy level decisions to rapidly provide relief materials to flood affected farmers in Cuddalore district. Based on the report, about 50 tonnes of paddy seeds of CO 51, a short duration newly released variety, and 30.000 nos. of Brinjal seedlings were mobilized for distribution among the flood affected farmers to enable rapid replanting. Tamil Nadu Rice Research Institute, a research body specializing in rice research, in cooperation with the Department of Agriculture deployed teams of scientists to the affected area and suggested the use of micronutrients for quick recovery wherever inundation was observed. Based on the RIICE flood report a team from the Directorate of Natural Resource Management of the Tamil Nadu Agricultural University worked on the possible nutrient loss and silt deposition due to the floods besides the improvement in resources across waterbodies in the region.

Text box 5: Making an impact through RIICE-based disaster relief management in India

3.2 Enabling and inhibiting factors

This section sums up the most important findings of the evaluation with regard to *why* RIICE has achieved some of its goals while it has failed to achieve others. In order to facilitate learning, we clustered these findings along four categories that emerged from the analysis and that also correspond to the evaluation questions.

The three categories are technology, PPP set-up, overall strategy and project management.

In short, the section seeks to answer the evaluation question No 7 which was identified as one out of three key questions for the evaluation:

Questions No	
7	**Which major factors have influenced the achievement or non-achievement of the expected results?**

3.2.1 Technology

This section clusters the answers to the following evaluation questions:

Questions No	
2	In general terms, were the approaches chosen by RIICE appropriate to the expected results, in particular in terms of promoting technological innovation and inducing institutional / system changes?
3	Which more adequate options could RIICE have chosen to produce more relevant results?
10	Which alternative approaches might have led to similar results at lower costs?

RIICE initially set out to have a positive impact on food security of rice farmers through more efficient crop insurance schemes and improved crop monitoring. To reach this ultimate goal, it chose to work with an innovative technology that was developed and continuously adapted by sarmap and IRRI. In its core, it consists of an image processing software called MapScape and a yield prediction mapping platform called RICE-Yield Estimate System, based on the rice crop model called ORYZA 2000. The characteristics of this technology can help explain why some of the results as described in section 3.1 occurred.

To begin with, the technology is **more efficient** than traditional crop monitoring methods **with regard to cost, time and accuracy**. Traditional crop cutting experiments in all its local variations require a great number of staff to prepare and implement data collection, process data and analyze results.

The **timeliness** of RIICE technology is a great comparative advantage not only with regard to crop monitoring, but also when it comes to **agricultural insurance**. Especially in schemes where farmers are supposed to be compensated for early losses so that they can still replant, timeliness is key.

Stakeholders in partner countries who were interviewed in the context of this evaluation are fully aware of these advantages of RIICE technology over traditional monitoring methods and therefore support its implementation in their national systems.

However, the implementation of this innovative technology depends on a number of **prerequisites**. These prerequisites include the following:

- RIICE technology requires that staff in respective departments are capable of and willing to undergo intensive capacity building in the initial stages and continue to receive technical support at later stages.
- To calibrate the forecasting models, RIICE technology requires data that has to be collected in the respective country context. This data collection / piloting may take several cropping seasons before it reaches a good level of accuracy, and it requires certain technical capacities from partners for field data collection.
- When it comes to using RIICE technology for insurance, there is a requirement for historical data from the respective country context. As was witnessed in the project countries, collecting historical data from traditional sources can be a very time-consuming process. However, the project has shown in the cases of Viet Nam and Cambodia, that it is possible to overcome this obstacle by retro-processing SAR data from sentinel to generate the needed historical data (2015- onwards).
- According to the intervention logic of RIICE, the technology is plugged into an existing agricultural insurance scheme that is subsidized by the government and thereby replaces other means of data collection for calculating pay-outs.
- Further, the introduction and establishment of an insurance product that is based on RIICE technology also heavily depends on the knowledge and attitude of those rice farmers who are supposed to purchase the insurance product in the end and thereby they must express a high level of trust in the data, data provider, and solution.
- Finally, challenging traditional methods of crop monitoring by introducing an innovative technology such as promoted by RIICE requires that stakeholders all across relevant institutions are open-minded and support this kind of change. People who are employed to conduct crop cutting experiments may lose their jobs, other stakeholders may see that an increased transparency in the results as personal disadvantages for them.

In summary, **remote sensing technology is more than just technology**. The RIICE approach has implications on a wide range of stakeholders in central and decentralised parts of the government as well as with insurance partners and, ultimately, farmers – these implications need to be taken into account strategically.

All stakeholders who provided an input to this evaluation agreed that the approach of RIICE was too much centered on the technology, assuming that its factual benefits would be convincing enough for other stakeholders to embrace the whole package. Not enough attention was paid to institutional change

and political economy in the beginning. Institutionalization was increasingly prioritized in phase II. Section 3.2.3 discusses the RIICE strategy and how it evolved throughout the implementation of RIICE.

3.2.2 PPP setup

This section clusters the answers to the following evaluation questions:

Questions No	
5	Which other global actors could have RIICE include in its intervention toward increasing its global coherence, impact and sustainability?
9	**Was the public-private partnership approach an appropriate choice for RIICE? What strength and weaknesses has it generated during the implementation? In how far were the principles of shared value, shared costs and shared risks applicated?**

The implementing entity, a public-private partnership, in its core consisted of two public partners (SDC and GIZ), two private partners (sarmap and Allianz Re, later Swiss Re), and a non-for-profit international research organization IRRI. To what extent have these entities, but also its individual members, contributed to the results as discussed above?

There is a strong agreement among all informants of this evaluation that the complex task of RIICE would not have been achieved by any of the partnership's members alone. **Each member of the partnership** brought **specific expertise and experience** in their field – but also lacked expertise in other fields that were then addressed by other members.

- **SDC** could build on existing bilateral relations with partner countries. It was therefore able to facilitate dialogue between relevant stakeholders in those partner countries and the other members of the partnership. This was particularly relevant because government representatives had reservations toward the private sector, even though it was able to make a relevant offer (technology and insurance). All interview partners agreed that without support of a public stakeholder such as SDC, it would have been nearly impossible for the private stakeholders to cooperate with the partner institutions. However, political contexts in the partner countries were of great significance, and SDC therefore had to recruit consultants with in-depth knowledge of the stakeholder landscape, political mechanisms, and – ideally – well-established personal connections with relevant stakeholders. In addition to its role as a facilitator and door-opener, SDC took on operational responsibility, which makes RIICE a rather unique endeavour compared to other SDC projects and programs. It should be mentioned that even though SDC officially set out to support the technology and insurance solutions as they got developed within RIICE, its engagement in this PPP was not uncontroversial and triggered some amount of internal discussions regarding the role of private partners.

- **GIZ**, similarly to SDC, could build on relations in its partner countries and was therefore equally relevant in the partnership with a focus on implementation in India and Cambodia (between mid-2017 and 2019), where it had taken the project management lead in phases I and II. Its mandate, however, was slightly different to SDC's mandate in the partnership. While SDC set out to support the technological innovation as developed by sarmap and IRRI, including direct funds flow to sarmap, GIZ committed to the partnership's common goals. Following the general rules of its nonprofit activities ("gemeinnütziges Geschäft"), GIZ concentrated on those parts of the partnership that focused on supporting public goods and public partners. This, as per the partner agreement, included supporting an "IRRI-sarmap joint venture" which was envisioned in earlier stages, but never put into practice. This may have weakened the common focus on one specific technology (MAPscape-Rice and Rice-YES). Further, GIZ fostered the capacity building dimension of RIICE when it comes to its target group: rice farmers. Together with local partner organizations, it facilitated capacity building activities in India and Cambodia and thereby contributed to awareness raising and confidence-building measures.
- **sarmap** brought technical knowledge and existing technical solutions into the partnership. sarmap's technology was the basis of the innovative RIICE-technology. sarmap worked closely with IRRI to develop the rice monitoring solution, and to adapt it to different local contexts. In addition, sarmap provided technical capacity development for users of the technology on the ground and provided ongoing technical support.
- **IRRI** cooperated closely with sarmap a) in research and development by providing input to the development of the mapping of the yield forecasting technology (and crop yield model / yield assessment), and b) in providing capacity building activities and support regarding the use of RIICE technology. In addition, in the Philippines, due to its permanent presence and long-standing good relationship with local stakeholders, IRRI also engaged in institutional outreach. As it is probably natural to a research institute, IRRI lacks a clear mandate and experience / capability with regard to the commercialization of RIICE technology within the partnership (or technologies in general). This issue is discussed further in section 3.2.3.
- **Allianz Re** and, later, **Swiss Re**, were responsible for the development of agricultural insurance solutions that build on RIICE technology, in collaboration with national insurance partners. The reinsurance partner was responsible for the product development while the national insurance would take on the marketing and operations. In phases I and II, Allianz RE worked on the calculation of premiums based on historical and satellite data in all project countries, but it discontinued its engagement in June 2017 and Swiss Re rejoined. Swiss Re took up the work from Allianz Re and continued the insurance product development. In Cambodia, in the end of 2019, SCOR reinsurance took over from Swiss Re (see **Error! R eference source not found.**).

Resources for the PPP were provided by all stakeholders – both in-kind and in cash.

In sum, the members of the partnership complemented one another with their different areas of expertise. A complex project such as RIICE that seeks to make an impact through innovative technology solutions in governments could not be realized without the involvement of both public and private entities. The interviews have shown that the consortium was perceived as professional, progressive, as well as problem solving.

Spot on: Insurance partners in the RIICE partnership

It is difficult to determine the reasons for why Allianz Re discontinued its engagement in RIICE. Most likely, it was a combination of different developments within Allianz and within the PPP. Beginning in 2015, the Allianz Re unit that was involved with RIICE, was facing internal turbulence, which had no direct connection with RIICE. These developments ultimately lead to Allianz Re's assessment that it would not be able to further fulfill its obligations within the PPP. In addition, it can be assumed that it had become obvious in the first couple of years that Allianz Re had underestimated the complexity of the task at hand and lacked resources such as market presence and experience in dealing with public sectors. That is why, with approval of Allianz Re, the PPP took up dialogue with Swiss Re in 2016 that ultimately resulted in Swiss Re officially joining RIICE in July 2017.

Text box 6: Insurance partners in the RIICE partnership

However, our analysis revealed that the **discrepancy in the individual mandates** of the involved parties and, consequently, in their scopes of action, was an obstacle in the implementation of RIICE. In short, these discrepancies involve the following:

- While SDC deliberately supported one technical solution that was at least partly produced by a private business, GIZ had to focus on public goods/public partners as per its rules for nonprofit programmes. This discrepancy became an obstacle in phase III when commercialization turned out to be the central strategy to achieve sustainability.
- While sarmap required commercial success for its technology, IRRI was rather hesitant and could not clearly commit to a solution that is neither open-source nor not-for-profit. Further, by supporting only one solution, IRRI felt it was risking to be seen by its regional stakeholders and partners as advocating a commercial solution to the benefit of a specific commercial partner. Despite efforts to develop a solution that could help overcome institutional differences, this issue remained unsolved. This partly explains why the final product of the PPP is split into three separate SAR-based components (MapScape, Rice-Yes and ORYZA 2000).
- While the insurers were committed to operate in the best interest of the PPP and develop insurance solutions based on the RIICE technology, they were also confronted with demands by their insurance partners to use different technological solutions.
- Internally, insurers struggled to get continued support and significant resources in the respective country teams to conduct all the necessary steps for the product development, especially as the route to success became longer and less predictable.
- GIZ, due to its funding context and specific requirements, had a mandate to provide capacity development to farmers (education on agricultural insurance and empowerment) that was not

shared by the other partners in the PPP and that did not match progress that was made in other areas of activity.

- A striking difference between the involved public and private partners – and this is true for every PPP – concerns the underlying institutional mindsets and practices that results from them. While the private partners and, to some extent, IRRI being a research institute, can adjust to changing contexts rather quickly, the public partners SDC and GIZ have more institutional boundaries that manifest through more static goals and procedures.

In more general terms, the PPP parties have very **different backgrounds and organizational cultures**. Despite an overall positive atmosphere in the partnership, this sometimes lead to misunderstandings and frustration. According to our interviews, the different mindsets were not actively addressed, e.g. by making space for updates on expectations and perceptions within organizations.

3.2.3 Overall strategy and project management

This section moves from analyzing the characteristics of the overall strategy to observations regarding more specific strategy elements. It thereby clusters the answers to the following evaluation questions:

Questions No	
2	In general terms, were the approaches chosen by RIICE appropriate to the expected results, in particular in terms of promoting technological innovation and inducing institutional / system changes?
3	Which more adequate options could RIICE have chosen to produce more relevant results?
4	To what extent is RIICE fitting in the strategic priorities and modalities of SDC Global programme food security, in the mandate of the Global cooperation of SDC and of SDC more broadly?
10	Which alternative approaches might have led to similar results at lower costs?
11	Was the development intervention implemented on the basis of a result-oriented approach? Was the monitoring system in place to track the impact of the development intervention suitable in terms of its objective?
12	How did the project management as well as steering and decision-making processes function? Were problems identified in good time and were practical, feasible solutions proposed?

The overall strategy of RIICE is typical of an international cooperation program. Some of its elements are well tried and tested and were included purposefully, while others result from trade-offs that are, to some extent, necessary in a multi-stakeholder project. While each element of the strategy can be addressed on its own, the analysis also revealed that some strategy features were missing that would have been more appropriate for this innovative, high-risk endeavour.

To begin with, the initial project design of RIICE was drafted by the initiating members of the PPP without consultation of partner country representatives (**supply-driven approach**). This lack of participation in the very early stages of RIICE had a number of consequences. First, it made it harder for partner

institutions to develop a sense of ownership for RIICE. Second, the exclusive outsider perspective resulted in an overemphasis of the technological aspects of the change that the partnership was seeking to induce. Institutionalization, on the other hand, did not receive much attention in the first phase of RIICE. Only when it became clear that the technology by itself would not be sufficient to convince partners to embrace the change, the partnership refocused its attention on policy dialogue. Third, partner countries' preferences when it comes to crop monitoring were not taken into account sufficiently. This became apparent when partner countries did not fully embrace the whole RIICE package, but opted out of some parts (as, for example, Cambodia and the Philippines did not support the insurance component in the early stages of RIICE). Finally, since they did not oversee the whole strategy of the PPP, partner institutions were (at least until 2015) not sufficiently informed that after the donor funding ends, they would have to bear the ongoing costs of the RIICE technology (license, support and training) themselves. Even though RIICE parties started communicating this in phase II, the message was not fully understood for a long time.

The **selection of partners in the PPP** was a strategic choice that was made even before RIICE was accepted for funding by SDC. While all partners brought valuable resources into the PPP, leverage might have been larger by inviting more donors into the endeavor and targeting a field building approach instead of focusing on one particular technology.

Project implementation largely followed the **boundaries of the results framework** that was drafted in the early beginnings of RIICE. Details were adapted (i.e. the insurance component was eliminated in Cambodia and the Philippines, institutionalization received more weight since phase II), but the overall goal and the overall approach never changed – even when it became obvious for many stakeholders that the project would not be able to meet its ambitious targets on the impact level. In particular, the PPP continued to bet on one technology (instead of supporting multiple remote sensing solutions). Also, even though the PPP was part of a global program, the promotion of knowledge sharing and networking on remote sensing technology between involved governments in South-East Asia was very limited. This, however, could have facilitated building a broader base of support and, potentially, demand.

One reason for following through with the initially planned inputs and activities was that the project design lacked the existence of **pre-determined decision points** and **spaces in the partnership to critically review and adapt the initial design.** Several interview partners confirmed that even though they felt that their efforts could not lead to the planned results eventually, they saw the solution in trying harder instead of critically questioning the RIICE overall strategy. The steering committee meetings that were held regularly were designed around operational monitoring. There were some strategic discussions, but they did not lead to major changes. This was a disadvantage for a high innovation, high risk project.

RIICE, by design, chose to approach selected departments within the **ministries of agriculture as primary partners** in the project countries. The reasoning behind this strategy was that those departments were expected to have the greatest interest in RIICE technology because they would be able to use it for crop monitoring and for disaster relief management, but also because they were

expected to be capable of implementing and sustaining the technology in the medium term. Further, as per the initially envisaged programme theory, the governments could pass on the timely and accurate data to insurers and thereby make it more appealing for the insurers to bring an insurance product to the market. While the overall reasoning for this strategic choice is defensible, it became obvious in the process that the political stakeholder landscape is more complex than was anticipated and that political relations between individual departments should have been considered more when choosing one partner over another. Also, more top-level support, e.g. by the minister, might have been helpful to advance decisions. This would have required a less technical, more diplomatic engagement approach from the very beginning. In sum, focusing on selected ministries and respective departments may result in creating a bottleneck that is critical for the overall success of the partnership. In the case of India, where the government – despite proof of concept of the RIICE technology – decided not to incentivize insurers to make us of remote sensing data, this ultimately resulted in discontinuation. In the Philippines, the government did not turn into a bottleneck, but into a key facilitator in creating PRiSM. In Viet Nam, the rigidity of the public insurance scheme hampers insurers to adopt new technology, and sarmap is now (post-RIICE) exploring the possibility of providing the service directly to insurers BaoViet and VinaRe and thereby bypassing the governmental bottleneck.

Another key design feature of RIICE is that initially, it never intended to build insurance schemes from scratch. Instead, it envisioned and planned for **plugging the technical innovation into existing schemes** and thereby upgrading their quality and relevance for rice farmers. The existence of some kind of a public insurance scheme was therefore one of the criteria for selecting partner countries and it was met in all of the project countries (except for Cambodia). This approach (which has been coined “top-down approach” by stakeholders in the PPP) has proven to be rather challenging (see text box 7 for two examples).

Spot on: The "top-down" approach

In the case of India, despite its initial success in Tamil Nadu, RIICE technology was not able to find its way into the flagship insurance scheme of the Government of India, Pradhan Mantri Fasal Bima Yojana (PMFBY) which was established in 2016. While it is difficult to pinpoint the exact reasons, interviews for this evaluation revealed factors that may have had an influence: RIICE technology is more costly than well-established (but less accurate) traditional tools and methods of crop monitoring, and stability is valued higher than accuracy and timeliness (see also section 3.2.1 on the nature of the technology). Finally, Indian institutions were hesitant to prefer a foreign provider over an established Indian business. Information based on RIICE-technology therefore was processed by TNAU, forwarded to the Tamil Nadu Department of Agriculture, and then in-turn shared with insurers. Only in the last phase, ICRISAT shared results with insurers and with India's National Crop Forecasting Centre with the view to raise awareness on the potential of the technology in in semi-arid ecosystems beyond the rice crop.

In the case of Viet Nam, the top-down approach has been equally challenging. To reach its goals with regard to crop insurance, the PPP was highly dependent on the Government of Viet Nam. Even though the prerequisites were met in terms of technological viability and in terms of government capacities, implementation was delayed for years. Given that there is no scope for insurance products outside the national program, RIICE was not able to follow an alternative strategy when it became apparent that timelines could not be met.

Text box 7: The "top-down" approach

An approach that was not envisioned initially but that took shape during the implementation of RIICE phases II and III is the "**bottom-up approach**" (again, this term has been coined by parties of the PPP). It refers to a case in which there is no pre-existing crop insurance scheme that can simply be upgraded with cutting-edge SAR technology. In the absence of a government-driven insurance scheme, the PPP builds a customized solution from scratch. In the process, it includes different stakeholders such as local insurers and government entities, but also farmers' associations and other organizations that can contribute to creating a demand-driven insurance solution. This approach was implemented in the case of Cambodia (see Text box 8 for more detail).

Spot on: The "bottom-up" approach

In Cambodia, there was no public agricultural insurance scheme with premium subsidy support prior to RIICE. But since the government expressed a strong interest in establishing a crop insurance (as is, for example, reflected in the Rectangular Strategy Phase 4), the PPP parties took a special interest in the country and chose to include it in RIICE despite the absence of the insurance scheme. The RIICE workstreams all run in parallel:

- the technology was adapted in close cooperation with MAFF and CARDI,
- trainings and workshops were organized (including a study tour to India to share experiences with different key organizations working on crop insurance and RIICE technology),
- insurance company FORTE developed a customized insurance index that is meeting the needs of small-scale rice farmers by simplifying product features used in the conventional market such as the use of deductibles and exclusions,
- technical staff of MAFF, FORTE and Syngenta foundation engaged in trainings and discussions with farmers on the area-yield insurance solution to increase acceptance of the index concept.

Text box 8: The "bottom-up" approach

As is to be expected from an innovative PPP such as RIICE, there was **no clear definition of its final technology output** in the very beginning. Given that the members of the partnership had different mandates (see section 3.2.2 for more details), the output was envisaged in different ways. While SDC, sarmap and IRRI could work toward a specific commercial product, GIZ was not able to support one product over another product by a competitor. The conflict in mandates was similarly significant in the case of IRRI: Being a recipient of public funds, IRRI could not fully commit itself to supporting a commercial product instead of offering it open-source – as it does with other research outputs. This conflict was addressed in a consulting process in 2018 and solutions were proposed, but ultimately, no actions toward these solutions were taken. Other factors that may have had an influence on IRRI's reluctance to further engage in commercialization were not addressed in data collection for this report. Despite these challenges, the PPP decided to go for a license model to commercialize RIICE technology. This model is highly adjustable: Time periods and conditions are unique in each contract that sarmap/IRRI are signing with a partner. This has advantages and disadvantages.

Closely linked with the lack of a tech output definition is the fact that the **commercialization of RIICE technology was neither conceptualized nor communicated** in phase I. Only in phase II, the PPP parties started addressing this issue in external communication, and it was a bitter pill to swallow for the partners. Even though the issue has been addressed regularly since phase II, the perception of a lack of transparency has remained.

One strategic choice of RIICE that explains the delay in institutionalization is the **preference of bilateral dialogue over more traditional ways of communication and marketing**, such as events, videos or publications. Interview partners confirmed that direct partners in the involved government departments were very aware of RIICE, but there was little awareness beyond that.

RIICE implemented activities for **the four different workstreams in parallel** (see Figure 1). Activities for farmer capacity development, however, could only contribute to the intended impact in case that outcomes were achieved in the other workstreams. Especially in cases where there was no outcome yet in the insurance component (in India: no longer; in Cambodia: not yet), the capacity development activities could not fulfill their function of facilitating insurance uptake.

The **RIICE project monitoring system** was perceived to be **too heavy** by all stakeholders who contributed to this evaluation. It remains unclear to what extent monitoring data really was used as an empirical basis for making operational and strategic decisions.

On a more general note, **steering** a complex and innovative global program requires a special purpose unit. In the case of RIICE, the program management office (PMO) fulfilled this function in phases I and II. It succeeded in engaging partners and overseeing progress in operational terms, but it did not go beyond by addressing more strategic issues. When the PPP parties met in the Steering Committee every six months, the time was used mainly to review progress along the M&E framework and make operational decisions, but more substantial changes regarding the overall strategy were not made.

3.3 Sustainability

This section clusters the answers to the following evaluation questions:

Questions No	
17	What evidence is there that the achieved effects will continue after the completion of the project?
18	Which major factors might enhance the effects achieved or prevent them from continuing?
19	Can the partner institutions and involved stakeholders continue the activity independently (existence of financial resources) and adjust their strategies to changing conditions? Do they have their own problem-solving capacities (technical capacity)?
21	In how far has RIICE contributed to a post-project continued provision of the new technology / services to the direct partners and to other partners / clients?

Answers to these questions vary greatly in the different countries.

For **India**, there is **not much evidence that the achieved effects will continue** after the completion of the project primarily because of the fact that for none of the public partners, RIICE is a core business, or the service provided by them creates relevant venues. Additionally, RIICE products – further developed within the 2.5 year project ReSAR – such as crop stress maps, prevented sowing, seasonal phenology etc. developed for deciding losses and aiding the process of insurance claims do not feature in the PMFBY guidelines and it is not mandatory for insurance companies to continue with the RIICE based products. However, there is also a growing interest in the application of SAR technology in the agricultural sector, evidenced i.e. by AICI launching a remote sensing based insurance product and more entities in India building capacities on the same.

The decision to move on to other states and other crops beyond rice in phase III was a risk. It meant starting all over again with the technical set-up and activities in the other workstreams, and climbing the whole pathway of change in a very limited time-frame. But even though RIICE could not reach its intended outcomes here, for India ICRISAT has at least indicated that they would continue to use SAR-based technology to develop and disseminate products since they now have the capacities to do so. Currently, they are working with technology that is available free of cost, and the institute does not have any immediate plans to tag a price to its products. Lack of funds post completion of the project was indicated as a constraint to continue using the RIICE technology. The fact that both TNAU and ICRISAT were technically capacitated, at best, indicates positive adoption of the technology.

In the Philippines, since RIICE was institutionalized in PRiSM and is valued across the government and third-party stakeholders, the **sustainability outlook is rather positive**. PRiSM is fully hosted and operated by PhilRice, which shares the data with the Department of Agriculture as well as third party stakeholders that have a vested interest in the rice information or the DRM products.

As mentioned before, PRiSM has led to a sustainable upgrading of technical capacity of PhilRice, the Department of Agriculture, and a general appreciation of technology across the public and private sector.

While the insurance part has not been pushed through during the official RIICE phases, the operationalization of the technology has encouraged previous partners of the insurance industry to re-evaluate their plans regarding the use of remote sensing. Therefore, the RIICE technology might have a chance to materialize in the insurance industry, which was the overarching goal of the RIICE project.

The continuation of PRiSM depends on available funds for PhilRice from the Philippine government. Since PRiSM depends on MAPscape-Rice, corresponding and recurring license costs will remain while the software of sarmap is being utilized. Moreover, PRiSM relies on trained and specialized staff that is employed by PhilRice. Those costs will remain and needs to be factored in within the budget of PhilRice. While there is no sign of discontinuation of PRiSM as a technology, new remote sensing technology providers have entered the market and are actively persuading governments in the region to use their technology. This could affect the dynamics of the RIICE consortium and working relationship with current client governments.

Just shortly before the end of the RIICE partnership, sarmap, IRRI and PhilRice took up conversations with insurer Pioneer about replicating the Cambodian approach in the Philippines. Post-RIICE, a field visit to Cambodia is planned for Philippine stakeholders to further explore the proposal.

In Viet Nam, there is evidence that MARD intends to apply RIICE technology after the donor's phasing-out. First, there are ongoing discussions among MARD's line agencies about how to connect RIICE technology to the national 4.0 revolution and digital transformation in the agriculture sector, how to secure technical and financial resources etc.. Second, the national 5-year business plan (2022-2026), proposes activities with the ability to generate revenue from service activities, attract funding, serving the Agriculture 4.0 strategy under the Government's orientation as well as the needs of market.

After the donor's phasing-out and in the absence of the donor's budget and national counter-budget, however, it is likely that the stakeholders who were involved in RIICE will change their activities in terms of human resources re-mobilization and financial resources re-allocation. DCERD under MARD, who served as a co-manager in RIICE phase III, will continue its MARD-assigned function of agriculture insurance within the governmental framework and continue to support the national rice insurance program in 7 provinces. In addition, sarmap is currently (post-RIICE) exploring possibilities to provide RIICE services to insurers BaoViet and VinaRe directly to bypass the bottleneck of the rigid public insurance scheme.

On a more general note, through 10 years of implementation, agencies such as NIAPP and CTU have been further equipped and consolidated problem-solving capacities in the fields of remote sensing and GIS, field data collection, modelling, etc. An effect can be seen as further awareness of PPP concept and important linkage between agriculture production and insurance via application of advance technology in the context of promoting agricultural modernization and the related Government's decrees and policies.

In **Cambodia**, there is strong indication that the Ministry of Agriculture, Forestry and Fisheries (MAFF), and Ministry of Economics and Finance (MEF) will financially support a continuation of activities after

phasing out of the SDC funded RIICE project. In relation to the project budget, the MEF has expressed their full support, but approval from the national assembly is still required. It will likely provide for the costs of the software, while operational expenses for the implementation of project activities will be shared among project partners such as GDA, DPS, CARDI, SF and FORTE. The insurance company FORTE has its own financial arrangement and is ready to adapt their working strategy accordingly.

What is beneficial to the continuation of activities in Cambodia is that in the recent development of the Agricultural Sector Master Plan 2030, the developing Agricultural Development Policy, and the Extension Policy of Agriculture, Forestry and Fisheries, the role of a PPP approach is strongly recommended. MAFF officials wish to change the traditional agricultural statistical data management system of the ministry by institutionalizing the RIICE technology. All the people who have been interviewed expressed their support for the change, but also are of the same opinion that the move should be delayed for the time being until getting all concrete results, problems of data discrepancy are found, and all technical procedures are in place. The concept of agricultural insurance and its role in food security and rural prosperity are well recognized among MAFF officials. There have been talks and discussions regarding development of agricultural insurance policy and program for the country.

4 Conclusions

This chapter draws the major conclusions from the findings that are presented above. It thereby seeks to answer one specific evaluation question, but also goes beyond by wrapping up the key take-aways for the items discussed above.

Questions No	
8	How to consider the fact that both the final duration and budget of RIICE have largely exceeded the initial plans? What can SDC and its partners learn from that?

The fact that both the final duration and budget of RIICE have by far exceeded the initial plans can be read as a failure, and it can be read as an indicator for **overambitious planning**. We argue that the latter interpretation is more convincing for several reasons.

First, on a positive note, the fact that they would contribute to very ambitious goal by fostering a cutting-edge solution **motivated all parties** to mobilise resources (both monetary and in-kind) in an exceptional way. Even though some of the intended outcomes and impact could not be reached, none of the PPP members who were interviewed for this evaluation regard RIICE as a (total or partial) failure. But the overall excitement over the PPP also contributed to the fact that the strategy lacked an element of **critical review within the partnership or from the outside** (i.e. an external mid-term evaluation or external strategic back-stopping)**.** More space for reflection may have enabled partners to adjust the approach as well as the targeted outcomes, based on on-the-ground experiences and changes.

Second, with regard to the **technology** at its center, RIICE was a **pioneering project:** remote sensing had not yet been used in partner countries for the purpose of agricultural monitoring. RIICE has been successful in demonstrating that remote sensing technology is superior to traditional crop monitoring methods and that it can be adapted to rice, but also other crops. However, the pioneering nature of the work would have required more time and budget than had been allocated. Progress on this front justified the extensions. Yet, the ambitious targets related to insurance coverage were simply out of reach and never got adjusted along the way.

Third, the PPP did not fully realize in the beginning (and therefore did not take into account in planning) that it was not only establishing a new technology, but attempting to induce **systemic change** at an institutional level. Replacing an existing approach to crop monitoring, a critical element of a country's strategy for food security, is not simply a technical issue. It requires experience, capabilities, and trust that grows over time. And it has consequences that are not necessarily in the interest of the relevant institutions. For example, to save costs, field staff needs to be made redundant. Consequently, institutional change requires long time frames beyond traditional development programming.

Considering the institutional implications of the project ambitions, RIICE would have benefited from **more open communication and engagement**. The focus on technology led partners to engage

national counterparts mainly on the technical level, namely through agricultural monitoring institutes and national insurance companies. In order for governments to change their approach, high level support is also required. High-profile events with high-ranking officials could have helped to create this support and to raise awareness more widely about the benefits of SAR-based crop monitoring. Also, more transparent communication material such as a website with a more user-friendly design that is clearly spelling out the product and its characteristics could have made the project more accessible and easier to communicate for partners.

Fourth, the intervention theory of RIICE includes **factors that are beyond the partnership's control**. For instance, the decision to focus on governments as a key entry point created a barrier – especially in combination with a product by a company that ultimately needs a commercial case. Also, the strategic decision to plug new technology into existing national insurance schemes made success completely dependent on the openness of these few schemes to actually adopt the technology. The overall strategy of RIICE did not sufficiently address these barriers and how the partnership could bypass them in case they cannot be met. Identifying **risks** early-on is important to mitigate them effectively. As the case of Cambodia is indicating, the "bottom-up" approach of building a SAR-based insurance solution from scratch instead of merely updating an existing solution is a promising alternative pathway to results.

Finally, the partnership **did not create space to understand its parties' internal priorities, changes in priorities**. In the PPP, different cultures and mindsets came together. For some of the partners, the internal setup as well as the support for the initiative changed. However, there was no dedicated time to update the collaboration based on the experiences on the ground and changes within partner organizations. Partners met for two days every six months for the Steering Committee. Yet, this time was used mainly to review progress along the M&E framework. As a result, the strategy and work plan could not integrate these changes in a more substantial way. Some of the private sector partners withdrew their support. Other partners remained, but sometimes with a sense of frustration and lack of achievement. More time to synchronize perspectives and adapt planning jointly might have benefited the collaboration.

The **M&E system** has not, in general, supported learning and adaptation of the project. The logical framework and associated indicators were developed in a fairly extensive process using external consultants during the first phase of the project. However, the complexity of the system required a lot of time on the side of the SDC program manager as well as during steering group meetings to be tracked and assessed. As the project evolved based on the realities on the ground, indicators in the framework became less relevant. The M&E system did not provide a good basis for understanding and testing assumptions, learning and adjustment. A Theory of Change that puts a greater focus on risks and assumptions and includes alternative causal pathways might provide a more productive basis for an innovative and complex project like RIICE. A tool like that could be used to track progress in a more flexible way (less focus on collecting data for pre-set indicators) and would need to be reviewed regularly with a focus on risks and assumptions and, derived from that, adaptations of project design.

Regarding the overall approach, we note that the logic is predominantly **supply-driven**. A supply-driven approach always creates risks and challenges in development cooperation, where projects are funded by donors and not by the ultimate users, and hence the mechanism of supply and demand is not in place. Introducing more demand-led mechanisms might have been helpful to ensure local support. This could have included, for example, (a) running open competitions for SAR based solutions, to avoid the complications around supporting one particular company; (b) open calls for engagement with country governments, including a contribution on the partner's side from the very beginning; (c) open calls for engagement from insurance companies, including a clear commitment to develop a product.

In hindsight, **other modalities of implementation than a PPP** appear relevant to achieve the goal of supporting satellite-based risk management of staple crops. In the decade of RIICE's activity, this approach emerged as a field with various players and solutions. SDC might have also taken a field-building approach, by running (challenge) competitions to identify and support several solutions, hosting events and conferences on the matter to connect relevant players and raise awareness, or facilitate multi-stakeholder system change processes. At the time when RIICE started, these approaches probably seemed unviable because of the lack of players and traction. For future projects of this kind, these options should be assessed during the design phase.

New solutions require acceptance and support from a wide set of stakeholders. It is never just about the technology. Being transparent and inviting conversation among diverse players creates a field of support. This should include high level support by ministers and other VIPs where possible.

5 Recommendations

RIICE was a pioneering project with an ambitious agenda, and a complex partnership. While it did not achieve the intended outcome through the insurance workstream, it proved that working together across sectors can accelerate the adoption of new technologies for the public good. Being a first of its kind, it also offers many valuable lessons for SDC, especially as it seeks to engage more in partnerships with the private sector.

Essentially, working through public private partnerships requires a different mindset from traditional development work. In a partnership, no single partner is fully in control. Also, with an ambitious and innovative objective, things will not always go according to plan. So, a three-step programming logic of *strategize – plan – execute* does not work under these circumstances.

Instead of following the traditional programming logic, high-risk endeavours require an approach and an overall attitude that is **innovative, open, iterative and adaptive**. We use these four words to structure our recommendations.

Innovative: RIICE has shown that collaborating across sectors can accelerate the adoption of cutting-edge technologies for the Sustainable Development Goals. We are living in a time of unprecedented technological change. At the same time, the climate crisis along with the social challenges that have

been exacerbated by the Covid-19 pandemic require systemic changes in most areas. Supporting innovative technology-enabled system change solutions should thus be the remit of donors. SDC has committed itself to contributing to this objective. A system change, however, especially when based on innovative technology, can only be achieved in partnership with complementary players from diverse sectors. RIICE can thus service as an inspiration for other partnerships.

- Identify promising technologies that can enable system change for the SDGs. Stay in dialogue with public and private research institutions on latest development, e.g. by hosting conferences, events, and challenges.
- Scout opportunities for partnerships, in particular with Swiss institutions. Engage in dialogue and be open to proposals, or even articulate objectives and invite proposals.
- Facilitate early adoption for development objectives. Depending on the nature of the challenges, this can be achieved in a PPP format, or also via competitions, facilitated dialogue and processes, and other mechanisms.

Open: Working in partnerships implies that actors with different mindsets, cultures and objectives work together to achieve a shared goal. When this goal is in the public domain or even requires changing existing systems, this affects not only government stakeholders but also other parties. Communication should therefore be open in both directions: sharing transparently what is planned, and hearing empathetically what is needed.

- Invite partners to share openly what they need in their institutions to receive support on a continued basis. Uncover differences and potential tensions between partners early on and co-design mitigating strategies. For example, technology development always comes with issues around intellectual property (IP). When commercial and non-commercial parties join forces in development, consequences for IP rights need to be addressed early in the process.
- Partner positions and internal setups change over time. The project becomes more concrete with every step in the implementation, and adaptations will be made to fit on-the-ground circumstances. Plan time to synchronize – e.g. once a year – around needs and concerns. Bring in an external facilitator and create a safe space to open up and reflect.
- Communicate transparently about the objectives and approach from the beginning. Consider which questions stakeholders may have to the initiative and develop an “FAQ”.
- Convene information events for broader audiences and share updates in the media to allow others to participate. Top level support is always useful. Politicians also usually like to engage with pioneering initiatives. Use these events to invite potential high-level supporters and build relationships.
- Such an open approach can also be used to generate demand in the beginning. So, instead of identifying implementation countries inside out (supply-driven approach), initiatives can invite interested partners to get in touch. If participation is tied to an own

contribution, this increases the stakes of the partners in the success of the collaboration and sends the signal that it's not a "free lunch".

Iterative: Technological adoption, systemic changes and institutional changes all require time. In combination, they are also highly complex. While the direction must be clear, the way there can only be defined step-by-step, or iteratively. The project setup thus resembles more an experiment, where different hypothesis will be tested and the "Theory of Change" will be refined along the way. Learning about the assumptions in the process is part of the outcomes and objectives.

- Partners need to be motivated by a shared vision, which will usually be long term. This can also include a measurable goal such as "reaching 5 million farmers". But it should be clear that this is a North Star, and navigation may need to be adjusted along the way.
- Partners also need to align on the next steps. Targets should be defined for each project phase. These targets should also explicitly identify hypotheses and learning targets.
- Assess the time needed for change realistically. Setting unrealistic targets, such as implementing new policies within 3 years, creates frustration among partners.

Adaptive: With iteration comes adaptation. Assume that plans can change from the beginning, and plan for it. Make sure you document why things have changed and share insights with others.

- In your plan, understand the requirements and assumptions, and invest in elaborate action plans that can be brought into action right away when critical assessment reveals that assumptions do not hold. This creates flexibility in the partnership and room to manoeuvre so things do not get stuck. For example, institutional changes, e.g. at policy level, can never be taken for granted. What could you do instead, or in the meantime?
- In an innovative project like RIICE, allow for a more flexible results-based approach. Goals can be framed broader, and there should be more freedom to change them along the way.
- When a project is designed as proposed here, the M&E system can be used to support learning both on the operational and on the strategic level instead of focusing on outcome targets that rather serve external accountability.
- Make time to adjust planning: Invite partners regularly to review progress and assumptions and reflect on ways forward. This should, ideally, be combined with open time to review partners' needs and challenges (see above). A Theory of Change can be a good tool to discuss progress and options while always keeping the focus on the "North Star". Note that the way the "North Star" is framed also plays a role. Check in: does this definition of success still resonate with partners? What other aspects of success do we now recognize that could be used to refine or adjust the definition?

6 Annex

6.1 Bibliography

6.2 Evaluation matrix (version Oct 5th)

See separate document

6.3 Interview guideline evaluation reference group members

Please note: This interview guideline was adapted for each interview with members of the evaluation reference group individually. The guideline depicted here is just one example; questions for the question blocks were changed or added or removed in the other versions.

(will be added to the final version of this report)

6.4 Interview guideline country case interviews (example)

Please note: This interview guideline is adapted for each interview, depending on the interview partners' background. The guideline depicted here is just one example (Viet Nam).

(will be added to the final version of this report)

Tool 7: Assessment Grid for the DAC Criteria

Assessment Grid for project/programme evaluations of the SDC interventions
Version: 30.06.2020

Note: this assessment grid is used for evaluations of SDC financed projects and programmes (hereinafter jointly referred to as an 'intervention'). It is based on the OECD Development Assistance Committee evaluation criteria.[1] In mid-term evaluations, the assessment requires analysing the likelihood of achieving impact and sustainability. All applicable sub-criteria should be scored and a short explanation should be provided.

Please add the corresponding number (0-4) representing your rating of the sub-criteria in the column 'score':
0 = not assessed
1 = highly satisfactory
2 = satisfactory
3 = unsatisfactory
4 = highly unsatisfactory

Key aspects based on DAC Criteria	Score (put only integers: 0, 1, 2, 3 or 4)	Justification (please provide a short explanation for your score or why a criterion was not assessed)
Relevance **Note**: the assessment here captures the relevance of objectives and design *at the time of evaluation*. In the evaluation report, both relevance at the design stage as well as relevance at the time of evaluation should be discussed.		
1. The extent to which the objectives of the intervention respond to the needs and priorities of the target group.	1	For rice farmers, managing climatic risks through insurance can contribute to resilience. For governments, managing climate related crises to improve food security is a critical task.
2. The extent to which the objectives of the intervention respond to the needs and priorities of indirectly affected stakeholders (not included in target group, e.g. government, civil society, etc.) in the country of the intervention.	1	A solid forecasting system for rice yields has value for many stakeholders beyond farmers and government, including traders, civil society organizations and financial institutions.
3. The extent to which core design elements of the intervention (such as the theory of change, structure of the project components, choice of services and intervention partners) adequately reflect the needs and priorities of the target group.	2	The design proposes a sensible approach by betting on government led crop insurance. However, no alternatives are available for this relatively risky approach. Furthermore, betting on one specific technical solution also narrows the options from a target group perspective.
Coherence		

[1] For information on the 2019 revisions of the evaluation framework see: Better Criteria for Better Evaluations. Revised Evaluation Criteria. Definitions and Principles for Use, OECD/DAC Network on Development Evaluation, 2019.

4. Internal coherence: the extent to which the intervention is compatible with other interventions of Swiss development cooperation in the same country and thematic field (consistency, complementarity and synergies).	1	Agriculture and agricultural insurance are an important area of intervention of SDC, including in India. Synergies were created with other programs.
5. External coherence: the extent to which the intervention is compatible with interventions of other actors in the country and thematic field (complementarity and synergies).	2	The project was implemented in collaboration with GIZ and leveraged some components in the German portfolio. Other attempts to align actions with donor portfolios were apparently not made.
Effectiveness		
6. The extent to which approaches/strategies during implementation are adequate to achieve the intended results.	2	The technological solution was created and implemented successfully. Institutionalization and commercialization were only partially successful and approaches to achieve these were limited and not very flexible.
7. The extent to which the intervention achieved or is expected to achieve its intended objectives (outputs and outcomes).	2	Crop monitoring and, to a lesser extent, rice yield forecasting based on satellite data is used by several governments to manage risks. Insurance products have been developed and tested, but market reach is limited.
8. The extent to which the intervention achieved or is expected to achieve its intended results related to transversal themes.		Click here to enter text.
Efficiency		
9. The extent to which the intervention delivers the results (outputs, outcomes) cost-effectively.	2	The project greatly exceeded the initial budget and time frame whilst in the end only partially delivering results. Still, the project created important technical advances and insights.
10. The extent to which the intervention delivers the results (outputs, outcome) in a timely manner (within the intended timeframe or reasonably adjusted timeframe).	2	Changing the way governments assess the status of its most important staple crop takes much longer than initially anticipated. Outcomes are still not fully achieved, and work will continue outside the project.
11. The extent to which management, monitoring and steering mechanisms support efficient implementation.	2	SDC dedicated significant resources to managing, steering and monitoring this complex intervention. With more flexibility and focus on learning this effort may have been even more effective. For example, a lot of time was dedicated to tracking a complex monitoring system that did not allow for adjustment and for asking the right questions.
Impact		
12. The extent to which the intervention generated or is expected to generate 'higher-level effects' as defined in the design document of the intervention. **Note**: when assessing this criterion, the primary focus is the intended 'higher-level effects'. In the event that *significant* unintended negative or positive effects can be discerned, they must be specified in the justification column, especially if they influence the score.	2	Results are mixed. In the Philippines, the intervention contributed to effective crop monitoring and disaster relief management in a substantial way. In other partner countries, a foundation was laid, but higher-level effects could not be reached yet.

Sustainability		
13. The extent to which partners are capable and motivated (technical capacity, ownership) to continue activities contributing to achieving the outcomes.	1	In all countries of intervention, partners are still collaborating to various degrees and are committed to pursue the intended outcomes further.
14. The extent to which partners have the financial resources to continue activities contributing to achieving the outcomes.	2	To date, it is not clear, for the most part, how the continuation of the activities will be funded. In Cambodia, a funding consortium is in place.
15. The extent to which contextual factors (e.g. legislation, politics, economic situation, social demands) is conducive to continuing activities leading to outcomes.	1	Overall, stakeholders agree that satellite-based crop monitoring is the future both for government-led risk management and for crop insurance. More and more actors are entering the space with relevant services and new satellite technology is delivering better data.

Additional information (if needed): Click here to enter text.
Title of the intervention: RIICE – Remote sensing based Information and Insurance for Crops in emerging Economies
Assessor(s): Endeva, Evelyn Funk, Dr. Christina Tewes-Gradl
Date: 28. February 2022