External Review of Vegetable Seed Project, Phase III

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Abbreviation

ADS	Agriculture Development Strategy
AEC	Agro Enterprise Centre
BCTN	Brahmin Chhetri Thakuri and Newar
CBS	Central Bureau of Statistics
SP CFC	Seed Producer's Central Federation of Cooperative
CEAPRED	Center for Environmental and Agricultural Policy Research, Extension and Development
DADO	District Agriculture Development Office
DAGs	Disadvantaged Groups
DCC	District Coordination Committee
DDC	District Development Committee
DoA	Department of Agriculture
FGD	Focused Group Discussion
FY	Fiscal Year
GESI	Gender Equality and Social Inclusion
GoN	Government of Nepal
ha	Hectare
HMRP	Hill Maize Research Program
HRD	Horticulture Research Division
HYV	High Yielding Variety
IFAD	International Fund for Agricultural Development
IQC	Internal Quality Control
kg	Kilogram
km	Kilometre
LILI	Local Infrastructure for Livelihood Improvement
MoAD	Ministry of Agriculture Development
MT	Metric Tone
NARC	Nepal Agriculture Research Council
NGO	Non Government Organization
NPR.	Nepalese Rupees
NSB	National Seed Board
NSB	National Seed Board
NSC	National Seed Company
OPV	Open Pollinated Variety
PVS	Participatory Variety Selection
RSTL	Regional Seed Testing Laboratory
SDC	Swiss Agency for Development and Cooperation
SEAN	Seed Entrepreneurs Association of Nepal
SQCC	Seed Quality Control Center
SSMP	Sustainable Soil Management Program
TC	Technical Committee
TL	Truthful Labeled
ToR	Terms of Reference
VDC	Village Development Committee
VDD	Vegetable Development Directorate
VSP	Vegetable Seed Project

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Executive Summary

The external evaluation team conducted the review of the Vegetable Seed Project (VSP) Phase-III implemented by Centre for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED) with the support from the Government of Switzerland, through the Swiss Agency for Development and Cooperation (SDC)/Embassy of Switzerland. The goal of the project is "Poor and Disadvantaged Households (HHs) in remote areas of Nepal have improved food security and income". The SDC contribution for the VSP Phase III is CHF 2'335'000. The interventions of the project focus on two result areas (outcomes): (i) Farm families from poor and DAGs produce and sell quality seeds; (ii) National Seed Board (NSB), Nepal Agriculture Research Council (NARC) and Department of Agriculture (DoA) enforce decentralised seed production and quality control through both public and private institutions.

The team aimed to assess the impacts (both intended impacts against the target indicators set in the project log frame, and wider areas of impact on the livelihoods of target beneficiaries, particularly disadvantaged groups, women and children, highlight best practices and learning from the Vegetable Seed Project (VSP) III, and explore avenues for potential to capitalise and build on vegetables and seed sub-sector as part of the newly approved Nepal Agriculture Market Development Program (NAMDP) and Nepal Agricultural Services Development Program (NASDP).

The team reviewed relevant documents, met with key stakeholders including Federation of Nepalese Chambers of Commerce and Industries/Agro Enterprise Centre (FNCCI/AEC), Seed Entrepreneurs Association of Nepal(SEAN Seed), Seed Producers Central Federation of Cooperative (CPCFC), Vegetable Development Directorate (VDD), Seed Quality Control Centre (SQCC), Nepal Agricultural Research Council(NARC) and held discussions with CEAPRED management and VSP team and farmers' groups and cooperatives, district based line agencies and partners such as District Agriculture Development Office, DDC and district based agro-entrepreneurs. The mission also observed project activities in four (Surkhet, Dailekh, Kavre and Okhaldhunga) project districts.

This report presents the key impacts, best practices and lessons learnt from the VSP III, and suggest strategic ways and recommendations to refine future focus for improving competitiveness of Nepalese vegetable seed subsector.

Key findings of the review team are:

- The impacts of VSP in terms of improved livelihoods are well appreciated by the target groups. The Cost- Benefit analysis revealed that almost all vegetables species (onion, radish, pea, beans, and cress) cultivated in project areas for seed productions fetched two to three times net benefits compare to the traditional cereal like maize, wheat and millet. For example, the production of 40-days radish seed shows that per unit investment on seed production gives around 57% higher income on investment with 1.57 benefit—cost ratio, with NRs 257 per unit return to labour. At household level, the project made direct contribution to increased income through sale of vegetable seeds by 17%. The average annual income per household in 2013 from vegetable seeds alone in the project areas was NRs 20,484 (ranged from NRs 560 to NRs 157,358) calculated from 892 households. The participation of DAG (>60%) and women (>50%) in project activities was encouraging. There have been number of wider indirect impacts of the project although it is difficult to assess the extent (i.e. direct attribution of the project). Positive impacts have included an increase in food and nutrition security, improved leadership and collective efforts, increased physical assets, increased investment (one-fourth of total income

from vegetables is spent in education) on children's education and better access to financial and government services. There were instances in which the increased dependency on single crop posed some risks on farmers in relation to climate change and market uncertainty.

- Key stakeholders recognised the importance of vegetable seeds as an agricultural input that contribute to increase crop productivity by 30 percent and to strengthening food security directly and indirectly impacting on the improvement of livelihoods in project areas. The district level stakeholders extended full cooperation to the VSP and put joint efforts to promote the sub-sector.
- VSP has done commendable job in strengthening farmer groups and developing them into specialized seed cooperatives for quality seed production and marketing. As of July 2013, VSP has facilitated the formation of 41 cooperatives representing 599 farmers groups, and contributed in establishing 'Seed Producers Central Federation of Cooperatives' – as an umbrella organisation of primary cooperatives. However, some of them are still in infant stage with high dependency on project support.
- Vegetable seeds and off-season vegetables are closely tied up. Being high value and low volume, vegetable seeds offer unique opportunities for poor and disadvantaged people residing in remote/inaccessible areas. Although, integration of fresh vegetables as kitchen garden and livestock seemed to be better preferred by the DAGs. Whereas fresh vegetables as commercial farming is more suitable for settlements in road corridors. Moreover, vegetable seeds generate better income but pose more risks due to longer payback time and market uncertainty as compared to the fresh vegetables.
- VSP is a kind of project that is meaningful for integrating DAG and women in the value chain. However, as vegetable seed production requires specialized skills, better micro climatic environment including fertile land, irrigation and suitable topography the marginalized groups need to be supported with additional packages including infrastructure support, smart subsidies, and quick gain activities.
- The project made good efforts to create enabling environment through providing support in preparing 'Decentralized Source Seed Production Directive'; preparation of 'National Seed Vision 2013-2025'; amendment of Seed Regulation (2013) and other seed policy reforms.
- In case of market linkages, the project made good efforts in bringing agro-vets and farmer groups/cooperatives in one platform and facilitating contractual arrangement between buyers and suppliers. However, breaching of contracts is quite common and the level of trust between private sector/traders and farmers groups/cooperatives is not very high. The mission noted number of reasons for breaching of the contracts, including: lack of balance sheet that result into huge gap in demand-supply situation, poor enforcement of contractual laws, lack of professionalism among traders as well as farmers groups, looking for short-term gains rather than sustainable business. It is likely that market uncertainty and risk of falling of the price may continue, if external facilitation 'neutral brokering role' is not provisioned. The private sector actors highlighted clear need to undertake detailed assessment of market trend and promote only those seed varieties which offer comparative advantages.
- In the context of rural-out migration, the VSP contributed to reducing the period of seasonal migration to India and in some cases completely foregoing the season migration. Increased income from vegetable seed production is being used to finance migration to Gulf and East Asian countries. It was also noted that the returnees were more receptive in adopting new technologies and proactive in group and cooperatives activities.

Major learning from the VSP:

- Acceptability and ownership: The review mission noted high level of acceptability of the project by the community, compatibility with other initiatives and collaboration with the local stakeholders as well as adherence to government policies which is among the most important factors for any project to succeed.

- Leveraging resources: VSP played very constructive role in leveraging resources from other programs/project including VDC funds in agriculture sector through 'Agriculture, forestry and environment sub-committee in VDC. The review team found that the 15% VDC block grants are effectively mobilized to agriculture sectors particularly in vegetables due to constant and constructive engagement of VSP's groups in the sub-committee in both Dailekh and Okhaldhunga (e.g. Mr. Bishnu Shahi, Chairperson of *Hate Malo Cooperative* in Dailekh appointed as head of subcommittee to decide on the use 15% budget in his VDC. Similarly, in Rumjatar of Okhaldhunga, Mr. Abhikesar Dahal of Kunjara Vegetable Seed Producers Group has been appointed as head of VDC sub-committee to mobilise the budget allocated for agriculture.)

- Inclusion and competitiveness: The review mission noticed that the farmers who have sizable lands (>2 ropani), irrigation facilities, some level of exposure and affordability to apply fertilizers and pesticides seemed to be more competitive than those who have marginal lands and limited financial resources to purchase agro-inputs. So, to include DAG in vegetable seed there is a need to ensure forward linkage and provide additional support for integration of vegetable seed production with other quick gain activities. In absence of additional support packages, the DAG having marginal lands with no irrigation facilities likely to drop out from the vegetable seed business.

- Creating win-win: The approach adopted in the project put high emphasis on strengthening capacity of the actors that are involved in production of vegetables and seeds. It appeared that the project managed to win high level of trust from farmers' groups/cooperatives and local agro-vets but it could not manage to win the same level of trust from big firms, which is equally important to create a situation where both suppliers and buyers see seed business as win-win for both parties. During the interviews, almost all cooperatives expressed interest to perform additional roles (i.e. establishment of processing unit, packaging, labelling, distributing seeds through agro-vets to farmers), which are currently performed by big firms, having no clear answers about the sustainability of such initiatives.

- Exit strategy and sustainability: Though the project specified some strategies for the sustainability of the interventions[1], the review team could not find clear answers on phasing out and phasing in mechanism, i.e. (i) who will play the roles currently played by the project, and (ii) whether the technical inputs and market services will be available and get paid by the target groups after the project is phased out. Recently (April 7, 2014), the Project Steering Committee meeting discussed about possible exit strategies, which include handing over the part of the project functions to government and other stakeholders, strengthening internal quality control system and mobilisation of human resources during the post project activities through developing MOU between CEAPRED and SPCFC. However, the questions still remain unanswered whether the required capacity can be built within remaining months to sustaining the project interventions.

[1] Project document submitted to SDC by CEAPRED in July 2010 specifies some actions under Section 8 Sustainability and Exit Strategy

Way forward (recommendations)

- Harnessing comparative advantage to improve competitiveness: To be competitive in the market, it is important to determine the most valuable and popular crop varieties (identifying max of 10 most promising varieties from a long list). For which it is suggested to have thorough assessment of the demand and supply situation, comparative advantage of specific varieties, opportunities and critical bottlenecks in specific variety.

- Coordinated efforts: As highlighted in the National Seed Vision 2013-2025, production and marketing of vegetable seed is very sensitive enterprise, which requires coordinated efforts and strong collaboration between research, extension and the actors involved at different nodes of the value chain. It is therefore proposed to have one Vegetable Seed Development Program with different projects/components focusing on capacity development and institutional building to addressing the key bottlenecks (weakest link in the value chain). Since value chain is actor driven approach, it is also suggested to establish Vegetable Seed Development Alliance (VSDA), which includes societies of farmers' groups/cooperatives, agro-vets, seed entrepreneurs, logistic and other service providers engaged commercially in the value chain. The VSDA will be the first step towards well-coordinating and steering value chain public-private to align vegetable seed related programs with most other interventions of government (Seed Quality Control Centre, Horticulture Research Division, etc) and development partners (CEAPRED, IFAD projects etc). The VSDA will have access to value chain development fund to be established under "flagship value chains: maize, dairy, vegetables, lentils, tea", as suggested in the Agriculture Development Strategy (ADS).

- Focusing on Climate Resilient Production: Undertake a comprehensive assessment of environmental risks/climate change impacts along the value chain, and brainstorm/develop/demonstrate ways (methods, practices and technologies) to enhance resilient capacity of farmers to cope with the effect of climate change on vegetable seed production.

- Variety (both OP and hybrid) development, registration and maintenance: The mission noticed that the supply of source seeds (breeder and foundation seed) of improved/new OP varieties as well as the hybrid seed in adequate quantity is an obstacle for commercialisation of vegetable seeds. It seems very urgent to strengthen the capacity of the breeders (including NARC) for development, maintenance and registration of seeds.

- Incentives for Innovation: As competition is growing and Nepal has open border with India from where large quantity of seed is imported, it is time to encourage private sector in this business on public-partnership modality. The breeders should be rewarded for their innovations in developing and releasing new varieties.

- Using migrant youths as an entry point for technology promotion: The migrant households and returnees have higher risk taking ability compared to non-migrant households due to diversification of livelihoods. Because of remittances they can afford to wait for the payment, which is generally made after 3-4 months of delivery, and workmanship they brought with them from abroad make them more suitable for promotion of new technologies.

- Building trust and strengthening VC linkages: To achieve the growth and improve the performance of the value chain it is a prerequisite to have feeling that business of one actor is dependent on the performance on the other actor in the chain. So, efforts are needed to strengthen horizontal and vertical linkages between actors through increased transparency, exchange of information and provision of business embedded services from seed firms (e.g. SEAN members) to producers.

- Communication and knowledge management: Developing a plan and establishing a mechanism to identify the topics on which to generate knowledge, how to capture the success stories and whom and how to communicate the best practices and learning, and facilitate the adaptation process is also an important area to look at.

- Bridging-in arrangement: Though the target beneficiaries appreciated the efforts made by the project and showed their confidence in production of fresh vegetables and OP seeds, their dependency on project support for technical services and marketing of seeds appeared to be very high. As the project is phasing out in December 2014 (but not the commodity), target groups, particularly in project districts that were included during 3rd phase, might be shocked with project's exit. Hence, for gradual phasing out of the project it is recommended to make arrangement for bridging between VSP III and the upcoming new programs.

1. Introduction

1.1 Background

This report presents the findings from the external review of the Vegetable Seed Project (VSP) Phase-III implemented by Centre for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED) with the support from the Government of Switzerland, through the Swiss Agency for Development and Cooperation (SDC)/Embassy of Switzerland. The project partners include: Department of Agriculture (DoA), Nepal Agricultural Research Council (NARC), farmers' groups, seed producer cooperatives, and private seed entrepreneurs. The goal of the project is "Poor and Disadvantaged Households (HHs) in remote areas of Nepal have improved food security and income".

The project is implemented in 16 hill districts namely, Baitadi, Dadeldhura, Achham, Surkhet, Dailekh, Dolpa, Kalikot, Rukum, Salyan, Jajarkot, Parbat, Myagdi, Kavre, Ramechhap, Okhaldhunga and Khotang. The project started in 2004 and is now in its third phase (2011 – 2014). The SDC contribution for this phase is CHF 2'335'000.The interventions in the third project phase focus on two outcomes: (i) Farm families from poor and DAGs produce and sell quality seeds; (ii) National Seed Board (NSB), Nepal Agriculture Research Council (NARC) and Department of Agriculture (DoA) enforce decentralised seed production and quality control through both public and private institutions.

1.2 Strategic Context and Project Relevancy

Nepal is classified as low income food deficit country and agriculture is central to the national economy. Overall, the agricultural sector contributes 35% of national GDP with over 76% of all households principally rely on the sector for their livelihoods. The land holding size is getting smaller (average holding size reported to be 0.8 ha), and for 60% of holdings , annual production is not sufficient to feed the households over the year and 20% of holdings are food deficient for more than half the year. In this context, the modernisation and commercialisation of agriculture is considered to be one of the four pillars of national priorities outlined by the GoN for achieving higher employment rates, especially for youths. The main vehicles to sustain agriculture productivity include irrigation, fertilizers and quality seed.

Off-season vegetables and vegetable seeds have high potential for poverty reduction, growth, gender and social inclusion and environmental sustainability. Based on ranking of 48 value chains across the four major sectors - crop (32 commodities/products), livestock (11), fisheries (2), and NTFP/MAP (3), vegetable subsector ranked 3rd(after maize and dairy)most important value chain[2].

Demand of vegetable seeds in country has been continuously growing with expansion of areas under vegetables production due to increasing road connectivity and increased demand of fresh vegetables in urban and semi urban areas. Within two decades, some mid hills road corridor and nearby areas of Kathmandu valley have tremendously demonstrated as hub of fresh vegetable production.

Recognising the fact that seeds are the most cost-effective technology for sustained productivity, representing only eight percent of all direct expenses for inputs and materials and three percent of the overall production cost, the demand for improved seed is on raise. Against a current annual demand of 2,000 tons of vegetable seed in Nepal, only about half is produced domestically, and rest are met mainly by import from India, Japan, Korea, Thailand and other countries.

[2] Agriculture Development Strategy

The agro-climatic diversity of Nepal (ranging from tropical low lands in the south to high mountains in the north, to Himalayan elevation) has an advantage of producing different kinds of vegetable seeds, both for meeting domestic need (import substitution) and export. Seed is considered the key subsector that offers entry points for stimulating growth and productivity. Thus the project like VSP III that focuses on production and marketing of quality seeds are of great relevance for improving income and livelihood of farm families, thereby contributing to poverty reduction, enhancing food and nutrition security and improving access to basic services like health and education.

1.3 Project Approach and Implementation Modality

The project was implemented with major emphasis on production and marketing of quality seeds for increased income and livelihood of farm families. The two- fold strategy for designing VSP III has been adopted:

1. Deepening the intervention in the on-going districts (11) of phase II
2. Expanding and up scaling in five new districts in Phase III (total district 16)

CEAPRED, as an executing agency of VSP III, has employed its three-pronged strategies in project implementation: i) social mobilization, ii) capacity enhancement of farmers and iii) building local institution of the vegetable farmers by organizing them into groups and cooperatives for seed production and marketing. The entry points for project intervention were farmers groups already existed (formed and strengthened in target VDCs by different programs and government agencies like DADO, DWO, DRSP etc) in selected project districts.

Geographical targeting

The key criteria for district selection were: remoteness for harnessing the comparative advantage of vegetable seeds, implementation feasibility considering geographical harmony, clustering districts to raise the economies of scale and establish commodity specific blocks for enhancing value chains, climate/suitable crop ecology to capitalize ecological advantage, diversification of crop species for maximizing income, and SDC Clustering.

Beneficiary targeting: (60% DAG and 50% women)

Guided by the project scope and also by Swiss Cooperation Strategy for Nepal, 2009-12, the primary criteria of identifying target beneficiaries is the inclusion of farmers, with priority to small holders, who are potential to meet the technical requirements for vegetable seed production, selected with GESI consideration. The ultra-poor groups in the vicinity of selected sites were also targeted to create equity in growth. Since vegetable seed production requires specific geographic locations and the desired economies of scale is to be achieved to demonstrate the impacts, farmers with relatively larger holdings (>0.5 ha) were also targeted. The seed production pockets are relatively in the interior parts (5-30 KM from main road head), while that of fresh vegetable pockets are close to road heads.

Key elements of the project interventions

The major parts of the project interventions were directed towards farm households (Outcome A) and the rest towards seeking policy and regulatory support of the governmental agencies, and marketing support of the private sector agencies (Outcome-B). The inclusion of the poor, disadvantaged groups and women remained as key strategic elements for the project. The project envisaged to implement the activities in close coordination and partnership with local government agencies (DADO, DDC/VDC) and

other various public and private organizations including in synergy with SDC sister projects particularly in Swiss cluster districts. The key interventions made to achieve the results include:

- Strengthening Public-private Partnership
- Bringing Cooperatives into Formal Marketing Channel
- Promoting synergy and connected approach for development
- Regular technical backstopping, Monitoring, Evaluation and Cross-Learning
- Reinforcing Partnership with stakeholders with Defined Roles as specified in the annex 5 of the project document
- Building on CEAPRED's past experience in fresh vegetable and vegetable seeds
- Promoting partnership with international research institutions (e.g. AVRDC) and universities (e.g. AFU)
- Focus on high value seeds and demand based seed production with pre-contract
- Emphasis on varietal development and maintenance (in CEAPRED's resource farms)
- Decentralized source seed production (primarily through cooperatives)

Project management structure

VSP adopts decentralized project management consolidating the districts into clusters and aligning production pockets along commodities. The Project Steering Committee (PSC) chaired by Secretary, MoAD is the key governing body for the project, of which the Project Team Leader acts as Member Secretary to PSC. Policy guidance, coordination support, approval of the work plan and budget, and reviewing the project progress are the main responsibilities of the PSC.

At district level, a District Coordination Committee (DCC) has been constituted. The DCC is chaired by DADO and members are: Program Officer (DDC), Women Development Officer (WDO), representative from NARC/DOA farm, farmers' representative (at least one female) and VDC authority from major seed producing area, representative of seed production and marketing cooperatives, and representative of local seed entrepreneurs. District /Cluster Coordinator acts as Member Secretary. The DCC approves the project activities of the district, supervise, monitor, and guide district activities. DCC meeting takes place at least twice a year.

2. Purpose of External Review and Terms of Reference

SDC commissioned a team of national experts consisting of two independent consultants and a representative from the Ministry of Agriculture Development (MoAD). As provisioned by SDC, the evaluation team received inputs from migration expert on seasonal/youth migration issues in general and migration impact on vegetables seed production in particular.

The evaluation aims to assess the success, and capitalize the achievements, best practices and learning from the Vegetable Seed Project (VSP) III to refine future focus and foster the sustainability of past achievements in the newly approved Nepal Agriculture Market Development Program (NAMDP) and Nepal Agricultural Services Development Program (NASDP). The terms of reference includes number of specific questions around the following areas (compare TOR – Annex 1):

Capitalization of impact level achievements, best practices and learning**:** The team expected to document impact level achievements, best practices and learning in terms of sub-sectoral relevance, its contribution to sectoral growth, implementation modality, commodity promotion throughout value chain, capitalizing niche-based opportunities, supporting women and social inclusion objectives, and policy contribution.

Way forward*:* Based on the assessment of impact level achievements, best practices and learning, the team is expected to reveal the link between the results of VSP phase III and upcoming projects (NAMDP and NASDP) and recommend avenues for i) potential to capitalise and build on vegetable and seed sub-sector as part of the NAMDP and NASDP, ii) institutionalising cost-efficient implementing mechanisms for value chain development supporting to women, poor and DAGs in specific and the private sector and iii) potential strategic alliance for program harmonisation and resource sharing with like-minded development partners.

3. Methods of the Evaluation

The team applied a mix of assessment methods to ensure a balanced and fair view of the project and to ensure that all stakeholders' views are reflected in the evaluation report. The draft methodology was shared and review schedule was finalized in consultation with SDC and CEAPRED (Annex 3).

3.1 Methodology

The methodology applied for external review included:

Analysis of project documentation: The team reviewed a large number of documents including the project design, agreement, baseline survey report, annual reports, outcome monitoring surveys, internal assessment report, Steering Committee minutes, field visit reports, and other documents as required and available.The team also reviewed the strategy and policy documents to see whether the project fits in well with the context of target groups, agenda of executing agencies and policies of the concerned national governments.

In-depth interviews with project personnel: he team conducted in-depth interviews with CEAPRED personnel to gather background information on project activities, strategic approaches and changes, policy issues, achievements and constraints of project implementation.

Key Informants interviews with stakeholders: The team prepared lists of key questions for interviews and discussions with stakeholders, which include Government line agencies (Seed Quality Control

Centre, Vegetable Development Directorate and Horticulture Research Division NARC), business membership organisations (SEAN, AEC), NGOs/projects involved in vegetable sub-sector (e.g. SSMP, LILI, CIMMYT, HVAP), Agro-vets and cooperatives. The list of people met is given in Annex 2.

Field observations and interviews with target groups:districts, in consultation with SDC, ensuring representation of one SDC cluster district in eastern / central and one in mid-western development region were selected for field visits. Focus group discussions and individual interviews were held with target group beneficiaries, i.e. seed growers, cooperative members, commercial farmers, training participants, collectors, local traders etc). Observations of farmers' field including those of disadvantaged groups were made to get in-depth cases of project impact. Apart from project beneficiaries, non-participating households were also reached out by the team to understand the limitation/reason for their non-participation.

Data analysis and comparison with baseline: the review team took advantages of using data from a mini survey done by CEAPRED in July-August 2013. The survey had covered 905 sample households out of 12,395 in 16 project districts. The household level data stored in SPSS were analysed in selected indicator and compared with baseline data of year 2011.

Debriefing meetings with key stakeholders: After the field visits, the review team conducted debriefing meetings with key stakeholders at district and national level with an intention to share preliminary findings and seek inputs from the participants for finalization of the report.

3.2 Review Principles

- **Proportionality:** The review team visited men and women, migrant/non-migrant families, discriminated/non-discriminated families, public and private and VC actors involved at different node of the chain to have balanced views on the project.
- **Independence** but heavy consultation with project key stakeholders: The review team had thorough consultation with project implementing agencies and key stakeholders, but presented their independent views on this report.
- **Transparency**: validation of information during FGDs and debriefing at district and national level
- **International Evaluation Standards:** Using the criteria of DAC/Organisation for Economic Co-operation and Development as reference

4. Key Achievements and Impacts of the Project

The findings related to the number and type of beneficiaries households, volume of production, price of vegetable seeds and incomes received by target groups as well as the contribution of the VSP in policy and institutional development have been well highlighted in the internal assessment report[3]. The external review therefore focus more on VSP contributions to the areas of intended impact mentioned in the logical framework of the program as well as the unintended impact of VSP III[4].

[3] For details, please refer Report of Internal Assessment for Vegetable Seed Project (VSP) III, February 2014

[4] The VSP was started from 2004 in few districts and then gradually scaled-up to 16 districts in its third phase. The areas where VSP has been continuously providing supports from its first phase to the third phase might have wider and deeper impact. However, the review team was primarily focused on but not limited to the third phase while presenting impacts from VSP.

4.1 Major Impacts (both intended and unintended)

The intended impacts include:

- ***Increase in income*** (12,000 small holders including 60% DAG increased their income through vegetable seed production and marketing)
- ***Food Security*** (50 % of HHs increased food security; and consumption of fresh vegetables doubled by 2014)
- **School Enrolment**: Increased school enrolment for DAGs household in better school.

The unintended impact directly and/or indirectly contributed by VSP include: impact on health and hygiene, women empowerment, participation of DAG in local development initiatives, seasonal/youth migration. However, contributions from different actors in bringing positive impact on households' wellbeing, individual behaviour and in society are equally important to be acknowledged.

Increased income from vegetable seeds and fresh vegetables

The incomes from vegetables seeds, and its share on total households income vary depending upon the vegetable seed farm size, commercial orientation and quality and quantity of seed produced per unit area. The average annual income per household in 2013 from vegetable seeds in the project areas was NRs 20,484 calculated from 892 households, and income range was starting from just NRs 560 to NRs 157,358. A large number (64%) of households earned less than 20,000 in year 2013 (Data Source: Mini Survey 2013 CEAPRED) .From the group interaction and evidences available from the project, the review team found that vegetable seeds fetched almost two to three times net benefits compare to the traditional cereal like maize, wheat and millet. The Cost- Benefit analysis done by CEAPRED in 2012 almost all vegetables species (onion, radish, pea, beans, and cress) cultivated in project areas for seed productions are relatively more profitable than cereals. A simple example of cost benefit analysis of 40-days radish seed production presented in Annex 5 shows that per unit investment on seed production gives around 57% higher income on investment with 1.57 benefit—cost ratio, with NRs257 per unit return to labour per day.

"Before I started vegetables and seeds production, I had many instances humiliated by neighbour and relatives when I had to ask for small amount of money as credit. Now with increased income the same people started trusting me and my family. These days, I get loan easily and feel better recognized in the community"– says Ms. Shram Maya Rai of Barnalu VDC Okhaldhuga

The income from vegetable seed per ropani of land varies from place to place. In Dailekhand/or Surkhet situation the average annual income per ropani of land from some selected vegetable species (open pollinated varieties) estimated in 2012 is presented in Table below:

Table 1: Average annual net return per unit land from selected vegetable seeds

Variety of vegetable seeds	Net return (Rupees) Ropani	Variety of vegetable seeds	Net return (Rupees) Ropani
Radish (40 days	4,115	Rayo (Marpha)	4,495
Onion (Red Creaul)	2,1820	Snake Gourd	6,505
Bean (Four Sean	4,405	Pea (Sikkim Local)	6,505
Okra	3,445		

Source: CEAPRED Cluster Office, Surkhet

The average cultivation area for vegetable seeds irrespective of species and varieties was very minimal with below 0.5 ropani per household that has not been significantly increased over the years (Annex 4). Overall the contribution of vegetables seeds in household's income was around 17 percent with highest (20%) in non-discriminated poor households and lowest (13%) in discriminated non-poor households. In case of disadvantaged groups contribution from vegetable seeds in households' income was around 18 percent. Increased income has made poor people self-reliant to some extent for their immediate but smaller cash need.

Who earned the most?

The average annual income from vegetables seed among disadvantaged (DAG) communities was NRs 16,419 whereas the non-discriminated non-poor households were able to harness almost double income compares to DAG. Among 892 households surveyed by CEAPRED in 2013,almost two-third households earned less than NRs 20,000. Of them, 25 percent of households earned less than NRs5,000 annually. Only 19 households were able to earn above NRs 100,000 annually. The results further revealed that the relatively better off households with relatively better lands could harness higher incomes.

When cumulative percent of the annual income from vegetable seed is plotted against cumulative percent of the total surveyed household in Lorenz curve (Fig1), it shows that 60 percent of total households received only 20 percent of the total income whereas top 20 percent households has about 40 percent share in the cumulative income from vegetable seeds reflecting that relatively few households are able to get larger benefits from vegetable seeds. The reasons behind could be availability of fertile land, irrigation and the household labour.

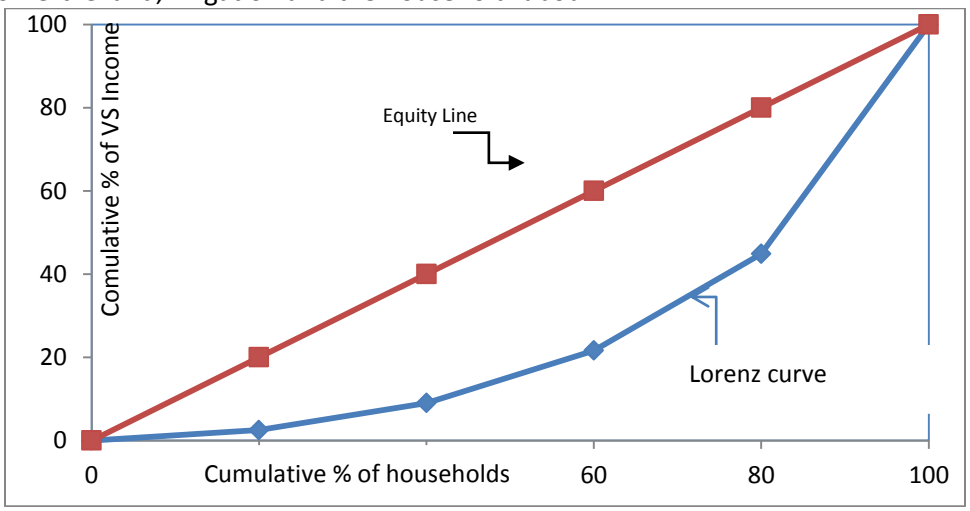


Figure 1: Lorenz curve showing vegetables seeds income distribution across the beneficiaries' households

Among different ethnic and caste groups Thakuri earned the highest average income (NRs 31,707) from Vegetable seeds which is more than double than that of Dalit Community. The average annual income in Dalit community was 26 percent less than average annual income of all groups from vegetable seeds(Table2).

Table2: Average income from vegetables seeds in different ethnic and caste groups

Ethnic and gender Categories	Average	N	Std. Deviation	Minimum	Maximum
Dalit	15,068	145	16,172	900	92,110
Janajati	19,586	187	22,485	560	137,375
Brahmin	22,439	152	25,636	1,300	148,850
Chhetri	21,062	335	21,784	875	157,358
Newar	15,473	22	28,692	886	131,950
Thakuri	31,707	51	31,369	2,910	133,575
Male	***22,599***	***310***	***25,693***	***886***	***157,358***
Female	***19,357***	***582***	***21,231***	***560***	***131,950***
Total	**20,484**	**892**	**22,918**	**560**	**157,358**

Source: Abstracted from CEAPRED database

Increased food and nutritional security

With increased income the household expenditure has also been increased. The overall expenditure pattern shows with additional income increased household expenditure on food consumption (buying food grains, meat and milk products) has been increased. The evaluation team found similar impression from the interactions with beneficiaries' communities in Surkhet,Dailekh and Okhadhunga districts. FGD with farmers groups (men and women) and cooperative members mentioned that additional cash income from vegetable seeds and fresh vegetables are mainly spent in household consumption and meeting various livelihood needs. The increased income has therefore directly contributed in security food sufficiency among the food deficit households. If we compare with baseline data (2011) done in 432 households of project locations with mini-survey data done in 894 households, there is significant improvement in household food sufficiency status from on-farm sources (Table 3). Vegetable seed is one of the major contributing factors to ensuring household food sufficiency. Around 42 percent of vegetables income is spent in food items[5].

> *"It's not only money we earn from sale of vegetables but our food has also become nutrient rich as we regularly eat vegetables at home" says Chitra B. Oli of Mehelkuna VDC, Surkhet*

Table3: Household food sufficiency from on-farm resources

	<3 Months	3-6 Months	6-9 Months	9-12 Months	>12 Months
2011 (Baseline)	30.78%	40.74%	16.66%	11.34%	0.46%
2013 (Mini Survey)	6.71%	21.03%	27.07%	31.66%	13.53%

Source: Baseline Survey 2011, and Mini Survey 2013, CEARPRED

Vegetables seed production and fresh vegetable production have immediate contribution in availability of diverse fresh vegetables for households' consumption, which has direct impact on food and nutritional security. The baseline survey report 2011 had reported an average vegetable consumption per household per day as below one kg, whereas within two years of intervention the vegetable

[5] Internal Assessment of Vegetable Seed Project, CEAPRED 2014

consumption has been increased almost by double (1.59 kg per household per day) in the beneficiaries' households. The increased availability of fresh vegetables means quantity as well as diversity of fresh vegetables for household consumption which has direct impact on nutritional security.

The community people during group discussion in different project locations mentioned that the increased consumption of fresh vegetables has not only provided nutritious and healthy food for family members but also reduced cereal consumption by around 10-15%. With increased production, vegetable self-sufficiency has been significantly increased at farm household level. In 2011, only nine percent sample households were vegetable self-sufficient whereas in 2013 the figure has been sharply increased to 47 % (Mini survey 2013). This observation supports the ADS finding "Rising incomes are changing food demand from cereals towards more protein, fruit, vegetables and processed food. In the south Asia, per capita consumption of rice declined from 20% to 15% of consumer food spending (1980-2008), while 85% of consumer food spending is on vegetables, meat, dairy and fish".

Increased physical and financial assets

During the field visit, the review mission noted that the households who earned relatively larger amount from vegetables seed and or fresh vegetables have invested part of the money in building new houses, repairing house (overwhelmingly changing thatch roof by CGI sheets), buying land, installing solar set for electricity etc. Particularly in Okhaldhunga, the review mission has been told by the beneficiaries as well as some key informants that before five years, only around one-fourth houses were with CGI sheet roof now the situation has been reversed replacing thatched roof by CGI sheets. Almost every household has installed solar panel for electricity. Although it might not possible to bring those changes from the smaller amount of income earned from vegetables seed and fresh vegetables, it has certainly contributed positively. Moreover, if we compare baseline data with 2013 mini survey we could found significant replacement of thatched roofed households by CGI sheet or concrete building i.e. 72% of the sampled beneficiaries households in mini survey (2013) has CGI roofed or concert building indicating their improved well-being status.

The review team also found that the social mobilization has resulted into increased awareness among community members that positively contributed in toilet construction and constructive participation in community sanitation and open defecation free campaigns facilitated by different agencies. Participants in group discussion at Mehelkuna VDC of Surkhet district shared with review team that they had spent part of the seed income in toilet construction and solar system installation. The VDC is now declared free from open defecation and almost every household have solar panel for electricity. Similar response found in Malika VDC of Dailekh district too. The mini survey (2013) data has further justified the community responses. In 2011, baseline percentage of sample households with private toilet were 75 which increased to 93 percent as found in mini survey 2013.

During the FGD and individual interviews, the review team also found that with the increased income, the poorer households feel financially secured and their credit worthiness at community has been substantially improved. Particularly the women felt more secure and economically empowered as they don't need to ask their husband and or other member of household for their petty expenses. Besides vegetable seed income, monthly individual saving in the group is another opportunity to meet their immediate cash need. This observation of the review team is also backed-up by the Mini Survey 2013, which stated that among 892 households surveyed in project areas 326 households had saved their income of that year with average amount of Rs 7,151.

Positive contribution in individual health

The review team found that VSP has significantly contributed in fresh vegetable production for household consumption. Every individual participating in the group discussion in Okhalndhunga, Surkeht and Dailekha mentioned that they have realized very positive health impact, especially on women and children health due to fresh vegetable consumption. They say "Few years back we had nothing except dried mustard leaves (*Gundruk*), fermented radish chips (*Sinki*) during winter to early summer (Jan to June)to eat as vegetables. We used to collect nettle leaves and fern from forest. Now, we have varieties of vegetables like cauliflower, cabbage, rayo and many more in our garden to eat".

> *"Working in the field together with family members is not only enjoyable but it also helps to maintain fitness" says Bishnu Shahi of Dailekh district*

Moreover, the women participating in the focus group discussion shared with the review team that infant mortality due to malnutrition was very much common in their community particularly during winter. With increased fresh vegetables, along with increased health facilities and awareness raised, the incidence of infant mortality has been substantially decreased and there are hardly few children in the village with malnutrition problem (with large belly and smaller limbs) locally called '*sukenas'*. Another visible health impact has been found in decreased almost to zero in the number of people eating red soil. Generally soil eating '*geophagia*' was common among pregnant and lactating women. But now no one in the community found eating soil said the women participating in focus groups meeting at Malika of Dailekh district. The reason behind soil eating could be due to iron deficiency. While acknowledging that there are number of other factors that are contributing to reducing this problem but increased fresh vegetable consumption might have might have greatly contributed to this.

> *"I used to feel* weak and tired with *heavy bleeding during menstrual period in the past. But now with increased green vegetable consumption I don't have such problems. I can work normally" says Shram Maya Rai in Okhaldhunga.*

Quality education and leadership development

In all group discussion participants shared that increased income has made them easy to manage stationeries, tiffin and school dress to their school going children which has obviously been motivating children for their regularity in school attendance. In some cases parents were able to send their children for tuition class and coaching centre particularly to the SLC appearing kids. The mini survey 2013 found that around one-fourth of total income from vegetables is spent in education. It is interesting to note that in Okhaldhunga and Dailekh, the review team had an opportunity to interact with youths enrolled for junior technical assistance (JTA) course in agriculture school. Up on the queries of the review team, they mentioned that they were encouraged and got motivated to study agriculture after seeing the benefits their parents were receiving by growing fresh vegetables and seeds.

With increased income, tendency of sending kids to private schools for quality education has also been increased. In Barnalu VDC of Okhaldhuga district, a private school principal, who was also participating in cooperative meeting, said almost every vegetable grower transferred their children to his school from nearby government school. But the number of girls transferred to private school is relatively lower in compare to boy. The review team met two school-going children in one of the vegetable growing household and asked who is going to 'boarding' school and who is in government school. The girl who is

at class eight shared that her younger brother goes to private school from the last year but she is still in government school. This shows intra-household gender disparity in education.

Despite increased income intra-household gender disparity in quality education is still prevailing with high preference to boy's education

Leadership development particularly among women is another prominent area of impact of social mobilization and capacity development supports of VSP in groups. In all group discussion and focus group interview women participants overwhelmingly shared how they feel empowered due to their participation in the groups. In addition to vegetable seed related activities, the group also does number of other activities like saving and credit, and other community development activities. Due to increased participation in social activities and discussion and or interaction in groups meeting, participation in different training exposure visit leadership capacity of VSP group members has been enhanced. In many instances, VSP group members are nominated as member of school management committee, community forest users' committees. Ms. Nirmala Dangi, Treasurer of Pabitra Vegetables Seeds Cooperative at Mehelkuna VDC, Surkhet shares her experiences that the very first day of her visit to the cooperative she came with her friend to the meeting and could not even introduce her (spell out her name). Now, she feels proud of being treasure of the cooperative and with her increased leadership the community forestry users committee has nominated her for the position of secretary. Similarly, Mr. Bishnu Bahadur Shahi, the chair of *Hatemalo* Cooperative, Dailekh has been approached by different political parties to be member of their political parties. The reason behind is obviously his increased leadership quality and credibility in the society.

Better use of land, access to local funds and "we feeling"

With increased technical skills and confidence, seed production of some selected vegetable like radish, pea, Rayo, Chamsur (Garden cress) has been integrated in the annual cropping cycle in selected areas where VSP presence is relatively longer (e.g. Mehelkuna VDC of Surkhet; Malika VDC in Dailekha, vegetable seed production has now been a culture. However, in new district like in Okhaldunga, farmers' confidence on vegetable seed production is still lower. Vegetable seed production has partially replaced wheat in the winter and millet in the summer. But in most cases vegetable seed production has added cropping intensity by better utilizing the land which otherwise used to left fallow in the winter.

Interestingly, the review team found that in the past very few people used to grow winter crops and other households let animal grazing in the barren field which sometime used to be a cause of conflict between or among the households. They say "in every winter we had to face complaints from neighbor or had to complain neighbors in relation to animal grazing. Sometimes such conflict used to grow into violent form. Now almost every household grow vegetables and keep their animal in controlled feeding / stalled feeding".

The team also noticed that the households within VSP group have certain level of '*we feeling*' and culture of helping each other since the issues they face and priorities they set in vegetable seed production are same. At community level, VSP has played very constructive role in mobilizing VDC funds in agriculture sector through Agriculture, forestry and environment committee (AFEC) in VDC. The review team found that both in Dailekh and Okhaldhunga, the AFEC's 15% grants are effectively mobilized to agriculture sectors particularly in vegetables due to constant and constructive engagement of VSP' s groups in the sub-committee. In many cases, VSP's group leaders are nominated as member of the sub-committee. Vegetable seed groups have also been able to mobilize local resources from

different agencies (e.g. OXFAM, DADO) for small infrastructures and purchases of sources seeds, agriculture tools and equipment etc. The leveraging of VDC grants for agricultural activities seemed to be more effective in districts, where SSMP and SDC's local governance programmes have been supporting VDCs to establish AFEC.

VSP has positive demonstration effects

Review team found that quite a larger number of households outside of the groups have learned knowledge and skills visiting vegetable seed and or fresh vegetables production sites. Particularly the off-season vegetable production technologies in plastic tunnel and kitchen wastes management techniques has been adapted by larger number of households within and outside the community. In Barnalu VDC of Okhaldhunga district alone around 8 to 10 households outside of the VSP group have done fresh vegetable cultivation in plastic tunnel due to demonstration impact of the VSP groups. The review team estimated that the knowledge, information, experiences and the technology (the seeds) shared by VSP farmers have benefited around 10-15 percent additional farmers.

Local institution building

VSP has done commendable job in strengthening of local farmers groups and developing them into specialized seed cooperatives for quality seed production and marketing are tangible impact of VSP found across the project districts. As of July 2013, VSP has facilitated the formation of 41 cooperatives representing 599 farmers groups. Similarly, the project has contributed in establishing 'Seed Producers' Central Federation of Cooperatives (SPCFC) Ltd. –as an umbrella organization of primary seed cooperatives.

The review team found that the participation of community members belonging to different caste in group meetings and training resulted into increased awareness, which have greatly contributed in reducing caste-based discrimination at least at the community affairs.

Contribution in national policy and plan development

VSP was constructively engaged in consultative process of formulating long term Agriculture Development Strategy. More prominently the project has contributed in preparing 'Decentralized Source Seed Production Directive'; preparation of 'National Seed Vision 2013-2025'; amendment of Seed Regulation (2013) and the seed policy reform. The project was engaged with both private sectors in assisting policy reform exercises. However, the project could not manage to influence in market specific policies such as taxation on export of seeds and import of packaging materials. The review team was informed that the locally produced seeds are transported out of the districts, which were then packaged, labeled and again imported to the district. In some cases, agro-vets do pack locally produced seeds in small packets and sell to the farmers in the name of imported seeds.

Contribution to meet national seed demand

VSP did commendable job in improving production and productivity of number of open pollinated varieties. It also collaborated with Horticulture Research Division/NARC and provided support to vegetable seed producers' groups/cooperatives for the production of *Srijana* (Tomato hybrid seeds) in number of sites.

As per the internal assessment report, VSP has contributed to meeting 14% of national vegetable seed demand which accounts for 27% of the domestic production. It has also contributed about 16% to the total source seed supply in the country. By the end of the project, VSP is expected to contribute about 30% to the total domestic production and about 20% to the source seed production of vegetables.

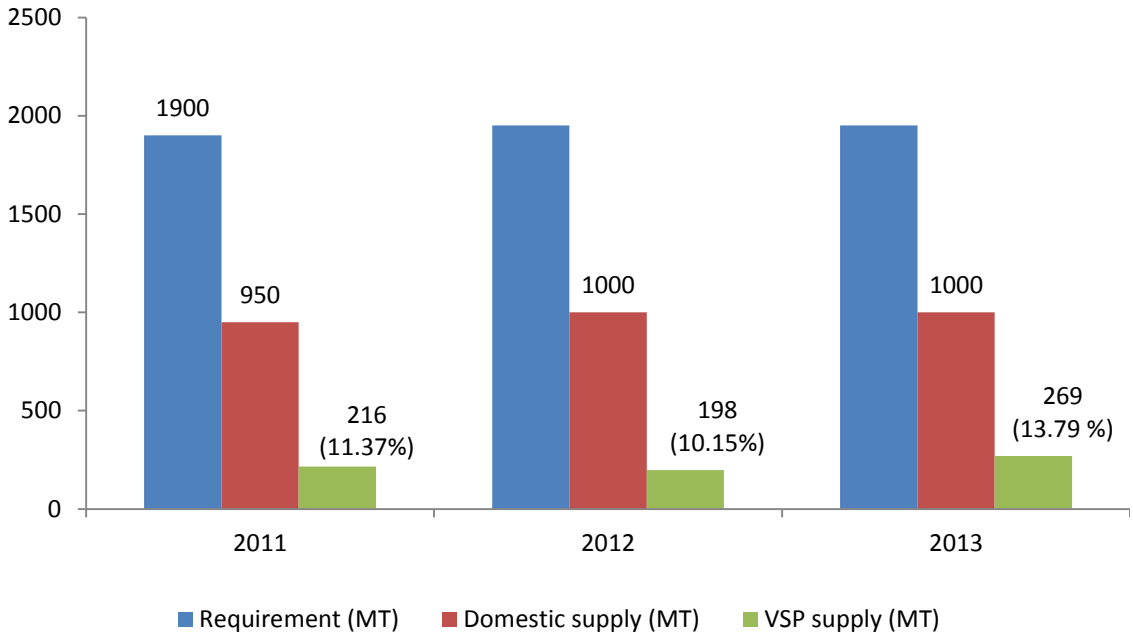


Figure 2: Demand and supply situation of vegetables seeds in Nepal

Source: CEPREAD 2013

Climate change and environmental risks

As highlighted in ADS, climate change, input and output market price fluctuations, transboundary disease and natural disasters have major local and regional impacts on agriculture. During FGD and key informants' interviews, the similar issues have been shared with the review team. The dependency of fresh vegetable and vegetables seed production on weather seemed very high and due to change in weather patterns (erratic rain -too much or too little water, high fluctuation and sudden rise and fall in temperature, hailstorm and other effects of climate change, the production has become highly unpredictable, which put them in difficult situation to make commitment for supply quantity.

One year there is bumper harvest while other year there may be crop failure. Since there are no agricultural insurance and disaster response mechanism, farmers feel unsecure to expand their investment. The review team felt that the VSP could have done more on this issue.

Increased dependency on single subsector

The review team observed that farmers earned 3-4 times more by switching from cereal (millet, maize and wheat) production to fresh vegetable/vegetable seed production-but with great increase in risk in that they will have higher dependency on one subsector for their livelihoods. The members of Navjyoti Seed Producers Group during FGD in Dailekh quoted an example that one of their members earned NRs. 72,000 through sale of onion seed grown in the plot of land from where he used get just 100 Kg of wheat (worth of approx. NRs. 200). Of course the investment in terms of labour and agro-inputs were higher in onion production than on wheat. Impressed with the amount of earning, next year some others also started to produce onion seeds, and they managed to get 175 kg (worth of NRs. 150,000 based on previous year's price). Due to lack of proper market intelligence/demand-supply arrangement, they could not sale the seeds. After keeping it in poor storage condition, the seed lost germination rate from 89% at the beginning to just 19% at the end. This showed proper drying and storage facilities are

important in case seed could not be sold in a particular season. There are number of such instances where farmers produced huge quantity of seeds and disappointed at the end of not being able to sell it. The general trend noticed in vegetable sub-sector is that the price of OPVs has gone down due to increased preference of fresh vegetable growers for hybrid seeds.

Unlike cereals, the government has no record of vegetable seeds demand and supply. There is always discrepancy in information on vegetables seed demand and supply. The direct implication of this situation has been found in the farmers who are facing the market uncertainty, for example- radish seed almost equivalent to NRs. 10 million NPR is still in store in Rukum district, says Ms. Gopa Budha Magar, Vice Chair of Central Federation of Vegetables Seed Cooperatives.

4.2Effects in relation to rural-out migration

In the context of rural-out migration[6], the participants of the focus group discussion revealed the following points:

Participation:

- Migration does not seem to hinder participation of migrant households in the project activities, provided they have not migrated outside the village.
- Major reasons for participation of migrant families include: potential to increase farm income, improved social status (while working in key position in the group and cooperatives), risk taking ability of the migrant farm households. For example, a farmer in Dailekh has seed worth NRs. 45,000 in storage as he was not able to sell it off immediately. It is yet to be seen if he would be able to sell it. However, as the household has a male migrant (who is able to make NRs. 65,000 in a season), the farm family is not excessively under financial pressure.

"By switching from maize and millet cultivation to fresh vegetable production, I managed to earn (4-5 times more money) almost NPR 100,000 from one Ropani of land. If I were aware of this in year 2009, I would not have opted to go to Malyasia for work" says Shiva NidhiDahal of Barnalu VDC in Okhaldhunga, who spent 3 years in Malaysia with extreme hot climate and poor work conditions

Technology adoption:

- Shifting their agriculture from traditional crops to cash crop such as vegetable seed production has not only increased the income but also the work load on the women left behind. Therefore, for adoption of technology and sustaining its use, work load needs to be considered and/or women friendly mechanization to be developed and introduced.

Sustainability:

- In the groups and cooperative visited by the team, a number of key positions were filled by women members of migrant households or by returnees themselves. This clearly shows that migration has helped in expanding the knowledge and attitude as well as the self-confidence of not only the

[6] According to reports from Department of Immigration, everyday more than 1500 youth migrate abroad for better opportunities from the Tribhuvan International Airport and quite the same number of youth via land to India. As a result of this migration, Nepal received 434 billion in the last fiscal year 2012/13. The scale of remittance in Nepal is 25% of the country's GDP, which is the highest among south Asian countries (WB-Migration and Development Brief). On the other hand, youth migration is leaving women, children, and old people in the villages.

migrants but also the left behind women of migrant households. This trait would potentially help in sustaining the technology adoption.

- With the shift in farming from traditional to income generating crops, more remittances are being invested in the agriculture sector. It is rather difficult to say how much percent.
- Migration in India is temporary in nature, with the migrants using this strategy for a couple of years before they return back. Income generating opportunities provided by project activities are being used as a resettlement strategy by the migrant households. Remittance is being invested in the cash crop production so that the gains from remittance earnings could be sustained.

Impact of project activities in the migration trend:

- Income from vegetable seed production has been successful in increasing the overall household income thus reducing the period of seasonal migration to India and in some cases completely foregoing the season migration (when the income from the seed production and marketing is on par or more than the remittance income).
- During the FGDs in Dailekha and Surkhet districts, it was also reported that the increased income from vegetable seed production is being used to finance migration to Gulf and East Asian countries. In Okhaldhunga, the increased income is also found to be used to shift migration from Gulf countries to South Korea (a better destination from both economic and protection aspects).
- Migration has one more benefit – the improved workmanship – which has made the returnees more proactive in vegetable seed production

4.3 Effectiveness of the Project Interventions

The available material and evidence indicate that the assistance provided by VSP was quite effective in terms of capacity growth of individual actor to produce vegetable seeds and fresh vegetables, formation of groups/cooperatives and their functioning, and collaboration between actors and supporting agencies. The VC actors rated the interventions of VSP as very effective compared to similar interventions (cost/benefit in terms of volume of support provided versus income generated by the target groups and related impact). Reasons cited by VC actors for the effectiveness included: field presence of competent technical staff, high level of commitment, high level of mobilization, capacity to leverage other funds and introduce new initiatives.

The total budget allocated for VSP III is Rs. 191.2 million for the period of four years (2011-2014), out of which NRs. 117.8 million has been spent by July 2013 (CEAPRED, 2013). According to the internal assessment report, about half (49%) of the current budget goes to staff salary and one third of the centrally allocated budget (35%) goes to administration of the project activities. The higher allocation of budget for staff salary and administration is justified for its strong social mobilization and supporting role to farmers' groups, cooperatives and communities predominantly in the remote areas. As far as program budget is concerned, it comes about NRs. 346 thousand per VDC, NRs. 131 thousand per cooperative and NRs. 78 thousand per group and NRs. 3.6 thousand per beneficiary household. Annually, a beneficiary household receives about NRs. 1,500 as program fund. This seems reasonable considering technical complexity, input support and technologies required for quality vegetable seed production and marketing.

More than economic gain, the VSP project positively contributed (not easy to estimate the exact value in economic terms) to household welfare with increased investment on food security, education and health. Since women play key roles in vegetable seed production and marketing, income a certain level of equity in income distribution within household have been reported.

5. Major learning from VSP

VSP has promoted several good practices and documented success stories and lessons learnt with regards to quality seed production, institutional development of cooperatives, gender and social inclusiveness, effective functional relationship between the VC actors both at horizontal and vertical level, engagement with government and private stakeholders. NAMDP and NASDP can build on those best practices and learning, which may include:

Functional Relationship and Coordination

The VSP III did commendable job in getting key stakeholders on board for smooth implementation of the project. At the national level, the Project Steering Committee (PSC) chaired by the Secretary in MoAD and comprised of the high level officials from (details once please and provide list of abbreviations) MoAD, SQCC, DoA, NARC, SEAN, FNCCI/AEC, HMRP and SDC has been formed, which oversaw the implementation progress and provided policy guidance and coordination support. At the district level, the District Coordination Committee (DCC) headed by DADO and comprised of the representatives of related district line agencies has been an important institutional arrangement for planning and review of seed production and marketing related interventions.

In order to improve market linkages, the project has been organizing two value chain actor meetings in a year, first during April-May for price fixation and pre-contract agreement and second in Sept-October for source seed supply, fix production quantity and marketing management. As most sales of seeds occur through a network of agro-vets, largely based in district headquarters and emerging towns and also in the major cities like Kathmandu, the project approached them to collect their market demand and accordingly supported farmers' groups/cooperatives to produce the quantity demanded by the agro-vets.

The review mission noted high level of acceptability of the project by the community, compatibility with other initiatives, and collaboration with the local stakeholders as well as adherence to government policies, which among the most important factors for any project to succeed. Establishment of functional relationship and coordination mechanism helped not only to avoid duplication and create synergy among various interventions, but also channelize the resources for wider impact.

Building on past initiatives and adaptation

The VSP III made good attempts to build interventions on past initiatives undertaken by various programs. In light of the recommendations made in the 1st and 2nd phase of the project, the VSP III put emphasis on market linkages in addition to strengthening farmers/ groups/cooperatives, social mobilization and institutional development. As an entry point, the project approached existing groups and cooperatives formed by Seed Sector Support Project (SSSP), SAPPROS, District Agriculture Development Office, Women and Children Office and other development agencies, which helped to kick-start the project interventions without spending much time in surveys/assessments.

Rigorous engagement with target groups

The project put high emphasis to remain very close to the target beneficiaries through deployment of highly committed and competent social mobilisers, seed technicians and marketing officers. The field staff worked hands on hands, motivated farmers (especially women and youths) to grow vegetables/seeds and provided on the spot technical support and skill training. The project has also established multi-location trial in its office premises to test different varieties and to demonstrate technologies. As "showing by doing" is the best method to disseminate skills and technologies, the

project encouraged farmers to visit farms and interact with successful entrepreneurs. Having rigorous engagement with target groups, the project staff managed to win the trust.

Synergy with others programs

A clear synergetic impact among different program has been observed particularly in SDC cluster district where number of SDC funded projects and programs are working in the same communities with different inputs. In Bigutar VDC of Okhaldunga, SDC funded project SSMP has provided soil management and organic manure preparation through livestock shed improvement, the LILI has provided water harvesting pond supports to vegetable growers contributing to expand vegetable seeds and fresh vegetables cultivation. Besides, SDC funded project contribution of other project like Community Support Program of CARE/DFID has also supported community level small infrastructures like in irrigation, micro-hydro, drinking water etc contributing to better synergetic impact on vegetable cultivation along the road corridors and over all livelihoods impact of the community people. In Dailkha as well, we found same or ever better level of collaboration among different agencies complementing each other's contribution. In Malika VDC of Dailekha district different project and program work closely with VDC. The VDC' agriculture, forest and environment sub-committee is well represented and currently led by the chair of vegetable seed corporative. VDC has supported vegetable seed farmers for 'shed improvement, construction of seed collection centre, irrigation and to buy source seeds. LINK/HELVETAS has supported for 'Agribusiness literacy classes' to women farmers. SSMP provided small grants to the VDC's sub-committee for agriculture related activities. Among SDC funded projects we found very close working relations representing each other's coordination committees and targeting the same communities where possible. Because of collective and collaborative efforts, communities have been able to get better impact of external supports. However, with different working modalities and scale or volume or support, there is some level confusion among the famers. For example- the micro-irrigation ponds funded by LILI are relatively larger with iron fences, but the ponds provided under VSP are small with bamboo fencing. Likewise, VSP partial subsidies in seeds, fertilizers and other inputs but the whole materials from other project are totally grants. Therefore discrepancies in support mechanism or norms among different projects from the same funding agencies may create confusion in the recipients' side. Another important observation was on lack of joint planning to work in the same target communities. If it has been done, the support from different agencies would have been much more effective to generate the results.

Priority shift

Considering high value low volume and storability characteristics of vegetable seeds, VSP's focus was to promote seed production in the remote areas. It was a noble idea to provide income earning opportunities to the people living in the remote areas. However, with improved access to road networks and connectivity with road head market centers and district headquarters, farmers' priority has been shifted to fresh vegetables production for immediate cash requirement. VSP made efforts to align its interventions with the priority of farmers, by promoting fresh vegetable production in road corridors and seeds in hinter lands.

Competitiveness versus inclusiveness

Although the project made good attempt to include women (>50%) and DAG (>60%), as primary beneficiaries of the project, in the groups and cooperatives and other activities, the level of their participation greatly varied depending on the type of settlements and physical settings, and dependency on project supports for quality seed production and marketing is appeared to be very high. Considering the conditions of the poor and DAGs, who come from remote marginal hills and are hard pressed to

meet their immediate food and livelihood needs, it is likely that very poor and DAGs may find difficulty of sustaining production of seed crops, particularly where market is uncertain and payments are not instant.

So, to include DAG (discriminated or non-discriminated poor) in vegetable seed there is a need to ensure forward linkage and provide additional support for integration of vegetable seed production with other quick gain activities.

Functioning of the value chain

The VSP has put lot of emphasis on formation and strengthening of farmers' groups and gradual transformation of these groups into specialized seed cooperatives as an important prerequisite for project implementation. In general, the participation of individual farm family members in groups or organizations can reduce farm business development costs (reduced service delivery transactions costs, bulk input and output marketing) as well as the performance monitoring costs as opposed to individual farm families. However, for the value chain to succeed efforts are equally needed at firms/traders level that buy farmer' products, and input suppliers that provide seeds, fertilizers and other agro-inputs, business development, financial and technology dissemination services.

As stated in the project document of the VSP III, inadequate linkage and trust between producers and traders and breaching of contract are some of the key issues which distort the value chain. Private sector actors make agreement (written contract or informal commitment) with farmers' groups/cooperatives - in some cases also with individual farmers – to purchase certain quantity seeds of specified varieties, but depending on supply and demand situation, the chances of breach of the contract are very high. The mission was told during the meeting with stakeholders in the district that "if there is bumper harvest and seeds of same variety are available at cheaper rate in other areas, the traders are tempted to breach the contract by putting additional conditions on quality, and if there is more demand than supply then farmers breach the contract to sale their seeds at higher rate to new buyers". During the interviews, almost all cooperatives expressed interest to perform additional roles (i.e. establishment of processing unit, packaging, labeling, distributing seeds through agro-vets to farmers), which are currently performed by big firms.

The approach adopted in the project did not seem to have clear answers on what the project did differently to address above issues, i.e. to change the ways market operates and create a situation where both suppliers and buyers see seed business as win-win for both parties. The VSP III could have played a role of neutral broker to strengthen relationship and build trust between actors working at different node of the chain. However, it appeared that the project managed to win high level of trust from farmers' groups/cooperatives but it could not win same level of trust from big traders, which is equally important to improve the performance the subsector.

"The private sector people indicated that the VSP had focused more on social dimension rather than on businesses. Without having clear assessment of market, the project supported farmers to produce seeds. As a result there was a glut of certain seed varieties and price has gone down (for example, the price of Bhaktapur local (OP cucumber) dropped down from NRs. 2000 to NRs. 1000. The price of peas was 250-300 but in 2 years' time it came down to NRs. 80-100. Similarly, the price of onion seed was NRs. 1000, which is now dropping down to NRs. 700 per kilo gram)". They further added that even if there is demand, the preference of fresh vegetables growing farmers goes for imported seeds, especially for hybrid ones. So, there is a need to understand the trend, and focus on hybrid varietal development, which have distinct comparative advantages.

Exit strategy and sustainability

This strategic question is essentially about the exit (phasing out and phasing in) strategy of the project; (i) what roles the project played to upgrade value chain and achieve sustainable impact, (ii) who will play the roles currently played by the project, (iii) whether the technical inputs and market services will be available and get paid by the target groups after the project is phased out.

In the current situation, CEAPRED-the implementing agency provides a range of services to target beneficiaries through its full-fledged field offices with competent technical staff and social mobilisers. In addition to facilitating formation of groups/cooperatives, providing training on different aspects of seed production, book-keeping, accounting and cooperative management and social mobilization, CEAPRED does provides seeds, sprayers, sprinklers and other agro inputs to the farmers at subsidized rates. It also provides seed money for the federation and revolving fund for low earning farmers, facilitates pre-contract agreement based on quantity, price and embedded services, and supports for micro-irrigation, collection/evaluation of crop varieties and production of hybrid tomatoes (Srijana). In doing so, CEAPRED establishes itself as a long-term partner providing direct technical assistance to farmers/groups/cooperatives and agro-vets. In the project areas, the interviewees have well appreciated the efforts made by CEAPRED to increase the performance of target beneficiaries and improve relationships between agro-vets, local traders and farmers' groups/cooperatives. Interestingly, many of the participants mentioned that if market is assured they can pay for agro-inputs (seeds, fertilizer, pesticides etc), but they are not in a position to pay for fee-based services from technical experts.

According to value chain principles, to achieve large-scale outreach and sustainable growth of the subsector the development organisations and program like VSP, are expected to bring change in the behavior of market actors by playing the role of a facilitator or catalyst that has a clear understanding of underlying constraints (causes of underperformance) rather than to provide technical experts solutions. In VSP III, the CEAPRED seemed to play the role of both facilitator as well as inputs/experts service provider (e.g. distribution of seeds and pesticides to vegetables growers, collection and testing of seeds, and in some cases purchase and delivery of seeds). This has created dependency of target groups on project, with no clear picture of the future scenario - who will be phasing in (taking over the roles currently played by the project) after the project phased out in December 2014.

6. Way Forward (Recommendations)

Harnessing comparative advantage to improve competitiveness

Nepal has comparative advantages in export markets in resource and labor intensive low technology agriculture products such as vegetable seeds, coffee, tea, vegetable and roots, ginger, and cardamom (ITC, 2011, Online trade statistics; cf ADS). Vegetable seed is a high value, low volume and high price-fetching essential agricultural input with increasing domestic demand and export potentiality. It has both the comparative and competitive advantage for the local markets as well as exports to nearby Indian markets and Bangladesh (AEC, July 2003 and AEC, 2004). The value chain prioritisation workshop organized by the High Value Agriculture Project on 10-11 May, 2011 at Surkhet, which brought 40 participants including two females representing producers/cooperatives, regional Private sectors/agribusiness organisations, Government agencies and I/NGOs representatives besides the HVAP team, ranked vegetable seed as 4th important sub-sectors (HVAP 2011)[7].

Numbers of local varieties are known to have better taste and distinct physical appearance which fetch better price in the domestic markets. Being produced in cold temperate zone -with traditional seed exchanging practice, location advantage for maintaining isolation breeding, low pressure of disease and pest–some of the vegetable seeds offers potential for export as well. The unique characteristics of those varieties, which may result into improved competitiveness, need to be assessed following four factors, which according to Porter[8] support or hinder the organization from being competitive in the market:

I. Demand Conditions
ii. Factor Condition
iii. Related and Supporting Industries
iv. Firm strategy, structure and rivalry

While recognizing the (i) unique features of some local varieties, (ii) trend of fresh vegetables production with increased demand for seeds, (iii) friendliness to smallholders,(iv) labour intensiveness, and (v) small initial investments, the review team suggests including vegetable seed as strategically important subsector for agriculture development. However, considering the preference of farmers for hybrid seeds and imported OP varieties, it is important to have focused interventions on seed varieties that offer both comparative and competitive advantages. Therefore, the review team recommends to undertake in depth assessment of factors of competitiveness of Nepalese seed sub-sector with following steps: (i) quick scan review of all local and improved OP varieties, and hybrid seeds, (ii) shortlisting of most promising varieties based on set criteria, (iii) detailed analysis of selected varieties in terms of market demands, supply conditions, status of supporting industries, local rivalry, major constraints and opportunities, and (iv) suggested list of interventions for the promotion of selected value chains (maximum of 10 vegetable crops that offer best prospect for growth).The matrix given in the annex – may be used for short-listing of the seed varieties.

Focusing on Climate Resilient Production

Nepal is one of the world's most vulnerable countries to climate change variability, due to its high climate sensitivity and low adaptive capacity. During FGD and individual interviews with key informants, it has been well highlighted that vegetable seed production practices are highly dependent on weather

[7]High Value Agriculture Project in Hills and Mountains (HVAP), Value Chain Prioritisation Workshop Report, 10-11 May, 2011 (Surkhet)

[8]Michael Porter in his book, 'The Competitive Advantage of Nations' proposed a four factor model of national advantage known as 'Porter's Diamond'.

and due to erratic rain, sudden fall/rise in temperatures and other effects of climate change the production volume is highly unpredictable which result into big fluctuation in price. Considering this in view, it is important to undertake a comprehensive assessment of environmental risks/climate change impacts along the value chain, and brainstorm/develop/demonstrate ways (methods, practices and technologies) to minimize the effect of climate change on vegetable seed production. The interventions may include: soil moisture retention, increasing the use of organic pesticides complemented by balanced use of fertilizers through integrated pest management, reduce use of chemical pesticides, and improvement of soil fertility.

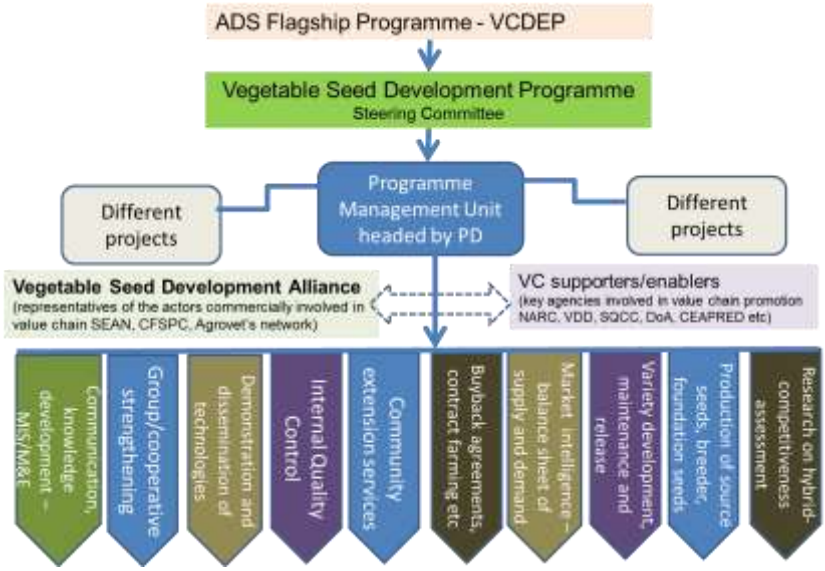
Variety (both OP and hybrid) development, registration and maintenance

Variety development, release, registration and maintenance are the key components for increasing agricultural production and income. For this, there is a need to increase the level of investment in terms of research fund and human resources for variety development and their maintenance, and to improve organizational and institutional framework as envisioned in the National Seed Vision 2013-2025.

At present, the rate of variety release in many crops has been low and registration process is quite cumbersome. As mentioned in the National Seed Vision, no single improved vegetable variety has been released (which constitutes 40 of the crops) post 1995 and the same applies for industrial crops post 2005 despite the fact that a fairly good number of varieties were developed and released previously[9]. Considering this slow release of new varieties, the NAMDP may focus on development and release of new OP varieties that are competitive and acceptable by the farmers and other VC actors. It is also time to focus on hybrid seeds keeping view the increasing trend of using hybrids among farmers. As per the market survey, about 47% of the total sale of agro-vets is occupied by hybrid seeds[10].

Institutional Arrangement for Coordinated Efforts

As highlighted in the National Seed Vision 2013-2025, production and marketing of vegetable seed is very sensitive enterprise, which requires coordinated efforts and strong collaboration between research, extension and the actors involved at different nodes of the value chain. It is therefore proposed to have one Vegetable Seed Development Program with different projects focusing on capacity development and institutional building to addressing the key bottlenecks (weakest link in the value chain). As highlighted in the 6th PSC meeting of the VSP III, it is recommended to establish **one single program steering committee to steer all seed related projects**. Since value chain is actor driven approach and its success depends on togetherness, it is also suggested to establish Vegetable Seed Development Alliance (VSDA), which will include



[9] Seed Vision 2013-2025

[10] A Report on Market Survey of Agro-vets and Seed Companies, CEAPRED 2012

societies of farmers' groups/cooperatives, agro-vets, seed entrepreneurs, logistic and other service providers engaged commercially in the value chain. The VSDA will be the first step towards well-coordinating and steering value chain public-private to align vegetable seed related program with most other interventions of government (SQCC, HRD/NARC, VDD) and development partners (e.g. IFAD's *Kisan Ka Lagi Biu-Bijan Karyakram*). The VSDA will have access to value chain development fund to be established under "flagship value chains: maize, dairy, vegetables, lentils, tea", as suggested in the Agriculture Development Strategy (ADS).

The purpose of VSDA is to ensure timely availability of/and access to quality seeds and other agricultural inputs at affordable price. The VSDA will:

- Develop a collective value chain vision and identify, develop and coordinate plans and interventions.
- Generate knowledge and facilitate learning; successes and failures are shared and the increased volume of the value chain is initiated or accelerated.
- Foster partnership with relevant public, private and cooperative organizations, including seed research stations to produce breeder and foundation seeds, and stimulate private sector leadership with increased level of participation, inclusiveness and ownership.

Incentives for Innovation

To improve the competitiveness of vegetable seed-subsector supports needs to be provisioned for the up-grading and up-scaling of specific value chain. The term upgrading covers "improved" or "new" ways of organizing the value chain; which, in most cases, requires a certain level of "innovation". The upgrading vision is driven by a growing market demand, and it is done by actively addressing binding opportunities or constraints for enhanced commercial market linkages. The entry for upgrading is often a combination of increasing volumes with an improved quality and improving existing market channels or exploring new markets.

Considering the underdeveloped stage of the sub-sector and high transaction risks resulting from the shift in farming practice from open pollinated to hybrid seeds and availability of a range of imported hybrid seeds in the market, support need to be provided in the following areas:

- Capacity building and direct public investments to strengthen supportive institutions (e.g. SQCC, NARC-HRD and VDD for new variety development in collaboration with Private sector and I/NGOs including seed cooperatives)
- Business development – strengthening, cost-sharing and investment support for buyers, processors, wholesalers, exporters and farmers and their organizations to improve the performance.
- Agro-inputs and service providers and markets: strengthening, cost sharing and investment support for a sustainable supply of agricultural inputs, business and financial services, technology, information, capital, etc. – from private, NGO and government.
- M&E and learning – documenting and disseminating evidenced based results, developing practices and guidance within the value chain, between value chains and among value chain developers.
- Using migrant youth as an entry point to promoting tested and verified technologies -The impressions and reflections from the field suggest that the migrant households and returnees have higher risk taking ability compared to non-migrant households due to diversification of livelihoods. Thus, for promotion of new technologies this group of people could be particularly suitable. As migration in gulf countries, Malaysia and India is temporary in nature, income

generating activities such as vegetable seed production could be a potential resettlement strategy for the returnees. Even when the returnees might not have enhanced their agricultural skills, the change in attitude and broader life skills are also valuable. These added life skills could help in developing the returnees as innovators and entrepreneurs in the vegetable value chain.

Building trust and strengthening VC linkages

Trust building is an important area to strengthen linkages and foster cooperation among value chain actors. For this there is a need to bring a shift in the general assumption within development practice that the economic advancement of one actor does not inevitably occur at the cost of other actors. It is all about 'shared value' and common understanding of the fact that companies need sustained supply to thrive their business whereas producers need assured market to sell their products. Elements here are building confidence, sharing information and increasing transparency through strengthening the decision making, negotiation and dialogue. So, to establish functional relationship and build trust, it is important:

- 'Neutral brokering' and facilitation of dialogue between buyers and suppliers to have sort of buy-back agreement and contract for purchasing the entire harvest (pre-defined quality and quantity) along with incentives and risk sharing mechanism for improving motivation and bonding the seed firms with farmers. For instance, if seed firms/ entrepreneurs provide the needed source seeds to the farmers, and in case of crop failure in that area, certain portion of loss is shared by the seed firm. This ensures that the seed firms/ entrepreneurs earn trust and goodwill of the farmers for the next cultivation.
- Bringing private sector investors towards production pockets: Like in the case of IFAD supported High Value Agriculture Project, it is appreciated that "project grant" would help to bring private sector/seed companies closer to rural areas where seeds are produced, but this should be seen in the form of incentives to compensate risks of "doing things differently or new things" rather than subsidising businesses of individual firm/private sector that may otherwise lead to monopolistic exploitation through creating over dependency of seed producers on a single firm. Identification of market demands and actors who are better placed to satisfy the needs of the customers and designing interventions together with private firms may bring better results to address the marketing issues.
- Business embedded services: Vegetable seed production is highly sensitive sub-sector that requires strong inter-(value chain) actors' cooperation and collaboration, and enabling supporting service markets. Arrangements can be made so that the firms working at the upper node of the chain can help to provide small holding farmers, financing and inputs (technical, materials and other resources). This will help not only to improve relation but also to ensure quality that is demanded by the company, resulting into lesser risks for farmers to sell their produce.
- Insurance of seed crop be initiated jointly by government and donors in the seed sectors for risk lowering against natural hazards and climatic hazards.

Communication and knowledge management

It has been noted that the timely information about demand and supply by crop and area is severely lacking in vegetable seeds. On one hand, farmers groups, cooperatives and agro-vets face difficulty to have adequate supply of source seeds (breeder and foundation seed including desired type of varieties), while on the other hand farmers are complaining about their inability to sell the seeds. Due to lack of updated database for crop and variety wise requirement at national level (which quantity of a specific

variety is required for whom), it is difficult to advice, plan and make commitment for the production of vegetable seeds. Therefore, it is very important to establish database and make information available to all the stakeholders through proper communication channels.

It is also important to generate knowledge (what worked well? how did it work? where and for whom it worked well?) and disseminate it for the benefits of wider communities.

Bridging-in arrangement

As mentioned above in Section 5, the dependency of the target beneficiaries on project support for technical services and marketing of seeds appeared to be very high. As the project is phasing out in December 2014 (but not the commodity), target groups, particularly in project districts that were included during 3rdphase of VSP, might be shocked with project's exit. Hence, it is recommended to make arrangement for bridging between VSP III and the upcoming new programs. The SDC may review the options suggested in the 6th Meeting of the Project Steering Committee and find ways to bridge the link for gradual "phasing out" and "phasing in".

Annex 1: Terms of references

Contract no. 81025546 (Local Mandate)
External Review of Vegetable Seed Project, Phase III

1. Introduction

1.1 Scenario of agriculture sector performance and seed sub-sector:

Nepal is still predominantly an agricultural country. The agriculture sector contributed to almost 35 percent of Gross Domestic Products (GDP) in the fiscal year 2012-13 (MoF, 2013) and provides livelihood to about 76 percent of households (NLSS, 2011). However, agricultural productivity is low, and is only on a slow upward trend, especially in hillside agriculture. Much of hill agriculture is still subsistence-oriented, with little diversification and vertical integration and fragmented land-holdings.

The composition of Agriculture Gross Domestic Products (AGDP) has changed gradually over the past ten years with the share of food crops declining to 36% from 41% and that of horticulture increases to 21% from 17% (ADB, 2009). This shows a shift from cereals towards high value crops and products (Pullabhotla et al, 2011)[11]. The gradual shift to commercial high-value crops has led to a decline in cereal cropped areas, from 78% in 1999 to 74% in 2011 (MoAD, 2012).

In this scenario, Government of Nepal (GoN) has been making its effort to adapt the sectoral priorities according to the changed economic and socio-political circumstances through various plans, policies and programs such as Agriculture Perspective Plan (APP), series of periodic plans, annual programs and budgets. Out of those priorities, focus on seed-sector development is one of the major interventions that directly target to the remote rural households to engage in low-volume-high-value commodity for income generation, food security and livelihoods improvement.

Presently, there are four different types of agencies involved in the seed sector development in Nepal: public sector (Nepal Agriculture Research Council-NARC, Department of Agriculture-DoA, National Seed Company-NSC), community (District Seed Self-Sufficiency Program-DISSPRO, Community Based Seed Production-CBSP, Community Seed Bank-CSB, Cooperatives), private sector (Seed Entrepreneur's Association of Nepal-SEAN, Agro-vets, Seed Companies, importers and distributors) and non-governmental organizations (CEAPRED, LIBIRD, FORWARD etc.).

Based on the seed sector potential in Nepal, the Government of Nepal has recently developed the National Seed Vision (2013-2025). The Agricultural Development Strategy (ADS) also has recognized seed as one of the major potential commodities to be promoted for better market and income opportunities for poor and small holder farmers.

By the nature of commodity, vegetable seed is a high value, low volume and relatively non-perishable product having good domestic demand and exclusive export potential. It has proved to be a viable income and employment generation option for economic development of remote areas. Due to

[11]Pullabhotla H, G Sridhar, AG Kumar and A. Gulati, 2011: *A Review of Input and Output Policies for Cereals Production in Nepal.* IFPRI Discussion paper 01114, International Food Policy Research Institute, Sept 2011.

increasing commercial vegetable farming during the last two decades, the demand for vegetable seeds has been growing steadily. The estimated vegetable seed demand for 2013/14 is 1,900 MT (SEAN, 2013)12 which is expected to increase by about 30 MT annually (VDD, 2010). The present domestic seed production is about 1,000 MT which meets 53% of the total seed demand. This shortfall in supply of vegetable seeds is primarily met through import, mainly from Japan, Korea, Thailand, China and India. Recently, the demand of hybrid seeds in Nepal has been growing exponentially due to rapidly increasing area under off-season vegetables and crop intensification. As Nepal's present domestic capacity of hybrid seed production is limited to a few crops, mainly to tomato, the import of hybrid seeds constitute a substantial part of total imports. It is reported that hybrid seeds occupy about seventy percent of total import by volume (VSP, 2010)13.

The growth potential of the vegetable seed subsector is evident from the following perspectives:

- In remote hills, vegetable seeds, being a low volume high value non-perishable commodity, and generate 3-5 times higher income as compared to alternative cereal crops, which impart the beneficiary farmers an economic advantage of buying at least three times more food than by growing traditional food crops in the same piece of land,
- Due to limited research and varietal development in the country, commercial fresh vegetable production became predominantly dependent on seed import despite the country's existing vast potential of growing most economic vegetable crops harnessing Nepal's wider agro-ecological diversity suitable to these crops. Therefore, a systematic program involving research for varietal development and maintenance, source and improved seed production and marketing based on seed certification, and appropriate extension tools is one of the possible areas of intervention for sub-sector development,
- The timely availability of quality seeds of the right varieties suitable to farmer's cropping pattern can increase the production at least by 20-25%,
- The poor and disadvantaged rural people, particularly residing in the inaccessible remote areas are deprived of an opportunity to come into the mainstream of economic development. However, the commodity like vegetable seed with indigenous post-harvest management knowledge and skills of women, low volume and non-perishable in nature has the potentiality to provide better opportunity to them,
- Nepal has high potential of seed sub-sector development to meet the objectives of self-sufficiency, import-substitution and export-promotion of selected vegetable crops and varieties.

1.2 Brief highlights about the Vegetable Seed Project-VSP:

The Government of Switzerland, through the Swiss Agency for Development and Cooperation (SDC)/Embassy of Switzerland, is supporting a project on vegetable seed subsector development.

CEAPRED-a national NGO has been implementing different phases of vegetable seed production project by involving women and disadvantaged communities and developing networks of producer cooperatives and seed entrepreneurs ensuring the subsector's sustainability through development and operation of the appropriate seed marketing system (based on an appropriate seed value chain) in the country,

[12] Market Information Study for Analyzing National Demand, Supply, Import and Export Situation of Vegetable Seeds In Nepal, CEAPRED, 2013

[13] Market Information Study for Analyzing National Demand, Supply, Import and Export Situation of Vegetable Seeds In Nepal, CEAPRED, 2013

securing government's enabling policy support, enhanced private sector investment and widening community participation through groups and/or cooperatives.

Some of the major highlights from the phase I and II and the findings of the internal assessment of the phase III are summarized below:

Phase I: of the seed project named **"**Promotion of Vegetable Seed for Poverty Reduction in Remote Areas of Nepal (PVSPR) was implemented from 2004 to 2006 in five conflict- affected districts namely, Baitadi, Dadeldhura, Surkhet, Kavre and Dolakha. The main objective of the project was to promote vegetable seed production and marketing for poverty reduction in excluded and conflict - affected areas. Mainly women and the disadvantaged farm families were targeted by the project. The project ended up with key noticeable outputs - generating farm income of about Rs 36.28 million through production and marketing of 240 MT of vegetable seeds involving 3,600 farm families and the construction and operation of 88 community micro-irrigation schemes as one of the major inputs to produce quality seeds and one collection center for market facilitation. Thus, this phase shows the beginning of organizing the seed producer groups and capacitating them for adoption of scientific seed production practices, which helped to upscale the program with its focus on pro-poor targeting.

Phase II: of the seed project implemented during the period of 2007 to 2010 aimed to contribute to sustainably improve livelihoods through seed production and marketing in the remote rural areas of eleven districts - Baitadi, Dadeldhura, Surkhet, Dailekh, Salyan, Jajarkot, Kavre, Dolakha, Ramechhap, Khotang and Okhaldhunga covering 79 VDCs and one municipality and supported 7,704 HHs in production and marketing of 510 MT of seeds resulting into generating direct income of NPR 87.5 million. The availability of quality vegetable seeds due to project intervention contributed to expansion of the area under commercial fresh vegetable production along the adjoining highway corridors within the project districts. Around 1,500 farmers organized in 90 groups were engaged in fresh vegetable production and generated additional income of NPR 6.9 million by selling 244 MT fresh vegetables. The overall impact was realized in terms of its contribution to better food security and poverty reduction - the vegetable seed production in remote areas and fresh vegetables production along the roadcorridors contributed to raise more than 800 HHs above the poverty level (EPR, 2011)[14]. This phase of the project also made a beginning of introducing the concept of mainstreaming gender and social inclusion and establishing the value chain in the vegetable seed subsector more systematically.

This phase of the project in particular laid the foundation of pro-poor commercialization of vegetable seed by linking the poor seed producers to seed traders for establishing a sustainable market chain and ultimately to fresh vegetable producers with some intermediary actors in the value chain, and influencing the public policy environment in favor of public-private partnership for the vegetable seed subsector. This phase also contributed to organizing and strengthening the seed producer groups into primary cooperatives. During this phase, 23 seed production and marketing cooperatives were registered and mobilized for organized seed production and marketing (PCR-PVSPRP, 2010)[15].

Phase III: the current phase of the project is being implemented in 16 hill districts namely, Baitadi, Dadeldhura, Achham, Surkhet, Dailekh, Dolpa, Kalikot, Rukum, Salyan, Jajarkot, Parbat, Myagdi, Kavre, Ramechhap, Okhaldhunga and Khotang.

[14] End of Phase Report 2011, VSP, CEAPRED
[15] Project Completion Report, PVSPR 2011, CEAPRED

The objectives of the VSP-III are:

Goal: "Poor and Disadvantaged Households (HHs) in remote areas of Nepal have improved food security and income"

To achieve this goal, the following two outcomes of the project are set:

Outcomes:

1. Farm families from poor and DAGs[16] produce and sell quality seeds.
2. National Seed Board (NSB), Nepal Agriculture Research Council (NARC) and Department of Agriculture (DoA) enforce decentralised seed production and quality control through both public and private institutions.

Some of the major findings of the internal assessment carried out for VSP-III are:

Outreach: the direct beneficiaries include over 15,000 households (12,395 for seeds and 3,033 for fresh vegetables) with major target to the small farmers (<0.5 ha land) women and disadvantaged groups (DAGs).

Volume of production and contribution to national demand**:** the production of seed has increased over 50% from 173 MT (2010) to 269 MT (2013) per annum. In the same period, the gross income from seed sale has increased by over 200% from Rs. 18 million in 2010 to Rs. 57 million in 2013. The share of VSP districts in total vegetable seed production is about 27% and that of national seed requirement is 14% and the share of VSP is estimated to be 30% of the domestic production and 20% of the source production in the country by the end of phase III.

Seed marketing system establishment: project promoted and strengthened diversity of value chain actors particularly with new roles for cooperatives in source seed production and quality (Truthful Labelling-TL) seed marketing. It established pre-contract agreement, which largely assures market for the growers and buyers and lower the chances of market distortion. Farmers able to fetch approximately 32% better price for the TL seeds.

Income contribution: income from vegetable has increased to the extent of Rs. 20,000 per seed producing HHs and about 42% of vegetable seed income goes on food purchase and 23% for better education of children. The vegetable seed production activities also generates additional employment (20-30% more) as compared to cereal crops through its labor intensive production, post-harvest handling, processing and marketing related tasks. The VSP activities have been helpful to some extent to reduce short-term seasonal migration (to India and urban areas in Nepal) for low paid manual jobs especially in the mid-western Hills.

Policy contribution: contributed in the development of Decentralized Source Seed Production Directives (to be approved), amendment of Seed Regulation (2013) and development of Seed Vision 2013-2025. It also supported in development of mechanism for internal quality control (IQC) system and facilitation for seed testing, labeling and storage of seeds for marketing.

Institutional development**:** project facilitated to transform farmers groups into seed cooperatives and central cooperative federation for facilitation of demand based seed production and marketing by linking groups and cooperatives with entrepreneurs through pre-contract, marketing agreement,

[16] DAGs are economically poor households that suffer from caste, gender or ethnic discrimination

capacity building of local producers, local service providers and other stakeholders in quality seed production and marketing.

2. Purpose of the external review

Based on the agriculture sectoral review 2012 recommendations, SDC/Embassy of Switzerland is aiming to reorient its agriculture sector program, with two-pronged focus: i) strengthening decentralized service provisions; and ii) agricultural market development. The reorientation will capitalize the achievements, best practices and learning from the ongoing initiatives. Therefore, capitalization of achievements at impact level, best practices and learning from long-standing ongoing project like VSP is very relevant and crucial to refine future focus and foster the sustainability of past achievements either by recommending how the handing over can best be made or suggesting what still needs further support through the two above mentioned new programs.

In this pretext, SDC and the project implementing agency CEAPRED had commissioned an internal assessment to understand and document project's achievements in a greater detail against the set outcomes and outputs. Therefore, the external review will be considered as a basis for future orientation of the Swiss contribution in agriculture sector development. It is expected that the review recommendation will help to respond some of the open questions listed out in the newly approved Nepal Agriculture Market Development Program (NAMDP) and Nepal Agricultural Services Development Program (NASDP).

Furthermore, the Seed Vision 2013-2015 with its three objectives of self-sufficiency, import substitution and import promotion; Agro-Business Policy focusing on commodity specific promotion; Contract Farming Bill to optimize land and other production resources, responding to impact of migration through commodity specific enterprising, optimizing better connectivity and water management, District periodic Plans (DPPs) identifying seed as one of the potential commodities for local economic development and Agriculture Development Strategy (ADS) focus on seed as one of the potential marketable commodities are some of the policy milestones that confirm the scope to invest on vegetable seed subsector development in Nepal.

One of the recent study carried out Seed Entrepreneurs Association of Nepal (SEAN) shows there are ample opportunities for Nepal to capitalize niche based vegetable seed sub-sector potential.

Increasingly, majority of the development partners are orienting their support towards market development program. It will give space to Swiss support to explore possible areas of sub-sectoral collaboration and or work for policy lobby as the internal assessment of the review had indicated its scope.

On this outset, the main purpose of the external review is to assess both backward and forward linkages based on the achievements at impact level, validate the current monitoring systems (especially the monitoring and reporting through the Outcome Monitoring Summaries), best practices and learning. Therefore, the external review is expected to focus on following two broad aspects;

2.1 Objective 1-Capitalization of impact level achievements, best practices and learning

The first part of the review is to document the impact level achievements, best practices and learning in terms of sub-sectoral relevance, its contribution to sectoral growth, implementation modality,

commodity promotion throughout value chain, capitalizing niche-based opportunities, supporting women and social inclusion objectives, and policy contribution;

Key Questions

1.1 What has been the overall socio impact on the livelihoods of the beneficiaries that can be attributed to the project? How is the situation of school enrolment for disadvantaged children in better schools? How have the disadvantaged groups increased their incomes through production and sell of vegetable seeds? How is the situation of consumption of fresh vegetables in the project working districts? What are the cost benefit ratio at net present value and EIRR of the project?

1.2 What has been the contribution of project to meet national seed demand, improve seed replacement rate and varietal development/maintenance supporting in the total value chain development?

1.3 How far project has been able to meet the gender and inclusion objectives through targeting, creating space for participation of women and disadvantaged groups throughout the value chain and influence the policy provisions? How the projects like VSP remain meaningfully beneficial for women, poor and disadvantaged especially in the remote areas? How project has achieved policy influence agenda through its collaboration with the local state, sectoral agencies, private sectors and farmer's cooperatives?

1.4 In the context of rural-out-migration of youths, who has been actually participating in the program? What is the trend of technology adoption among the men and women recipients especially of the migrant families? How does the sustainability of technological adoption and skills transfers being assured? Do the migrant families/returnees continue to apply project inputs after the end of the intervention? Are there any specified targeted programs to manage remittances and land resources for commercial production such as vegetable seeds? What is the effect of project in relation to the migration trend?

2.2 Objective 2-Way forward

Recommend avenues for i) potential to capitalise and build on vegetable and seed sub-sector as part of the NAMDP and NASDP, ii) institutionalising cost-efficient implementing mechanisms for value chain development supporting to women, poor and DAGs in specific and the private sector and iii) potential strategic alliance for program harmonisation and resource sharing with like-minded development partners.

Key Questions

2.1 How significant is the relevance of vegetable seed-sub-sector to meet the local economic development priorities and national objectives of seed-self-sufficiency; import substitution and export promotion capitalising the niche based production potentials and trade opportunities?

2.2 What would be the best practices and learning that NAMDP and NASDP can build on? What would be the possible modalities for effective implementation of sub-sectoral initiative like vegetable and seeds to support the commodity chain irrespective of the geographic boundary?

2.3 What would be the best modality to institutionalize vegetable and seed based value chain development by capitalizing the synergy potential available through Small Irrigation, skill programs, road connectivity, market actors, and mobilizing private sectors so to establish the sub-sector as an economically viable, socially accepted and environmentally sustainable venture?

2.4 What would be the actual scenario of the competitiveness of local seed production with the imported seeds, and the potential for import substitution, or even export to India for certain crops and varieties?

2.5 What would be the best possible ways to promote seed production as economically viable activity to engage women and youth in specific? How the women's leadership can best be promoted to lead the subsector growth? What would be the specific measures the program needs to adopt to encourage the participation of migrant families? What specific measures have to be applied to encourage migrants to invest remittances in profitable production ventures such as vegetable seeds?

3. Methodology

3.1 The project will be reviewed with its core focus on the identified objectives above. The process will follow wide consultation with the SDC, farmers, MoAD and its departments, directorates, district offices, AEC/FNCCI, SEAN, Implementing Partners (IPs), other national stakeholders (NPC, MoF and other experts in the field of seed sub-sector development) to capture both policy and programmatic aspects of the project interventions. The overall assessment and documentation is to focus on vegetable seed sub sector development.

3.2 Composition of the review team

The team will consist of two national experts; with i) extensive knowledge and expertise in the field of seed-sub-sector and value chain management and ii) gender, inclusion and poverty analyst. The team is expected to have a good knowledge of issues regarding result chain management, organizational governance, and overall knowledge of agriculture market governance, social inclusion, and sectoral policy update. One expert from GoN will be requested to join the team for joint review and process and result ownership to guide future course of collaboration on the particular field of support. Certain day's contribution of migration expert will be provisioned to support the team in understanding the migration/mobility dynamisms and its inter-linkages with the agriculture sector development.

The team leader will be responsible for overall coordination, report writing and debriefing with the support of team members.

The team member will be responsible for gender, inclusion and poverty focused observation, review and analysis of the project delivery at the impact level. It is expected to have systematic analysis of the project from result based management. The positive changes in the life of beneficiaries in terms of their participation, representation and voices are crucial to get documented. The team member therefore is responsible to bring analytical perspectives from both beneficiaries and service providing institutions including the policy changes. Moreover, the team member is to bring critical analysis of how the project of this nature is most relevant and important to the people in remote areas and especially for women and disadvantaged groups. Therefore, the team member is expected to prepare part of the report with gender, inclusion and poverty focused analysis with appropriate recommendations. The inputs received from migration related expert to be considered while analyzing the gender, inclusion and poverty aspects. He will support the team leader in preparing detail methodology of the review, preparing presentation and the report.

3.3 Period of review

The review is scheduled for 25 actual working days from 02nd of April to 30th of May, 2014. The review is expected to consolidate the observations and comments from different stakeholders after debriefing and a final report submission to SDC/Embassy by end of April 2014.

Table 1. Review plan of activities and number of days

Tasks to be done	Working Days	Responsible
Agreement signing	-	SDC/Embassy
Documents review	3	CEAPRED and SDC to provide necessary documents
Initial discussion with GoN, CEAPRED and SDC/Embassy before departure to field	1	CEAPRED and SDC
Field visits to three clusters and debriefing to district based partners	12	CEAPRED/DADO
Consultation with national stakeholders	2	CEAPRED
Write up review report	4	Review team
Debriefing for GoN, CEAPRED, SDC/Embassy and stakeholders	0.5	SDC to organize forum in cooperation with the implementing agency
Incorporation of comments by the team members and finalize the report	2.5	Consultants
Total days	25	

3.4 Reporting Schedule

The review team shall report to Yamuna Ghale, Senior Program Officer, at SDC/Embassy of Switzerland.

- A first draft of the report will be submitted to SDC/Embassy by 20th of April 2014,
- The Review Team will provide a debriefing to MoAD, SDC, CEAPRED and other invited stakeholders before finalizing the report,
- The final report, incorporating the comments received from GoN, SDC, VSP/CEAPRED and other stakeholders during the debriefing, will be submitted by end of April.

4. Documents to be provided to reviewers

- Project Agreement, Project document and log frame
- Outcome Monitoring Summary
- Brief status and field visit reports
- Annual technical reports

- Yearly Plan of Operations
- Steering Committee minutes
- Audit reports
- Policy study reports and recommendations submitted to GoN by the projects
- Related facts and figures published by CEAPRED and Ministry of Agriculture and Cooperatives
- The Swiss Cooperation Strategy for Nepal 2013-2017
- Seed Vision 2013-2015
- ADS
- Agri-business Policy
- Contract Farming Bill
- NAMDP and NASDP-EP
- Internal Assessment report of the VSP-III

5. Relevant stakeholders to be consulted

- GoN, SDC/Embassy
- VSP team and CEAPRED management
- Farmers and cooperatives, especially women and DAGs
- District based line agencies and partners such as District Agriculture Development Office, DDC
- District based agro-entrepreneurs
- Members of the Project Steering Committee and Technical Committee
- Representatives of the National Planning Commission, Ministry of Agriculture and Cooperatives, Department of Agriculture, Vegetable Development Directorate, Seed Quality Control Center, National Seed Board, Nepal Agricultural Research Council and National Maize Research Program
- Federation of Nepalese Chambers of Commerce and Industries/Agro Enterprise Centre
- Seed Entrepreneurs Association of Nepal
- HMRP
- Other development partners supporting on seed sub sector

Annex 2: List of persons met[17]

Name	Designation	Institution
Mr. Pradeep Maharjan	Chief Executive Officer	FNCCI/AEC, Kathmandu
Mr. Durga Adhikari	General Secretary	SEAN, Kathmandu
Mr. Dharma Raj Adhikari	Marketing Manager	SEAN Seed, Kathmandu
Dr. Ram Chandra Bhusal	Value Chain and Marketing Expert	CEAPRED, Kathmandu
Dr.Mahendra P. Khanal	Senior Seed Development Officer	SQCC, Harihar Bhavan
Mr. Ram Prasad Pulami	Joint Secretary	MoAD, Singhdurbar
Dr. Gajendra Sen Niroula	Program Director	VDD, Khumaltar
Mr. Surendra Lal Shrestha	Senior Scientist	Horticulture Research Division, NARC, Khumaltar
Mr. Keshab Datt Joshi	Senior Program Manager	CEAPRED, Kathmandu
Mr. Bhim Prasad Poudel	Proprietor	Bishal Agrovet Centre, Chhinchhu, Surkhet
Ms. Devi K Acharya	Proprietor	Pralahad Pangali Agrovet Centre, Birendranagar
Ms.Yamuna Ghale	Portfolio Manager	SDC, Kathmandu
Dr. Hari Krishna Upadhyay	Executive Chairman	CEAPRED, Kathmandu
Mr. Bharat P. Upadhyay	Executive Director	CEAPRED, Kathmandu
Mr. Indra Raj Pandey	Team Leader, VSP III	CEAPRED, Kathmandu
Ms. Subhekchha Shrestha	Monitoring Officer	CEAPRED, Kathmandu
Ms. Laxmi Rai	Chairperson and other committee members/shareholders	Srijansil fresh vegetables and seed producers cooperative, Bigutar VDC, Okhaldhunga
Mr. Shivnidhi Dahal	Committee members and shareholders	Kunjara fresh vegetables and seed producers cooperative, Barnalu VDC, Okhaldhunga
Mr. Yub Raj Karki	Proprietor	Karki Agro-vet, Okhaldhunga
Mr. Dhruba Raj Pandey	Chairman	Central Seed Cooperative Federation, Kathmandu

[17] In Okhaldhunga and Dailekh, the review team had a meeting with the members of District Coordination Committee, which represented LDO, LILI, LINK, CYMMIT, NARC and other key stakeholders, at DADO office; In Surkhet, the review team had discussion with senior officers at Regional Agriculture Directorate, DADO, Women and Children Office.

Name	Designation	Institution
Mr. Nawal Singh Khatri*	Chairperson along with Mr. Nar B. Chand, Ms. NirmalaDangi, Mr. Pratap Pun and others Committee members and shareholders	Pabitra Janakalyan Krishi Sahakari Sanstha, Mehelkuna-1, Surkhet
Mr. Chitra B. Woli*	Chairperson along with other committee members and shareholders	Jharana VSP group, Jarkate, Mehelkuna VDC -9, Surkhet
Mr. Rudra B. Bisunkhe*	Chairperson along with other committee members and shareholders	Jorsalla Vegetable Seed Production and Marketing Cooperative, Methinkot, Kavre District
Mr. Keshav Pandey	Marketing Officer	CEAPRED, Kavre
Ms. Vidya Shrestha	District Coordinator	CEAPRED, Kavre
Mr. Ram Deo Shah	Seed Technician	CEAPRED, Kavre
Mr. Bishnu B. Shahi*	Chairperson and other committee members/shareholders	Hatemalo Sahakari Sanstha,Simakot, Baraha-5, Dailekh
Mr. Rudra Poudel	Planning Officer	DADO, Surkhet
Ms. Laxmi Chaudhary Mr. Prem B. Dangi	Senior Mobiliser	Women and Children Office, Surkhet
Mr. Ganesh Acharya	Monitoring Officer	CEAPRED, Kathmandu

*Focus Group discussion with 15-25 people

Annex 3:Review Schedule

Date	Activities	Responsible
02.04.2014	Document review	
05.04.2014	Methodology discussion and finalization in consultation with VSP/CEAPRED and SDC	
06-09.04.2014	Okhaldhunga	
10.04.201	Review methodology and adaptation of plan in Kathmandu	
11-13.04.2014	Consultation with national actors	
15.04-21.04.2014	Surkhet and Dailekh	
21-24.04.2014	Report writing	
25.04.2014	Presentation of findings to MoAD, SDC, CEAPRED, other actors	
26-27.04.2014	Finalisation of report	

Annex 4: Average Area (*Ropani*) under Vegetable seed Production (selected Species) by socio-economic categories

Year: 2011	Total HHs	Average Area in Ropani				
Socio-economic category		Radish	Peas	Cress	Beans four season	Okra
Disadvantaged Group (DAG)	6,141	0.034	0.12	0.012	0.039	0.022
Discriminated Non Poor	1,739	0.037	0.25	0.021	0.048	0.023
Non Discriminated Poor	1,433	0.041	0.21	0.041	0.053	0.031
Non Discriminated Non Poor	922	0.24	0.42	0.15	0.22	0.13
Total	**10,235**	**552**	**1,860**	**306**	**599**	**335**
Year:2012		Radish ME	Peas Sikim Local	Broad Leaf Mustard	Beans 4 s	Rajma
Disadvantaged Group (DAG)	7,581	0.06	0.08	0.04	0.03	0.01
Discriminated Non Poor	1,863	0.08	0.09	0.03	0.03	0.01
Non Discriminated Poor	1,993	0.08	0.10	0.03	0.02	0.01
Non Discriminated Non Poor	994	0.30	0.60	0.24	0.25	0.08
Total	**12,431**	**1,012**	**1,532**	**630**	**615**	**200**
Year: 2013		Radish	Peas	Cucumber	Beans four season	Broad Leaf Mustard
Disadvantaged Group (DAG)	7,531	0.11	0.06	0.02	0.08	0.04
Discriminated Non Poor	2,021	0.18	0.09	0.04	0.11	0.09
Non Discriminated Poor	1,919	0.25	0.16	0.09	0.13	0.12
Non Discriminated Non Poor	924	0.61	0.37	0.21	0.45	0.21
Total	**12,395**	**2,232**	**1,252**	**612**	**1,499**	**915**

Source: CEAPRED

Annex 5: Cost –Benefit Analysis of seed production on selected Crop (An Example)

District: Dailekh **Crop:** Radish **Variety:** 40 days **Year:** 2012

Description of Cost

Area: 1 Ropani (500 Sqmapprox)

S.N.	Date	Description of Cost	Unit	Rate	Quantity	Amount NPR	Remarks
Land Rent							
		Land	Ropani		1		
A. **Material Cost**							
1		Seed/ Seeding	Gram/Ropani	600	250	150	
2		Fym	Doko/Ropani	25	20	500	
3		DAP	K.g./Ropani	65	10	650	
4		MOP	K.g./Ropani	50	3	150	
5		Urea	K.g./Ropani	50	5	250	
6		Fungicide	Gram /ML/ Ropani		50	100	
7		Insecticide	Gram /ML/Ropani		100	180	
8		Irrigation …….	/Ropani				
		Total				1,980	
B. Power Cost							
	Date	**Description of Cost**					
Bullock			Days/Ropani	500	0.5	250	
Bullock			Days/Ropani	500	1	500	
		Total				**750**	
C. Labor Cost							
	Date	**Description of Cost**	Labor days/Ropani				
		Manure and fertilizer application	day	250	1	250	
		Sowing	day	250	3	750	
		Irrigation & pesticide application	day	250	1.5	375	
		Hoeing & Weeding	day	250	4	1000	
		Harvesting	day	250	1	250	
		Threshing, Grading & Transportation	day	250	5.5	1375	
		Total				**3,750**	
D.		Interest on working capital (10%pa)				180	
E.		Total Variable Cost (A+B+C+D)				6,660	

F		Total fixed cost (Opportunity cost of land -Rented value)	Unit	300	1	300	Assumption
G		Total Cost of cultivation				6,960	

Production & Income Description

	Production kg.	Sale Rs.(/kg.)	Income/Cost
I. Main Product (Seed)	50	190	9,500
J. Additional products (Fresh Veg.)	105	15	1,575
K. Gross return per Ropani (I+J).	**11, 075**		
Net Income/Ropani (K-G).			4,115
Benefit -Cost Ratio			**1.59**
Return to labor			**257**

Annex 6: Sample for prioritization of seed varieties

Factors	Seed Varieties									
	Onion	*Cauli flower*	*Cab-bage*	*Radish*	*Rayo*	*Cucu-ber*	*Pum-pkin*	*Toma-toes*	*Peas*	*Chilli*
A. Demand Conditions										
Size of domestic market (volume in demand, proportion of imported seeds)										
Size of export market (niche market for Nepalese seeds in Bangladesh, other countries)										
Growth rate/ market trend (last 10 years data)										
B. Factor Conditions										
Breeder, source seeds, foundation seeds availability										
Human resource and skills (how feasible it is in the context of Nepal)										
Knowledge base and research capability										
Capital availability (initial investments required)										
Infrastructure (irrigation, storage etc)										
C. Industry Structure										
Involvement of DAG/women										
Linkages between actors involved commercially (farmers groups/cooperatives, agro-vets, seed companies)										
Entry Barriers*										
D. Support Industries										
Training/research for variety development, maintenance development										
Marketing Research (demand-supply assessment)										
Agro-inputs, machinery and equipment suppliers										
E. Production resources										
Easy to grow, harvest and process (knowledge, agro-inputs, post-harvest care)										
Labour intensiveness										
Inclusiveness										
Friendly to Small land owners										
Friendly to DAG										
Women friendly										
Adaptation to Climate Change										
Crop known to be locally adapted to climate change										
Drought tolerance/ low water requirement										
Susceptibility to pest and diseases										

Note: Ranking in the scale from 1-5, with 1 being the low end and 5 the high end. The preference of above should come from the consultation with experts and value chain operators (producers, processors, traders).

*High entry barriers (i.e. requiring high investment, technology etc) represented with score **1**and low barrierswith **5**