Value Chain Development of Fruits and Vegetables Project in Nepal

Mid-term Evaluation Report

Timeframe of the evaluation: July 2018-March 2021

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Project information

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	29 June 2018	31 December 2022
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Evaluation by	Nepal Development Research Institute (NDRI)	
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Acronyms and abbreviations

AKC	: Agriculture Knowledge Centre
ADS	: Agriculture Development Strategy
APP	: Agriculture Perspective Plan
DADO	: District Agriculture Development Office
EQ	: Evaluation Question
FGD	: Focus Group Discussion
HH	: Household
KII	: Key Informant Interview
KOICA	: Korea International Cooperation Agency
MoALD	: Ministry of Agriculture and Livestock Development
MTE	: Mid-term Evaluation
NARC	: Nepal Agricultural Research Council
NDRI	: Nepal Development Research Institute
NPC	: National Planning Commission
OECD-DAC	: Organization for Economic Co-operation and development -Development Assistance Committee
PMAMP	: Prime Minister Agriculture Modernization Project
SDG	: Sustainable Development Goal
ToC	: Theory of Change
ToR	: Terms of Reference
UNDP	: United Nations Development Programme
USD	: United State Dollar
VCDP	: Value chain Development of Fruits and Vegetables in Nepal Project

Executive Summary

Introduction

This evaluation report presents results of the Mid-term Evaluation (MTE) of Value Chain Development Project (VCDP) implemented by the Ministry of Agriculture and Livestock Development (MoALD) with the support from Korea International Cooperation Agency (KOICA) and United Nations Development Programme (UNDP). The project aimed to increase incomes of smallholder farmers by a) increasing selected crop production and productivity through capacity development of the government agencies and better access to production technology by farmers; b) reducing post-harvest losses through developing post-harvest technology; and c) enhancing better market linkages in local level through strengthening collaborating collection centres and satellite markets. The project is implemented in three road corridors; BP Highway, Prithvi Highway and a part of the East-West Highway (Hetauda-Dumkibas) targeting vegetables-tomato, cauliflower, cabbage, capsicum, cucumber, radish, potato, onion, garlic and fruits-banana, citrus, papaya, pineapple, and watermelon.

The overall objective of the MTE was to assess the results and approaches of the project interventions from the start to date. The evaluation identified and documented the achievement of the project interventions, challenges, lessons learnt and assessed the progress against the baseline data. The project interventions were assessed in terms of relevancy, effectiveness, efficiency, impact and sustainability. Results were assessed against project output targets and project's contribution to a higher level of outcome results. The findings of the evaluation provided guidance for the way forward for the future course of action for the remaining project years in consideration of the COVID-19 situation.

The MTE adopted a mixed approach combining both quantitative and qualitative techniques. The MTE followed the revised OECD-DAC evaluation criteria of relevance, effectiveness, coherence, efficiency, impact and sustainability and answered the given key evaluation questions. Partnership, GESI and Human Rights were the cross-cutting criteria followed by the evaluation. In total, 400 household survey, 46 Key Informant Interviews and 1 FGD were conducted along with review of existing project documents as well as other relevant literatures to answer the evaluation questions. Few informal observations were carried out in collection centres, NARC and cooperative however limited number of FGD and observation is attributed to the limitation caused by the pandemic. Instead, informal discussions and meetings with cooperative members were carried out to gain insight about contribution of the project to the cooperatives. UNDP Nepal Country Office, KOICA and implementing partner Ministry of Agriculture and Livestock Development (MoALD) are the primary audiences of this MTE.

Key findings

Relevancy: The overall design and approaches of the project was relevant in addressing the needs and priorities of the target groups and communities, supporting women and other marginal and disadvantage groups in normal as well as in the crisis context and changing conditions such as transition to federalization. Its focus on functional capacities of partner institutions, access to technology and essential inputs, access to extension services for improved production and productivity, access to technologies for post-harvest loss reduction, finance, and improved market linkages to the farmers are highly relevant as these are the key needs and priorities of the smallholder farmers particularly women and marginalized groups. However, the revised Theory of Change could not be justified for increased access to finance.

Post federalism, the local governments are playing instrumental role in project implementation at local level and have been taking charge of provision of technical support, access to finance, infrastructure support, extension service support and delivery. The priority of local government on agriculture sector, availability of resources and absorption capacity have led to the effective partnership with the VCDP leading to better and positive outputs. Even in the situation of pandemic, the local government, cooperative and other market actors were able to execute some of its activities at local level through COVID-19 relief and response activity budget such as for transportation and marketing support, youth and foreign returnee support program etc. Some of the municipalities with technical and financial support of VCDP, initiated agri-ambulance to ensure that vegetables and milk products do not go waste

during the lockdown period and reaches the consumer directly from the farm without involvement of intermediaries and at reasonable price.

The project has followed human rights based and Gender Equality and Social Inclusion (GESI) approach through which it has prioritized female farmers and farmers from marginalized groups - such as prioritizing female participation in training, internship and extension services, increasing their access to resources (income, grant etc.), technologies and knowledge, encouraging them for decision-making, and ultimately empowering them. The project has mainstreamed GESI into every stages and activities.

The project is well aligned with the national priorities and strategies of the country such as Sustainable Development Goals (SDGs); Nepal's Agricultural Perspective Plan (APP, 1995-2015) followed by Agricultural Development Strategy (ADS, 2015-2035) with adopting a 'pocket package' approach. The project aligns with the 10th Five Year Plan (2002-2007) that initiated the prioritization of postharvest technology for fruits and vegetables and the 15th Plan (2019/20-2023/24) that has prioritized food security and nutrition, and includes increase in agricultural production and productivity, coordination and collaboration with federal, provincial, local level and other stakeholders, emphasized the involvement of the private sector and cooperatives in marketing etc. in its strategies and working policies.

Effectiveness: Given the constraints faced during pandemic, the overall VCDP intervention is effective, and the project activities were delivered effectively in terms of quality. To improve agricultural productivity, capacity enhancement of agriculture technicians, lead farmers, and cooperative officers have been done. The project has already developed several manuals and knowledge products through consultation with local governments, cooperatives and farmers, and determined the best way to disseminate knowledge and technology. Activities are disseminated through knowledge and information systems established by existing networks, online training materials and other knowledge products. The capacity of NARC has been strengthened through engagement in postharvest technology related research activities, and extension on postharvest technology has been provided to farmers and cooperatives. However, there were some key internal and external factors (COVID-19) that have affected the achievement of the outcome indicators, particularly in terms of quantity and timing but these Disturbances were managed by project team and the partners by changing their program modality as per need.

The monitoring arrangements have been limited due to the pandemic and most of it is planned to be conducted in another quarter. As depicted by the project team, only 49% of the total budget of the project has been disbursed. The project has been producing quarterly and annual progress report as per the plan, and the audits have been done to review the effectiveness of activities undertaken in relation to the funds utilized. However, the lower than planned expenditure is attributed to the COVID-19 induced restriction measures and partial closure of agriculture services at Palikas with primary focus on health recovery. Besides, other planned activities such as gross margin study, training, farm demonstration and exposure visits have also led to delay in monitoring and evaluation.

The project has been significantly effective in enhancing the capacity of local partners and the institutions to create an enabling environment for value chain development and in creating employment and income opportunities to the local people including women and marginalized groups through provision of technical trainings and extension and input services. Provision of grant to graduate students is highly effective for human resources development and for enhancing their potential for contributing for agriculture development in the nation. Similarly, laboratory establishment strengthened with all the equipment that are required for the post-harvest research at NARC. However, marketing of vegetables to distance market is still a problem. Likewise, effectiveness of infrastructures particularly collection centers are bit questionable in the changing context considering the sustainability.

The project advocates for ensuring GESI in all project implementation process: from the identification of beneficiaries to the selection of facilitators, consultants, and other stakeholders. The project has made an effort to mainstream GESI in its project cycle through identifying women, indigenous people, and those from socially disadvantaged groups

and understand their different needs, constraints and their vulnerability regarding access to services and opportunities. This was done to make sure that project interventions benefit women, men, and socially disadvantaged groups meaningfully and equitably, proving equitable access to project resources; and to minimize any unintended gender-based discrimination. However, the GESI aspect is largely confined to participation of women and socially marginalized groups in the project activities.

Coherence: VCDP intervention is overall coherent with Government's policies and with other interventions carried out by UNDP or Government of Nepal. For example, APP and ADS have adopted "pocket approach" that aims for specialization and commercialization to which the strategy of VCDP is coherent with. The intervention is also in line with the "Game Changer" projects of Nepal such as Prime Minister Agriculture Modernization Project which aims to enhance competitiveness and to ensure food and nutrition security by industrializing the sector to create sustainable economic opportunities and to be self-reliant in agricultural production.

Efficiency: Overall efficiency in terms of utilization of the resources including human, material and financial resources to achieve the results in a timely manner, project management structure, fund flow mechanism and project implementation strategy and execution is satisfactory. The existing project management structure was quite appropriate and efficient in generating the expected results because the involvement of local government as implementing partner allowed for internalization of the VCDP intervention. The estimated cost per beneficiary was US$ 552.2, whereas, the project expended only US $ 376.865 per beneficiary till date. The project expended 31.75% lower than the estimated cost per beneficiary. Hence, in terms of expenditure on execution of the project, project shall be considered as cost effective. However, there are some activities yet to be done as proposed by the project such as gross margin analysis, exposure visits, dissemination of technologies, publications etc.

Sustainability: The main strength of VCDP project is the partnership with local government and the local cooperatives for implementing its project which is likely to contribute to sustainability of the intervention even after project closes. VCDP was implemented through national implementation modality (NIM). Institutional capacity development and individual's capacity building are the important activities of VCDP which significantly contributes to sustainability. Also, the project has supported use of post-harvest technologies- such as use of plastic crate, which is a proven technology, are extremely helpful for farmers and traders to reduce post-harvest losses in fruits and vegetables apart from imparting awareness. The established/strengthened laboratory, cold rooms with both coolbot technology and refrigerator system based technology are also important initiations of the project. Besides, since Palikas have allocated budgets for agricultural activity, majority of the Palikas have adopted the modality of VCDP and internalized the activities in their programs to support smallholder farmers for the improvement of their livelihood and income generation activities, in general. They also commit to continue supporting agricultural development even after phase out of the project. Overall, ownership by local government and the cooperatives, farmer's use of materials from the cooperative, NIM modality, capacity building and institutional strengthening of Palikas and development of working procedures for them indicate some of the actors and factors of the sustainability of the project.

Impact: As the activities of project are more focused in developing strategies, strengthening government bodies (capacitate Palika, establishment of collection center, market place, and lab) in past years, it is difficult to measure proper impact of project. The pandemic has also adversely affected the scheduled programs and implementation of project activities. The training based on the result of research is yet to be delivered by NARC to the beneficiaries because it takes about 2 years to complete the research. During the time of dissemination, COVID-19 affected all possible methods of dissemination of research findings. However, the capacity building trainings to staffs of NARC and Palikas were considered effective. Some activities of the Palika is found to be highly effective and replicated to another areas.

Partnership: The government organizations, academic institutions and local organizations which were supposed to be partnered are equally involved in completion of activities of project. Local government/Palikas as implementation partner, academic institutions as research and result findings partners, cooperative as activities promoting and implementation partner for infrastructure development like collection center, market place, NARC as research and disseminating partner, and KOICA and UNDP as decision making body for project implementation are working effectively from their sides. This project has provided an avenue to strengthen the linkages between UNDP Nepal and KOICA Nepal. The partnership with local government, cooperatives, and farmers' group have created synergies and contributed positively to project's achievements.

Cross-cutting issues: VCDP has been effective in addressing needs of women and most vulnerable groups in the design, implementation and monitoring of the project, in general. The project has prioritized women and socially disadvantaged groups in all steps of the project. Before implementation, data collection and series of consultations were made to identify women, indigenous people and those from socially disadvantaged groups from the project pockets and analyzed their different needs and gaps so that project interventions benefit them equally. The entire activities conducted through NARC, Universities, Palikas and Cooperatives under VCDP ensures the participation of women and ethnic groups as far as possible. Disaggregated data are found to be prepared specifically in the case of participation in training, access to support and grant by the all implementing partners. The project has integrated Human Rights based approaches in the design, implementation and monitoring of the project as far as possible. In all stages of the project design and implementation, issues of gender and marginalized groups have been found to be addressed.

Conclusion

The overall design and approaches of the project was relevant and was able to address the needs and priorities of the target groups and communities, supporting women and other marginal and disadvantage groups to some extent. The output level results are in progress but they are not fully in line with the activities envisaged and planned which is largely associated with the pandemic induced restrictions. However, the project is able to produce unintended positive effects, on the local people who are not the beneficiaries of the project, as well. The reprogrammed project activities were very relevant in meeting the local needs during COVID-19 pandemic however the revised Theory of Change could not be justified for increased access to finance.

Given the constraints faced during pandemic, the overall VCDP intervention activities were delivered effectively in terms of quality, however there were some key internal and external factors, particularly COVID-19, which has affected the achievement of the outcome indicators, particularly in terms of quantity and timing. The project has been significantly effective in enhancing the capacity of local partners and the institutions to create an enabling environment for value chain development and in creating employment and income opportunities to the local people including women and marginalized groups. However, effectiveness of infrastructures, particularly collection centers and CoolBot technology, are bit debatable in the changing context of increase in road accessibility that has facilitated direct linkage of traders and producers. The project significantly contributes to the UNDP Country Programme Document outcome and outputs, the SDGs, the UNDP Strategic Plan and national development priorities such as Agriculture Development Strategy.

VCDP intervention fits very well in the changed context of federalization and UNDP's National Implementation Modality and is coherent with Government's policies considering the priority of Government on agriculture development. The fund flow mechanism has been an appropriate and efficient mechanism to leverage the resources of the community. However, quarterly budget disbursement system of VCDP is not quite favorable. The project management structure was appropriate and efficient in generating the expected results even in context of pandemic.

The benefits of the projects likely to be sustained after the completion of this project. Key factors that will require attention in order to improve prospects of sustainability of project outcomes and the potential for replication of the approach is the establishment of well-equipped collection centers supported by an integrated pack house and

internalization by the local government.

Overall, considering the challenging situation in which the VCDP intervention was carried out, the project outputs achieved so far is commendable. The partnership among different stakeholders including local government and cooperative has huge potential for contributing in sustainable agriculture development at local level given their contextual relevance and complement to the national priority of agriculture development. With the incorporation of GESI and human rights-based approach in the design and implementation, the efforts have been made to benefit women and people from ethnic minorities or disadvantaged or marginalized groups, however, most of these inclusion are limited to participation mostly.

Recommendations

- The initial Theory of Change for VCDP had revolving fund provision for input support as one of the assumptions that led to increased access to finance which was modified later into provision on input support. This modification in assumption does not exactly lead to increased access to finance which should be reconsidered and revised accordingly.
- An integrated mechanism i.e. a collection centre or the cold store - with basic facilities such as washing, cleaning, trimming, sorting, grading, sanitization or disinfection, garbage disposal and packaging practices as per the commodity requirement - is needed for enhanced market linkages, considering timeframe of the project. This centre should be piloted, it should be placed in an accessible place and land for collection centre should be managed by the local government.
- A refresher capacity building or revisiting of the system strengthening and dissemination is recommended to be done based on the capacity of the institutions.
- More awareness and technology transfer for grading that is locally relevant and adaptable should be widely promoted. Besides, packaging container should be designed to avoid damage to the commodity during transportation and handling. Transportation container should be designed to keep produce without damage and the produce should be transported during night time or in refrigerated containers.
- VCDP's support for the preparation of broader guideline or strategy for collective marketing along with exposure visit and capacity building for the cooperatives and Palikas is appreciable, and it needs to be further expedited and promoted.
- Prioritizing record keeping by farmers in diary in the training and in practice is must in all the intervening Palikas.
- Apart from collection centre, it is essential to develop a well-designed (having proper infrastructure, entry point, exit point, wastage area, recording system, information system, grading system, storage facility) or capacitated agriculture market centers at Palika level with allocation of the land from Palika on their own or in partnership with development partners.
- Considering the challenges, the project has gone through in terms of delay of project activities in the initial stage and COVID-19 induced disturbance, expediting of activities in certain Palikas and for certain commodities seems essential. Further, extension for the project seems essential and focus should be prioritized based on progress across different Palikas.
- Some of the approaches that should be considered for increasing women's involvement in the project are flexible venue and timing of training for the women, couples training approach, involvement of both men and women in all value chain development work, developing linkage of women with market and changing self-perception of women.
- The project has not recorded number of people with disabilities who are benefitted from the intervention although it was noted that there are project beneficiaries with disabilities. As UNDP emphasizes "leave no one behind" notion, the project should increase participation of people with disability in upcoming activities and keep a record of it.

1. Introduction

Ministry of Agriculture and Livestock Development (MoALD) with the support from Korea International Cooperation Agency (KOICA) and United Nations Development Programme (UNDP) is implementing a project entitled "Value Chain Development of Fruit and Vegetables in Nepal". This project focuses on increasing productivity, reducing post-harvest losses and improving the marketing system for selected fruits and vegetables in Bagmati Province and Gandaki province. The project is part of UNDP's overall strategy to support the MoALD, provincial governments, and local governments to strengthen the agricultural value chain with a focus on income generation of smallholder farmers.

The VCDP project has entered the mid-point of its implementation. This milestone calls for a mid-term evaluation (MTE) (Annex A-ToR) to ascertain the results achieved or would suggest any revision in the remaining period of the project. The main purpose of MTE is to assess the results and approaches of the project interventions from the beginning till date and will guide a way forward for future course of action for the remaining period of the project. The evaluation aims to assess the relevance, effectiveness, coherence, efficiency, impact and sustainability of the project interventions in project sites between July 2018 and March 2021. Also, MTE indicates if the achieved results are in the right direction towards contributing to strengthening the value chains and increasing incomes of smallholder farmers in the project areas or would require to change the course of direction in order to achieve the expected outcome.

Furthermore, some key events such as implementation of the new constitution, federalization of the country, localization of sustainable development goals and more importantly COVID 19 have taken place since the beginning of the project. These events brought challenges in implementation as well as achieving the project targets. Therefore, the MTE is perceived as needed also to identify the ways forward to address these new issues. UNDP, KOICA and the implementing partner - MoALD are the primary audiences of this evaluation. They will use the evaluation findings to make the informed decision in improving the interventions. The evaluation has followed Organization of Economic Cooperation Development (OECD) Development Assistance Committee (DAC)'s evaluation criteria – relevance, coherence, effectiveness, efficiency, impact and sustainability. Partnership, Gender Empowerment and Social Inclusion (GESI) and human rights are added as cross cutting criteria. In line with this, the report follows the following outline:

Section 1 introduces in brief about MTE
Section 2 describes about the project/intervention
Section 3 describes MTE scope and objectives
Section 4 describes MTE approach, questions, sampling design, methodology and limitations
Section 5 presents the findings along the main evaluation criteria
Section 6 summarizes the main conclusions
Section 7 details out key recommendations
Section 8 lists out the main lessons learnt

2. Description of the intervention

2.1 The Project

Nepal's agriculture shows weak growth rates with low productivity and competitiveness, and limited adoption of improved technology. Some sub sectors such as dairy, poultry, tea, vegetables, vegetable seed, and fisheries show dynamism, but overall, these positive signs are not yet sufficient to lift many people engaged in agriculture out of poverty, make a dramatic dent in malnutrition, and assure food security. On the other hand, postharvest loss is high in Nepal. This leads to lower returns through revenues foregone, as well as higher costs of transportation and marketing. Various studies have conducted to determine the post-harvest loss of fruits and vegetables, which estimated the post-harvest loss from 20 to 30% for fresh fruits and vegetables and could exceed 50% under adverse conditions with rates slightly higher for fruit than for vegetables. Major reasons for losses in fruits and vegetables caused by harvesting at an improper stage of maturity, direct packing and shipping without removal of field heat, improper methods of harvesting, transportation and storage (Gautam et al, 2018). The majority of loss occur during transportation from the farm yard to the collection center and thereafter to the wholesale market and retail outlets. Effects of post- harvest loss are felt both by traders and farmers, with the loss to farmers cumulative as traders' discount payments to farmers to reflect expectations of losses. In addition, postharvest losses affect food security and nutrition. Some estimates suggest that, even in high income countries with efficient postharvest management, over 30% of the food produced is not consumed. Quality losses lead to inferior nutritional value, foodborne health hazards, and financial losses when the produce misses market opportunity or loses attributes that make it appealing to consumers. Technology interventions along with technical and financial assistance play a critical role in addressing the issue of post-harvest loss. Despite of several efforts that have been made to develop and disseminate these technologies for smallholder farmers, these technologies have not been reach out yet to those farmers who really in need. Besides, Nepal is a food importer with an agriculture trade deficit which is mainly due to inadequacy of domestic production that has not been able to match up with the national demand. However, this is not only the case. There are imports even in cases where domestic production is adequate to suffice the demand which is attributed mainly to market challenges such as low market volumes apart from loss between farmers and consumers. Nepal's fruit and vegetable markets are not much well-developed, and markets are congested and unhygienic with many issues and concerns such as presence of many intermediaries resulting in high cost of products, lack of proper market-led infrastructure for management of goods, lack of availability of market information etc.[1]

In this context, the Value Chain Development of Fruit and Vegetables in Nepal Project (VCDP) is led by the Ministry of Agriculture and Livestock Development (MoALD) with support of UNDP and the Korea International Cooperation Agency (KOICA). The project is part of UNDP's overall strategy to support the MoALD, provincial governments and local governments to strengthen the agricultural value chain with a focus on income generation of smallholder farmers. The MoALD, The Nepal Agricultural Research Council (NARC), local governments, cooperatives, market operators, farmers, agrovets, service providers and other actors along the value chain are the key implementing partners for the project. The project aims to increase incomes of smallholder farmers through improved vegetables and fruits farming in Nepal. Recognizing the key gaps in the vegetables and fruits farming, the project has focused on production support with enhanced access to extension, postharvest loss management, and market linkage improvement. Since the launch to date, the project identified 185 pocket areas, about 9,960 farmers, 30 cooperatives and market centers from 37 Palikas of 11 districts for technical assistance. The project supported cooperatives and farmers' group better access to production technology as well as improved crop production practices and access to finance to farmers through Palika and cooperatives. Similarly, the project supported market access by establishing and strengthening necessary physical infrastructures such as collection centres, satellite market, procuring mini-trucks, and establishing low-cost cold rooms (both CoolBot based and refrigeration system based). Similarly, the project also supports in updating laboratory along with necessary equipment to NARC to perform research and develop different post-harvest loss minimization technologies for farmers. In order to reduce the scale of post-harvest losses, the project supports in development of post-harvest technologies and rolled-out in collaboration with NARC, Similarly, the project also supports to physical facilities, organizational management, and access to market price information to collection centres and satellite markets to enhance market linkages. The project

[1] ADB (2019). Dysfunctional Horticulture Value Chains and the Need for Modern Marketing Infrastructure: The Case of Nepal. Accessed at https://www.adb.org/sites/default/files/publication/534711/dysfunctional-horticulture-value-chains-nepal.pdf

is implemented in three major road corridors: BP Highway, Prithvi Highway and a part of the East-West Highway (Hetauda-Dumkibas) targeting vegetables-tomato, cauliflower, cabbage, capsicum, cucumber, radish, potato, onion, garlic, carrot and fruits- banana, citrus, papaya, pineapple, and watermelon.

The three key project outcome results and their indicators are:

Project outcome 1	Improve agricultural productivity through increased capacity of government agencies and better access to production technology by farmers ✶ % increase in gross margin of selected commodities by collaborating farmers (Target 15% against baseline data) ✶ % increase in yield of average crops for collaborating farmers (Target 20% against baseline data).
Project outcome 2	Reduce postharvest losses of selected fruit and vegetables by postharvest technology development ✶ % decrease in postharvest losses occurring from farm to collection center and wholesale markets by volume (baseline vegetables 20.7%, fruit 26.3% collected in 2019 | target 5%p)
Project outcome 3	Better market linkage at local level. ✶ % increase in the volume of selected commodities traded at collaborating collection centers and satellite markets (baseline 2,747 MT collected in 2019 | target 40% increase).

The project duration is July 2018 - December 2022. The new federal structure came into place at the time of project launch. The country is at the early stage of implementing its federal structure facing a number of issues and challenges. The institutional capacity of the local government in the changing context of time is contentious. Thus, the project supported in enhancing the institutional capacity of the new government system focusing on the agriculture sector. VCDP specifically provided financial as well as technical support in equipping human resources in need at Palikas and organized orientation workshops to clarify the roles and responsibilities of the local governments for agriculture extension services. Besides, significant resources in the form of physical, financial and technical support have been provided in building capacity of cooperatives which has resulted in improvement in their marketing, information provision on different technologies and extension services to the cooperative members, improvement in their physical facilities such as construction, collection center improvement, and equipment provision etc. The total budget for the project is US$ 5.5 million.

VCDP Theory of Change

The main objective of the project is improved crop productivity and increased incomes for farmers. The pathway to change are production support enhanced, postharvest loss reduced and market linkage improved which is done through provision of input support, extension services support, development of postharvest technology, rehabilitation of collection centres and wholesale market and promotion of market information network system. Initially, for production support enhancement, increase access to finance was planned through provision of revolving fund for input support however the modality was changed to provision of input support in the revised Theory of Change (Figure 1).

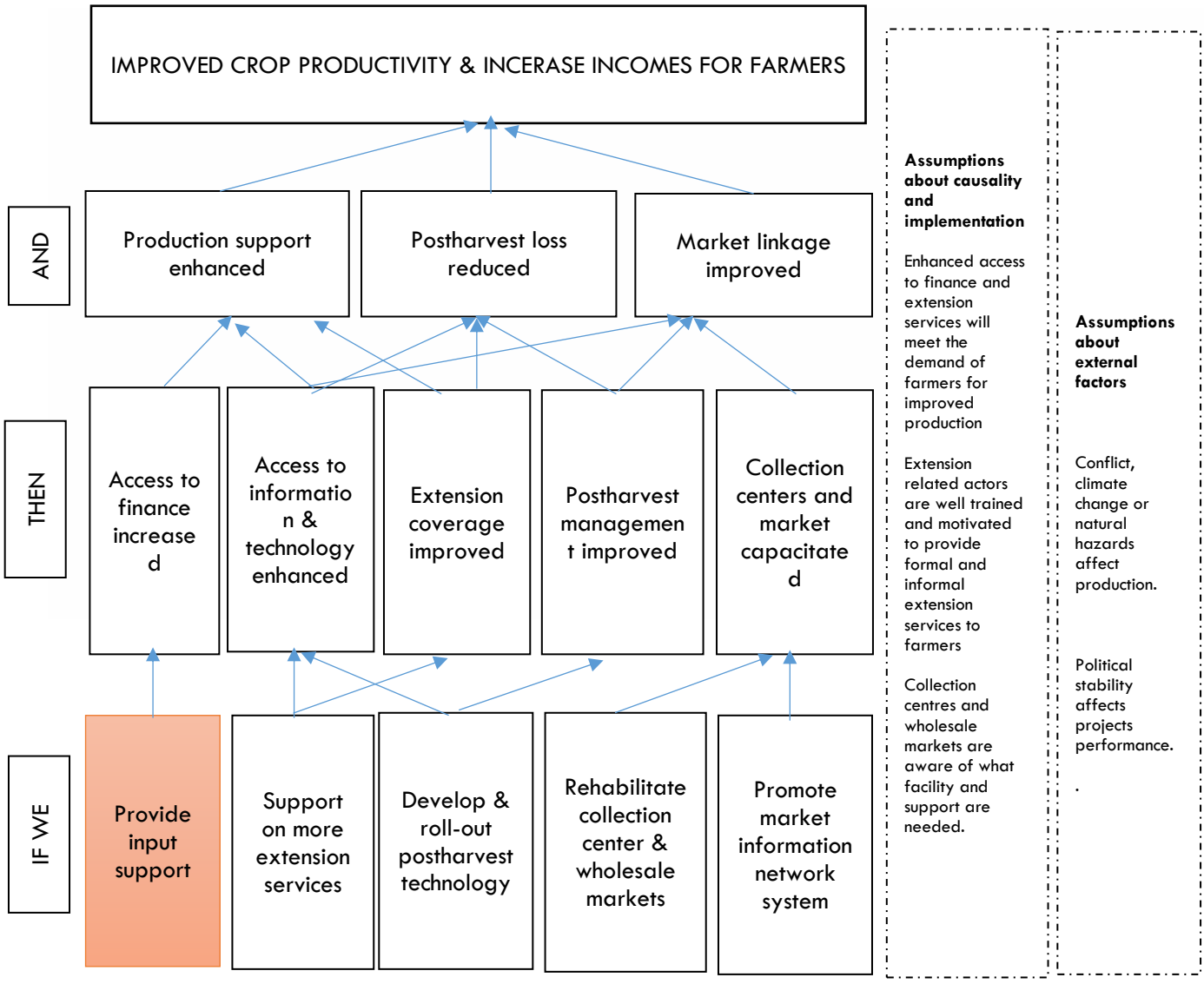

Figure 1: Revised VCDP Theory of Change

Implementation modality

The VCDP project was launched on June 29, 2018 by Ministry of Agriculture and Livestock Development (MoALD) with support from Korea International Cooperation Agency (KOICA) and United Nations Development Programme (UNDP). The project period is July 2018 - December 2022. At federal level, the project is led by the MoALD according to National Implementation Modality, as agreed between Government of Nepal (GoN) and UNDP. Department of Agriculture, NARC, and local level government bodies are the cooperating agencies in the new federal structure. NARC is also a co-implementing agency and local government bodies are the main implementing partners at local level. Local partners including input suppliers, cooperatives, lead farmers and local commodity market owners are also engaged in the project (Figure 2).

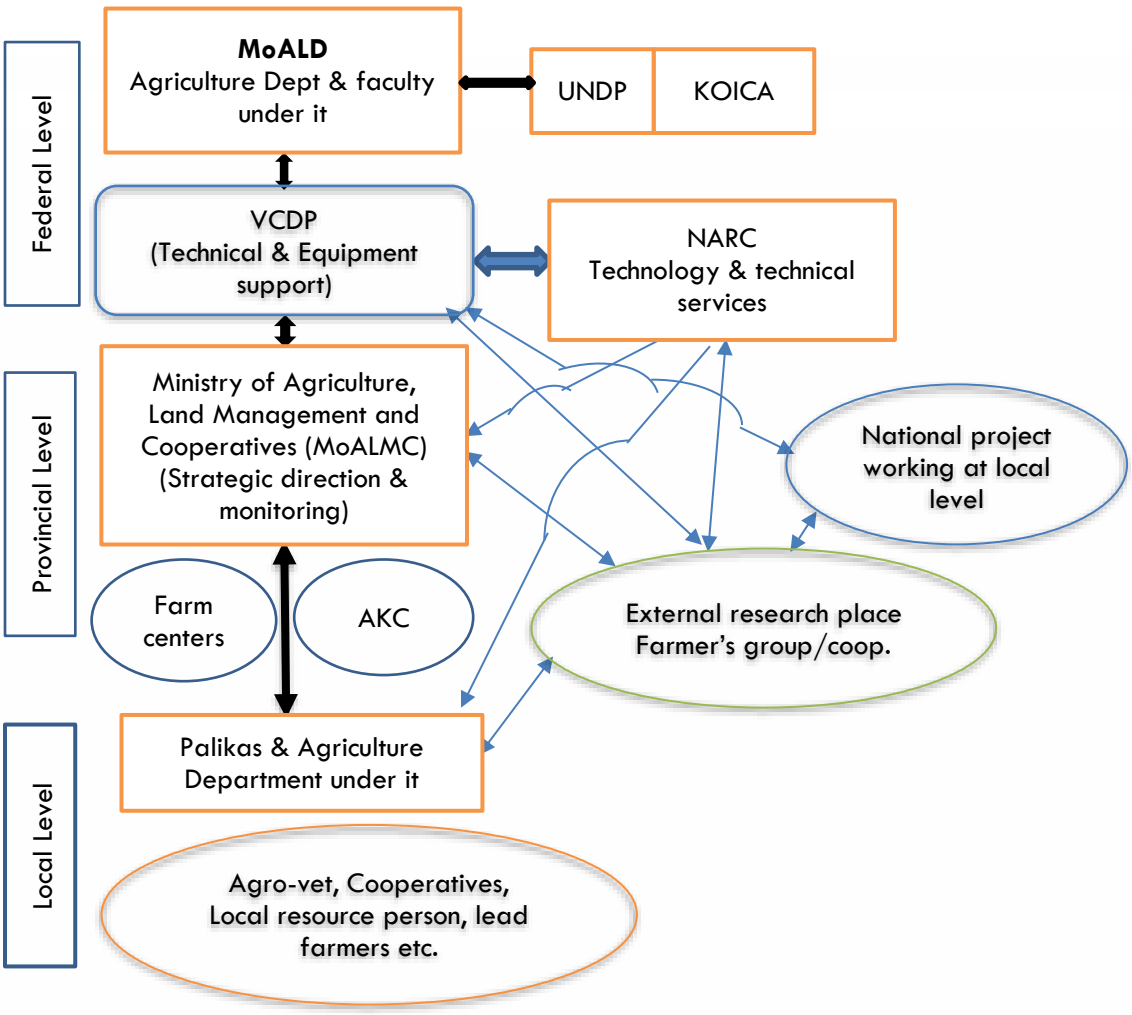

Figure 2: Implementation modality of project

3. Evaluation scope and objective

UNDP has commissioned this MTE to assess the results and approaches of the project interventions from the start to date. The MTE serves as an important function to identify and document the achievements of the project interventions, challenges, lessons learnt and best practices.

Scope: The MTE of the project was carried out for the period from July 2018 to March 2021. The evaluation identified 9 districts considering three selected road corridors BP- Highway corridor, Extended Prithvi Highway corridor and East west highway corridor of Bagmati Province and Gandaki province. They covered two districts in BP Highway (Kavre and Sindhuli), four districts in extended Prithvi Highway (Dhading, Tanahu, Gorkha, and Syangja) and three districts in East-west Highway (Chitwan, Makawanpur and Nawalparasi East). In total, 19 pockets from 13 respective municipalities were selected on the basis of target crops to be covered. The total number of sampled pocket areas of respective municipalities according to districts is shown in Table 1.

Table 1: Sample pocket areas of respective municipalities according to districts

Districts	Municipality/Rural Municipality	No. Municipalities
A. BP- Highway corridor		
1.Kavre	Banepa, Dhulikhel,	2
2. Sindhuli	Kamalamai	1
B. Extended Prithvi Highway corridor		
3. Dhading	Dhunibesi, Gajuri	2
4. Gorkha	Sahidlakhan	1
5. Tanahu	Byas, Myagde	2
6. Syangja	Putalibazar	1
C. East west highway corridor		
7. Makawanpur	Hetauda	1
8. Chitwan	Ichchhakamana	1
9. Nawalparasi (East)	Devchuli, Kawasoti	2
Total		**13**

Objectives: The overall objective of the MTE is to assess the project results and approaches from the beginning till date. It will identify and document the achievement of the project intervention, challenges, lessons learnt and best practices. It also assesses the progress against the baseline data, highlights what has been achieved and proposed what needs more attention. The MTE provides the recommendation which will serve as guidance for the way forward for future course of action to be taken by the project in remaining years given the pandemic situation.

The specific objectives of the MTE are as follows:

- To ascertain the achievements of the project and its relevance, effectiveness, efficiency, sustainability and impact including synergies with other government-led initiatives and UNDP support efforts (coherence).
- To assess the effectiveness of the project activities provided to smallholder farmers and local partners such as Palikas, cooperatives, and local service providers in increasing incomes and strengthening the horticultural value chain

- To assess engagement of local partners such as Palikas, NARC, Cooperatives, agribusiness association, and other actors along the value chain in the project, and their understanding, including financial and other commitment for sustainability of activities
- To review and assess the risks and opportunities (in terms of resource mobilization, synergy and areas of interventions) for future
- To assess the effectiveness and efficiency of the fund flow mechanism (Letter of Agreement and Value Chain Grants)
- To suggest amendments in project activities and working modalities, if needed, for the better contribution to the beneficiaries considering the context of federalization
- To appraise the recently repurposing response to COVID-19 affected vulnerable extension workers, farmers, cooperatives, and other actors along the value chain to continue the production, postharvest management and market support

Criteria: The MTE follows the revised OECD-DAC evaluation criteria of relevance, effectiveness, coherence, efficiency, impact and sustainability. In line with the TOR, the evaluation assessed whether the achieved results of the project within two years of project period are in the right direction towards contributing to strengthening the value chains and increasing incomes of smallholder farmers in the project areas or would require changing the course of direction in order to achieve the expected outcome. Furthermore, collaboration among stakeholders and mainstreaming of cross cutting issues i.e. Gender Equality and Social Inclusion (GESI) and human rights were also covered as cross-cutting criteria.

Questions:

Criteria	Evaluation questions
Relevance	✶ How relevant were the overall design and approaches of the project? ✶ To what extent the project was able to address the needs and priorities of the target groups and communities in the crisis context and changing conditions? To assess whether the results achieved had a differentiated impact on women and other vulnerable groups? ✶ To what extent did the project contribute to the national policies and strategies such as the Agriculture Development Strategy? ✶ To what extent were the output level results achieved and how did the project contribute to project outcomes? Does the project contribute to the outcome and output of the UNDP Country Programme Document? Were there any unintended positive or negative results? ✶ To what extent the reprogramming of project activities for immediate COVID-19 response are relevant to meet the local needs?
Effectiveness	✶ To what extent the project activities were delivered effectively in terms of quality, quantity and timing? ✶ What are the key internal and external factors (success & failure factors) that have contributed, affected, or impeded the achievements, and how the project and the partner have managed these factors? ✶ To what extent have monitoring arrangements been effective and supported adaptive management? What were the lessons and how was feedback/learning incorporated in the subsequent process of planning and implementation? ✶ How effective has the project been in enhancing the capacity of local partners to create an enabling environment for value chain development?

	✶ To what extent did the project contribute to the UNDP Country Programme Document outcome and outputs, the SDGs, the UNDP Strategic Plan and national development priorities such as Agriculture Development Strategy? ✶ To what extent was the project successful in creating employment and income opportunities to the local people? ✶ How effective was the project in ensuring that concerns around GESI were integrated in its approach?
Coherence	✶ How well the intervention fits in a changed context? ✶ To what extent the intervention is coherence with Government's policies ✶ To what extent the intervention addressed the synergies and interlinkages with other interventions carried out by UNDP or Government of Nepal? (Internal coherence) ✶ To what extent the intervention was consistent with other actor's interventions in the same context or adding value to avoid duplication of the efforts? (External coherence).
Efficiency	✶ How efficiently were the resources including human, material and financial resources used to achieve the results in a timely manner? ✶ To what extent the fund flow mechanism (Letter of Agreement, Low Value Grant or Value Chain Grant) has been an appropriate and efficient mechanism to leverage the resources of the community? ✶ To what extent was the existing project management structure appropriate and efficient in generating the expected results? ✶ To what extent has the project implementation strategy and its execution been efficient and cost-effective?
Sustainability	✶ To what extent are the benefits of the projects likely to be sustained after the completion of this project? ✶ What are the key factors that will require attention in order to improve prospects of sustainability of Project outcomes and the potential for replication of the approach? ✶ How were capacities strengthened at the individual and organizational level (including contributing factors and constraints)? ✶ What could be done to strengthen exit strategies and sustainability of the project?
Impact	✶ To what extent the project outputs were achieved and contributed to outcome level results? ✶ To what extent can the program contribute to resilient and inclusive economic recovery through support to production, postharvest loss management, and market linkage? ✶ To what extent has the support enabled citizen's trust in local government and its systems, particularly those of women?
Partnership	✶ How the partnerships affected the project achievement, and how might this be built upon in the future? ✶ Have the ways of working with the partner and the support to the partner been effective and did they contribute to the project's achievements? ✶ How does partnership with local partners including Palikas, cooperatives, farmers' association and other actors along the value chain? Does it create synergies or difficulties? What type of partnership building mechanism is necessary for future partnership?

Gender equality and Social Inclusion	✶ To what extent have issues of gender and marginalized groups been addressed in the design, implementation and monitoring of the project? ✶ To what extent the project approach was effective in promoting gender equality and social inclusion - particularly focusing on women and socially disadvantaged groups? ✶ To what extent has the project promoted positive changes for women and marginalized groups? Were there any unintended effects?
Human rights	✶ To what extent have Dalit, ethnic minorities, women and other disadvantaged and marginalized groups benefitted from the work of the project and with what impact? ✶ To what extent have projects integrated Human Rights based approaches in the design, implementation and monitoring of the project? Have the resources been used in an efficient way to address Human Rights in the implementation (e.g. participation of targeted stakeholders, collection of disaggregated data, etc.)?

4. Evaluation approach and methods

4.1 Evaluation approach

The MTE was undertaken using a mixed approach combining quantitative and qualitative techniques. In the initial phase of evaluation, desk study of all the documents pertinent to the project including project document, project progress reports, baseline study report, quarterly and annual progress reports, progress against output and other result indicators were thoroughly reviewed. Quantitative technique included household survey. Face to face interviews with the beneficiaries of sampled households (HHs) from the project areas were undertaken. The qualitative technique included mainly Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), informal discussions/meetings and informal observations. The target respondents for KIIs were key stakeholders comprising of local ward/municipality leaders, cooperative heads, focal person of agriculture department of municipality, local level government chiefs and so on. Similarly, the target respondents for FGDs were members of farmers groups, agriculture cooperatives, head of academic institutions, traders and other value chain actors. Observations was done basically at institution level such as main market centers, NARC office, and agriculture cooperatives. Several consultations with members of collection centers, cooperative members, farmers and relevant stakeholders were carried out at district as well as national level.

4.2 Sampling design

Sampling procedure for this study was based on two-stage sampling with selection of pocket areas at the first stage and the HHs of beneficiaries in the second stage. Representative sampling techniques (purposive sampling) was used to select the pockets on the basis of types of target vegetables and fruits to be studied. A sample enables the valid inference if the sample is more representative, and the tools become appropriate. The results lead to valid conclusions for the sample size not less than 10 percent at the primary sampling units (PSU). Here, altogether 19 pockets which are 10.5 percent of PSU out of 185 pockets were chosen representatively. In the second stage, at least 20 beneficiaries' HHs were randomly selected from each of the chosen pocket areas (Table 2). Total of 9 pockets for fruits (banana, orange, mandarin, lime, papaya, pineapple and watermelon) and 10 pockets for vegetables (tomato, cauliflower, cabbage, capsicum, cucumber, radish, potato, onion and garlic) were selected among 19 pockets considering all types of agro-ecological regions (Table 3). The sample pockets were identified in consultation with the VCDP team and representatives of Agriculture Department of respective municipalities.

Table 2: Selected pocket areas with respective vegetables and fruits and sample size distribution

Highway corridor	District	Muncipality	Pockets (N)	HH (N)	Fruits	Vegetables
BP Highway	Sindhuli	Kamalamai	2	48	Junar, Pineapple	Potato, Cauliflower, Cabbage
	Kavre	Dhulikhel	1	26		Potato, Tomato, Radish
		Banepa	1	26		Capsicum, Cucumber, Cauliflower
Prithivi Highway	Dhading	Dhunibesi	1	21		Cauliflower, Cabbage, Tomato, Capsicum
		Gajuri	1	20	Banana	
	Gorkha	Sahidlakhan	1	22	Orange, Lemon	
	Tanahun	Myagde	1	21	Orange	Cauliflower, Cabbage, Tomato
		Vyas	1	20	Watermelon	
	Syangja	Putalibazar	3	57	Orange, lime/lemon	Cauliflower, Cabbage, Potato, Tomato, Garlic, Onion
East-West Highway	Nawalparasi	Devchuli	1	20	Lemon, Papaya	
		Kawasoti	2	44	Papaya	Cauliflower, Cabbage, Tomato, Cucumber

	Makwanpur	Hetauda	2	40	Lemon, Banana	Tomato and Cucumber
	Chitwan	Ichhakamana	2	35	Lemon, Banana, Papaya	Tomato and Cucumber
Total			**19**	**400**		

Table 3: Pocket area selection by agro-ecological regions

S N	Districts	Hill	Mid-hill	River basin	Tar	Terai	Total Pockets
Prithvi- Highway							
1	Syangja		2	1			3
2	Tanahu			1	1		2
3	Gorkha			1			1
4	Dhading				2		2
East-west Highway							
5	Nawalparasi					3	3
6	Makawanpur		1		1		2
7	Chitwan	1		1			2
BP Highway							
8	Sindhuli	1		1			2
9	Kavre	1			1		2
Total pockets							**19**

4.3 Sample size estimation and distribution

To ensure the findings are statistically valid, a 95% confidence level and 5% confidence interval was employed for the sample size determination in the study districts by using the formula given by Arkin and Colton (1963).

$$n = \frac{Nz^2 * p(1-p)}{Nd^2 + z^2 * p(1-p)}$$

Where,

n = sample size
N = total number of households
z = confidence level (at 95% level z = 1.96)
p = estimated population proportion (0.5)
d = error limit of 5% (0.05)

The total sample generated for this study was 384 individuals. However, considering the potential risk of getting incomplete questionnaires, an additional 16 HHs were surveyed, and therefore a total of 400 individuals were interviewed (Table 2). The sample was designed to assess the individual level status of a household taking into consideration gender and caste/ethnicity as far as possible.

The data for computing MTE indicators were collected from a sample of 400 households, which was distributed in 19 pocket areas in the sampled districts. Of this total sample pockets, 10 pockets were considered from fruit pockets and 9 were from vegetable pockets.

4.4 Data collection techniques

The survey team collected quantitative data (household survey) and qualitative data (focus group discussions (FGD) and key informant interview (KIIs)). The different types of data were collected to triangulate responses from farmers and government officials, cooperative staff, traders and their overall satisfaction with the services provided. Semi-

structured questionnaires (Annex B), and checklists (Annex C) for HH survey and qualitative data collection were administered respectively. The household questionnaire consisted of mostly closed-answer questions and a few open-ended questions were administered to collect data/information. A total of 46 KIIs and 1 FGD conducted were summarized in Table 4. Because of COVID-19 situation, intended number of FGDs could not be carried out as people were reluctant to sit together in groups, and hence, few informal discussions/meetings were carried out in a group of 3-4 people.

Table 4: Data collection methods

Data type	Survey type	Sample size
Quantitative	Household Questionnaire Survey	400 (Farmers-188 Female and 212 Male)
Qualitative	Focus Group Discussion*	1 (Cooperative members, traders)
	Key Informant Interview**	46 (15 Female and 31 male) (local/national level government representatives, trader, coop representative at local level)
	Observations	Collection centers, Market centers, NARC, Cooperatives

** Six FGDs were planned, however, due to COVID situation only 1 FGD could be conducted.*

*** List of respondents of KII is presented in Annex F.*

Similarly, secondary data and information was collected from different published and unpublished sources including VCDP annual reports, booklets, bulletins and annual reports of agriculture cooperatives, main market centers' documents, MoALD and other relevant past studies to generate the required information that had focused on production, productivity, post-harvest loss, processing, and improve the marketing system of selected fruits and vegetables.

4.5 Performance standards

The mid-term evaluation of VCDP was carried out based on the evaluation criteria of OECD-DAC and the guiding questions outlined for each criteria. The evaluation framework used for carrying out this assignment is presented below:

Criteria	Evaluation questions	Data collection tool	Data Sources
Relevance	• How relevant were the overall design and approaches of the project? • To what extent the project was able to address the needs and priorities of the target groups and communities in the crisis context and changing conditions? • To assess whether the results achieved had a differentiated impact on women and other vulnerable groups? • To what extent did the project contribute to the national policies and strategies such as Agriculture Development Strategy? • To what extent were the output level results achieved and how did the project contribute to project outcomes? • To what extent the reprogramming of project activities for immediate COVID-19 response are relevant to meet the local needs?	a. Desk Review observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other stakeholders	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders
Effectiveness	• To what extent the project activities were delivered effectively in terms of quality, quantity and timing? • What are the key internal and external factors (success & failure factors) that have contributed, affected, or impeded the achievements, and how the project and the partner have managed these factors? • To what extent have monitoring arrangements been effective and supported adaptive management? What were the lessons and how were feedback/learning incorporated in the subsequent process of planning and implementation? • How effective has the project been in enhancing the capacity of local partners to create enabling environment for value chain development? • To what extent did the project contribute to the UNDP Country Programme Document outcome and outputs, the SDGs, the UNDP Strategic Plan and national development priorities such as Agriculture Development Strategy? • To what extent the project was successful to create employment and income opportunities to the local people?	a. Desk Review b.Observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other stakeholders	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders

	• How effective was the project in ensuring that concerns around GESI were integrated in its approach?		
Coherence	• How well the intervention fit in changed context? • To what extent the intervention is coherence with Government's policies ? • To what extent the intervention addressed the synergies and interlinkages with other interventions carried out by UNDP or Government of Nepal? (internal coherence) • To what extent the intervention was consistence with other actor's interventions in the same context or adding value to avoid duplication of the efforts? (External coherence)	a. Desk Review b.Observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other stakeholders	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders
Efficiency	• How efficiently were the resources including human, material and financial resources used to achieve the results in a timely manner? • To what extent the fund flow mechanism (Letter of Agreement, Low Value Grant or Value Chain Grant) has been appropriate and efficient mechanism to leverage the resources to community? • To what extent was the existing project management structure appropriate and efficient in generating the expected results? • To what extent has the project implementation strategy and its execution been efficient and costeffective?	a. Desk Review b.Observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other stakeholders	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders
Sustainability	• To what extent are the benefits of the projects likely to be sustained after the completion of this project? • What are the key factors that will require attention in order to improve prospects of sustainability of Project outcomes and the potential for replication of the approach? • How were capacities strengthened at the individual and organizational level (including contributing factors and constraints)? • What could be done to strengthen exit strategies and sustainability of the project?	a. Desk Review b.Observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other stakeholders	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders
Impact	• To what extent the project outputs were achieved and contribution to outcome level results? • To what extent can the program contribute to resilient and inclusive economic recovery through support to production, postharvest loss management, and market linkage? • To what extent has the support enabled citizen's trust in local government and its systems, particularly those of women.	a. Desk Review b.Observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders

		stakeholders	
Partnership	• How the partnerships affected in the project achievement, and how might this be built upon in the future? • Have the ways of working with the partner and the support to the partner been effective and did they contribute to the project's achievements? • How does partnership with local partners including palikas, cooperatives, farmers' association and other actors along the value chain? • Does it create synergies or difficulties? • What type of partnership building mechanism is necessary for future partnership?	a. Desk Review b.Observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other stakeholders	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders
Gender equality and Social Inclusion	• To what extent have issues of gender and marginalized groups been addressed in the design, implementation and monitoring of the project? • To what extent the project approach was effective in promoting gender equality and social inclusion - particularly focusing on women and socially disadvantaged groups? • To what extent has the project promoted positive changes of women and marginalized group? Were there any unintended effects?	a. Desk Review b.Observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other stakeholders	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders
Human rights	• To what extent have Dalit, ethnic minorities, women and other disadvantaged and marginalized groups benefitted from the work of the project and with what impact? • To what extent have project integrated Human Rights based approach in the design, implementation and monitoring of the project? • Have the resources been used in an efficient way to address Human Rights in the implementation (e.g. participation of targeted stakeholders, collection of disaggregated data, etc.)?	a. Desk Review b.Observation c. KII with farmer, cooperative members, market operators, and local traders d. FGDs with project beneficiaries and other stakeholders	• Program documents, progress report including financial report, annual report • Program activities • Program beneficiaries • Program stakeholders

4.6 Stakeholder participation

Key stakeholders at national as well as local level including project donors were considered for this study. Almost 33% of the key informants were female. Key stakeholders comprised of local ward/municipality leaders, cooperative heads, and focal person of agriculture department of municipality, local level government chiefs and project beneficiaries were considered at local level. Whereas key stakeholders comprising of representatives of MoHA, NARC, Universities (TU, IAAS, HICAST), UNDP, KOICA, were considered at national level.

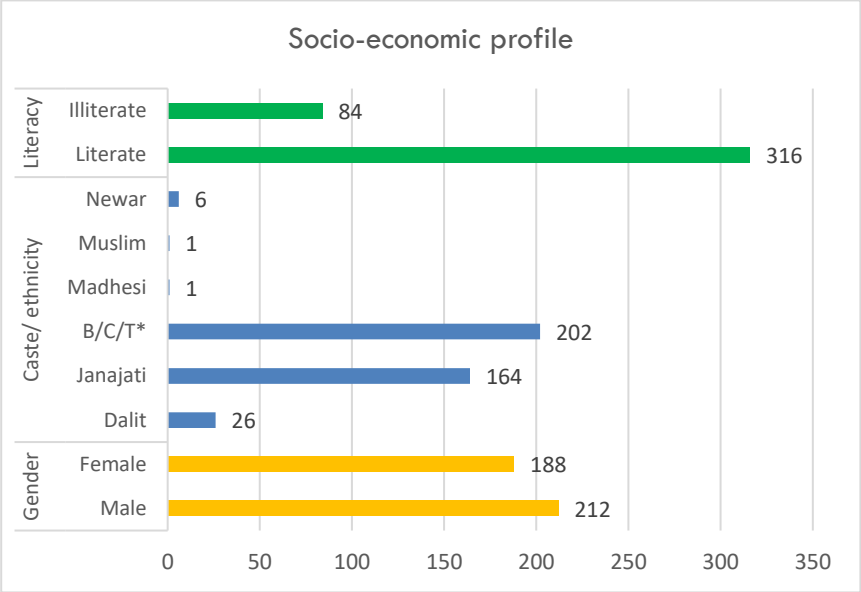

Figure 3 Socio-economic profile of respondents

As mentioned in preceding section, the findings are based on a desk review of project documents and other relevant documents, interviews with key stakeholders, face to face interview with beneficiaries from the project sites. The household (HH) survey was carried out with 400 beneficiaries of the VCDP project. Out of total respondents, 47% (188) are female. Majority of the respondents are from Brahmin/Chhetri/Thakuri* caste (50.5%) followed by Janajati (41%) and Dalit (6.5%). The literacy rate is better among respondents as 78% of the respondents are literate (Figure 3). Out of 400 beneficiaries, 23% are involved in fruit cultivation (60 male and 32 female) and 77% are involved in vegetable production (152 male and 156 female) (Table 5).

Table 5: Number of respondents cultivating fruits/vegetables by sex

Types		Male	Female	Total
Fruits	Banana	2	9	11
	Lime	4	1	5
	Mandarin	41	13	54
	Pineapple	13	9	22
Vegetables	Cauliflower	21	26	47
	Cabbage	2	9	11
	Capsicum	4	4	8

	Tomato	64	51	115
	Cucumber	36	33	69
	Radish	4	3	7
	Potato	19	22	41
	Onion	1	5	6
	Garlic	1	3	4
Total		**207**	**179**	**400**

4.7 Background information on evaluators

The evaluation team comprised of senior experts who have in-depth knowledge on the value chain study of fruits and vegetables, and evaluation studies. The Team Leader, Mr. Kamal Raj Gautam has specialization in agriculture economics and agri-business management. He is the expert in value chain based program development, monitoring and evaluation. The other team members- Prof. Dr. Durga Mani Gautam is an expert in postharvest management and Mr. Mahendra Thapa has specialization in agriculture economics. Likewise, Dr. Manjeshwori Singh has specialization in rural and regional studies with expertise in GESI sector and Dr. Rajman Shrestha is a statistician and Associate Professor. The team also had two researchers- Ms. Shreya Bajimaya and Ms. Urmila Gautam, who have immense experience in carrying out research and evaluation studies.

4.8 Limitations

Some of the limitations faced by the evaluation are:

- Field survey was conducted immediately after lockdown ended. At that time, people were still in stressed situation. So, they were hesitant to talk during household survey. Due to COVID-19 pandemic, respondents were conscious of health protocol and therefore allowed for minimum time duration for the survey which affected the adequacy of information collected.
- Initially 6 FGDs were planned for the evaluation, however due to COVID-19 related awareness, respondents hesitated to participate in group and therefore, only 1 FGD could be conducted. To minimize data and information gaps, few informal discussions and meetings were carried out in a small group with key people.
- Considering time management, COVID-19 protocol and respondent's preference, some of the interviews with key actors were conducted via phone, mainly in the case of representative of cooperative and Palikas.
- Initially informal observation was planned to conduct in institutions like cooperative, NARC and collection/market centers. However, due to the pandemic situation observation could not be conducted as field researchers were not allowed to visit cooperative office. Cooperative representatives were interviewed outside of the office mostly.
- Some of the data related to the outcome indicators could not be found such as gross margin analysis, decrease in postharvest losses, and yield of average crops for collaborating farmers etc. which is largely due to the COVID-19 pandemic related restrictions.
- In some of the selected pocket areas, the fruits and vegetables were not available as per the proposed respective crops.
- Project had provided training on diary maintenance to the beneficiaries to keep track of their cost of production, production quantity and their farm related other information. However, most of the farmers were not maintaining the diary which affected their record keeping and track of the progress happened due to the project implementation. This also affected data collection as farmers didn't have record of their production details.
- Due to the project implementation modality i. e. NIM modality, most of the beneficiaries were not able to recognize that the support they received from the palika is supported by VCDP.

4.9 Data analysis

The collected data was analyzed both qualitatively and quantitatively with the mixed method approach. The primary data acquired in qualitative mode was analyzed using qualitative data analysis techniques such as validations, triangulations and interpretations, logically interpreting perceptions and statements, keeping in view the specific context of the respondents. The analysis of data integrated gender considerations, ensuring that collected data is disaggregated by sex, caste/ethnicity and other relevant categories where appropriate. Quantitative data was analyzed using simple statistical methods (SPSS). The output results of data analysis were presented in a tabular form i.e. cross tables and also graphics, diagrams, photographs, and so on were also used for presentation of data/information in the report.

Furthermore, mapping of the theory of change considering the inputs (training, revolving funds, extension services, post-harvest technologies and physical facilities and networking) provided by the project to achieve final outcomes and reverse were analyzed.

The draft report with an analysis of the key findings and recommendations is presented to UNDP, KOICA and other relevant stakeholders, thereby allowing a review and validation exercise to be conducted prior to finalization of the VCDP report.

5. Key findings

5.1 Relevancy

This section presents the main evaluation findings for each specific evaluation question.

Finding 1. The overall design and approaches of the project was relevant in addressing the needs and priorities of the target groups and communities, supporting women and other marginal and disadvantage groups in normal as well as in the crisis context and changing conditions.

This project intends to strengthen the agricultural value chain with a focus on income generation of smallholder farmers through increased capacity of government agencies, better access to production technology by farmers, reduction of postharvest losses and better market linkage at local level. The project was initially designed to be coordinated through District Agriculture Development Office (DADO) prior to nations' transition to federal structure- DADO was largely responsible for agriculture extension services, cooperative management and technology handover. However, the new federalized structure opened an avenue for the local government to play the essential role of implementing partner. Post federalism, the local governments are playing instrumental role in project implementation at local level and have been taking charge of provision of technical support, access to finance, infrastructure support, extension service support and delivery. The priority of local government on agriculture sector, availability of resources and absorption capacity have led to the effective partnership within the project leading to better and positive outputs. The evidence suggests that this transition has supported their project design and implementation plan.

The overall design and approaches of the VCDP project is relevant as the project puts smallholder farmers producing fruit and vegetables and associated value chain actors at central. The objective of Sustainable Development Goal 1 is to reduce the proportion of people living in poverty. Accelerating the development of agriculture is an important way for millions of people to get rid of poverty as more than two-thirds of the population is engaged directly or indirectly in agriculture. Low production and productivity, lack of market linkages, post-harvest loss are the key issues in Nepal's agriculture. VCDP's focus on function capacities of its partner institutions, access to technology and essential inputs, access to extension services for improved production and productivity, access to technologies for post-harvest loss reduction, finance, and improved market linkages by farmers are highly relevant as these are the key needs and priorities of the smallholder farmers particularly women and marginalized groups. The VCDP was designed and implemented to address these issues by providing the technical as well as financial support to the smallholder farmers producing fruits and vegetables and other value chain actors. The household survey revealed that the total production has increased by 64% and total selling quantity (without grading) has increased by 79% after project implementation (Annex D-III).

The project has followed human rights based and Gender equality and social inclusion (GESI) approach through which it has prioritized female farmers and farmers from marginalized groups - such as prioritizing female participation in training and internship, emphasizing women empowerment through increased access to income and overall, ensuring GESI through the policy provisions. The UNDP Strategic Plan 2018-2021 commits to the principles of universality, equality and leaving no one behind. It focuses on strengthening gender equality and the empowerment of women and girls among other solutions to better respond to development settings i.e. poverty reduction, eradication, structural transformation for sustainable development, and resilience building to shocks and crises. The project has mainstreamed GESI into every stages and activities. The promotion of gender equality and empowerment are fundamental to the mandate of UNDP. In line with the same, VCDP project has followed GESI approach strictly during designing and implementation of the project. During the identification of collaborating farmers, pocket areas, and cooperatives, data collection and consultation was made to identify vulnerable groups such as women, indigenous people, and those from socially disadvantaged groups and analyzed their different needs and constraints. The gender and vulnerable group's issues have also been addressed properly by VCDP project as majority of the respondents during key informant interview also indicated that the project was relevant in addressing the needs and priorities of the target groups. The half yearly report of VCDP also indicates that out of 7,109 participating farmers, 62% (4,405) were female and 51% were from ethnic groups or Dalits (496 Dalit and 3,136 Janajati). The annual reports of 2019 and 2020 depicted that 7,232 farmers got empowered in increasing

their incomes out of which 48% on average were female and 30% were from ethnic groups.

The respondents during HH survey (Figure 4) were asked to give their opinion on the statement "This project is able to address the need and priority of women's, marginalized and disadvantage groups." About 56% of the total respondents mentioned that they neither agree nor disagree whereas, about 28% agreed the statement. About 8% of the respondents found to be fully agreed with the statement, whereas very few about 1% of the respondents mentioned as totally disagree with the statement (Figure 4). This faintly depicts that although project has been designed and approach has been well taken to incorporate GESI in its activities, the beneficiaries have not perceived it clearly either due to lack of information or understanding of the project benefits.

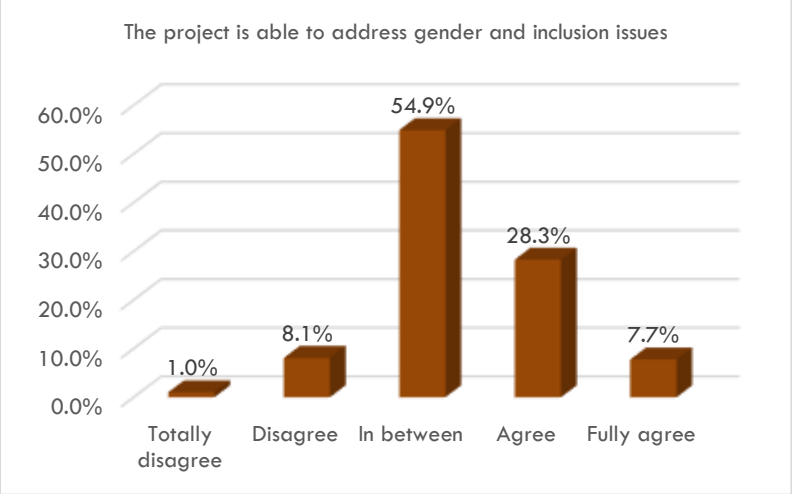

Figure 4 Perception of respondents on "This project is able to address the need and priority of women's, marginalized and disadvantage groups."

The project has facilitated a broader coverage of extension services, provision of better physical and economic accessibility to collection centres and satellite market. Information sharing have also been prioritized which has allowed beneficiaries to be well informed. It has followed a "pocket package" approach that supports commercial farmer from the pocket area and provides grants with the aim of encouraging commercialization. Further, presence of farmers' groups have been facilitating the project implementation activities, however their involvement in promoting cultivation of fruit and vegetables by providing technical and financial support to farmers is limited. The respondents in HH survey were asked if they have received support from VCDP in production of vegetables and fruits, and what type of support have they received. Out of 383 respondents, 52% (111 men and 88 women) said that they have received some form of support from VCDP. For three consecutive years after the project began, majority of them (48%) said that they received seed/seedlings followed by technical support (26%). Some received support in terms of vehicle (mini-tillers), irrigation and farmyard improvement (Annex D- I and II).

The Theory of Change (TOC) was slightly revised. The pathway to change to meet the objectives of this study are production support enhanced, postharvest loss reduced and market linkage improved. For production support enhancement, initially the project planned to provide revolving fund for input support leading to increased access to finance. But theory of change was slightly modified and instead, providing input support was put as an assumption for increasing access to finance. However, increased access to finance is not justified through input provision only. There are several agricultural interventions at government or non-government level that has been providing input to the farmers; and with increased capacity building and other forms of support, farmers have been able to increase their production. However, these do not provide direct access to finance. The provision of revolving fund would increase access to finance as they will have direct access to fund through cooperative or other financial mechanisms/institutions that they can utilize for procuring the inputs based on their need and requirement. This study suggests that the Theory of Change should be as it was before "Provide revolving fund for input support" because if farmers get fund i.e. direct access to fund, they can procure input as per their requirement and their access to

finance can be increased but it should be ensured that there is a proper monitoring mechanism to regulate the use of fund by farmers. Also, through revolving fund, farmers can feel empowered and be able to take decisions to manage the fund required for their crop production.

Finding 2. The project is relevant in contributing to the national policies and strategies such as Agriculture Development Strategy and contributes to the outcome and output of the UNDP country program document. The output level results are in progress but they are not fully in line with the activities envisaged and planned which is largely associated with the pandemic induced restrictions. However, the project is able to produce unintended positive effects on the local people who are not the beneficiaries of the project.

The project is well aligned with the national priorities and strategies of the country. The project contributes significantly in addressing the national policies and strategies as the key indicators of the project are in line with the Sustainable Development Goals (SDGs). SDG 2 emphasizes doubling agricultural productivity, increasing investment in agricultural research and extension services, and ensuring the normal functioning of the food market. Similarly, SDG 8 promotes sustainable economic growth and employment which would contribute to agricultural development. SDG 12 addresses food loss reduction along in production and supply chains, including post-harvest losses. The project is in line with the targets of SDG as follows:

1.4. By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership, control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.
1.4.1. Proportion of population living in households with access to basic service

2.3. By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.
2.3.1. Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
2.3.2. Average income of small-scale food producers, by sex and indigenous status

2.4. By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.
2.4.1. Proportion of agricultural area under productive and sustainable agriculture

2.a. Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks to enhance agricultural productive capacity in developing countries, least developed countries.
2.a.1. The agriculture orientation index for government expenditures
2.a.2. Total official flows (official development assistance plus other official flows) to the agriculture sector

2.c. Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, to help limit extreme food price volatility.
2.c.1. Indicator of food price anomalies

By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including postharvest losses.
12.3.1. Global food loss index

The project aligns with Nepal's Agricultural Perspective Plan (1995-2015) (APP) which emphasizes post-harvest technology for fruits and vegetables with essential infrastructure such as equipped market centers and storage facility, improved packaging systems, transportation with adopting a 'pocket package' approach. It is also in line

with Agricultural Development Strategy (ADS) 2015-2035 that continues to adopt the pocket approach of APP envisioning a self-sufficient, sustainable, competitive and inclusive agricultural sector to promote economic growth and help improve livelihoods and food and nutrition security, thereby achieving food sovereignty. It pays particular attention to agricultural research and extension to increase productivity, develop value chain infrastructure to reduce post-harvest losses, and connect markets for commercialization and competitiveness. The project aligns with the 14th Plan (2017-2020) that identifies agricultural transformation as one of five priority development strategies for economic enhancement targeting 7.2 percent as annual growth rate. The project also aligns with 15th Plan (2019/20-2023/24) that has some of the strategies and working policies such as to increase agricultural production and productivity by introducing agricultural policies, laws and plans in coordination and collaboration with federal, provincial, local level and other stakeholders; to integrate education, research, and extension services for increasing their effectiveness and ensure the availability of quality goods and services for increasing the productivity of the agriculture sector; prioritizing the involvement of the private sector and cooperatives in marketing in potential sectors by establishing and operating integrated market information centres and market information systems; to increase competitiveness by developing agricultural infrastructure, establishing market information systems, developing entrepreneurship in small and medium agricultural enterprises, and improving food hygiene and quality etc. VCDP followed the close involvement of the national stakeholders in the process of project development and implementation.

The efforts are made in line with achieving the outputs envisaged in the project however the COVID-19 pandemic has affected the project activities significantly. Since the launch of the project, 185 out of 200 target pocket areas have been identified. In total, 7109 farmers (73% of target farmers) have benefitted and 42 cooperatives have been identified. The project has considered gross margin as an important indicator to measure project impact and thus it intends to increase the gross margin of the beneficiary households. As per the plan, the baseline study has been completed which indicates that all the commodities have profits with gross margins ranging from 8.22% (capsicum) to 39.94% (carrot) in vegetables, and 9.82% (pineapple) to 50.21% (watermelon) in fruits. While the gross margin analysis report[2], carried out in 2019, indicates that the gross margin has increased for capsicum to 42.3% and for pineapple to 218.27 while decreased for watermelon to 23.4 and carrot to 34.97%. The gross margin analysis report further indicates that the commodities have profits with gross margins ranging from 13.44% (radish) to 45.74% (cucumber) in vegetables, and 23.40% (watermelon) to 255.64% (lime) in fruits (Annex D-VII). However, the restrictions imposed due to the pandemic caused partial closures of agricultural services in the municipalities delaying another gross margin study along with training activities, farm demonstration and exposure visits. Thus, progress in gross margin could not be traced.

In terms of outcomes envisaged by the project, a decent progress is observed in access to production technology as a comprehensive support package for improved access to production technology was transferred to Agriculture Officers, farmers and cooperative officers with policy, plan, financial, technical, and input supports. In total, 239 agriculture technicians (97 in 2019, 89 in 2020 and 53 in 2021) were provided training and 135 farmers benefitted by online call centre, and agri-technicians of the 37 working municipalities and cooperatives were benefitted through constant coaching and mentoring support for providing information on different technologies and extension services. The respondents in HH survey were asked about the training opportunities they have received from VCDP to which 31% of the respondents said that they received training at varied time period after project implementation (Annex D-II). Also, working Palikas were categorized into four different categories: A, B, C and D. This categorization was based on the crop production and marketing potentials, Palika's priority on agriculture sector, availability of resources and absorption capacity.

[2] MoALD/UNDP (2019). Gross margin analysis of selected vegetables and fruits.

The project has also enabled farmers to be part of groups and cooperatives. The farmers' groups are formed, the existing cooperatives are strengthened and linked with the farmers' group. These groups have enabled better access to production technology, as well as improved crop production practices. The proportion of male and female in these groups are almost equal (Figure 5). The project has provided infrastructure support in terms of rehabilitation of collection centres and market hubs, and equipment support which has improved functions of collection centres and market hubs, and thus contributed to improved market linkages.

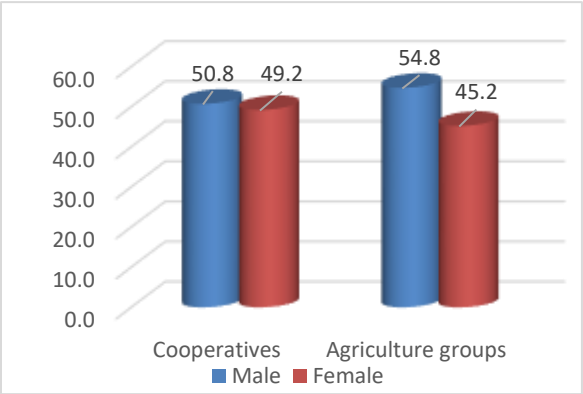

Figure 5: % of the respondents engaged in the Cooperative/Agricultural groups (n=400) total involved in groups

The baseline survey indicates that the postharvest loss in vegetables is at 20.7% and fruits is at 26.3% however no data is available post baselines due to the pandemic. The HH survey respondents were asked whether they agree or disagree with the statement "Due to the project, postharvest loss is significantly minimized" to which almost 30.8% of the beneficiaries agreed (Figure 8). In total, 14 human resources were hired and engaged in project activities including postharvest management to strengthen NARC capacity, 17 research students master's in agriculture science, focusing particularly on postharvest technology development equipment, were financed by the project and the

Perception of key informants on postharvest loss

"Due to lack of refrigerated vehicles and unsuitable road facility, almost 2-4% is lost (pressure damage and rotting) during delivery and storage of product"- Trader, Kawasoti

"About 8-10% loss is found during delivery and storage in collection center in most commodities."- Cooperative representatives, Sindhuli

"About 2-6% loss is found during harvesting, washing/cleaning, grading, and packaging and delivery based on type of commodity."- Cooperative member, Makawanpur

"About 5% loss during harvesting, cleaning/ washing, grading and packaging is prominent due to rotting of commodity, pressure damage, and scratch and disease-pest damages"- Farmer/traders, Kawasoti Nawalparasi

"Most of the damages found in products are scratches, pressure damage, rotting, underdeveloped product, breaking and cracking, wilting and cuts during harvesting. But, there is no system of Jarti in local commodity, so traders are now starting to deduct about 2-3 kg per 50kg plastic packages in Cauliflower, Cabbage, Tomato and Radish."-Trader

"Sometime 3-5% Jarti is deducted during trading of banana based on quality of product"- Banana farmer Sindhuli

1-2 kg per crates (25-30kg) is deducted as Jarti. Most damages in tomato are pressure damage, rotting and cracking. Tomato Trader, Dhading

physical facility of one postharvest laboratory at the NARC was improved. Likewise, postharvest reduction technology was developed, and 11 research are conducted by NARC scientists on postharvest related topics. In between January and June 2021, postharvest technologies such as fruit harvester were tested and introduced, and commodity postharvest management factsheets were published in easy local language. All of these activities have contributed to strengthening the capacity of NARC, development of postharvest losses management technology, the transfer of postharvest technology to the farmers in also in progress which is delayed due to the pandemic.

In total, 182 (29%) public as well as non-government extension officers/providers received training. Almost 71% (7109) farmers received input support and services through projects, municipalities and cooperatives while only 5% (314) farmers received postharvest management extension services. According to HH survey data relating to postharvest loss, almost 63% respondents mentioned that after project implementation there is only 2% postharvest loss in terms of picking/harvesting and 29.7% said that there is 2-5% postharvest loss. Although there is lack of complete data on postharvest loss, the information provided by the key informants revealed that there has been significant deduction in postharvest loss after project intervention.

Also, the progress report (half yearly report of Jan-June 2021) has revealed that postharvest loss reduction technology of targeted crops - 5 fruits (Tomato, Junar, Banana, Lime, Papaya) and 2 Vegetables (Potato and Cauliflower) were introduced to 53 Agricultural Technicians, 102 Cooperative members and farmers, and 20 farmers. In total, 11 NARC Scientists (3 female; 1 Janjati) have prepared postharvest research out of which 5 are on postharvest loss management including appropriate engineering technologies, storage, socio-economic assessment and nutrient management, 3 research (citrus, papaya, and pineapple) on storage and handling, and other 3 are on postharvest technologies for vegetables (potato, tomato, carrot, sweet pepper and cauliflower). Further, VCDP has also supported 6 master's thesis proposals on postharvest management by Master students of Tribhuvan University and Agriculture and Forest University. VCDP has also granted opportunity to 7 interns from PU HICAST (4 female and 2 Janajati).

Besides, postharvest loss reduction technologies developed have been widely shared for knowledge dissemination through presentation in seminars and publications (Annex G)-in the form of factsheets and paper for different commodities. Demonstration of postharvest loss technology have also been done for knowledge transfer to 791 farmers, 53 agricultural technicians and 112 members of cooperatives albeit all demonstration activities as planned could not be done due to pandemic.

Based on the nature of crop, the HH survey revealed that the respondents are using different packaging practices for the crops after project implementation. Before project implementation, traditional practice such as the use of Doko, jute bag or poly sack were common in the study area but farmers didn't use plastic crates due to high initial investment. However, at present, plastic bag is used by nearly 23% of the respondents, jute bag by19% and bamboo basket 12% while crate is used by almost 45% of the respondents (Table 6). This shows variation in the technology used by the farmers for their crop transport depending on their crop type for postharvest loss management. The incidences of using packaging practice has increased as compared to baseline in which the HH survey had revealed that poor packaging was one of the major factors leading to higher losses during product movement.

Table 6: Container used by the farmers while transporting the commodities by gender

Gender	Container type					Total
	Plastic bag	Jute bag	Bamboo basket (doko)	Crate	Other	
Male	42	23	13	86	1	165
Female	24	33	21	43	4	125
Total	**66 (23%)**	**56 (19%)**	**34 (12 %)**	**129(45%)**	**5(2%)**	**290**

For the increased market linkages at local level, no data is available because of the pandemic limitations. However, the progress report indicates that 34 collections centres and satellite markets have received physical support and 349 participants (operators of collection centres and satellite market) have received training on marketing and management which surpasses the target. However, the project aimed to increase volume of 16 target commodities traded at collaborating collection centres and satellite markets, while the HH survey revealed that the intervention has been done only on 13 crops in the field.

The country programme document focuses on increased access to sustainable livelihood, safe and decent employment and income opportunities, particularly, for vulnerable people which is also align with the project focus- on increasing production, reducing postharvest losses and improving marketing system for selected commodities thereby increasing income of smallholder farmers and contributing to their sustainable livelihood. The HH survey indicates that the average annual family income of the respondents have increased by 66% in terms of fruit production and by 20% in terms of vegetable production. The overall average annual family income of the respondents, considering different sources, have increased by 33% which clearly depicts the effectiveness of the project in improving income opportunities of the local people. Therefore, the project largely contributes to the outcome and outputs of the country programme document. Besides, the project has also been able to produce some unintended positive results. Some of the non-beneficiaries from marginalized group have received opportunities to be involved in off-farm activities such as vegetable transportation, grading etc. due to the project activities. Also, the beneficiary households are mobilizing paid labour, who are mostly non-beneficiaries, for their agricultural work such as cultivation, harvesting, transportation etc. The project has been able to generate employment opportunities for the non-beneficiaries, as noted from KII with representative of Banepa Municipality. About 47% of the respondents from household survey responded that they use paid labour for fruits and vegetables production.

Finding 3. The reprogrammed project activities were very relevant in meeting the local needs during COVID-19 pandemic.

During the lockdown period, price of fruit and vegetable decreased but it gradually increased in later months after the lockdown was eased. The prolonged impact and resulting uncertainty affected the market functioning, leading to higher risks of food security vulnerability. However, even in the situation of pandemic, the local government, cooperative and other market actors have been able to execute some of its activities at local level through COVID-19 relief and response activity budget such as for transportation and marketing support, youth and foreign returnee support program etc. The project revised the annual budget due to COVID-19 situation and reprogrammed its activities to provide COVID-19 relief and response support. As a management response, the project revised its annual work plan and initiated ICT based extension services through partnership with FM radio and local governments to continue provision of farming information even in COVID-19 context. The project has continuously coordinated with Palikas to swiftly act even in the situation of pandemic.

Considering the restrictions imposed due to COVID-19 that impacted the planned activities adversely, the COVID-19 relief activities were initiated by VCDP during lockdown period. The project supported farmers and stakeholders' transition to recovery through a combination of relief fund provision, support to transportation, agri-entrepreneurship support to migrant returnees, and protective materials provision. It provided financial support to Palika/ cooperative to buy seeds and required materials based on request of groups and cooperatives. It also organized training and provided direct financial support to the migrant returnees to establish a farm. An agriculture entrepreneurship support was provided to 69 migrant returnees (10 female; 6 Dalits; 24 Janjati). Training on "agri. business promotion and business plan preparation" was provided to 19 Migrant returnees and 5 agriculture technicians of Dhunibesi and Thakra municipality (4 women and 20 men) that resulted in preparation of 19 business plans. A training on 'Tomato and Other Crop Cultivation under Polyhouse" was provided to 20 migrant returnees and youth (6 female, 4 Dalit, 4 Janjati) and 2 Palika Technicians (1 female and 1 male) to capacitate them with commercial farming. Similarly, with

the material support of VCDP, 16 youth and migrant returnees constructed polyhouse and cultivated tomato which resulted in good income earning for them. Each entrepreneur produce tomato and sell to market with the worth range from 12 thousand to 100 thousand Nepali rupees. Also, 37 agri-entrepreneurs (Phedikhola, Namobuddha and Putalibazar Palikas) were given mini-tillers and trained on its operation and maintenance. Besides, as reported in Annual Report 2020, 11 technical manuals, articles, handouts, poster and information sheets were published (Annex I). These activities minimized the impact that the pandemic had on project activities by continuing its support through agricultural production and marketing support. It strengthened the collaboration among different stakeholders of the project and continued its extension services through different virtual medium. All of these activities also contributed to the gradual transition of farmers and stakeholders to recovery, and paved way forward for the migrant returnees for future course of action towards agri-entrepreneurship and some of the migrant returnees also highlighted that they want to continue working in agri-business in future.

The project also supported on delivering seasonal seeds to the farmers of different pocket areas and in marketing of farmers' produce in coordination with Palikas and cooperative/market centers by providing vehicles support for transportation of farmer's products. The input provision in the form of seed, transportation vehicle for transporting vegetables and fruit to the market etc. have benefitted the beneficiaries. For example: Phedikhola Rural Municipality with technical and financial support of VCDP, have initiated agriculture ambulance to ensure that vegetables and milk products do not go waste during the lockdown period and reaches the consumer directly from the farm without involvement of intermediaries and at reasonable price. Following a positive impact of agri-ambulance, other cooperatives are also planning to buy vehicle for agriculture products transportation. Similarly, VCDP also supported its grant holder students by providing transportation for them to visit their research areas for the study. Overall, these reprogrammed activities contributed significantly to meet the local needs. Table 7 presents the newly added project output in COVID-19 context and the progress made so far in the activities. However, several activities were postponed and could not be carried out timely due to rapid spread of COVID-19 such as gross margin analysis, in-person training and exposure visits, study on financial incentives for technology adoption and promotional video production.

Table 7 Summary of progress for reprogrammed activities during COVID-19

Project Output	Indicator	Target	Activity	Progress (upto mid 2021)
Combat impact of COVID19 through agricultural production and marketing support	# of palikas executing Farmer Relief Fund	37	Establish and mobilize farmers Relief Fund at Palika and Cooperatives for relief and recovery	37 (100%)
	# of cooperatives, market centres, and palikas received transportaion and marketing support	20	Transportation and marketing support	10 (50%)
	# of returnees and youth benefitted in 7 palikas (names)	65	Youth and foreign returnee support program for COVID19	69 (106%)
	# of extension staff and market operators receiving protective materials	140	Protective and safety materials for extension staff and cooperative operators	111 (79%)

5.2 Effectiveness

Finding 1. Given the constraints faced during pandemic, the overall VCDP intervention seems effective and the project activities were delivered effectively in terms of quality, however there were some key internal and external factors (mainly COVID-19) that have affected the achievement of the outcome indicators, particularly in terms of quantity and timing.

The overall VCDP intervention seems effective, and the project activities were delivered effectively in terms of quality, however, some of the activities could not be conducted mainly due to COVID-19 and has been postponed or reduced thereby affecting the timing and quantity. The detail of progress of project result is presented in Annex E.

Project outcome 1: Agricultural productivity and Production support

Until mid of 2021, the project has reached out to 7,109 farmers (4,405 females; 496 Dalit; 3,136 Janjati), identified 185 pocket areas and 42 cooperatives and market centres in project area. Baseline study was conducted in 2019 which includes gross margin of selected commodities. Similarly, gross margin analysis of selected fruits and vegetables were carried out in 2019 which showed significant improvement in gross margin of selected commodities (except radish, carrot and watermelon) after project intervention. For example, the baseline study indicates that all the commodities have profits with gross margins ranging from 8.22% (capsicum) to 39.94% (carrot) in vegetables, and 9.82% (pineapple) to 50.21% (watermelon) in fruits. While the gross margin analysis report (2019) indicates that the gross margin has increased for capsicum to 42.3% and for pineapple to 218.27 while decreased for watermelon to 23.4 and carrot to 34.97%. The gross margin analysis report further indicates that the commodities have profits with gross margins ranging from 13.44% (radish) to 45.74% (cucumber) in vegetables, and 23.40% (watermelon) to 255.64% (lime) in fruits (Annex D-VII). However, gross margin analysis could not be conducted in 2020 due to the pandemic situation.

The project has made decent progress in improving agricultural productivity through increased capacity of government agencies and increased access to production technology by farmers. Capacity enhancement of agriculture technicians, lead farmers, and farmers were done through different training and workshop- both in person and virtual. In total, 361 (72%) participants including extension officers, agrovets, lead farmers, cooperative officers have received comprehensive support package for improved access to production technology through different trainings along with policy, plan, financial, technical, and input supports. Out of the target 10,000 farmers, 7109 (71%) have received extension on production technology and practice and have also received input support and services through Palikas and cooperatives. Also, 13 manuals (43%) related to postharvest technology, for transferring the knowledge to farmers, were developed and printed. The manuals have paved way for dissemination of knowledge and technologies to the farmers.

Similarly, project has been able to combat impact of COVID-19 through agricultural production and marketing support such as by establishing farmers' relief fund that is mobilized at Palikas and Cooperatives for relief and recovery. This has enabled 50% of the target cooperatives, market centres, and Palikas to receive transportation and marketing support while 69 migrant returnees i.e., more than 100% of the target have benefitted from the support program. Almost 79% i.e., 111 extension staff and market operators received protective materials. The reprogrammed activities have been able to minimize the impact of pandemic by continuing the support in agricultural production and marketing.

Project Outcome 2: Postharvest loss management

The indicator for this outcome is decrease in postharvest losses of average fruit and vegetables occurred from farm to collection centre and wholesale markets by volume, but this has not been done due to COVID-19 and disruption at the market.

In terms of the outputs, the capacity of NARC has been strengthened through several activities. For example, 22 human resources (almost double the target) were hired and engaged in project activities and technical inputs were provided for postharvest technology related research. Financial support was provided to 20 research (double the target) on production support, postharvest management and marketing conducted by students mastering in agriculture science related matters and the physical facility of the postharvest laboratory at the NARC was improved as planned. However, the exposure visit/observation tour for government officials working on postharvest management could not be conducted due to the pandemic.

Similarly, the project has also been able to develop postharvest losses reduction management technologies by the NARC. As targeted, 3 postharvest technology has been developed out of which, 2 technologies have been tested. Also, 18 manuals (60%) on postharvest loss management have been produced while technology dissemination strategy have not been developed. Despite the target, financial analysis report with analysis of financial incentive of technology adoption have not been done at all. Due to this, farmers have low level of awareness about potential incentive of postharvest technology adoption. This has delayed the anticipated result of the project at the beneficiary level as the ownership, adoption and use of technology by them have not been done yet. Only 40% of the public and non-government extension officers have been provided training while 17.6% (1085) farmers and cooperatives have received extension on postharvest technology. More than 100% (7,109) farmers have received agricultural inputs and services through the project, Palika and cooperatives. Through this, the project has been able to transfer postharvest technology to farmers with improved access to input support.

Project Outcome 3: Market linkage

The indicators of third outcome is increase in the volume of selected commodities traded at collaborating collection centres and satellite market. For this also, data collection is remaining due to pandemic.

As per the progress in the indicators, there has been significant improvement in the functions of collection centres. Almost 170% (34) of the target collection centres and satellite markets received support on physical facility and 349 (233%) operators of collection centres and satellite markets received training on marketing and management. Almost 80% (16) of collection centres/wholesale markets are using the improved market information network. Also, 17 out of targeted 20 cooperatives have received equipment for the physical support for market information system. This has contributed in promoting market information system.

As depicted above, review of secondary data and analysis of qualitative data shows that the overall effectiveness of the project seems to be good. Besides, the project has already published several manuals and knowledge products. These manuals are available in print version, online version and tables in local languages. The project uses radio programs and other media to spread the details of the activities and knowledge related to the project. Extension workers are referred to Palika as they work with coordination between Palika, farmers and cooperatives. Activities are disseminated through knowledge and information systems established by existing networks, online training materials and other knowledge products. The capacity of NARC has been strengthened through engagement in postharvest technology related research activities, and extension on postharvest technology has been provided to farmers and cooperatives. Also, support has been provided to improve functions of collection centres and satellite markets. However, exposure visits of government officials working on postharvest management and operators of collection centres have not been done yet. Because of this delay, the information exchange, and knowledge and skill sharing could not be done. This limited the knowhow on current updates on extension knowledge of extension officers and limited farmers' access to extension which ultimately affected project delivery.

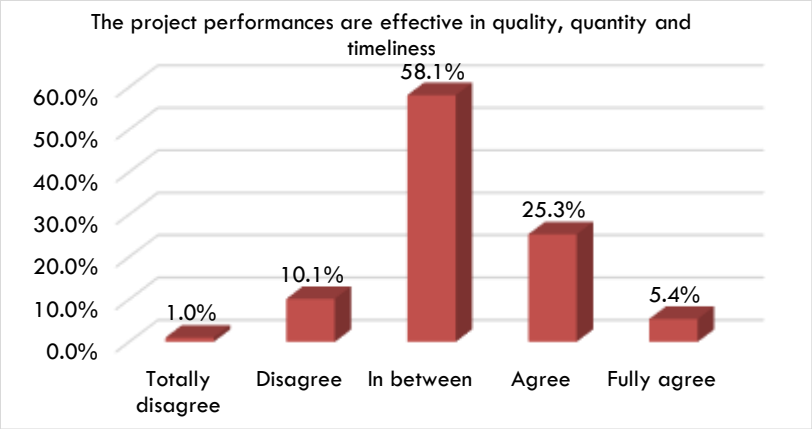

Figure 6: Perception of the respondents towards the statement "Project performances are effective in terms of quality, quantity and timeliness

The respondents during HH survey were asked to give their opinion on the statement "The project performance are effective in quality, quantity and timeliness" About 30.7% of the total respondents agreed with the statement while 58% of the total respondents mentioned that they neither agree nor disagree with the statement. However, around 11% of the respondents disagreed with the statement as shown in the Figure 6. This could be because although the deliverables were effective in terms of quality, the COVID-19 pandemic caused delay of several planned activities of the project which was reflected in quantity and timing. Also, majority of the respondents were not aware that the support they are receiving is from VCDP as they opine it to have received from the Palika only. Some of the deliverables could not be materialized as planned in the initial phase. Also, it was noted from the field survey that some of the training activities provided by the Palikas have not been properly utilized or implemented by the beneficiaries. For example: Through the project, the Palikas had provided training on diary maintenance to the beneficiaries to keep track of their cost of production, production quantity and their farm related other information. However, most of the farmers were not maintaining the diary which affected their record keeping and track of the progress happened due to the project implementation. This also affected data collection as farmers didn't have record of their production details.

The respondents were also asked about their cultivation status before and after the project implementation. In terms of area of cultivation, the average area of cultivation for fruits and vegetables has reduced by 25% after project implementation which is largely due to the reduction in sell of fruits and vegetables caused by the pandemic. The reduction in sell of fruits and vegetables led farmers to reduce their cultivation area, which was also highlighted by the representative of agricultural department of some of the selected Palikas. But the total area of cultivation has increased by 21% after project implementation and number of beneficiaries cultivating fruits and vegetables have also increased post project implementation. The HH survey also revealed that the production quantity and sell quantity (without grading) has increased after project implementation as compared to before project period. This could be attributed to support provided by the project in terms of seed distribution, irrigation support, fertilizer support and training on the knowledge required for increasing fruits and vegetables cultivation such as training on compost fertilizer. It was also found that the practice of grading vegetables and fruits is limited although project has provided training about grading to the beneficiaries.

The HH survey respondents were also asked about their perception on performance of project activities to which out of 193 respondents, more than 50% said that the performance of the project activities for fruit production was better while almost 73% said that the performance is better for vegetable production. Almost 56% said that value addition

has been better due to project activities, 42% said that the project has positively helped in marketing was better while only 36% said that the support of project for storage was better. It was also noted that food security of the respondents have improved from 23.4% (baseline data) to 27.6% (Annex D-VI). Overall, the delivery of project activities were much effective in terms of quality while the challenge in quantity and timing is associated with the pandemic restrictions.

The main support provided by VCDP both in individual level and institutional level are financial and technical support and support in developing the technologies including infrastructures for postharvest loss reduction. For this, VCDP has been collaborating with Nepal Agriculture Research Council (NARC) and academic institutions- universities at national level as well as Palikas and cooperatives at local level.

University/Academic institute**:** Research grant is provided to students who are pursuing master's degree at Institute for Agriculture and Animal Science, Tribhuvan University (IAAS, TU) and Agriculture and Forest University (AFU). In the case of master's degree students, the grant was provided for a six-month research. Students are assigned as a researcher and have to complete their research within the given timeframe and prepare the research as the thesis in partial fulfilment of the requirement for their master's degree. The interns pursuing their research on VCDP commodities received research grant. These activities contributed for the development of research work in postharvest technology which ultimately strengthened the capacity of NARC. Interns were from AFU and HICAST. They are assigned as an intern and have to work as staff/member in Palikas for 6 months and prepare thesis in partial fulfilment of the requirement for their bachelor's degree. Selection of students for the grant award is done by university. However, grant support directly provided to selected students by VCDP, UNDP in the case of HICAST, whereas, grant flow through university in the case of IAAS. It will help to keep record and keep in touch with the grant holders even after completion of the research. While the selection of students for grant support, it was found that both the universities have strictly followed the criteria developed by VCDP- priority was given to female and students from most vulnerable groups, theme of research etc. The status of students receiving grants is summarized in the Table 8.

Table 8: The status of students who received grants from VCDP

University	Research completed (N)		Research ongoing (N)		Total
	Male	Female	Male	Female	
IAAS, TU	1	1	2	2	8
HICAST, PU	2	4	3	4	13
AFU					7

Nepal Agricultural Research Council (NARC)**:** VCDP has been collaborating with NARC, particularly for the research and develop postharvest losses reduction management technologies for fruits and vegetables. The main responsibilities of NARC under VCDP are i. Develop post-harvest technologies for different value chain activities such as varietal screening, management practices, harvesting, picking methods and timing, cleaning, grading, sorting, packaging, carrying and transporting ii. On-farm testing of developed technologies, iii. Analysis of financial incentives of technology adoption for both existing and new technologies, iv. Develop and print manuals on proven post-harvest technology including development of protocol and standard of grading and packaging and v. preparing detail roll-out strategy for technology dissemination. In order to carry out those activities VCDP provided financial support to establish/strengthen laboratory with necessary equipment and storage facilities to NARC and technical support-training to NARC staffs for capacity development.

Target crop-based research on harvest and post-harvest loss reduction has been conducted by NARC and disseminates the result and findings to farmers, cooperatives, agriculture staffs, traders and market personal in the form of training, manual available in hard copy, online and on wall chart in local languages. The project make good use of media such as TV or radio programmes and disseminate details of project-related activities and knowledge. Till date, NARC under VCDP has conducted research on different themes, publications and technology distribution that are presented in Annex I.

Finding 2. The monitoring arrangements have been limited due to the pandemic and most of it is planned to be conducted in another quarter.

The respondents were asked about the quality of the support received by them during COVID-19 period to which all the respondents said that the quality of support provided by the VCDP was quite better while almost 95% of the respondents said that the quality of support provided by both cooperative and Palika was better. It was however noted that the beneficiaries have some confusion regarding the institution from where they are getting support.

As depicted by the project team, only 49% of the total budget of the project has been disbursed. The project has prepared monitoring and evaluation plan with the action plan and corresponding stakeholders outlined. The project has been producing quarterly and annual progress report as per the plan, and the audits have been done to review the effectiveness of activities undertaken in relation to the funds utilized. However, the lower than planned expenditure is attributed to the COVID-19 induced restriction measures and partial closure of agriculture services at Palikas with primary focus on health recovery. Besides other planned activities such as gross margin study, training, farm demonstration and exposure visits, this also led to delay in monitoring and evaluation. Online ME software was cancelled and in-person monitoring visits were reduced. In total, 41% of the monitoring and evaluation budget i.e. $157,635 out of $388,520 was disbursed (Source: Project report). Similarly, the audit findings suggest some discrepancies in the project activities to which project will increase monitoring activities in future and their further intervention will be prioritized over effective and efficient utilization of existing facilities, functions and services. The project will also support joint planning and monitoring through strengthening intergovernmental coordination among AKC, provincial and local governments.

Finding 3. The project has been significantly effective in enhancing the capacity of local partners and the institutions to create an enabling environment for value chain development and in creating employment and income opportunities to the local people including women and marginalized groups through provision of technical trainings and extension and input services. However, marketing of vegetables to distance market is still a problem. Effectiveness of infrastructures particularly collection centers are bit questionable in the changing context considering the sustainability. Intervention of CoolBot technology in storage of crops is highly helpful for small scale product storage. VCDP also contributes in enhancing the capacity of farmers, researchers and extension officers at NARC.

During interview with the university representatives, majority of the respondents mentioned that the grant provided by VCDP was strongly helpful to produce new scientists to research on post-harvest loss reduction. Students get adequate grants with timely payment from VCDP to conduct their research activities, which lead to effective researches and authoritative writing. Similarly, laboratory establishment strengthened with all the equipment that are required for the post-harvest research at NARC, Khumaltar. The list of laboratory equipment provided by VCDP is presented in Annex H. Also, NARC completed majority of the proposed research, on-station and on farmers' field till date. As missionaries in project papers, scientist of NARC were supposed to go for tour, attend different seminars and workshops, but due to COVID- 19, it is not yet accomplished. Project is effective considering the activities it has done and reprogrammed activities despite of disturbances imposed due to pandemic. However, the effectiveness of

infrastructures, particularly collection centres are bit ambiguous considering their sustainability. A sustainable holistic approach such as cooperative cold store should be developed and linked with concerned stakeholders of value chain for future implementation. Also, the project may be more effective if the support focuses on marketing (transportation and storage of produces) and expediting the activities focusing on outcome indicators as well.

Fruits/Vegetables collection center at local level: In Nepal, establishment of fruits/vegetables collection centers initiated during last 50 years. Since then, thousands of fruits and vegetables collection centers have been established in the production pocket areas aimed to assemble fruits/vegetables so that buyer can reach to collection centers and buy the vegetables. Collection centers near to the road head facilitate transportation of assembled products. In many point, collection centers are the meeting point between producers and buyers. In the beginning, vegetable collection centers were very much effective to promote vegetable as marketing was facilitated however the scenario is changing at present. There is an access to road in most of the vegetable production areas. Many farmers sell their produce directly to the intermediaries and do not bother going to the collection centers. It seems collection centers are less utilized in this context need to be utilized not only for assembling fruits/vegetables but also for the other value chain activities such as grading/sorting/trimming etc.

Both fruits and vegetable are perishable commodities and cannot be held long time in ordinary condition. In ordinary condition, they should reach to the market within a day or two. Effective marketing of vegetables to distance market is still a great problem in Nepal. Vegetables harvested properly at proper stages of maturity with utmost care, sorted, graded, pre-cooled and properly packed can be effectively transported to long distance markets. Establishing simple collection centers may not be very much influencing to promote commercial fruits and vegetables production. Emphasis should be given to upgrade existing collection centers with basic facilities such as washing, cleaning, sorting, grading, garbage disposal, pre-cooling, storage and refrigerated vehicles for transportation to long distance market. Ultimate goal of value chain development should be focused on proper harvesting, handling, sorting, grading, packaging, and storage and cold-chain movement of fruits and vegetables that can only support commercial production in large scale.

***CoolBot storage*:** CoolBot[3] technology is relatively a newly developed technology. In the last few years, CoolBot storage technology has been tested at Agriculture and Forestry University, Chitwan, Postharvest division, Harihar Bhawan and Horticulture Research Center, NARC, Khumaltar, Banke and at farmer's level.

- CoolBot reduces the temperature to about 8-14 ^{0}C. It is difficult to further lower down temperature. Most of the subtropical fruits and vegetables are stored safely in between 8-12 ^{0}C however some of the temperate horticultural produce require further lower temperature between 0-6 ^{0}C.
- CoolBot is designed to maintain the lower temperature bot not to pre-cool the commodity. It takes long time to lower down the temperature of produce. Sometimes delay in cooling spoils the commodity and temperature inside storage increase as a result of heat production from fruits and vegetables. Freshly harvested fruits and vegetables have field heat on them, they have higher rate of respiration therefore difficult to cool in CoolBot. Therefore, a refrigerated-forced air cooling system is recommended for pre-cooling.
- Generally in CoolBot storage relative humidity is maintained at low level. Most of the fruits and vegetables require high humidity around 85-95 %. Additional humidifier is to be connected to cold room to maintain higher humidity.
- CoolBot storage is effective only for small quantity about 500 kg to 1000kg. What is the implication in farmer's conditions? How that much amount will be transported to the market? It is necessary to transport pre-cooled

[3] CoolBot is a device that if attached to air conditioner it further lowers the room temperature. CoolBot store is a store in which low temperature is maintained by the support of CoolBot.

commodity to the market in cold chain. It is not possible to transport such small amount to the market. It is not feasible and cost effective. CoolBot storage is not suitable and worthless to the individual farmers or collection centers. There is need of big cold storage (not less than 20 m ton capacity) facility and pre-cooling device for the production and marketing of fruits and vegetables.

- CoolBot storage may be effective to the retail shop to prolong the shelf-life of fruits and vegetables and release for sale at different time as demanded. Literature review indicated that it may be more effective to the commodities which require low temperature and low humidity like cheese, vegetable seeds, processed tea etc.

Capacity building, and strengthening of laboratory and organization is effective, as it leads to their development. Grants to students for interns and research are also effective as it leads to actual and resourceful findings. Project is somewhat effective in current situation but may be more effective if support focuses on marketing (transportation and storage or produces). Establishment of cold store in few areas would be considered more effective than CoolBot in many areas (as coolbot is less effective, can store low volume and supposed to store cooled products by maintaining the temperature than to place objects for cooling). In terms of capacity building, the training based on the result of research is yet to be delivered by NARC to beneficiaries because it takes 2 years to complete research and during the time of dissemination, COVID-19 affected all possible ways of dissemination. Some capacity building training to staff of NARC and Palikas is considered effective. The equipment (lab equipment, computers, watering can, fruit picker) supported by VCDP were properly in use by farmers, cooperatives and traders while status of infrastructure such as collection centre and CoolBot is largely questionable. This is also shown by the audit report of 2020. The audit report has also clearly spelt out that the facilities developed under the project have not been fully utilized. The cold rooms constructed are not in operation in the places they have visited such as in Myagde Rural Municipality (Jamune Bahu-Udeshya Sahakari Santha Ltd), Pokhara Metropolitan City (Pumdi Bhumdi Collection Centre), Chitawan (Shree Gramin Taaza Tarkari tatha Falful Utpadak Sahakari Sanstha Ltd.). Output level achievements that could be judged, so far, at this stage with available data are mostly on track. Overall supports provided and activities carried out under VCDP till date are summarized in the Annex L.

Finding 4. The project is in line with the UNDP Country Programme Document outcome and outputs, the SDGs, the UNDP Strategic Plan and national development priorities such as Agriculture Development Strategy.

The ultimate goal of VCDP intervention is to increase income of smallholder farmers through value chain development for which it aims to improve agricultural productivity through increased capacity of government agencies and increased access to production technology by farmers, reduction of postharvest losses of selected fruit and vegetables by postharvest technology development and increased market linkages at local levels. The activities carried out to achieve these objectives, as mentioned in preceding section, are in line with contributing to the UNDP Country Programme Document outcome and outputs, the SDGs, the UNDP Strategic Plan and national development priorities such as Agriculture Development Strategy. The project has been able to increase access of smallholder farmers to sustainable livelihoods and income opportunities which is the outcome of UNDP Country Programme Document.

When the household survey respondents were asked about their average annual family income before and after project implementation, it was analyzed that the average annual family income of the respondents have increased by 66% in terms of fruit production and by 20% in terms of vegetable production. However, when this data (after project implementation) was compared with baseline data, it was noted that the average annual income of family through fruit production has increased by 82% and through vegetable by 14.58%. The average annual family income of the respondents were also asked for different sources such as food/grain production, animal rearing, cash crops etc. The overall average annual family income of the respondents, considering different sources, have increased by 33% which clearly depicts the effectiveness of the project in improving income opportunities of the local people

(Annex D-V).

The respondents in HH survey were asked whether they agree or disagree with the statement "Due to the project, production and productivity of the crops increased" to which 34.4% of the respondents responded positively while 47.2% provided answer in between and almost 18% disagreed with the statement (Figure 7). The support provided by the project in terms of input support, extension service and postharvest technology has undoubtedly enabled farmers to increase their production however some of the factors have affected their production for which the project are implementing mitigation measures. There is a low level of awareness among smallholder farmers about the potential incentive of postharvest technology adoption which might be the cause for farmers less attraction towards such technology. The project has initiated a study to identify the reasons behind this and are increasing the awareness level among farmers and local level traders/collectors through extension services. The occurrence of natural disasters such as droughts, wind, landslides, flood and hailstone could disrupt farmers' production, therefore the project is planning to provide training that includes a session on crop insurance which will help farmers to mitigate crop losses occurred by natural disasters. The training will also suggest alternative crop plans.

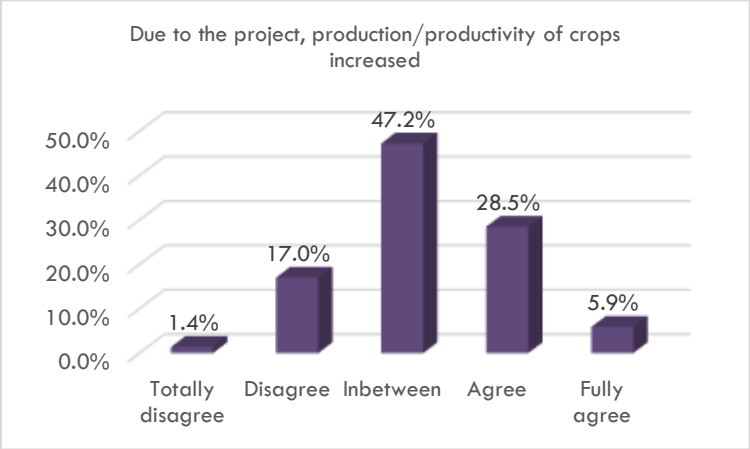

Figure 7: Perception towards the statement "Due to the project, production and productivity of the crops increased"

The HH survey respondents were asked whether they agree or disagree with the statement "Due to the project, postharvest loss is significantly minimized" to which mixed responses were received. Almost 30.8% agreed and 3.8% fully agreed with the statement, while 27.1% disagreed and 1.7% totally disagreed with the statement. Also, 36.6% neither agreed nor disagreed with the statement (Figure 8). This could be associated with NARC's limited resources (human and financial) in post-harvest technology development and validation that leads to limited number of technologies availability to the farmers. To address this, the project has procured the laboratory facility in NARC. The project has encouraged to develop postharvest related projects and mobilizes interns for supporting research activities. Project supports the functional postharvest laboratory establishment at NARC and engages 18 NARC research scientists for postharvest technology matters.

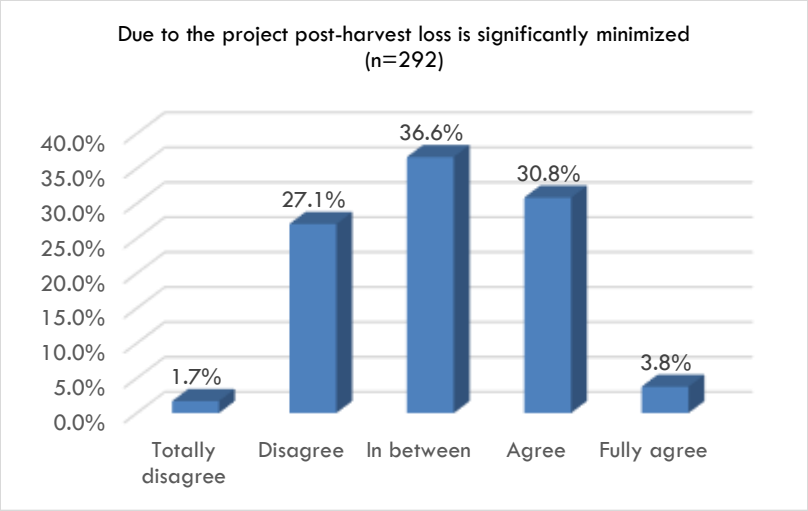

Figure 8: Perception against the statement "Due to the project post-harvest loss is significantly minimized"

As of June 2021, the project has been able to reach out to 41 cooperatives and market centres in 11 districts in Bagmati and Gandaki provinces. They have been able to improve their marketing through physical, financial and technical support. As noted from progress report, between January and June 2021, 34 cooperatives or market committees were able to improve physical facilities such as construction, collection centre improvement, and equipment provision (i.e. weighing scales, crates, and office facility). However, the budget expenditure of the project for market linkage is only 13%.

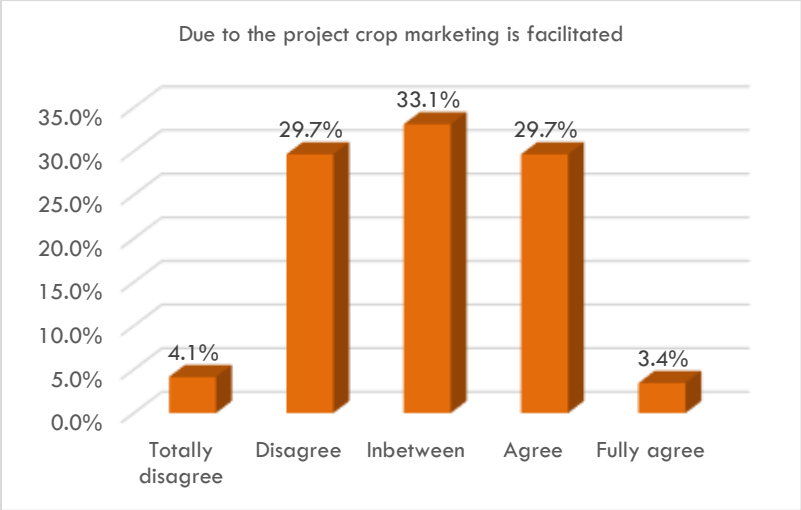

Figure 9: Perception towards the statement "Due to the project, crops marketing is facilitated

The HH respondents were asked about their perception on if the crop marketing is facilitated due to the project. The mixed responses were received. About 33.1% agreed with the statement while another 33.1% said that they neither agree nor disagree to the statement (Figure 9). This could be associated with the partial activities that could be carried out by the project because of the pandemic. Some of the planned project activities could be carried out to enhance market linkages however, majority of them have been postponed for another quarter such as exposure visit or observation tours for operators of collection centre could not be done and data on volume of selected commodities

traded at collection centres and satellite market could not be collected. It is largely noted that there is still some gap in the information delivery to all the beneficiaries as their perceptions are mixed.

In case of enhancement of market linkage, there has been improvement in the functions of collection centres and satellite markets, and market information system has been supported. As of progress report, physical facilities such as construction, collection centre improvement, and equipment provision (i.e. weighing scales, crates, office facility) of 34 cooperatives or market committees are improved. Different activities (Annex M) have been undertaken by the project such as initiation of collective marketing of agricultural produce, vegetable marketing function, cold rooms etc. that have facilitated improvement of market linkage.

The HH survey asked respondents about market linkage for the output of the respondents to understand where their products are sold. Almost all the farmers sell their produce through the collection centre to the wholesale market, however, 14% farmers reported that they also sell their commodity through contractor while 39% sell their produce from the farm itself (Table 9). This indicates that their market linkage is still diversified and is not focused on one mechanism although it shows that some level of practice has begun in terms of contracting out and on farm.

Table 9: Market Linkage status of respondents

Gender	Contract out	%	On farm	%	Nearest market	%	Total
Male	17	63	85	27	212	68	314
Female	4	6	69	37	188	72	261
Total	21	14	154	39	400	100	400

Finding 5. The project has mainstreamed GESI consideration in its project cycle however the GESI aspect is largely confined to participation of women and socially marginalized groups in the project activities.

GESI is at the forefront of the national agenda and it is also core to UNDP work. The project advocates for ensuring Gender Equality and Social Inclusion in all project implementation process: from the identification of beneficiaries to the selection of facilitators, consultants, and other stakeholders. The project has made an effort to mainstream GESI in its project cycle. First step is the identification of women, poor and excluded. During the identification of collaborating farmers, pocket areas, and cooperatives, data collection and consultation are made to identify women, indigenous people, and those from socially disadvantaged groups and understand their different needs, constraints and their vulnerability regarding access to services and opportunities. This was done to make sure that project interventions benefit women, men, and socially disadvantaged groups meaningfully and equitably, proving equitable access to project resources; and to minimize any unintended gender-based discrimination. The statistical data have also been disaggregated into gender and people from excluded or marginalized groups. As reported earlier, out of 7,109 participating farmers, 4,405 are female, 496 Dalit and 3,136 Janjati in the project. Access to project activities such as for training, input support, extensions services etc. were flexible noted to be flexible for both men and women, and for socially marginalized people. The project basically focused on inclusion approach and it was noted that GESI approach was mostly confined to the participation of women and socially excluded groups in project activities. However, VCDP has also employed gender mainstreaming approach to reach women and other socially disadvantage groups to increase their access to resources (loan, grant, and income), technologies and knowledge which could consequently improve their economic and social status. In addition, provision of the necessary knowledge and skills is a crucial component for increasing productivity and effective marketing. The project has targeted participation of women and the other marginalized groups in knowledge sharing and capacity building activities like

training, field visits and other interventions in value chain development of fruits and vegetables. Targeting women means empowering them for their economic independence and enhancement of their participation in social and economic development of their communities.

The HH survey respondents were asked about their perception towards the statement "The project helped women and marginalized community to increase in crop production, reduce post-harvest loss and better market linkages" to which majority of the respondents provided response in between. The proportion on the agreement side was more with 34.9% agreeing and 4.1% fully agreeing with the statement while less than 20% disagreed with the statement. This provides an overall good picture of the project in ensuring that GESI concerns were integrated in its approach however there seems to be a gap in the effectiveness of GESI integration (Figure 10).

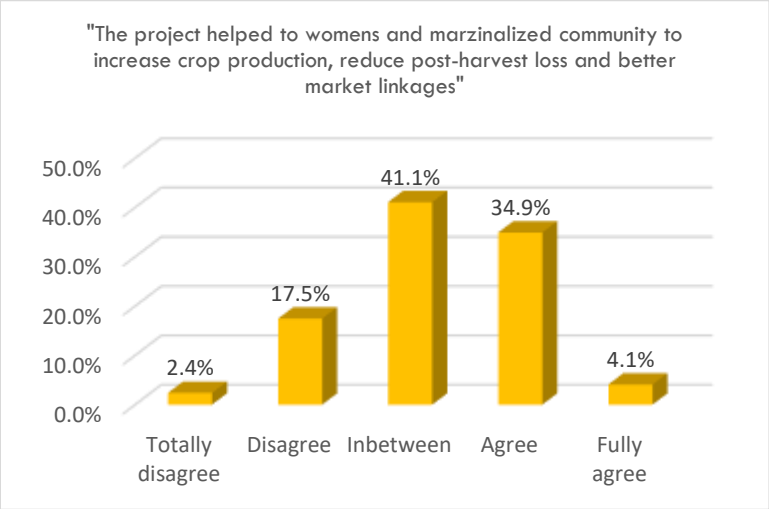

Figure 10: Perception on "The project helped to women and marginalized community to increase in crop production, reduce post-harvest loss and better market linkages"

5.3 Coherence

Finding 1. VCDP intervention fits very well in changed context. The intervention is coherent with Government's policies, and the intervention has addressed the synergies and interlinkages with other interventions carried out by UNDP or Government of Nepal.

Postharvest losses in fruits and vegetables in Nepal is significantly high, with some estimates suggesting losses of up to 40-50% by volume. While farmers are struggling to improve their livelihood, their potential revenue could be increased by reducing postharvest losses. This could be only achieved if the priority is given to value chain segment from farmers to trader in terms of reducing losses along with development of postharvest technology, which is also essential to commercialization and in raising farmers' gross margins. Plus, the enhancement of market linkages and production technology coupled with postharvest loss reduction would greatly increase the farmer's gains. Therefore, for an agriculture dependent country like Nepal, the VDCP intervention is a critical approach to accelerate agricultural development and rural growth, particularly given the high rates of postharvest losses in Nepal and hence fits very well in changed context.

The project is designed and implemented under UNDP's overall strategy to support the MoALD, provincial governments, and local governments to strengthen the agriculture value chain with a focus on income generation of

the smallholder farmers. For fruit and vegetable, VCDP multi-sectorial collaboration requires the engagement of multiple stakeholders both from across government and outside government. A range of government ministries representing different sectors need to work in a coherent way supported by external organizations that are strengthening government-led endeavors to improve poverty reduction and food security nutrition. The private sector, although it falls under the multi-stakeholder group, has shown less interest in nutrition, and post-harvest loss management, until and unless it made business sense and profitable venture for the initiators. The government has recognized the important contribution of cooperative, local government and private sector that can play a role in this endeavor with coordinating projects like Prime Minister Agriculture Modernization Projects which focuses on commercialization of commodities with identifying – commodity specific pockets, zones and super zones areas. VCDP was designed and implemented in accordance with the similar approach.

The VCDP intervention is coherent with Government's policies as Nepal's Agriculture Perspective Plan (1995-2015) and Tenth Five Year Plan (2002-2007) have prioritized postharvest technology for fruits and vegetables. The project is also coherent with the 14th Plan (2017-2020) that identifies agricultural transformation as one of five priority development strategies for economic enhancement and with 15th Plan (2019/20-2023/24) that has strategies and working policies such as to increase agricultural production and productivity by introducing agricultural policies, laws and plans in coordination and collaboration with federal, provincial, local level and other stakeholders; to integrate education, research, and extension services for increasing their effectiveness and ensure the availability of quality goods and services for increasing the productivity of the agriculture sector; prioritizing the involvement of the private sector and cooperatives in marketing in potential sectors by establishing and operating integrated market information centres and market information systems; to increase competitiveness by developing agricultural infrastructure, establishing market information systems, developing entrepreneurship in small and medium agricultural enterprises, and improving food hygiene and quality etc. It has put several mechanisms in place such as market centres equipped with facilities for postharvest operations, installation of ventilated stores in new rural markets and improvement of packing systems for the transportation of fruit and vegetables from collection centres to wholesale markets. Similarly, APP and Agricultural Development Strategy (ADS) have adopted "pocket approach" that aims for specialization and commercialization to which the strategy of VCDP is coherent with. The intervention is also in line with the "Game Changer" projects of Nepal such as Prime Minister Agriculture Modernization Project which aims to enhance competitiveness and to ensure food and nutrition security by industrializing the sector to create sustainable economic opportunities and to be self-reliant in agricultural production. One of its major activities is to enhance value chain by assisting the establishment of the processing industry and postharvest centre, market management and regulation of the quality of food commodities and expansion of quarantine services.

UNDP Nepal is one of the forefront organizations that have been providing technical assistance for improved economic opportunities for vulnerable groups and social inclusion through livelihood development. As majority of Nepalese populace are dependent on agricultural activities, UNDP programmes and projects have made several interventions in agriculture related infrastructure development, capacity building, extension services support and policy level support. Examples of such projects are Micro-Enterprise Development Programme (MEDEP, 1998-2018), Community Infrastructure Livelihood Recovery Program (CILRP, 2015-2017), GEF Small grant Programme (2015), Supporting Nepal to Integrate Agriculture Sectors into National Adaptation Plans (2017-2020) and Cooperative Market Development Programme. All of these projects have contributed to the agriculture development in Nepal. For example: The VCDP's intervention is coherent with the objective of the Cooperative Market Development Programme (CMDP)- to develop the cooperative market chain through increased production, creation of collection centres, and creation of enabling policy environment for the cooperative promotion. There could be potential collaboration between these projects with VCDP developing new postharvest technologies and the CMDP using postharvest loss management.

5.4 Efficiency

Finding 1. Overall efficiency of utilization of the resources including human, material and financial resources to achieve the results in a timely manner is satisfactory.

The VCDP intervention has been implemented through local government with fund transfer to their account as per the provision of constitution. Due to challenges occurred in inter-government coordination and linkage causing difficulty to roll-out the technologies developed by NARC at the local level. The project was designed and developed before transition of the federal structure in the country. As per the project design, project was envisioned to work through District Agriculture Development Office (DADO) as implementing partner in the local level. After the country transitioned to federalism with the adoption of new constitution in 2015, the project had to swift their implementation modality with working through local government. i.e. Palikas as an implementing partner. Since the local government was new with a new system and inexperienced leadership (election after two decades), it was challenging to roll out the project activities on ground. Hence, a significant project time and budget needed to be spent on institutional development of Palikas, NARC and cooperatives. In line with that, the project supports in institutional capacity development by providing support in preparing policy, norms, working procedure, guidelines and protocols, business plan and also on equipment, software, HR support, trainings to existing HR for institutional capacity development etc. for Palikas and cooperatives. The project activities had to focus more on institutional development of the local implementing partners, which delayed the execution of their planned activities in the initial stage. However, given the pandemic imposed restrictions, overall efficiency of the project in achieving its results can be considered as satisfactory. The project was efficient in conducting trainings to researchers and extension officers of NARC, staffs of Palikas and cooperatives, input providers, farmers and traders. Also, several options were considered to minimize operating costs of the project. For example, the project is using the office space currently available in the Agriculture Department of MoALD and for technical support, interns have been mobilized with minimum payment.

Finding 2: The fund flow mechanism (Letter of Agreement, Low Value Grant or Value Chain Grant) has been an appropriate and efficient mechanism to leverage the resources of the community. However, quarterly budget disbursement system of VCDP is not quite favorable.

Majority of respondents of Palika representatives during interview indicated that project supports to Palika with a minimal budget and does not get priority because Palika itself has a higher sum of budget for agriculture development. Whereas, supportive models to cooperative are efficient enough to help in inputs supply, and post-harvest activities (collection, marketing) and infrastructures and marketing channels are for long term use. Majority of respondents agreed with timely fund flow from VCDP to all its implementing partners. Fund flow mechanism of VCDP is scheduled as quarterly disbursement. Due to the internal procedure at NARC, budget disbursement for research is slow which affects in conducting research work. However, NARC used to manage using their own seed money to efficiently conduct their researches. They suggested it is better to have annual budget disbursement or half yearly rather than quarterly disbursement by VCDP. Since it is internal issue of NARC, so we don't suggest for any changes in budget disbursement modality. In case of IAAS, it was found that student's research grant was directly paid to the grantees. So university representatives are not aware whether it was paid timely or not. In case of direct disbursement to student - VCDP release budget only upon recommendation of the major supervisor from the university. However, they assumed it was paid timely as none of the students compliant about the delay in grant disbursement. The existing project management structure is quite appropriate and efficient in generating the expected results because the involvement of local government as implementing partner allowed for internalization of the VCDP intervention. Agriculture development is the priority of local government and has accordingly allocated huge budget to which the addition of VCDP has increased focus on agriculture development, particularly on postharvest loss reduction and market linkage enhancement. VCDP also envisages improving access to production technology, strengthening capacity of NARC and government officials, developing and transferring postharvest technology etc. - all of which are planned through capacitating and mobilization of the local government. The local government is

also taking charge of the cooperative management and technology transfer which will be pivotal for the sustainability of the project.

Finding 3: The project management structure was appropriate and efficient in generating the expected results even in context of pandemic.

This project is implemented by Ministry of Agriculture and livestock Development (MoALD) with support of Korea International Cooperation Agency (KOICA) and UNDP. The project is part of UNDP's overall strategy to support the MoALD, provincial governments, and local governments to strengthen the agricultural value chain with a focus on income generation of smallholder farmers. The National Programme Director for this project is the Joint Secretary of MoALD who is responsible for overseeing the responsible for overseeing overall programme implementation and ensuring that the Programme's objective and outcomes are achieved. There is a Programme Executive Board which carries out overall programme oversight and is the decision-making body responsible for ensuring that the programme implementation is in line with the agreed strategies of implementation and programme inputs are utilized effectively for producing maximum outputs in a timely and cost-effective manner. The local government is implementing partner, as per National Implementation Modality, is mainly involved in implementation of project activities at grass root level such as technology demonstration and handover, extension service support and cooperative management. NARC is a co-implementing agency which is the autonomous agency mandated for development of technologies, including production, postharvest management, and marketing. It is responsible for research on postharvest loss and for the release of technology to the extension service. It also provides short-term training for disseminating information about new technology. Cooperative is a local partner which is mainly involved in production technology support, marketing and knowledge transfer.

The involvement of local government in management structure has been efficient in implementing project activities because it has internalized modality of the project in its development activities. The local government has constitutional power in the operation and regulation of agricultural extension, which has enabled the local government to work in line with the VCDP objectives as it relates to the project focus on production support and technology transfer. The approach of the project complements the annual work plan of the local government and therefore project management structure is appropriate for generating desired results. However, it is pivotal to capacitate the human resources at local level for efficient in project execution. Besides, role of cooperative could be vital and its capacity development is essential considering the contextual knowledge it will have of the respective Palikas and its close involvement with local people as a community institution which will allow for ease in transferring knowledge and technology to the local beneficiaries. On the basis of crop production and marketing potentials, Palika's were grouped in A, B, C and D based on agriculture sector (Annex D-VIII) - availability of resources and absorption capacity of working Palika's which has also contributed to efficiency of the project implementation strategy.

Finding 4: The project implementation strategy and its execution has been efficient and cost-effective in terms of expenditure made per beneficiary.

The estimated cost per beneficiary was US$ 552.2, whereas, the project expended only US $ 376.865 (68.25%) per beneficiary till date. The project expended 31.75% lower than the estimated cost per beneficiary. This estimated cost per beneficiary includes cost in terms of production support, COVID-19 support, postharvest technology, market linkage, communication, monitoring and evaluation, and management. Hence, in terms of expenditure on execution of the project, project shall be considered as cost effective. However, there are some activities yet to be done as proposed by the project such as exposure visits, dissemination of technologies, publications etc. has not been made so far due to COVID-19.

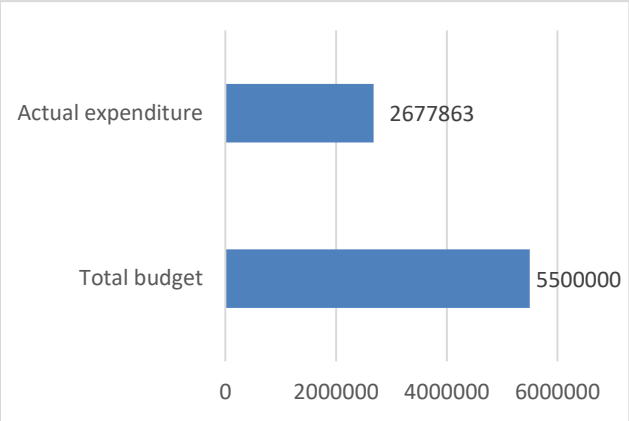

Figure 11: Status of total budget expenditure

As reported, the project has expended nearly 49% of total budget till the end of June 2021 (Figure 11, Table 10). Since the project has only a year more to spend almost half of its budget, the project is lagging behind in terms of timely execution. But this is significantly attributed to disturbances caused by the pandemic and to address the issue, the project revised its work plan and even carried out relief and response activities during the period. Hence, the project implementation strategy is efficient in terms of project delivery and cost-effective but the activities needs to be expedited or no-cost extension needs to be provided to finish the remaining activities in a planned way. In this context, project has also explained that they started the implementation of the project through capacitating the Palika in various aspects like guidelines, norms development and orientation to manage the activities.

Table 10: Total budget and expenditure of VCDP till July 2021

Outcome	Total Budget	Expenditure till July 2021	% of expenditure
Production support	918,348.00	425,632.06	46
COVID-19 Support	323,783.00	163,330.92	50
Postharvest loss management	1,304,569.00	642,684.00	49
Market linkage	1,571,228.00	659,601.00	42
Communication	110,684.00	83,881.61	76
Monitoring and evaluation	388,520.00	157,635.00	41
Management	882,868.00	545,098.00	62
Total	**5,500,000.00**	**2,677,863.00**	**49**

5.5 Sustainability

Finding 1: The benefits of the projects likely to be sustained after the completion of this project.

The main strength of VCDP project is the partnership with local government and the local cooperatives for implementing its project which is likely to contribute to sustainability of the intervention even after project closes. With its strong focus on capacity development of local government, VCDP has been engaging government officials and other actors in the value chain since the beginning of the project. The project also seeks to provide input support to

farmers, mobilize local resources by supporting cooperatives and encouraging farmer's involvement as well as investment. Besides, it has ensured the NARC's budget commitment for the maintenance of the laboratory facility even after project closure. Also, it ensures establishment of a knowledge management system for experience and knowledge product sharing and it also works on to raise awareness among beneficiaries and stakeholders. All of these elements are likely to contribute to sustainability of the project.

VCDP was implemented through national implementation modality. Institutional capacity development (preparing norms and working procedure, guidelines, business plan etc. to Palikas and cooperatives) and individual's capacity building through training are the key efforts being carried out by the project which shall last for long run. Furthermore, scaling up of post-harvest technologies- such as use of plastic crate are extremely helpful for farmers and traders to reduce post-harvest losses in fruits and vegetables apart from imparting awareness. The established/strengthened laboratory, cold rooms with both coolbot technology and refrigerator system based technology are also important initiations of the project. Establishment/strengthened Infrastructures (collection center, market place), technology (Coolbot) and lab strengthening (with required equipment) – all of these activities were carried out through internalized system (Palika, cooperative, NARC). Further, local government has supported cooperative with small implements such as sprayer, mini-tiller etc. for developing different aspects of agriculture activities by smallholder farmers in the modality of hiring, but for free of cost or with minimum charge, as reported by the Dhunibesi Palika representative. This helped in the overall gross margin improvement and production enhancement. Besides, since Palikas have allocated budgets for agricultural activity, therefore majority of the Palikas have adopted the modality of VCDP and internalized the activities in their programs to support smallholder farmers for the improvement of their livelihood and income generation activities, in general. They also commit to continue supporting agricultural development even after phase out of the project. This indicates sustainability of the project.

However, as one of the major project outcome is reduction of post-harvest loss, but the differentiated product market value found to be very negligible. In order to promote post-harvest management practices, economic efficiency of cost at the farm level needs to be explored and demonstrated which helps to sustain project even after the completion of the project.

The respondents of the HH survey were asked about their perception towards the statement "After project completion, some activities will be continued". Almost 26% agreed with the statement while almost 61% of the respondents provided a mix response of in between to the statement. This could be because the project intervention has not penetrated in all its study area uniformly thus leading to difference in opinion across different respondents in different Palikas. There are some Palikas such as Banepa where the intervention has been very successful (Figure 12) which is largely due to the enthusiasm and leadership quality of Banepa representative and also the availability market in the vicinity thereby making easy access of the farmers to the market.

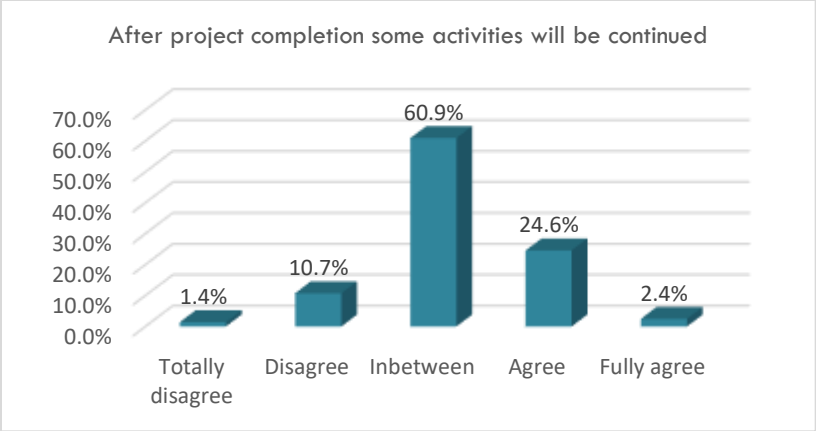

Figure 12: Perception towards the statement "After the project completion some activities will be continued" (n=289)

Finding 2: Key factors that will require attention in order to improve prospects of sustainability of project outcomes and the potential for replication of the approach is the establishment of collection centers and internalization by the local government.

Establishment of collection center in the private land, lack of economic analysis of CoolBot, lack of value chain concept are some of the key factors that will require attention in order to improve prospects of sustainability of project outcomes and the potential for replication of the approach. The case of collection centers is bit questionable in terms of sustainability. Most of the collection centers in the study districts were found to be constructed in private land having 5 or 10 years contract agreement which does not appear to be sustainable in the long run. Hence, changing modality to either having a contract for 20 years or exploring the public land for establishment of collection centre is desirable. It was noted that most of the collection centers lack good infrastructure and are like road market sheds with no logistic facilities at all. For the sustainability, the collection centre needs to have good infrastructure constructed in public land and it should be supported by an integrated approach which has all the basic facilities such as washing, grading, storage, garbage disposal etc. that supports the collection centre. It is also desirable that since local government has considerable budget separate for agriculture development, the institution should internalize these sort of key positive aspects and approach of the VCDP project for the longevity of the project outcomes.

Followings are some of the key factors that need to be given attention in order to improve prospects of sustainability of the project outcomes and the replication of the approach:

- *Location of the collection centres and market places:* Local government ie. Palika shall play a facilitating role in establishment/development of collection centers and market place in public land. Palika needs to allocate a specific public area to establish collection centers and market centers where a well-equipped, managed and functioning collection centers and market place can be established for long run.
- *Lack of economic analysis of CoolBot technology*: It may be utilized only as a teaching or demonstration tool, hence its economic analysis may be needed for further expansion.
- *Concept of value chain*: The project was designed with a concept of value chain development for fruits and vegetables, however, the study of value chain of individual commodities of the project is missing.
- *Poor institutional capacity, lack of skilled human resources:* Institutional capacity as well as human capacity of the Palika needs to be further enhanced considering fresh vegetables and fruits agriculture commodity nature business and the awareness generation should be expedited to increase adaptability by all the beneficiaries.

✶ *Inadequacy of practicing group approach:* Practice of group based approach with development of cooperative, farmers group still not adequate. Household survey data shows that more than 50% of the farmers were associated with either agriculture group or cooperatives (Table 11). However, still 35% of the farmers were not associated with any of the groups/cooperatives rather doing agri-business individually.

Table 11: Farmers associated with coop. or groups (N-386)

Group Type	N	%
Agriculture Group	215	56
Cooperative	252	65

The accessibility of production technology is transferred to Agriculture Officers, farmers and cooperative officers with policy, plan, financial and technical input and support. Particularly 53 (30 women and 17Janjati) agriculture technicians and 135 farmers were found to be benefitted by training and online call center. Since human resources have been allocated for technology use and transfer, this could contribute to knowledge, skill and technology transfer, and ultimately to sustainability.

Some of the risk factors that needs to be reviewed and needs more attention for smooth execution of project activities and strengthening the project impact are:

- The optimum use of collection centre and the infrastructure such as Coolbot is dubious considering its sustainable and productive use which could affect the market linkages at local level.
- At the local government level, the human resource is scarce for managing the intervention activities as they are already occupied with their own agriculture related activities which could affect the project delivery and monitoring activities.
- Level of awareness in farmers was not found to be satisfactory. Since they are the beneficiaries who will be implementing the project learnings/technologies, inadequacy of awareness about the objective of intervention as well as willingness to own and implement the technologies/learnings handed over to them could be risking the sustainability.
- Location of collection centre in private land could be risky in long run as it has several implications in terms of finance, accountability and operation and management.
- COVID-19 induced restrictive measures have significantly affected the project delivery and delayed some planned activities, and it is still uncertain how the situation evolves and thus, an extension period could be vital for the project.

Finding 3. Capacities are strengthened adequately at the individual and organizational level (including contributing factors and constraints) and recommendation for exit strategies and sustainability of the project.

The outcomes and outputs of the VCDP projects are focused on capacity strengthening at both individual and institutional level. Different capacity building activities have been undertaken by the project to the NARC officials, extension workers, Palika representatives and cooperative staff- the detail is presented in preceding sections. In case of institutional development, support for infrastructure development and strengthening, equipment support and vehicle support have been done. The NIM modality followed for the project execution and the timely decision by the programme executive board and the management team has played as contributing factor for strengthening capacities at organizational and individual level. In terms of constraints, COVID-19 induced restriction measure is the main constraint that hampered project activities significantly.

The project is implemented with the principle of National Implementation Modality and the pocket package approach has been implemented in the present context. The same approach has been followed by the Palikas in their other activities or the regular programme of the Palika. The outcome research on post-harvest technologies conducted by NARC should be demonstrated and motivated to the farmers and the related stakeholders to adopt it for the sustainability of the project. It was found that NARC has planned its exit strategy as development and sharing of research protocols, manual for cooperatives and technology user manuals for farmers and ensure own budget commitment for the maintenance of the laboratory facility. In addition to that, NARC has planned to continue the researches using own budget even after completion of the project. All of the collection center and market places were constructed in collaboration with cooperatives with certain financial contribution of cooperative has made them responsible to operate the facilities even after close of the project. Cooperatives are the representative of local community and therefore, handing over project intervention to the cooperatives under leadership of local government and other local partners could facilitate sustainability of the project even after its exit. Also, awareness raising on technologies for postharvest loss reduction, that is locally accessible and adaptable, should be widely done among beneficiaries and stakeholders for its sustainable utilization.

The next step of NARC is to circulate information of research and technology to farmers, cooperatives and traders through training, distributing factsheets, booklets, leaflets and publications which are understandable to sharecroppers. If VCDP project completes, then NARC will continue its action and take these learning to build new project. Academics are not sure about reprogramming and sustainability after completion of the project.

5.6 Impact

Finding 1. Some of the activities and supports of the VCDP were effective and helped to achieve the project outputs and contributed to outcome level results.

As the activities of project are more focused in developing strategies, strengthening government bodies (capacitate Palika, establishment of collection center, market place, and lab) in past years, it is difficult to measure proper impact of project. Furthermore, COVID-19 adversely affected the scheduled programs and implementation of project activities.

The training based on the result of research is yet to be delivered by NARC to the beneficiaries because it takes about two years to complete the research. During the time of dissemination, COVID-19 affected all possible methods of dissemination of research findings. Some capacity building trainings to staffs of NARC, cooperatives and Palikas were considered effective. Similarly, some activities of the Palika is found to be highly effective and replicated to another areas. For example; among the VCDP activities, improved shed program is highly adopted by farmers and helped to increase production and replicated it frequently.

The equipment (lab equipment, computers, watering can, fruit picker) supported by VCDP are properly in use by farmers, cooperatives and traders but the infrastructures such as collection centre, Coolbot are not utilized to its full capacity and mostly are not funcitoning properly. However, only few farmers use collection centers as a practice of selling off their products directly to the intermediaries is developed by most of the farmers. There is no significant contribution of CoolBot on storage and marketing of vegetables, as observed from the study. Also, some of the activities like harvesting and packaging activities were effective. Farmers have initiated proper harvesting, grading and packaging technologies however, in the market, there is no variation in the price for graded products as reported by the farmers.

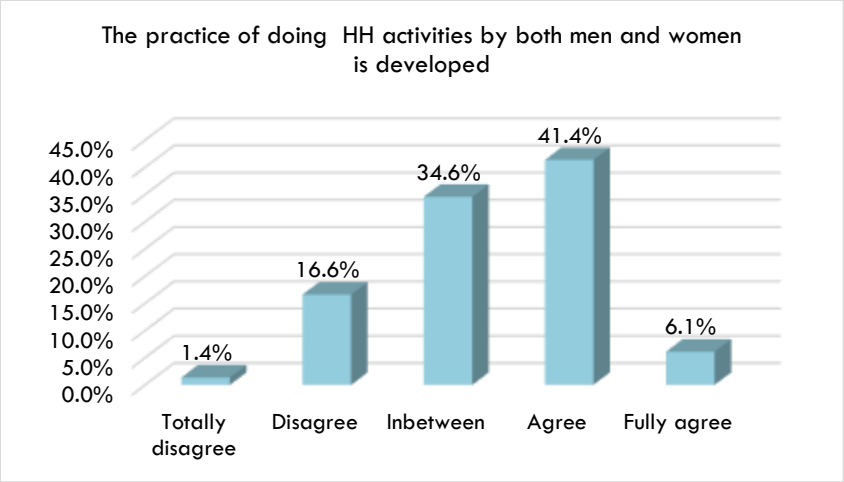

Figure 13: Perception toward the statement" The practice of doing HH activities by both men and women is developed

After the project intervention, the practice of doing household activities by both men and women member of the household is developed. This can be considered as indirect benefit of project intervention to the women. The HH survey respondents were asked about their perception on the practice of doing HH activities by both men and women to which majority of the respondents (47.5%) said that such practice has developed after project implementation (Figure 13).

The HH survey respondents were asked about the changes in the production and productivity of vegetables and fruits after VCDP intervention. In terms of area of cultivation, production and productivity, almost 30% said that the status has increased by more than 50% while around half of the respondents said that the status has changed by less than 25%. Similarly, almost 34% of the respondents said that their selling quantity have increased by 50% while 30% of the respondents shared that their income through sell have increased by 50%. Similarly, they were asked about the adequacy of the agricultural inputs before and after project intervention to which encouraging responses were received. Almost 51% of the respondents said that the seed input were adequate before project implementation while after project intervention, 85% said that the seed input were adequate. Likewise, status of adequacy of fertilizers, irrigation facility, production ability, technical knowledge and access to market was also better for majority of the respondents post project implementation. For example, 34% respondents said that the technical knowledge was adequate before project intervention while 60% said that the technical knowledge was adequate after project implementation. This portrays the positive impact that the project had on the respondents after its implementation started.

5.7 Partnership

Finding 1. Positive effects and effectiveness of partnership on the achievement of the project outcomes is found to be highly significant.

The government organizations and academic institutions and local organizations which were supposed to be partnered are equally involved in completion of activities of project. Local government/palika as implementation partner, academics institution as research and result findings partners, cooperative as activities promoting and implementation partner -infrastructure development like collection center, market place, NARC as research and disseminating partner are working effectively in from their sides.

The project kept informed KOICA of the progress through monthly progress update; quarterly, half yearly, and yearly reporting; Project Board; and joint field visit. For the Covid-19 relief and response activities, the project reported its delivery status on a half monthly basis. Meetings, interactions, and extension for cooperatives, farmers' groups are organized as per the work plan and the reporting is done accordingly.

The partnership with KOICA has also added to further strengthening of the project. In 2020, together with KOICA Nepal, the project organized a series of webinar on Recovering Livelihoods and Jobs through Agriculture and MSME in the Context of COVID-19, attracting 488 attendees (52% female; 73% from Nepal; 17% from South Korea). National Project Manager presented 'Weakening Supply Chain Partners Response on Vegetable Marketing Case of Value Chain Development Project." In 2021, Mr. Chiranjibi Adhikari, National Project Manager presented the project overview to 2021 KOICA-KAAN Knowledge Sharing Program on 2 June 2021.

The project also has visibility plan that aims to generate awareness about project objectives and approach, and it intends to report progress with partners, beneficiaries, and media. For example: The project progress was communicated via SMS, local newspaper, and media such as BBC. On 24 January 2021, the inauguration of a collection centre in Manthali Municipality was featured in local media. Similarly, BBC covered some news on VCDP's support on Agri-ambulance during lockdown period, which was featured on 10 June. Likewise, the project initiated partnership with three local FM radio stations to provide virtual extension service. Two Kissan call centers were established in Phedikhola Gaupalika and Kamalamai Nagrpalika so that farmers do not need to physically visit extension officers for farming questions. In total, 135 farmer obtained the service.

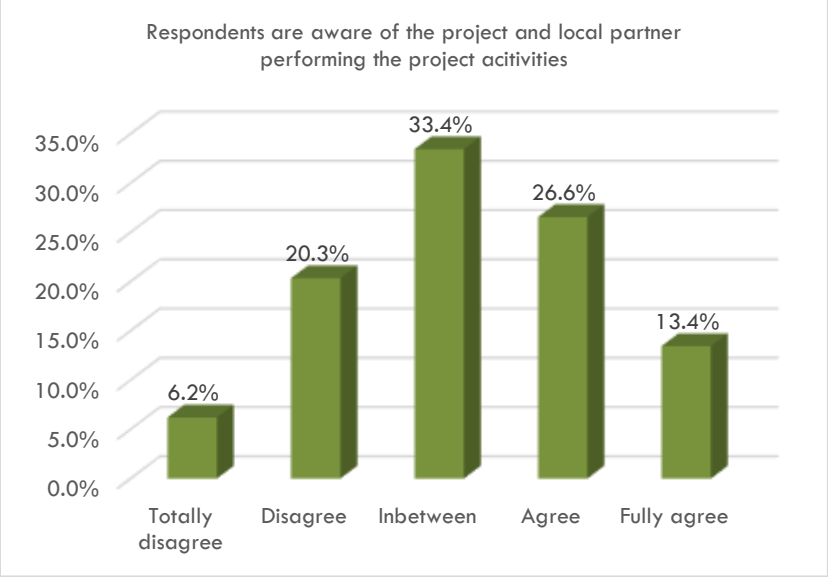

Figure 14: Perception towards the statement "They are aware of the project and local partners performing the project activities"

The HH survey respondents whether they are aware of the project and local partners performing the project activities (Figure 14) to which 40% of the respondents said that they are aware while 33.4% provided mix response. Almost 26.5% respondents said that not much aware of the project and local partner performing the project activities. This indicates a huge gap in the project execution and at the receiving end by the local beneficiaries.

5.8 Cross-cutting issues

The Constitution of Nepal is a significant milestone for Gender Equality and Social Inclusion (GESI) and preserves equal rights for women, the poor and vulnerable and people from different social groups. Consequently, most development partners have adopted GESI as a crosscutting issue in their programs. UNDP focuses directly on gender, social inclusion and empowerment of women, integrating it into their key thematic areas i.e. Inclusive Economic Growth, Democratic Governance, Climate and Disaster Risk Reduction Management.

Gender equality and Social Inclusion and human rights

The third UNDP Gender Equality Strategy 2018-2021 commits to uplifting and integrating gender equality into all aspects of its work to reduce poverty, build resilience and achieve peace in communities and territories. In particular, the strategy delineates the UNDP commitment to:

- Strengthen UNDP interventions tackling structural changes that accelerate gender equality and women's empowerment;
- Strengthen the integration of gender equality into UNDP's work on the environment, energy and crisis response and recovery;
- Better align UNDP programming with the centrality of gender equality and women's empowerment to the achievement of sustainable development; and
- Build upon institutional mechanisms for gender mainstreaming such as the Gender Equality Seal and the Gender Marker, which provide measurable standards and incentives to drive development progress.

Finding 1. VCDP, overall been effective in addressing needs of women and socially disadvantaged groups in the design, implementation and monitoring of the project. Similarly, it has been effective in promoting gender equality and social inclusion - particularly focusing on women and socially disadvantaged groups. It also has been effective in consistency of applying this across all the interventions following the formally approved procedures and guidelines and Social and Environmental Standard of UNDP.

Analysis of secondary data shows, the project has given first priority to women and socially disadvantage groups in all steps of the project. While designing the project it has identified women and socially disadvantage groups as a main target population. Before implementation, data collection and series of consultations were made to identify women, indigenous people and those from socially disadvantaged groups from the project pockets and analyzed their different needs and gaps so that project interventions benefit them equally. Out of total beneficiaries (7,109), about 62% (4,405) are female farmers. Similarly, about 7% (496) of the total beneficiaries are Dalit whereas, about 41% (3,136) from Janjati ethnic community. It indicates that approximately equal number of men and women with different caste/ethnicity is considered by the project.

Field survey shows that women were focused in every activities of the project as most female farmers were associated with cooperatives. Farmers from marginalized groups were equally on boarded in the project, however, in some areas people from marginalized groups left behind as they were considered as not eligible to participate in the project. Because they have very less land and cultivate fruits/vegetables only at subsistence level. However, the project could make their involvement in other off-field activities such as loading, unloading, cleaning and grading carried out by farmer groups and cooperatives which helps to generate employment and income earning opportunities for those farmers.

The types of respondents considered in the household survey were both men and women from different caste/ethnicity which accounted for 53% and 47% respectively. Caste/ethnicity in the MTE was classified into five categories: Dalit, Janajati, Brahmin/chhetri/thakuri, Madhesi and Muslims (Data in Section 5). Also, there are people with disability in beneficiaries of the project, however, quantifiable information has not been recorded. This needs to be incorporated in the M&E system of the project.

Gender division of Labor division in value chain of fruits and vegetables

The gender analysis for value chain of fruits and vegetables indicated that, although the division of activities varies between commodities and between locations, it is possible to make some broad generalizations regarding the typical division of labour between women and men in fruits and vegetables production, harvest and post-harvest activities.

Men are responsible for the heavier manual job in crop production such as land preparation and tillage with oxen or tractor. Both men play a lead role in seed selection as they have better access to information as compared to women. However, after involvement in various VCDP training programmes women are also start doing the task. Both men and women perform jobs of broadcasting seed and fertilizer. Similarly, they are responsible for harvesting. Men are play a dominant role in marketing and transportation of the products. However, women also play role in carrying products from farm to collection center. Women are often involved with activities that require dexterity and attention to detail such as transplanting and weeding. They are also involved with activities closely associated with their household responsibilities, such as storage, Sorting/Grading, trimming and packaging

Table 12: Gender division of labour in value chain of fruits and vegetables

Activities	Gender involvement
Production	Both men and women
Storage	Both but mostly Women
Sorting/Grading/Trimming	Both but mostly women
Packaging	Both Women Men
Marketing	Both but mostly Men
Transportation	Both Men Women*

Use of paid labour in value chain of fruits and vegetables:

The MTE shows there is a gender based division of labour in vegetable and fruits production with involvement of men and women at all stages of vegetable and fruits production (Table 12). Majority of the respondents (226) reported that they use paid labor for land preparation followed by use of fertilizer (113). It was noted from the survey than more women labor are mobilized in use of fertilizer and harvesting or cutting as shown in Table 13. The number of women involved in marketing is still less. Use of women paid labour in all stages of production indicates increasing accessibility of employment opportunities for the women in vegetable and fruits sector. However, the wage payment per day for men and women labor is not equal. The HH survey noted that the average wage payment per day for women is NRs. 587 while for men is NRs. 860 which shows huge disparity in wage payment between men and women.

Table 13: Number of respondents who use paid labour by gender

Activities	Unit	Men	Women
Land preparation	Mean	12.11	11.15
	N	133	93
Use of fertilizer	Mean	6.18	14.19
	N	33	80
Use of pesticide	Mean	5.59	4.42

	N	41	24
Harvesting/cutting	Mean	8.91	8.47
	N	34	49
Marketing	Mean	3.00	1.38
	N	12	8

Finding 2: The VCDP has been effective in addressing the needs of the most vulnerable groups (Dalit, ethnic minorities, women and other disadvantaged and marginalized groups) and could provide benefits to them. The project has integrated Human Rights based approaches in the design, implementation and monitoring of the project as far as possible. So far, the project has utilized existing resources in an efficient way to address Human Rights in the implementation (e.g. participation of targeted stakeholders, collection of disaggregated data, etc.)

VCDP employed gender mainstreaming approach to reach women and other marginalized farmers to increase their access to resources (loan, grant, and income), technologies and knowledge which could consequently improve their economic and social status.

The project advocates for ensuring GESI in all project implementation process. In all stages of the project design and implementation, issues of gender and marginalized groups have been found to be addressed. The entire activities conducted through NARC, Universities, Palikas and Cooperatives under VCDP makes sure for the participation of women and ethnic groups as far as possible. Disaggregated data are found to be prepared specifically in the case of participation in training, access to support and grant by the all implementing partners. Till date, the project covers 4,405 females, 496 Dalits and 3,136 janajati out of 7,109 farmers. There are many examples of mainstreaming the concerns about the vulnerable groups.

Access to support: Mainly three types of supports – financial (loan and subsidy), and technical support (research and technologies) and inputs (seed, equipment, irrigation, fertilizer etc) were provided by VCDP. About 48% female respondents and 52% male respondents responded that they have received inputs support from the VCDP (Figure 15). Among them highest number of respondents who responded they received input supports were found to be from Brahmin/chettri/thakuri caste followed by Janajati and Dalit (Figure 16). Similarly, in the case of provision of research grant, majority of grantees found to be female students. Out of 21 students of IAAS and HICAST, more than 50% (11) are female. Priority was given also to students from ethnic and marginalized groups while selecting the candidates for research grants.

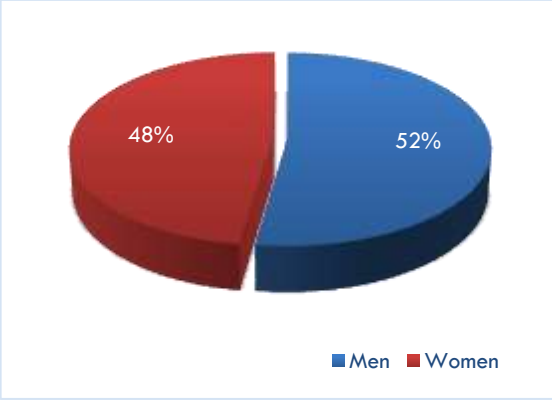

Figure 15: Gender-wise recipients of input support

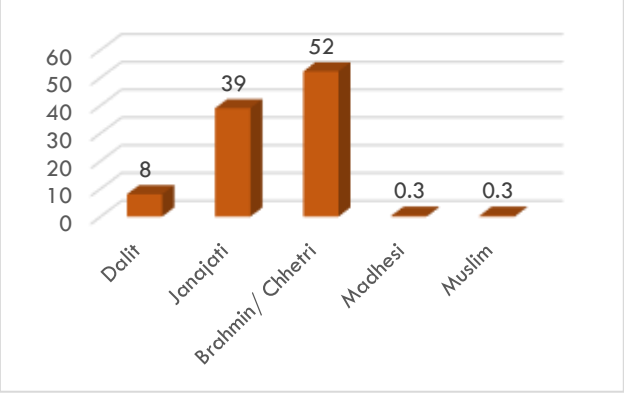

Figure 16:% of recipients of input support by caste/ethnicity

Participation in training: Training on application of technologies for reducing post-harvest loss is one of the key activities of VCDP. It was found that the project has followed human rights based approaches prioritizing the female farmers including farmers from social and marginalized groups. For example, a high number of female farmer received training in Banepa municipality as shown in Table 14. Similar approaches found to be adopted in other districts. Majority of the respondents during KII responded the same. The production technology developed by NARC is transferred to Agriculture Officers, farmers and cooperative officers through training and with policy, plan, and guidelines. Particularly, 53 (30 women and 17 Janajati) agriculture technicians and 135 farmers were found to be benefitted by training and online call center.

Table 14: Number of farmers participated in training, Banepa municipality

Category	Dalit	Janjati	Others	Total
Male	4	61	94	159
Female	23	77	309	409
Total	27	138	403	568

Source: Data provided by DoA, Banepa municipality.

Contribution in women empowerment:

Most respondents in FGDs and KIIs related empowerment with some achievements in different aspects of their life and changed in the relationship with their husbands and other male members of the family and outside family. Diverse opinion and perception was expressed throughout the discussions, most opinions were attached to their situation in life and how society views or treats them. Therefore, some women perceived empowerment as the increase in benefit accrued due their involvement in different VCDP activities- capacity building training, access to information, access to market and marketing their products that contribute to their income and control over their income. Increased participation and influence in household decision making and acquiring sense of self-worth recognition and respect in the household and in the community were also mentioned as important attribute of their empowerment. Women's perception over their empowerment covered a wider context ranging from realizing and using their own potential, increase in income, ability to meet some household expenditure and self-expenditure- such as ability to buy gold ornaments, cloths, and ability to expense in entertainment and increased participation in development activities as well as in the household decision making. Majority of respondents also recognize the ability of individuals to gain more control in determining their lives and the ability to present their ideas with the project leaders, local government authorities, cooperative representatives, and increase in pricing and bargaining power with traders as important aspects of empowerment. The following quotes highlight important aspects perceived to be critical to aspect of their empowerment.

"Before participating into the training programme and other group activities I felt shy to speak in public, but now I can even speak in front of men or ask questions in the meeting" Women FDG, Syangja

"Before VCDP project, women usually produce vegetables for their own consumption, but after VCDP project women started producing vegetables for sell and earn income from it. Women were free to expense their income as per their interest. Women contributes in all the activities related to vegetable production- planting, harvesting, storing, marketing except in input support. Men supports in providing inputs for vegetable production." Chairperson of Pipal Danda Cooperative KII, Syangja.

"Due to my involvement in this project, the practice of jointly working in my household activity is developed. My family member including my husband supports me in household activities and encourage me to involve in productive activities" Women farmer engaged in Mandarin farming.

"I have planned to buy gold ornament. I feel I have more power to do many things than I used to." Woman FGD, Syangja.

The VCDP apart from promoting production, productivity, post-harvest loss reduction and marketing do also support women to join into groups or cooperatives. These groups and cooperative members are used for trainings related to fruits and vegetables production, post-harvest loss management and marketing as well as increasing women's knowledge in other important aspect of their livelihoods such as capacity development, entrepreneurship and managing income generating activities. The efforts and support provided by VCDP through developing fruits and vegetables value chain were anticipated to impact on women's empowerment. Most of the notable changes brought by VCDP activities are increase women involvement in production, marketing, cooperatives and other groups.

In addition, provision of the necessary knowledge and skills is a crucial component for increasing productivity and effective marketing. The project has targeted participation of women and the other marginalized groups in knowledge sharing and capacity building activities like training, field visits and other interventions in value chain development of fruits and vegetables. Targeting women means empowering them for their economic independence and enhancement of their participation in social and economic development of their communities.

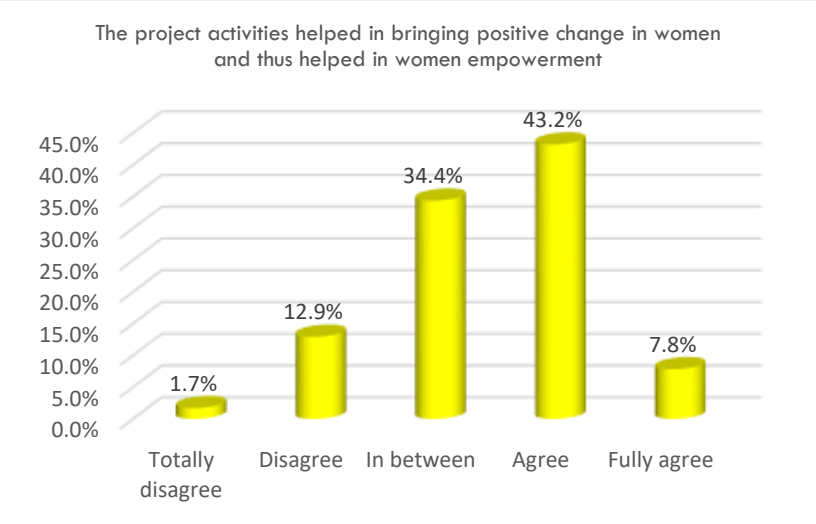

Figure 17: Perception toward the statement" The project activities helped in bringing positive change in women and thus helped in women empowerment

The HH survey respondents were asked about their perception towards the statement" The project activities helped in bringing positive change in women and thus helped in women empowerment" to which encouraging response was received. Almost 51% of the respondents said that they agree that the project is helping in women empowerment while around 34% of the respondents gave a mixed response (Figure 17). However, it is worth noted here that the project has been able to bring positive change in women to certain extent.

5.9 Response to COVID-19- Reprogramming of the activities to response to covid-19

Covid-19 affects the ability to perform planned activities at the field level. NARC researchers could not able to collect data and the research results in time as planned from the field due to lockdown consequently, the research results and the technology developed has not been disseminated to the farmers and related stakeholders. After lockdown declared by the Government, farmers could not sell their products due to restriction in transportation and could not sent their products to the market. As the uncertainty of lockdown, farmers start cultivating a low volume of

produces because they are afraid of the inaccessibility of market and reduction in price of commodities. Similarly, Covid-19 effects adversely in inputs supply, technical knowledge, production, market and price. Some farmers were not able to harvest vegetables because of high cost to hire labor for harvesting, particularly, for tomato and cucumber. Also, the established collection centers and market place were not in operation due to lockdown and restriction opening the markets. Similarly, Interns and academics researchers, who received VCDP grant were also not able to go to the field for the study.

In that context, VCDP changed their programme modality. COVID-19 relief activities were initiated by VCDP during lockdown. It provided financial support to Palika/ cooperative to buy seeds and required materials based on request of groups and cooperatives. Also held training and provide financial support (direct funding) to migrant returnees to establish a farm. VCDP supported on delivering seasonal seeds to the farmers of different pocket areas. It also aids in marketing of farmers' produce in coordination with Palikas and market centers by providing vehicles support for transportation of farmer's products. It also support to provide COVID-19 safety materials for farmers and relevant stakeholders. Similarly, VCDP also support its grant holder students by providing transportation for them to visit their research areas for the study. The COVID-19 relief activities and budget disbursement is summarized in Table 15.

Table 15: COVID-19 response and budget disbursement

Activities	Budget USD	Expenditure (%)
Farmers Relief Fund (Transportation and marketing support)	63,820	91,696 (144%)
Youth and Foreign Returnee Support Program for COVID-19	130,250	54,697 (42%)
PPE and health/safety materials for farmers and cooperative operators for COVID-19	6,930	6,598 (95%)

As a response to COVID-19, the project supported farmers and stakeholders' transition to recovery through a combination of relief fund provision, support to transportation, agri-entrepreneurship support to migrant returnees, and protective materials provision. It provided financial support to Palika/ cooperative to buy seeds and required materials based on request of groups and cooperatives. It also organized training and provided direct financial support to the migrant returnees to establish a farm. An agriculture entrepreneurship support was provided to 69 migrant returnees. Training on "agri. business promotion and business plan preparation" was provided to 19 Migrant returnees and 5 agriculture technicians of Dhunibesi and Thakra municipality that resulted in preparation of 19 business plans. A training on 'Tomato and Other Crop Cultivation under Polyhouse" was provided to 20 migrant returnees and youth and 2 Palika Technicians to capacitate them with commercial farming. Similarly, with the material support of VCDP, 16 youth and migrant returnees constructed polyhouse and cultivated tomato which resulted in good income earning for them. Also, 37 agri-entrepreneurs were given mini-tillers and trained on its operation and maintenance. Besides, as reported in Annual Report 2020, 11 technical manuals, articles, handouts, poster and information sheets were published.

In terms of respondents' perception towards quality of support provided by VCDP/Palika/Cooperative, it was noted that majority of the respondents provided the response as "good" followed by "medium". There were also some respondents who said that the support provided was excellent. Also, it was noted that there was more responses received for Palika and Cooperative than VCDP project which shows that the local people perceive most of the activities of VCDP as intervention of local government and cooperative only, and it appears that the visibility of the VCDP seems limited. Nevertheless, their perception towards the intervention is on a positive side (Table 16).

Table 16 Perception of respondents towards quality of support provided by VCDP/Palika/Cooperatives

Support received from		Bad	Non-benefitted	Medium	Good	Excellent	Total
VCDP	Count			23	30	8	61
	% of Total			37.7%	49.2%	13.1%	100.0%
Palika	Count	1	4	42	42	6	95
	% of Total	1.1%	4.2%	44.2%	44.2%	6.3%	100.0%
Cooperative	Count	2	1	49	34	6	92
	% of Total	2.2%	1.1%	53.3%	37.0%	6.5%	100.0%

Similarly, the HH survey respondents were asked about the effectiveness of the project even after COVID-19 to which majority (40.1%) of the respondents provided mixed response while around 34% of the respondents said that the activities were effective even during pandemic while around 25% said that the effectiveness was less (Figure 18).

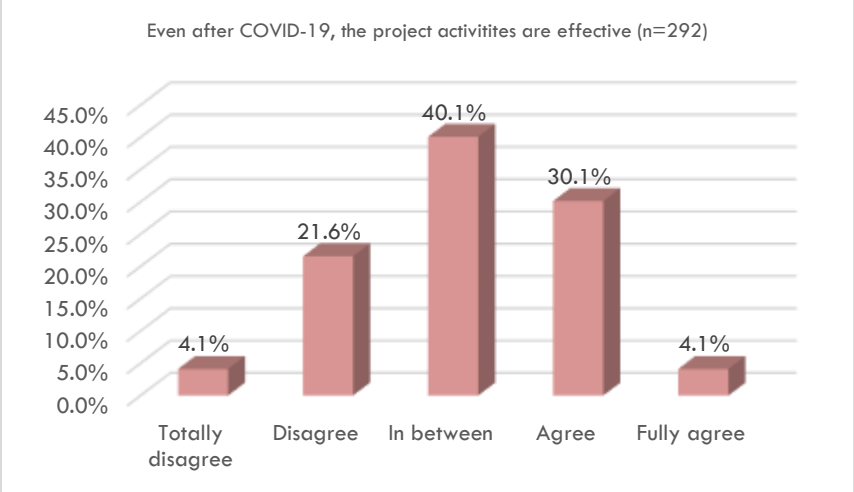

Figure 18: Perception toward the statement "Even after COVID-19, the project activities are effective

6. Conclusion

The VCDP project is a part of UNDP's overall strategy to support MoALD and local governments to strengthen the agricultural value chain with a focus on income generation of smallholder farmers. It was launched by MoALD with support from KOICA and UNDP. The project aims to increase incomes of 10,000 smallholder farmers focusing on Bagmati and Gandaki province along the road corridors. The pathway to change are the crop productivity enhanced, postharvest management technology developed, and market linkages improved. It has partnered with 37 Palikas in 11 districts and targets vegetables and fruit including tomato, cauliflower, cabbage, capsicum, cucumber, radish, potato, onion, garlic, banana, citrus, papaya, pineapple, and watermelon.

The key project outcome results are:

- Improve agricultural activity through increased capacity of government agencies and better access to production technology by farmers
- Reduce postharvest losses of selected fruit and vegetables by postharvest technology development
- Better market linkage at local level

The overall objective of this mid-term evaluation is to assess the results and approaches of the project interventions from the start to date. The evaluation has assesses the relevance, effectiveness, coherence, efficiency, impact and sustainability of the project interventions in project sites between July 2018 and December 2020. Following conclusions are derived:

Relevance: The overall design and approaches of the project was relevant and was able to address the needs and priorities of the target groups and communities, supporting women and other marginal and disadvantage groups to some extent. The output level results are in progress but they are not fully in line with the activities envisaged and planned which is largely associated with the pandemic induced restrictions. However, the project is able to produce unintended positive effects, on the local people who are not the beneficiaries of the project, as well. The reprogrammed project activities were very relevant in meeting the local needs during COVID-19 pandemic however the revised Theory of Change could not be justified for increased access to finance.

Effectiveness: Given the constraints faced during pandemic, the overall VCDP intervention activities were delivered effectively in terms of quality, however there were some key internal and external factors, particularly COVID-19, which has affected the achievement of the outcome indicators, particularly in terms of quantity and timing. The project has been significantly effective in enhancing the capacity of local partners and the institutions to create an enabling environment for value chain development and in creating employment and income opportunities to the local people including women and marginalized groups. However, effectiveness of infrastructures, particularly collection centers and CoolBot technology, are bit debatable in the changing context. The project is in line with the UNDP Country Programme Document outcome and outputs, the SDGs, the UNDP Strategic Plan and national development priorities such as Agriculture Development Strategy.

Coherence: VCDP intervention fits very well in changed context and is coherent with Government's policies considering the priority of Government on agriculture development.

Efficiency: Overall efficiency of utilization of the resources including human, material and financial resources to achieve the results in a timely manner is satisfactory. The fund flow mechanism has been an appropriate and efficient mechanism to leverage the resources of the community. However, quarterly budget disbursement system of VCDP is not quite favorable. The project management structure was appropriate and efficient in generating the expected results even in context of pandemic.

Sustainability: The benefits of the projects likely to be sustained after the completion of this project. Key factors that will require attention in order to improve prospects of sustainability of project outcomes and the potential for

replication of the approach is the establishment of well-equipped collection centers supported by an integrated pack house and internalization by the local government.

Overall, considering the challenging situation in which the VCDP intervention was carried out, the project outputs achieved so far is commendable. The partnership among different stakeholders including local government and cooperative has huge potential for contributing in sustainable agriculture development at local level given their contextual relevance and complement to the national priority of agriculture development. The project has created space for dialogue and has enhanced trust and motivation among participants. However, continuous institutional and individual capacity development, effective coordination among stakeholders, comprehensive exit and viable strategy for every outcome and speeding up of the activities as well as spreading the awareness coverage to wider local people seems pivotal for successful execution as well as sustainability of the project. For example: Capacity development of cooperative should be a continuous process to enable them to handle fresh fruits and vegetables in value chain approach with gross margin analysis. With the incorporation of GESI and human rights based approach in the design and implementation, the efforts have been made to benefit women and people from ethnic minorities or disadvantaged or marginalized groups, however, most of these inclusion are limited to participation mostly.

7. Recommendations

Some of the key recommendations for the project are:

I. The initial Theory of Change for VCDP had revolving fund provision for input support as one of the assumptions that led to increased access to finance which was modified later into provision on input support. This modification in assumption does not exactly lead to increased access to finance which should be reconsidered and revised accordingly by implementing agencies including UNDP and KOICA.

II. As this project envisages strengthening collection centres for enhanced market linkage, it was observed that the role of collection centre and that of cooperative was largely limited to that of collection of produce only. Therefore, an integrated mechanism i.e. a collection centre or the cold store with basic facilities such as washing, cleaning, trimming, sorting, grading, sanitization or disinfection, garbage disposal and packaging practices as per the commodity requirement should be considered for enhanced market linkages. This integrated collection centre should be piloted, should be placed in an accessible place and land for collection centre should be managed by the farmers' cooperative or the local government. Also, existing collection centres should be improved to support large storage facility (greater than 10-20 ton capacity) to be able to store enough volume for considerable benefits for the farmers. If possible, collection centres should be linked with supply market.

III. Institutional capacity building and system strengthening has been the core of the VCDP intervention. However, it was realized during the survey that all the Palikas have not utilized the learnings effectively while ownership and internalization by the institutions is critical for the sustainability of the project. Hence, a refresher capacity building or revisiting of the system strengthening and dissemination should be done and these activities should be continued based on the capacity of the institutions.

IV. Grading is important component for reducing postharvest loss, however the knowledge and practice of grading seems limited in the respondents. Therefore, more awareness and technology transfer for grading that is locally relevant and adaptable should be widely promoted. Besides, packaging container should be designed to avoid damage to the commodity during transportation and handling. Transportation container should be designed to keep produce without damage and the produce should be transported during night time or in refrigerated containers. For the effective marketing, there should be a store of the farmers in the cooperative for which the plastic crates are the most suitable in the present context.

V. It was observed during the survey that farmers' diaries are not maintained properly and training on record keeping is not done in all Palikas, which is in fact critical for farmer's records. Hence, prioritizing record keeping in training is must in all the intervening Palikas. Monitoring of farmer's diary is also part of monitoring plan of the project, however it has not been maintained so needs to be considered.

VI. Some of the approaches that should be considered for increasing women's involvement in every phases of the project and engaging them in each step of value chain are flexible venue and timing of training for the women, couples training approach, involvement of both men and women in all value chain development work, developing linkage of women with market and changing self-perception of women.

VII. Similarly, the project has not recorded number of people with disabilities who are benefitted from the intervention although it was noted that there are project beneficiaries with disabilities. As UNDP emphasizes "leave no one behind" notion, the project should increase participation of people with disability in upcoming activities and keep a record of it.

VIII. Post-harvest training is usually provided only to the farmers however, usually market level stakeholders such as contractors of orchard or product harvester are handed over the responsibility of picking or harvesting fruits and vegetables, and transporting to the market. Therefore, training should be provided to the contractors and product harvesters as well to maintain the productivity of the plants and reduce postharvest loss.

IX. The disaggregated data of the project target beneficiaries in terms of gender, ethnicity and people with disabilities was found to be missing, and hence needs to be clearly mentioned from the beginning.

X. The value chain study of each commodity selected by the project seems to be missing which is important for strengthening stakeholder level chain considering the nature and scope of each commodity.

XI. Overall, the project intervention is currently in progress considering the challenges it has gone through in terms of delay of project activities in the initial stage and COVID-19 induced disturbance. However, planned activities could not be carried out in timely manner and certain commodities such as watermelon have not been intervened. Therefore, expediting of activities in certain Palikas and for certain commodities seems essential. Further, the survey also noted that the project intervention has not reached out to all its beneficiaries considering their mixed responses in perception related questionnaire. Hence, extension for the project seems essential and focus should be prioritized based on progress across different Palikas.

8. Lessons learned

- Since the project is implemented with NIM modality, the linkage with and capacity of the local government has been strengthened. The local government has internalized the learnings and project activities- this has contributed positively for the overall agricultural development at the local government level.
- Collective marketing is a good approach for commercializing farm products which leads to the market linkage enhancement. This approach basically balances the commercial relation between buyers and producers and is a win-win situation for smallholder farmers, big farmers, processors, consumers and buyers. VCDP's support for the preparation of broader guideline or strategy for collective marketing along with exposure visit and capacity building for the cooperatives and Palikas is appreciable, and it needs to be further expedited and promoted.
- It was realized that there is a need of large production volume for transportation from production to market. This was noted from District Agriculture Cooperative Association, Hetauda, Makwanpur which is a message for the agriculture commercialization or production diversification strategy development.
- Apart from collection centre, it is essential to develop a well-designed (having proper infrastructure, entry point, exit point, wastage area, recording system, information system, grading system, storage facility) or capacitated agriculture market centers at Palika level with allocation of the land from Palika. This will enable proper market development with adequate infrastructure required for operating systematic market centre. Palika should be at the forefront for development of market centre owing to the priority mandate of local government over agriculture market development.
- Cooperative Cold Storage is better than CoolBot technology. The precool commodities should be enough for distant market if cooperative cold storage modality is followed. It is better to establish very few cooperative cold store which will be sustainable for long term while Coolbot may not be. Basically, a sustainable holistic approach should be developed for collection, sorting, grading and transportation, and it should be coordinated with the Palikas and linked to the concerned stakeholders of value chain for the future implementation. If possible, collection centres should be linked with supply market.

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10. Annexes

Annex A: ToR for Mid-term evaluation

Mid-term evaluation
United Nations Development Programme/MOALD
Value Chain Development of Fruit and Vegetables in Nepal Project (VCDP)

1. Background

Nepal's agriculture shows weak growth rates with low productivity. Marketed volumes of fruit and vegetables are low and farmers have limited access to agricultural technologies. Postharvest losses of fruit and vegetables are high by volume in specific commodities, with rates slights higher for fruit than for vegetables. This leads to lower returns through revenue foregone, as well as higher costs of transportation and marketing. The postharvest losses start from farmers' field with harvesting time, the harvesting methods, rough handling, exposure to sun and rain, and poor packaging and transportation.

With these facts, the Ministry of Agriculture and livestock Development (MoALD) with Korea International Cooperation Agency (KOICA) and United Nations Development Programme (UNDP) launched the Value Chain Development of Fruit and Vegetables in Nepal (VCDP) on 29 June 2018 The project period is 29th June 2018 - 31st December 2022. The total budget for the project is US$ 5.5 million. Focusing on Bagmati and Gandaki Pradesh along the road corridors, the project aims to increase incomes of 10,000 smallholder farmers. The pathway to change the crop productivity enhanced, postharvest management technology developed, and market linkages improved. It has partnered with 37 Palikas in 11 districts and targets vegetables and fruit including tomato, cauliflower, cabbage, capsicum, cucumber, radish, potato, onion, garlic, banana, citrus, papaya, pineapple, and watermelon.

Context of the project being evaluation

The project is part of UNDP's overall strategy to support the Ministry of Agriculture and Livestock development, provincial governments, and local governments to strengthen the agricultural value chain with a focus on income generation of smallholder farmers. The three key project outcome results and their indicators are as follows:

- Project outcome 1: improve agricultural activity through increased capacity of government agencies and better access to production technology by farmers
  - % increase in gross margin of selected commodities by collaborating farmers (baseline figure is in Table 1 collected in 2019 | target 15%)
  - % increase in yield of average crops for collaborating farmers (baseline figures in Table 2 collected in 2019 | target 20%)
- Project outcome 2: reduce postharvest losses of selected fruit and vegetables by postharvest technology development
  - % decrease in postharvest losses occurring from farm to collection centre and wholesale markets by volume (baseline vegetables 20.7%, fruit 26.3% collected in 2019 | target 5%p)
- Project outcome 3: better market linkage at local level % increase in the volume of selected commodities traded at collaborating collection centres and satellite markets (baseline 2,747 MT collected in 2019 | target 40% increase).

Since the launch to date, the project identified 185 pocket areas, 7,000 farmers, 30 cooperatives and market centers, and 37 Palikas of 11 districts for technical assistance. A series of extension service were provided to extension workers, Junior Technicians, agrovets, and lead farmers through on site visit, group meeting, and farm demonstration. The project provided input support and access to finance to farmers through palika and cooperatives. Postharvest technologies have been validated or developed in collaboration with the Nepal Agricultural Research Council. The project contributed to improved market access by building collection centres, procuring mini trucks, and making low cost cold storages. Since the new federal structure came into effect when the project was launched, it also supported the stable operationalization of the new government system in the agriculture sector. VCDP specifically provided financial and technical assistance in equipping human resources in need at Palikas, and

organized orientation workshops to clarify the roles and responsibilities of local governments for agriculture extension service

Project/Outcome information		
Project/outcome title	Value Chain Development of Fruit and Vegetables in Nepal (VCDP)	
Atlas ID	0095359	
Corporate outcome and output	UNDAF/CPD Outcome: Outcome 1: By 2022, impoverished, especially economically vulnerable, unemployed and under-employed and vulnerable people, have increased access to sustainable livelihoods, safe and decent employment and income opportunities. UNDAF/CPD Output: Outcome 1.1: Policy, institutional and capacity development solutions lead to improved disaster and climate resilient livelihoods, productive employment and increased productivity in rural areas.	
Country	Nepal	
Region	Asia Pacific	
Date project document signed	29 June 2018	
Project dates	Start	Planned end
	29 June 2018	31 December 2022
Project budget	$5.5m	
Project expenditure at the time of evaluation	$...	
Funding source	KOICA:$5 million UNDP:$0.5 million	
Implementing party	MoALD	

COVID-19 Context

As of 5 November 2020, Nepal has confirmed 185,974 cases of COVID-19 of which 148,408 are recovered and 1,052 are died. The COVID-19 pandemic in Nepal has given socio-economic consequences. The GDP is expected to decrease from 7.1 percent to 5.3 percent in the 2019/2020 fiscal year. There is an unprecedented level of reverse migration of Nepali migrants. Considering that one third of 2018 GDP was from remittance, the economic downturn cannot be avoided. Without sufficient job supply and social assistance system to absorb those migrant returnees back to the national economy, it will also magnify the socio-economic risks.

With a high proportion of Nepal's food requirements filled by imports, shocks to the inflow of food commodities could have effects on food security. Advance estimates of wheat production in Nepal using the Craft methodology show an increase of about one percent from last year, driven by favorable rainfall during planting and maturity season in December to February. The current period marks the start of the wheat harvest, but restricted physical mobility and absence or shortage of daily agricultural wage labor could impact the activity.

After the pandemic outbreak, the project reviewed the annual work plan and initiated COVID-19 relief and recovery activities. It reviewed reports of loss assessment in the agriculture sector during the crisis; mobilized Farmer Relief Fund to collaborating Palikas to ensure the provision of minimum production support to farmers; facilitated transportation and marketing function at local level so that agricultural produces are traded; assisted 7 Palikas in providing agribusiness startup support to migrant returnees and youths; and procured protective and safety materials for 37 Palikas and 13 cooperatives. As farmers growing a wide range of commodities suffer from the unprecedented crisis, the project extended its technical assistance to a group of vegetable commodities wider than target ones.

2. Evaluation purpose, scope and objectives

The overall objective of the mid-term evaluation is to assess the results and approaches of the project interventions from the start to date. It will identify and document the achievement of the project interventions, challenges, lessons learnt and best practices. It should assess the progress against the baseline data and propose what has achieved and what needs more attention. Results will be assessed against project output targets and project's contribution to a higher level of outcome results. The findings of the evaluation will provide guidance for the way forward for the future course of action for the remaining project years in consideration of the COVID-19 situation.

Specifically, the objectives are:

- To ascertain the achievements of the project and its relevancy, effectiveness, efficiency, sustainability and impact including synergies with other government-led initiatives and UNDP support efforts (coherence).
- To assess the effectiveness of the project activities provided to smallholder farmers and local partners such as Palikas, cooperatives, and local service providers in increasing incomes and strengthening the horticultural value chain
- To assess engagement of local partners such as Palikas, NARC, Cooperatives, agribusiness association, and other actors along the value chain in the project, and their understanding, including financial and other commitment for sustainability of activities
- To review and assess the risks and opportunities (in terms of resource mobilization, synergy and areas of interventions) for future
- To assess the effectiveness and efficiency of the fund flow mechanism (Letter of Agreement and Value Chain Grants)
- To suggest amendments in project activities and working modalities, if needed, for the better contribution to the beneficiaries considering the context of federalization
- To appraise the recently repurposing response to COVID-19 affected vulnerable extension workers, farmers, cooperatives, and other actors along the value chain to continue the production, postharvest management and market support

3. Scope of work

The evaluation should assess the relevance, effectiveness, coherence, efficiency, impact and sustainability of the project interventions in project sites between July 2018 and December 2020. In addition, the evaluation should indicate if the achieved results are in the right direction towards contributing to strengthening the value chains and increasing incomes of smallholder farmers in the project areas or would require to change the course of direction in order to achieve the expected outcome. The evaluation should cover but not limited to the following areas.

- Relevance of the project: review the progress against project outputs and contribution to outcome level results as defined in the project's theory of change and ascertain whether assumptions and risks remain valid. Identify any other intended or unintended, positive, or negative, results.
- Effectiveness and efficiency of implementation approaches: review project's technical as well as operational approaches and deliverables, quality of results and their impact, alignment with national priorities and responding to the needs of the stakeholders; covering the results achieved, the partnerships established, as well as issues of capacity;
- Review the project's approaches in general including mainstreaming of gender equality and social inclusion, with focus on women and marginalized groups.
- Review and assess the sustainability of the results and risks and opportunities (in terms of resource mobilization, synergy and areas of interventions) related to future interventions.
- Review external factors beyond the control of the project that have affected it negatively or positively.
- Review planning, management, monitoring and quality assurance mechanisms for the delivery of the project interventions.
- Review coordination and communication processes and mechanisms with the stakeholders.

- Track progress made as per baseline indicators.
- Review how the implementation of project interventions may have been impacted by COVID-19 and how the reprogramming for immediate response be effective and appropriate to respond the pandemic.

4. Evaluation criteria and key questions

The evaluation will follow the Organization of Economic Cooperation Development (OECD) Development Assistance Committee (DAC)'s evaluation criteria – relevance, coherence, effectiveness, efficiency, impact and sustainability. Partnership, Gender Empowerment and Social Inclusion (GESI) and human rights will be added as cross cutting criteria. The guiding questions outlined below should be further refined by the consultant and agreed with UNDP before commencement of the evaluation.

Key Questions

i. Relevance

- How relevant were the overall design and approaches of the project?
- To what extent the project was able to address the needs and priorities of the target groups and communities in the crisis context and changing conditions? To assess whether the results achieved had a differentiated impact on women and other vulnerable groups?
- To what extent did the project contribute to the national policies and strategies such as Agriculture Development Strategy?
- To what extent were the output level results achieved and how did the project contribute to project outcomes? Does the project contribute to the outcome and output of the UNDP Country Programme Document? Were there any unintended positive or negative results?
- To what extent the reprogramming of project activities for immediate COVID-19 response are relevant to meet the local needs?

ii. Effectiveness

- To what extent the project activities were delivered effectively in terms of quality, quantity and timing?
- What are the key internal and external factors (success & failure factors) that have contributed, affected, or impeded the achievements, and how the project and the partner have managed these factors?
- To what extent have monitoring arrangements been effective and supported adaptive management? What were the lessons and how were feedback/learning incorporated in the subsequent process of planning and implementation?
- How effective has the project been in enhancing the capacity of local partners to create enabling environment for value chain development?
- To what extent did the project contribute to the UNDP Country Programme Document outcome and outputs, the SDGs, the UNDP Strategic Plan and national development priorities such as Agriculture Development Strategy?
- To what extent the project was successful to create employment and income opportunities to the local people?
- How effective was the project in ensuring that concerns around GESI were integrated in its approach?

iii. Coherence

- How well the intervention fit in changed context?
- To what extent the intervention is coherence with Government's policies

- To what extent the intervention addressed the synergies and interlinkages with other interventions carried out by UNDP or Government of Nepal? (internal coherence)
- To what extent the intervention was consistence with other actor's interventions in the same context or adding value to avoid duplication of the efforts? (External coherence)

iv. Efficiency

- How efficiently were the resources including human, material and financial resources used to achieve the results in a timely manner?
- To what extent the fund flow mechanism (Letter of Agreement, Low Value Grant or Value Chain Grant) has been appropriate and efficient mechanism to leverage the resources to community?
- To what extent was the existing project management structure appropriate and efficient in generating the expected results?
- To what extent has the project implementation strategy and its execution been efficient and cost-effective?

v. Sustainability

- To what extent are the benefits of the projects likely to be sustained after the completion of this project?
- What are the key factors that will require attention in order to improve prospects of sustainability of Project outcomes and the potential for replication of the approach?
- How were capacities strengthened at the individual and organizational level (including contributing factors and constraints)?
- What could be done to strengthen exit strategies and sustainability of the project?

vi. Impact -

- To what extent the project outputs were achieved and contribution to outcome level results?
- To what extent can the program contribute to resilient and inclusive economic recovery through support to production, postharvest loss management, and market linkage?
- To what extent has the support enabled citizen's trust in local government and its systems, particularly those of women.

Partnership:

- How the partnerships affected in the project achievement, and how might this be built upon in the future?
- Have the ways of working with the partner and the support to the partner been effective and did they contribute to the project's achievements?
- How does partnership with local partners including palikas, cooperatives, farmers' association and other actors along the value chain? Does it create synergies or difficulties? What type of partnership building mechanism is necessary for future partnership?

viii. Gender equality and Social Inclusion

- To what extent have issues of gender and marginalized groups been addressed in the design, implementation and monitoring of the project?
- To what extent the project approach was effective in promoting gender equality and social inclusion - particularly focusing on women and socially disadvantaged groups?
- To what extent has the project promoted positive changes of women and marginalized group? Were there any unintended effects?

ix. Human rights

- To what extent have Dalit, ethnic minorities, women and other disadvantaged and marginalized groups benefitted from the work of the project and with what impact?
- To what extent have project integrated Human Rights based approach in the design, implementation and monitoring of the project? Have the resources been used in an efficient way to address Human Rights in the implementation (e.g. participation of targeted stakeholders, collection of disaggregated data, etc.)?

5. Methodology

The consulting firm should propose a detail methodological framework in the inception report. The study should undertake a quantitative and qualitative assessment. The study will assess the progress against baseline value of indicators to compare results in the given period of time. The firm will be responsible for designing and conducting the evaluation including proposing appropriate methodology, designing tools, developing questionnaires, and other instruments for data collection and analysis. The consultant is responsible, but not limited to:

- Desk study and review of all relevant project documentation including project document, annual work plans, project progress reports, progress against output and other results indicators with baseline value, quarterly progress reports, annual project reports, minutes of the Project Board, and financial statements
- In depth interviews to gather primary data from key stakeholders using a structured methodology
- Focus Group discussion/consultation with project beneficiaries and other stakeholders like UNDP Country Office, Project team, Ministry of Agriculture and Livestock Development, KOICA, Nepal Agricultural Research Council, local partners along the value chain such as Palikas, cooperative, and market centres in project areas.
- Field observations, interactions, interviewed (structured, semi-structured), and consultation with project beneficiaries. The evaluator will carry-out necessary field visits using checklists which have been pre-approved by the office as part of the Inception Report and ensuring that all beneficiaries are adequately covered.
- Sample survey should be conducted with a reasonable and statistically meaningful sample size in each project areas and crops. Farmers, cooperative members, market operators, and local traders should be interviewed.
- Briefing and debriefing sessions will be organized.
- The evaluator should ensure triangulation of various data sources to maximize the validity and reliability of the data. Analysis leading to evaluate judgement should be clearly spelled out. The limitations of the methodological framework should be also spelled out in the review reports.
- In addition, any necessary methodologies for ensuring that the evaluation addresses the needs of vulnerable groups as identified in the project document, employs a rights-based approach and takes questions around gender into consideration.

6. Evaluation products (key deliverables)

The firm should submit the following deliverables in line with IEO's guidelines:

- Inception report detailing the reviewer's understanding of what is being evaluated, why it is being evaluated, and how it will be evaluated. The report shall include a proposed schedule of tasks, evaluation tools, activities, report structure and deliverables. Inception report must demonstrate whether the evaluator's have the same understanding of the Theory of Change as the CO; Inception report should include specific questions to be posed to the stakeholders under each of the evaluation categories
- Evaluation matrix that includes key criteria, indicators, and questions to capture and assess them.
- Evaluation debriefing immediately after completion of data collection, the evaluator should provide preliminary debriefing and findings to UNDP.

- Draft evaluation report for review and comments.
- Final report along with clean data within stipulated timeline with sufficient detail and quality by incorporating feedback from the concerned reviewers.

7. Evaluation team composition and required competencies

The contracted organization and its relevant staff members should comprise of reasonable number of experts having proven track record in designing and conducting evaluation, socio-economic research, baseline studies. The proposed team should have a good depth of understanding of value chains, with expertise in agriculture interventions in horticulture, extension services, and postharvest management.

Moreover, they should be technically sound for conducting evaluation independently. They should possess significant experience conducting evaluation or research in the Nepalese context. Furthermore, the team should comprise members with significant technical experience in monitoring and evaluation and project management. The contracted organization should have the capacity to deliver quality services in a timely, professional manner. The project team should have excellent oral and written fluency in English and Nepali.
It is advised that following experts be made available for the study.

- Team leader– 1
- Horticulture expert – 1
- Agriculture economist – 1
- GESI expert-1
- Data analyst (part time as needed) – 1
- Enumerators as needed

Position	Qualification	Experience
Team leader	At least Master's degree in agriculture related discipline.	• 10 years of professional experience in designing and conducting rigorous project assessments with both desk and field research for agriculture projects in Nepal • Demonstrated experience working in national governments, INGOs, donors, communities, and diverse stakeholder groups • At least 5 listed projects undertaking similar assignments with description of work and specific roles • Demonstrated knowledge of value chain on agriculture commodities • Proof of experience in applying or engaging in community participatory approaches. Strong knowledge of federalization and proof of experience working with local governments. • Demonstrated experience leading field and/or research teams • Experience working in monitoring and evaluation Strong understanding on gender empowerment and social inclusion and human rights-based approach. • Strong understanding of and experience working with Government Projects and UN agencies in Nepal desirable
Horticulture expert	Master's degree in Horticulture	• 8 years of professional experience • At least 3 listed projects undertaking similar assignments with description of work and specific roles • Demonstrated knowledge of horticulture and value chain

		• Proof of experience in applying or engaging in community participatory approaches
Agriculture economist	Master's degree in agricultural economics (preferably, marketing and value chain)	• 8 years of professional experience • At least 3 listed projects undertaking similar assignments with description of work and specific roles • Demonstrated knowledge of agriculture economics and value chain development • Proof of experience in applying or engaging in community participatory approaches
GESI expert	At least Master's degree in Gender studies, Sociology, Development studies or other relevant field	• At least 5 years of professional experience in gender and inclusion-sensitive programming • Conducting similar assignments of at least 3 projects • Knowledge of agriculture economics and value chain development • Knowledge of gender sensitive evaluation
Data analyst (part time as needed)	Master degree on statistics or economics or biometrics	• 5 years of professional experience • At least 3 listed projects undertaking similar assignments with description of work and specific roles • Demonstrated knowledge of value chain on agriculture commodities • Strong statistical skills and knowledge and experience of using data management software such as SPSS, STATA
Enumerators	B.Sc. in agriculture	• Demonstrated knowledge of value chain on agriculture commodities • Experience in applying or engaging in data collection

8. Evaluation ethics

The evaluation will be conducted in accordance with the principles outlined in the UN Evaluation Group 'Ethical Guidelines for Evaluation.' The consultations must safeguard the rights and confidentiality of information providers, interviewees, and stakeholders through measures to ensure compliance with legal and other relevant codes governing collection of data and reporting on data. The consultant must also ensure security of collected information beforehand and after the evaluation and protocols to ensure anonymity and confidentiality of sources of information where that is expected. The information knowledge and data gathered in the evaluation process must be also be solely used for the evaluation and not for other users without the express authorization of UNDP and partners. Consultations will be held to the highest ethical standards and are required to sign a Code of Conduct upon acceptance of the assignment.

9. Management and implementation arrangement

The principle responsibility for managing the evaluation resides with the UNDP Nepal. The UNDP Nepal will contract the research agency and will ensure the timely implementation of the evaluation. The team leader will directly report to Evaluation Manager i.e. Result-Based Management (RBM) Analyst for the assignment. The Evaluation Manager (RMB Analyst) will assure smooth, quality, and independent implementation of the evaluation with needful guidance from UNDP senior management. The project team will provide required information for evaluation in leadership of Portfolio Manager. The project team will arrange all the field visits, stakeholder consultations and interviews as needed.

The details of the implementation arrangement are described in below table.

Who (Responsible)	**What (Responsibilities)**
Evaluation Manager/RBM Analyst	• Assure smooth, quality and independent implementation of the evaluation with needful guidance from UNDP's Senior Management. • Prepare and approve ToR and selection criteria.

	• Hire the research agency by reviewing proposals and complete the recruitment process. • Ensure the independent implementation of the evaluation process. • Approve each steps of the evaluation • Supervise, guide and provide feedback and comments to the evaluation consultants. • Ensure quality of the evaluation. • Ensure the Management Response and action plans are fully implemented
Portfolio Manager-Inclusive Economic Growth	• Draft ToR to be reviewed and provided inputs to be finalized by the evaluation manager • Support in hiring the consultant • Provide necessary information and coordination with different stakeholders including donor communities • Provide feedback and comments on draft report • Prepare management response and action plan and follow up the implementation
Project Team (VCDP)	• Provide required information, furnishing documents for review to the consultant team. • Logistic arrangement, such as for support in setting up stakeholder meetings, arranging field visits and coordinating with the Government.
team/Research agency	• Review the relevant documents. • Develop and submit a draft and final inception report • Conduct evaluation. • Maintain ethical considerations. • Develop and submit a draft evaluation report • Organise meeting/consultation to discuss the draft report • Incorporate inputs and feedback in draft report • Submit final report with due consideration of quality and effectiveness • Organise sharing of final evaluation report
Stakeholders	• Review draft report and provide feedback • Participate in debriefing session and provide suggestions

The evaluators will be briefed by UNDP upon arrival on the objectives, purpose and output of the evaluation. An oral debriefing by the evaluator on the proposed work plan and methodology will be done and approved prior to the commencement of the process.

The evaluation of VCDP will remain fully independent. The evaluators maintained all the communication through the Evaluation Manager during the implementation of the evaluation. The Evaluation Manager should clear each step of the evaluation. Evaluation report must meet the requirements from the Independent Evaluation Office's guidelines which will be provided as part of the inception meeting.

Contractors will arrange mission wrap-up meeting with the stakeholders and noted comment from participants which will be incorporated in the final report.

The final report will be signed off by Deputy Resident Representative of UNDP Nepal.

10. Timeframe for the evaluation

The evaluation is expected to start in February 2021 for an estimated duration of 35 working days. The timeline for final report submission will be consulted with UNDP.

Planned Activities	**Tentative working days**	**Remarks**	**Payment**
Desk review and preparation of design (home based)	2 days		
Finalizing design, methods & inception report and sharing with reference group for feedback (home based)	3 days	UNDP needs atleast 3 days to review and provide feedback on the inception report	20% of the total contract cost
Stakeholders meetings, interviews (Virtual and/or field base) and Household survey	20 days		
Analysis, preparation of draft report and shares for review	5 days	30% of the total contract cost	30% of the total contract cost
Presentation of findings for concerned stakeholders	1 day		
Incorporate suggestions and comments to finalize the report and submit final report to UNDP	4 days	UNDP needs at least 10 days to review and finalize the report	50% of the total contract cost
Total	35 days		

11. Use of evaluation results

The findings of the evaluation will be used to analyze the lessons learnt and provide way forward and actions to be taken in remaining period of the project. Therefore, the report shall provide critical findings and specific recommendations for remaining period of the project and future interventions.

12. Annexes

(i) Relevant Documents: Project Document, Multi-year work plan, Annual Work Plan 2018 and 2019, Project Progress Reports of 2018 and 2019, Financial Reports, Technical Needs Assessment Report, Project Management Structure, Knowledge products etc.

(ii) IEO's guidance on Structure and content of report,

(iii) List of key agencies, stakeholders and partners for evaluation

UNDP

- UNDP Senior Management (DRR), Policy Advisors, Portfolio Managers, RBM Analyst
- VCDP- National Project Manager, National Project Director, and other Project Staff as needed

Stakeholders:

- International development partners
- Project donor and other donors

- National Project Managers of other projects

Implementing Partners

- Ministry of Agriculture and Livestock Development
- Cooperatives, market operators, farmers, agrovets, service providers, local traders, and other actors along the value chain
- NARC
- Local governments

(iv) Inception Report Contents Outline
(v) Review matrix
(vi) Format of the review report
(vii) Evaluation Audit Trial Form
(viii) Code of Conduct

Annex B: Questionnaire for the household survey

This survey is conducted by Nepal Development Research Institute on behalf of UNDP/MoALD. The main objective of this study is to assess the results and approaches of the project interventions from the start to date. Therefore, this one-on-one interview is carried out with you to support us in understanding the project relevancy, effectiveness, efficiency of the project intervention and what impact has been shown for the beneficiaries and other stakeholders by this project. The responses provided by you will be kept confidential and will only be used in analyzing the context. your participation will be voluntary and will not be forced. You can leave the interview in any time. NDRI and UNDP are very thankful to you for supporting us in filling this form.

Questionnaire No.			
Name of the surveryer :		**Date of survey :**	
District :	**Municipality/VDC**	**Ward**	**Tole**
Name of pocket area			

A. General Information

1. Full name of responedent:	
2. Ethnicity/Caste: 1. Dalit 2. Janajati 3. Brahmin/ Chhetri/ Thakuri 4. Madhesi 5. Muslim 6. Newar 7. Others	
3. Gender : 1. Male 2. Female 3. Others	
4. Literacy : 1. Literate 2. Illiterate	**5. Contact information**

6. Tick the crops that you cultivate commercially.

a. Fruits

1. Banana	2. Lime	3. Swet orange	4. Mandarin orange	5. Papaya	6. Pineapple	7. Watermelon

b. Vegetables

8. Cauliflower	9. Cabbage	10. Capsicum	11. Tomato	12. Cucumber	13. Radish	14. Potato	15. Onion	16. Garlic

7. Are you engaged in any agriculture groups ? a. yes b. no

If yes, please tell the name of group _____

8. Are you engaged in any cooperatives? a. yes b. no

If yes, please tell the name of cooperative _____

9. What is the status of food security? (of own production)

i. 3 months or less than three month

ii. 3 to 6 month

iii. 6 to 9 months

iv. 9 to 12 months

v. 12 months secure and sell the excess

B. Family details

1. Family members (number)

Gender	Number	Literate	Illiterate	Outside this district	Outside country	At home	Age (year)		
							Below 16 years	16-60 years	Above 60 years
Male									
Female									
Others									
Total									

2. How many members are involved in agriculture?

Gender	Continuous (number)	Partially (number)
Male		
Female		
Others		

C. Land ownership and Agriculture production

1. Does your family have agriculturable land? **a. yes** **b. no**

If yes, please fill the following table,

S.N	Type of land	Total agricultured land		Irrigation facility		
		Ropani	Kattha	No	All year around	Only in rainy season
1	Khet					
2	Bari					
3	Pasture land					
Total						

2. Do you take land from others to commercially cultivate fruit and vegetables? (ठेक्का, अदिया, भाडामा, बन्दकी)

a. no **b.yes** **if yes, please fill the following table:**

S.N	Type of land	Total agricultured land		What type of arrangement? १.अधिया २. ठेक्का ३. भाडा ४. वन्दकी ५. करारनामा
		Ropani	Kattha	
1	Khet			
2	Bari			
3	Kharbari/ Pasture			
Total				

3. Details of animals and birds (number)

S.N	Animals and birds (till date)	Hybrid (number)		Local (number)	
1	Buffalo				
2	He-buffalo				
3	Cow				
4	Ox				
5	Sheep				
6	Goat				
7	Pig				

8	Duck				
9	Poultry				
10	Others				

4. Family income and expenses details

4. 1 What are the source of your family income?

S.N	Source of income	Total yearly income (Rs.)	
		Before implementation of project	After implementation of project
1	Fruit cultivation		
2	Vegetable cultivation		
3	Food grains Production		
4	Animal rearing and sell		
5	Business and trade		
6	Wages work		
7	Employment		
8	Remittance/ foreign employment		
9	Pension		
10	Non-timber purchase		
11	Cash crops production and trade		
Total Income			

4.2 What are the areas of expenses?

S.N	Area of expenses	Total yearly expenses (Rs.)	
		Before implementation of project	After implementation of project
1	Educatuion		
2	Health		
3	Food grains purchase		
4	Dress purchase		
5	All related to agriculture		
6	Festival expenses		
7	Productive animal purchase		
8	Tractors and other purchase		
9	Fixed assets purchase		
10	Others		
Total Expenses			

D. Details about agriculture production

1. Do you get supports from VCDP in production of fruits and vegetables?
a. yes b. no ....

2. What type of supports from which organization?
a. Loan

Organization	Rs.	Interest rate (%)	2075-76	2076-77	2077-78

b. Grants

i. Financial grants

Organization	Rs.	2075-76	2076-77	2077-78

ii. Seeds and seedlings

Organization	Unit	Quantity	2075-76	2076-77	2077-78

iii. Others (tractors, irrigation, farm yard improvement)

Organization	Unit	Quantity	2075-76	2076-77	2077-78

iv. Technical (technological) supports

For what (fruit, vegetable, both)	Organization	How many times a year?	2075-76	2076-77	2077-78

3. What crops do you cultivate in your land before and after project implementation? Please fill the table

S. N	Crops	Area of cultivation				Production quantity (KG)		Sell quantity (KG)				Selling price (Rs/kg)				Total income	
		Ropani		Kattha				Without grading		With grading		Without grading		With grading			
		Before project	After project	Before project	After project	Before project	After project	Before project	After project	Before project	After project	Before project	After project	Before project	After project	Before project	After project
1																	

S. N	Crops	Area of cultivation				Production quantity (KG)		Sell quantity (KG)				Selling price (Rs/kg)				Total income	
		Ropani		Kattha				Without grading		With grading		Without grading		With grading			
		Before project	After project	Before project	After project	Before project	After project	Before project	After project	Before project	After project	Before project	After project	Before project	After project	Before project	After project
2																	
3																	
4																	
5																	

4. Have you received inputs support from agriculture knowledge center, palika, and cooperative?
a. Yes b. No
If Yes,

Name of the organiztion	Support type	Which time/condition	Quality of support received (5=Excellent, 4=Best, 3=Good 2=weak,1=worst)

4.1 If no, from where do get the input support?.....

5. What changes do you find in the productition and productivity of vegetables and fruits after intervention of VCDP?

S.N.	Paticulars	Status of change (%)				
		More than 100%	76-100%	50-75%	26-49%	0-25%
1	Area					
2	Production					
	Productivity					
3	Production Price					
4	Sell amount					
5	Price of inputs					
6	Income through sell					
7	Compost fertilizer					
8	Chemical fertilizer					
९	Treatment technologies for crops a) Integrated weed management b) Use of incecticides c) Use of hormone growth					

Name of used varities	Before	Now

6. Adequacy status of seeds and other inputs/survices (before and after intervention of VCDP)

Sn	Seeds and other inputs/survices used	Adequacy status			
		Before		After	
		Adequate	Not adequate	Adequate	Not adequate
1	Seeds				
2	Fertlizer				

3	**Treatment technologies for crops** **a) Integrated weed management** **b) Use of incecticides** **c) Use of hormone growth**				
4	**Advanced technologies** **a) Equipments (Spade, tractor,)**				
	b) Irrigation (fountain, drop, traditional, pipe,..)				
	c) Technical knowledge				
5	**Production ability**				
6	**Access to market**				
7	**Market price fovorability**				
8	**Grading opportunity**				
9	**Others if any (Specify**				

7) Have you used paid labours for farming?
a) yes b) No
If yes, fill out following table

Activities	Men	women	Third gender
Land preparation			
Use of fertilizer			
Use of pesticide			
Harvest/ cutting			
Marketing			

8. In an average, how many labours do you use in a ropani of land?
.....

9. How much do you need to pay for a labour per day?

Gender	Without lunch	With lunch
a) Women	Rs.	Rs.
b) Men	Rs.	Rs.
c) Others	Rs.	Rs.

E. Production cost

Particulars	Key fruit			Key vegetable		
	Unit	Amout	Total (Rs)	Unit	Amout	Total (Rs)
A) Proudction cost						
1. Seed/seedlings						
2. Organic fertilizer (cow dung, chicken dung)						
3. Chemical fertilizer						
4. Agriculture chemicals (hormone, tonics..)						
5. Pesticide						
6. Stakes						
7. Others (Specify)						

Total (A)						
(B) Labour expense – labours, bulls, machine_						
!. Land preparation						
2. Nursery						
3. Plantation						
4. Fertilizer use						
5. Inter-cultural operations						
6. Irrigation						
7. Harvesting						
8. Others						
Total (B)						
(C) Marketing Cost						
1. Collection expense						
2. Sanitation						
3. Grading expense						
4. Packaging)crate, wooden boxes, paper boxes, rope etc)						
5. transportation {						
6. Storage cost						
7. Marke cost						
8. others (Specify)						
Total (C)						
(D) Loan for investment						
1. Land rent						
2. Insurance						
3. Interest						
4. Build physical infrastructure and maintainace cost						
5. other services						
Total(D)						
(E)Total production cost (A+B+ C+ D)						

F. Market related information

1. **How far is your nerarest favourable market?**

a) Less than Half kilometer
b) Within half to one kilometer
c) Within One to two kilometer
d) Greater than 2 kilometer

2. **Where do you sell you vegetables and fruits and how much?**

S.N.	Vegetables and fruits	Unit	Contract Out	On farm	Self-nearest market	Sell to wholesaler

			Price	%	Price	%	Name of place	Price	%	Name of place	Price	%

3. Which container do you use while you bring your products to the market?

a. Plastic bag	b. Jute bag	c. bamboo bag (doko)	d. crerat	e. Others .....

4. Which transportation do you use to bring your products to the market?

	Distance (Kilometer_	Time taken to transprt (minutes)	Transportation cost (per unit)
walking			
Cycle			
Motorbike			
E. Rikshow			
Tractor			
Cooperative vehicle			
Truck			
Others			

5. Status of road connecting to market

Place (from where to where)	Rough	Grabel	Black topped
1			
2			
3			

6 Do you know the market price of Fruit and vegetable before sales? A yes- B No

6.1 If yes how and through which means?
…….

6.2 Do you know what market information is? A. Yes B. No?
If yes what it means?
……..

6.3 How price of your veg or fruit price is fixed.	a- self b-Buyer or trader c-Collection center or Cooperative d- other pls specify…….
6.4 What is the process of payment of sold goods?	a-Advance payment b- At the time of sales c- After some time of sales
6.5 Who bears the transportation Cost?	a- Farmers b-local trader c- Whole saler d- Other pls specify…….

6.6 How much is lost during transportation?

S.No	Name of fruit or vegetable	Distance-km	Quantity during Load (unit)	AfterUnload sold quantity (unit)

6.7 Who bears the loss during transportation?	a-Farmers b- traders c-Whole salers- d-Distributed among farmers and traders e-if other pls pls specify……………

6.8 What is the weight difference between the price received in delivery quantity and price received?

S.No	Name of fruit or vegetable	Unit	Difference	Quantity (Weight)during sales delivery	Quantity (trader informed)

6.9 Informtion on Problem- Ranking-From production to Collection

Name of fruit or vegetable	Land preporation	Seed management	Fertilizer and pesticide management	Irrigation	Picking or harvesting
	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.
	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.
	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.
	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.
	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.

6.10 Training opportunities on Vegetable and fruit production and Marketin

6.10.1 Have any of your family have participated in training Organized by VCDP	**a) Yes** **b) No**

6.10.2 if yes what training

S.No	Training subject	Training period (Days)	Year
1)			
2)			
3)			

4)			

6.10.3 Does the trained personale is using the skill obtained in training?	**a) Yes** **b) No**

6.10.4 If yes in which activity

S.N=	Trained knowledge or skill	In practice used area
1)		
2)		
3)		

6.10.5 If No why
……

G. Post Harvest loss

1 Percentage of loss during harvesting/picking

S.No	Crop name	Less the 2%	2-5%	5-10%	10-20%	Above 20%

2 does any family member has participated in picking/harvesting loss management training?	a) Yes b) No

2.1 If Yes how much loss is minimized from which skill and technology

S.N.	Useful training and technology	Estimated Loss reduction %
1		
2		
3		
4		

H. Loss managment after production

1. When do you pick your fruit and vegetable?
a-Morning b- day time c- evening

2. Tools used for picking

S.No	Fruit and vegetable name	Naked hand	Knife	glove	Siktcher	Net	Kuto	spade	Scissor	(Post-harvest loss (%)

3. Collection method of harvested crop

S.No	Fruit and vegetable name	Method applied A) Direct in bucket b) first in land and then bucket c) bag/bucket then in big bucket

4. Do you know about pre-cooling a) Yes b) no
If yes how you do?

a) Keeping in open space
b) Keeping in Shade
c) Wshing with water
d) Keeping in coldstorage/or cold room

5. Suggest in which aspect you need to give attention to get better price
(5=excellent, 4=very good, 3=good, 2=satisfactory, 1= poor)

S.N.	Fruit and vegetable name	During cropping	During picking harvesting	Grading	Packaging	Transportation	Market identification	Pricing

6. Does any member of your family have participated in post harvest loss minimization training,touur		a) Yes b) no
6.1 If yes what type of training	1	
	2	
	3	
	4	
6.2. Does the trained person use the skill knowledge		a) Yes b) no

6.3. If yes what experience you have in post-harvest loss minimized?

S.No	Used the skill knowledge	experience you have in post-harvest loss minimized %
1		
2		
3		
4		

7. What are the Main problem faced by your family in production and value addition and your suggesstion pls?

Value addition	Problem as per rank			Sugesstion
	1	2	3	
During production				

During Grading				
During Packaging				
During Transportation				
During Pricing				
During Marketing				

I. About Credit and Insurance

1. Status of accessability for Credit

Service provider	Distance	Available services	Services received (Yes/No)
Bank			
Cooperative			
Farmers group			
Crop insurance			
Agrovet			

2. Have you insured your crop? a) yes b)no

2.1 if yes

S.No	Crop name	insurer	Area of insured crop	premium	Insured value

2.2 insured crop damaged or not	**a)Yes b)No**
2.3 if crop lossed have you claimed for payment	**a)Yes b)No**
2.4 Have you received money?	**a) Timely received b) late receive d) not received**
2.5 Do you get government support on crop insurance premium?	**a)Yes b)No**

J. Soil and fertilizer mangement

1. Do you have improved cattle shed?	a-Yes b-No

2. How you manage the fruit and vegetable westage?
a) Use as fodder to livestock
b) Comosting
c) dumping to palika or cooperative facility
d) Other.....

3. Have you practice soil management	a) Terrace management b) SALT c) Agro forestry d) Other

K. Covid 19

1. Due to COVID-19 in which stage of your business is affected? And in what percentage

Activity	Percentage (%)
a. Production	
b. Post harvest	
c. Market price	
d. Other	

2. Have you received any support from Project, Palika, cooperative

S.N	Organization	Type of support	Relevancy (5=excellent, 4=good, 3=medium, 2= non-benefitted, 1=bad)
1	VCDP		
2	Palika		
3	Cooperative		

3. Out side from community or not related with VCDP does they ask or with you about the VCDP
a Yes b. No

4. If you have any problem in farming to whom you ask for service?
a Cooperative
b Agrovet
c Palika 's JT/JTA's
d other……

L. Impreesion of Beneficiaries on VCDP

1. Pls give your openion infollowing issues

Issues	5= Fully agree	4= Agree	3= inbetween	2= Disagree	1= totally disagree
1. This project is able to address the need and priority of women's, marginalized and disadvantage groups.					
2. This project performance are effective in quality, quantity and timelyness.					
3. After project completion som activities will be continued.					
4. Due to this project production and productivity of crops are increased.					
5. Due to this project post harvest loss is significantly minimized.					
6 Due to this project crop marketing is facilitated					

7 This project have helped to women's, marzinolized and disadvantage community in production increament,pot harvest loss management,in market linkage development					
8 Aware with project and local partner performing the project activities					
9 Even after COVID-19 first the project activities are effective?					
10 Due to the women's envolvement in this project, the practice of jointly working inother household activity is developed?					
11 does this project activities have positively changed the women and othe marginalized communitys or inwomen's empowerment.					

2- How did you evaluate the in total project activities (5=excellent, 4=good, 3=medium, 2= non-benefitted, 1=bad)						
S.N	Description	**5**	**4**	**3**	**2**	**1**
A	fruit production					
B	vegetable production					
C	value addition					
D	Help In fruit and vegetable marketing					
E	Help In fruit and vegetable storage					

Annex C: Checklists for KII and FGD

Checklist for local representatives/agri-officials
Nepal Development Research Institute (NDRI) / UNDP Nepal

1)	What kind of support have VCDP provided for the development of Value chain in vegetables and fruits? Probe: (Institutional support, Technical /resource materials, Infrastructures and equipment, Training, Technology and financial)
2)	What are the benefits of VCDP project support? Was the benefit efficient? (Capacity build institutional and staff, strengthen of Value Chain, increment in production, market linkage, ...)
3)	Could you please share about the VCDP's fund flow mechanism? Do you receive it in time?
4)	What is the status of forward and backward linkages in fruits and vegetables value chain?
5)	In what basis the financial support of VCDP is being used? (VCDP target product, area)?
6)	How far are the VCDP's technical (technologies) support adopted by farmers especially by female farmers?
7)	What are the main crops of this District/Palika? Are the technologies in post-harvest management provided by VCDP is effective? What can be done to improve this problem?
8)	How far the VCDP provided technology is included/promoted /adopted in other program in Palika
9)	What are the effects of COVID-19 in VCDP activities (input supply, services, product collection and trading)? What supports did you get from VCDP during COVID?
10)	To what extent the reprogramming of project activities for immediate COVID-19 response are relevant to meet the local needs? (program structure)
11)	How do you evaluate the project itself (design & approach) and overall activities of VCDP project? (Relevancy, effectiveness, impact….)
12)	What needs to be done to improve the approach and activities of the VCDP in the remaining period of project? (Suggestion and recommendation)

Mid Term Evaluation of VCDP Project
Checklist for Traders and Cooperative personals
Nepal Development Research Institute (NDRI) / UNDP Nepal

Municipality:
Name of the respondent:
Name of Organization:
Contact number:
Type of trading: 1. Wholesale 2. Retail
Main fruit and vegetables of this area: (VCDP crops)

1)	What kind of support has VCDP provided for the development of value chain in vegetables and fruits in your area? Probe: (Institutional support, Technical /resource materials, Infrastructures and equipment, Training, Technology and financial)
2)	What are the benefits of VCDP project support? Was the benefit effective? (Capacity build, strengthen of Value Chain), Are the supports effective?
3)	Do you get the grants and supports in time? Or is it lately provided?
4)	How far are the support materials being used? Especially by female?
5)	In what basis the financial support of VCDP is being used? (VCDP target product, area)?
6)	How far is the technology adopted by farmers? How far is the technology promoted to in other parts of the Palika
7)	What is the status of forward and backward linkages in fruits and vegetables value chain?
8)	What are the effects of COVID-19 in VCDP activities (input supply, services, product collection and trading)? What supports did you get from VCDP during COVID?
9)	To what extent the reprogramming of project activities for immediate COVID-19 response are relevant to meet the local needs? (program structure)
10)	How do you evaluate the project itself (design & approach) and overall activities of VCDP project? (Relevancy, effectiveness, impact….)?
11)	Suggestion and recommendation to Project. If Any in remaining time period of Project.

Checklist for Focus Group Discussion
(Mixed group- traders, farmer's group, and cooperative members)

Municipality:
Name of the participants (use another sheet):
Name of Organization:
Main fruit and vegetables of this area: (VCDP crops):

1. Are you aware about VCDP project? What is the status of your involvement in the project?
2. What kinds of support have VCDP provided for the development of value chain in vegetables and fruits in your area? (Probe: Institutional support, Technical /resource materials, Infrastructures and equipment, Training, Technology and financial)
3. What are the benefits of VCDP's support? (Probe: Capacity strengthened-institutional and staff, strengthen of Value Chain, increment in production, improved market linkage,) 4. Was the benefit effective?
5. What technologies are provided by VCDP to minimize post-harvest loss? How far the technologies are effective?
6. Are you involve in the VCDP training program? What kind of training have you received? Are you benefited? 7. To what extent the program addresses gender and ethnicity issues? (Probe: participation, access to technology, fund…..
8. What value addition activities do you carried out before marketing (cleaning, sorting/grading, packaging to get high value of the products?
9. What is the status of forward and backward linkages in fruits and vegetables value chain?
10. What is the status of women involvement in different stages fruit and vegetable of value chain? 11. What are the barriers and motivating factors for women's involvement at each stage of the value chain of vegetables and fruit? (Production, collection, sorting/grading, Packaging, Processing, marketing, transportation….)
12. What are the effects of COVID-19 in VCDP activities (Probe: input supply, services, product collection and trading)? What supports did you get from VCDP during & after COVID-19?
13. To what extent the reprogramming of project activities for immediate COVID-19 response are relevant to meet the local needs? (program structure)
14. How do you evaluate the VCDP project itself (design & approach) and overall activities of the project? (Relevancy, effectiveness, impact….)?
15. Suggestion and recommendation to Project. If any in remaining time period of Project.

Annex D: Tables

I. Number of respondents receiving support from VCDP by gender

Status	Unit	Gender		Total
		Men	Women	
Received	N	111	88	199
	%	29.0%	23.0%	52.0%
Not received	N	89	95	184
	%	23.2%	24.8%	48.0%
Total	**N**	**200**	**183**	**383**
	%	**52.2%**	**47.8%**	**100.0%**

II. Type of support received by the respondents in different consecutive years (n=400)

Support type	2075-2076		2076-2077		2077-2078	
	N	%	N	%	N	%
Loan	29	7.3	12	3.0	11	2.8
Tecnnical	36	9.0	53	13.3	35	8.8
Grant	2	0.5	0	0.0	2	0.5
Seed/seedlings	55	13.8	93	23.3	78	19.5
Others*	15	3.8	23	5.8	25	6.3

* *support in tractor, irrigation, farmyard improvement*

III. Area of cultivation (fruits/vegetables), production quantity, sell quantity, selling price and average income

Type		Before	After	Difference	%
Area of cultivation (Ropani)	N	184	264	80	30
	Mean	4	3	(1)	-25
	Sum	667	842	175	21
Production quantity (Kg)	N	135	228	93	41
	Mean	1,069	3,001	1,932	64
	Sum	144,299	684,117	539,819	79
Sell quantity without grading	N	42	45	3	7
	Mean	207	1,004	796	79
	Sum	8,710	45,160	36,450	81
Sell quantity with grading	N	63	124	61	49
	Mean	10,260	2,589	(7,671)	-75

	Sum	646,400	321,088	(325,312)	-50
Selling price without grading	N	41	47	6	13
	Mean	39	37	(3)	-8
	Sum	1,616	1,730	114	7
Selling price with grading	N	43	160	117	73
	Mean	71	47	(23)	-33
	Sum	3,042	7,566	4,524	60
Total Income	**N**	**81**	**277**	**196**	**71**
	Mean	**65,487**	**132,089**	**66,602**	**50**
	Sum	**5,304,475**	**36,588,650**	**31,284,175**	**86**

IV. Respondent's perception towards performance of the project activities

Type	Gender	Unit	Bad	Non-benefitted	Medium	Good	Excellent	Total
Fruit production (n=193)	Men	N	1	49	37	19	7	113
		%	.5%	25.4%	19.2%	9.8%	3.6%	58.5%
	Women	N	0	42	30	8	0	80
		%	0.0%	21.8%	15.5%	4.1%	0.0%	41.5%
Vegetable production (n=300)	Men	N	3	46	72	39	5	165
		%	1.0%	15.3%	24.0%	13.0%	1.7%	55.0%
	Women	N	1	30	63	37	4	135
		%	.3%	10.0%	21.0%	12.3%	1.3%	45.0%
Value addition (n=278)	Men	N	8	63	61	19	7	158
		%	2.9%	22.7%	21.9%	6.8%	2.5%	56.8%
	Women	N	6	45	49	16	4	120
		%	2.2%	16.2%	17.6%	5.8%	1.4%	43.2%
Helped in marketing (n=279)	Men	N	20	75	51	10	2	158
		%	7.2%	26.9%	18.3%	3.6%	.7%	56.6%
	Women	N	16	50	46	5	4	121
		%	5.7%	17.9%	16.5%	1.8%	1.4%	43.4%
Helped in storage (n=203)	Men	N	9	74	31	5	0	119
		%	4.4%	36.5%	15.3%	2.5%	0.0%	58.6%
	Women	N	5	41	37	0	1	84
		%	2.5%	20.2%	18.2%	0.0%	.5%	41.4%

V. Annual family income status of the respondents before and after project implementation

Income Sources		Before Project Implementation	After Project Implementation	Difference	% Difference
Fruit production	N	51	81	30	59
	Mean (income/yr)	92400.00	153265.43	60865.43	66
Vegetable production	N	98	234	136	139
	Mean	127867.35	153257.48	25390.13	20
Food/grain production	N	25	57	32	128
	Mean	36200.00	43824.56	7624.56	21
Animal rearing	N	68	153	85	125
	Mean	104073.53	96418.30	-7655.23	-7
Business	N	18	51	33	183
	Mean	41111.11	176137.25	135026.14	328
Wage	N	26	38	12	46
	Mean	71923.08	57726.32	-14196.76	-20
Employment	N	27	86	59	219
	Mean	189185.19	316965.12	127779.93	68
Remittance	N	26	48	22	85
	Mean	213153.85	410875.00	197721.15	93
Pension	N	19	39	20	105
	Mean	45000.00	131928.21	86928.21	193
Cash crops	N	21	25	4	19
	Mean	117142.86	200080.00	82937.14	71
NTFPs	N	11	16	5	45
	Mean	4545.45	87187.50	82642.05	1818
Total	N	135	328	193	143
	Mean	313506.67	418292.23	104785.56	33

VI. Food security status of the respondent

Caste/ ethnicity	3 months or < 3 month	%	3 to 6 months	%	6 to 9 months	%	9 to 12 months	%	Above 12 months & sell surplus	%	Total
Dalit	6	24.0	6	24.0	9	36.0	3	12.0	1	4.0	25
Janajati	15	9.5	38	24.1	28	17.7	45	28.5	32	20.3	158
B/C/T	24	12.1	36	18.1	22	11.1	46	23.1	71	35.7	199
Madhesi	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0	1

Muslim	0	0.0	0	0.0	0	0.0	0	0.0	1	100.0	1
Total	**45**	11.7	**80**	20.8	**59**	15.4	**94**	24.5	**106**	27.6	384

VII. Gross margin of selected fruits and vegetables

S.N.	Name	Baseline report		Gross margin report (2019)	
		Productivity (Mt/Ha)	Gross margin %	Productivity (Mt/Ha)	Gross margin %
	VEGETABLES				
1	Cabbage	21.24	18.81	31.25	21.00
2	Cauliflower	15.95	24.64	22.84	42.46
3	Tomato	26.66	26.43	20.76	36.93
4	Potato	14.83	14.57	19.07	39.77
5	Cucumber	15.23	30.12	23.52	45.74
6	Radish	12.13	14.78	18.97	13.44
7	Capsicum	4.32	8.22	20.31	42.30
8	Garlic	8.14	15.99	5.21	40.05
9	Onion	9.59	14.08	16.46	33.46
10	Carrot	29.34	39.94	45.22	34.97
	FRUITS				
11	Mandarin orange	13.05	15.91	18.4	237.22
12	Sweet orange	11.23	10.08	15.3±8.32	206.99
13	Watermelon	16.5	50.21	19.83	23.40
14	Banana	16.69	16.74	33.0	227.32
15	Pineapple	7.2	9.82	13.5	218.27
16	Lime	6.39	22.99	8.8	255.64

Source: Baseline report and Gross margin analysis of selected vegetables and fruits (2019)

VIII. List and category of VCDP supported Palikas

Category A	Category B	Category C	Category D
Phedikhola Gaupalika	Pokhara Mahanagarpalika	Devchuli Nagarpalika	Roshi Gaupalika
Putalibazar Nagarpalika	Myagdye Gaupalika	Siddhalek Gaupalika	Panchkhal Nagarpalika
Vyas nagarpalika	Bhanu Nagarpalika	Ichchhakamana Gaupalika	Golanjor Gaunpalika
Aanbookhaireni Gaupalika	Sahidlakhan Gaupalika	Bandipur Gaupalika	Manahari Rural Municipality
Namobuddha Nagarpalika	Dhulikhel Nagarpalika	Benighat Rorang Gaupalika office	Bharatpur Mahanagarpalika
Thakre Gaupalika	Dhunibeshi Nagarpalika	Gandaki Rural Municipality	
Kamalamai Municipality	Manthali Nagarpalika	Gajuri Gaupalika	
Sunkoshi Gaupalika	Hetauda Upa-Mahanagarpalika	Galchi Ga. Pa. Mul Sanchitkosh khata	
Ratnanagar Nagarpalika	Khairahani Nagarpalika	Rapti Municipality	
Kawasoti Nagarpalika	Madhyabindu Nagarpalika	Banepa Na.Pa.Na. Karyapalika	
		Khadadevi Gaupalika	
		Gaindakot Nagarpalika	

Annex E-Project target and achievements (Source: Project progress report)

Project outcome 1	Outcome Indicator 1.1	Baseline	Target	Means of Verification	Source of data	2020 Result	2021 target	Activities					
Improve agricultural productivity through increased capacity of government agencies and increased access to production technology by farmers	% of increase of average gross margin of selected fruit and vegetables from collaborating farmers	Table 1 (2019)	15%	Progress report, evaluation report, baseline report, and gross margin analysis	UNDP, MoALD, NARC, local municipality	due to c19 situation, study dropped it.	10%						
	% increase in yield of average crops for collaborating farmers	Table 2 (2019)	20%	Progress report, evaluation report, baseline report, and gross margin analysis	UNDP, MoALD, NARC, local municipality	due to c19 situation, study dropped it.	15%						
Project output 1.1	Output Indicator 1.1.1	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.1.1	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
Identify potential fruit and vegetables production pockets and conduct gross margin analysis	Number of pocket areas, cooperatives and collaborating farmers (40% of female; 15% ethnic groups or Dalits)	0 (2018)	150P, 20C, 9,960F (3,984 female ; 1,494 from ethnic or Dalits)	Progress report, baseline report	UNDP	Yearly		Identify pocket areas, collaborating municipalities, cooperatives, farmers, extension officers and informal extension providers	Project, UNDP, MoALD	150P, 20C, 9,960F (3,984 female ; 1,494 from ethnic or Dalits)	115P, 39C, 7,109F	115P, 39C, 9,960F	115P, 42C, 7,109F
	Output Indicator 1.1.2	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.1.2	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of baseline survey done	0	1	Baseline report	UNDP	Yearly		Conduct a baseline survey	Project, UNDP, MoALD	1	1	1	1
	Output Indicator 1.1.3	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.1.3	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress

	# of gross margin analysis produced	0	4	Gross margin report	UNDP, MoALD, NARC, local municipality	Yearly		Conduct gross margin analysis	Project, UNDP, MoALD	4	2	3	2
Project output 1.2	Output Indicator 1.2.1	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.2.1	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
Improve access to production technology	# of participants – extension officers, agrovets, lead farmers (20% women; 15% of those from ethnic groups or Dalits) received training	0	500 (100 female; 75 from ethnic or Dalits)	Progress report, monitoring visit	UNDP, MoALD, NARC, local municipality	Yearly		Provide training on production technology and optimal practice to extension officers	Project, UNDP, MoALD	500 (100 female; 75 from ethnic or Dalits)	308	468	361
	Output Indicator 1.2.2	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.2.2	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of farmers received extension (40% of female; 15% from ethnic or Dalits)	0	10,000 (4,000 female; 1,500 from ethnic or Dalits)	Progress report, monitoring visit	UNDP, MoALD, NARC, local municipality	Yearly		Provide extension on production technology and practice to cooperatives and farmers	Project, UNDP, MoALD, local government	10,000 (4,000 female; 1,500 from ethnic or Dalits)	7109	9960	7109
	Output Indicator 1.2.3	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.2.3	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of manuals developed and printed	0	30	Publications	UNDP, MoALD, NARC, local municipality	Yearly		Develop and print manuals and materials	Project, UNDP, MoALD	30	13	16	13
	Output Indicator 1.2.4	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.2.4	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress

	# of farmers received input support and services (revised in 2020)	0	7,000 (2,800Fe; 1,050E)	Progress report, monitoring visit	UNDP, MoALD, NARC, local municipality	Yearly		Provide inputs and services through palikas and cooperatives	Project, UNDP, MoALD	7,000 (2,800Fe; 1,050E)	7109	9960	7109
	Output Indicator 1.2.5	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.2.5	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	Technical inputs made	0	0	Financial report	UNDP	Yearly		Provide technical inputs of Technical Specialist	UNDP	1	1	1	1
	Output Indicator 1.2.6	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.2.6	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	Technical inputs complete	0	5	Financial report	UNDP	Yearly		Provide technical input and support of technology extension specialist	UNDP	5	3	4	3
Project output 1.3 (newly added in 2020)	Output Indicator 1.3.2	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.3.2	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
Combat impact of COVID19 through agricultural production and marketing support	# of palikas executing Farmer Relief Fund	0	37	Quarterly report, technical report	UNDP	Yearly		Establish and mobilize farmers Relief Fund at Palika and Cooperatives for relief and recovery	UNDP	37	37	37	37
	Output Indicator 1.3.3	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.3.3	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of cooperatives, market centres, and palikas received transportaion and marketing	0	20	Quarterly report, technical report	UNDP	Yearly		Transportation and marketing support	UNDP	20	10	10	10

	support												
	Output Indicator 1.3.4	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.3.4	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of returnees and youth benefitted in 7 palikas (names)	0	65	Quarterly report, technical report	UNDP	Yearly		Youth and foreign returnee support program for COVID19	UNDP	65	50	65	69
	Output Indicator 1.3.5	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 1.3.5	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of extension staff and market operators receiving protective materials	0	140	Quarterly report, technical report	UNDP	Yearly		Protective and safety materials for extension staff and cooperative operators	UNDP	140	111	111	111
Project outcome 2	Outcome Indicator 2.1	Baseline	Target	Means of Verification	Source of data	2020 Result	2021 target	Activities					
Reduce postharvest losses of selected fruit and vegetables by postharvest technology development	%p decrease in postharvest losses of average fruit and vegetables occurred from farm to collection centre and wholesale markets by volume	10	5	Progress report, evaluation report	UNDP, MoALD, NARC, local municipality	not done due to c19 and disruption at market	4%						
Project output 2.1	Output Indicator 2.1.1	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.1.1	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress

Strengthen the capacity of the Nepal Agriculture Research Council	# of human resources (intnern/consultant) hired and engaged in project activities including postharvest management (50% female, ethnic, or Dalit)	0	12 (6 female, ethnic or Dalit)	Progress report, monitoring visit	UNDP, NARC	Yearly		Provide technical inputs for postharvest technology-related research	Project, UNDP, MoALD, NARC	12 (6 female, ethnic or Dalit)	14	21	22
	Output Indicator 2.1.2	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.1.2	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of staff of the Nepal Agriculture Research Council and relevant government agencies received training and exposure visits	0	35	Progress report	UNDP, NARC	Yearly		Organize exposure visit or observation tour for government officials working on postharvest management	Project, UNDP, MoALD, NARC	35	0	35	0
	Output Indicator 2.1.3	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.1.3	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of researches financed on postharvest management have been financed	0	10	Progress report, researches	UNDP, NARC	Yearly		Provide financial support to researches on production support, postharvest management and marketing conducted by students mastering in agriculture science related matters	Project, UNDP, MoALD, NARC	10	17	20	20

	Output Indicator 2.1.4	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.1.4	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of NARC laboratory furnished with postharvest technology development related equipment	0	1	Progress report, delivery bill	UNDP, NARC	Yearly		Improve the physical facility of the postharvest laboratory at the Horticulture Research Division, the Nepal Agriculture Research Council	Project, UNDP, MoALD, NARC	1	1	1	1
Project output 2.2	Output Indicator 2.2.1	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.2.1.	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
Develop postharvest losses reduction management technologies by the Nepal Agriculture Research Council (NARC)	# of postharvest technology developed and verified/recommended by the Nepal Agriculture Research Council by year 3	0	3	Progress report, monitoring visit	UNDP, MoALD, NARC	Yearly		Develop postharvest technology	Project, UNDP, MoALD, NARC	3	2	4	3
	Output Indicator 2.2.2	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.2.2	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of technology tested, verified and recommended by NARC	0	3	Progress report, monitoring visit	UNDP, MoALD, NARC, local municipality	Yearly		On-farm testing of available technology and newly developed technology	Project, UNDP, MoALD, NARC, local government	3	2	4	2
	Output Indicator 2.2.3	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.2.3	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress

	# of financial analysis report produced	0	3	Report	UNDP, MoALD, NARC, local municipality	Yearly		Analyse financial incentives of technology adoption (both existing and new postharvest technology)	Project, UNDP, MoALD, NARC	3	0	2	0
	Output Indicator 2.2.4	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.2.4	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of manuals produced	0	30	Manuals	UNDP, MoALD, NARC, local municipality	Yearly		Develop and print manuals and materials	Project, UNDP, MoALD, NARC	30	12	22	18
	Output Indicator 2.2.5	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.2.5	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of dissemination strategy developed	0	1	Strategy	UNDP, MoALD, NARC, local municipality	Yearly		Develop the technology roll-out strategy	Project, UNDP, MoALD, NARC	1	0	1	0
Project output 2.3	Output Indicator 2.3.1	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.3.1.	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
Transfer postharvest technology to farmers with improved access to input support	# of participants of public and informal extension providers (15% female; 20% of from ethinic or Dalit) received training programmes	0	625 (93 female, 125 from ethnic or Dalits)	Progress report, monitoring visit	UNDP, MoALD, NARC, local municipality	Yearly		Provide training to public extension officers as well as non-government extension providers	Project, UNDP, MoALD, NARC	625 (93 female, 125 from ethnic or Dalits)	182	482	255
	Output Indicator 2.3.2	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.3.2	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress

	# of participants (farmers) received extension (40% of female; 15% from ethnic or Dalits)	0	6,250 (2,500 female; 937 from ethnic or Dalits)	Progress report, monitoring visit	UNDP, MoALD, NARC, local municipality	Yearly		Provide extension on postharvest technology to cooperatives and farmers	Project, UNDP, MoALD, NARC, local government	6,250 (2,500 female; 937 from ethnic or Dalits)	314	4314	1085
	Output Indicator 2.3.3	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.3.3	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of farmers received input support and services (revised in 2020)	0	7,000 (2,800Fe; 1,050E)	Progress report, field visit	UNDP, MoALD, NARC, local municipality	Yearly		Support cooperatives in capacity development	Project, UNDP, MoALD, NARC, local government	7,000 (2,800Fe; 1,050E)	7109	7109	7157
	Output Indicator 2.3.4	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.3.4	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	Technical inputs made	0	5	Financial report	UNDP	Yearly		Provide technical input and support of horticulture specialist	UNDP	5	3	4	3
	Output Indicator 2.3.5	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 2.3.5	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	Technical inputs made	0	2	Financial report	UNDP	Yearly		Provide technical inputs of technical specialist	UNDP	2	1	2	1
Project outcome 3	Outcome Indicator 3.1	Baseline	Target	Means of Verification	Source of data	2020 Result	2021 target	Activities					
Increased market linkages at local level	% increase in the volume of selected commodities traded at collaborating collection centres and satellite markets	2,747MT (2019)	40	Progress report, evaluation report, gross margin report, monitoring report	UNDP, MoALD, NARC, local municipality	raj. No data due	20%						

Project output 3.1	Output Indicator 3.1.1	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 3.1.1	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
Improve functions of collection centres and satellite markets	# of collection centres received support on physical facility	0	20	Progress report, cooperatives' account books	UNDP, MoALD, NARC, local municipality	Yearly		Provide physical support to collection centres and satellite markets as per agreed terms and conditions	UNDP, MoALD, local government	20	32	32	34
	Output Indicator 3.1.2	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 3.1.2	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of participants (30% female; 15% ethnic or Dalits)	0	150 (45 female; 22 from ethnic groups or Dalits)	Progress report, field visit	UNDP	Yearly		Provide training on marketing and management to operators of collection centres and satellite markets	UNDP, MoALD, local government	150 (45 female; 22 from ethnic groups or Dalits)	349	469	349
	Output Indicator 3.1.3	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 3.1.3	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of persons (30% female; 15% ethnic or Dalits) joined exposure visits	0	60 (18 female; 9 from ethnic or Dalits)	Progress report, monitoring visit	UNDP	Yearly		Conduct exposure visit or observation tours for managers and operators of collection centres	UNDP, MoALD, local government	60 (18 female; 9 from ethnic or Dalits)	27	35	27
Project output 3.2	Output Indicator 3.2.1	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 3.2.1.	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
Promote market information system	# of collection centres/wholesale markets using the improved market	0	20	Progress report, monitoring visit	UNDP, MoALD, NARC, local municipality	Yearly		Strengthen the market information system at collection centres and	UNDP, MoALD, local government	20	13	20	16

	information network							satellite markets					
	Output Indicator 3.2.2	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 3.2.2	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	# of cooperatives receiving equipment for the physical support for market information system	0	20	Progress report, monitoring visit	UNDP, MoALD, NARC, local municipality	Yearly		Provide support to ICT service and equipment if necessary	UNDP, MoALD, local government	20	17	20	17
	Output Indicator 3.2.3	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 3.2.3	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	Technical inputs made	0	2	Financial report	UNDP	Yearly		Provide technical inputs of Technical specialist	UNDP, MoALD, local government	2	1	1	1
	Output Indicator 3.2.4	Baseline	Target	Means of Verification	Source of data	Frequency of data collection		Activity 3.2.4	Responsible Party	Planned Target (2018-2022)	2018-20 result cumulative	2021 target	2021 progress
	Technical inputs made	0	5	Financial report	UNDP	Yearly		Provide technical inputs of value chain and market linkage specialist	UNDP, MoALD, local government	5	3	4	3

Annex F: List of KII respondents and FGD participants

FGD Participants - Pipal danda Agriculture Co.Ltd, Putalibazar municipality -ward 13, Syangja			
SN.	**Participants Name**	**Position**	**Co-operatives**
1	Khem Naryana Chaoppagain	Chair-perons	Pipal danda Agriculture Co.Ltd
2	Maniram Chapagain	members / VCDP Veg. beneficiary	Pipal danda Agriculture Co.Ltd
3	Umakanta	members / VCDP Veg. beneficiary	Pipal danda Agriculture Co.Ltd
4	Bhim Raj Aryal	members / VCDP Veg. beneficiary	Pipal danda Agriculture Co.Ltd
5	Resham Aryal	members / VCDP Veg. beneficiary	Pipal danda Agriculture Co.Ltd
6	Madhu Thapa	members / VCDP Veg. beneficiary	Pipal danda Agriculture Co.Ltd
7	Kamala Basyal	members / VCDP Veg. beneficiary	Pipal danda Agriculture Co.Ltd
8	Ram Basyal	members / VCDP Veg. beneficiary	Pipal danda Agriculture Co.Ltd

List of KII Respondents			
Sn	**Districts**	**Respondent**	**Position**
1	Syangja	Manisha Lamichhane	Agriculture Officer, Putalibazar Mun.
2	Tanahu	Nirmal Adhikari	Chair person ,Jamune Agri-cooperative
3	Tanahu	Chandra Bdr. Ranabhat	Ward Chair person, Maygde ward No. 2
4	Gorkha	Sila Koirala	Agriculture assistant (JT)
5	Chitwan	Kamana Pokharel	Act. Agriculture officer (Pra.sa)
6	Chitwan	Bijya Kumar Shrestha	Krishi Bikri Sahayak
7	Nawalpur	Narendra Bhandari	Act. Agriculture officer (Pra.sa)
8	Nawalpur	Baburam Majhi	Cooperative Chair person
9	Nawalpur	Balaram Pokharel	Chair person, Krishi samuha
10	Nawalpur	Dr. Tek Raj Poudel	Agriculture officer
11	Nawalpur	Sunita Chapagain	Manager
12	Makwanpur	Basata Ghalan	Manager
13	Makwanpur	Rabindra Poudel	Tech. Assistant
14	Dhading	Sharmila Subedi	Assistant. Agri-officer
15	Dhading	Santosh Khadka	Agriculture officer
16	Kathmandu	Hari Bahadur KC	Joint Secretary, MoALD
17	Kathmandu	Ishwori Prased Gautam	Principal Scientist
18	Kathmandu	Suprabha Pandey	Technical Officer
19	Kathmandu	Giridhari Subedi	Sr. Scientist
20	Kathmandu	Resona Simkhada	Scientist
21	Kathmandu	Ram Bahadur KC	Director
22	Kathmandu	Dr. Sudha Sapkota	Sr. Scientist
23	Kathmandu	Prof. Bhargab Dhital	Dean
24	Kathmandu	Dr. Hari Krishna Pant	Director
25	Kathmandu	Dr. Kishor Chandra Dahal	Assistant Dean (Academics)

26	Kathmandu	Dr. Binayak Prasad Rajbhandari	Executive Chairperson
27	Kathmandu	Ms. Pratima Poudel	Agriculture Program Coordinator
28	Sindhuli	Devi Prasad Devkota	Agriculture Assistant Officer
29	Sindhuli	Ichha Rawat	Manager
30	Kavre	Nawaraj Ghimire	Focal person, Banepa VCDP
31	Kavre	Roshan Adhikari	Manager
32	Kavre	Mukunda KC	Agriculture officer 6th level
33	Kavre	Members	Shree Maheshwori Krishi Sahakari Sanstha Ltd.
34	Kavre	Mandil Krishna Shrestha	Agriculture officer 6th level
35	Nawalparasi	Bimala Gaire	Manager
36	Hetauda	Naresh Acharya,	Manager
37	Sindhuli	Menuka subedi	Chairperson
38	Sindhuli	Nirmal ramtel	Trader
39	Kawashoti	Som Bahadur BK	Trader
40	Kawashoti	Guru Prasad Bhattrai	Trader
41	Sindhuli	Suresh Sah	Trader
42	Dhading	Tula Ram Magar	Trader
43	UNDP Nepal	Kalpana Sarkar	Portfolio Manager, UNDP
44	UNDP Nepal	Binda Magar	GESI Advisor
45	UNDP Nepal	Dharma Swornakar	Policy Advisor
46	KOICA Nepal	Giebbum Yo	KOICA

Annex G: List of publications

Name of Publication	LANGUAGE
Project Brochure	Nepali/English
Project Leaflet	English
Project Infographic	Nepali
News Letter	English/Nepali
Agriculture Newswater	English
आलु बालिमा हावापानी व्यवस्थापन	नेपाली
आलु खेति प्रबिधि	नेपाली
Compendium of Postharvest Research on fruit and vegetable in nepal	English
तरकारी खेतिवाली पात्रो तथ्यकं संकलन फारम कृषक समुह सहकारी तथा पालीका	नेपाली
सुन्तलाजात फलफूल खेती उद्यम विकासको लागि प्रविधिक नीति निदेशन	नेपाली
फलफुल कृषक डायरी	नेपाली
तरकारी वाली कृषक	नेपाली
गोठको भुइ सुधार गोठमल सुधार र (थलो) पशुमुत्र संकलन तथा प्रयोग	नेपाली
स्थानिय तहको कृषि विकासका लागि व्यवथापनका लागि स्थानिय संचालन एन,२०७४	नेपाली

गरेको व्यवस्थापन	
सुन्तला जात फलफुल नर्सरी वयवस्थापन प्रविधि	नेपाली
राम्रो आमधानिका लागि केहि मुख्य बेमैसम तरकारी उत्पादक	नेपाली
फलफुल तथा तरकारी बालीको उतपादनो परात्त क्षति नयुनिकरण	नेपाली
फलफुल तथा तरकारी बालीको उतपादनो परामर्श क्षती घटाउने अन्य खाद्य तथा पोषणको उपलब्धि	नेपाली
फलफुल तथा तरकारी मूल्य श्रृखला विकास आयोजना नोटप्याड	नेपाली
तरकारी खेति प्रविधि	नेपाली
एसियामा गोलभेडा उत्पादन परान्त परिचालन	नेपाली
तरकारीका स्वाथय वेर्न उत्पादनकालागि नर्सरी व्यवस्स्थापन	नेपाली
पोस्टर मेवाको फल टिप् ने उपयुक्त अबसर -	नेपाली
- कागति भन्डारण गर्ने सरल प्रविधि	नेपाली
- घरेलु स्तरमा बीउ भणडारा प्रविधि	नेपाली
- बजार सहजिकरण कालागि काउली भणडारा प्रविधि	नेपाली
राज्यको संरचनामा राज्यशत्तिको बाडफाड	नेपाली
कुलबाट प्रविधि जडित चिस्यन कक्ष	

Annex H: List of laboratory equipment provided by VCDP to NARC

S.N.	Name of Equipment	Quantity	Received Year
1	Auto Clave	1	2018
2	Digital Refractometer	1	2018
3	DA Meter	1	2018
4	High speed refrigerated centrifuge	1	2019
5	Texturometer	1	2019
6	Co2 and O2 Logger	1	2019
7	Citric acid Brix Meter	1	2019
8	Digital Vernier Calliper	2	2019
9	Digital Balance	1	2019
10	Magnetic Stirrer	1	2019
11	VDRL Rotary Shaker	1	2019
12	Thermometer	1	2019
13	Digital thermometer with probe	1	2019
14	Spectrophotometer cuvette	2	2019
15	DSLR Camera	1	2019
16	Rigid ice box	1	2019
17	Muffle Furnance	1	2019
18	Thermometer	1	2019

19	DA Meter	1	2020
20	Four Digits Digital Balance	1	2020

Annex I: List of Research on different themes, publications and technology distribution by NARC

Research themes conducted by NARC under VCDP

1. Postharvest loss minimization of different vegetables in a storage condition.
2. Development of appropriate postharvest handling technologies on Papaya.
3. Postharvest loss minimization in tomato through variety selection
4. Postharvest loss minimization of different fruits in a storage condition
5. Scaling up sustainable technologies for reducing postharvest losses of potato in corridors of Prithivi and B.P highways of Nepal
6. Adoption of appropriate engineering technologies for reducing postharvest losses of fruits and vegetables and profit enhancement of farmers
7. Development of technologies for postharvest loss reduction of Horticultural crops
8. Minimizing postharvest losses of fruits and vegetables through appropriate postharvest technology in Gandaki Province of Nepal
9. Citrus fruits postharvest loss minimization technologies verification and promotion along BP highway corridor
10. Minimizing postharvest losses of fruits and vegetables through effective nutrient management
11. Socio-economic assessment of post-harvest loss of fruits and vegetable in Bagmati and Gandaki province of Nepal

Publications of NARC under VCDP in international and national journals

1. Storability of potato varieties under ordinary storage condition in Panauti, *Nepal* *https://sfna.org.my/snfa-02-2020-51-57/*
2. Effect of postharvest application of edible coating and packaging on acid lime fruit varieties Sun Kagati 1 quality at ambient storage condition
3. Modified atmosphere packaging of capsicum for extending shelf life under Cool-bot condition.

Technical manuals, information sheet, handouts for technology distribution

1. Nursery management technology for citrus species
2. Local agriculture programme operation and management guideline
3. Agri business promotion guideline for youth entreprenures affected by C19
4. Postharvest handling of fresh produces- Resource booklet- Nepali
5. Modified atmosphere packaging of capsicum for extending shelf life under coolbot condition
6. Effect of postharvest application of edible coating and packaging in acid lime fruit var. Sun Kagati 1 Quality at Ambient Storage Condition
7. Compendium of postharvest research in Nepal- Tech booklet- English
8. Technical guidelines for Citrus Industry Development in Nepal- Tech manual- Nepali
9. Cold Room with Cool-Bot Technology-Leaflet-Nepali
10. Storability of potato varieties under ordinary storage condition in Panauti
11. Collection/Sales Centre Operation guideline

Annex J: Observation and informal discussions

Observation/informal talk

SN.	Informal discussion / Observation	with	where
1	Krisi Upaj sankanlan tatha bikri kendra	local vegetable collector, tranders, and suppliers, and farmers.	Kawasoti Municipality, Nawalpur
2	Jamune Multipurpose cooperatives	with benficiies who came to take crates	Myadge - 2 , Tanahu
3	Jamune Multipurpose cooperatives	cold chain, infomal with other regular staffs of the cooperatives	Myadge - 2 , Tanahu
4	Jamune Multipurpose cooperatives	Newly built veg./ fruit collection centres	Myadge - 2 , Tanahu
5	Farm observation and informal talk	lacal farmers and Kamana Pokharel (Agri. Assistant in Sahid lakhan RM)	Manakamana RM, Gorkha
6	Nursary and farm ovservation	Balaram Pokharel beneficiries and other villagers	Devchuli M. Nawalpur
7	Farm observation and informal talk	With Basanta Ghalan and beneficiries	Basamadi, Makwanpur

Annex K: Few demonstration activities

- Training to 26 (17 female and 7 Dalit & Janajati) agricultural technicians on "Postharvest Handling of Fresh Produces"
- Training to 27 (13 female, 9 Janajati) agricultural technicians on "Postharvest Handling of Fresh Produces"
- Postharvest handling training to 55 members (47 female, 12 Janajati, 4 Dalit) of District Agriculture Cooperative Federation of Makwanpur
- Training on vegetable postharvest management training to 57 members (39 female, 2 Dalit, 7 Janajati) of Sasakta Women Agriculture Cooperative of Sindhuli
- Training on postharvest consideration for better market and longer shelf life to 20 farmers (7 female, 4 Dalit and 4 Janajati) primarily growing tomato under polyhouse
- Postharvest handling training of the prioritized commodities to 771 farmers (479 female, 42 Dalit and 237 Janajati) of different working Palikas

Annex L: Summary of overall supports and activities of VCDP till date

- Provide training on production technology and optimal practice to extension officers
- Provide extension on production technology and practice to cooperatives and farmers
- Develop and print manuals
- Establish and mobilize farmers Relief Fund at Palika and Cooperatives for relief and recovery

- Transportation and marketing support to cooperatives, market centers, and Palikas
- Protective and safety materials for extension staff and cooperative operators
- Strengthen the NARC capacity- Provide technical inputs for postharvest technology-related research human resources hired and engaged in project activities including postharvest management (8 interns completed internship by 2020)
- Organize exposure visit /observation tour for NARC/ government officials working on postharvest management
- Provide financial support to researches on VCDP outcome related subjects by students mastering in agriculture science or related matters
- NARC laboratory furnished with postharvest technology- Improve the physical facility of the postharvest laboratory at the Horticulture Research Division
- Develop, verified, and recommended postharvest losses reduction management technologies by the Nepal Agricultural Research Council by year 3.
- On-farm testing, develop and print manuals of postharvest losses reduction management technology by NARC
- Provide training to public extension officers as well as non-government extension providers to transfer postharvest technology to farmers with improved access to input support.
- Provide Postharvest management extension to cooperatives and farmers
- Provide agricultural inputs and services to farmers through the project, Palika and cooperatives- Provide technical input of Horticulture Specialist and Technical specialist.
- Provide physical support to collection centers and satellite markets
- Provide training on marketing and management to operators of collection centers and satellite markets.
- Conduct exposure visit or observation tours for operators of collection centers
- Exposure visit to NARC

Annex M: Different activities taken under VCDP for market linkage improvement

- 3 new collection centres (Paurakhi Agriculture Cooperative in Manthali; Aandhimul Agriculture Cooperative, Bandipur, Small Farmer Agriculture Cooperative-Hatiya, Hetauda) have started collective marketing of agricultural produce.
- Farmer Multipurpose Cooperative, Sunkoshi has restarted vegetable marketing function.
- 2 cold rooms installed at Birauta farmers Market, Pokhara and Paurakhi Youth Agriculture Cooperative, Manthali.
- Khairahani Municipality, Chitwan formed the Market Management Committee and endorsed the market management guideline for Khairahani Agri-Product Market Centre with technical support from VCDP
- 100 crates supported to Junar Superzone Commmittee, Sindhuli to store sweet orange in cold room.
- Sasakta Women Agriculture Cooperative, Sindhuli received 200 plastic crates through Value Chain Grant, 190 of which were distributed to 103 farmers (73 female, 22 Janjajati, and 4 Dalits).
- Milijuli Agriculture Cooperative provided production inputs to 53 members (37 female, 28 Janjajati, and 3 Dalit) through Value Chain Grant.
- The Agriculture Product Market Management Cooperative of Phedikhola, Syangja, received VCDP support to procure Agri-ambulance for vegetable transportation which is mobilized to collect vegetables from farm to the cooperative's collection centre and then dispatch them to different markets.
- Local Development Training Academy of Ministry of Federal Affairs and General Administration organized a Cooperative and Entrepreneurship' workshop at Lalitpur on 13 January 2021
- 3 cooperatives - Paurakhi Cooperative, Manthali, District Agriculture Cooperative Federation, Hetauda, and Bhakunde Agriculture Market Management Committee - installed digital price board.

- 4 cooperatives or market centers - Bhakunde market mgmt., Madiphat Cooperative, Khairahani market committee and Sasakta women agriculture cooperative- received ICT facility such as computer and printer.
- 16 cooperatives received support on market information system at local level and project is working to connect them with national MIS network.

(Source: Half-yearly report (Jan-June 2021)

Annex N: UNEG Code of Conduct signed by Consultants

UNEG Code of Conduct

Annex 2: United Nations Evaluation Group Code of Conduct for Evaluation in the UN System

Evaluation Consultants Agreement Form

To be signed by all consultants as individuals (not by or on behalf of a consultancy company) before a contract can be issued.

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Kamal Raj Gautam

Name of Consultancy Organisation (where relevant): Nepal Development Research Institute (NDRI)

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at (place) on (date) 18 March, 2021, Kathmandu

Signature: 

UNEG Code of Conduct

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Evaluation Consultants Agreement Form

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Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Prof. Dr. Durga Mani Gautam

Name of Consultancy Organisation (where relevant): Nepal Development Research Institute (NDRI)

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at (place) on (date) 18 March, 2021, Kathmandu

Signature: 

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Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Mr. Mahendra Thapa

Name of Consultancy Organisation (where relevant): Nepal Development Research Institute (NDRI)

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at (place) on (date) 18 March, 2021, Kathmandu

Signature: 

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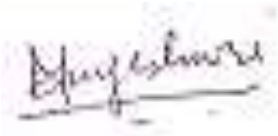
Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Dr. Manjeshwori Singh

Name of Consultancy Organisation (where relevant): Nepal Development Research Institute (NDRI)

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at (place) on (date) 18 March, 2021, Kathmandu

Signature: 

UNEG Code of Conduct

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Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Dr. Rajman Shrestha

Name of Consultancy Organisation (where relevant): Nepal Development Research Institute (NDRI)

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at (place) on (date) 18 March, 2021, Kathmandu

Signature: