

Pre-Crisis Market Analysis (PCMA) of Vegetables Market System

Kailali and Bardiya Districts, Far-western Region, Nepal

Informing Disaster Preparedness, Emergency Response and Livelihoods Recovery

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Acronyms

BFI	:	Banking and Financial Institution
CDMC	:	Community Disaster Management Committee
CSDR	:	Centre for Social Development and Research
CSO	:	Community Support Organisation
FDG	:	Focus Group Discussion
Ha	:	Hector
INGO	:	International Non-Government Organisation
JICA	:	Japan International Cooperation Agency
KII	:	Key Informant Interview
MOAC	:	Ministry of Agriculture and Cooperative
MT	:	Metric Ton
NGO	:	Non-Government Office
NFRP	:	Nepal Flood Resilience Project
PAC UK	:	Practical Action Consulting, United Kingdom
PAC SA	:	Practical Action Consulting, South Asia
PCMA	:	Pre Crisis Market Assessment

Executive Summary

The Pre Crisis Market Assessment (PCMA) exercise on vegetables was conducted building upon the experience gained by the project and field staffs during a similar assessment conducted for rice, which emphasized that vegetable is an important commodity that needs to be accessed for livelihoods during floods. Ground research indicates that due to immediate cash flow available to communities - selling vegetables is more lucrative as opposed to other commodities in both Bardiya and Kailali districts along the Karnali flood plains. This PCMA assessment was critical to understand the impact of floods on market systems and recommend strategies and propose interventions that might be useful to reduce market system vulnerability.

Coping mechanism of farmers such as use of dried vegetables during the monsoon along with practices such as not selling vegetables to markets rather consuming locally within the communities was discerned whilst conducting Key Informant Interviews (KIs) and Focus Group Discussions (FGDs) and speaking to local stakeholders and partners. The project interventions of Nepal Flood Resilience Project (NFRP) that integrated Farmers Field School (FFS) into resilience building, though commendable was at times fragmented and not comprehensive catering to overall community flood resilience. However, with interventions such as making FFS more effective by diversifying these services technically and taking them to vulnerable farmers would be valuable. Collective commercial production and marketing vegetables within the communities also needs to be explored as that would enable regular cash flow to farmers and aid them to address their immediate needs. Better and regular cash income may address the issue of migration by males in the areas. Similarly, engaging and connecting vegetable traders with farmers needs to be better explored to ensure that the market for produced vegetables is diverse and uninterrupted during crisis scenarios. Moreover, collaboration with financial institutions specifically with local branches of commercial banks is also likely to enable farmers to access financial services, thereby helping them build resilience in the long term. In summary, indigenous practices and knowledge on vegetable farming needs to be integrated whilst developing future interventions.

Section 1: Objectives and Key Analytical Questions

Objectives of the PCMA Study

The Global Zurich Flood Resilience Programme seeks to understand the role played by market systems in building resilience to flood. In Nepal the project has activities to understand and act on the issues in the community and the markets where they have been connected to. Within the project outcome 2, ***“The impact of floods on market systems will be assessed and the strategies will be put in place to reduce market system vulnerability”***. The project team including staffs from PAC UK had already carried out the market sectors identification, prioritization and selection exercise and selected the three highest potential market systems of products i.e. Rice, Private Health Service & Medicines and Vegetables respectively out of 6 identified market systems for further assessment and design market based responses. The Pre Crisis Market Assessment (PCMA) study focusing on Rice Market System was successfully conducted by the same DRR team in Kailali and Bardiya Districts, who contributed to this PCMA on vegetables.

The project team decided to carry out the PCMA of vegetables as it has potential to flood resilience of the communities. The reason for choosing the vegetables market system is its significant contribution in the livelihood of the people in the selected geographic location. During the last PCMA most of the crucial information such as crisis situation of August 2014, humanitarian responses during the situation, role and responsibilities of Practical Action, socio-economy situation of the targeted population etc. had been already collected. Hence, the focus of the study was on analysis of vegetable market system.

The specific objectives of the study are:

Question1: How are local markets operating to deliver services that benefit local people?

Question 2: How are local markets affected by floods? *(For this we need to map the market system before flood and after flood. It will then allow us to see the differences between the two period and also see how floods impact the market system we are trying to intervene.)*

To answer the above two question, first we need to identify the target community then we need to identify the appropriate market system and subsequently conduct FGDs and KIs with the market actors of the identified market system. This will then allow us to sketch a market map. Both these questions will be answered by step 4 and 5 in the list of activities mentioned below.

This will enable the study to understand during non-flood times how do the markets operate and how does this change during times of flood? Based on what we know about the functioning and changes in functions of markets during flood events then we can explore;

Question 3: How to make the market more resilient to floods?

Question 4: What markets focused actions should the project support to build flood resilience?

These two questions will be answered only after we conduct a thorough analysis of the market system we have selected. Then we need to get all the market actors on board and conduct a participatory workshop to discuss on the strategies to be implemented and way forward (Step 6, 7, 8 & 9)

About PCMA

We utilized the PCMA to understand how market functions in different (before, during and usual) situations and affects vulnerable peoples' resilience besides itself. As it is itself at risk of disasters and further affected by response actions during and after disaster events. Evidences and learning show that humanitarian interventions can have negative impacts on local markets, either before, during or after a crisis occurs. Hence, it is important to analyse the markets at all stages of humanitarian response in order to:

- Mitigate risks of medium and long-term negative impacts that may be created by humanitarian responses neglecting local economic dynamics on local markets and people's livelihoods,
- Use the capabilities and networks of existing market actors to cater the needs of affected populations before, during and aftermath of crisis,
- Analyse how humanitarian responses can be accelerated and improved by enhancing the capacities of market actors before, during and aftermath of crisis,
- Strengthen preparedness and emergency response by designing market based preparedness and responses that could mitigate the effect of a crisis,
- Support livelihoods and local economic cycles in all stages of preparedness and emergency response, to support resilience building,

The PCMA is an approach to conduct market assessments prior to emergencies in order to anticipate how markets will respond after a shock occurs. It builds on earlier experiments with market baseline mapping and analysis conducted in pre-crisis settings. PCMA does not replace existing market analysis tools; rather it is intended to provide a guide to applying those tools in pre-crisis contexts, particularly in contexts that are prone to recurring humanitarian crises.

This PCMA exercise took place in the broader context of the Nepal Flood Resilience Project (NFRP) (2013-2018) that aims to build community flood resilience for the most vulnerable areas of the Karnali River Basin, through its integrated framework that also recognizes function of market and its sensitivity to emergencies, particularly flood emergency. This PCMA is considered to contribute to generate decision support information in planning and implementation of strategies and action to improve preparedness, particularly on vegetable market systems. Vegetables are potential cash crops helping farmers to generate income, provide food security, complement crop losses due to hazards – the floods, but are sensitive to market for their quickly perishable in nature. It is expected that this will help project team, respective farmers and other actors in strengthening vegetable market systems ahead of crisis would potentially reduce the impact of disaster on lives and livelihoods, and begin to address the longer-term or chronic nature of poverty and vulnerabilities.

Key Analytical Questions

The key analytical questions to analyze vegetable market system focused on three main aspects:

- a. The conditions and constraints for the target groups in accessing market systems, both in the normal situation and in the event of floods;
- b. The capacity of vegetables market system to meet the needs of the target groups, in both current and flood situations; and
- c. The most appropriate interventions to improve preparedness, feed into future planning efforts and contribute to the design of emergency interventions as a response to the forecasted floods.

The above key analytical questions are further elaborated below.

Box-1: Key Analytical Questions for market analysis for disaster resilience through PCMA

In “normal times”	
1. How does the market system operate in normal times?	<ul style="list-style-type: none"> - Seasonal analysis of market functions of vegetables, - Domestic production, consumption and markets (within selected geographic locations), - Import and export markets and volume (Within and Outside selected geographic locations), - Supply and Demand, Prices, Quantity, Quality, stocks, - Who are main market actors of the market chain, market support service providers that providing infrastructure, inputs and services and enablers that playing pivotal roles in creating enabling environment and their roles? - What are the main relationships and linkages? <p><i>All within 3 components of a market map</i></p>
2. Does the market system cover the needs of the people in normal times?	<ul style="list-style-type: none"> - Can people access these markets? - Who dominates the decision making? (price, quantity, quality...) - How disadvantaged people/communities access to markets? - What are the major challenges/constraints of the vegetables market system? - What are the opportunities of the vegetables market system? (Alternative markets, value addition, organic etc.) - What are the important factors affecting the vegetable market system?
In “crisis scenario” (heavy flood)	
3. How does the market system operate in times of heavy flooding?	<ul style="list-style-type: none"> - Seasonal analysis of market functions of vegetables, - Domestic production, consumption and markets (within selected geographic locations), - Import and export markets and volume (Within and Outside selected geographic locations), - Supply and Demand, Prices, Quantity, Quality, stocks, - Who are main market actors of the market chain, market support service providers that providing infrastructure, inputs and services and enablers that playing pivotal roles in creating enabling environment and their roles? - What are the main relationships and linkages?
4. Does the market system cover the needs of the people in times of heavy flooding?	<ul style="list-style-type: none"> - Can people access the market in times of heaving flooding? - Who dominates the decision making? (price, quantity, quality...) - How disadvantaged people/communities access to markets in times of heavy flooding? - What are the major challenges/constraints of the vegetables market system in times of floods that may hamper its ability to absorb the shock? - What are the opportunities of the vegetables market system? (Alternative markets, value addition, organic etc.) - What are the important factors affecting the vegetable market system during flooding and aftermaths?
5. What are the most relevant <u>market interventions</u> to build <u>long-term resilience</u> to flooding?	
a. What immediate and longer-term market interventions are required to build the resilience of the selected market to flooding?	<ul style="list-style-type: none"> - Who should undertake these market interventions? - What market interventions should Practical Action / CSDR & partners take/support a) within Zurich project? b) in another interventions? - Who should Practical Action, CSDR & partners work with to implement these market interventions? <p>i.e. existing structure(s) e.g. Local CSOs, NGOs , networks, government agencies, Finance institutions, Market Actors etc.</p> <ul style="list-style-type: none"> - How feasible are these market interventions in practice (technical, social and political feasibility)? - How quickly could these market interventions be implemented?

<ul style="list-style-type: none"> - What resources would be required to implement each market intervention?
<p>b. How willing and capable are the market actors (and essential/key service providers) to support these market interventions?</p> <ul style="list-style-type: none"> - What challenges/limitations exist (e.g. what is the traders' cash absorption capacity) - What can Practical Action / CSDR & partners do to reduce those limitations (this includes advocacy as well as a market support intervention)? - What are opportunities, how can they be tapped in for enhancing market capacity to make more resilient to floods and contribute to community flood resilience?
<p>6. What are the most relevant <u>emergency response options</u> to flooding (that take into consideration the market system capacity to provide for the needs of the people)?</p>
<p>a. What market-based emergency response actions are required to meet the priority needs of the target people?</p> <ul style="list-style-type: none"> - Who should undertake these market-based emergency response actions? - What market-based emergency response actions could Practical Action / CSDR & partners take/support? (??) - Who should the project & DRR actors work with to implement these market-based emergency response actions? (i.e. existing structure(s) – e.g. Local CSOs, (I)NGOs, networks, government agencies, Finance institutions etc.)? - How feasible are these market-based emergency response actions in practice (technical, social and political feasibility)? - How quickly could these market-based emergency response actions be implemented? - What resources would be required to implement each market-based emergency response action?
<p>b. How willing and capable are the market actors (and essential/key service providers) to support these market-based emergency response actions?</p> <ul style="list-style-type: none"> - What challenges/limitations exist (e.g. what is the traders' cash absorption capacity) - What can Practical Action do to reduce those limitations (this includes advocacy as well as a market support intervention)? - What are opportunities, how can they be tapped in to enhance market capacity to function during floods and contribute to community flood resilience?
<p>7. What market indicators can be monitored if flood occurs (part of EWS and Contingency plan) to prepare the market to cope better with the shock.</p> <ul style="list-style-type: none"> • Physical access to markets • Availability of commodities/products (Quantity and Quality) <ul style="list-style-type: none"> ○ Local production ○ Import • Prices • Types of traders • Mode of transaction • Access to finance

Methodology

The study adopted the PCMA that builds on the Emergency Market Mapping and Analysis (EMMA) methodology for the pre-crisis context in order to map and analyse vegetables market system. Market systems are composed of networks of market actors (the market chain), whose dynamics are influenced by institutions, norms and trends (the enabling environment) and supported by a range of key infrastructures, inputs and market support services.

During this exercise, the baseline or “normal” scenario was established as August 2016 (i.e. same month, when there was flood). The flood-affected market scenario was defined as the worst-case flood scenario in the two districts of Kailali and Bardiya, which was agreed to be during August third week, 2014. The PCMA team compared how vegetable market system was functioning during the August 2014 flooding with how that is functioned at the time of this PCMA exercise (August 2016) to model how market will respond during future flooding of a similar impact. For this, two

market maps were produced; the first showing how the market systems are functioning in the current situation (August 2016), and the second capturing the impacts of the flood affected market system scenario during and aftermath of flood in August, 2014 (*Please refer to figure 2 & 3*). This study therefore mapped and analysed the current constraints/challenges that is facing vegetable market system, and how it would be affected by the flood in the future. This provided the evidences and information and allowed the identification of interventions aimed at supporting vegetable market systems to cover the needs of the target population where some gaps were found, and prepare for the crisis scenarios. The recommendations resulting from this exercise are based on the analysis of how the market was functioning in August 2016, and would need to be further informed by operational feasibility and coordinated needs assessments following the onset of a crisis.

For this analysis, a PCMA team of 13 people from PAC SA (1), NFRP Nepalgunj (3), CSDR (5) and Local enumerators (4) was formed. They were mostly local personnel familiar with the context of Kailali and Bardiya districts. The team presented a mix of skills team covering a range of fields such as market system development, disaster risk reduction, livelihood, monitoring & evaluation and agriculture. Most of the team members were programme staffs of NFRP (Practical Action and CSDR), who had already participated in the previous Rice PCMA. Since, NFRP is already supporting flood affected communities in vegetable farming through Farmers Field School approaches and mechanisms, NFRP team of Practical Action and CSDR staffs had a good knowledge of vegetable markets' in both areas of analysis. The PCMA facilitator from PAC SA facilitated the team work on carrying out the study and preparing the report.

The project team strategically included and built capacity of local enumerators from Tharu communities for carrying out field study as most of the study's target groups in the areas speak Tharu. It is often found that local language and knowledge on local contexts are barriers to communicate with local communities for collecting required information properly. The local enumerators with knowledge on the local context including the vegetable markets helped significantly to accomplish the field study swiftly. Moreover, capacity development of local communities in such studies would help in creating pool of local resource persons who can be catalyst for bringing change at community level based on the garnered knowledge during the process as well as this may increase employment opportunities for them.

The Rice PCMA (please refer to that report for details) was departure point to this study and it therefore started with a review of secondary information, prior to the start of field study. The draft Rice PCMA report including study procedures, key analytical questions guiding the process and developed tools were reviewed. The developed key analytical questions and tools were adapted for the field data collection. Similarly, objectives, methodology and scope of analysis were also reviewed and re-adapted to the vegetables market systems' context.

A strong emphasis was put on developing the capacity of team members many of them were local youth volunteers. Two days (August 23 & 24) orientation was organized in Tikapur facilitated by the PCMA Facilitator with the co-facilitation of NFRP team of Practical Action, Nepalgunj. The objective was to familiarize with the purpose and process of PCMA, and to develop common understanding on the key analytical concepts of market system. The details of the two days activities are described in bullet points below.

Day -1

- Developed common understanding on objective of the study, critical analytical questions and methodologies,
- A preliminary market map of current vegetables market system was also developed based on the existing knowledge of the team and discussed on relationship of market actors,

existing infrastructures, available inputs & support services and business enabling environment & institutions (see *annex-1*). The map is composed of three layers i.e. **Central layer: Market Chain** – key market actors and their linkages. This shows how the commodity is produced and supplied to consumers; **Top layer: Enabling Environment** – key factors such as institutions, rules, norms, trends and practices which influence the functioning of the market chain; and, **Bottom layer: Key Infrastructure, Inputs and Market support services** - which support the functioning of the market chain.

- Team was divided into 3 groups and divided the areas and stakeholders for Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). A team leader was designated for each team.

Table-1: Team for KIIs and FGDs

Team-A	Team-B	Team-C
Lok Narayan Pokharel (Team Leader)	Buddhi R. Kumal (Team Leader)	Bibek Shrestha (Team Leader)
Prakash Khadka	Lautan Chaudhary	Lalmani Bhandari
Mina Chaudhary	Bipana Chaudhary	Surya Kumari Chaudhary
Ratan Chaudhary	Purnima Chaudhary	Shanta Chaudhary

Day II

- Next day team was oriented on the adapted tools for KIIs and FGDs for data collection. Team practiced to use the tools by practicing with each other. Based on the learning of using the tools some additional simplification was done immediately to ease the data collection process at the field.
- The team conducted semi-structured interviews, with the help of a checklist of questions to discuss, with Agriculture Extension Offices of Tikapur and Rajapur, Tikapur Municipality, Nirdhan Uthan Bank and Agriculture Cooperative that supplies manures in Rajapur. In addition, KIIs were conducted with a wholesaler cum retailer of vegetables in Rajapur on same day.

Field Study

The three teams carried out 37 KIIs and FGDs on August 25, 26 and 27 using the structured questionnaires and checklists with identified market actors – the vegetable farmers, local collectors, wholesalers, commission agents and retailers) and semi-structured interviews with input suppliers and support service providers (agro-centres, cooperatives, BFIs, transporters, cold storage etc.) and enablers (Municipalities, Tikapur Chamber of Commerce and Industries etc.). Debriefings at the end of each day enabled all three teams to do some preliminary analysis of the data gathered in order to refine the market maps and make necessary adjustments to the fieldwork plans for the following days. Most interviews were conducted by team members in pairs, using paper-based surveys. The sample sizes were small and flexible to address the scattered market actors and disparity of value chain in actual market places and their dynamics (particularly the key actors). The analysis was not intended to statistical analysis but instead aimed at capturing changing dynamics of market system during crisis and normal situation.

At the end of the field study, the team updated the preliminary market map of current scenario of vegetables market system that was drawn in the workshop on the first day and developed market map for the "reference crisis" (August 2014 flood), consolidated the gaps and market analysis and worked on the response analysis. This helped in capturing the market dynamics and preparing the report.

In addition to this, the PCMA facilitator carried out semi-structured KIIs with Retail Heads of Banking and Financial Institutions (BFIs) operating in the NFRP areas and SAKCHYAM Access to Finance Programme in Kathmandu for further analysis of value chain financing in vegetable market system.

Table-2: Vegetables PCMA Schedule

Activities	August 17-21	August 22-28	September 5-20
Preparation			
Team Orientation and Field study			
Data analysis, formulation of recommendations, development of reports, presentation of findings			

Limitations of the Study

The vegetable farming is common throughout the Baridiya and Kailali districts. Most of the targeted population in all 9 VDCs and 2 Municipalities produce vegetables for their daily household consumption. This study purposively selected the farmers and local markets in the VDCs/Municipalities for consultation, where the project has been supporting communities for their flood resilience. However, it conceptualizes the scenario of all communities in the flood affected areas. Information on market was gathered from local markets of Rajapur, and Tikapur. The information was also gathered from Bhajani, and commission agents/wholesalers at Tikapur that import and export vegetables to & from Baitadi, Salyan, Dang, Kohalpur, Atariya, Nepalgunj and even India. In addition, there is not any report available regarding the impact of flood on vegetable markets and number of farmers benefitted from the relief programme after the flood for secondary information review (e.g. consolidated impact report, census, economic data etc.).

Section 2: Crisis Scenario and Selected Timeframe

Description of the Selected Reference Crisis – August 2014

Based on secondary data review and discussions with project team, the Karnali River floods that occurred in August 2014 were agreed as a crisis scenario. According to the NFRP Baseline Survey Report-2015, the frequency of floods has increased in last 5 years. Obviously, their impact is also increasing; however, the human loss is decreasing due to the effective early warning system, awareness and exposure level of the community people and effective response. The flood mostly occurs during the four months of the rainy season: June, July, August, September and in rare cases in October. The project had selected the communities as they were flooded at least once in the last five years. In mid-August 2014, three days of torrential monsoon rainfall led to the widespread floods in Western Nepal. Out of the 74 communities, 30 communities indicated that the flood had entered into their houses and provoked physical damage in August 2014. The report shows that some people did not have food grain and firewood for cooking food and money to buy food items during and after the 2014 floods. Food supply, food storage and cash for purchasing the food were identified as major constraints for recovery.

Overview of Humanitarian Responses to Date

A report¹ published in 2015 showed that the August 2014 floods were the worst event ever recorded in 24 hours, nearly 500 mm of rain fell across the plains and foothills. Rivers rose rapidly in the middle of the night. Flooding was perhaps a one-in-1,000 year event and exceeded the previous largest flood by nearly a meter. However, the Early Warning Systems (EWS) put in place since 2009 on the Karnali river were instrumental in saving lives and assets during the 2014 floods. The response actions from the Government and INGOs were however slow and poorly coordinated, particularly in terms of food items distribution. During 2013 floods, there were political pressure, complicated responses and beneficiary selection, ultimately leaving the most vulnerable behind and led to situations where food items distribution created security issues. But the situations in 2014 had improved as compared to previous flood crisis. Significant improvements still require taking place in terms of crisis preparedness and coordination during and aftermath of similar floods.

Practical Action's Role and Geographical area of Responsibility

The Karnali Basin is more advanced than most regions in Nepal in terms of its disaster preparedness. Substantial NGO intervention (including through the NFRP) in the basin has included setting up EWS, community disaster management committees (CDMCs) and other formal disaster preparedness structures; these exist in combination here but not necessarily elsewhere in Nepal. It is likely that a similar flood elsewhere in the country might have had a different and potentially more severe impact.²

Emergency relief activities fall under the responsibility of the Red Cross and CDMCs, who coordinate search and rescue activities as well as food distribution

¹ [*Urgent Case for Recovery: What We Can Learn From the August 2014 Karnali River Floods in Nepal*, ISET-International, ISET-Nepal, Practical Action Nepal, 2015](#)

² Ibid

Section 3: Scope, Depth of the Analysis and Market Assessment Tools

Based on analysis of secondary information and interviews and focus group discussion with stakeholders, the PCMA team identified the needs of the affected population should a similar flood crisis unfold again in the future.

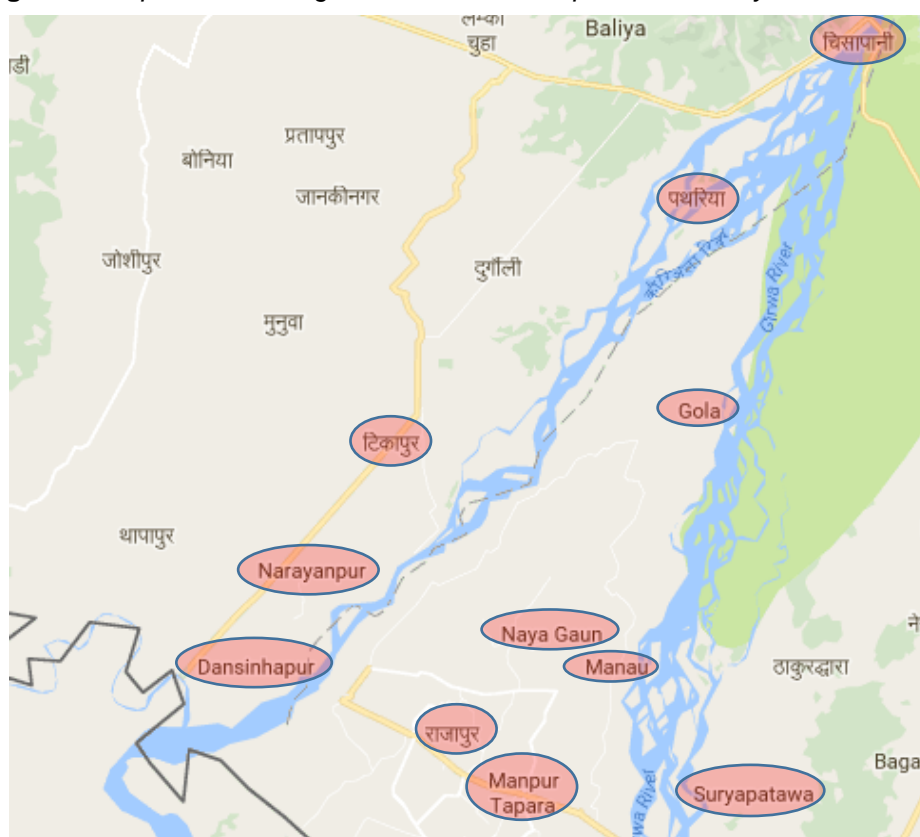
The Target Population of Project

The target population is about 52,527 people (33,805 in the “Bardiya NFRP working area” and 18,722 in Kailali NFRP working area). This population is part of the NFRP target population, i.e. the households of 74 communities of vulnerable downstream communities of 9 VDCs and 2 Municipalities of Kailali and Bardiya districts residing along both sides of the Karnali River. The population targeted by the PCMA was mainly the actors involved in the market chain, e.g. farmers (flood affected communities), local collectors, wholesalers, commission agents, retailers and consumers/households. This population has got pre-existing needs that would be increased in case of another severe flood of the Karnali river. These needs are mainly on extension services and agro-inputs, safe collection centre and storage, market information and linkage facilitation and access to finance.

The Geographical Scope

The geographical location chosen for this PCMA exercise on vegetable was the communities residing in the flood plains of Karnali river with big flood impacts. The flood affected VDCs of Karnali and Bardiya Districts are presented in figure-1. The PCMA focused on the Rajapur and Tikapur areas where the team realised most of the interviews individually and in groups with each of the market actors, inputs and support service providers and enablers; in Dakshinshahipur, Bangaun, Bangalipur, Lalpur, Tighra and Chhotkidaulatpur with flood affected communities.

Figure-1: Map of NFRP Programme VDCs/Municipalities in Bardiya and Kailali



Social & Economic Situation

The majority of the target populations are from ethnic and indigenous Tharu community. Although there are heterogeneous communities, Chaudhary/Tharu is the dominant caste in the target area. Most of target population follows Hindu religion; however there are Buddhist, Christian and Islam families among the target communities. The main sources of livelihoods are traditional agriculture including subsistence livestock rearing, agriculture wage labour and remittance. The economy of target population depends on agriculture production & its selling and agro services. In addition, alternative sources of livelihood have been promoted by the NFRP such as bamboo/cane furniture making, vegetables production, food making, carpentry, masonry, electrical wiring, plumbing, veterinary service and tailoring.

Section 4: Market Systems and Season of the Analysis

Market System Selection

The project team had selected the rice and vegetables market system through market selection exercise. PCMA study focusing on Rice Market System had been successfully conducted by the same team in the flood affected areas of Kailali and Bardiya Districts. The reason behind carrying out the PCMA of vegetables is for its significant contribution in the livelihoods of the people in the selected geographic locations. Further to this, the technical and some financial support being provided by NFRP to flood affected communities through Farmers Field School for commercial cultivation of vegetables helped the team in understanding the contribution of vegetables in the livelihood of communities. Vegetables are found to be one of the major sources of regular cash income for the communities. The average yearly income from commercial farming of vegetables is found to be NPR 37,000/- per year.

Table-3: Seasonal Calendars of Vegetables

Vegetables Seasonal Calendar in Kailali and Bardiya Districts																																																				
Season	Summer																Rainy																Winter																Remarks			
Name of Vegetables	Mar				Apr				May				Jun				Jul				Aug				Sep				Oct				Nov				Dec				Jan				Feb							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Cauli Flower/Cabbage																																																	Off-season/Better Price			
Cucurbits*																																																				
Chilli																																																				
Lady Finger																																																				
Cowpea/Asparagus																																																				
Bean/Green Bean																																																				
Tomato																																																				
Radish/Potato																																																				
Functions	Acronyms																																																			
1. Nursery	N																																																			
2. Transplantation	TP																																																			
3. Planting	P																																																			
4. Harvesting	H																																																			
* Sponge Gourd, Bottle Gourd, Bitter Gourd, Pumpkins etc																																																				

* Sponge Gourd, Bottle Gourd, Bitter Gourd, Pumpkins etc.

Source: Agriculture Extension Office, Tikapur and Rajapur

Section 5: Market Maps and Analysis

Overview of Vegetables Market System in Nepal

The vegetable sector has been growing rapidly over the last 10 year in Nepal. The vegetable production increased by an average of 6.9% per annum from 2000 to 2010.³ The demand of vegetables is increasing due to a major shift towards healthy food habit by people living in the country. Vegetables have become an integral part of a balanced diet and provide nutritional security. A result has been an improvement in the financial situation among a majority of small-scale farmers. In 2009/2010, production of vegetable was 3,003,821 MT from an area of 235,098 ha at an average yield of 12.77 MT/ha (MOAC, 2010). Average yield has also increased by 2.2% on average annually (17.7% overall). The vegetables have higher commercialization rates (30-50%) than other crops. Furthermore, Nepal's per capita vegetable consumption has increased from 60 kg to 105 kg over last two decades (MOAC and JICA 2010).

Nepal has a wide range of agro-ecological variation that provides a comparative advantage for the production of different vegetable crops. The production of season and off-season vegetables could be extremely beneficial in the context of nutrition, employment, and income generation. The Agriculture Development Strategy 2015-2035 of Government of Nepal has identified vegetables as one of the prioritized value chain. The integrated interventions on production, marketing and policy/institutional arrangement have been made through value chain development approach for vegetable market system development. The higher return per unit of land, the area, production, and productivity of vegetables is increasing day by day. The vegetable sector contributes more than Rs. 36 billion of value in the country, with cauliflower, tomato and cabbage as the lead contributors with values of Rs. 4.9 billion, Rs. 4.4 billion and Rs. 2.8 billion respectively (CBS, 2010). Smallholders produce almost all vegetables. Nepal Vegetable Crops Survey conducted in 2009/10 shows that vegetable farming is an important source of subsistence for over 3.2 million families (69% of all households) in Nepal. However, 90% of producers own less than 0.5 hectare (ha) of land and grow mainly for subsistence. The 18% producers are growing for the market and only 5% deriving their main income from vegetables (7% in the hills and 4.5% in the Terai). 12% of producers are sustained by vegetable farming (income and consumption) all year round, with a further 37% being sustained for 4-6 months. Vegetables can be grown year-round, including in the off-season for staple crops such as rice, maize and potatoes⁴. This provides an opportunity for increased income and employment generation for smallholder producers through intensifying cultivation of season and off-season vegetables throughout the year.

Existing Scenario of Vegetables Market System in Bardiya and Kailali

As mentioned above the vegetable cultivation in Bardiya and Kailali districts also plays a role for subsistence. Most of the producers in the programme areas grow vegetables for their daily consumptions and their surplus production is sold in the local weekly market. There are still practices of sharing the harvested vegetables with neighbours rather than selling in the market. The demand of vegetables in the areas have been fulfilled by importing from bordering areas of India and hilly areas of Nepal such as Salyan, Dadeldhura, Doti etc. Large numbers of small traders on bicycle from India brings vegetables in the villages and barter with rice and other cereal crops.

After the devastating flood of August 2014, various development agencies including NFRP of Practical Action supported flood affected communities for vegetable farming to enable them to work together to access the market thereby increasing income and employment. This has gradually changing the cultivation practices of target populations from subsistence farming to commercial farming. The programme has so far supported through Farmers Field School 719 HHs

³ HVAP_VCA Report_Off-Season-Vegetables

⁴ SAMARTHA_Rapid-Market-Analysis_Vegetables

for commercial cultivation of various types of vegetables. The support includes soil testing, nursery establishment and management, transplantation, diseases control & treatment, pesticide preparation, pre/post harvesting technologies, grading, group registration, irrigation facilities and linking with agro-vet etc. The commercial production not only achieves self-sufficiency but good potential for import replacement in vegetables. In addition, this will also contribute to food and nutrition security of flood affect communities.

According to the Agriculture Extension Office Tikapur and Rajapur, the areas have loamy soil, which is good for vegetable cultivation. Necessary infrastructure such as road, irrigation facilities are available even though improvements are still required. Similarly, service and inputs providers such as agro-vets, Agriculture Extension Offices, I/NGOs, cooperatives, banking and financial institutions have been providing services and inputs for vegetable production. Small, medium and large-scale producers, farmer groups and cooperatives have been utilizing these inputs and services for vegetable production, which are sold to local consumers, local collectors, wholesalers and retailers. A major challenge to enable targeted populations to gain access to markets is to reliably produce adequate volumes of high quality vegetables to supply to the wider markets. Similarly, higher volume of production requires adequate supply of quality inputs such as seeds, fertilizers, pesticides etc. and technical supports on time, which has to be improved significantly. In addition, facilitation for access to market information, market and finance are also crucial for commercial cultivation of vegetables in the areas.

Table-4: Annual vegetable production by volume and area in two districts

Districts	Households	Total Population	Area under vegetable cultivation (ha)	Vegetable production (MT)	Average yield (kg/ha)
Bardiya	84,207	426,946	4,715	77,250	16,384
Kailali	146,431	770,279	10,035	154,074	15,354

Source: Census 2011 and Statistical Information on Nepalese Agriculture, 2013/2014

Table-5: Annual production of major vegetables by volume and area in two districts

Vegetables	Bardiya			Kailali		
	Area (ha)	Production (MT)	Average yield (kg/ha)	Area (ha)	Production (MT)	Average yield (kg/ha)
Cauliflower	600	14,000	23	290	3,060	11
Cabbage	500	11,556	23	250	5,250	21
Radish	200	7,000	23	450	4,400	10
Asparagus Bean	50	100	2	200	3,000	150
Green Bean	100	500	6	785	12,460	16
Cowpea	100	250	3	150	2,500	17
Tomato	300	7,100	20	300	1,000	3
Chilli	150	1,200	8	348	4,000	11
Potato	4,100	56,300	N/A	6,200	99,600	N/A
Cucurbits	1,157	19,733	18	1,860	31,920	17

Source: Statistical Information on Nepalese Agriculture, 2013/2014

Market Chain: Market Actors, Functions and Linkages

Farmers

There are two types of vegetable farmers i.e. subsistence and commercial farmers in the study areas. Subsistence farmers grow vegetables for their household consumption and sell some surplus in the local weekly market, whereas the commercial farmers sell their produce to local collectors or wholesalers. Farmers are further categorized into three i.e. (i) Smallholders Farmers - with commercial cultivation of vegetables in up to 2 Kathhas of land; 27% of respondent HHs falls under this category, (ii) Medium Farmers – with commercial cultivation of vegetables in more than 2 Kathhas to 5 Kathhas of land; 60% of respondent HHs falls under this category and (iii) Large Farmers – with commercial cultivation of vegetables in more than 5 Kathhas of land; 13% of respondent HHs falls under this category. The history of commercial cultivation in the NFRP areas is not so long. The commercialization of vegetables has recently started and this was, in some areas such as Tigra areas of Rajapur, Bardiya according to farmers even due to the intervention of NFRP. Hence, the number of large and medium farmers is limited. Some farmers have realised the cost benefits of vegetables than other crops, however limited business awareness has hindered the commercialisation of vegetables in the areas. Another key challenge is access to market information and market outside Tikapur and Rajapur. As the vegetables are perishable, they have to be sold as soon as harvested. Farmers highlighted that for vegetables; there are no any set arrangements for marketing based on contract.

Collectors/Wholesalers

Collectors and Wholesalers are the key market actors of the vegetables market system who are involved in trading of vegetables from production areas to the retail markets. As the commercialisation has recently started, the produced quantity is not much lucrative for large collectors. There are three types of collectors i.e. (i) collectors/retailors from Dang, Lamki, Nepalgunj, Salyan, Baitadi and Doti, who directly collect from production areas of Kailali, where comfortable quantities are available. They sell it to retailers or retail themselves. However, their number is limited and due to lack of regular products flow and limitation of quantity, their purchase is not regular; (ii) Collectors/Wholesalers/Retailors from Tikapur and Rajapur also directly collect the vegetables from production areas. Large Collectors/Wholesalers purchase and sell it to local retailers and commission agents that import and export vegetables to & fro Tikapur and other markets such as Dang, Lamki, Nepalgunj, Atariya, Salyan, Baitadi and Doti; and (iii) Small collectors from Rajapur, Tikapur and Bhajani, who collect from smallholder farmers and sell door to door in the market centres themselves. Sometimes they also sell to retailers at the market centres.

The collectors (outside Tikapur/Rajapur) and wholesalers trading activities include: buying and assembling, repacking, sorting, transporting and selling to commission agents/retailors. Their market margin share is about 10-15% after deducting all the costs incurred in above activities including the taxes and transport damage losses.

Commission Agents

There are few commission agents operating in the Tikapur. They supply surplus vegetables specifically off-season vegetables purchasing from the collectors/wholesalers of Tikapur and transport and sell to retailers of the major market centres of mid-hills and other markets (Dang, Lamki, Nepalgunj, Salyan, Baitadi and Doti) as per their demand. Similarly, the commission agent also supply off-season vegetables produced in the mid-hills to the wholesalers/retailors of Tikapur.

Retailers

Retailers are another important actors with close linkages with the collectors/wholesalers and the consumers. Their involvement in the market system includes buying of vegetables, grading, displaying and selling to the consumers. In Tikapur, the retailers are organized informally and support each other in the business. Whereas in Rajapur and Bhajani number of retailers are limited and are not organised, they all conduct their business on individual basis.

Consumers

Consumers with respect to this study are the individual households, government/NGO staffs, hotels, army and police who buy and consume season and off-season vegetables.

Infrastructure, Input Suppliers and Support Service Providers

Infrastructure, Input Supplies and Support Services are crucial for well-functioning of any market systems. Each of market actors have their own requirement of inputs and support services.

Infrastructure: Most of the NFRP programme areas are connected with black topped or all seasoned road. Mobile network of major mobile service providers are also available in the areas. Most households have got access to mobile phones. Further to this, most of the programme areas have irrigation facilities through Rani Jamara Kulariya Irrigation Project and Budikulo Irrigation Project. However, there is a lack of sufficient water during the dry season. Farmers are supported for installation of boring facilities for irrigation by Agriculture Extension Offices and various development agencies operated in the areas including NFRP.

There are no facilities for storage of vegetables at local level. Actually, most of the vegetables cannot be stored for long time. However, potatoes are being stored in the cold storage of Mahendra Nagar, Dhangadi and Kohalpur by farmers for seed. They are fetching good price of stored potatoes, while selling as seed in the planting season. Potatoes of the Bardiya districts are transported and stored in the Kohalpur, whereas potatoes from Kailali districts are transported and stored in the cold storage of Mahendra Nagar and Dhangadi.

Input Supplies: Required inputs such as fertilizers, pesticides, poly bags and agriculture equipment are sold to farmers in the areas by private agro-centres, cooperatives and utensil shops (pipes, carets, plastics for tunnelling etc.). Cooperatives purchase fertilizers from Agriculture Inputs Company Ltd. of Government of Nepal and distribute to farmers directly or through local agro-centres. The fertilizers are traded in cash by cooperatives. However, cooperatives provide to their members in credit as loans. Sometimes cooperatives are unable to provide fertilizers timely due to delay in availability of fertilizers by Agriculture Inputs Company Ltd.

The encouraging aspects in the input supplies and small agriculture equipment is that the Agro-Centres are not only supplying agro-inputs and equipment but also providing technical supports for proper use of fertilizers and pesticides to farmers as an embedded service. Most of the transactions with farmers are in cash. However, they provide in credit as well to the reliable farmers.

In terms of mechanisation of agriculture, some of the lead farmers have bought Tiller Machine, which they rent to other farmers at the rate of Rs. 300/- per Kathha. It is cheaper and efficient than using the Oxen for field preparation and also address the shortage of labour. The Tiller Machine has business for throughout the year and good return as well. However, lead farmers are unable to access loan facilities from banking and financial institutions in the areas due to lack of financial literacy and access to bank.

In addition, Agriculture Extension Offices and development agencies have been providing agro-inputs to farmers as grants or in subsidy to farmers of the flood affected areas. The extension services are also being provided by both organisations in the areas.

Banking and Financial Services: Numbers of banking and financial institutions (BFIs) are available in Bardiya and Kailali districts. However, their presence is limited to the district headquarters and key market centres only. The numbers of BFIs in the key market centres such as Rajapur, Tikapur and Chisapani have been increased in recent year. Commercial Banks, Development Banks, Finance Companies and Micro-Finance Institutions are providing banking and financial services from Tikapur and Rajapur in the NFRP project areas. It is found that the access of flood affected communities to BFIs is very limited. It is due to lack of financial literacy. And, BFIs are not much interested to provide loans in the agriculture sectors and especially in the flood affected areas as they see agriculture as risky sector for lending. Their financial needs are being

catered by local saving and credit cooperatives/groups and largely by the local lenders. In some areas, micro finance institutions have been providing loan to farmers without physical collateral i.e. in group guarantee however the interest rate is very high.

Commercial Banks: Nepal Bank Ltd., Nepal SBI Bank Ltd., Sidhartha Bank Ltd., Agriculture Development Bank Ltd, Bank of Kathmandu Lumbini Ltd., etc. are the key commercial banks being operated in the Rajapur and Tikapur areas. However, their loan offer in the agriculture sector is limited to the processors and traders level in their vast majority. A few loans have been attributed to farmers but it is also for poultry, banana and livestock, and to large farmers only. Central Bank of Nepal has recently issued the directives to Commercial Banks for compulsory 2% direct lending in the agriculture sectors. It is expected now commercial banks will start lending in the agriculture sectors. Some commercial banks have already shown their interest to collaborate with NFRP in agriculture lending.

Bank of Kathmandu Lumbini Ltd. (BoK) with the support of DFID funded SAKCHYAM-Access to Finance Programme has recently established the branch in Rajapur. The BoK has been offering two different types of loan products to farmers i.e. (i) Overdraft to Farmers – This loan is for cultivation of agro-products (Purchase of inputs, Labour cost etc.). The payment of such loan is made by farmers after harvesting only; and (ii) Term Loan – Maximum 4 Hundred Thousand Rupees up to maximum period of 3 years. The payment can be scheduled as per the cash flow of the farmers.

Global IME Bank Ltd. (Global) in collaboration with SAKCHYAM Access to Finance Programme has provided post-harvest loan in rice market system through its Guleriya Branch in Bardiya district. The flood affected communities were among the targeted population in the areas. The loan was provided against receipt issued by the warehouse. However, it did not work as expected.

In addition, Global offers special loan products of maximum of Five Hundred Thousand Rupees for a period up to 5 years. The interest rate is from 6% to 12% according to agriculture commodities and targeted population. The payment can be scheduled as per the cash flow of farmers and the service can be delivered from Guleriya branch.

Micro-Finance Institutions: Micro Finance Institutions such as Nirdhan Utthan Bank Ltd. and United Youth Community Nepal (Unique Nepal) are operating in the study areas. They are providing loan to farmers on the group guarantee provision. No physical collateral is required. Their loans in agricultural sectors are for the purchase of agro-inputs and cultivation of vegetables and rice. However, the interest rate of micro-finance institutions is more than the double compared to commercial and development banks. Some of the flood affected communities are already members of these institutions and have access to loans. Nirdhan Uthan Bank Ltd. has shown interest in collaborating with the NFRP for extending their services to other flood affected communities as well complying with their existing procedures. Whereas Unique Nepal is a partner micro-finance institution of SAKCHYAM Access to Finance Programme also working on financial literacy in the Kailali district. There are opportunities to work with Unique Nepal as the discussion with SAKCHYAM is underway for potential collaboration.

There are a few issues with financial services provided through micro-finance institutions such as the duplication of loans' taking (membership of various micro-finance institutions and cooperatives taken by a same person who contracts loans from all of them), misuse of loan and repayment of loan by borrowing loan again from local money lenders as the repayment schedule is impractical.

The Business Enabling Environment – Enablers, Policy Framework, Rules and Regulations

In market systems, movement of a product or services along its chain are either facilitated or hindered by norms and customs, laws, regulations, policies, international trade agreements and public infrastructure. The business enabling environment at the national and local level includes policies, administrative procedures, enacted regulations and the state of public infrastructure. In addition to these more formal factors, social norms, business culture and local expectations can be powerful aspects of the business enabling environment.

The existing government policies and regulations are conducive for vegetables market system development. The government of Nepal has identified vegetables as one of the prioritized value chain in its Agriculture Development Strategy 2015-2035. The government with the support of various donors and development partners have been implementing value chain development programme on vegetables in many districts of Nepal such as High Value Agriculture Project (HVAP), Rising Income for Small and Medium Farmers (RISMPF), High Mountain Agribusiness and Livelihood Improvement (HIMALI) Project, Project for Agriculture Commercialization and Trade (PACT), Nepal Agriculture and Food Security Project (NAFSP) and several regional agriculture development projects. The integrated interventions on production, marketing and policy/institutional arrangement have been made through value chain development approach for the promotion of vegetables. Further to this, Government institutions such as the Agribusiness Promotion and Marketing Development Directorate (ABPMDD), the Vegetable Development Directorate (VDD), the Nepal Agricultural Research Council (NARC) and the Department of Cooperatives (DoC) are working for development of market infrastructure, capacity development of stakeholders for collective effort through cooperatives, dissemination of technical knowledge and skills and technologies, research and distribution of improved seed varieties and planting materials in vegetable farming.

The level of physical infrastructure in the region has been improving in the recent years. Some irrigation systems are in place in the NFRP areas. Some embankments are now under construction. They have a high potential in reducing the impact of floods at the farm and household level and can protect the most vulnerable fields from severe flooding of the Karnali River. Two new bridges have been inaugurated in two branches of the river, one on the left branch that connects Rajapur to district headquarter and another one on the right branch of the river, now creating a rapid connection between the Municipalities of Tikapur and Rajapur, traditionally referred to as “Rajapur Island” because of the isolation of the Municipality located between two arms of the river. Economic growth and business opportunities expansions are expected Rajapur Municipality in the next years.

The Chamber of Commerce and Industries of Tikapur and Rajapur has been supporting for market development by facilitating in managing weekly markets and market linkages. In collaboration with World Vision International, they organized exposure visits for collectors/wholesalers/commission agents to the major market centers of Nepal and organized business to business interactions with the traders of these market centers recently. Regular policy advocacies have been done with local governments such as District Development Committees, Village Development Committees and Municipalities to allocate resource for the promotion of vegetable markets such as management and development of necessary infrastructure for weekly markets at local level. Various capacity development activities including dissemination of agro-equipment and irrigation system to farmers have been carried out in collaboration with local governments and development agencies.

Various development agencies and their programmes are on-going in the areas such as Knowledge-based Integrated Sustainable Agriculture and Nutrition Project (KISAN), World Vision International, Kamaiya Mahila Jagaran Samaj etc. Most of them are supporting for vegetable farming in the areas. Similarly, SAKCHYAM Access to Finance programme have been working with Bank of Kathmandu and Unique Nepal for increasing access to financial services to farmers in the areas. However, there is no coordinated effort for synergic results. The collaboration among development partners along with Banking and Financial Institutions and Agriculture Extension Office found to be crucial for avoiding duplication and for the meaningful contribution in vegetable market system development.

In spite of favorable conditions for the vegetables market system to develop, the vegetable production has not yet been commercialised in the areas. Most of the farmers are engaged in subsistence farming of vegetables for their household consumption. Only surplus productions are sold to weekly local market. There is growing awareness of the benefits of commercial farming of vegetables to the farmers. The increasing number of farmers and land size for commercial vegetables farming in the areas clearly demonstrate the commercial orientation of farmers. However for commercial production, farmers have identified the lack of access to other markets is challenging. Sometimes farmers even have to let their produce go to waste due to lack of consumption in local markets. This contradicts the information collected among the collectors/wholesalers/retailers who reported that low volumes and irregular production were major challenges rather than the market for vegetables. Collectors/Wholesalers do not always get a full load to pickup truck in the village. Hence, the transport is often done by motorbike and the maximum collection volume is 30-40 kg from a number of farmers at a time. Due to limited quantity and irregular supply wholesalers have to import from India and other major markets including mid-hills of Nepal to fulfill the local demand. The encouraging fact is that collectors/wholesalers have also already started to export vegetables to the markets of mid-hills such as Salyan, Dadeldhura, Doti and other major markets such as Lamki, Atariya and Nepalgunj as well even in low volumes. They are confident that they will be able to produce enough to substitute their production to the current imports, and also be able to export vegetables in these markets. They are even ready to sign contractual agreement with farmers for seasonal and off-season vegetables. Their suggestion is to focus on off-season vegetables so that farmers have comparative advantage and can fetch better price. This requires intensive awareness programme and technical assistance at farmers' level to produce marketable volume.

Gender Equality

According to MOAC 2009, 72.8% of economically active (age 10 and over) women are engaged in agricultural work compared to men's 60.2%. Women play a significant role in all the various stages of crop production, processing and preparing for markets. In the study areas, women chiefly perform tedious and time-consuming work such as planting, weeding, harvesting, threshing, and milling, whereas men generally perform tasks that require heavy physical labor such as ploughing. Most of the men in the areas are abroad most of the time in the year for additional income, but they come back during the cultivation and harvesting seasons to support women. 74% of responded farmers said that their males were abroad for additional income. Women's access to extension services, institutional credit, or production inputs is limited but is gradually increasing. Similarly, access to market is directly linked with income; women are mostly deprived with such opportunities. Since men are abroad most of the time, women are involved in buying and selling of vegetables. Even though women have access of marketing and income, decision-making on expenditure of savings are mostly done by men.

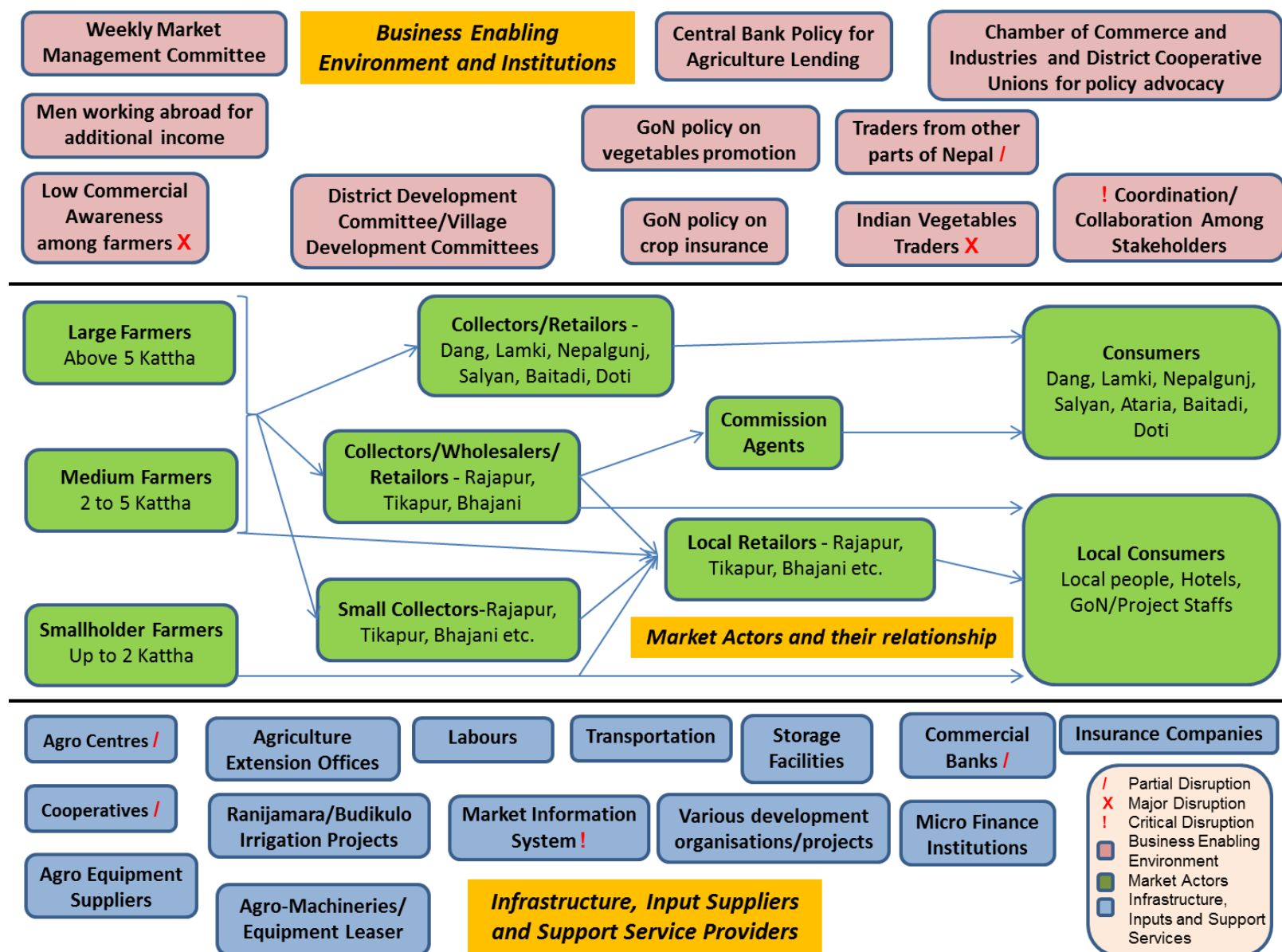
Issues/Challenges and Opportunities

Based on the vegetable market analysis conducted in the field, key issues/challenges and opportunities for vegetable market system development in NFRP area are highlighted in the table below.

Table-6: Issues/Challenges and Opportunities

Issues/Challenges	Opportunities
<ul style="list-style-type: none"> ▪ Lack of awareness and confidence on benefits of commercialization of vegetables at farmers level, ▪ Limited access to external/bigger markets due to low volume and quality, ▪ Limited practice of off-season vegetable farming, ▪ Lack of vegetable collection centres, ▪ Limited access to finance from banks and financial institutions due to lack of financial literacy, ▪ Lack of market information, ▪ Limited access to agriculture extension services, ▪ Limited irrigation facility, ▪ Limited availability of workers as most of the male goes abroad for work, ▪ High production cost that cannot compete with vegetables supplied from India and other areas of Nepal, 	<ul style="list-style-type: none"> ▪ Loamy soil – best for vegetable cultivation, ▪ Higher return than any other crops cultivated in the areas, ▪ Farmers are gradually realizing the benefits of commercial production of vegetables after intervention through Farmers Field School, ▪ Increase interest of banks and financial institutions to collaborate with development projects and programs. The Central Bank directives have compelled commercial banks to lend 2% in agriculture sector directly. The interest rate will be lower than of local money lenders and micro-finance institutions, ▪ Well managed weekly market throughout the week in the nearby major market centers for selling vegetables in retails, ▪ All seasoned road and transportation facility and nearby major markets such as Nepalgunj, Lamki, Dang, Kohlpur and Atariya and mid-hills, ▪ Availability of agro-centres and cooperatives that provide embedded technical support in purchase of agro-inputs, ▪ Already practice of exporting surplus vegetables in the mid-hills and other key markets such as lamki, Atariya, Dang, Kohlpur and Nepalgunj, ▪ Collectors/Wholesalers are ready to have contractual agreement with farmers for buy back guarantee of the vegetables, if produced exportable volumes in good quality, ▪ Access to mobiles in each households for providing necessary market information, ▪ Numerous development agencies including GoN agencies supporting for commercialization of vegetables in the areas,

Figure-2: Market Map of Vegetable Market System during Non-monsoon Time (August 2016)



Impact of Monsoon on Vegetables Market System in August 2014

Overall Market Scenario

The NFRP communities were severely affected by the August 2014 flood. Many people had to abandon their homes for an average of 3 days; some for up to a month and some people could not still return to their homes due to the flood vulnerability. The flood has also affected the vegetable market system in Bardiya and Kailali districts to varying degrees. The NFRP areas were more affected as the planted/ready to harvest vegetables and saplings of vegetables were completely damaged. The vegetables market in Rajapur and Tikapur were partially functional during and in the aftermath of floods. The supplies of vegetables in these markets were managed from India and other parts of the districts or outside the districts. The local production and supply was completely disrupted for more than 3 months. The price of the vegetables increased and hence the demand was decreased by 50% as per the local wholesalers and retailers. Similarly, communities have developed the practice of eating dried vegetables during the monsoon period as in most of the areas vegetables cannot be grown due to water logging. They ate dried vegetables during and after the floods. However, there is no such study report available on the impact of August 2014 flood on vegetables supply and demand in the areas

Impact at Farmers Level

The farmers, the Agriculture Extension Officer and agro-centres reported during KIIs and FGDs that the vegetable crops were completely damaged due to the flood. In Bardiya district only, cultivated vegetables in 7 hectares were completely damaged (*Area Report 2014, Area Administration Office, Rajapur*). During the flood time the major cultivated vegetables were cucurbits, which cannot bear excessive water. Losing cucurbits had directly affected their cash income. In addition, farmers lost their saplings prepared for transplantation for the next season. As 92 HHs could not return back to their home before a month and 55 HHs even could not return back at all and are in a shelter of Ekatnagar, Tikapur, the cultivation of vegetables were severely decreased. The families who were able to come back were also engaged in renovation of their houses for some time. Further to this, the flood also damaged the stored fertilizers and pesticides as well as agro-input suppliers. There was shortage of agro-inputs for more than a month. The regular supply of agro-inputs was maintained after couple of months only. This also hindered the cultivation of vegetables and hence the local supply.

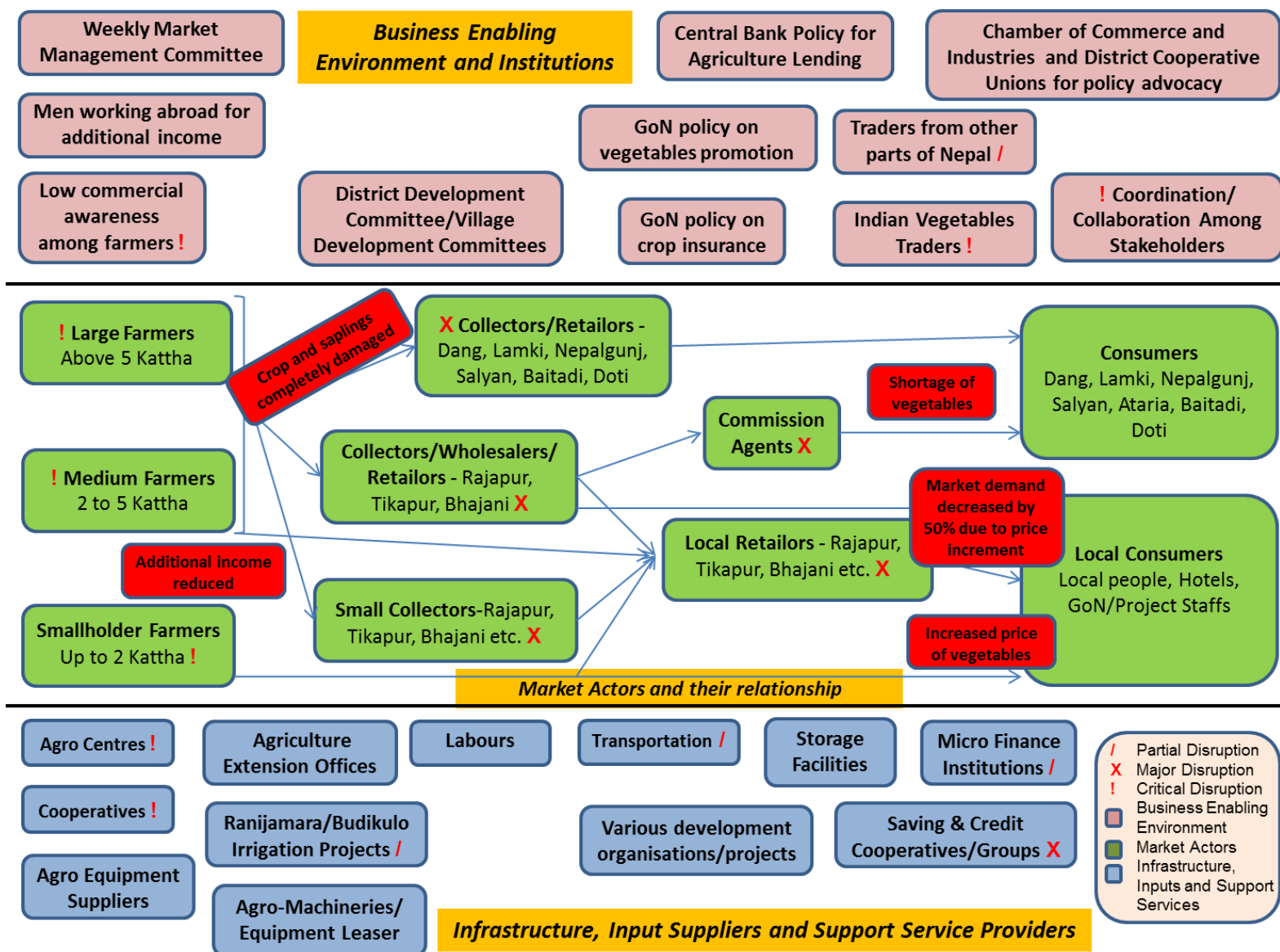
Impact at Trading Level (Collectors/Wholesalers/Commission Agents/Retailers)

The analysis reported that the local collections of vegetables were completely disrupted for more than three months from the flood affected areas. The supply of vegetables in Rajapur and Tikapur was managed from India and mid-hills of Nepal. However, as the Indian and mid-hills traders knew about the impacts of the flood in the study area, they significantly increased the price of vegetables. This has resulted in a decrease of demand by 50%. Another fact expressed by the wholesalers and retailers was the moral pressure they went through because of this price hike. They have been doing their business for many years and will continue in the future too. In such devastating situation, it was difficult for them to import and sell vegetables at an increased price. The business of commission agents were also significantly reduced as their business became one way (no export from the areas, only import from outside) for couple of months before supply of local vegetables started.

Impact on Infrastructure

The 2014 flood is representative of the kind of impacts that another similar severe flood could have in the study areas in terms of infrastructure. In August 2014, the roads were impassable for 3-5 days, but returned to normal after the flood receded. The import of vegetables from Indian markets immediately started after the flood but it took some time to continue from the mid-hills area. The flood affected communities outside the market centres cut off for up to 2 weeks. This made them rely on stored dried vegetables or neighbours' solidarity for vegetables. Further to this, the two major irrigation projects were partially damaged.

Figure-3: Market Map of Vegetable Market System during Flood Time (August 2014)



Emergency Response

Market Response

There was not any organized market response in the vegetables market system during and aftermath of floods.

Emergency Response Programme

In response to the August 2014 flood, the local Red Cross organised the distribution of food and non-food items⁵. All other organisations channelled the distribution of relief items through the Red Cross: the World Food Programme (WFP), the Government and other NGOs. The PCMA team met the Rajapur Island Red Cross team who recognised that they had distributed in the aftermath of the 2014 flood up to 6 times more than was actually needed. This proved to have had a major impact on the local demand for food items and the income generation for local food items producers.

The Government supplied food and non-food items coming from local markets; but relief activities provided by other organisations used food and non-food items coming from outside.

Recovery Activities

After the flood receded, the Agriculture Centre in Tikapur provided 600 households with hybrid seeds via arrangements with cooperatives. The farmers indicated that seeds were only distributed to organised smallholder farmers. This emergency response was funded by the central government.

In the next year of flooding during rice planting season and in other seasons, District Agriculture Development Office (DADO) of Bardiya District, through the Agriculture Extension Office distributed NPR 35 million worth of seeds, mostly for vegetables in the next season and the later.

According to the discussion with DADO in both Rajapur and Tikapur area, the government agencies (DADO in particular) provide seeds and technical supports including distribution of irrigation equipment through farmers' groups registered to them and cooperatives. Therefore, organized farmers and linked to cooperatives are more likely to get support after emergencies than not connected. It was impossible during the PCMA exercise to collect available information on the number of farmers who benefitted from this relief programme.

⁵ Information about relief distribution by the Red Cross were not made available at the time of the PCMA study or in secondary data analysis.

Section 6: Main Response Recommendations

The PCMA indicates that farmers are in shortage of cash during monsoon season due to substantial investment in paddy cultivation. There is a practice of borrowing credit as an advance payment from Kantawallas against the next delivery of paddy later in the season in order to fulfil their household needs during the monsoon and festival seasons. Kantawallas give as a reference the price fixed by the Nepal Food Corporation or a price set in October-November (harvesting season). Often farmers lose out because the price set up in advance is actually lower than the current market price when the farmers request this advance payment a few months later. Further to this, the report shows that lack of cash for purchasing food was one of the identified major constraints during and aftermath of floods in 2014 (Draft Rice PCMA Report, NFRP). Thus, it is crucial for farmers to have regular cash flow to become more resilient to farmers.

As evidenced above, there is a huge potential for vegetable market system development in the study areas, which can be instrumental for increasing income and employment of flood affected communities. This would be a critical factor to ensure a more regular cash flow, which would make them more flood resilient. The harvesting of any vegetables crops start lately by 60 days after plantation/transplantation (earlier than paddy and cereal crops). Similarly, some crops like cucurbits can be harvested regularly for 3 months. Various report shows that the return from vegetables especially off-season vegetables is higher than other crops. In addition, there is also a good practice among local communities of storing dried vegetables before the monsoon, which they eat during the heavy monsoon and flood time. Most of the study areas are affected by water logging during the monsoon, if it rains continuously for more than 2 days. **Commercial production will enable them to store more dried vegetables, which helps them during heavy monsoon or flood time.**

In addition, most of the men are abroad majority of time in a year for labour work. Women are responsible for managing day to day activities in the farms after managing the household activities. There is not much time available for them to engage in other activities. **Hence, it is worth to enhance their capacity for commercialisation of vegetables rather than engaging in other income generating activities since NFRP has been already initiated to support farmers through Farmers Field School.** Further to this, it is challenging to provide support to numbers of individuals engaged in diverse income generating activities. This requires massive financial and human resources to achieve the results.

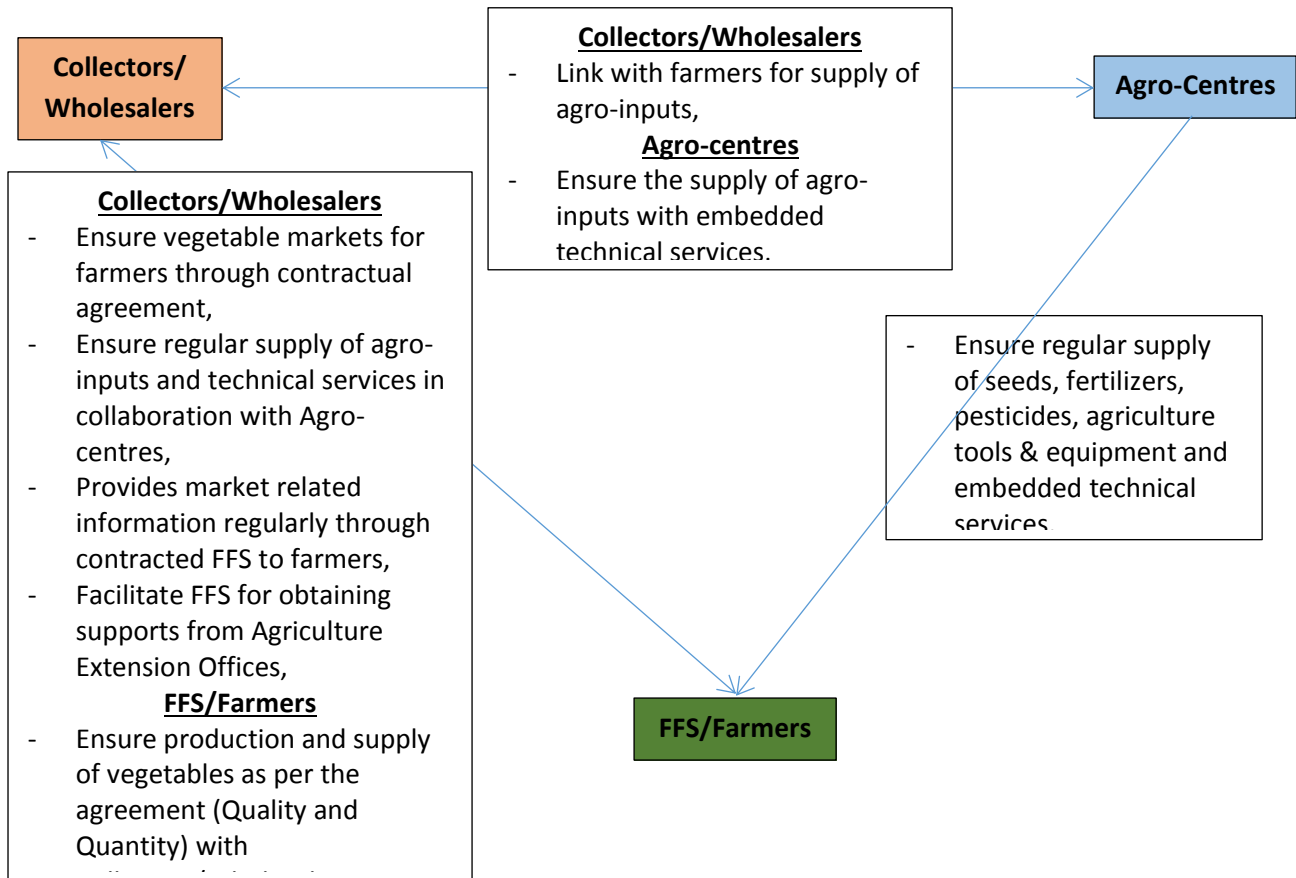
The analysis also evidenced that the vegetables market system in the NFRP areas was affected and there are possibilities to be affected in the future too. **Minimising disruption to vegetable production and supply is critical for maintaining the regular cash flow in the communities as the vegetable farming is becoming regular source of cash flow for farmers after the labour work at local level and abroad. Hence, the assessment indicates a need for short-term and long terms interventions to strengthen vegetable market system.** Potential areas for response are presented below. Further analysis would be needed to assess the feasibility and exact mechanisms behind these interventions prior to uptake. Consultation and collaboration with concerned stakeholders including Government, private sectors, BFIs, I/NGOs engaged in promotion of vegetables in areas is important when considering implementing interventions.

Table-7: Interventions

Short to Medium-Term	Long-term
<p>Enhance the services of Farmers Field School (FFS)</p> <ul style="list-style-type: none"> - Increase the outreach of FFS to a higher number of farmers as it is currently serving a limited number of farmers (18-25), - Create business awareness among member farmers and other farmers in the communities about the benefits of commercial vegetable farming, - FFS members work collectively for production and marketing of vegetables to comply with the quality and quantity required by the buyers, - Link with agro-centres for regular supply of seeds, fertilizers, pesticides and other agro-inputs together with technical services, - Link with Agriculture Extension Offices to obtain support provided by the offices, - Develop FFS as a resource centre for technical services and market related information, - FFS members can act as a group for micro-finance institutions for financing on group guarantee, - Support lead farmers to act as a change maker for necessary mechanisation in vegetable farming for addressing the labour shortage. The mechanisation with help in paddy as well, - Support for irrigation facilities in the required areas, <p>Note: <i>Currently the services of FFSs are limited to technical support only,</i></p>	<ul style="list-style-type: none"> - Graduate FFSs as farmers' cooperatives for its sustainability,
<p>Collaboration with Agro-Centres</p> <ul style="list-style-type: none"> - Help agro-centres to link with FFS and their members for regular supply of fertilizers, pesticides and other agro-inputs together with embedded technical services, - Provide necessary business development services to agro-centres that collaborates with FFS and their members, <p>Note: <i>Some agro-centres have already started providing technical services to farmers as an embedded service with purchase of agro-inputs,</i></p> <p>Collaboration with traders (Collectors/Wholesalers)</p> <ul style="list-style-type: none"> - Collaborate with traders to ensure the market for produced vegetables by farmers, - Support traders in maintaining their supply 	<ul style="list-style-type: none"> - Engage traders and agro-centres collaboratively for supply of fertilizers, pesticides and other agro-inputs and providing technical support to farmers including marketing of produced vegetables,

<p>chain from farmers,</p> <ul style="list-style-type: none"> - Provide necessary business development services (Linking with BFIs, Business Plan development, Business Management etc.) to traders that collaborates with FFS and their members, <p>Note: <i>Collectors/Wholesalers are ready for signing the contractual agreements with farmers for buy-back guarantee. Provided farmers are ready to produce the required quantity and quality.</i></p>	
<p>Collaboration with Banking and Financial Institutions for access to finance</p> <ul style="list-style-type: none"> - Collaborate with SAKCHYAM Access to Finance Programme of DFID to ensure access to finance for farmers through their partner banks and micro-finance institutions, - Identify the exact financing needs of market actors, their cash flow and status of collaterals, - Collaborate with SAKCHYAM Partner Bank i.e. Bank of Lumbini Kathmandu and Global IME Bank to identify the appropriate and viable financing products and models for financing vegetable farmers. Same can be applied for rice as well, - Collaborate with Nirdhan Uthan Bank and SAKCHYAM Partner Micro-Finance Institute i.e. Unique Nepal for financial literacy and financing farmers on group guarantee, <p>Note: <i>The interest rate of commercial banks will be more than 50% cheaper than micro-finance institutions. However, physical collateral is required for them. Hence, value chain financing products need to be identified in collaboration with BFIs. Bank of Kathmandu Lumbini Ltd. in collaboration with SAKCHYAM Access to Finance Programme has already interested to collaborate with NFRP to finance flood affected communities.</i></p>	<ul style="list-style-type: none"> - Graduate FFSs and existing farmers groups as farmers' cooperatives and link with banking and financial institutions,
<p>Encourage farmers for Agriculture Insurance</p> <ul style="list-style-type: none"> - Collaborate with Nepal Insurance Company, National Insurance Company and United Insurance Company operated in the far-western and Agriculture Extension Offices for creating awareness about vegetable crops insurance and linking with insurance companies to farmers, <p>Note: <i>GoN bears 75% of premium as grant for farmers,</i></p>	

Potential intervention model for strengthening vegetables market system:



Section-7: Monitoring and Updating the Results

Regular monitoring of the vegetable market system and updating its results are crucial for ensuring the relevance of the present findings and recommendations. In addition, it is to make sure that they are adjusted, if the situation evolves. The monitoring of the vegetables market system aims to identify any major changes in the market functions over the time in order to keep the findings and recommendations up to date.

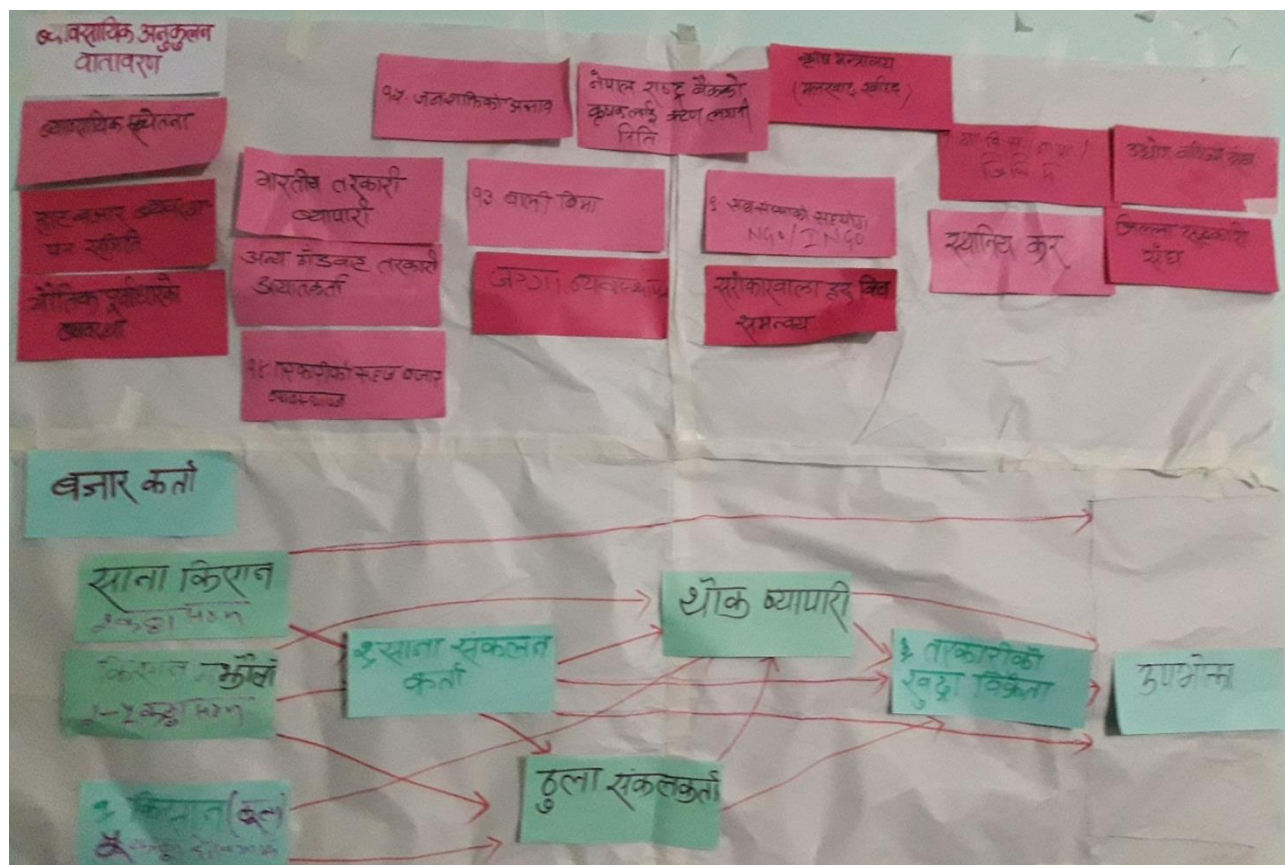
It is recommended to involve the Local leaders/government/other development actors including Chamber of Commerce and Industry to the extent possible. The mechanism should be developed in close collaboration with local government, Agriculture Extension Office, I/NGO and Chamber of Commerce and Industry for ensuring the regular data updates as well as to follow up monthly on the on-going monitoring results and to discuss needs for adjustments to findings and recommendations. It is also recommended to appoint a dedicated person to oversee data compilation and analysis. This can be from private sector organization such as Chamber of Commerce and Industry. The indicators in the monitoring plan should be checked against data that are already being collected by other agencies for avoiding duplication in the efforts.

Table-8: Vegetable Market System Monitoring Plan

Types of Indicators	Indicators	Monitoring Time	Informant	Method for Data Collection
HH Level	HH cultivation of vegetables	Quarterly as per the season	<ul style="list-style-type: none"> FFSs and their members Agriculture Extension Offices or Agro-centre 	<ul style="list-style-type: none"> Meeting with FFSs and their members Telephone calls
	HH production of vegetables			
	HH access to market			
	HH income level			
Market System Level	Number of collectors/wholesalers collecting vegetables from targeted population	Monthly	<ul style="list-style-type: none"> Chamber of Commerce and Industries 	<ul style="list-style-type: none"> Telephone calls
	Vegetables exported from the NFRP areas	Monthly	<ul style="list-style-type: none"> FFSs and their members Chamber of commerce and Industries, collectors/wholesalers/ commission agents 	<ul style="list-style-type: none"> Telephone calls
	Vegetables imported from India and outside the districts in the major market centres of NFRP programme areas	Monthly	<ul style="list-style-type: none"> Chamber of commerce and Industries, wholesalers/ commission agents/ Retailers 	<ul style="list-style-type: none"> Telephone calls
	Price trends of vegetables in wholesales	Monthly	<ul style="list-style-type: none"> Chamber of commerce and Industries, 	<ul style="list-style-type: none"> Telephone calls
	Number of market actors received loan	Quarterly	<ul style="list-style-type: none"> Bank staffs (Credit Department) 	<ul style="list-style-type: none"> Telephone Calls
	Price trends of vegetables in retail market	Monthly	<ul style="list-style-type: none"> Chamber of commerce and Industries, Retailers 	<ul style="list-style-type: none"> Telephone calls
Market Place Level	Number of BFIs providing loan to HHs	Quarterly	<ul style="list-style-type: none"> Bank Staffs (Credit Department) 	<ul style="list-style-type: none"> Telephone calls

Annexes

Annex-1: Preliminary Market Map



Annex-2 : List of KIIs and FGDs

S.N	Name of Key Informants	Organisation	Address	Position	Contact Number	Remarks
Farmers						
1.	Ms. Somati Chaudhary		Tigra-6, Rajapur			
2.	Ms. Laxmi Tharu		Tigra-6, Rajapur			
3.	Ms. Ajita Tharu		Tigra-6, Rajapur			
4.	Ms. Janaki Kulrani Tharu		Suryapatuwa-6, Bangalipur			
5.	Ms. Sita Tharu		Dhansinghpur-2, Bangaun			
6.	Mr. Fularam Tharu/Ms. Musiya Tharu		Suryapatuwa-6, Bangali Tole			
7.	Ms. Sarita Chaudhary		Dhansinghpur-2, Bangaun			
8.	Mr. Budhiram Chaudhary		Dhansinghpur-2, Bangaun			
9.	Ms. Dongli Tharu		Suryapatuwa-6, Bangali Tole			
10.	Ms. Fulkumari Chaudhary		Khairichandanpur-1, Lalpur			
11.	Ms. Pramila Chaudhary		Khairichandanpur-1, Lalpur			
12.	Ms. Sita Chaudhary		Khairichandanpur-1, Lalpur			
13.	Mr. Tusli Ram Chaudhary		Tikapur-2, Dakshin Saipur			
14.	Ms. Fulbasni Tharu		Tikapur-2, Dakshin Saipur			
15.	Mr. Balbahadur Khatri		Tikapur-2, Dakshin Saipur			
Commission Agents/Wholesalers/Retailers						
1.	Prem Bahadur		Tikapur	Retailer	9448534295	

	Chaudhary					
2.	Holi Chaudhary		Tikapur	Retailer	9811644244	
3.	Parsu Chaudhary		Tikapur	Retailer	9848499750	
4.	Shila Chaudhary		Tikapur	Retailer		
5.	Daya Shankar Chaudhary		Tikapur	Retailer		
6.	Motiram Chaudhary		Tikapur	Wholesaler/Retailer		
7.	Sanu Sekh		Rajpur	Wholesaler/Retailer	9848113530	
8.	Kishan Chand (Bambaiya)		Rajapur	Retailer	9822563305	

8Banking and Financial Institutions

1.	Mr. Dharma Raj Devkota	Sidhartha Bank Ltd.	Tikapur	Credit Officer		
2.	Mr. Anjani Subedi	Bank of Kathmandu Lumbini Ltd.	Tikapur	Branch Manager	985111965	
3.	Mr. Dip	Nirdhan Utthan Bnak Ltd.	Rajapur	Account Officer		
4.	Mr. Raju Shrestha	Bank of Kathmandu Lumbini Ltd.	Kathmandu	Head Development Credit Unit –	9851132319	
5.	Mr. Rupendra Wagle	Global IME Bank Ltd.	Kathmandu	Head – Retail Banking	9851024190	

Enablers

1.	Mr. Ananda Hamal	Tikapur Chamber of Commerce and Industry	Tikapur	Chairperson		
2.	Mr. Dipen Man Singh Pradhan	SAKCHYAM Access to Finance Programme	Kathmandu	Bank Partnership Advisor	9801074586	
3.	Mr. Nirmal Dahal	SAKCHYAM Access to Finance Programme	Kathmandu	Deputy Team Leader	9841202583	
4.	Ranju Acharya	Tikapur Municipality	Tikapur	Administrative Officer	091-560118	

Support Service Providers						
1.	Mr. Gauri Shankar Gupta	Agriculture Extension Office	Tikapur	Extension Officer	9749050200	
2.	Mr. Ishor Nath Tripathi	Agriculture Extension Office	Rajapur	Extension Officer	9748515047	
Input Suppliers						
1.	Mr. Bharat Chaudhary	Rajapur Cooperative Ltd.	Rajapur	Accountant		
2.	Mr. Santa Ram Tharu	Sikha Agro-vet Centre	Rajapur	Proprieter	98480642	

Annex-3 : Tools for Data Collection

1. KIIs for Farmers
 2. FGDs for Farmers
 3. KIIs for Collectors, Wholesalers and Retailers
 4. Checklist for Support Service Providers and Enablers
- (All files are attached as PDF)*

Annex-4 : Some Pictures of PCMA



Focus Group Discussion with Farmers



KII with Farmer



NFRP supported farmer ready for market



Vegetable Nursery



An Agro Centre at Rajapur



NFRP supported Boring Water Facility