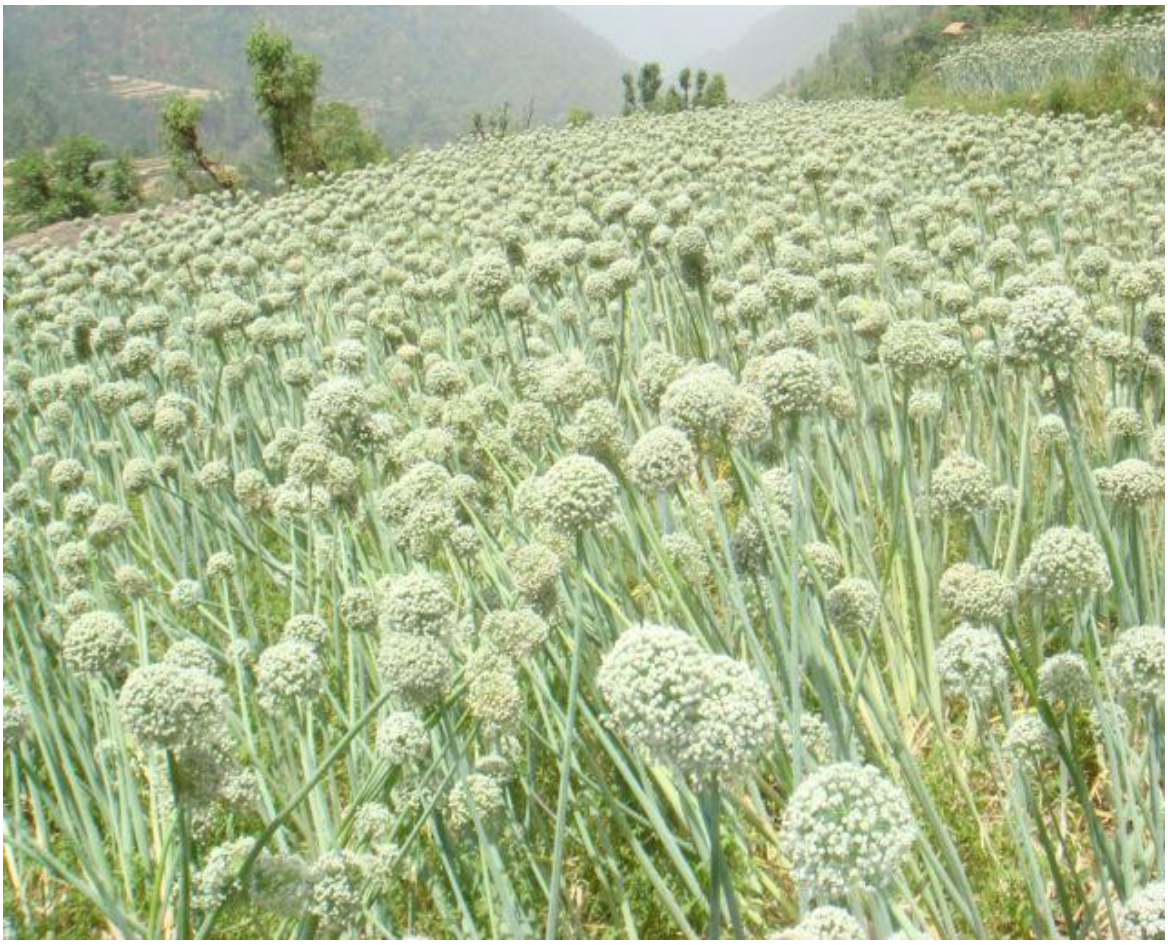
MARKET ACCESS AND VEGETABLE SEED PRODUCTION
A CASE OF VEGETABLE SEED PRODUCTION IN NEPAL



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Research Report for a M.Sc. Thesis (MST 80433 – 33 ECTS)
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Suresh Baral

Acronyms

AEC:	Agricultural Enterprise Cooperation
AFC:	Agricultural Fertilizer Cooperation
AGDP:	Agricultural Gross Domestic Product
CBED:	Community Based Economic Development
CBS:	Central Bureau Statistic
CIDA:	Canadian International Development Agencies
CIMMYT:	International Maize and Wheat Improvement Centre
DADO:	District Agricultural Development Office
DDC:	District Development Committee
DOA:	Department of Agriculture
FAO:	Food & Agricultural Organization
FNCCI:	Federation of Nepalese Chambers of Commerce and Industry
GoN:	Government of Nepal
HVAP:	High Value Agricultural Product
IFAD:	International Fund for Agricultural Development
IRRI:	International Rice Research Institute
ISTA:	International Seed Testing Association
KISAN:	Knowledge-Based Integrated Sustainable Agriculture and Nutrition Project
LI-BIRD:	Local Initiatives for Biodiversity, Research and Development
MCPR:	Ministry of Cooperative and Poverty Reduction
MOAC	Ministry of Agricultural and Cooperative
MOAD:	Ministry of Agricultural Development
MST:	Management Studies Group
NARC:	Nepal Agricultural Research Centre
NFP:	Nuffic Fellowship Program
NSB:	National Seed Board
NSC:	National Seed Cooperation

NPQP:	National Plant Quarantine Program
NSP:	National Seed Planning
PFMS:	Planning Formulation and Monitoring Sub-committee
PMG:	Producer Management Group
QSDMS:	Quality Standards Determination & Management Sub-committee
R & D:	Research and Development
SEAN:	Seed Entrepreneurs' Association of Nepal
SSSP:	Seed Sector Support Program
SPISP:	Seed Production and Input Storage Project
SQCC:	Seed Quality Control Centre
TEPC:	Trade Export and Promotion Centre
UMN:	United Mission to Nepal
USAID:	United States Agencies for International Development
VDC:	Village Development Committee
VDD:	Vegetable Development Directorate
WTO:	World Trade Organization

Executive summary

Access to market is important in enhancing the smallholder enterprises. Therefore, this study aims to explore the market options for the smallholder vegetable seed producer of the Rukum district of the Nepal and presenting the options for improvement. Analysis was done by exploring the factors of market access for smallholder vegetable seed producers. A case study methodology was used to explore the factors of market access of smallholder vegetable seed producers. Primary data were collected through interviews, were carried out with vegetable seed producers, local traders and Seed Companies. The questionnaire used for the interviews was semi - structured. Interviews with experts, vegetable farmers and retailers were conducted after the cross analysis to gather additional information.

Review of literature on transaction cost theory, collective action theory; global value chain theory and factors affecting the market access of smallholder farmers provided insight into the possible concepts (factors affecting for market access of smallholder producer) that can be used in order to access the vegetable seed sectors of the Nepal. Important market access factors that should be given more importance in order to improve the market access of smallholder vegetable seed producer of Nepal were identified. Lack of access to assets and working capitals, small land holding, inferior quality of seeds, lack of institutional arrangements, asymmetric market information, lack of skills, poor infrastructures, small size rural markets, lack of bargaining powers, relationships, low commitment, high dependency of smallholder with the local traders and Seed Companies, lack of institution supporting contracts and poor enabling environments are the major factors that hinders the smallholder producer market access. Transaction cost, collective action and global value chain related factors are identified as important factors that affect the market access of smallholder producer.

Literature review on collective action, investing in value chain, contract farming approach, institutions involved in vegetable seed production and marketing in Nepal as well as policy environments of vegetable seed of Nepal were reviewed. Collective marketing and contract farming are seen as the options for improving market access of smallholder vegetable seed producer of Nepal. While, additional activities of value addition improve the position of

smallholder producers. Literature shows that contracting is an effective way to coordinating and improving market access of smallholder vegetable seed producer and where an institutional arrangement is a prerequisite for coordination and compliance of contractual arrangement.

The analysis of the results gives the farm characteristics, market characteristic, production problems, marketing problems and overall situations of the vegetable seed sectors of Nepal. High cost of production and costs related to transaction are found to be the important factors hindering market access of smallholder vegetable seed producer of Nepal. Lack of institutional arrangement, weak implementation of rules and regulations, less innovation in product on the producer side, low-level of trust, low quality of the products and poor network were found the main problems in the vegetable seed sectors of Nepal.

Concerning with these multi-fold problems, reviewing the literature on market options, analysing the current situation of the vegetable seed sector of Nepal an approach; collective marketing (cooperative) through contractual arrangements may be an effective market option in improving the market access of smallholder vegetable seed producers of Nepal.

Key words

Market access, smallholder producer, transaction cost, collective action and Vegetable seed.

Table of Contents

Lists of Figures

Lists of Tables

CHAPTER 1: INTRODUCTION

1.1 Background information

Agriculture is the foundation of the Nepalese economy, generating employment opportunities to 66 percentages of the total population. It contributes 34.7 percentages in the national GDP and total national trade of the foreign country is 13 percentages (CBS, 2011). Nepal has a diversified agricultural sectors predominated by smallholder and marginal farmers. Farmers having the land below one hectare are 70.68 percentages and average land holding is 0.68 hectares (CBS, 2011). Commercialization of agricultural commodity is minimal and farmers do multiple crops at a time, including food crops, cash crops and livestock. Because of the diversified climatic situation, the crop grown varies according to the geographical location and time. The smallholder sector is characterized by diversified crop and livestock farming.

Agriculture sector has been a primary priority of the Government of Nepal since Fourth Five Year Plan. After that, role of horticulture in Nepal was seen as very important and scope for accelerating income earning of farmers and contributed for commercialization of rural economy through production of market oriented high value crops.

Horticulture remains one of the major sub-sectors of the agricultural sector with 16 % contribution in national AGDP (MOAC, 2012). Because of increased demand of vegetables; areas of production as well as commercial growers are increasing every year. The total area of vegetable production was 245,037.00 hectares with a total production of vegetables 3,301,684.00 metric tons in the year 2012 having the average productivity 13.4 metric tons per hectares with compared to 165,988.00 hectares with a total production of vegetables 1,799,973.00 tons in the year 2002 having the average productivity 10.08 metric tons/hectares (VDD, 2012). Commercialization has increased lately; as a result the demand of the vegetable seeds has also been increased. Total demand of vegetable seeds increased from 1,334 metric tons in 2001 to 2,026 tons in 2012 (VDD, 2012). In the last four decades, national production of vegetable seed was almost 50 % deficit as compared to the demand of the total production of

seed; in 2012 national production was 1,272.73 metric tons and while the demand was 2,026.00 metric tons (VDD,2012). Still, large numbers (74.43 %) of farmer's use local vegetable seed followed by 19.89 % use improved vegetable seed and only 4.68 %of farmers use hybrid seed for vegetable production (MOAC, 2012). Large volume of deficit vegetable seeds, especially hybrid, is being imported from the foreign country and to some extent the local demand is fulfilled by the local producers, who produce vegetable seed for their own use. The trend of importing vegetable seed is continuously increasing each year and reached to 275.39 metric tons in year 2013 and with worth €2,085,916.18 compared to 193.177 metric tons in year 2009 and with worth €584095. 50 (TEPC, 2014). (1 Euro = Rs 110). Vegetable seed export from Nepal jumped to 21 metric tons in 2000/01 from four metric tons per year during 1989/00-93/94 (Chitrakar et al., 2004). But, later the exporting of vegetable seed is limited to only some crops (Radish). However; there is the potentiality of the exporting vegetable seed to Bangladesh and India.

From, Seventh Five Year Plan (1985-1990) vegetable seed got priority. Governments of Nepal recognized vegetable seed as a high value; a low volume product that if effectively implemented can be used to address issues of both food security and self-sufficiency, as well as economic development of rural areas (Agricultural policy, 2005). Realizing the importance of the seed sector the Government of Nepal developed the Seed Vision 2025. The seed vision, aims at: increasing crop productivity, raising income and generating employment through self-sufficiency, import substitution and export promotion of quality seeds. The government, non-government and private sectors are committed and have been continuously making efforts to promote the vegetable seed sectors. Despite the considerable efforts that have gone into the sector, the vegetable seed sectors lie fragmented, disorganized and unable to meet the changing demands and market variation (HVAP, 2011).

Private sector actors are relatively new phenomenon, though the vegetable seed production in Nepal started over the four decades ago. Involvement of the private sectors in the marketing channels of the vegetable seed sector is still considered to be under the process of development. The government mechanism and structure still play a major role in the

functioning of the domestic market. Seed production of vegetables is still limited to the government institution, as the government farms that fall under the Vegetable Development Directorate (VDD) are responsible for the production of breeder and foundation seed. These seeds are further multiplied by seed producing groups or farmers, ready for commercial sale. These seeds are collected, processed and cleaned by lead farmers, cooperatives and local seed traders and who then supply these vegetable seeds to wholesaler (company). Then the wholesalers again process and repack the seed in the small package and then subsequently passed on to the retailers for the sale in the market. The supply of the vegetable seed from farmers to farmers is also a common practice in Nepal, where established marketing channel does not exist, or contractual farming for vegetable seeds does not fully executed (HVAP, 2011).

Governments of Nepal implemented seed promotion program through DADO from 2011. As a result numbers of seed traders registered in the National Seed Board (NSB) increased from 1477 in 20011 to 2208 in 2012 (SQCC, 2014). Seed Entrepreneurs Association of Nepal (SEAN) is the lead organization among the seed entrepreneurs of Nepal. Many of the SEAN members are involved in wholesaling and retailing of vegetable seed in Nepal. Their engagement is only limited to importing seed, wholesaling and retailing of the vegetable seeds. Involvement of private sectors in Research and Development is almost negligible.

Vegetable seed is one of the main income generating cash crops of the Rukum district of Nepal. Vegetable seed farming in the district started with the establishment of Subtropical Vegetable Seed Production Centre (SVSPC) farm at Rukum in 1978. After that the area of vegetable seed production and numbers of farmers has increased dramatically. But, quantity of vegetable seed production and numbers of farmers involve in the vegetable seed farming was not consistent. The vegetable seed production in the year 2000 was 170 metric tons with the involvement of 1,200 vegetable seed producer and later dropped to 32 metric tons with the involvement of 327 vegetable seed producer in 2008. This figure reached to 120 metric tons in 2011 with increased numbers of vegetable seed frames (SVSPC, 2013). Figure 1 shows the trend of vegetable seed production in the Rukum district over the last 12 years.

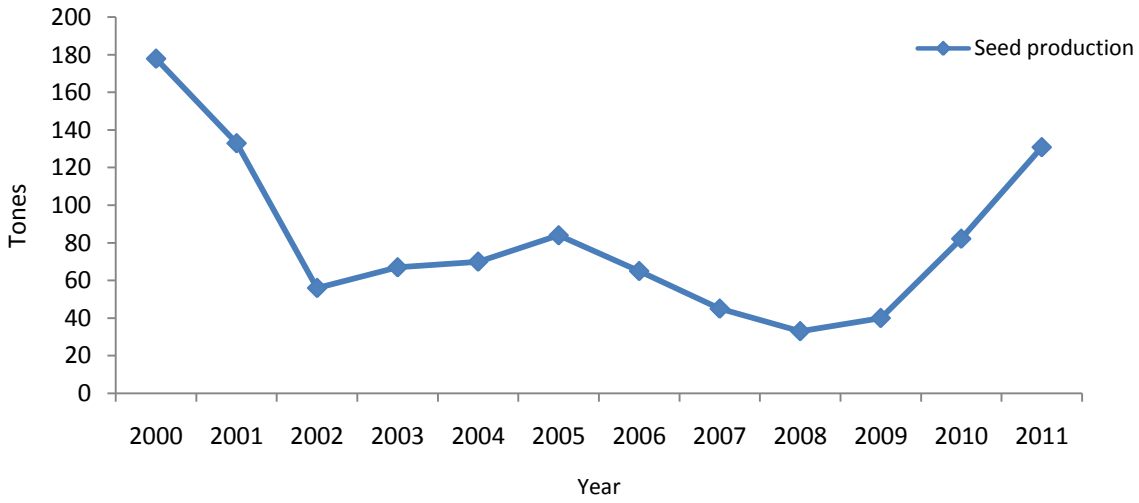


Figure1. Trend of vegetable seed production in Rukum district

Vegetable seed is recognized as one of the cash generating activities in the Nepal. However, smallholder vegetable seed farmers have faced multifaceted problems and farming vegetable seeds in harsh condition with limited access to factors of production (quality source seed, inputs), collection centre, seed testing facilities, Enabling environment (policy and support measures on hybrid seed production and crop insurance), market information and incentive schemes that are prerequisite for making Nepalese vegetable seed grower more competitive in the market (USAID, 2004). Due to high production costs and high investment in accessing the necessary market information, technical services, inputs and secure access in new technology were the major problems faced by the Nepalese vegetable seed growing farmers. As Poulton et al., (2006) argue farmers in developing countries face the problems of high unit transaction cost in almost all-labour transaction.

As AIC dissolved after the liberalization of the economy, a void had been created in the Nepalese vegetable seed market. Private sectors were not able to fulfil that vacuum and at the same time the influence of the Indian vegetable seed market was gradually increased in the Nepalese vegetable seed market. Therefore, Nepalese vegetable seed producers were worried about the assured market of vegetable seed, even worried with their seed farming occupation. Nowadays, hardly few vegetable seed producers have a contract agreement with the buyers which used to be done by AIC before. In the absence of an Agriculture Contract Act and

effective regulatory mechanism, quality and quantity aspects of vegetable seed production of vegetable seed through contract arrangement was not a regular phenomenon. As a result, the entrepreneurs are ultimately loosing competitive capacity of both in the internal as well as in the external markets.

Therefore, contract farming would be one of the options to improve the market access of smallholder vegetable seed grower farmer of Nepal. The contract farming delivers multi-folds benefits to the smallholders including access to new markets, technical assistance, specialized inputs and financial resource as well as reducing crop price variation and help farmers bear the risk (Key et al., 1999).

1.2 Research objectives and questions

The research objective aims to improve the economic position of the small holder vegetable seed farmers of the Nepal by exploring the options for improving market access by analyzing the current problems of production and marketing of the smallholder vegetable seed growing farmers and presenting options for improvement.

Research question

The general research question is derived from the research objective. Further, specific research questions are developed to answer the general research question.

General research question

The main research question is *"What are the options for the smallholder's vegetable seed producer of the Nepal to improve the market access in the national vegetable seed market?*

Specific research questions

1. What options for improving market access could be derived from the literature?
2. What are the farming characteristics of the vegetable seed sub-sector of the Nepal?
3. What are the market characteristics of the vegetable seed sub-sector of the Nepal?
4. What is the current state of development of vegetable seed sub-sector in the Nepal?
5. How does the government policy influence the vegetable sub-sector development?

6. What are the key production and marketing constraints faced by the smallholder vegetable seed growing farmers of the Nepal?
7. What are recommendations for future positioning of the smallholder vegetable seed growing farmers of the Nepal?

1.3 Research framework

According to the Verschuren and Doorewaard (1999) a research framework is a diagrammatic representation of the research objective and description of the research steps that need to be taken in order to achieve the objective of the research question. Research framework consists of six sections. Below each of the sections in the figure 3 are described.

Literature study: - Here existing literature on transaction cost theory, collective action theory and global value chain theory will be reviewed which will provide strong theoretical insight into the subject matter. It will be useful in developing the theoretical framework.

The current situation of the vegetable seed sector including marketing channels, situation of vegetable seed production and marketing will be reviewed and empirical study of market access aspects in the Nepalese vegetable seed sectors will give the more insight into the current situation of the vegetable seed sectors.

The result of the analysis will give the overall situations of the possible options of the market access of smallholder farmers that best fit in the Nepal and verify it empirically.

Finally the results of the analysis together with proposed vegetable seed marketing options helps to increase the smallholder vegetable seed producer farmers access on the market and should conclude the research objectives. Figure 2 shows the framework of this research.

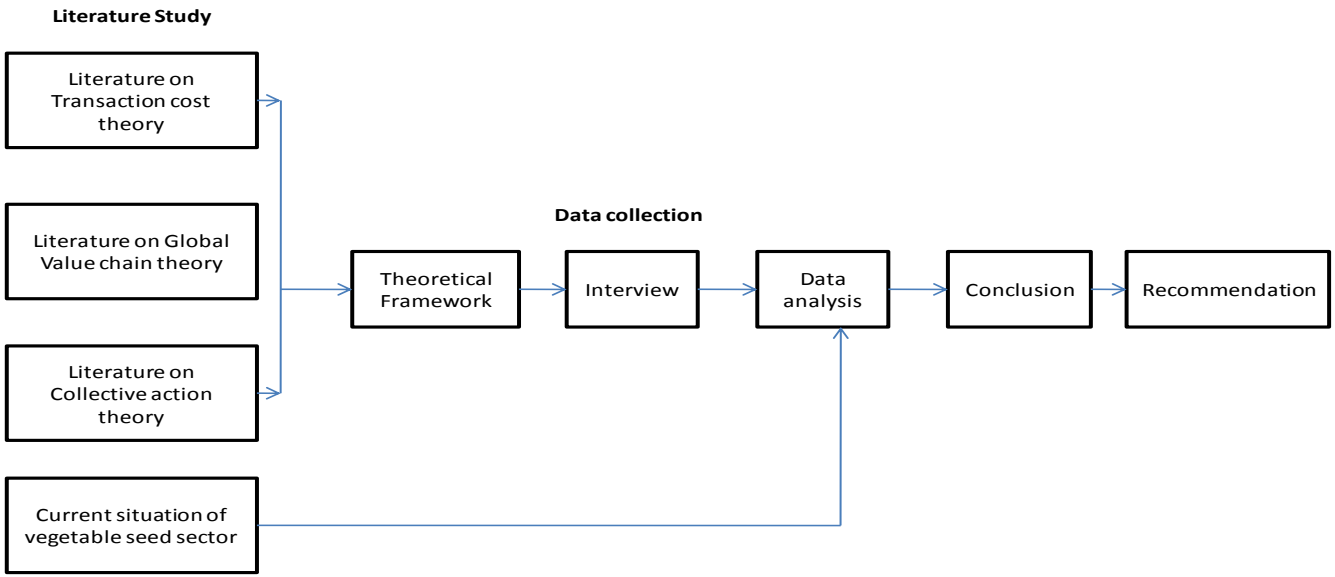


Figure 2. Research Framework

1.4 Definitions of the concepts

For the purpose of this project, the following concepts are defined. The goal of these definitions is to ensure a clear understanding of the research ambitions and outcomes to every reader.

Market

An actual or normal place where the forces of demand and supply operate, and where buyers and sellers interact (directly or through intermediaries) to trade goods, services, or contracts or instruments, for money or barter (Business Dictionary.com).

Market Access

In this research market access is defined as a well-functioning market that provides consistent outlets for vegetable seeds produced by the smallholder's farmers of Rukum district of Nepal and also serving as dependable sources of affordable seed as a result from an economy possessing the right set of public institutions, an appropriate regulatory environment, and the requisite network industries.

Smallholder producers

A producer who has limited land availability, and is resource poor, i.e. limited capital (including animals), fragmented land holdings, and limited access to inputs and market and depended on family labour for production.

Transaction cost

Transaction costs are simply the costs of carrying out any exchange, whether between firms in a market place or a transfer of resources between stages in a vertically integrated firm.

Vegetable Seed

In general, it passes four phases from the time of registration to the distribution of certified seed to the farmers. In our study vegetable seed refers to the fourth stage vegetable seed (certified vegetable seed/improved) that is produced from the registered vegetable seed by the vegetable seed producer's farmers which is later supply to the market for commercial use, vegetable production.

Collective Action

Collective action occurs when individuals working together to achieve the shared objectives to overcome the common problems. In this study, collective action means smallholder producer of vegetable seed work collectively to buy inputs required for vegetable seed production and supply outputs (vegetable seed) to improve the market access by reducing the transaction costs.

1.5 Outline of the thesis

This thesis consists of nine chapters. Chapter one presents the Introduction part that includes background information, conceptual and technical design of the research. The theoretical background of the study is presented in Chapter two. Chapter three discusses the different options for smallholder farmers to increase the market access. Vegetable seed production, marketing and policy environment are discussed in chapter four. The methodology applied in this research is discussed in chapter five. Chapter six presents the overview of the results of this research. Discussions of the results are presented in chapter seven. And finally, conclusions and recommendations are presented in chapter eight and nine respectively.

CHAPTER 2: DETERMINANTS OF THE MARKET ACCESS FOR SMALLHOLDER FARMERS

2.1 Introduction

Literatures on factors influencing market access of smallholder farmers are reviewed in this chapter. It includes the factors that obstruct smallholder farmers' access to market. Areas covered include not only participation of smallholder but also to some extent control over the market. The factors confer are not exhausted but also develop foundation for the rest of the study. This chapter begins with discussion of transaction cost as a major cause that obstructs the market access to smallholder farmers. The collective action is for increasing market access as well as control over the market to some extent. As the collection action approach is helpful to reduce the transaction cost as well as increasing the bargaining power of the smallholder. It means farmers have control over the market to some extent. Finally, global value chain theory is discussed. It is related to the value upgrading of the vegetable seed through branding and labelling.

2.2 Transaction costs theory

Transaction costs are important determinants of market access of smallholder farmers. According to Williamson (1989) transaction occurs when goods and services are transferred across a technological separable boundary. Therefore, transaction costs are the associated costs when goods and services are transferred across a technological separable boundary (Williamson, 1989).It does not only include the direct cost of vegetable seed production and marketing costs, but also the costs related to management of overall vegetable seed business. Thus, costs related to transaction of vegetable seed and associated costs for management of inputs for the production and marketing of vegetable seed are the barriers to access market for the smallholder vegetable seed farmers. Monopolies, imperfect market, uncertainty, difficulties associated with price determination and trust relationship are the example of market obstructions. Opportunist behaviour is one of the factors in monopolistic market. The opportunist behaviours of the actors can be reduced by entering into the contract arrangement.

However, transaction costs are incurred while drafting, monitoring and enforcing of such contractual arrangement. These costs can be classified into an ex - ante (i.e., environmental uncertainty), cost during the transaction and ex-post (i.e., behavioural uncertainty). Information costs while searching information about the market and location which occurs before the transaction (ex-ante). While the transaction being incurred negotiation costs incurred, i.e. costs associated with drawing up the contracts and negotiation terms of the exchange). Similarly, monitoring and enforcement costs incurred once the transaction is completed (ex-post) in order to ensure the terms and condition agreed in ex ante - payment arrangement (Hobbs, 1997). In addition, because of the standards required in term of quality, size, and delivers a new set of transaction costs has arisen with the rise of modern supermarkets. Customer are more aware and willing to pay for product attributes that include convenience, reliable, variety, high quality, and high value product (Napier, 2001). It has seen that smallholder farmers are locked into traditional modes of production system far removed to meet the requirements demanded by modern food systems that transaction costs have tended to become prohibited. The transaction costs associated while dealing with large numbers of small farms are as follows (Hayes, 2000):

- The bureaucratic cost related to managing and coordinating for goods production, processing, and marketing.
- The opportunity cost of time used to coordinate and communicate with farmers.
- The cost incurred in establishing and monitoring long-term contracts.
- The cost of screening linked to uncertainties about the reliability of potential suppliers or buyers and the uncertainty about the actual quality of the goods.
- The cost of transfer associated with the legal or physical constraints on the movement and transfer of goods. It also includes handling (load, unload), storage costs, packaging and labelling costs and transport costs and so forth.

The transaction cost theory analyse the comparative costs of planning, adapting and monitoring under the alternative governance structures. To align, transaction cost with government structure in such a way that it can minimize the transaction cost as well as production is the main idea of the transaction cost theory (Fischer et. al., 2006). The transaction cost approach as

developed by Williamson (1991), focus on how the characteristics of the transaction costs affect the cost of handling through market, bureaucratic and other forms of organization. Williamson (1975) acknowledged the possible effect of reducing transaction costs through the effects of the organizational environment, in which organizational socialization process and culture may build convergent goals between the parties. The basic assumptions of the transaction cost theory is that the firm wants to reduce the transaction cost which includes the information asymmetries, bounded rationality, information gathering, identifying suitable trade partners, opportunities behaviours, detecting quality, branding and certification of the product.

Due to the limited study in developing countries and complex nature of measurement it is difficult to measure the transaction cost into economic analysis in the real practical word. Moreover, there is less empirical data for estimation of transaction cost and even more so in developing countries. Therefore, measurements of market transaction costs still remain one of the major hurdles in case of developing countries.

2.3 Global Value Chain Theory

GVCs are often a stepping stone for producer of developing countries because it links firms, workers and consumers around the world and to integrate into the global economy. But, producer of developing countries face many problems in linking to the global value chain. Developing countries value chain is characterized as a lack of effective coordination, lack of resources, infrastructures supports and enabling environment for business (Trienekens, 2011). Therefore, it is challenging to smallholder producers of developing countries to enter into these value chains and improve their competitiveness to compete in these emerging market. The value chain describes the full range of activities that firms and workers perform to bring a product from its conception to end use and beyond. This includes activities such as design, production, marketing, distribution and support to the final consumer (Gereffi and Karina, 2011).

Producers of the developing countries are seen as only the suppliers of raw materials. Due to the little capital to invest, use of traditional farming practices, and depend on family labour and

lack of contract with buyers smallholder producer of developing countries are not able to get benefit from the global value chain (Reardon and Barret, 2000).

Value chain upgrading can be seen as an avenue for smallholder producer to improve the market access. But, in developing countries factors such as physical infrastructures, institutional arrangement and networks are weak. Similarly, low level of education, low level of trust, lack of specialized skills, and difficulty access to technology, inputs, markets, information and external services are the hindering factors of market access of stallholder producer in developing countries (Giuliano et al., 2005). Weak infrastructure hampers the effective flow of products to markets. In developing countries institutional that supposed to be support the markets are absent and weak or fail to accomplish the role expected from them (Martin and Mair, 2008). And according to Murphy (2007) roles of government for upgrading of the products produce by smallholders are often consider conditional. In addition, standards rules and regulation also negatively affected to the smallholder producer participating in the global value chain. Furthermore, products are supplied through different complex channels.

2.4 Factors influencing market access by smallholder farmers

Market access implies the transition from subsistence farming to a market engagement mode, with the recurrent use of markets for the exchange of products and services (Amrouk, et. al., 2013). Market access allows smallholder farmers' participation into the mainstream; therefore, it is one of the important determinants of smallholder farmer's better livelihood. According to Cai et al., (2012) marketing contributes to the better life of smallholder farmer's which guides to poverty reduction. However, in developing countries access to markets for smallholder farmers has many challenges that face serious obstacles in advancing from subsistence farming to high-income pathways. Smallholder farmers face difficulty dealing with market and find themselves in a difficult because many of them don’t know the market well how it works and why price fluctuate as they have little or no information about market condition and prices (Magingxa et al.,2009). Even they do not have experience of market negotiation and are not collectively organized. Due to lack of institutional arrangement there is always uncertainty in the market

that resulted increased in transaction cost. Millions of smallholders in developing countries face serious obstacles in advancing from subsistence farming to high-income pathways.

One of the characteristics smallholder farmers is lack of assets and working capital. These affect the way that smallholder can benefit from the agricultural markets, especially in terms of volume of the product traded and quality of product (Bienabe et al., 2004). Markets are often constrained by inadequate property rights and transaction costs for the smallholder farmers of the developing countries and have limited access market information, credit facility and factors of production (Lyne, 1996). Due to small land holding, lack of quality, necessary financial and human capitals farmers are not able to fulfil the buyer's requirement as well as quality standards and food safety rules of the consumers that hinder the smallholder access in the high-value chains (Kristen et al., 2002).

The issues of market access can be considered according to three dimensions: physical access to markets (distances, costs, etc.), the structure of the markets (the asymmetry of relations between farmers, market intermediates and consumers), and produces' lack of skills, information and organization (their understanding of the market, prices, bargaining, etc.) (IFAD, 2003). According to Bienabe et al., (2004) farmers have insufficient information about the price of a product at a final consumer level, potential buyers and quality requirement. Incomplete or asymmetric information on current and future conditions create uncertainty thus the transaction partner has to invest more resources to resolve the information problems. Therefore, farmers refrain from entering transactions that require additional information (Bijman, 2008). These uncertainties for producer can be reduced through contact farming as a contractor provides a guaranteed outlet (Bijman, 2008) and through getting timely and reliable information by developing good relationships with chain actors (Barham, et al., 2009).

In developing countries absence or inadequacy of rural market raises transaction cost and prevent smallholder from market access and traders from access to suppliers. Poor infrastructure, especially, lacks of facilities such as storage, testing and processing facilities increase losses to commodities and reduces the quality of the product. It has been shown that

lacking transport infrastructure is an important determinant of low technological adoption, cropping choices and of low agricultural productivity in developing countries (Zeller et al., 1998).

Small farmers have lack of bargaining power and asymmetry of negotiation. Bargaining power refers to the relative capacity of different actors to secure an agreement on one's terms (Chamberlain and Kuhn, 1965).Smallholder can increase the bargaining power by exploiting the scale of economics and improved access to technology through producer cooperatives.

Trust among the actors of the supply chain is important factors in enhancing access to a market of smallholder farmers. Moorman et al., (1992) defines trust as a willingness to rely on an exchange partner in whom one has confidence. Trust will be critical if two situational factors are present; risk and incomplete buyers' information (Hawes et al., 1989).But in developing countries, according to Aghion (2009) poor enforcement of contracts and incidence of mistrust has been a problem due to lack of laws and institutions supporting contracts.

2.5 Conceptual framework

A conceptual framework describes the process still tending to be unidimensional, telling some linearity and logic (Kitson et al., 1998). It is the basic tool for carrying out the research. The conceptual framework of this research is constructed on the idea how the different factors influence smallholder farmers' access to market. The conceptual framework consists of broadly three concepts: collective actions, value chain upgrading and finally, contract farming and associated factors that play important role in market access of smallholder farmers. Figure 3 presents the relationship of the concepts used in this research.

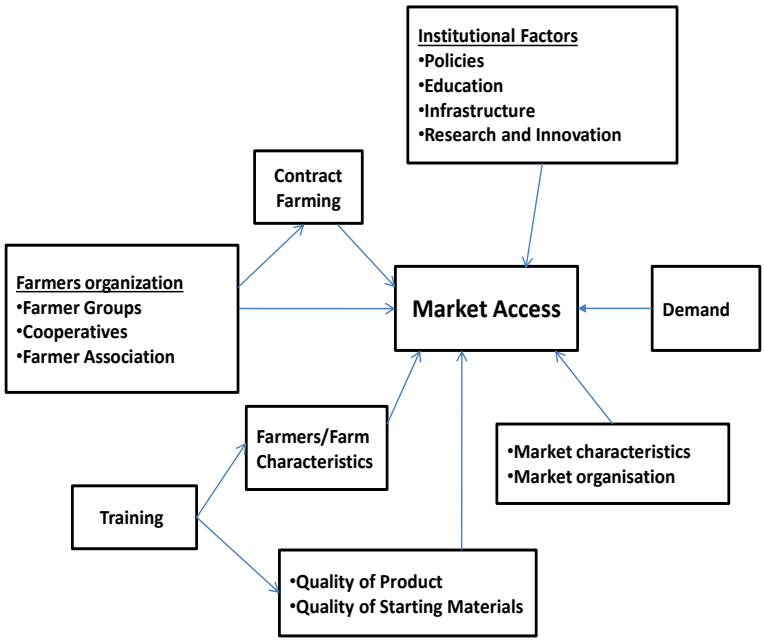


Figure 3. Conceptual framework

2.6 Chapter conclusions

This chapter focused on the theories and concepts of transaction cost and factors that obstruct smallholder producer's market access. There are no single factors of production and marketing that obstruct smallholder producer to access the competitive market. Broadly, factors associated with the transaction of goods and services are the major hindrance of market access of smallholder farmers. Particularly, in developing countries like Nepal small size rural markets, poor infrastructures (lack of post-harvest facility, seed testing facility), lack of assets and working capitals, lack of institutional arrangement, lack of quality product and education, incomplete or asymmetric market information, smallholding land size, high costs of labour are the major hindrance of market access. In addition, trust, relationship, lack of enabling environment and poor bargaining power of the smallholder producers are also the determinants of the market access of smallholder producers.

CHAPTER 3: OPTIONS FOR IMPROVING MARKET ACCESS FOR SMALLHOLDER FARMERS

3.1 Introduction

This chapter describes the different market options that can improve the market access of smallholder producer of Nepal based on the identified market obstructing factors in the described in previous chapters. Smallholder farmers come across several challenges in gaining market access which are identified in the previous chapter. Two types of markets; spot markets and markets where credit and output markets are linked through some sorts of contracts are common in South Asia. For the welfare of the smallholder farmers, just getting the price of the produce is not enough. Therefore, it is important to get the right organization, appropriate arrangement and enabling environment that can be helpful for smallholder farmers to improve the market access.

3.2 Collective action

Collective action via farmer's organization and cooperatives is an important approach that helps to improve the smallholder's position by reducing inefficiencies, better coordination and reducing the barriers of market access (Shepherd, 2007). Collective action occurs when individuals work together to achieve the shared objectives to overcome the problems. Transaction costs due to asymmetric market information, access of inputs and outputs, secure access to technology required for the production of high value crops can be reduced through collective action (Stockbridge et al., 2003). Therefore, a better position of the smallholder farmers in the market can be expected. As Thorp et al., (2005), smallholder producer's position in the market can be improved by increasing bargaining powers with the buyers and intermediate through reducing the market barriers to entry into the market. Thus, working collectively allows small-scale producers to spread the costs of marketing, enhancing their ability to negotiate for higher price, and improve the market power. In addition, through coordination of marketing activities, a well-organized farmer can bypass brokers or assemblers, rural wholesalers and transporters. Thus, working collectively can reduce the transaction cost

associated when dealing with the multiple actors as well as increase the economic scales of the farming system. According to Devaux et al., (2009) acting collectively also increases the participation of diverse stakeholder and can contribute to the innovation process that benefit smallholder by strengthening business contacts and social network, shared knowledge and built up trust.

Marketing collectively viz. through a cooperative could be the avenue for smallholder producer to increase the market access by providing several benefits. Collective marketing allows small holder farmers to allocate the costs of marketing, increase the ability of negotiation for better prices. The contribution of cooperative marketing in agricultural development is high as it is user-driven business (USDA, 2002). Cooperative marketing is useful because it overcome the market access barriers of smallholder producer. For instance, it reduces the transaction cost associated with transfer of goods and services that is required for vegetable seed production and marketing. They can assure supply of the required quantity and quality of product agreed with the buyers, reduce the risk of production, and market uncertainty. According to the West (2008) cooperative marketing offers multiple benefits; obtaining economics of scale, increasing bargaining power, increasing level of trust and higher commitment, coordination with different actors as well as assuring the continuous flow of agricultural product. Cooperatives marketing can overcome both contract default and scale of farming operations (Coulter et al., 1999).

3.3 Investing in value chain for market access of smallholder producer

According to Kaplinsky et al., (2002) value chain is defined as a complete range of activities that are necessary to bring a product or services from beginning, through the entire stages of production, transformation and delivery to final consumers, and eventual disposal after use. Therefore, value chain can be seen as an avenue for smallholder market access because it introduce new forms of production, logistics, technologies, labour processes and organizational relations and network (Trienekens, 2011). Thus, the value chain approach is anticipated to provide a systematic process and develop a linkage between different actors. Furthermore, it facilitates for coordination between different actors involved in the chain and reduces transportation cost and develops better communication between different actors (Gibbon et al.,

2008). This can be done through standardization of process and sophisticated information and communication technology. Explicitly, the approach aims to change the buying and selling culture from the "occasional" and "opportunistic" sales transactions of individual farmers to transient traders, to a more consistent sales approach that builds relationship between groups of organized farmers selling to known trading partners. Undertaking new productive functions, entering higher unit value market niches, entering new sectors and enlarging the technological capabilities of the firm as a whole are the upgrading options proposed by Pietrobelli and Saliola (2008). However, the value chain is only achieved through attention to multiple businesses, such as combined attention to product and process, upgrading or collaborative product upgrading in combination with the contractual arrangement (Trienekens, 2011). Table 1 shows the different value chain upgrading options.

Table 1.Upgrading options in value chain

Heading	Upgrading options
Upgrading of value added production	Upgrading of product related to intrinsic (quality, composition, packaging) and process upgrading related to extrinsic (CSR-fair trade, welfare of labour and animal welfare, etc., use of automated production and packaging lines, cooling installation, modern transportation technology, communication technology like internet connection, GPS systems)
Value chain network upgrading	Collaboration with horizontal partners (Joint purchasing of production inputs, joint use of production facilities and joint marketing of products), developing horizontal relationships (producer groups, associations or cooperatives), development of business groups and upgrading vertical linkage.
Upgrading of governance	Shorter supply chain, increase collaboration of actors in the value chain, increase relationship of actors in the value chain through contracts and horizontal collaboration between actors.

Source: (Trienekens, 2011).

3.4 Contract farming and market access

Contract farming has been used in agricultural production from the past several years. But in the recent years, the relevancy of contract farming in the developing countries has been gradually increasing. According to Eaton and Shepherd, (2001) contract farming is “being essentially an agreement between unequal parties: companies, government bodies or individual entrepreneurs on the one hand and economically weaker farmers on the other". Therefore, contract farming approach is seen as important avenue for small holder resource poor producer who faces multiple problems in production and marketing. Contract farming helps to smallholder producers by arranging an environment where producer have no access to spot markets by ensuring the market access, providing market information and factors of production and so forth (Key and Runsten, 1999).Contract farming solve the many problems that smallholder producer face. Therefore, Key and Runsten (1999) argued that contract farming is an institutional solution to the problems of market failure in the markets for credit, insurance, and information. Further, according to Bijman (2008) contract farming can be considered as an avenue that minimizes the transaction cost, reduces the uncertainties and improve the incentives for smallholder farmers through vertical coordination between production and marketing activities. Moreover, contract farming arrangements serve to link farmers to distant markets where the demand for and price of crops are often more favourable. The use of contract farming is increasingly being used by agribusiness firms and retailers around the world. The reason behind this is it offers many benefits to the smallholders farmers. In addition, recently, much development has occurred which support contract farming. The rise of supermarket food retailing is one of these developments. According to the Reardon and Berdegue (2002) the number of supermarkets in the urban areas of the developing countries like Asia and Latin America has rapidly grown.

3.5Contract farming in Nepal

Contractual arrangement in Nepal initiated after 1975 with the aim of increasing vegetable seed production at the farmer's level and thereafter, two years in 1977 also started in cereal seed (NSV, 2013).The contractual arrangement is carried in scattered and small plots individual

farmers, which was not cost efficient. Afterwards, due to a great number of farmers involved in contract, Agricultural Input Cooperation (AIC) started to arrange contractual arrangement with the lead vegetable seed farmers.AIC was actively involved in vegetable seed production as well as cereal seed production program through the seed promotion program and contractual arrangement with the producer in the support of SPISP. The aim of this program was to reduce the pressure on subsidy in transporting seed from Terai to the hills. This program did not prove to be commercially viable, but AIC continued contracting farmers in the Terai for producing seeds and supply them in the hills to fulfil the requirement. During the period of (1997- 2002) Community Based Economic Development Project (CBED), funded by the Canadian International Development Agency (CIDA), adopted the demand-based vegetable seed production program linking seed growers with seed traders through regional seed contracting workshops. It was successful to introduce seed production practices in some of the western hill districts of Nepal. After that Seed Sectors Support Project (SSSP); KOSEVEG project adopted the same approach for seed production and marketing and got successful. The approach was based on contract seed production agreed with seed producer-groups and seed-buyers during the seed planning workshops. This model was later replicated in other parts of the country. The SSSP contributed to enhance the Nepalese seed industry by encouraging private sector in the seed business. Subsequently, other many seed companies, for instance SEAN Services Centre, Thankot, followed the same model for vegetable seed production and selling.

Despite the contractual arrangement starting long back in Nepal, due to lack of Contract Farming Act contract farming has so far not been a regular phenomenon in Nepalese agriculture. Some seed entrepreneurs, however, have started vegetable seed procurement through contractual arrangement, though the experience is not so cheering in the absence of any regulatory mechanism both in terms of the quality and quantity aspects of seed production. At the same time, low-graded vegetable seed with forged claims for high grade price and has created a lack of confidence among the entrepreneurs to ultimately lose the competitive capacity both in the internal and external market. Breaching of contractual arrangement from both sides is common in Nepal. Thus, present contract seed production system needs to be re-examined for its effective implementation and for keeping producers and contractors under

legally binding. Further, it is necessary to formulate or amend seed acts and regulation to protect the rights of seed producers and farmers. Table 2 shows the sequential development of contract farming in Nepal.

Table 2. Development of contract farming in Nepal

- GO/N at fifth five-year plan included the issue of contract farming.
- Then initiation of Public Private Partnership: AEC and MOAC. A series of workshops led to conclude the essence of Contract farming in 1999
- Prepared and submitted legal framework of contract farming
- "Commercial Agriculture Contract Act-2004" prepared and submitted by AEC/FNCCI in 2003/2004
- “National agriculture Policy-2061” came into existence, but the Commercial Agriculture Contract Act-2003 not declared yet.
- Issue of contract farming included in this policy
- Liberalization and free market economy after 1990.
- USAID and FNCCI continuously working in the cooperative agreement
- Contract farming model launched in some commodity like vegetable seed, Jute and cereal seed crops.
- Due to administrative obstacles and multi-location fees policy isn't traders friendly.
- Recently, the government of Nepal has a final draft of Contract Farming Act and likely to be endorsed very soon by the parliament of the Nepal (Kathmandu post 2012)

Source: Authors own (Compiled from different reports, books and newspapers)

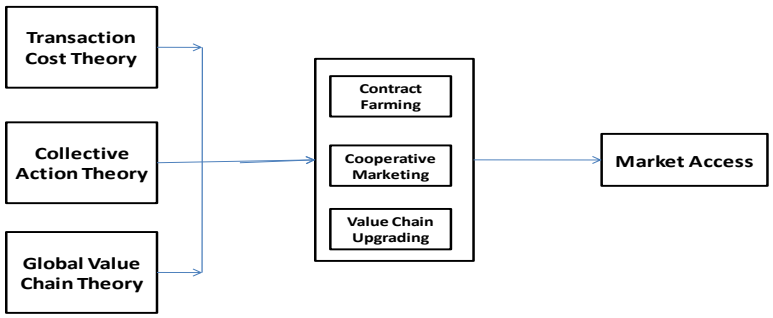


Figure 4. Theoretical framework

3.6 Chapter conclusion

To conclude, Chapter three reviewed the different options of market access of smallholder producer and provided an answer to the research question one.

RQ1: What the options for improving market access could be derived from the literature?

To answer this question three different options (Collective action, contract farming and value chain upgrading) that could be helpful in improving the market access of smallholder vegetable seed producer of Nepal are reviewed. Smallholder producer face multifaceted problems to access the market due to the multiple factors of market hindrance. Therefore, not a single option is suitable for improving the market access of smallholder vegetable seed producer of Nepal. Combination of different options is required to have an access to market of smallholder producers. The options should be in line with reducing the transaction cost, improving the quality of the products, improving the bargaining power of the smallholder's producer, appropriate institutions, and creating enabling environment. This could be the achieved through institutional arrangement of vegetable sales (contract farming), working collectively for marketing (cooperative marketing) and overall upgrading the value chain (Quality product, packaging and labelling at farmers level).

CHAPTER 4: VETEGABLE SEED PRODUCION, MARKETING AND POLICY ENVIRONMENT IN NEPAL

4.1 Introduction

This chapter reviews the literature on the vegetable seed production, marketing and policy environment of the Nepalese vegetable seed sectors. The first section deals with a description of the organizations and roles in the vegetable seed production followed by the organization involved in the vegetable seed marketing and their roles in section two. Section three includes brief reviews of the seed policy environment in Nepal. This chapter finally ends up with chapter conclusions at the end.

4.2. Vegetable seed production in Nepal

National Seed Board (NSB)

Government of Nepal under the Ministry of Agriculture and Development has formed a National Seed Board to advise the Government of Nepal on preparing and formulation of national seed policies as per the provision of Seed Act. Under the NSB three sub-committees have been formed such as variety approval, release and registration. They provide managerial as well as guidance, support on different seed quality related issues. Moreover, it has the responsibility of seed program planning, policy formulation, preparing balance sheet base on the required national demand and supply and coordinate with the different actors involved in seed sectors. Similarly, it has the objectives of releasing and registering of new varieties and de-notifying obsolete varieties. NSB looks after the issues of Genetically Modified Organism and policies about the protecting breeder's right. They also coordinate with the SAARC countries to make harmonization of seed related policies and procedures as well as regulation of imports and export policies.

Nepal Agricultural Research Council (NARC)

Nepal Agricultural Research Council (NARC) was established in 1991 as an autonomous organization under "Nepal Agricultural Research Council Act-1991" with the aim of

strengthening of varietal development and maintenance breeding as per the national requirement. It is mainly involved in the production and development of breeder and foundation seed. Partnerships with private sectors it conduct research and develop inbreed line of seed and supplying to the government farm, seed companies and NGOs for seed multiplication. It has a well-established network of regional and research farms and has been undertaking commodity-specific research for varietal improvement.

Seed Quality Control Centre (SQCC)

SDQCSS was upgraded to SQCC as an independent seed quality control organization under the ministry of Agriculture and Cooperatives development. The first seed testing laboratory was established in 1962 under the Agronomy Division of Department of Agriculture (DOA) with an objective to distribute quality seed to farmers of the government farms/stations. After that in 1964 the lab was accredited to the International Seed Testing Association (ISTA). Then the laboratory came under the division of Botany after the establishment of Agriculture, Botany Division at Khumaltar in 1995 and started seed quality control activities. SQCC is responsible to implement seed policies, acts and regulations, acting as National Seed Board Secretariat, and providing seed quality control centre. It supports to private sectors to follow both seed quality and internal quality guarantee system. It facilitates to develop Human resource, SPS harmonization, coordination with national plant quarantine and quality control services for seed imports and exports. In addition, it is responsible to monitor the activities of organizations working in the seed sectors to ensure the supply of quality seeds in the market. There are fourteen seed lab under the SQCC. Out of these, two are private (one from a seed company and one from NGOs); next two belong to National Seed Board limited. Ten seed labs belong to the governments of Nepal (SQCC, 2014). According to the annual report of SQCC (2014) there are 23 agencies approved by NSB for foundation seed production. Out of those only two agencies (CEPREAD-National NGOs and Sean Seed Service Centre are permitted for foundation vegetable seed production. This shows that foundation seed production of the private seed company is hardly limited (NSV, 2013). The total numbers of varieties of vegetable seed registered at SQCC are 340. Out of which 226 are open-pollinated and 114 are hybrid (SQCC, 2014).

Vegetable Development Directorate (VDD)

Vegetable Development Directorate serves as vegetable sub-sector centre point for national and international level organization and actors related to it. It helps Department of Agriculture and Ministry of Agricultural Development in formulating policy, strategy, periodic plan and annual program. The mandate for the VVD is to supervise and monitors the district level vegetable seed program and providing technical backstops especially in technical matters. VDD is also accountable for provide quality vegetable seed and planting materials through government and private sectors. Maintaining necessary information essential for the vegetable sub sector and also maintains national level database of vegetable sub-sectors are the key role of the VDD. It also provides technical guidance to the vegetable seed producer. Under the VDD there are six vegetable seed production farm. One is at the central level. The remaining five are in the regional level; each one is at one region, including one in Rukum district of Nepal. Figure 5 shows the annual vegetable seed demand and production trend since last 10 years. The trend shows the gaps of more or less 50 percent in the requirements and productions of the vegetable seeds. But the gap has slightly widened from 2006/07 onward (VDD, 2012).

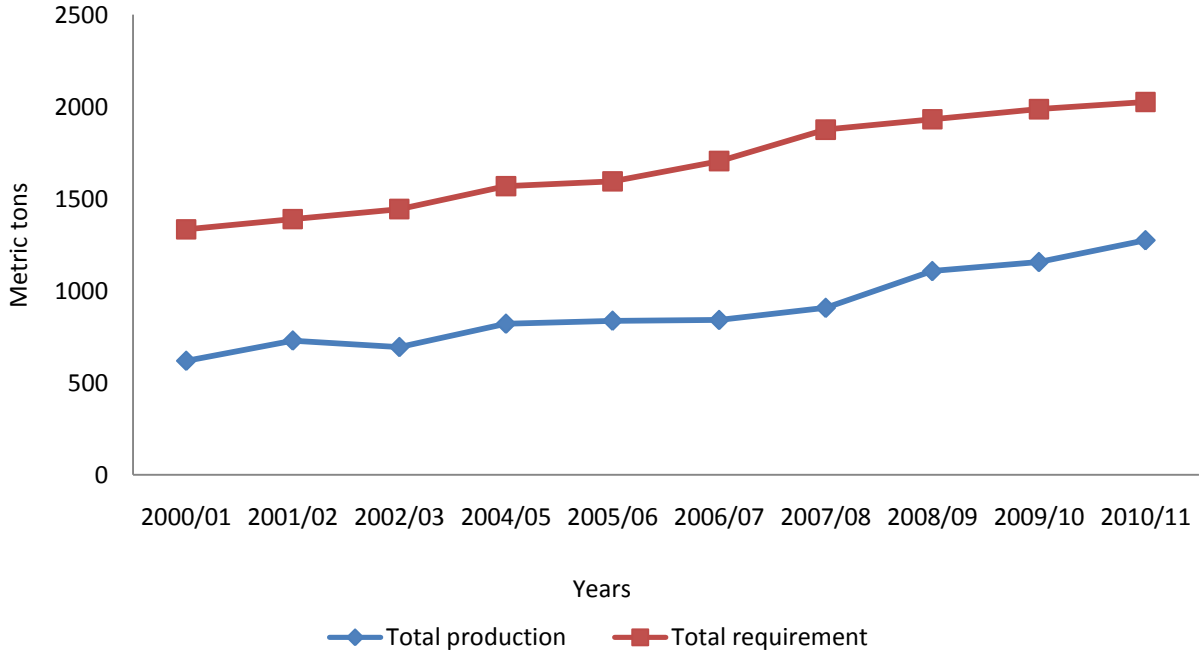


Figure 5. Annual production and demand of vegetable seed

Vegetable seed growers (Seed Producer groups, Cooperatives and Individual Entrepreneurs)

Vegetable seed producer groups get registered in DADO for seed-production purpose. They make plans in advance and request to the concerned body, either government farm or Seed Company for foundation seed. These groups produce vegetable seed by either having a prior contract with the vegetable seed buyers or without having contractions. There are many formal or informal farmers' groups who are engaged in vegetable seed production. As an umbrella organization of vegetable seed producer farmers, one national level federation of vegetable seed was registered with the Ministry of Co-operative and poverty Reduction (Personal communication, Indra Raj Pandey). It has 48 district level seed cooperatives as members and one district level federation based on Rukum district (Personal communication, Indra Raj Pandey).

4.3 Vegetable seed marketing in Nepal

National Seed Company Limited

National Seed Company formulated under the MOAD after separation of Agricultural Input Cooperation into two separate companies in 2002 as public companies. Among them one is focused on seed (NSC) and next on is on fertilizer (AFC). NSC has the mandate of producing foundation and improved seeds. Seed procurement, multiplication, processing, storage, distribution through its dealer network is the regular tasks of NSC. Especially, distribution of seed is focused on remote areas of Nepal, where the private sector is absent. In addition, it has the responsibility of providing seed storage facilities for buffer stocks maintaining at different ecological regions. In total, NSC has a storage capacity of approximately 8,700 tons, 10 processing plants, and 4 seed labs.

Trade and Export Promotion Centre (TEPC)

Trade and Export Promotion Centre as a national trader promotion institution of the country was established in 2006 (http://www.tepc.gov.np, 20 March 2015). The main aim of the TEPC is to promote foreign trade in general and export trade to the foreign country. Besides, as a provision in export policy, TEPC is involved in facilitating value chain actors in exporting and

importing seeds. They also provide trade information to the actors involved in the seed sectors. Figure 6 shows the total import and export of vegetable seed from Nepal since 2009 to 2013.

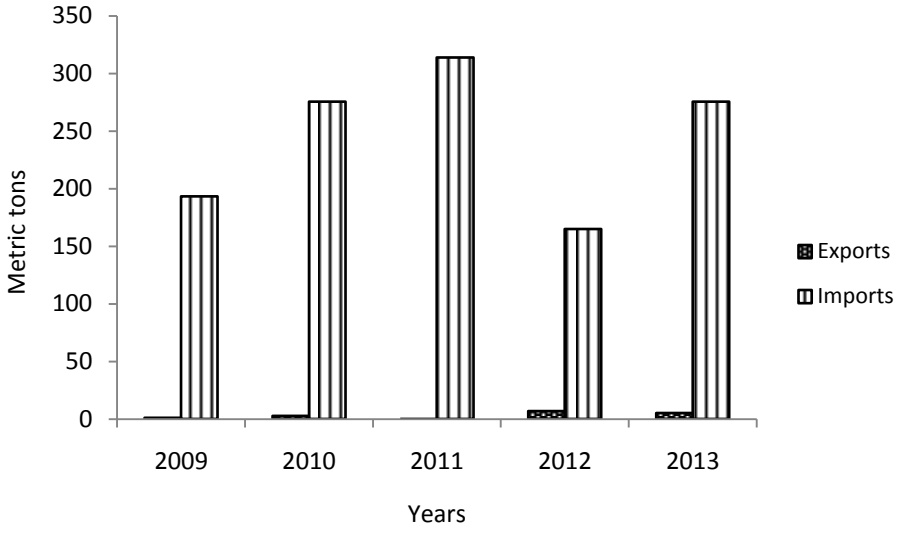


Figure 6. Vegetable seed import and export

Seed Entrepreneurs' Association of Nepal (SEAN)

Seed Entrepreneurs' Association of Nepal (SEAN) is the lead organization among the seed entrepreneurs of Nepal. As a non-profit organization it was registered in 1991 with the Governments of Nepal (http://www.seedquest.com/seed/associations/asiapacific/nepal/sean.htm20 March, 2015).The main purpose of the SEAN is to organize individual entrepreneurs and seed companies, especially private sectors and supports them in improving production, processing and marketing of high quality seed. The total members of the seed entrepreneurs under the SEAN are 234 (SEAN, 2014). Many of the SEAN members are involved in vegetable seed production, wholesaling and retailing of vegetable seeds in Nepal. They also import vegetable seed from India and to some extent export to a foreign country. (NSV, 2013)

Seed Companies

Vegetable seed companies in Nepal are involved in seed production, processing, marketing through local dealers, and export and import. Some of the seed companies do vegetable seed

trading on a contractual arrangement with the vegetable seed producer while most of them do not make contractual arrangement. They provide technical and market information to the producer and to some extent financial provision. Total seed companies registered at the SQCC are 26 from all over the country (SQCC, 2014). They supply seed through either seed dealer or directly through seed retailers to all over the Nepal. (NSV, 2013)

Seed Retailers

Seed retailers exist at the end of the supply chain on the vegetable seed market. Seed retailers as per the seed demand develop seed procurement plan and sell good quality seed as decided in the seed quality act in their respective area. After 1990's, seed retailers have opened in many districts of Nepal. As recorded in SQCC, the numbers of registered seed traders at NSB was increased from 1476 in 2011 to 2208 in 2012 (SQCC, 2014).

4.4 Policy environment of vegetable seeds in Nepal

Formally vegetable seed production and marketing in Nepal began from 1975 after the establishment of Agricultural Input Cooperation. But the Seed Act and the National Seed Policy were formulated later in 1988 and 2000 respectively. The seed sector in Nepal is regulated under these Seed Act and National Seed Plan (NSP). It is clearly mentioned in the preamble that act is circulated to maintain the convenience and economic interest of the stakeholder by providing the highest quality seed. The aim of NSP is to ensure the availability of quality seeds in the required quantity of various crops and to ensure conservation of indigenous genetic resources. Varietal development, seed multiplication, quality control, supply management, strengthening and capacity building of the organizations and promotion of the private sector in the seed are the main emphasis of the NSP. Table 3 presents the overview of policies and institutions pertaining to the seed sector in Nepal.

Table 3. Policies and institutional framework governing the seed sector in Nepal

Functional Area	Laws/Organizations	Main Features/Functions
Major laws and regulations related to the	National Seed Act (1998) National Seed Policy (2000)	The principal national law of seed • Establishes a nodal agency governing all seed-related issues in Nepal

seed sector in Nepal	Plant Protection Act (1972) Plant Protection Rules (1974)	Governs introduction of germ plasm and establishes rules governing international trade of seeds
Regulatory organizations	National Seed Board (NSB)	Nodal agency to formulate and implement policies related to the seed sector
	NSB subcommittees: • Variety Approval, Release and Registration Subcommittee (VARRS) • Planning Formulation and Monitoring Subcommittee (PFMS) • Quality Standards Determination and Management Subcommittee (QSDMS)	Subcommittees to undertake various functions Functions: • Monitoring the release, registration, promotion, and protection of released varieties • Planning, organizing production, supply, prescribing seed price, and so on • Recommending quality standards
	Seed Quality Control Centre (SQCC)	Independent quality control organization under the Ministry of Agriculture and Cooperatives (MoAC)
	National Plant Quarantine Program (NPQP)	• Undertake seed testing, maintain testing standards, registration and updating of varieties of imported/exported seeds, monitoring and inspection to control seed quality
Research and extension	Nepal Agricultural Research Council (NARC)	Apex public organization for agricultural research
	International Agricultural Research Centres (IRRI, CIMMYT, and others)	Research, including the introduction of germ plasma, research capacity building, and so on
	Department of Agriculture (DoA)	Public extension organization with an organized network at the district level across the country
	Donor-aided programs and nongovernmental organizations (NGOs) (Hill Maize Program, LI-BIRD, CEAPRED, and others)	International and local NGOs involved in seed research, extension, and development

Seed Supply	National Seed Company Ltd. (NSC)	Public seed company • Produce, procure, process, store, and sell seeds and also export/import
	Private sector	Currently there is no large private seed company, but there are 897 registered seed entrepreneurs/dealers
	Informal seed supply system / farmer-to-farmer seed exchange	Ninety percent of seed demand is supplied by informal and on-farm sources

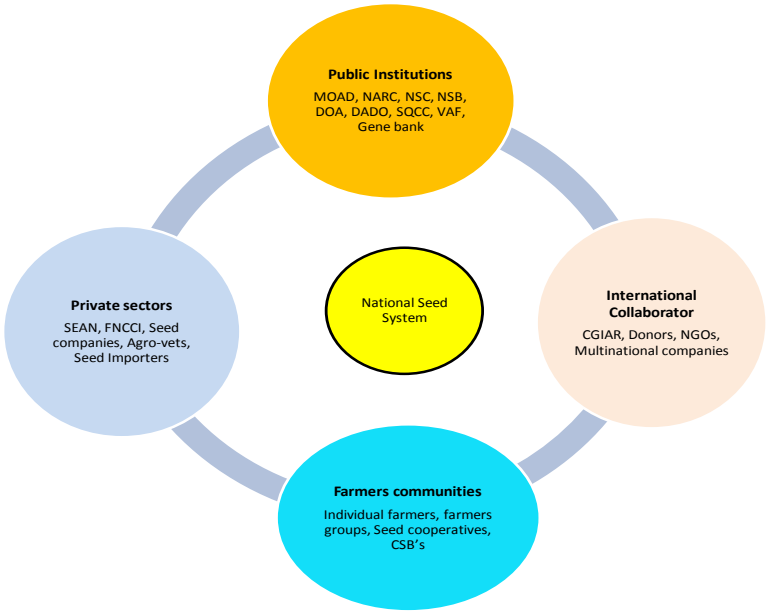
Adapted from: Pullabhotla, Shreedhar, Kumar and Gulatin 2011

Currently, breeder and foundation seed production is mainly done by NARC, for the provision of the National Seed Company and 23 registered private seed companies (Annual report (SQCC, 2014).SQCC annually conducts coordination meetings with the participation of all actors, including NSC, DADO, Seed Companies, farmer groups and cooperatives, agro-vets, and donor representatives to place their order for the breeder and foundation seed. However, due to lack of legal contract arrangement there are no binding commitments from the both sides in quality, quantity and price of the seed (Sha, 2014).It causes inefficiency in timely marketing and distribution of vegetable seeds. Thus, it is necessary to review the method of estimating seeds demand in the current situations.

There are several hurdles that need to be overcome to accelerate to full integration of private sectors; however the new seed acts and regulations have begun to endorse private sector participation. The public system does not appear to be responsive to the demands of the private sectors or farmers, and seed subsidy and the dominance of the NSC hinders private industry's interest in the market (Sha, 2014). Thus, it would be more encouraging if public institutions focus on R&D, infrastructure, capacity building and human resource development as well as providing quality seeds to the farmers at affordable prices.

Local bodies such as the Village Development Committee (VDC), District Development Committee (DDC) and Municipalities have authorities to formulate and implement policies, programs and activities related to agriculture and rural development according to Local Self Governance Act (1998). The implementation of LSGA had hindered the seed business due to the imposition of unnecessary local taxes on seed movement across the district (NSV, 2013)

It is estimated that around 76 percent seeds in the border area are imported unofficially. The illegal import with India and China was considered as 93 and 70 percent respectively. In addition, the involvement of international seed players is 40 and 60 percent in Nepal for supplying both registered and unregistered seeds. This has been possible mainly due to weak seed quality control system, which needs to be implemented with strong and user friendly regulation in Nepal. Management of border seed trade (import/export) is not easy between the countries like India and Nepal, where there is long open/porous border. Figure 7 presents the overviews of the Nepal's national seed system.



Adapted from: Sha, 2014

Figure 7. Overview of the vegetable seed system in Nepal

4.5. Chapter conclusion

To conclude this chapter, reviewed the literature on vegetable seed production, marketing and policy implication in vegetable seed sectors of Nepal and presents the answer to the research question numbers five and partly to the answer of question number six.

RQ 5:- What is the current status of the development of vegetable seed sub-sector in Nepal?

RQ 6:- How does the government policy influence the vegetable sub-sector development in Nepal?

Government of Nepal still play an important role in vegetable seed production and marketing. As breeder and foundation vegetable seed production is still limited to the government body; NARC and Government Seed Farm. Private sectors involvement in the production of vegetable seed is still limited. The reason behind this neither is that private sector either capable of producing vegetable seed (especially breeder seed) nor fully trusted by the government. However, as a whole vegetable seed sector is gradually growing in terms of volume of vegetable seed production and demand within the country, numbers of Seed Companies and retailers. But, export of vegetable seed is negligible compared to the import. Rules and regulation of the vegetable seed is not effectively implemented as supply of vegetable seed without proper truthful level is common. The local governance rules impose by the local authority is not market friendly. Coordination mechanism within the government bodies and between different actors of vegetable seed sectors is weak. Because of this, there is no consistency between the demand of vegetable seed in the market and seed production within the government farm. Unreliable market information and unofficial import of vegetable seed from Indian and China further worsen the vegetable seed market of Nepal for the smallholder producers of Nepal.

CHAPTER 5: METHODOLOGY

This chapter focuses on the methods used in empirical research. It starts with the introduction of the inspected problems, an overview of the study area (5.2) and followed by the description of the research strategy (5.3) - case study design in sub-chapter 5.4 that includes methods used for data collection, process of data analysis and reliability and validity of the research. Limitation of the study is presented in sub-chapter 5.5.

5.1 Introduction

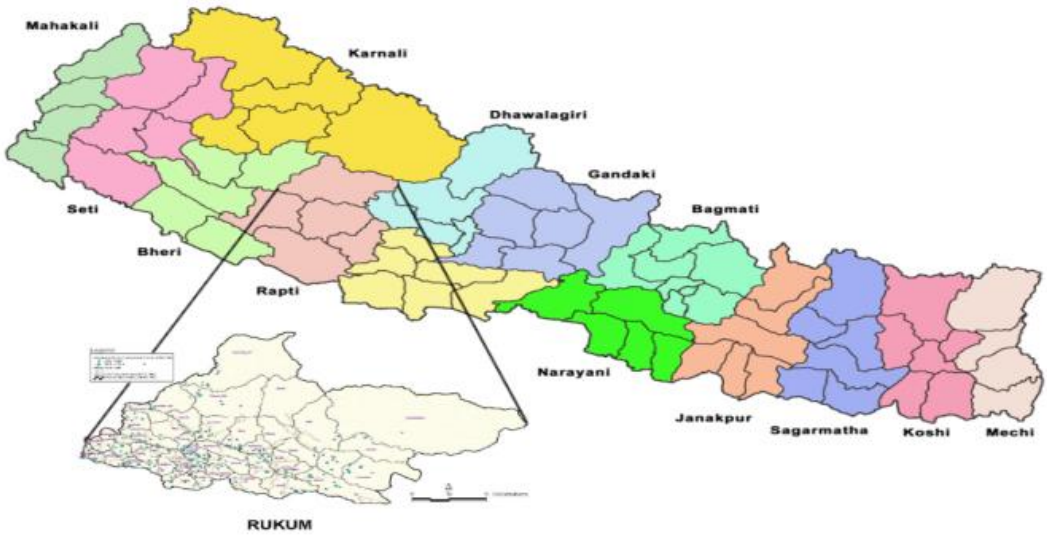
The problem of this study is to find the options that can apply to the smallholder vegetable seed producers of Nepal to enhance access to markets. Three different market options for smallholder producers of Nepal were discussed in the theoretical part of the research. Later, analyzes of the selected market options were done based on the based on the market characteristics, farming/farm characteristics and vegetable seed actor's perceptions in selected market options. Factors affecting access to market, and enabling factors for enhancing market access of smallholder farmers will be analyses that will guide to answering the main research question. "***What are the options for the smallholder vegetable seed producer of the Nepal to improve the market access in the national vegetable seed market***"?

5.2 Description of study area

Rukum district is located in Rapti Zone in Midwestern development region of Nepal occupying 293,182 hectares of land. About 29 percentage of land in Rukum is steep slope and it is geographically divided into four types: Taar and Besi, Hill, Lekali and Himali area. It has 12.08 percentage cultivable lands out of which 18.89 percentage lands have irrigation facility. The district is characterized as small land holding as 82.36 percentages people have land less than one hectare. People living below the poverty line are 49.1 percentages while the percentages of the literate are 45. However, large numbers (72.69 %) of people depend on the agriculture for the livelihoods which is higher than national average; the district had food deficiencies of 1511 metric tons in year 2013. Maize, wheat and rice are the major food crops produced in the lower

part of the district, but in case of high and mid-hill fruits and livestock are the main sources of income. Vegetable seeds are grown from the low hills to mid hills of the district ranges from 800 Meters to 2200 Meters. (DDC Rukum, 2013).

There are mainly four reasons why this region being selected. The first reason being that since last 34 years, farmers have been involved in vegetable seed farming in this area. The second one is this region is the largest pocket area of the country in terms of area, production and numbers of farmers involving in vegetable seed production. The third reason is that a large numbers of local traders are from the same region has and who have been involved in the vegetable seed trading. The final reason is the authors' work in the same community around four years, so he wants to use the advantage of his experience and knowledge. Figure 8 displays the location of the study area.



Source: en.wikipedia.org

Figure 8. Location of the study area

5.3 Research strategy

According to the Verschuren & Doorewaard (1999), the research strategy is a set of interrelated decisions about in what way the research will be conducted. Research strategy used for

empirical data collection in this study is case study design. The case study design is based upon the assumption that it provides holistic insight into the events and situations prevalent in a group from where the case has been drawn (Kumar, 2011). In this study a single case is studied. The reason why a single case is studied is that the main objective of the research question is to find out the marketing options for improving the access to market of smallholder vegetable seed producer of Nepal. Therefore, a case of vegetable seed production in Rukum district of Nepal was selected. Multiple respondents were used to gather the relevant information. Under this farming/farms characteristics, market characteristics, vegetable seed production problems, marketing problems and market channels are identified. Similarly, respondent's attitudes, perceptions, interest and situations towards the different factors that affect in the choice of marketing options are compared and analysed to find out the market option of the smallholder vegetable seed producer of Nepal. Reviews of the theories, present in the research framework and research material, in a combination with empirical study give a comprehensive insight of the overall pictures of the vegetable seed sectors of Nepal.

5.4 Case study design

The case study design investigates an area where little is known or where you want to have a holistic understanding of the situation, phenomenon, episodes, site, group or community (Kumar, 2011). The case study design tries to find out the answer to the main research question by investigating the holistic situation of the case. Thus, several steps have to be taken. First the sources of data are identified, strategies for data collection discussed and finally, the process of data analysis is explained.

5.4.1 Data collection

In the empirical section, people are the prime source of information acting in the role of informants. However, different sources of data are used for the purpose of empirical research: documents, literature and people. The first two sources are used in the first part of the results and analysis in order to explore the different concepts and factors that obstruct market access of smallholder producers. In combination with these factors and concepts a research framework is developed which, is used in the empirical section of this research. These concepts and factors

are derived from the theory of transaction cost, collective action and global value chain that created foundation for the empirical study. Also, the literature of vegetable seed sectors of Nepal provided more insight in the overview of the vegetable seed production, marketing and policy environment that is helpful at a time of data analysis. The third source of information, people (farmers, local traders and Seed Companies) provided the detailed data on the situation of vegetable sectors as well as perception, views and interest in the market options that are selected from the literatures.

Smallholder vegetable seed producer, seed local traders and manager of Seed Companies are the prime source of the data for this study. Sample selection is very important to obtain a meaningful response to answer the main research question. Therefore, a prior contact was made with the United Mission to Nepal; an organization that has been working in the same area for the promotion of vegetable seed. In consultation with the program coordinator of the Vegetable Seed Promotion Program of UMN Rukum a list of vegetable seed producer and local seed traders were developed. From that list each 10 larger vegetable seed producers who had also experience in vegetable seed trading and 10 local seed traders who are currently engaged in the vegetable seed trading were selected purposively. Besides, three focus group discussions were conducted. Similarly, in consultation with the Planning and Monitoring Officer of SQCC 10 Seed Companies were selected from the list that was registered at the SQCC. Two Seed Companies that are involved in the seed import, two Seed Companies that are involved only in sales of domestic vegetable seeds and six Seed Companies that are involved in both trading of imported vegetable seed and seed produced in Nepal were selected. Three experts were selected through use non-random sampling methods of purposive sample method. The selection criterion was entirely based on the preference of researcher and consultation with the selected Seed Companies managers. The first one is Kedar Budathoki, Ex-head of the horticultural department of Ministry of Agriculture and Rural Development. At present, he is employed as a consultant and involve in hybrid seed production of tomato (Shrijana). The second one is Indra Raj Pandey. He is also a retired officer of Government of Nepal under the Ministry of Agricultural and Rural Development and currently working as a team leader at CEPREAD, a leading organization working in vegetable seed promotion in the Nepal. The third

respondent is Krishna Timilsena, employ of the Government of Nepal as a scientist in Socioeconomic Division of Nepal Agricultural Research Council. Purposively selected respondents are more informative and it is necessary to have holistic information about the cases to its totality (Kumar, 2011). Furthermore, the results obtained from the purposeful sampling are on average, more informative and holistic in nature than those obtained from other technique of sampling methods and helpful to select participants in preferred categories.

Regarding the time of interviews, and contact process, local traders and Seed Companies were asked for appointments via email. In some cases, appointments were asked through telephone calls and also direct by going participant's offices. For focus group discussion, first contact was made with the United Mission to Nepal - Rukum, an organization implementing vegetable seed promotion program in the study area. That organization helped me by organizing a meeting for Focus Group discussions. In case of farmers, interviews were done by direct visits to their places. All the interviews were taken place according to their affordable time and places and the interviews were taken place between January and February 2015.

According to DiCicco-Bloom and Crabtree (2006) the time for semi-structured interviews may take between half an hours's to several hours. Duration of interview in this study took between one hour to two hours. The variation in interview time was mainly due to their busy schedule in the work. The final version of interview document can be found in the **appendix 2.**

Interviews

Interview has become the main data collection method intimately associated with qualitative, human scientific research. The empirical research was performed by conducting interviews. The main purpose of interview is to gather relevant information in order to answer the research question. Interview techniques for qualitative data collection methods are most helpful in getting the story behind a participant's experience and the interviewer can pursue in-depth information around the topic (Mc. Namara, 1999). Selection of the type of questions, participants and numbers of participants is the main focus of the interview process (Englander, 2012). The selection method of respondents for interview is purposeful sampling method (Maxwell, 1998). The interviews in this research can be characterized as semi-structured

interviews, in which the respondents were asked about facts, perception as well as opinions (Yin, 2003). The interviews included open questions and multiple choice questions. The open questions allow the respondent to express an opinion or explanation about the subject. The multiple choice questions were given on a form to the respondents in order to read all the answers and to fill the question in. To have a holistic understanding of the situation and in-depth knowledge about the case participants were selected from the different groups. In this study participates were selected from the individual vegetable seed producer, local vegetable seed traders and Seed Companies. 30 numbers of interviews were conducted, including 10 from vegetable seed producers, 10 from vegetable seed local traders and 10 from Seed Companies. Besides, 3 focus group discussions, 3 experts interviews, 3 interviews with fresh vegetable producers and 3 interviews with Retailers were done after the cross analysis as a check on the validity of the results. The detailed of the lists of the respondents can be found in the **appendix 1.**

During interviews, the process was accompanied by listening and showing enthusiasm towards interviewees' ideas and experiences. Interviewees were allowed enough time to clarify certain points as well as cooperation was developed when paused, by simplifying themes. The interviews were recorded after getting permission from the interviewees to use for analysis later. In addition to the recordings, handwritten field notes were also made to visualize data and interviewees focus on issues. Ethical as well as technical issues were covered during the interview process.

5.4.2 Data analysis

Data analysis involves the identification, coding and categorizing the patters found in the data (Woods, 2011). Information gathered through the interview was analysed to find the characteristics of farming, marketing and constrained faced by the smallholder farmers in production and marketing of vegetable seeds. Respondents were asked to rate the statements on- trust, commitment, dependency, bargaining power, compliance of contractual arrangement and relationships for vegetable seed trading on three scale ranges from 1 = low/or poor, 2 = average or medium and 3 = good/or high to access the current situations of the vegetable seed

sectors. Thereafter, mean scores of each rating were calculated and presents through use of visual graphs. The data analysis was conducted in a single phase: within case analysis. The data obtained from the empirical study were compared to each other (between different groups of respondents) on the separate topics and within the case for detail scenario. First data were analysed collectively to describe the overall situation of the seed sectors. And, later a more detailed of the case. The descriptive analysis was done using EXCEL, which provided descriptive statistics. Mean values for each factor were calculated.

5.4.3 Reliability and validity

This section describes the validity and reliability of the empirical research in order to examine the quality of the research. First reliability and second validity are discussed.

Validity refers to the precision and correctness applied to the research process (Kumar, 2011). It is affected by the researcher's perception of validity in the study and his/her choice of paradigm assumption (Creswell and Miller, 2000). Validity can be defined as internal and external both are described below.

Internal validity refers to the degree to which the structure of a research design enables to draw clear cut conclusions from the results (De Vaus, 2001). Guba (1981) uses the term credibility instead of internal validity and credibility increases the trustworthiness of the research process. The internal validity of this research is increased by the use of data triangulation. Different sources of information are used for data triangulation. Desk research, interviews with vegetable seed producer, vegetable seed local traders and Seed Company are the different sources which are used in this research. The expert interviews and focus group discussions were used to increase the internal validity of this research.

Guba's (1981) construct of a corresponding term for external validity is transferability or generalisability. The external validity "is concerned with the extent to which the findings of one study can be applied to other situations. This is a unique case and findings are relevant to study area. Producer respondents sample size is small and not representative of the total population

seed producers, and not able to demonstrate that findings and conclusions to another situation and populations.

Reliability deals with demonstrating that the operations of a study – such as the data collection procedures – can be repeated, with the same results (Yin, 2003). Due to the changing nature of the phenomenon study researcher gets difficulty in getting the same result in their work. Therefore, the questions of reliability in case study come because one cannot repeat the same experiments twice due to changes in situation and time. Reliability in this research is improved by developing a case study protocol that ensures the data gathering was conducted always in the same way and could be repeated. As developing case study protocol and case study database is an avenue to improve the reliability of the research.

5.5 Limitation of the study

There are several limitations that could have influenced the results of the research. One of the limitations of this study is the generalizability of the study findings beyond the case study region. This is because of the uniqueness of the case.

The second limitation of the study is the limited numbers of respondents and non-random choice of sample. Due to the non-random choice of the sample generalizability of the research is not possible. The numbers of vegetable seed producer respondents are not representative.

The third limitation of the study is that only respondents perceptional information's are used in the empirical study to access the market options for smallholder vegetable seed producer.

This study is intended to find out the feasible market options, but lacks the economic analysis to analyze the viable options for market access. Therefore, market options are selected more on theoretical perspectives and perceptions of the respondents and less by the economic analysis.

CHAPTER 6: RESULTS

This chapter presents the results of the empirical research. It provides the answers to the main research questions, what are the options for the smallholder farmers of vegetable seed growing farmers of Nepal to increase the market access:

6.1 Introduction

First the general results for the total sample of the respondents will be presented, where the results for farmer's information (household's information, land holding pattern, income sources, food sufficiency status, and knowledge of farmers) and educational level of 30 respondents also presented in the general information section. The next sub - section 6.2 displays the vegetable seed production and marketing problems, loss of vegetable seed because of diseases and pest and finally end with marketing channels of the vegetable seed in Nepal. Sub - section 6.3 deals with cleaning, grading, packaging and labelling situation of vegetable seeds, services for vegetable seed production and satisfaction level with different services deals in sections 6.4 and 6.5 respectively. Similarly, sub -section 6.6, 6.7, 6.8 and 6.9 are for level of trust, commitment, dependency/bargaining power/relationship and negotiation of conflict between different actors respectively. The sub - section 6.10 presents the contractual arrangement that includes types of contract, compliance of the agreement, willingness of actors goes into contractual arrangement and preference for contractual arrangement. The last sub - section 6.11 presents expert's views and ends conclusion remarks will conclude this chapter at the end.

6.1.1 General household information of the farmers

Figure 9 shows 10 farmer's respondents average household members, including male and female. It indicates that the average numbers of household is 7.2. It appears that 3.6 is average male and female.

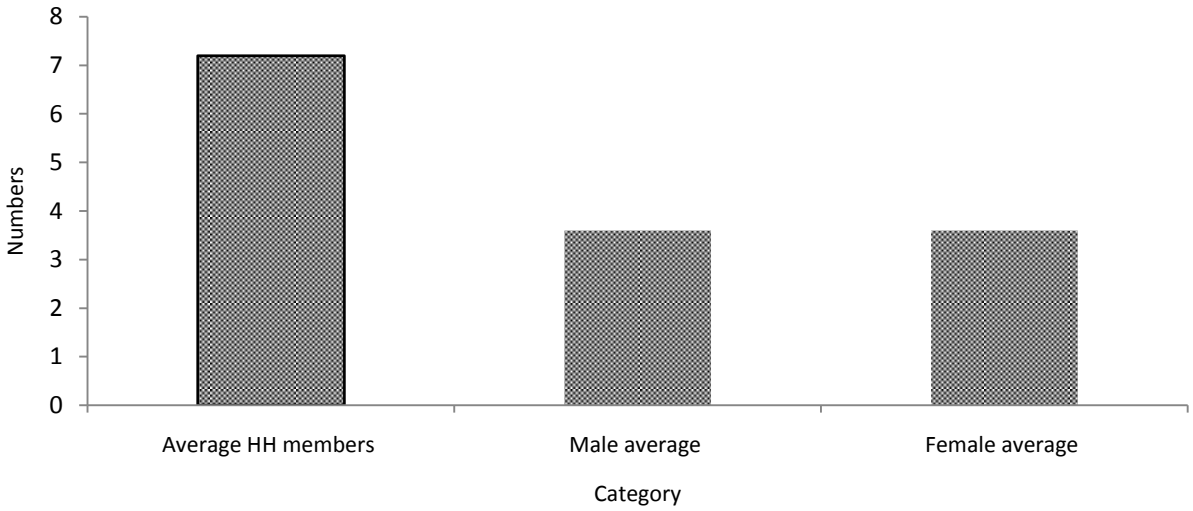


Figure 9. Household's member's information

6.1.2 Land holding pattern of the farmers

Figure 10 indicates the average land distribution of the 10 farmer respondents. It shows that an average land holding of the household is 1.44 hectares. Out of that 0.51 hectare land has irrigation facility and 0.93 hectare land does not have irrigation facility. The figure shows that an average lowland and upland land is 0.91 and 0.53 hectares respectively. It appears that average land suitable for vegetable seed cultivation is slightly less than one fifth (19.85 %) of the total average land holding, that is 0.28 hectares. None of the respondents either rented land or rented to land for vegetable seed farming. Average irrigated land holding and average land suitable for vegetable seed farming has positive correlation (0.56).Since last 10 years the vegetable seed farming land is almost constantin the study area. But, numbers of farmers and area of vegetable seed farming have increased in the rural areas; the contrasting situations can be seen where there is no access to the road and outputs markets and situation is opposite in the areas near to the roads and output markets.

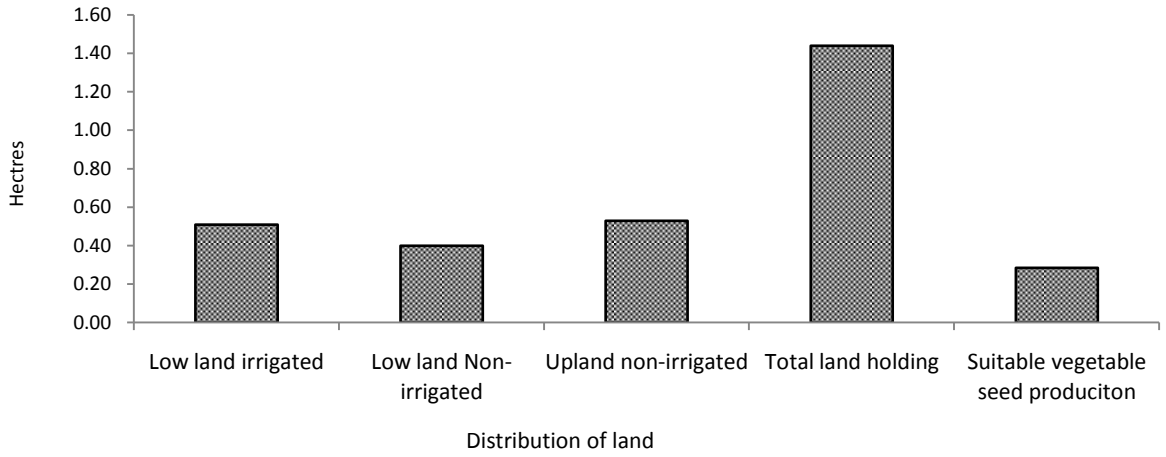


Figure 10. Household average land holding of farmers

6.1.3 Income sources of the farmers

Figure 11 shows 10 farmer respondents average income sources from the different income generating activities. It appears that income from the on-farm (52 %) activities is slightly higher than the off-farm (48 %) activities. The contribution of household income from the vegetable seed is the highest (33 %) followed by remittance (24 %) and income from government employment (17 %). The least contribution (2 %) is from the daily wages followed by other income source (3 %). It shows that the 7 percentage income is from fresh vegetables and 9 percentage from the livestock. It seems that the horticultural sector contribution in household income is 2/5 of the total income. Vegetable seed income source depends on the labor. For the last 5 years, the labor cost has increased from Rs. 80 to Rs. 400. Therefore, there is no profit if we use hired labor in Radish and Onion seed crops. Therefore, use of hiring labour is more expensive.

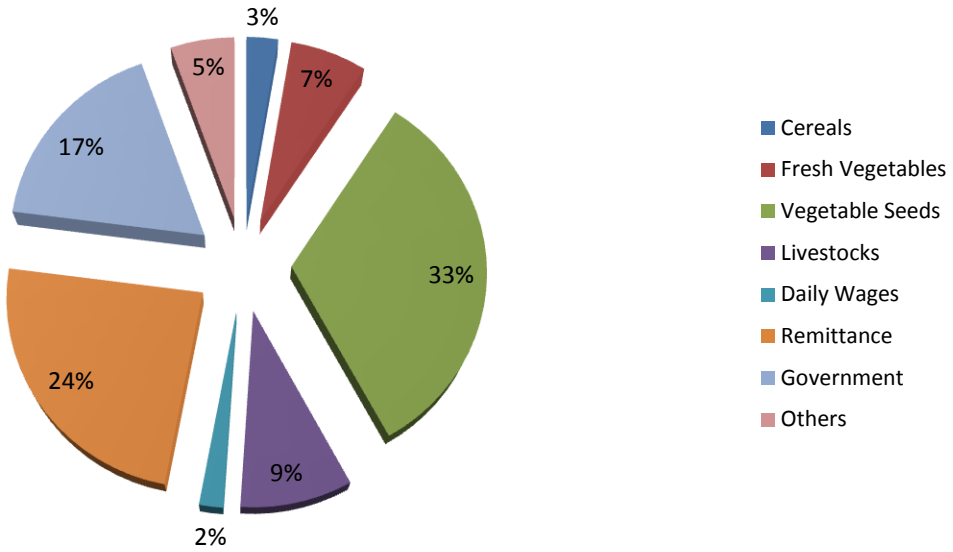


Figure 11. Income sources of the farmer's household

6.1.4 Food sufficiency status of the farmers

Table 4 shows 10 farmer's respondent's food sufficiency status. Food sufficiency status is measured based on from their own production. It indicates that out of 10, 9 farmers have food sufficiency status more than twelve months. 1 farmer has a food sufficiency in the category of 3 to 6 months.

Table 4. Food sufficiency status of the farmers

Food sufficiency level	Economic status	Percentage
> 0- 3	Very poor	0 (0.0)
> 3- 6	Poor	1 (10.0)
>6 -9	Capable poor	0 (0.0)
> 9 -12	Better-off	0 (00.0)
>12	Well-off	90 (90.0)
Total		10 (100.0)

6.1.5 Farming knowledge of the farmer's and application of farming knowledge

Figure 12 displays 30 respondents rating on the farming knowledge of farmers and 10 farmer's respondents rating on use of farming knowledge. The knowledge of vegetable seed farming and application of knowledge is confined to mainly four vegetable seed crops (Radish, Cauliflowers, Broad Leaf Mustard (Rayo) and Onion). These are the main vegetable seed crops grown in the study area. It appears that the perception of farming knowledge decreases as it moves from farmers. Farmers' perception on application of farming knowledge is slightly more than the seed companies' perception of farming knowledge of farmers; all the respondents gained the farming knowledge of vegetable seed production from experience. Farmers have lack of time and busy schedule at the time of vegetable seed sowing and harvesting. Farmers are involved in other farm activities (cereal crops production and livestock management) at the same time.

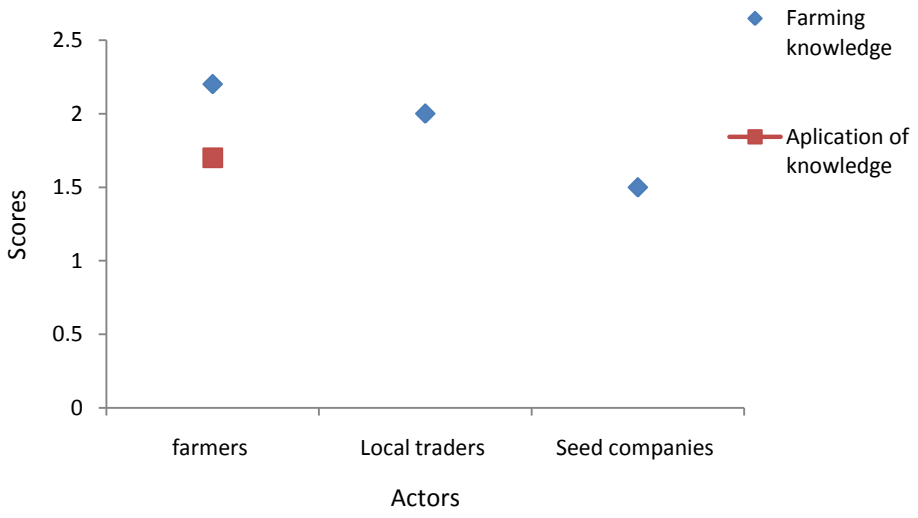


Figure 12. Farming knowledge and application

6.1.6 Cleaning, grading, packaging and labelling at farmers level

None of the farmer respondents have vegetable seed cleaning, grading, packaging and labelling machine. All farmers use local materials for vegetable seed cleaning, grading, packaging and labelling. Threshing (separation) of vegetable seed from the husk especially for Radish seed is

done through use of ox. But the damage is higher and ranges from 15 - 30 percentage of the total seed production. The threshing process of cauliflower and Rayo is similar to Radish but the threshing process is different from Onion seed. Cleaning and separation of dust and husk from the vegetable seed is entirely dependent on the flow of wind. Farmers use local materials, for instance Nanglo for cleaning and grading of vegetable seed. It takes more time and is labour consuming. In the past, two farmers had grading machine, but it does not work now. Farmers use jute/plastic bag having the inside plastic cover for packaging of vegetable seed. It is not too strong because the farmers face the problems of tearing/rupturing during the time of loading and unloading. Farmers do packaging in a bulk of 25 - 30 kg. Still, farmers do not have practices of labelling except tagging the name of individual farmers/farmers' groups or seed cooperatives in the bag. This is practiced with the support of local NGO's who are working in the promotion of the vegetable seed project in the district. At the shortage time of vegetable seed quality does not matter. Local traders and Seed Companies are ready to buy the vegetable seed regardless of the quality. Large numbers of customers who produce vegetable for their own consumption pay attention not to the quality of vegetable seed but rather to the price. Farmers are planning to packaging and labelling of vegetable seeds in the name of cooperatives.

6.1.7 Educational level of the respondents (n=30)

Figure 13 shows 30 respondents (farmers=10, local traders=10 and Seed Companies =10) educational level. Education level is categorized into 4 levels. The categories are primary level (1-5 classes), secondary level (6-10 classes), higher secondary level (11-12 classes) and higher education level (13-16 classes). None of the respondents are illiterate. It appears that local traders are least educated among the three groups followed by farmers. Farmers are slightly more educated than local traders. But, Seed Company respondents are more educated compared to the other two groups. Four Seed Company respondents are from a technical background that completed by. B. Sc. in Agricultural Science. No single respondents from the local traders are from a technical background. Six farmers participated week long training in vegetable seed production and harvesting organized by Local NGO's. Two farmers participated

in a three-day long "Seed Beginners Training" organized by SVSPC farm. None of the respondents from the farmers' group have a technical background (Agriculture).

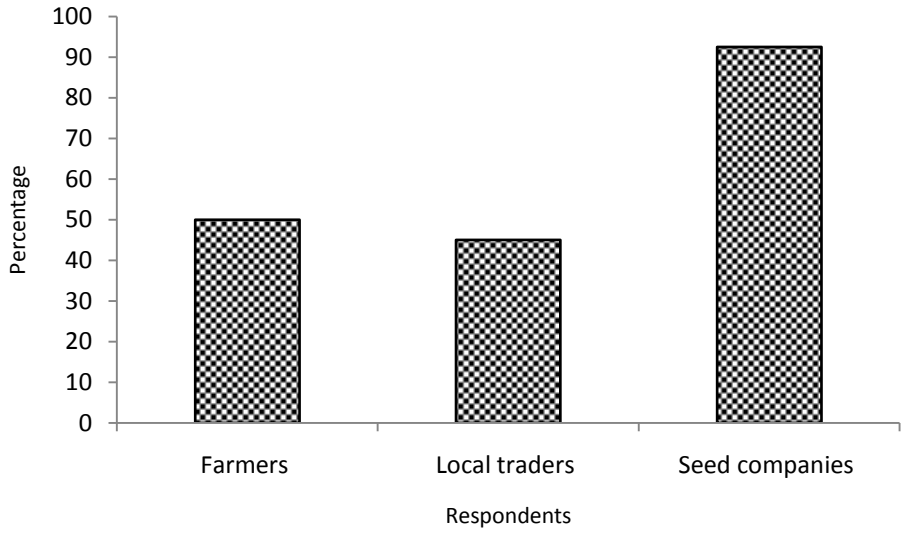


Figure 13. Education level of the respondents

6.2 Production, marketing problems in vegetable seeds and current marketing channels

6.2.1 Production problems of vegetable seeds

Table 5 displays the major vegetable seed production constraints ranked by individual 10 farmer respondents and ranked by 3 focus groups. Individual farmers ranked lack of availability of quality seed is the top problem followed by disease, pest infection, and lack of market information, low price of the vegetable seed, unavailability of quality inputs and lack of insurance policy. But in farmer's group's discussion diseases, pest infection is ranked as top problems followed by lack of market information, low price of vegetable seed, lack of quality seed, the unavailability of quality inputs and lack of crop insurance policy.

Table 5. Preference ranking of vegetable seed production problems by farmers & focus groups

Production Constraints	**Ranking by farmers (Individual)**	**Ranking by farmers (FG)**
Lack of availability of quality seed	1	4

Disease, pest infection	2	1
Lack of market information	3	2
Lowest price of the vegetable seed	4	3
Unavailability of quality inputs	5	5
Lack of crop insurance policy	6	6

6.2.2 Loss of vegetable seed because of diseases and pest (n=10)

Table 6 indicates the rating of 10 farmer's respondents about the crop loss of vegetable seed because of disease and pest infection during the entire crop cycle. Highest numbers (6) of farmers rate the loss of crop is low followed by 4 who rate loss of crop is average. But, particularly for Onion vegetable seed all 10 farmers respondents rate, the highest loss of crops. Each of them said it was happening since the last 5 years.

Table 6. Vegetable seed loss from diseases and pest

Loss of vegetable seeds	Low	Medium	High
Loss of vegetable seed because of disease and pest	6	4	0

6.2.3 Marketing Problems of the vegetable seed (n=20)

Table 7 shows the preference ranking of vegetable seed marketing problems ranked by local traders and seed companies. Production of vegetable seed not according to the market is the top most problems for Seed Companies followed by the low price of the vegetable seeds, lack of market information, lack of collection centre, inferior quality of vegetable seeds and lack of the processing facility respectively. Similarly, local traders ranked lack of market information as top problems followed by production not according to market, low price of the vegetable seeds, inferior quality of vegetable seed, lack of processing facilities and lack of collection centre respectively.

Table 7. Preference ranking of market problems by local traders and Seed Companies (n=20)

Marketing Constraints	Ranking by Local traders (Individual)	Ranking by Seed Companies

Production not according to the market	2	1
Lowest price of the vegetable seed	3	2
Lack of market information	1	3
Lack of collection Centre	6	4
Inferior quality of vegetable seed	4	5
Lack of processing facility	5	6

6.2.4 Marketing channels of the vegetable seed

Figure 14 displays the production and marketing channels of vegetable seed. This channel is derived from the production and marketing information obtained from 39 respondents (farmers =10, local traders =10, seed company =10, Agro-vets =3, experts = 3 and fresh vegetable producer farmers =3). Out of 80.8 metric tones vegetable seed produce in the study area 52.52 metric tons (65 %) were supplied through the cooperative channels either to wholesaler or retailers.The figure shows 6 different channels of vegetable seed production and marketing:

1. Seed Producer ➔ Retailers
2. Seed producer ➔ farmers Groups ➔ Seed Company/Retailer (larger) ➔Retailers
3. Seed Producer ➔ Cooperatives ➔ Retailers/Seed Company ➔ Dealer ➔ Retailers
4. Seed producer ➔ farmers Groups/Cooperatives ➔ Branding ➔ Retailers
5. Seed producer ➔ farmers Groups ➔ Cooperatives (suppliers) ➔ Cooperatives (Buyers)
6. Seed producer ➔ Local Traders ➔ Seed Company (Wholesalers) ➔ Dealers = Retailers

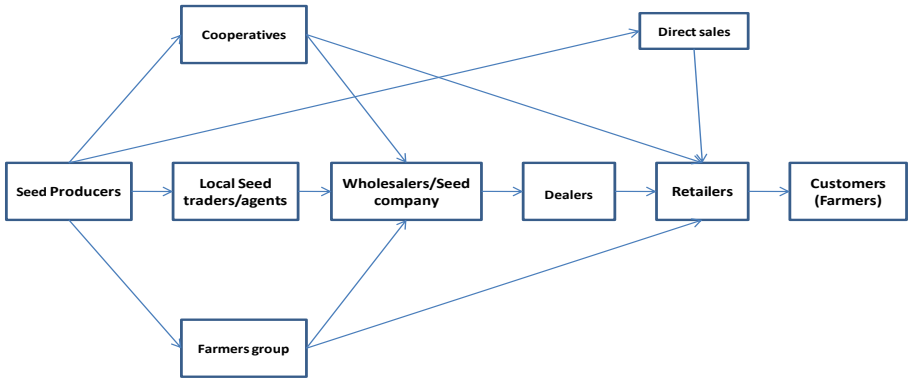


Figure 14. Vegetable seed production and marketing channels

6.3Perceptions of farmers

6.3.1 Services for vegetable seed production

Figure 15 displays the 10 farmers' respondents rating on the reliability and feasibility of goods and services required for vegetable seed production. It appears that the feasibility of seed testing facility is higher followed by its reliability which is above the average. Similarly, reliability of inputs is the lowest, followed by reliability of market information which is less than average. The figure indicates that possibility of quality vegetable seed production in the current situations is slightly less than average.

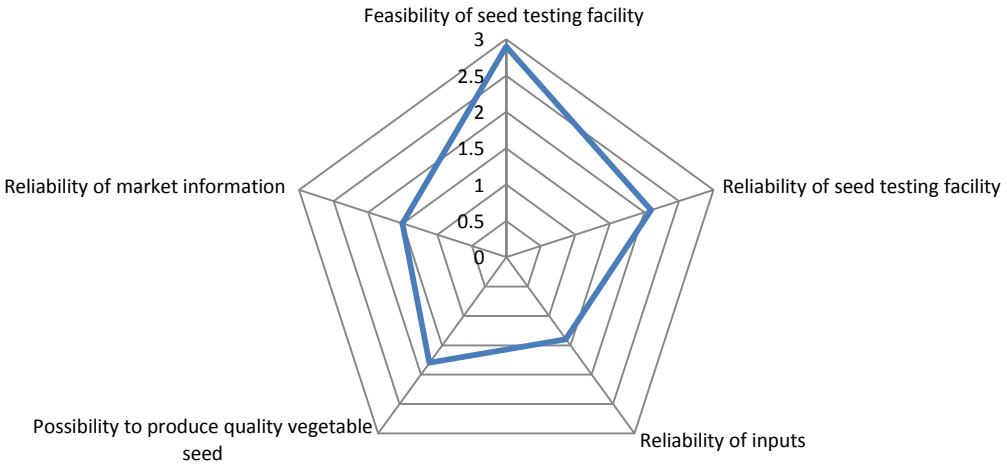


Figure 15. Services for Vegetable Seed Production

6.3.2 Satisfaction level in different services and farmers rating on it

Figure 16 indicates the level of satisfaction of 10 farmer's respondents with different goods and services that are required for vegetable seed production. It appears that the level of satisfaction with the services of the Seed Company (seed offer) is the highest which is slightly higher than the average, but other services(level of satisfaction with technical services from Government organization, satisfaction level with post-harvest management equipment's and satisfied with vegetable seed prices) are equals and around the average.

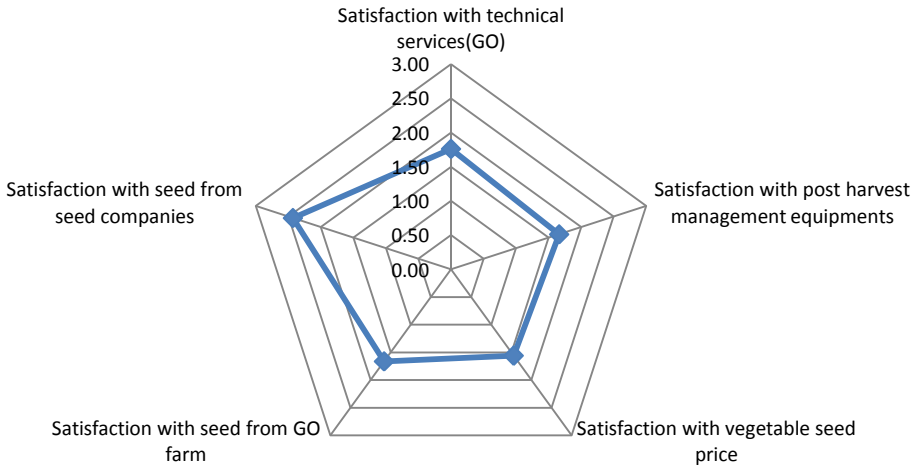


Figure 16. Satisfaction level of farmers with different services

6.4Perceptions of respondents (n=30)

6.4.1 Level of trust between different actors

Figure 17 shows the 30 respondents (10 = farmers, 10 = Local traders and 10 = Seed Company level of trust with the farmers, seed cooperative, retailers and seed company. It appears that local traders and Seed Company level of trust with other actors are more or less similar pattern. But, farmers have least trust level with the Seed Company followed by the local traders. Farmer's level of trust with cooperatives is higher. All three actors have more or less similar level of trust with cooperatives and that is higher than average. Out of 10 farmers 2 farmers shared that they still do not get the price of vegetable seed from the local traders. Until now, farmers never got the money in time as agreed in the contracts. The next thing is that buyers force to supply either fertilizer, pesticides, even food, groceries instead of providing cash of vegetable seeds.

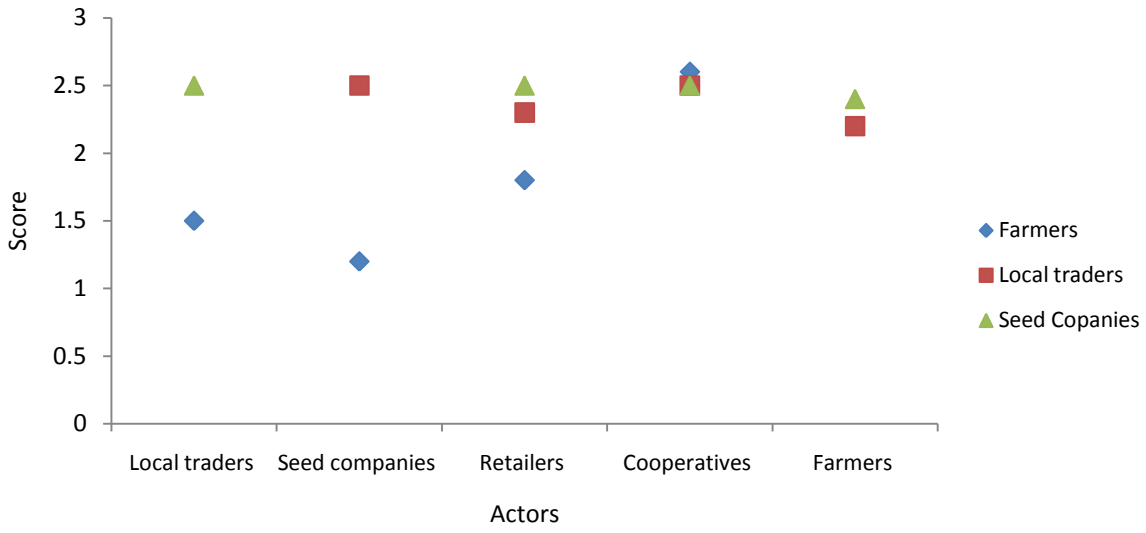


Figure 17. Level of trust between different actors

6.4.2 Level of commitment between different actors

Figure 18 shows the perception of 30 respondents (10 = farmers, 10 = local traders and 10 = seed companies) with the level of commitment from local traders, seed company, cooperatives and farmers. Farmers have lower level of perception in commitment followed by local traders and Seed Company. It shows that retailers are higher committed followed by cooperatives. It shows that Seed Companies are least committed followed by local traders.

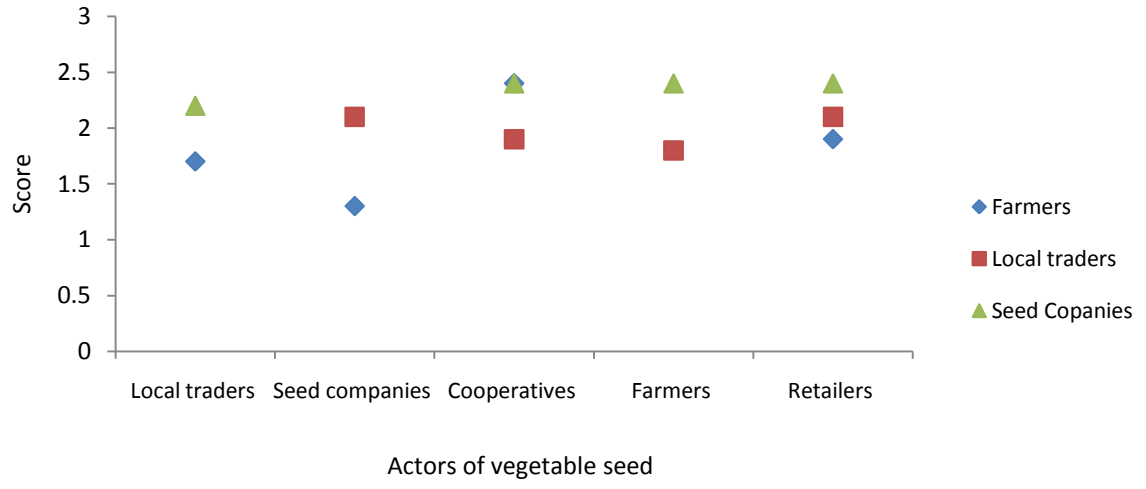


Figure 18. Perception of commitment

6.4.3 Dependency, bargaining power and relationship of respondents with buyers

Figure 18 shows the 30 respondents (10 = farmers, 10 = local traders and 10 = Seed Companies) dependency, bargaining power and relationship with buyers. Farmers have the lowest bargaining power and highest dependency. Seed Companies have the highest bargaining power and lower dependency with the buyers. Local traders are in an average in both dependency and bargaining power. Relationships of actors with buyers increase as moves from farmers to Seed Company.

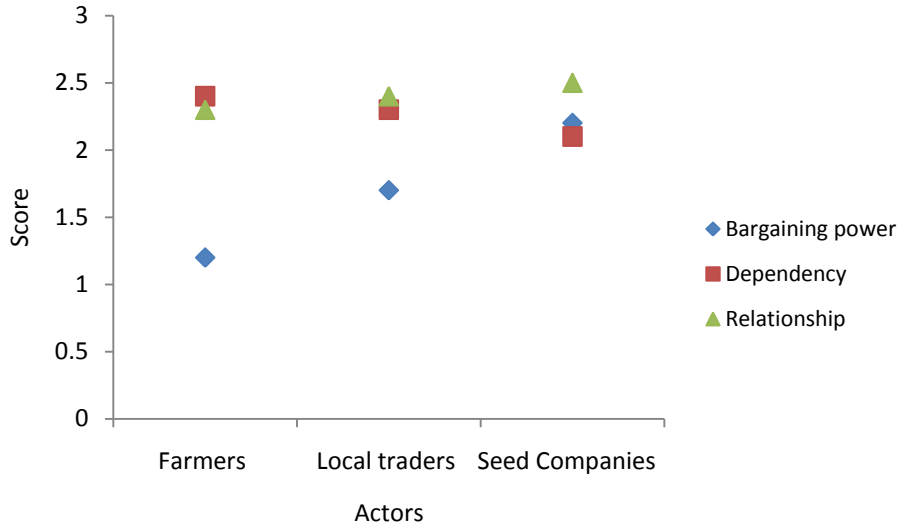


Figure 19. Level of dependency and bargaining powers with buyers

6.5 Conflict and negotiation

Figure 20 shows the way of conflict resolution between parties. It appears that 40 % respondents terminated relationship with the buyers while they had a conflict over the issues of vegetable seed business and 60 % were able to resolve the conflict. Out of the 60 %, 10 % cases were solved with the support of a third party while 50 % cases were solved through negotiating on behalf of oneself.

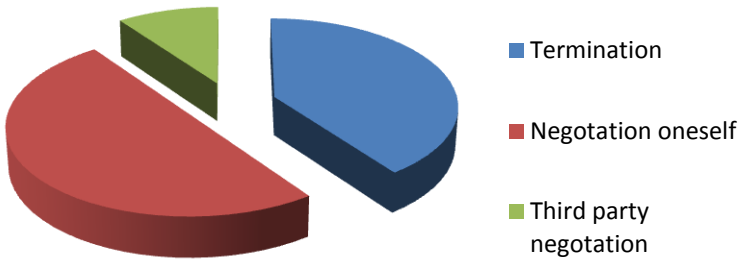


Figure 20. Negotiation of conflict

6.6 Contractual arrangements

6.6.1 Types of contract

Figure 21 displays 30 respondents (10 = farmers, 10 = local traders and 10 = Seed Companies) situation of the contractual arrangement. Percentage of the Seed Company having formal and informal contract is equal. 20 % local traders and 30 % farmers have formal contract and informal contracts are 80 % and 70 % respectively.

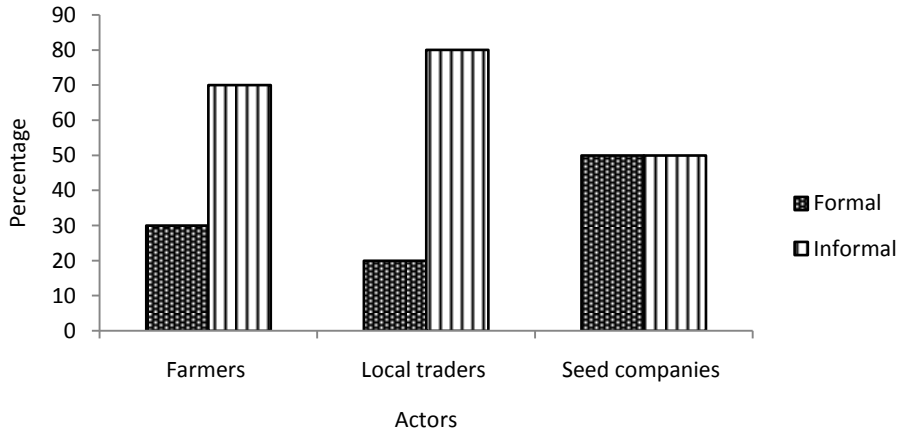


Figure 21.Contract systems in Vegetable seed sectors

6.6.2 Compliance contractual agreement of actors with buyers and suppliers

Figure 22 presents the 30 respondents' perception of the flow of contractual arrangement by their respective vegetable seed buyers and suppliers. It appears that buyers and suppliers have more or less similar in following contractual arrangement and buyers the similar pattern. But, Seed Company suppliers are more committed to follow the contractual arrangement compared to buyers.

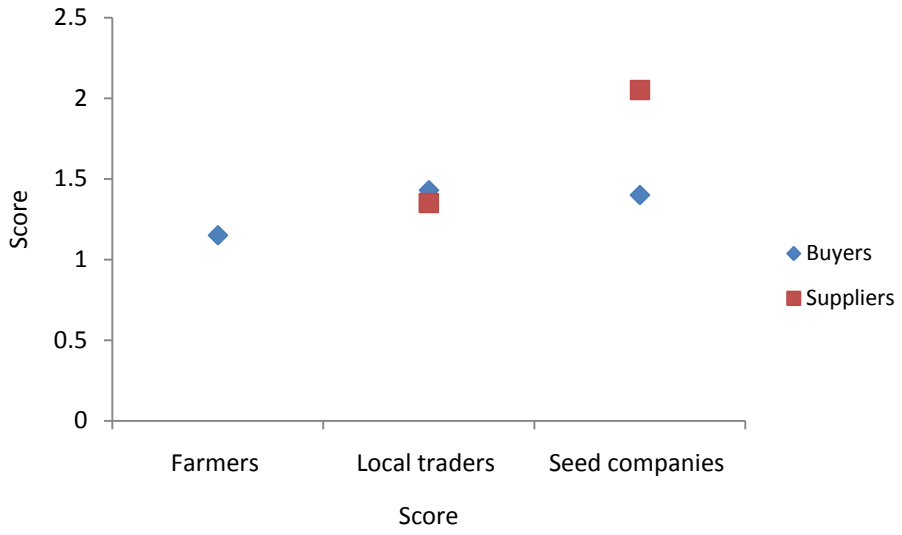


Figure 22. Preference of actors to follow of contractual arrangement

6.6.3 Willingness of different actors goes into contractual arrangements

Figure 23 indicates the willingness of the 30 respondents (10 = Farmers, 10 = Local traders, 10 = Seed Company) on the contractual arrangement. 90 % Seed Companies are interested to go into a contractual arrangement followed by 70 % and 60 % local trader and farmers respectively. The highest percentage (40 %) of farmers doesn't like to go into a contractual arrangement followed by local traders (30%) and Seed Company (10 %) respectively.

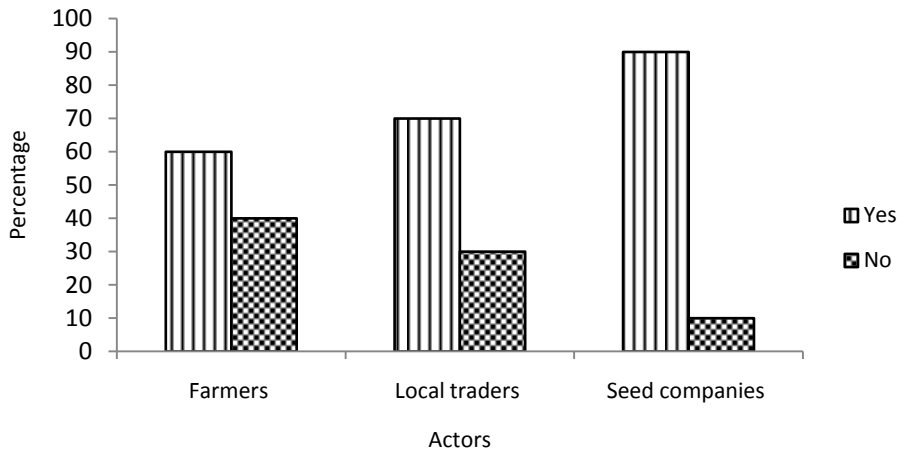


Figure 23. Actor's willingness goes into contractual arrangements

6.6.4 Preference of the respondent for contractual arrangement

Figure 24 indicates the preference of the 30 respondents for contractual arrangement. Farmers are higher (80 %) interested to go with cooperatives for contractual arrangement followed by local traders (20 %). Local traders are also more interested with cooperatives (60 %) followed by individual farmers (30 %) and farmers association (10 %). Preference of seed company also goes to cooperatives (50 %) followed by local traders (30 %) and farmers' groups (20 %).

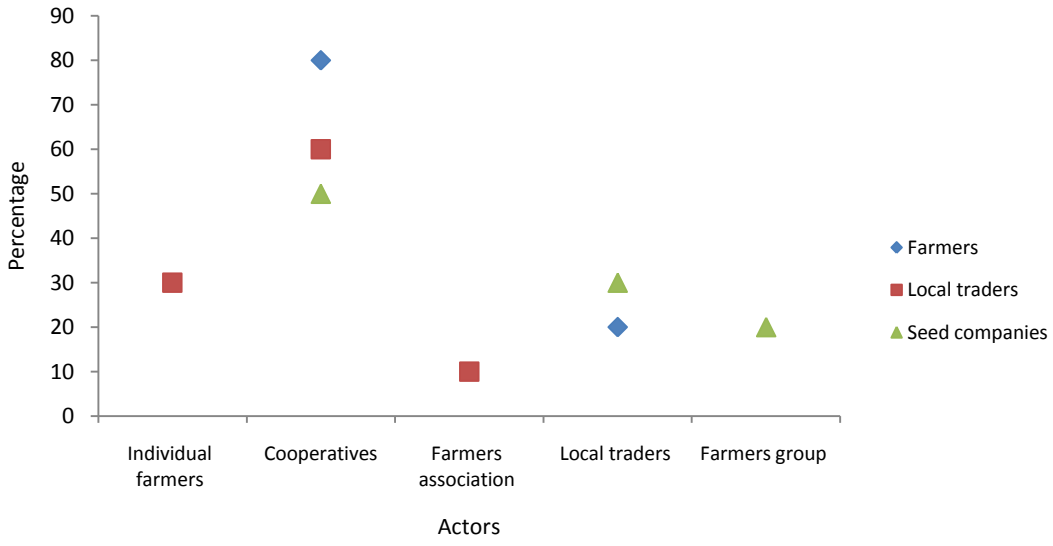


Figure 24. Actor's preference to into contractual arrangement

6.7Expert's views

Descriptions below are the views of the three respondents. This sub-heading presents the expert's views on private sectors; the expert's views on policy issues and problems in vegetable seed sectors and finally ends with the expert's views on the way forward for improving market access for smallholder farmers.

Experts' views on private sectors

There are 2200 seed entrepreneurs, including Seed Company all over the Nepal. Seed Company doesn't have Research& Development program, except 2-3 seed companies. Even they don't have strong R & D program. They are depending on the government for R & D program and even government R & D is too poor. Therefore, private sectors are not capable to engage in or & D program because of deficiency of financial as well as technical back stopping. All companies are engaging only in trading of vegetable seed. As a member of the WTO, we can't restrict on the importing of vegetable seed from international companies. Even Nepalese companies are more interested to import international seed and trade to the Nepalese market. The high level of trust, high margin and high commission compared to the seed produce in Nepal. Nepalese market is just like a hub for seed trading. In the recent years, demand for hybrid is increasing and this is threatening Nepalese local vegetable seed growers. The trend shows that the demand of seed produce in Nepal is declining. Nevertheless, due to some uniqueness and good keeping-quality there is an equal demand of seed produce in Nepal. And customers have used vegetable seed for different function like in northern portions of Nepal customers use Radish for leafy vegetables. Thus, zoning is necessary for vegetable seed farming. Source seed are not quality, so it is required to work entirely with the whole value chain. Therefore, it is necessary to include private sectors for varietal selection of vegetable seeds.

Experts view on policy issues and problems associated with seed sectors

No coordination is found existing within government organization like NARC and Department of Agriculture. Research is limited only to the farm. Food security policy is defective. Weakness is also evident in implementing seed acts and policy. There is a wide gap between research and

extension. The research is limited only to research fields. Research and development are still limited to the government organization.

Table 8. Problems in vegetable seed sectors

The high cost of production and quality of vegetable seeds are the main problems in the vegetable seed production and selling. Initially, farmers used family labour for vegetable seed production and, but situation is different today, they use hired labour that is also high compared to last five years. Vegetable seed is itself subsistence farming, small scale farming. Quality of vegetable seed is not solely the technical problems it is more issues of governance, however, despite there being a Seed Act, implementation is too weak. There is a lack of statistical information about the demand and supply of vegetable seed on the one hand and on the other hand production of vegetable seed is hazardous. In the meantime, many international organizations implementing vegetable seed production program focusing to the ultra-poor that also supports for unplanned production. Trust level among the stakeholders is too low. Either party does not have confidence or reliability with the quality of vegetable seeds. In addition, there is a lack of strong law to punish if either party breaches the understanding so-called contractual arrangement. Honouring of the contractual arrangement is poor. Technical value chain is not good. Unfair marketing process and competition with international markets as well as lack of branding and packaging are some of the problems. Subsistence marketing of seed, once they earn a little more they shift their business. Nepal is an example of being just a trading hub of the vegetable seed market not able to go in company concept. Nepalese vegetable seed market is highly influenced by Indian seed market and there is no estimation of vegetable seed transacted through the open border.

Experts' view on the way forward

Technical value chain is necessary to strengthen the whole seed sectors of Nepal. It starts from breeder seed production to end user, customers. There should be assurance of quality registered seed for vegetable seed production. Farmers are in small scale and produce in a small quantity. To make lots and assurance of quality and guarantee a legal body or organization is desired that could be achieved through a farmer's organization in the form of cooperatives. It

will be able to minimize the trust gap between buyers and suppliers as well as can supply as demand by the buyers. Similarly, it also provides information of production as well as market in total. For example, National Seed Federation can play that role as well as facilitate the member cooperatives. Therefore, it is necessary to go collectively to ensure economic scale as well as to increase the power of small farmers through collective action. The network is necessary, thus ensuring that information flow is reliable and farmers being able to manage and who has to produce how much. In the current situation the model presented in the figure 25 could be the option in Nepalese context. It shows that farmers are collectively working in a group. Cooperative forms a marketing committee and facilitates the marketing of vegetable seed through contractual arrangement with the buyers.

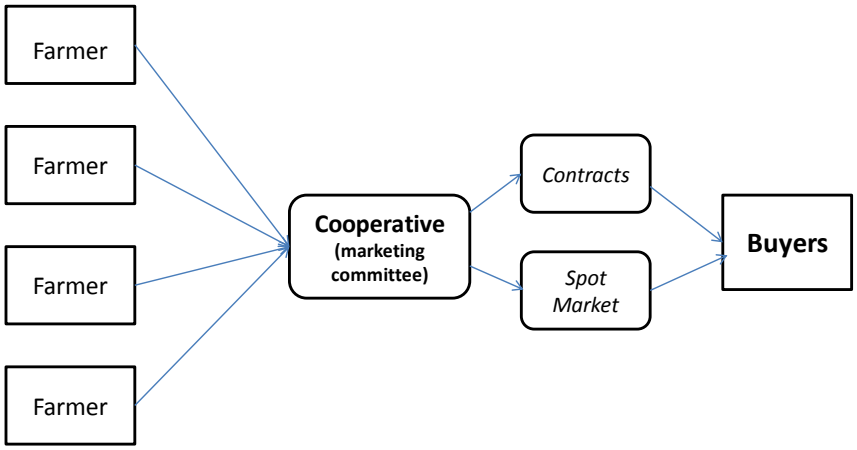


Figure 25. Proposed Vegetable seed production and marketing channel

For example: Panchakanya Cooperative pvt. from Kavre district of Nepal has been successful in producing Peas seed through cooperative farming. The working approach is that the cooperative has a marketing committee which is responsible for facilitating all the services (making production plan, purchasing inputs required for vegetable seed production, gathering

market information and making contractual arrangement with the buyers) required for vegetable seed production and marketing. They also do some field level trial to demonstrate the quality of vegetable seeds produced by them. This cooperative is getting support from one of the project (KISAN). At the moment, the cooperative is not fully matured, thus, it is necessary to have support from outside until they develop their own capacity to run all these activities independently. In general, many cooperatives get support from development organization as well as governments of Nepal. Supports are like subsidy in inputs, small scheme irrigation, infrastructures development (Cooperative building), training (book keeping, leadership development, vegetable seed production, marketing and post-harvest management), workshops and seminars for market promotion and linkage. At the least cooperatives needs three years support from the time of establishment, so they can enhance their strength and capacity to compete in the market.

CHAPTER 7: DISCUSSIONS

This chapter presents the summary of findings of the study and discussions. The purpose of the discussions is to answer the research question that was formulated in the research proposal by interpretations of research findings, giving own opinions on the findings, explaining the implications of the research findings, and make suggestions for future research (http://www.sfedit.net/discussion.pdf, accessed on April 7, 2015). Therefore, this chapter presents the summary of findings of the study and discussions on it.

7.1 Introduction

First the summary of the findings of the study is presented in sub-chapter 7.2. The summary of the findings are categorized into six different topics which are general information of the respondents; more focus given to producers. Next heading consists of problems on production and marketing of vegetable seeds and marketing channels of the vegetable seeds. The third one consists of perception of farmers on different services and level of satisfaction. The fourth one describes on perception of all respondents in relationships, trust, commitment, bargaining powers and dependency. In the fifth part description is done on negotiation and conflict management between actors. Details of the contract system are presented in the sixth part. Finally, experts' views on private sectors, policy implications, problems in production and marketing of vegetable seed and way forward for improving market access for smallholder farmers are discussed. Based on above different sections discussions of the finding are done in sub-chapter 7.3.

7.2 Summary of the findings

The household's average (7.2) numbers of the farmer respondents are almost double than the national average (4.4) household members. Seed farmers have higher average land holdings (1.44 ha.) than national average (0.96 ha.) (MoAC, 2012). The interesting point is that seed farmers have more average land suitable for vegetable seed farming (0.28) than the national average per capita farmland holding (0.14) (Sharma S., 1999). 90 percentages seed farmers are

well-off in terms of food security situation. Compared to the knowledge the farmers have they imply less knowledge in vegetable seed farming.

Lack of quality seed (source seed), disease, pest problems, and incomplete market information's are the major problems of vegetable seed production. Loss of vegetable seed due to disease and pest is not so problematic. Similarly, production not according to the market, incomplete market information, low price of the vegetable seed and lack of collection centres are the major marketing problems of vegetable seed. Six different marketing channels of vegetable seeds are identified; that ranges from the direct sale from produce to retailers and passes through different actors i. e; producer > local traders > wholesales > dealers > retailers > customers. 65 percent of vegetable seed in the study area were supplied through the channel of cooperative. All the vegetable seed producers were not the members of the cooperatives. Still, local traders have influence on vegetable seed market and due to personal relations of individual producers with Seed Companies and retailers vegetable seed directly supply to Seed Companies and Retailers.

Feasibility of seed testing facility was found to be good (higher than average) but reliability is average. Reliability of market information is poor. Other services - like reliability of inputs, and possibility of quality seed producing are in an average. Similarly, farmers' level of satisfaction with the certified seed from seed companies is higher compared to government firm. Technical services from government body, equipment’s of post-harvest management that they use and with price of the vegetable seed are average.

Respondents (vegetable seed producers, local traders and Seed Companies) trust more to the cooperatives and think that cooperative are more committed in compliance of the agreement. Seed Company and local trader's perception of trust and commitment followed by other actors are more or less similar having the average level. But, farmers' perceptions on trust and commitment followed by the other actors were least among three. Farmers' bargaining was found to be the least and the highest level of dependence with the buyers while Seed Companies have the least dependency and higher bargaining powers. The local traders are in between them. Relationship with the most important buyer is slightly increasing when it moves

from farmers - local traders and Seed Companies. Conflict negotiations and terminations of the actors with the either buyers or sellers are 60 % and 40 %.

The informal contract system is highly dominated in the vegetable seed sector. Even contractual arrangements are so called "gentleman's agreement". Higher numbers of Seed Companies were in contractual arrangements followed by seed farmers and local traders. Buyers are more committed and consistencies in compliance of the contractual agreement for all actors, but, suppliers are more committed with Seed Companies compared to local traders and seed farmers. Large numbers of Seed Companies were willing to go into contractual arrangements followed by seed farmers and local traders. The majority of the vegetable seed actors are interested to go into contractual arrangements with cooperatives and least interested with farmers association.

With the liberalizations of economics, AIC dissolved and private sectors were not able to fulfil the role of AIC as a result a void in the vegetable seed markets has been seen. Contractual arrangement with legal institutions was seen to be more effective because AIC experienced working with individual farmers and the lead farmers were not encouraging. After that, new approach of working in vegetable seed sectors has come in the support of NGO's and INGO's. New cooperatives are formed and a marketing committee under the cooperative functioned to facilitate market activities like input purchase, vegetable seed sales and coordination activities with government bodies and development organizations. Coordination and cooperative within government bodies and between government and other vegetable seed actors are seen poor.

7.3 Discussions on the findings

Vegetable seed farming is a labour intensive and producers have to invest a large percentage of money on it. Due to the high cost of production, Nepalese vegetable seed farmers are gradually losing the national vegetable seed markets and Seed Companies are not able to export vegetable seed to India and Bangladesh as was used to be. Currently, vegetable seed producer of Nepal face the problem of high cost of vegetable seed. Therefore, it is one of the major challenges of the Nepalese vegetable seed producer for market access. If producers work collectively, it is possible to reduce inputs and outputs cost associated with the transportation

as well as the cost incurred in gaining the market information. In the working are cooperative is seen as an institution for collective action. Smallholder producer are more in favour of cooperative. One of the reasons of choosing cooperative is that smallholder producer getting direct support through cooperative either in cash or kind from the development organization and governments to strengthen its capacity and infrastructure development. This support directly benefits the smallholder producer to become more competitive in the vegetable seed market.

Large sizes of family members indicate the possibilities of using family members as a labour for vegetable seed farming and use of labour exchange approach within neighbour households could be the options. Use of family labour is helpful to reduce the cost of production of the vegetable seed. As the family labour has both incentive and informational advantages over non-family labour (Pollak, 1985).

Smallholder producers are characterized as small land holding. But, in this study vegetable seed farmers have more land compared to national average of farmers. Even they have more average land for suitable for vegetable seed cultivation than the national average of per capita farm land. Thus, this shows the possibilities of specialization of vegetable seed farming by using the land. Unless and until farmers move into the specialization in a particular crop it is not possible to reduce the cost of production. As specialization reduces the cost of production in the one hand and on the other hand it increases the responsiveness to market need and also increase in the diversity of marketing outputs at the national level (Pingali et. al., 2005). Therefore, vegetable seed producers produce outputs (Quality seed and required volume as required to the buyers) and can ensure the market of vegetable. As quality is also one of the problems in vegetable seed sectors in Nepal. However, it is not easy for smallholder farmers to go into specialization of the production systems due to their ability and willingness and difficulty in choosing the right crops or enterprises. But in case of vegetable seed producers in Nepal, they don't have problems in choosing the right crops or entrepreneurs because vegetable seed farming has been already there whose contribution in the household income is higher than any other activities. Smallholder producer if work collectively either in cooperatives or in groups can

collect the vegetable seed in one place and can supply required quantity of vegetable seed as demand by the buyers. As well as they can share equipments like threshers, grading machine labelling and packaging jointly. It ultimately reduces the costs incurred in vegetable seed production through sharing of costs among the producer and reducing the labour cost by increasing the efficiency of work. But, there should be collection centre and processing unit for vegetable seed processing. Equally, collective management aspect is most important and should be considered it to be more competitive in the market.

Farmers apply less knowledge as compared to the farming knowledge they have. As farming systems and livelihood strategies of smallholders in Nepal are highly diversified based on the combination of different cropping, livestock, and non-farm activities, and rely on strong interaction among agricultural activities. Farmers are engaging in different activities and production practices at the same time. Therefore, farmers are not able to concentrate in one crop or activities. Diversification is seen as a better approach to reducing the impact of risk on producers' welfare on the one hand and however, on the other hand Quiroz and Valdes (1995) argue that diversification of production at the household level is unlikely to greatly reduce price risk. This also applied to the vegetable seed farming in Nepal. As, vegetable seed producers give less attention at a time of vegetable seed harvesting. It results in low quality of vegetable seed due to poor management. And, it also increases the cost of vegetable seed. This implies the losses of current market of vegetable seeds due to the quality and high production cost of the vegetable seeds.

In addition, seed farmers use traditional equipments and practices for vegetable seed cleaning, grading and packaging, which is the characteristics of the smallholder farmers. Seed farmers just pack vegetable seed in a bulk (Jute Bag) and supply to the wholesalers due to the lack of grading machines and packaging materials. Thus, vegetable seed producers were not able to exploit the potentiality of (especially quality product due to good environment) vegetable seed production in the study area. Therefore, vegetable seed producer's access to market is gradually decreasing on the one hand and they are getting low price of the vegetable seed on the other hand. Therefore, well cleaning, grading, packaging and branding (value adding activities) at the

farmers' side has become a conditional strategy to improve the market access (Gereffi, 1999). Well packaging, grading and labelling of vegetable seed both increases the reputation of the vegetable seed due to high quality of seed and increased trust level between actors of the vegetable seeds. Bargaining power of the vegetable producer could be increased once the vegetable seed producer able to produce quality seed. Trust towards the vegetable seed can be assured through labelling (branding) of vegetable seed in the name of either cooperatives or farmers groups. Absence of proper labelling means there is no one to take responsibility of quality of vegetable seed. Because, in the current situation farmers blame to the buyers for inferior quality and buyers blame to the seed producers.

Quality of source seed is one of the important determinants of quality seed production. Whatever the farmers do at the times of vegetable seed cultivation and post-harvest management, quality seed cannot be expected without quality source seed. Source seed production and development is still limited to government farms. Due to weak R & D programs and weak coordination within the government's bodies production of either quality source seed or supply of required quantity of source seed is always being an issue in Nepal. Private sectors involvement in R & D is negligible. One of the reasons behind this is that the breeder and foundation vegetable seed production is still limited to government bodies. The next reason could be either private sectors are not capable of investing in R & D or they don’t want to invest on it due to less returns.

Factors affecting the vegetable seed production and marketing in Nepalese vegetable seeds are high cost of vegetable seed, timely unavailability of quality source seed, inputs, and disease, pest infections and lack of quality seed, unplanned production, processing facility and collection centre and lack of market information are the common production and marketing problems in vegetable sectors of Nepal. Neither the farmers nor the traders know the actual demand and production of the vegetable seeds. That is due to the lack of coordination and unreliable source of data on vegetable seed demand and supply (higher information asymmetry). And neither of them is interested to share the reliable data of vegetable production and market. The reason behind this is they want to increase the bargaining powers at the time of vegetable seeds sales.

As a result uncertainty in vegetable seed production and marketing is created. These are the factors of production and marketing which affect negatively to the vegetable seed business. Because of this, competitiveness of smallholder' seed producer is declined. Therefore, it may be necessary to develop a horizontal coordination (between farmers) as well as vertical coordination (between buyers and sellers) to solve the uncertainties to reduce the transaction cost. As Bijman (2008) says contract farming can be considered as an avenue that minimizes the transaction costs, reduces uncertainties and improve the incentives for smallholder producer through vertical coordination between production and marketing activities.

Vegetable seed marketing channels are not well established and are still in the process of development. Vegetable seed is supplied through six different marketing channels. That includes the direct sales to the customers and through long channels. The reason behind this could be that the vegetable seed producers don't have prior agreement with the buyers and sales vegetable seed to those places from where demand is come. The majority (65%) of the vegetable seed in the study area is supplied through the cooperative channel. The reason of choosing the cooperative channels might be the high level of trust with cooperatives and supports by the development organization. Development organization supports to the vegetable seed producer in many ways like providing bags for labelling, grading machines, transportation costs and also arranges meeting and seminars to for contractual arrangements. Farmers believed that if buyers do not provide cash in time, bargaining collectively is more effective than individual and buyers believed that they will get quality and required quantity of vegetable seed from cooperatives. Also cooperative provided many benefits to the smallholder farmers like input services, market information, etc. The farmer's choice of marketing channels for marketing their produce is determined by the offers on prices and sales services by the market channels (Chirwa, 2009). In addition, seed producers choose different channels based on the volume of seed they have, personal relationship, services and prices provides by the buyers and situation of the markets. As per Nwokoye (1981), factors like product characteristics, level of services, producer characteristics and market or buying characteristics determined the choice of market channels. Among the smallholder producers the choice of the marketing channels can be understood within the framework of contracts, contract enforcement and transaction

costs. In this study due to relations between producers and local traders and producer and Seed Companies also determine the choice of different marketing channels.

Smallholder farmers are more dependent on Government for different services and supports which are on average in reliability and satisfaction. Even farmers cannot fully rely on private sector for services, nor trusted with them. Here, therefore, the performance of the vegetable seed sector is not satisfactory. Uncertainty prevails in getting every service and supports as well as supply of product produced by the smallholder producers. Seed farmers have to incur more to access these services. The reasons behind this may be due to lack of good relationship between actors and poor governance. Because it has been observed that the government is weak in implementing the seed acts as well as rules and regulation that affect the growth and development of the vegetable seed sector. In addition in many parts the vegetable seed producers even don't care about the quality of vegetable seed. For instance, there is demand of around 10 tons of Radish vegetable seed for the purpose of using leafy parts not for roots. So, quality of radish vegetable seed doesn't matter in this regard. This resulted in inferior vegetable seed production. To minimize this and ensure the quality of vegetable seed it is necessary to choose the most efficient institutional and organizational structure to reduce the cost associated with production and transaction (Williamson, 1985). And, also it is necessary to build a trust level of vegetable seed produce by the producer to ensure the quality of the product. This may be done through the labelling of vegetable seed in the name of either vegetable seed groups or cooperatives.

Seed producer's level of trust to other actors is less as compared to the level of trust of local trader and Seed Companies to other's actors. Seed cooperatives found to be top committed among all the actors involved in the seed business. Level of commitments, trust and relationship are not found encouraging in the vegetable seed business. Farmers have low bargaining power and higher dependency with other actors compared to Seed Companies and Local traders. This may be the reason of weak social structure and absence of horizontal collaboration. The bargaining position of smallholder producers can be improved by setting up a horizontal governance mechanism (Ruben et al., 2007). In this case, bargaining position of the vegetable

seed producer can be increased through collective action (horizontal coordination), contract farming (Vertical coordination) and value chain upgrading (Cleaning, grading and packaging). Trust is the important factor in maintaining horizontal and vertical relationship. A commitment leads to the trust in the business. Therefore, working with cooperatives can safeguard against opportunistic behaviour and to keep transaction costs low. As, agreements between the parties involved in the business can increase the business relations (Trienekens, 2011).

The informal contract system is dominated in Nepalese vegetable seed sector. Even, formal agreement is like a gentlemen's agreement (understanding between two parties). According to Bogetoft and Olesen (2004) simple and verbal contracts are often in agriculture. Self-enforcement is the motives behind the informal contract system. As key and Runsten (1999) found out the self-enforcement mechanism of agricultural contracts is common in developing countries. Due to lack of agricultural contract act there is no strict rules and regulation to punish if either party breached the contract agreement. Therefore, there is a low possibility of compliance of contractual arrangement in the Nepalese vegetable seed sector. As seen here, the compliance of a contractual agreement by buyers and suppliers was good with the Seed Companies compared to individual farmers and local traders. This indicates that higher the position, higher will be the compliance of agreement by the parties. That may be the reason why large numbers of Seed Companies were interested in contractual arrangement compared to seed producers. Entering into contract farming is reduction of market risk and gaining of access to credit, inputs, and technical assistance for the farmers (Bijman, 2008). In addition, contract farming assured the market for smallholder farmers and long-term relationship reduced the uncertainties prevails in the vegetable seed sectors. However, the seed growing farmers of this study area were not happy with the current (individual farmers or farmers' groups with contractors) contract systems. Farmers were not able to enforce of contractual arrangement. As several studies found contract farming gives only limited gains and directly or indirectly harmed to the smallholder farmers (Little and Watts, 1994). In the study area, it has been seen that buyer never pays the seed price in time and some farmers even did not get vegetable seed price of the last 10 years. The reason behind this might be due to the nature of vegetable seed business. Seed business run on credit. It has been occurring due to the power

relationship as observed in this study Seed Companies and local traders have higher bargaining powers and less dependency with the current buyer and sellers. Carney and Watts (1990) in their study in African context also found that contract farming has been observed to disrupt power relations and increase the tension with the households. That may be the reason why seed farmers are interested to go into a contractual arrangement with the buyers through cooperatives. As, several studies claim that in farm groups, such as formal or informal producer organizations, collective approach may support the efficiency and equity of contract farming (Bijman, 2008). Collective actions (producer organizations) can improve the power balance between producers and contractors, thereby strengthening the incentives for both parties to continue bilateral contracting. And in the study area, it was found that large numbers of local traders and Seed companies were also interested to buy vegetable seed from the seed cooperatives and this process is also facilitated by many development organizations.

CHAPTER 8: CONCLUSION

Access to market for smallholder producers has become an important issue nowadays, especially in the developing countries. Long-term and assured market is essential for the betterment of smallholder farmer's life as well as economic development of the nation. Therefore, this study was set out to explore the options for improving market access of smallholder vegetable seed producers of Nepal and vegetable seed marketing by institutional arrangement (cooperative marketing) through contractual arrangement approach is identified as a marketing option of smallholder vegetable seed producer of Nepal.

Vegetable seed producers of Nepal are farming vegetable seed in a harsh condition due to the limited access to factors of production (quality source seeds, inputs), marketing and enabling environment. It is characterized as a smallholding land size, diversified farming, multiple cropping and multiple enterprises and small scale farming. However, vegetable seed producer are better off compared to national average farmers in term of food security, income sources, average land holding average land per capita farmland and potential household labour. But, vegetable seed farmers are not able to fully exploit these favourable conditions.

Vegetable seed market is characterized as large numbers of producers and small numbers of buyers. Influence of local traders is still high in vegetable seed market however; large percent (65%) of vegetable seed is supply through the cooperative channel. Farmers even don’t have full trust with the cooperative but, in the current situation Smallholder producers of vegetable seed are more in favour of vegetable seed marketing through cooperative channel. Cooperatives are getting more support and guidance by the developmental organizations to promote vegetable seed enterprises and cooperative development. Due to personal relationships and influence of the local traders many producers supply vegetable seed through other channels too. Vegetable seed market structure and marketing channels are diverse and to be under the process of development. Many channels are existed including the short chain (direct sale from producer to customers) and long chain (passing through multiple actors, producer > local trader's > wholesales > dealers > retailer's > customers).

Production-influencing factors like quality of seed, diseases, pest problems, lack of information, low price of the vegetable seeds, and unreliability of inputs services from both private sectors as well as the government sectors are the major barriers to the vegetable seed production in the Nepal. Similarly, unplanned production, lack of reliable data on production and supply, lack of market information due to weak coordination, high production cost, lack of processing and transportation facilities are the main problems in vegetable seed market in Nepal. Production of vegetable seed without any market assurance is common in vegetable seed sectors. Therefore, oversupply of the vegetable seed in the market is evident compared to the market demand. As a result vegetable seed producers face the problems of market.

Farmers are struggling to establish a long-term assured market with the buyers. Factor of market access like trust, commitment among the actors of vegetable seeds is weak due to the opportunistic behaviours of the both parties (seller and buyers). Still local traders influence is high in Nepali vegetable seed markets and this shows their highly opportunistic behaviours.

Conflict and termination of the relationship in the vegetable seed business are common in Nepal due to lack of business ethics among the stakeholders and breaching of so-called contractual arrangement made between different parties.

Both area and quantity of vegetable seed production has been increased gradually. But, the gap between demand and production is almost 50 percentages over the last decade. Smallholder producer only limit their production to open pollinated vegetable seed production. Increased quantity of vegetable seed is due to the increased numbers of vegetable seed producers. Numbers of vegetable seed retailers, Seed Companies are gradually increasing all over the Nepal. The Nepalese vegetable seed market is just like a trading hub as many of the seed companies are involved only in the seed trade. Export of vegetable seed is gradually declining and limited to only some crops while import is gradually increasing. Due to lack of other income generating activities and reliable investment opportunities seed farmers, local trader and seed companies are involved in this business. Neither of them is happy with the business. Therefore, none of them is either motivated or committed to the vegetable seed business. Seed companies

are interested to import vegetable seed and sales because they benefit more from import of vegetable seed and sale in the country due to higher margin and commission.

Research and development in the vegetable seed sector in Nepal are still dominated by the Government of Nepal. Government's researches are only confined to research centres. Coordination within the government is poor and little recognition of the fact that government must watch and act in the seed issues.

The informal contract system is dominated in the Nepalese vegetable seed sectors. Absence of contract farming act and weak governance for effective implementation of rules and regulation of seed act is one of the major challenges to maintain quality standard of seed. Therefore, from the analysis it has been found that the majority stakeholders are in favour of contractual arrangement with some sorts of institutions. Both parties (farmers and Seed Companies) are looking for a long-term assured relationship in the form of institutions. In the present situations, both seed producers and buyers don't have trust among each other's.

Absence of specialization and lack of collective action approach in the vegetable seed sectors creates more dependency of smallholder farmers with the buyers. Farmers have realized that forming a strong farmer's organization in the form of cooperatives or any forms of institutions can assist to the smallholder farmers in improving access on inputs and output markets providing facilities of coordination and cooperation and collective action. Development of an organization also creates enabling environment to this approach. For instance, it provides supports like inputs, training, and coordination meeting with buyers and sellers and infrastructure supports. These organizations also facilitate marketing activities of smallholder producers through organizing seminars and workshops and even in some cases organizing market study and coronation meeting with buyers.

Farmers, local traders and Seed Companies are more interested to work with the seed cooperatives in the long-term relationship to safeguard the individual farmers' interest (the high price of vegetable seed and access factors of production) as well as Seed Companies' interest (assured of high quality, quantitative vegetable seed supply in time).

The approach of working collectively and marketing of vegetable seeds through a marketing committee in some places found to be quite successful. But, farmers' organizations (cooperatives) are not fully matured and political influence within cooperative is high, so they need support, supervision and encouragement to increase the trustworthiness towards the cooperative.

CHAPTER 9: RECOMMENDATIONS

Cooperative marketing through the contractual arrangement is seen as an option for improving the market access of smallholder farmer therefore, it is recommended to adapt the cooperative marketing approach where a marketing committee under the cooperative takes responsibilities of coordination and collaboration to arrange the necessary actions for improving the market access of smallholder vegetable seed producers. But, it is necessary to have clear understanding about the role of marketing committee and should maintain transparency be maintained to develop trust level with in cooperatives. As well needed is how long and what kinds of supports are need from the development organization and how it will work independently should be clear.

As higher cost of production of vegetable seed is one of major problems of vegetable seed market and expenses on labour cost is high in vegetable seed production. Therefore, using of family labour and labour exchange approach for vegetable seed production is recommended. But, youths are not interested in this sector as it is not social prestigious job, therefore, special attention either from government or development organizations should be given to ensure the participation of youths in this sector.

Transaction costs are important factors in assessing market access of smallholder farmers. It is, therefore, recommended that working collectively viz. Producer organization (cooperative) in vegetable seed production and marketing for instance jointly procurement of inputs and supply of outputs as well as collectively using of equipments that are used in the vegetable seed production and marketing.

Vegetable seeds are supplied through multiple channels and different quality. Because of this trustworthiness of the vegetable seed gets decreased. Both suppliers and buyers are not responsible about the quality of seed and charge each other for low quality vegetable seed. If there is well established channels and vegetable seed supply through a legal institution i.e. cooperative channels it would help to overcome the issues of distrust that exist in the vegetable

seed sectors. Therefore, it is recommended to choose one appropriate channel, e.g. more producer can chose the Seed Cooperative channel.

Vegetable seed are supplied in bulk and in many cases without proper gardening and labelling. It is recommended to conduct value-adding activities at the farmers (facilitated by cooperative) level, such as grading, packaging, labelling and branding (Cooperatives name). Because doing so increases the marketing opportunities and reputation of the vegetable seed by increasing trust level among the vegetable seed actors.

Lack of reliable data of demand and supply of vegetable seed is one of the major problems in vegetable seed production. Therefore, it would be good if a proper and actual data base of vegetable seed demand and supplied is developed in coordination with the Seed Companies with other stakeholders.

Mistrust in vegetable seed business is one of the major problems. The majority of the actors don't trust each other. Therefore, an enabling environment to develop a trust among the actors of vegetable seed business is required. It can be developed through acting collectively as well as packaging and labelling of vegetable seed in the name of legal institutions and supply vegetable seed through one well established channel. In case of the study area cooperative channel is more dominant, but not independently run because many development organizations facilitated this process. Therefore, priority should be given to make it work independently.

Private sectors involvement in breeder seed and foundation seed production is not contributing enough because it is only limited to government bodies. Therefore, it will be better to encourage private sectors for participation in breeder and foundation seed production process. Further, to compete in the emerging market, there should be market-oriented varities of vegetable seed to produce.

Contract farming of vegetable seed appears to sound as the majority of the actors want to go with contract farming, but due to lack of agricultural contract acts, ineffective implementation of the seeds rules and regulation and opportunistic behaviours of actors involved in the seed sectors bleaching of the contract is common phenomenon. So, there should be an effective

implementation of the seed rules and acts to develop and implement agricultural contract act to develop trust among stakeholder. Also, it would be better and can develop high trust level that if marketing done through institutions (cooperatives).

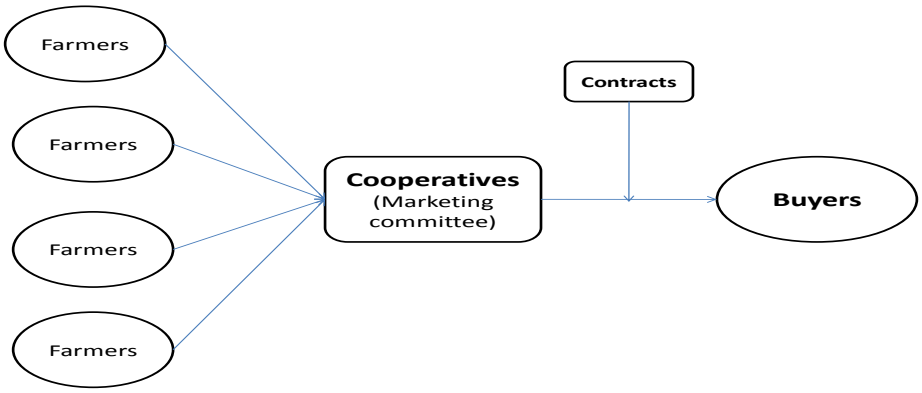


Figure 26. Recommended marketing option for smallholder vegetable seed farmers

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APPENDICES

Appendix I: Interviewees

A) List of respondents

S.N	Name of the respondents		
	Farmers	**Local traders**	**Seed company/Suppliers**
01	Mohan Khadka	Lal Singh Oli	Jaya Mankamana Trading concern-Kabi Krishna Amatya
02	LalBahadur Roka	Vesh Ram Mahatara	SEAN Seed Service Center Limited-Durga P Adhikari
03	Govinda Roka	Chakra BahadurBista	Chaudhari Group-Shyam Krishna Panta
04	Hem Prakash Oli	Nanda Ram Khatri	NIMACOL -Mani Dev Bhattari
05	Gopal KC	Dhan Raj Khadka	Gorkha Seed Company- BasantaMaharathha
06	Rishi Ram Chettri	TilakBahadur KC	Panta Seed PVT.- DipeshPanta
07	Nar Bahadur Pandey	GyanBahadurOli	New Averest Agro-Concern - MahendraMahatta
08	Nar bahadurKhadaka	Vim BahadurBohara	Kathmandu Agro-concern-Ganesh Baniya
09	Parsa Ram Oli	Parbin Pandey	New Averest Agro Seed Centre - Parash Nepal
10	Gopa BM	TulBirBista	R.K Agro Centre Balaju - Ram KedarSigdal

B) List of Focus Group Discussion

S.N	Group 1	Group 2	Group 3
01	Nanda Ram KC	Kaman Bahadur Khatri	VhadraBahadurBohara
02	Govinda KC	Tilak KC	SashiKiran Pun
03	Gopal KC	Nanda Ram KC	Jaya Bahadur Pandey
04	Man Bahadur KC	TulBahadurKhadka	Hari Maya Oli
05	Bhakti Ram Sharma	DhanBahadurOli	Manisha Giri
06	LokendraOli	NaryanKhadka	Parmila Pandey
07	Seti KC	OM Bahadur Khatri	Urmila Pun
08	Devi KC	Dal Bahadur Khatri	Purna Kala Giri
09	TulBahadurBista	DhanBahadurOli	Khali Pun
10	Mukunda KC	KhimBahadurKhadka	DamberKumariMalla
11	TekBahadurBista		

C) List of Experts

S.N.	Name	Position	Organization
01	Dr. KedarBudathoki	Ex-Chief of horiticultural Division	Nepal Agriculture Research Centre

02	Indra Raj Pandey	Team Leader	CEAPRED
03	Krishna Timilsana	S1 scientist	Nepal Agriculture Research Centre

D) **List of agrovet/retailers and vegetable farmers**

S.N.	Retailers/Agrovet	Farmers
01	SuniraAgrovet- Lamjung	TekBahadurBista
02	GywaliAgrovet-Rukum	VhimBahadurBohara
03	Green seed agrovet-Lamjung	Krishna Giri

Appendix II: Interview blueprint

A. Household Questions for farmers

Name of the respondent:

1) Household member's general information:

No. of HH members	Male	Female	HH members Involved in seed farming
Education level of the respondent			

2) Why have you started vegetable seed production?

3) Information about land (In Ropani-508 square meters)

Types of land	Khet		Bari	Kharbari	Suitable for Vegetable seed cultivation
	Irrigated	Non-irrigated			
Own land					
Rented land					
Rented to others					
Total					

4) What are your last year different income sources and amount of income from the different activities?

Cereals	Fresh Vegetable	Vegetable seeds	Livestock (meat, ghee, milk)	Daily wages	Remittance	Employment Government or private	Others

5) Food sufficiency status from own production

Less than 3 months		3-6 months		6-9 months		+12 months	

6) How do you rate the farming knowledge applied in your farm?

Farmer knowledge	Poor	Average	Good	Farming knowledge	Poor	Average	Good
How knowledge was gained	Experience			How knowledge was gained	Experience		
	Education				Education		

7) From where did you get the vegetable seed market information last year? Do the information you get reliable? If not what problems do you face?

DADO-Rukum	SVSPC-Rukum	UMN Rukum	CEPREAD	Agro vets	Cooperatives	Traders	Others
If any combination of two mention:-							

8) Are you willing to improve the quality of current vegetable seed? Why and in which condition?

9) Is it possible for you to follow quality requirement (according to seed act), (Techniques of cultivation and post-harvest management)? And why?

Isolation Distance	Roughing	Field Inspection	Moisture	Germination	Physical purity
Low (Less than 33 %)		Average (34-66) percent		High (66 to 100) percent	

10) Are you willing to do value adding activities? Why and in which condition?

Cleaning	
Grading	
Packaging	
Labeling	
Use of BT	

11) What is your source of registered vegetable seed? Do you have access on registered vegetable seed? What are the major problems in getting registered vegetables seed?

SVSPC-Rukum	Agro-vets	SQCC Kathmandu	National seed company	Government farm
If combination of any mention:-				

12) Do you have access on seed testing facility? Is it reliable and feasible and if not why?

Reliable	Less than 33 %	(34-66) percent	(66 to 100) percent
Feasible	Less than 33 %	(34-66) percent	(66 to 100) percent

13) Are you satisfied with the quality/quantity of registered vegetable seed that is provided by Seed farm/seed Company? If not why?

From farm (Gv)	Less than 33 %	(34-66) percent	(66 to 100) percent
Seed company	Less than 33 %	(34-66) percent	(66 to 100) percent

14) What do you know about seed inspection system? Does it work effectively? If not, why you think so?

15) What is your source of inputs (fertilizers/equipment)? Does it reliable? What are the major problems to access it?

Reliable	Less than 33 %	(34-66) percent	(66 to 100) percent

16) How do you manage labor force (Own & Outside) for vegetable seed crops cultivation?

17) How do you manage disease pest infection? Where do you get technical service for this? Are you satisfied with the services and if not why?

Level of satisfaction	Less than 33 %	(34-66) percent	(34-66) percent

18) To what extend your crop losses because of diseases and pest infection in last year?

Crops	Less than 33 %	(34-66) percent	66 to 100 percent

19) What are the major problems that you face on cleaning, grading, packaging and labeling of the vegetable seed?

Cleaning	
Grading	
Packaging	
Labeling	

20) What kinds of equipment do you use for post-harvest management? Are you satisfied with it? If not, why?

Cleaning	
Grading	
Packaging	
Labeling	

21) To whom do you sell the vegetable seed? Which would you want to have sell the vegetables seed in the future? Why?

Local traders	Outside(District) traders	Cooperatives	Agro vets	Seed company	Others

22) Do you have a prior agreement with the buyers? Does it work effectively? If not, why?

23) How would you rate the follow of a contractual arrangement between you and buyers and why?

Timely payment of seed	Poor (33)	Average (34-66)	(>66)Good
Financial & input support in time	Poor (33)	Average (34-66)	(>66)Good
Technical supports	Poor (33)	Average (34-66)	(>66)Good
Market information sharing	Poor (33)	Average (34-66)	(>66)Good

24) What are major problems that you face during transportation of vegetable seeds?

25) How would you rate the level of trust between different actors (farmers and local traders, Seed Company (suppliers) and retailers) in vegetable seed business? Why?

Between you and local traders	Poor (33)	Average (34-66)	(>66)Good
Between you and buyers (Wholesalers)	Poor (33)	Average (34-66)	(>66)Good
Between you and cooperative	Poor (33)	Average (34-66)	(>66)Good
Between you and Agro-vet			

26) What do you say about the level of commitment between you and buyers? Why?

Between you and local traders	Poor (33)	Average (34-66)	(>66)Good
Between you and buyers (Wholesalers)	Poor (33)	Average (34-66)	(>66)Good
Between you and cooperative	Poor (33)	Average (34-66)	(>66)Good
Between you and Agro-vet			

27) In your experience, considering your most important buyer, how would you rate the availability of other traders, dependency and bargaining power to fix the vegetable seed prices? And why?

Availability of other traders	Poor (30)	Average (34-66)	(>66)Good
Dependency on current	Poor (30)	Average (34-66)	(>66)Good

traders			
Bargaining power to fix the price	Poor (30)	Average (34-66)	(>66)Good

28) How would you rate the relationship between you and your most important buyers? And how would you resolve the conflict with your most important buyers?

Poor (33)	Average (34-66)	(>66)Good	
Terminate relationship	Negotiation ourselves	Third party help	If any

29) Are you satisfied with the price of the vegetable seed? Why?

30) Are you willing to collaborate with farmers group? Why and in which conditions?

31) Are you willing to collaborate with cooperative? Why and in which conditions?

32) Are you willing to collaborate with farmers association? Why and in which condition?

33) What do you think, which option is best for you to grow and market vegetable seed? Why?

Individual farming	Group farming	Cooperative	Farmers association

34) What are the major problems of vegetable seed production and sales? (1 1st, 2 second…)

Low price of vegetable seed	Lack of collection Centre	Less market information
Lack of processing Centre	Lack of farmers organization	Week transportation facility
Inferior quality of the seed	Production not according to market	Lack of packaging and labeling facility
Lack of testing and verification process	Tariff process while transporting seeds	Seed act policy and requirement
Tariff of local government	Any others	

B. Focus Group Discussion

1) When was the vegetable seed production started in this area? What was your motivation for vegetable seed production?
2) What type of equipment do you use for vegetable seed cultivation and post-harvest management? Are you satisfied? If not why?
3) Can you tell me the land use pattern of last 10 years in general Increasing/decreasing/stable)?

Agricultural (seed growing) land	Forest	Road	Building	Parks	Others

4) What is the annual cropping pattern in your area? Does it affect in the vegetable seed production? If so, can you tell the problems and what should be done to overcome it?
5) What do you think about the irrigation facility available for different types of land? Are you satisfied with this facility?

If yes …….

Types of irrigation	Management system			Irrigation availability	
	Private	Community	Government	Seasonal	Whole year
Canal					
Direct form River					
Others					

6) Can you tell me the farm gate price of the vegetable seeds that you grow?

7) What do you know about the quality of vegetable seed? Do you have access on certified vegetable seed? Can you tell me the quality requirement for vegetable seed?
8) What are the major problems in getting registered vegetables seed? Are you satisfied with the certified seed provided by SVSPC farm and Seed Company?

Satisfaction	Poor (≤33) %	Average (34-66) %	(>66)Good
Trust	Poor (≤33) %	Average (34-66) %	(>66)Good

9) Do you know the cost of production of vegetable seed that you produce?
10) What do you think, how does the zoning for vegetable seed production affect commercial seed grower and marketing?
11) What do you think about the crop loss due to diseases and pest infection? Severity?
12) Are you willing to improve your product (Vegetable seed) quality (Cleaning, grading and labeling)? Why and in which condition?
13) What do you think, how important is quality of seed for market? And why?
14) Do you have access on seed testing facility? Is it reliable and feasible and if not why?
15) What do you think, which options are best for you to grow and market vegetable seed? Why?

Individual farming	Group farming	Cooperative	Farmers association

16) In your opinion how does the local tariff system affect the vegetable seed production and sale? Why?

17) What do you know about seed inspection system? Does it work effectively? If not, why you think so?

Cooperative farming:

1. Are you willing to collaborate in cooperative? Why and in which conditions?
2. What could be your role in institutional development of the cooperative?
3. What additional benefits you may expect from the cooperative?
4. What do you think, how important is cooperative for vegetable seed business promotion?
5. What are the strength and weakness of vegetable seed farming through cooperative?
6. What do you think about the political influence on cooperative in Nepal?

Farmers association:-

1. Are you willing to cooperate in farmers association? Why and in which condition?
2. What could be your role in institutional development of the farmers' association?
3. What additional benefits you may expect from the farmers' association?
4. How does the current political situation influence the farmers' association in Nepal?

Farmers group:-

1. Are you willing to cooperate in farmers group? Why and in which condition?
2. What could be your role in institutional development of farmers group?
3. What additional benefits you may expect from the farmers group?

Contract farming:-

1. What do you know about contract farming?
2. Are you willing to enter a contract farming arrangement? Why and in which condition?
3. What additional services you may expect from contract farming?
4. What are the terms and condition would you like to incorporate while doing contract with the firm/seed company?
5. What experience do you have in a contract farming arrangement?
6. Would you like to extend your farming area? Does it possible to invest in the current situation and how?
7. To whom do you like to enter into the contract arrangement and why?

Local traders	Seed Company/supplier

C. Questions for vegetable seed traders

a. Local trader/middle man:

1) General information

Name of the respondent	
Date of starting trade	
Educational background/training	

2) From whom do you buy the vegetable seeds?

Individual farmers	Farmers groups	Farmers' cooperative	Farmers association

3) To whom do you sell the vegetable seeds?

Agro-vet	Wholesalers	Seed company	Individual commercial farmers	Others

4) Do you have prior agreement with the vegetable seed growers? If so, on what basis do you do agreement? If not why?

5) Do you have prior agreement with the vegetable seed buyers? If so, on what basis do you do agreement?

6) From whom do you prefer to buy vegetable seed? And why?

Individual farmers	Cooperatives	Farmers association	Farmers groups

7) Are you willing to go into a contract arrangement with the vegetable seed producers and buyers? Why and in which condition?

8) How would you rate the follow of a contractual arrangement between you and seed producers (from whom you buy) and why?

Quality of seed supply	Poor (33)	Average (34-66)	(>66)Good
Quantity of seed supply	Poor (33)	Average (34-66)	(>66)Good
Information of production	Poor (33)	Average (34-66)	(>66)Good

9) How would you rate the follow of a contractual arrangement between you and buyer and why?

Timely payment of seed	Poor (33)	Average (34-66)	(>66)Good
Financial & input support in time	Poor (33)	Average (34-66)	(>66)Good
Market information sharing	Poor (33)	Average (34-66)	(>66)Good

10) Do you specify seed quality when purchasing seed from producers? Why?

11) Can you tell me your purchasing price of the vegetable seeds?

12) How would you rate the quality of vegetable seed produced by farmers and their production practices? Why?

Poor (33)	Average (34-66)	(>66)Good

13) How would you rate the level of trust between different actors (local traders and farmers, Seed Company (suppliers) in vegetable seed business? Why?

With individual farmes	Poor (33)	Average (34-66)	(>66)Good
With cooperatives	Poor (33)	Average (34-66)	(>66)Good
With buyers	Poor (33)	Average (34-66)	(>66)Good
With agro-vet	Poor (33)	Average (34-66)	(>66)Good

14) How would you rate the level of commitment between you and producer/sellers? Why?

Between you and producer	Poor (33)	Average (34-66)	(>66)Good
Between you and buyers(suppliers)	Poor (33)	Average (34-66)	(>66)Good
Between you and cooperative	Poor (33)	Average (34-66)	(>66)Good
Between you and Agrovet (Retailers)	Poor (33)	Average (34-66)	(>66)Good

15) In your experience, considering your most important buyers how would you rate the availability of other traders, sellers, dependence and bargaining power to fix the vegetable seed price and why?

Availability of other traders	Low (33)	Medium (34-66)	(>66)High
Dependency on current traders	Low (33)	Medium (34-66)	(>66)High
Bargaining power to fix the price	Low (33)	Medium (34-66)	(>66)High
Availability of sellers	Low (33)	Medium (34-66)	(>66)High

16) How would you rate the relationship between you and your most important buyers?

Poor (33)	Average (34-66)	(>66)High	
Termination relationship	Negotiation ourselves	Third party help	If any

17) Are you satisfied with the quality of vegetable seed that you buy? Why?

18) What are the major problems that you face during transportation of vegetable seeds?

19) What is the current situation of vegetable seed contract system? What problems do you face?

20) In your opinion how does the local tariff system affect the vegetable seed buy and sale and why?

21) Are you willing to cooperate in farmers group? Why and in which condition?

22) Are you willing to cooperate in cooperative? Why and in which condition?

23) Are you willing to cooperate in farmers' association? Why and in which condition?

24) Are you willing to enter a contract process on vegetable seed business and with whom? Why and in which condition?

25) What do you think, which options are easy and manageable (Quantity/quality) for vegetable seed buying from the producer? Why?

Individual farming	Group farming	Cooperative	Farmers association

26) What are the major problems of vegetable seed marketing? (Prioritized-Preference ranking)

Low price of vegetable seed	Lack of collection Centre	Less market information
Lack of processing Centre	Lack of farmers organization	Week transportation facility
Inferior quality of the seed	Production not according to market	Lack of packaging and labeling facility
Lack of testing and verification process	Tariff while transporting seeds	Seed act policy and requirement
Tariff of local government	Any others	

B. Wholesale/seed company

1) General information

Name of the respondent	
Name of the company/agrovet	
Address of the company	
Date of establishment	

2) From whom do you buy the vegetable seeds?

Individual farmers	Farmers groups	Farmers' cooperative	Farmers association	Local traders

3) To whom do you sell the vegetable seeds?

Agro-vet	International company	Individual commercial farmers	NGO's	Others

4) Do you have prior agreement with the vegetable seed sellers? If so, on what basis do you do agreement? If not why?

5) Do you have prior agreement with the vegetable seed buyers? If so, on what basis do you do agreement?

6) From whom do you prefer to buy vegetable seed? And why?

Individual farmers	Cooperatives	Farmers association	Farmers groups	Local traders

7) Are you willing to go into a contract arrangement with the vegetable seed producers and buyers? Why and in which condition?

8) How would you rate the follow of a contractual arrangement between you and seed seller (from whom you buy) and why?

Quality of seed supply	Poor (33)	Average (34-66)	(>66)Good
Quantity of seed supply	Poor (33)	Average (34-66)	(>66)Good
Information of production	Poor (33)	Average (34-66)	(>66)Good

9) How would you rate the follow of a contractual arrangement between you and buyer and why?

Timely payment of seed	Poor (33)	Average (34-66)	(>66)Good
Market information sharing	Poor (33)	Average (34-66)	(>66)Good

10) Do you specify seed quality when purchasing seed from producers? Why?

11) Can you tell me your purchasing price of the vegetable seeds?

12) How would you rate the quality of vegetable seed produced by farmers and their production practices? Why?

Poor (33)	Average (34-66)	(>66)Good

13) How would you rate the level of trust between different actors (local traders and farmers, Seed Company (suppliers) in vegetable seed business? Why?

Poor (33)	Average (34-66)	(>66)Good

14) How would you rate the level of commitment between you and producer/sellers? Why?

Between you and producer	Poor (33)	Average (34-66)	(>66)Good
Between you and local trader	Poor (33)	Average (34-66)	(>66)Good
Between you and cooperative	Poor (33)	Average (34-66)	(>66)Good
Between you and buyers	Poor (33)	Average (34-66)	(>66)Good

15) In your experience, considering your most important supplier how would you rate the availability of other traders, sellers, dependence and bargaining power to fix the vegetable seed price and why?

Availability of local trader	Low (33)	Medium (34-66)	(>66)High
Dependency on current supplier	Low (33)	Medium (34-66)	(>66)High
Bargaining power to fix the price	Low (33)	Medium (34-66)	(>66)High

16) How would you rate the relationship between you and your most important supplier?

Poor (33)	Average (34-66)	(>66)High	
Termination relationship	Negotiation ourselves	Third party help	If any

17) Are you satisfied with the quality of vegetable seed that you buy? Why?

18) What are the major problems that you face during transportation of vegetable seeds?

19) What is the current situation of vegetable seed contract system? What problems do you face?

20) In your opinion how does the local tariff system affect the vegetable seed buy and sale and why?

21) Are you willing to cooperate in farmers group? Why and in which condition?

22) Are you willing to cooperate in cooperative? Why and in which condition?

23) Are you willing to cooperate in farmers' association? Why and in which condition?

24) Are you willing to enter a contract process on vegetable seed business and with whom? Why and in which condition?

25) What do you think, which options are easy and manageable (Quantity/quality) for vegetable seed buying from the producer? Why?

Individual farming	Group farming	Cooperative	Farmers association

26) What are the major problems of vegetable seed marketing? (Prioritized-Preference ranking)

Low price of vegetable seed	Lack of collection Centre	Less market information
Lack of processing Centre	Lack of farmers organization	Week transportation facility
Inferior quality of the seed	Production not according to	Lack of packaging and

	market	labelingfacility
Lack of testing and verification process	Tariff while transporting seeds	Seed act policy and requirement
Tariff of local government	Any others	

C. Retailers

1) General information

Name of the respondent	
Name of the agro-vet	
Address of the agro-vet	
Date of establishment	

2) From whom do you buy the vegetable seeds?

Individual farmers	Farmers groups	Farmers' cooperative	Local traders	Company/ wholesalers

3) To whom do you sell the vegetable seed?

Farmers groups	Farmers' cooperative	Farmers association	Individual commercial farmers	NGOs	Government

4) From whom do you prefer to buy vegetable seed?

Seed cooperatives	Wholesalers/seed company	Local traders	Individual commercial farmers	Farmers association

5) Do you have prior agreement with the vegetable seed sellers and buyers? If so, on what basis do you do agreement? If not, why?

6) Do you specify seed quality when purchasing and distributing/selling seed from producers?

7) What is your opinion about the quality of vegetable seed supplied local traders/company?

Very good	Good	Neutral	Low	Very low

8) To whom do you sell the vegetable seeds?

Individual farmers	Commercial farmers	NGO's	Governments programs

9) In your opinion does the prior agreement implemented properly? If not, why? What do you think of not implementing properly?

10) What is your opinion about the trust between suppliers and buyers in the seed business?

Very high	Medium	Neutral	Low	Very low

11) In your opinion, who is most influential in vegetable seed business and why?

Producer	Local traders	Suppliers	Retailers

12) In your opinion how does the local tariff system affect the vegetable seed buy and sale and why?

13) What are the major problems that you face during transportation of vegetable seeds?

14) In your opinion what are the major problems of vegetable seed marketing?

D. Questions for Government agencies

1) General Information:

Name of the respondent	
Name of the organization	
Position in the organization	

2) What is the role and functions of your organization to promote vegetable seed sub-sectors in Nepal? What are the major problems to implement the seed policy and act in Nepal?
3) Breeder seed, foundation seed and certified seed of vegetable seed production and distribution is limited to government farm, in your opinion how does it affect to overall development of seed-sectors?
4) What do you see the changes after dissolving Agricultural Input Cooperation in the vegetable seed-subsector?
5) How does the seed zoning affect the vegetable seed sectors? What is your opinion about it? Does it relevant till now? If so, why?
6) Horticultural officers act as seed inspector. What do you say about this mechanism?
7) There is different price of chemical fertilizers in the market because of government subsidy policy, how does it affect in the seed business?

8) What are the major problems to export vegetable seed to international market (Focus on policy and legal matters)?
9) What do you think about the vegetable seed farming through cooperative model? And why?
10) What do you think about the contract farming model for vegetable seed farming and why?
11) What do you think about the vegetable seed farming through farmer association and why?
12) What do you think about the vegetable seed farming through farmers group and why?
13) In your opinion, which option is best to promote vegetable seed sub-sectors in the current situation and why?
14) In your opinion, what are the major problems for improving vegetable seed business? And why?
15) What were the major changes that occur during the last 10 years in vegetable seed business?
16) What do you think, how the overall vegetable seed sector can be improved?
17) Are you satisfied with the policy implementation process? If not why?