

# **An Analysis of Influencing factors and logjams in the Existing Vegetable Value Chain in Waling, Nepal**

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## **Dedication**

To my mother Goma Devi Baral, for her continuous love, inspiration, and support.

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**Govinda R. Baral**

**Abstract**

Nepal is known for its three unique topographical regions: Mountain, Hill, and Terai. Since the Himalayan range is cold and damp and therefore unable to produce vegetables, most of the agricultural products such as vegetables, fruits, cereal crops, coffee, and tea are grown in Hilly and Terai regions. Waling, a city located in the hilly district of Syangja, has engaged in high production of vegetables. Its residents have embraced the production and marketing of vegetables as their main source of income generation. Despite the economic potentiality of vegetables, farmers have been unsuccessful in garnering maximum benefits. The vegetable value chain, which ranges from conception to consumption, is affected by numerous factors that have generated obstacles in maximizing benefits and minimizing risks. Hence, the objective of this study was to analyze the influencing factors and log jams in the existing vegetable value chain through farmers' interviews, focus group discussion, and consultation with farmers' groups, institutions, and individuals through phenomenological study. The study identified lack of effective technologies for packaging of grown vegetables, frequent price fluctuation, poor group management, and unavailability of quality seeds as the log jams of this value chain. In order to reduce and possibly eliminate these log jams, agricultural professionals should develop packaging methods using cardboard boxes and plastic crates that are readily available in the markets of major cities of Nepal, coordinate farmers and wholesalers during the product flowing process, and establish a cold store to preserve products and maintain quality.

**Key words:** Vegetable Value Chain, Technology, Influencing Factors, Logjams, Poor Farmers, Income Level, and Infrastructure Development

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## Chapter one

### Introduction

#### **Background and setting:**

Nepal, a small landlocked country situated between China and India, is topographically divided into three different regions, each with its unique climate and geography. Nepal's altitudinal variation, from 200m to 8,848m, fosters the growth of extensive agricultural species, especially vegetables (Poudel, 2013). More than 200 species of vegetables are grown and about 50 species and their varieties are grown solely on a commercial basis (Awasthi, 2007). Additionally, more than 73% of the population of Nepal engages in agricultural production. Horticultural crops contribute 14% to the total Agricultural Gross Domestic Product (AGDP) of Nepal (Thapa, 1998 as cited by ANSAB, 2014) and vegetables contribute 34% towards the GDP of Horticulture (Singh et al., 2013).

Syangja, a district located in the western region of Nepal, exhibits a wide altitudinal variation from 366m to 2512m, helping produce different species of vegetables and fruits (District Agricultural Development Office, DADO, 2014). Since this district exhibits a great potentiality for vegetable production, the potential for marketing of this produce has been automatically spurred. For instance, the Pokhara-Syangja-Butwal/Bhairahawa corridor has been highly popular in the vegetable buying and selling process, with an increasing profit every year (SNV/ANSAB, 2011). The growing popularity of this corridor has attracted a higher volume of wholesalers towards this district. The Waling municipality, a popular market in Syangja for buying and selling of vegetables, has great potential because of potential markets in popular and densely populated cities such as Pokhara, Butwal, and Bhairahawa. Similarly, the climate of Syangja is suitable for producing different fruits and vegetable species (DADO, 2014) and



selling them in national and international markets in order to improve the income level of the rural people who are participating in the vegetable buying and selling process.

Thus, we can easily say that a majority of the poor population of Nepal has embraced agriculture as their main profession. The availability of basic resources like land, water, and workforce serves as a stimulus, encouraging easy and effective cultivation. However, it is important to note that just the presence of an effective cultivation system is not sufficient for elevating the income level of the poor population because marketing and cultivation are equally influential. Thus, individual farmers should be knowledgeable of the existing marketing systems, development of enterprises, and adaptation of improved technology in lieu of traditional technology. In addition, it is important to conduct a Value Chain Analysis (VCA) of the economically viable species of vegetables which evaluates products and activities to encourage economic development of the poor population.

The economic development of poor people is directly dependent upon the sustainable development of agricultural products because agriculture is the main profession of Nepali people and the development of agricultural commodities can positively impact the income level of rural farmers. Such sustainable development of agricultural products is possible through enterprise development and well-organized local business systems.

Singh et al.(2013) state, “VCA provides a snapshot of an enterprise at a particular time, while a value chain map indicates the way a product flows from raw materials to the end market” (P. 136). In other words, it provides feedback to value chain players by describing the existing constraints and opportunities of a value chain, which facilitates full range of activities from conception to consumption for process upgrading, function upgrading, and product upgrading, as well as governance of the value chain players (Jordaan et al, 2014). A value chain approach

welcomes various income generating activities, supports the development of institutions of poor value chain players, adds value to their produced products, improves the local marketing system, maximizes profits, minimizes risks, builds capacity of value chain players, and distributes equitable profits to farmers for sustainable development (Singh et al, 2013). Thus, this study will assess whether the vegetable value chain contributes towards elevating the economic status of the poor value chain players. It is assumed that results of the analysis of the factors affecting the existing value chain will enable participating poor members to produce economically viable crops, develop a number of enterprises, create new job opportunities, and promote the products in the market for remunerative benefits through the utilization of efficient value chain. Therefore, the question of this study was: **How does an analysis of the vegetable value chain help to potentially elevate the income level of the poor population in Waling, Nepal?**

### **Statement of the Problem**

In the product flow process, the factors influencing the value chain directly affect the value chain players, and these influences ultimately lead to low performance of vegetable markets and overall activities in the value chain. Additionally, these influences often lead to log jams in the value chain which yields obstacles in the current value chain dynamic and governance, which are detrimental for the sustainable or regular vegetable market, and influential on the income level of the people and the nation. These log jams in the value chain include: disagreements between and among value chain players; gaps of communication, losses in business or less profits; fluctuations in market rate, irregularity in delivering services; discriminations based on the gender, race, economic standing, and living areas; and reduction in total production. These log jams have created various significant problems related to physical, social, and environmental which are unpopular in the local area. Low popularity in the local area have encouraged reduced market participants which lead to little enterprises and low production.

Thus, understanding of both the influencing factors, their influences, and log jams in the existing value chain is vital to bring an improvement in the value chain performance as well as to ensure the sustainability of the vegetable business in the rural area. This understanding would be very beneficial for ensuring economic development of value chain players and efficiency of the value chain as well as the sustained and profitable business among the local market actors.

Additionally, this business would serve as an attractive business among the local youths which helps halt the youth from leaving the country every year in search of better employment. This would increase the economy of the country and contribute to the total GDP of the country.

### **Purpose of the Study**

The purpose of this study was to discover and to discuss the factors impacting the effectiveness of the value chain and log jams in receiving remunerative benefits from the produced vegetables in the existing value chain in Waling, Nepal and recommend further activities for economic development of poor farmers to establish economically prosperous community. In order to ensure product upgrading, process upgrading, and function upgrading of the vegetable products, influencing factors and log jams should be identified. Identification of these log jams contributes towards the correction of activities existing in the value chain and the design of the activities to be conducted for further improvements in receiving the maximum benefits. Similarly, it would describe the constraints and opportunities which would be beneficial to identify strengths and weaknesses of the existing value chain and would be easy to design or plan the activities for improving the existing value chain with the effective results. The recommendations of this study will contribute to develop various activities for improving the livelihoods of the poor population.

**Objectives:**

The objectives are as follows:

1. Describe and analyze the vegetable value chain map with the demonstration of input supply, market rate, number of participants, marketing channels, commission, margins, processes, channels, profits, and marketing costs, etc.
2. Describe and analyze the existing constraints and opportunities of vegetable production and marketing.
3. Provide recommendations regarding further improvement related to value chain in the lives of poor market players in order to ensure the creation of economically prosperous communities.

**Definition of Terms**

**VC-** Value chain that studies produce from conception to consumption.

**Value Chain Players-** Participants in the value chain, who are directly involved in the product buying and selling process.

**Value Chain Supporters-** Participants who support the value chain players like researchers, mentors, development professionals, etc.

**Value chain influencers-** Factors that influence the value chain both positively and negatively such as, physical, social, environment, antecedent factors inter and intra-organizational both external and internal.

**DADO-** District Agricultural Development Office which is situated in district headquarter. This is a government supported office for providing services to farmers.

**GOs-** Governmental Organizations which are owned by Nepal government in the central, regional and local level.

**NGOs-** Non-Governmental Organizations that are working for development of the society and the country as a supporter of value chain players or program participants.

**GDP-** Gross Domestic Product which is the monetary value of all finished goods and services provided in the country's borders in a specific time-period.

**NIE-** New Institutional Economics that is a theory of economics which studies about institutionalism.

**SCP-** Structure Conduct Performance is a popular theory of economics which studies about the analysis of market.

**MoU-** Memorandum of Understanding which is an agreement between and among different business parties for the product buying and selling process.

**NPC-** National Planning Commission which is a part of Nepal government that plans the activities of government for further development.

**TEPC-** Trade and Export Promotion Center which is formed by Nepal-Government to facilitate the trade and export promotion activities.

**SNV-** The Netherlands Development Organization working in Nepal.

**MoAC -** Ministry of Agriculture and Cooperatives, owned by Nepal Government for plan, implement, supervise, control, and evaluate the agricultural sector in Nepal.

**FNCCI-** Federation of Nepalese Chambers of Commerce and Industry, owned by private sector to conduct business for enterprise development in Nepal.

## **Review of Literature**

### **Current Conditions in the Existing Value Chain**

Since agriculture is the main profession of a majority of the population of Nepal, the agricultural sector is a dominant player in the Nepalese economy. Thus, the majority of poor population who are under the poverty line are farmers that depend on agricultural production. The agriculture sector accounts for 34% of the gross domestic product (GDP) and employs 65% of the total population (Awasthi, 2007). Similarly, Nepal exhibits three main ecological divisions with 35% mountains, 42% hills, and 23% plains (Mishra & Kumar, 2013). This division is beneficial because hills and plains have great potential for vegetable production (Mishra, 2009). More than 65% of the total population of Nepal engage in agriculture and work in teams, institutions, and networking as it leads to better production results (Thapa, 2013). Likewise, 235,098 hectare of lands are cultivated vegetables. The production of vegetables was 3,003,821 MT with an average 12.77 MT/ha in 2009/2010 all over Nepal (MoAC, 2011). The USAID (2014) reports 30% consumption of vegetables in the rural villages in this western corridor from their field survey. Therefore, marketing of these vegetables to the urban or city areas is necessary to increase its potentiality in these rural areas. In the mobilization of vegetables from rural village to cities, there are more participants participating in the vegetables buying and selling process in different levels such as input supply, production, wholesaling, and retailing. These different levels have established the value chain and therefore value chain players collaborate with, assist, and compete with each other to maximize the benefits and minimize risks.

According to Singh et al ( 2013), “A value chain analysis (VCA) provides a snapshot of an enterprise at a particular time, while a value chain map indicates the way a product flows from raw materials to the end market or conception to consumption” ( P. 136). Singh et al (2013)

indicate that the value chain connects rural villages with cities and hence the marketing of the product is beneficial as a result of a mutual and cooperative relationship between and among the value chain players. Value chain players communicate market information, share experiences and ideas, influence, and support each other. Ineffectiveness of value chain directly affects to the performance of different market participants in the same levels (Singh et al, 2013). Losses in the business discourage the participants and reduces the popularity of the vegetable business.

Moreover, value chain players influence each other's activities in the process of buying and selling vegetables. Value chain players are also influenced by internal and external factors such as physical environment, rules and regulations of institutions and groups, intra-organization facilitators, inter-organizational environment, irrigation, economic standing of the people, societal needs, and personal and institutional interests of the value chain players (Jordaan et al, 2014).

### **Constraints in the Existing Value Chain**

More than 50% of the total population in Nepal exhibits an income level below the poverty line and earns less than \$1.25 per day (Singh et al, 2013). In addition, Thapa (2013) states, "primarily due to unemployment and low wages, 400,000 youths of rural villages have migrated to foreign countries like India, Saudi Arabia, Kuwait, Malaysia, Iraq, and South Korea in search for better employment opportunities." Moreover, Singh et al (2013) highlight constraints such as low availability of quality seeds, high input cost, inadequate knowledge of new technologies, and lack of irrigation facilities leading to rain-fed cultivation. They also note low knowledge about the production calendar, loss of vegetables due to improper handling practices, insufficient knowledge about post-harvest technologies, high marketing cost, and lack of market information. Similarly, some constraints also include shortage of skilled labors, lack of

year-round irrigation, lack of improved packaging, cultivation, and harvesting practices, dependence on India for agricultural inputs, high post-harvest losses, vegetable price fluctuation, unavailability of quality agricultural inputs on time, present of unorganized markets in the production areas, and lack of all-season agricultural roads are situated in the existing value chain (USAID, 2011). These above constraints are caused by external and internal influences within the value chain.

These challenges generate frustrations among value chain players and lead to discontinuity of further activities. Singh et al (2013) also provided a description about the low market value of produce which leaves farmers unable to make up their production costs and generate a profit. Less profits from vegetables reduce participants in its business and discourage production, which leads to reduced production and marketing enterprises. Reduced enterprises decrease the number of outside wholesalers in their village and thus, it discourages rural farmers to engage in vegetable business and they are compelled to leave this business. Leaving businesses cannot contribute to the society, farmers, and the nation. In a nutshell, it reduces the popularity of vegetable business and the service providers may also want to partner with other effective and viable business. Additionally, Poudel (2013) has stated, “the post-harvest loss of vegetables is the definitive cause contributing toward the high marketing costs and directly driving down farmer’s prices”. Therefore, previous studies reveal that value chain players and their activities have been influenced by various factors which can lead to low prices of products, imbalance in relationships, or reasonable benefit sharing.

### **Importance of the Value Chain Study**

Vegetable production is a crucial sector which positively affects general well-being, as it serves as a source of stable employment for agricultural workers (Poudel, 2013). Likewise,



agricultural production makes up 34% of the entire country's GDP in Nepal, where production of vegetable products constitutes the greater part of this percentage (Singh et al, 2013). Therefore, vegetable farming is one of the greatest potential sources of income generation and reliable means for the reduction of poverty and malnutrition persisting over the hills of Nepal (Tiwari et al, 2008). Furthermore, the development of an effective value chain for the production and marketing of vegetables spurs an increase in the national economy through the exporting of products to international markets. In order to reflect the effectiveness of the value chain, it is vital to analyze the factors that are influencing the existing value chain.

Analyzing and correcting the negative influences of these factors within the chain enhances the efficiency of the value chain and further contributes to improved governance among value chain players, establishment of small enterprises, and the creation of various full time and part time jobs. The opportunities of exporting increase the income of the poor people because of increasing demand and market prices of the vegetables. In order to take more profits from vegetables business, it should move from production pockets to the end market. For this, the farmers are alone unable to move vegetables. It needs more participants in the market with processing, storing, and packaging activities which generate income and new jobs. Creating new jobs increase the participation of the people in the marketing chains and it will be beneficial for stopping more youths from moving to get a better employment outside the country. The market competition occurs among more participants which is beneficial to sustain the product in a long term because of positive competition to upgrade the processes, functions, and value chain governance among value chain players. In order to know the activities held in the value chain, the value chain studies are needed. The study of value chain will be beneficial to find out the strengths, weaknesses, opportunities, and constraints as well as logjams of the whole value chain.

Finding out the constraints and log jams as well as the factors affecting value chain contribute to design various activities for the accurate solution. This may be useful to develop the product sustainably, develop relationships between and among the value chain players, and learn from others throughout the chain activities. Learning from others helps to extend the improved technologies to increase the overall production. With increased opportunities for product diversification, suitability of large scale quantity production, and high demand of vegetables from domestic, regional and local market, can lead to reduction of poverty and creation of jobs. Furthermore, job creation adds value to the products, reduces and possibly prevents the migration of youths, exports the products to international markets, establishes a prosperous community, and ensures biodiversity conservation (Singh et al, 2013). Finally, value chain studies contribute to discuss the factors affecting the existing value chain. The discussion of these factors help discover the logjams or bottlenecks of the value chain which will be beneficial to provide recommendations for improving value chain in the future to get more benefits from vegetable production and marketing.

### **Value Chain Improvement**

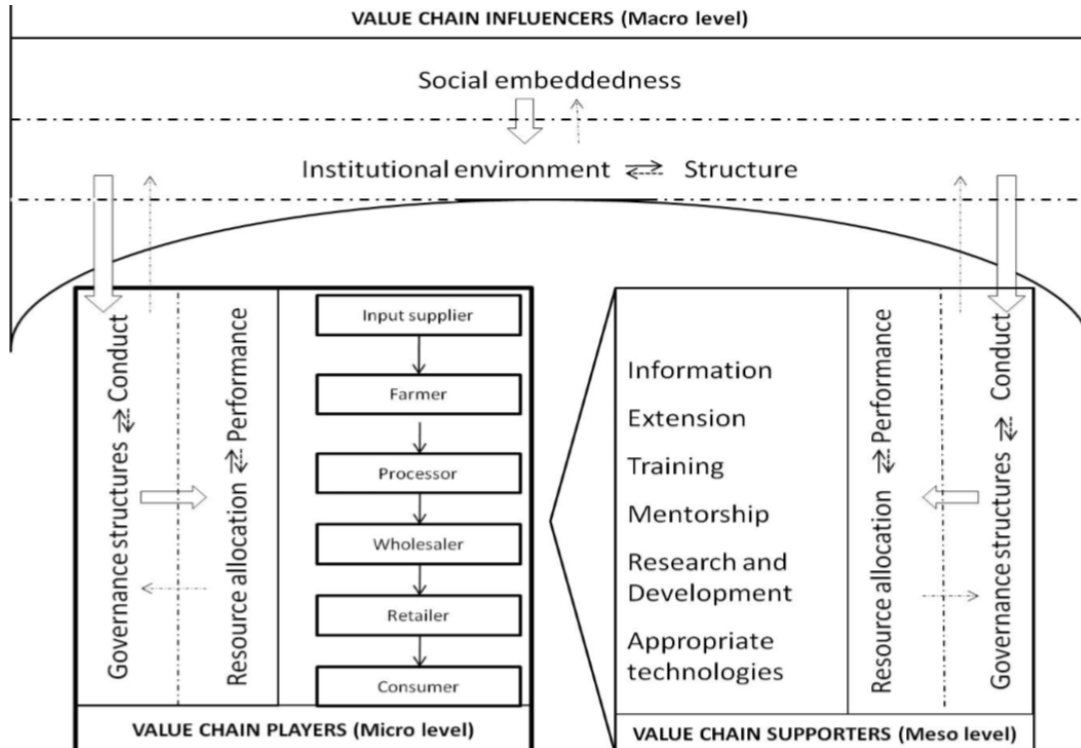
The variety of problems described above can be improved by making corrections in the value chains: creating awareness among the participants, building the capacities of the value chain players, strengthening their institutions, encouraging farmers toward market-led production, providing farmers better market information, and replacing the traditional technologies with improved technologies (Mishra and Kumar, 2012). Improvement of the value chain creates synergy in the process and provides the best option for value chain players. Identifying influential factors provides guidelines for value chain players and helps initiate action plans of the groups and institutions.

These types of corrections can be implemented when the influencing factors are identified. Mishra and Kumar (2012) emphasize the need for market information systems (MIS), infrastructure development facilities for institutional advancement, and the stimulation of long term sustainability. Likewise, Poudel (2013) recommends that the way of reducing marketing margin is by reducing the post-harvest loss. Poudel (2013) also recommends the selection of suitable varieties for production based on the local environment, implementation of improved production technologies, adaptation of appropriate varieties based on the production calendar, improved methods of harvesting, removal of unmarketable materials, grading, and smooth handling of products during harvesting.

In order to understand the factors that impact the value chain's effectiveness, this study generated data from focus group discussions, interviewed farmers, observed the market, analyzed the group records, and analyzed the supply chain performance based on various common factors. Particular attention was paid to costs, assets, reliability, responsiveness, and flexibility. Likewise, analysis of marketing costs, benefits, achievements and relationships among the value chain players considered. Beside this, satisfaction of value chain players as well as identification of the antecedent factors, such as environment, intra-organizational facilitators, and inter-organizational factors have been considered to discuss the influences within the value chain through the usage of the conceptual model, which can be seen in Figure-1.

**Conceptual Framework:**

The conceptual framework for this study incorporates *New Institutional Economics (NIE)* and *Structure Conduct Performance (SCP)* theories and is borrowed from Jordaan et al (2014). According to this framework, there are three levels in the value chain study. The first level of this framework comprises value chain players such as input suppliers, farmers, processors, wholesalers, retailers, and consumers. These value chain players are affected by value chain influencers which include physical, social, and environmental factors. These include climate; physical, environmental, economic condition of participants; rules and regulations of various groups and institutions. Lastly, the third level comprises value chain supporters who provide support and services to value chain players. Examples include governmental organizations, non-governmental organizations, business associations, research foundations, banks, and training centers.



**Figure 1: Conceptual framework for the analysis of Agri-food value chains**  
(Jordaan, Grové, & Backeberg, 2014)

The theoretical examination of society on four interrelated levels (social embeddedness, institutional environment, governance structure, and resource allocation) is made possible through the integrated model of NIE and SCP (Rodner 2007, as cited by Jordaan et al, 2014). In the social embeddedness level, value chain players exhibit their own set of beliefs, social norms, and practices, significantly impacting the value chain. Their relationships play a vital role in mutual interaction, negotiation, and support in order to solve issues affecting the dynamics of the value chain. In addition, mutual cooperation among the value chain players allows teamwork, making it possible to achieve goals faster. Finally, trust between value chain players strengthens the entire process, often guaranteeing agreement, mutual understanding, and Memoranda of Understanding (MoU).

The SCP theory demonstrates the framework of market analysis which is comprised of three components: industry structure, firm conduct and market performance (Milagrosa, 2007, as cited by Jordaan et al, 2014). The market performance of value chain players plays a crucial role in their welfare as the outputs of markets determine the further continuity of the process. For instance, if the market is not profitable and easily accessible the production of vegetables will decrease and the businesses related to the vegetable value chain will be shut down.

Group marketing produces effective outcomes by incorporating farmers into the whole, which is considered more efficient than the sum of individual activities. Due to mutual cooperation and teamwork, group marketing of the products reduces marketing and labor costs, which is useful for the farmers by causing increased profits per unit of the vegetables. This higher rate of profit empowers and motivates the farmers to increase production. Group marketing is especially helpful in the creation of quick and effective decisions in times of emergency, correction of mistakes on time, and effective applications of lessons learned.

The NIE, with the branches of transaction cost economics and agency theory, investigates the rationale of governance choices regarding company and inter-company relationships (Trienekens, 2011). This theory discusses the influences of the formal and informal institutions. Value chain players, in nature, may exhibit opportunistic behavior and weaken their organizations. Politics among the value chain players and their organizations affects the efficiency and dynamics of the value chain. However, results are more likely to be successful if value chain players engage in joint investment, monitor each other, and compete for more profits from their investments. Competition among value chain players creates checks and balances and opportunities to learn from their joint works on both a horizontal and vertical basis (Jordaan et al, 2014). All these factors contribute toward an increase in the income earned from vegetables, which is important for increasing the overall income level of the poor farmers.

This study focuses on the improvement of the income level of poor farmers who are experiencing poverty primarily due to the lack of access to markets, new technologies, and market information. Hence, it is important to study a wide range of value chain players and influencers, from conception to consumption, in order to improve the business of farmers. Therefore, this framework covers both input and output levels, as well as establishing enterprises in the local areas ensures regular employment. This, further, ensures a greater participation of the rural farmers and leads to a higher production, which is useful for supplying raw materials for industry. Working together in value chain helps empower poor farmers, contributes to positive relationships among the players, and grants opportunities to learn from seeing and doing. The establishment of the market system produces new leadership and creates new innovations.

**Significance of the Problem:**

This study helps strengthen the poor population and elevate their income level. An elevation in their economic status is crucial because they do not earn enough money to sustain livelihood, they need money to educate their children, and they need to decrease the rate of youths from leaving the country for better employment because of the absence of a viable marketing system. Through value chain, the participants engage in production and improve their businesses which will expand from their villages to the major cities of Nepal. This effective value chain development will generate income, which may be helpful in increasing one's status in the society.

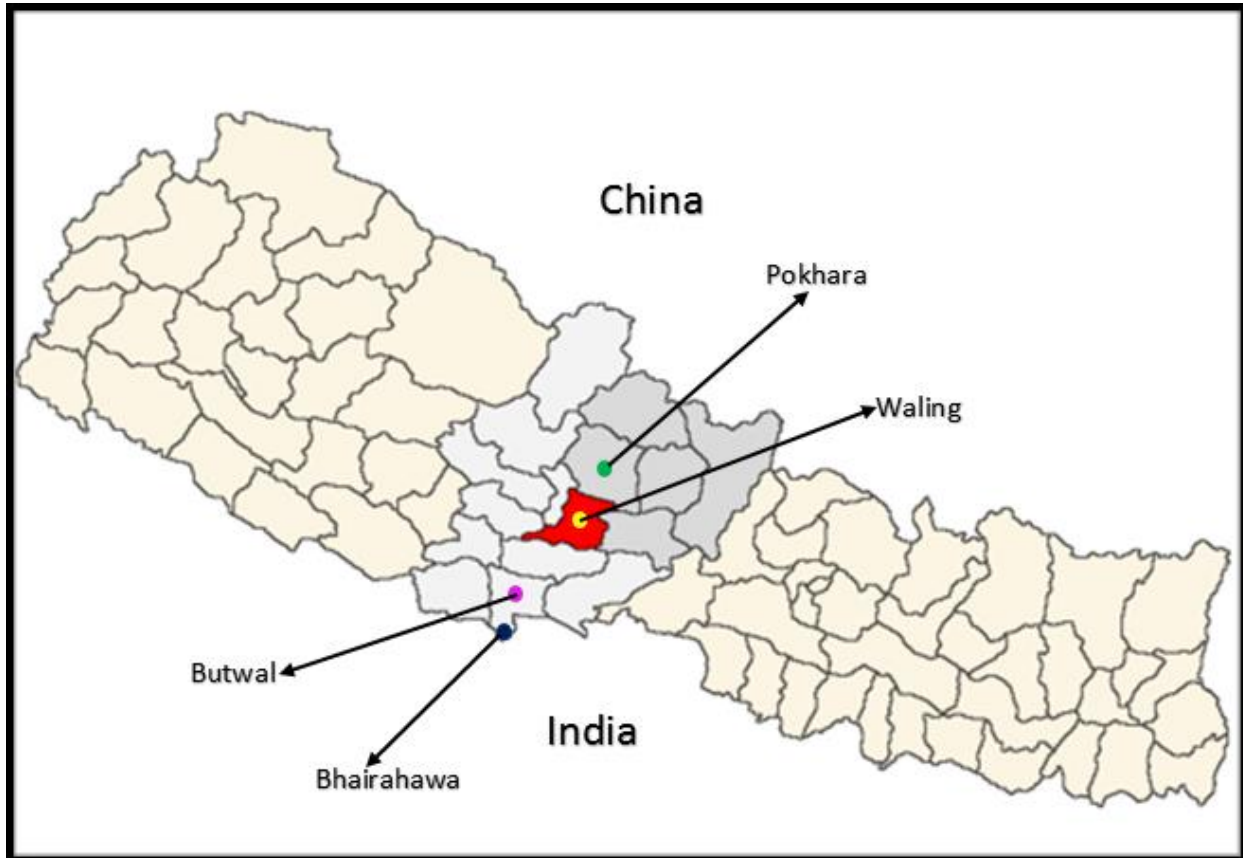
This study was beneficial for relationship buildup amongst market players while encouraging these players to conduct market-led production and prior agreements. Likewise, business loss produces frustrations among value chain players, leads to the migration of youths to other countries in search for better opportunities, and hinders the economic improvement of the country. All these activities yield low production, which again leads to the scarcity of raw materials in rural enterprises and small industries. Finally, this leads to a discontinuity of the institutions and enterprises and, moreover, invites incomplete and unprofitable businesses. Therefore, in order to ensure the attaining of maximum benefit from the vegetable business in Nepal, development professionals need to discuss ways to increase commercial farming and empower the participants for value chain improvement activities in the future. This will prove to be very effective for poor farmers because it will increase their economic level and bring changes in their lifestyles to improve their livelihoods.

## Chapter two

### Project Overview

#### Targeted Population and Participating Audiences

##### Overview of the targeted area



**Figure 2: The Waling Area of Nepal**

The targeted area was the Waling Municipality of Syangja district in Nepal. It is situated about 35 kilometers (km) away from Pokhara and about 73 km away from Butwal, both of which are major cities of Nepal in terms of business and marketing (DADO, 2014). In fact, Butwal is in proximity to the (28 km) India-Nepal border market. Such proximity to active trading cities emphasizes Syangja's potential for profitable vegetable selling. Syangja's agricultural productivity is further enhanced by its mid-hilly topography and its wide altitudinal variation from 366 meters to 2,512 meters from the sea level (DADO, 2014). Out of its total population of



289,148, about 233,390 people live in the rural areas and about 54,710 live in the urban areas (Nepal Census, 2011). Such a sizable population is capable of both production and marketing. Approximately 70% of the total adult population in Syangja is literate and are able to earn a minimum of \$1,215 per household annually (Human Development Report, 2014, as cited by DADO, 2014). This is a considerably above average income amount in the Nepali context.

Waling Area exhibits a diverse population that engages itself in specialized jobs from a wide array of fields including agriculture, business, science, mathematics, and economics (Gurung & Acharya, 2015). Within these varieties of professions, more than 65% of the population indulges in agriculture and agricultural production (Singh et al, 2013). Such increased popularity of agriculture is stimulated by the fact that residents possess individual lands which are utilized for crop cultivation. For instance, out of the 116,400 hectares of total land, 72,721 hectares of land are being used for cultivation (DADO, 2015). Out of this total cultivated area, approximately 69.6% or 50,350 hectares of land have been used for the production of agricultural crops. In addition to the available land, cultivation is also encouraged by the good precipitation rate. For example, average annual rainfall is 2,665 milliliters with an average temperature of 15-27 degrees Celsius (DADO, 2015). The resulting growth in vegetable production rate is further encouraged by the enablers of this sector who have and continue to research, test, and develop new and improved technologies in these rural areas. The use of these improved technologies has been helpful to increase production and the income of people, which further allows income elevation for the rural people.

This area is also recognized by its diversity in population consisting of members from over one hundred different castes and cultures (Nepal Census, 2011). The traditional caste system of this country divides its people into Brahmans, Chhetries, Vaishyas, and Sudras. This

system has distinguished Sudra as the lowest caste. The Sudra are often referred to as *untouchables* due to their lower social and economic standing (Riaz & Basu, 2007). The rest of the three groups are considered to be upper caste thereby holding onto a higher social status in the society. Such division in the society has garnered discriminatory practices which further stimulates economic and social problems in the village (Riaz & Basu, 2007). In order to avoid any sort of bias and discrimination, this study has attempted to include everyone's point of view regardless of gender, caste, tradition, language, etc.

There are two types of farmers in the vegetable production pocket: commercial and consistent. Consistent farmers are often referred to as smallholder farmers. These farmers have small portions of land and they utilize a significant portion of produced vegetables for household consumption. USAID (2014) has asserted that such types of farmers consume on average about 30% of the produced vegetables in their homes. Other saved portions of produced vegetables are sold in the local market; this money is allocated for personal spending (ANSAB, 2014). On the other hand, commercial farmers sell their produced vegetables for profit. In this entire process, the people from lower castes are dominated by the local upper caste because of their higher societal, economical, and political power (Riaz & Basu, 2007). This had led to larger discriminatory practices based on gender, castes, farm size, and economic standing of the people (Riaz & Basu, 2007). Traditionally, the male members work outside the home and engage in jobs that generate money. On the other hand, the female members engage in household work and are even referred to as second citizens of the country (Gurung & Acharya, 2015). The male members of the society work outside of home while the females handle household work (Thapa, 2013). In this sense, the female members are contributing more to vegetable production than male members. It is, however, crucial to note that the male members go to vegetable market centers in

order to sell vegetables and receive money from the selling of vegetables. This makes female members dependent upon male members for money despite equally contributing towards this whole process (Gurung & Acharya, 2015)). Often, the male members participate in the trainings of vegetables production, while the ones engaging in actual production are women (Thapa, 2013). Such discrimination and prejudices in the society has highly disrupted the developmental work (Riaz & Basu, 2007). Hence, development professionals should acknowledge various factors, superstitions, and discriminations in order to ensure the success of vegetable production and marketing processes in this area.

Waling Municipality possesses 21,869 total households in both urban and rural area. The people of Waling Municipality along with seven adjoining VDCs such as Jagat Bhanjyang, Eladi, Majhakot, Manakamana, Banethok Deurali, Chhangchhangdi, and Sworek are made up of production pocket that has 29,998 total population in which 27,700 are females and the remaining 22,298 are male members (Nepal Census, 2011). The farmers of these areas produce vegetables and sell their produced vegetables in Waling Municipality ward no. 8 Triyasi, where a collection center exists. The development of the marketing of produced vegetables in these areas proves more successful than the study of the whole vegetable market in Triyasi vegetable collection center. All the VDCs of these areas have about the same climate, nature of lands, and types of facilities for irrigation. The farmers work with groups, cooperatives, and individuals in a similar way. These farmers share their information with others and learn, teach, and interact with others regarding the process of production and marketing process of vegetables (Singh et al, 2013). Some service providers such as Agricultural Service Center, Agro vets, Farmer's Cooperatives, Non-Governmental Organizations (NGOs), and Local Resource Persons (LRPs)

provide services to farmers and help improve the production and marketing activities in the local area.

Since Nepal is a developing country with limited resources and skills, there are a number of problems associated with infrastructure development. The absence of infrastructure development has yielded low production and profits. Due to the shortage of water sources, there has been a problem in the development of irrigation channels for the watering of vegetable fields. Absence of infrastructures such as buildings, electricity, and irrigation, all-season agricultural roads, establishment of business institutions, etc., has led to poor management of institutions and programs which has further led to low performance of the program (ANSAB, 2014).

It is important to reduce, if not eliminate, the existing discriminations and prejudices in the vegetable buying and selling processes. This is because it helps improve the existing vegetable value chain. The discussion of these dominated farmers helps describe the actual situation of the value chain. Therefore, the sampling of this study was done with the help of the following criteria.

### **Criteria for Sampling:**

#### **Gender:**

The farmers in this study area were comprised of both **women** and **men**. Likewise, the farmer's groups and cooperatives have included the participation of women and men in order to ensure effective management. The female members are dominated by the male members in their homes (Thapa, 2013). This discrimination within a household translates into the entire society. Since females are often dominated by men in the society (Gurung & Acharya, 2015), the researcher has selected the same amount of members from each group to participate in this study

which were matched with the total population. Thus, the samples of participants were 50/50 amongst both men and women for farmer interviews.

**Farm Size:**

In this production pocket, it was observed that the land distribution is highly uneven. It ranges from big plots to tiny land plots. This goes on to show that there are two main types of farmers: commercial and small holders. Hence, in order to ensure equitable distribution of farmers, it is important to incorporate both types of farmers. Similarly, it is important to distinguish the two types of farmers. For instance, farmers who are producing vegetables on more than five ropani (8 ropani = 1 acre) lands are considered **Commercial farmers**. On the other hand, the farmers who are producing vegetables in less than five ropani lands where a huge chunk of their production is consumed at home are considered **Small-holder farmers**. It was observed that the size of farms of cultivators has affected economic development of cultivators and their families. The farmers' answers represented the voice of the whole population.

**Caste:**

Nepal is a mixed community with 126 different castes (Nepal Census, 2011). This means that people with different castes live, share, and interact with each other staying in a same place or village. The researcher followed the caste distribution of the Nepali Government. The farmers who belong to higher parts of the pyramid such as Brahmans, Kshetries, Vaisya, etc. as per the caste distribution of Nepal are considered **upper caste** while those belonging to the lower parts such as Kami, Damai, Sunar, Gharti, and Sarki etc. are considered **lower caste** (Riaz & Basu, 2007). The large chunk of upper caste people participate in jobs such as businesses, governmental jobs, the Indian Army, politics, and teaching in the local villages. The people from lower castes mostly work as laborers, farmers, and livestock holders in the local area. These farmers are seen as smallholder farmers because they have little awareness about vegetable

production and marketing. The large number of lower caste people often engage in loading and unloading of vegetables in the local vegetable collection centers. Therefore, this study emphasized the inclusion of lower caste farmers. The descriptions from these community helped balance the data collected in the study area and analyze the voices to discover the factors affecting value chain and log jams that are taking place in the existing value chain. It will also be helpful in providing recommendations for further corrections. The important point to note is that the improvement of the value chain is not possible without the participation and inclusion of lower caste people on the process of vegetable value chains.

**Economic Standing:**

The wide distinction between rich and poor can be easily observed in the society. Individuals are often labeled powerful or weak based solely on social and economic status. For instance, farmers with high economic status are considered more powerful in the society than others with lower economic status (Riaz & Basu, 2007). This situation has encouraged farmers with high economic status to assume power in decisions of cooperatives, groups, and business institutions. Such influences have established prejudices over powerless groups and individuals (Singh et al, 2013). Additionally, they have contributed towards the generation of constraints and logjams in the existing value chain and have discouraged the overall value chain dynamics and performance of the whole marketing system. Therefore, the researcher distributed the farmers in three groups. These descriptions of these different groups helped balance the numbers in data and make the study equitable in receiving results.

**Rich:**

Most of the upper caste population assume the position of **rich** in the economic hierarchy. People belonging to this hierarchy possess either profitable businesses and/or government jobs with lands of more than 40 ropani (5 acres). The rich population also comprises

families that have jobs in the Indian and British Army. Since these jobs have higher pay, they run a side business where they disburse loans in interest and rent their lands for cultivation to the middle class and poor population of the village. This population earns more than Rs. 100,000 per year from their businesses (DADO, 2014). Likewise, the rich population also comprises those who have homes in the big cities of Waling, Syangja, Pokhara, and Kathmandu with floors that are easily rentable. The rent is paid in a monthly basis so it acts as a definite income generating source. Overall, 12.6 % of the total population belong to this rich population within the targeted area (Nepal Census, 2011). They have a bigger say in the community and hence dominate those belonging to lower economic levels. This groups will not be included in the sample population for interviews because they are not, in general, farmers.

**Middle Class:**

Both upper caste and lower caste populations maintain this position in the economic hierarchy, but the upper caste people are seen more in this group than lower caste. This class contains farmers whose income and household expenditures are about the same. They possess lands somewhere between 40 to 20 ropani and comprise 41.5 % of the total population (Nepal Census, 2011). Generally, they earn Rs. 99,000-50,000 per year from their farming and laboring. Their main profession is agricultural production and hence produce vegetables, cereal crops, cash crops, coffee, oranges, and other fruits. Their children, in most cases, either continue the farming job or fly to do labor works in golf countries like Saudi Arabia, Dubai, Qatar, and Kuwait. They have a small, non-rentable home solely in their village. In cases of low produce and thus low earning, they have to borrow money from the rich population in order to satisfy household needs. Since their livelihood is directly affected by agriculture, improvements in the marketing system of agricultural products can positively affect their economic status.

**Poor:**

The majority of lower castes belong to this economic hierarchy. Nepal ranks as the 31<sup>st</sup> poorest country in the world according to the United Nations (United Nations, 2013). Approximately 45% of the total population of Nepal live under the poverty line, earning about \$1.25 a day (Singh et al, 2013). The assumption is that, just like the entire population of Nepal, 45.9 % of the population of Waling area are poor. This population does not earn enough money to supply them throughout the year. Their low income has compelled them to obtain loans from the rich population and sell their vegetables using the barter system. Their family members are unemployed, and they possess fewer than 20 ropani lands and earn less than Rs. 50,000 per year. They work as laborers in their villages and city areas. Their main income source is the agricultural production of cash crops, cereal crops, fruits, and vegetables and the income from their small and temporary labor jobs (Singh et al, 2013). Hence, the development of the marketing system of agricultural products directly affects their economic development and their livelihoods.

**Selection of the Participants for Farmers' Interviews:**

Since various people with different views, cultures, economic standings, genders, and castes work within the same value chain and marketing system, sampling from all these communities is vital in order to represent the population as a whole. 12 farmers were selected for interviews in order to balance the data collected from this study. Thus, the sample population was selected using the following criteria by using a stratified sampling procedure. In order to ensure that the researcher had a better grasp of the information about their lands, income, profession, and behaviors, the researcher was aided by group members.



Criteria	Number of farmers	Remarks
Commercial, middle class, and lower caste	3	Female-2, Male- 1
Small holder, middle class, and lower caste	3	Female-1, Male-2
Commercial, poor, and upper caste	3	Female-2, Male-1
Small holder, poor, lower caste	3	Female-1, Male-2
Total	12	Female-6, Male-6

**Figure: 3. Sampling Population**

### **Program Methodology:**

#### **Entering Capital City, Kathmandu, Nepal:**

Even before leaving for Nepal, the researcher was in constant contact with residents in the targeted area. Meanwhile, the researcher planned activities for data collection. Before starting his field work, the researcher contacted the representative of the Department of Agriculture in Hariharbhaban, Kathmandu, Nepal in order to educate him more about the literatures of the value chain study and the previously conducted activities and research by governmental and non-governmental agencies in Nepal. Subsequently, the researcher shared with them a study proposal of this research with a thorough explanation of goals and objectives. The representatives presented different corridors of Nepal, such as the Far-western corridor, Mid-western corridor, Western corridor, and Eastern corridor, as potential research areas. Upon careful examination of each of these areas, the researcher selected the Waling area because of its

potential for vegetable production and marketing, its associated vegetable value chain, and its diverse population, all of which satisfy the aims of this study. Hence, the selection of this area was conducted using a purposive sampling procedure. The representatives helped provide the literatures of the conducted studies within the western corridor along with pertaining national studies. The agricultural department officials suggested the researcher should select the top two or three species that are economically viable, socially acceptable, and environmentally sustainable. In regards to the study goals and objectives, success depends upon the recognition of factors that allow and encourage the economic development of the local community (See Appendix: 3 & 4, The Cost-benefit Analysis of Cauliflowers and Tomatoes). Therefore, the researcher checked the production and marketing data of these vegetable species and selected species to study. Likewise, the researcher contacted the Nepal Agricultural Research Centre (NARC) and looked for the latest research applicable to the vegetable value chain in Nepal. The representatives of NARC provided the literatures and online guidelines to search for this information. After collecting literatures from governmental agencies, the representatives of the Agricultural Department communicated it to Syangja district agriculture professionals. Finally, the researcher went to Syangja, which is 250 km away from the capital city Kathmandu. Prior to meeting the farmers, the researcher contacted the District Agricultural Development Office (DADO), the Local Development Office (LDO), and governmental agencies of the district headquarters.

### **Entering Syangja District for data collection**

Based on the plan with district line agencies, the researcher reached Syangja bazaar and discussed with the District Agricultural Development Officer (DADO) the overall field scenario. By utilizing the resources made available by these offices, the researcher was able to gather historical background, factors affecting the existing vegetable businesses, and maps and atlases

with separated Village Development Committees (VDCs). The researcher also received information about vegetable production pockets, potential markets, viable vegetable produce, and sustainable vegetable market areas. The District Agriculture Development Officer explained about the various agricultural programs conducted by the District Agriculture Development Office and the impacts it has precipitated in the local community. Furthermore, the researcher received the lists of Non-Governmental Organizations (NGOs), groups, cooperatives, the agricultural service centers, historical progresses of the districts, and year-wise reports of agricultural development. These documents reflected the potential areas of production and model of success marketing within the district with clear descriptions of number of participants, and the potentiality of vegetables. Additionally, this documents also described the successful groups, cooperatives, and individuals who are participating in various value chain development processes. DADO suggested focusing on tomatoes and cauliflowers based on the market demand, market prices, production quantity, local skills, community needs, and potential market. With all this in consideration, researcher selected the production and marketing pocket in Waling Municipality and seven adjoining VDCs which are conducting marketing activities from the same Triyasi vegetable collection center situated in Waling Municipality ward no. 8. This is why the improvements in the collection center would contribute towards improving marketing activities, reducing the constraints/weaknesses, and acquiring opportunities in the local vegetable businesses for the income elevation of local poor villagers. In addition, this would help describe the marketing activities, analyze the influencing factors, and find out the bottlenecks or log jams within the existing value chain.

**Entering Waling Municipality:****Selection of farmers for interviews:**

The researcher consolidated information of farmers including name lists and profiles.

The study of farmer profiles revealed the existing conditions of the farmers as reflected with their economic standing, farm size, gender, and caste. Subsequently, the researcher visited Triyasi vegetable collection center where vegetables are brought in by farmers for selling purposes. Then, the researcher decided upon two socially acceptable, environmentally sustainable, and economically viable vegetable species such as tomatoes and cauliflowers by consulting the chairperson of collection center. The bases of the sampling would be employed from these same four criteria: economic standing, farm size, gender, and caste. Based on the suggestions from the chairperson of vegetable collection center, study of the farmer profiles, and suggestions from the local agricultural professionals of DADO, the researcher established a sample of participants with the use of stratified sampling procedure for further data collection. The detailed information about sampling criteria can be seen in Figure: 3.

The researcher decided to determine the participants from the participation of whole groups in the villages because the economic, social, and behavioral conditions of the villagers are well-known to their neighbors in the local selected pocket. After selecting sample from the lists of farmers and their profiles, the researcher informed the qualified and interested participants by communicating through cell phone, local supporters' organizations, their villagers, and other individuals.

**Interviews with selected Sample population:**

The researcher scheduled a meeting time by allocating time preference and convenience from the participants. During the meeting, the researcher described the nature and objectives of the study and provided the consent form to participants. After collecting the

consent forms, the researcher asked participants to fill out a set of questionnaires (See Figure 4). In order to create a familiar environment, the researcher created a friendly environment with local farmers and entrepreneurs. In order to conduct interviews efficiently, the researcher first ensured that participants were comfortable and then proceeded with the interview questions from broader to specific ones. Follow up questions outside of the questionnaire were also frequently asked, as needed. The interviews took about 1-2 hours; however time was made highly flexible allowing participants to both finish early as well as take longer. Since the researcher was familiar with the targeted area, the farmers were able to develop friendly relationship and answer questions without any hesitation.

**Date:****Name of Interviewer:****Farmer's Name:****Address:****Name of Farmers Group:****Designation:**

1. Tell me about the types and quantity of vegetables you produced last year.
2. Where and how much vegetable did you sell? What was the market price per kg? Is that a reasonable price? Why or why not?
3. Who are the main service providers for your farm and enterprise? How do you feel about these services? Are they sufficient for your business?
4. How do you decide which varieties of vegetables to cultivate? How do you follow market-led production?
5. How do you sell your produce in the market? How do you decide about selling price of your vegetables? Justify your answers.
6. What type of payment system do you have?

7. Who or what factor(s) determines the market rate of your vegetables? What are the main factors affecting the product buying and selling system? Describe.
8. How satisfied are you with the current marketing activities and profit? What changes, if any, should be brought to the current marketing system and its policy to ensure the attaining of maximum profit?
9. Describe any difficulties you have experienced with governmental policies. How do you think these problems should could be resolved?
10. What strategies should be undertaken to improve the current production and marketing of vegetables?
11. What are the strengths and constraints of this business? How can the challenges be overcome?

**Figure: 4. Questionnaires for Farmers' Interview**

**Focus Group Discussion:**

During farmers' interviews, the researcher collected contact information of the key value chain players of Waling, Nepal. Subsequently, the researcher prepared the lists of participants involved in vegetable buying and selling processes. After listing these individuals, the researcher consulted with farmers' groups, Triyasi vegetable collection center, and Agriculture Service Center in order to finalize the lists of participants for focus group discussion.

Contact Information of the interviewees were obtained beforehand in order to communicate with market participants. Through telephone and other supporter organizations, the researcher dispersed the information about the focus group discussion in Triyasi vegetable collection center. The participants of focus group discussion included farmers, input suppliers, wholesalers, retailers, and consumers. The focus group discussion was held in the Triyasi

collection center for three hours in participation of 16 individuals and representatives of groups (7 male and 9 female). This focus group discussion was conducted using the steps described by Kitzinger (1995). Firstly, the researcher introduced himself and conveyed the objectives of the focus group discussion. The familiarity made it easier to share the issues, stories, and experiences of the existing value chain held in this production areas. Secondly, the researcher raised questions about the main marketing activities held in this production pocket and covered areas, factors affecting value chain, constraints and opportunities within the vegetable businesses as well as the existing log jams of the vegetable marketing chain. The participants discussed these question in a group. The issues raised by the participants were recorded in the field notes while ensuring that everyone was equally engaged in the discussion. Additionally, the key value chain players like wholesalers, farmers, and retailers identified different marketing channels and helped make a participatory value chain map in this discussion. This participatory map indicated different marketing channels and provided the overall scenario of the vegetable market. In other words, this made it easy to discuss the opportunities and constraints as well as find out the influencing factors in the existing value chain.

The factors that are positively or negatively impacting the existing vegetable value chain were discussed one by one by pointing out to the created opportunities and constraints. Additionally, the discussion described inter and intra-organizational factors that are impacting in the value chain both positively and negatively. For the preparation of the final map, the information received by the interviewees were used for filling data in the map like market rate of the vegetables, margins, commissions, transactions of the market, process of selling, transportation costs, value added activities, marketing costs, other expenses, profits, losses, and number and relationships of participants participated in the value chain. The researcher listed the

constraints, opportunities, and influencing factors with the participation of these key value chain players. These lists of the factors were beneficial to check the final logjams of the value chain which are creating problems in the value chain dynamics and performance. The reduction of these logjams helped improve the condition of the value chain as well. Finally, the researcher shared the summary of the decisions and main themes identified by the focus group discussion. Finally, with the agreement between participants regarding the main themes and decisions, the researcher recorded it for data analysis.

The limitations, as highlighted in the discussion, included the domination of farmers by wholesalers, fear of farmers to openly address issues with wholesalers (as a result of the greater power of wholesalers), and the resistance of the wholesalers to reveal the actual prices of vegetables in front of the farmers. In order to draw conclusions regarding data analysis, the researcher reviewed the data from farmers' interviews and focus group discussion.

**Data collection from local market and DADO:**

In order to receive information about the transaction of the market, total quantity of production all over the district and overall scenario of the vegetable markets were collected from District Agriculture Development Office (DADO), which is situated in the district headquarters. The DADO provided documents about the overall experiences of the districts as well as the year-wise progresses of the district. These documents reflected the impacts of vegetable production, history of agricultural production, the learnings from the conducted programs, behaviors of the market players, and overall impact of the agricultural production as well as vegetable production in the district. The data reflected studies of the specialists within the district, findings of these studies, and recommendations from these professionals and study team. These further made it easy to imagine the actual situation of the local market. Likewise, DADO suggested to obtain



marketed quantities from the records. These records of production and marketing provided the researcher information about actual transactions, former markets, and engaged participants. The annual report of DADO would provide information about the overall impact of vegetable production and marketing throughout the year along with the history of development.

Additionally, the researcher checked the transaction of collection centers and production logs of farmers' groups which provided the flow of the vegetables in the existing market in the final of the study. This made it easy to compare data from farmers, local market centers, and Nepal Government in order to determine the actual situation of the local market, value chain players, and their behaviors.

In a nutshell, data collection and analysis in this study incorporated multiple methods. Figure 5 outlines the research protocol for this study. The researcher designed a set of questionnaires and posed these questions to the selected sample population through phenomenological approach by describing the farmer's experiences. The experiences of the farmers as well as value chain players reflected the overall process of marketing system held in the field of production and marketing pockets in the existing vegetable value chain. The use of farmer's interviews represented the primary methods of qualitative data collection for exploring the processes of the existing vegetable value chain. At this moment, the researcher posed questions to the participants and recorded the answers in the provided spaces in the questionnaires. In addition, the researcher probed questions as necessary and sometimes asked additional questions for clarity. Some additional experiences in the existing value chain were recorded in the field notes which were useful in understanding the overall processes of the vegetable value chain.

The use of focus group discussion helped collect information of the vegetable market from local level to major cities like Pokhara, Butwal, and Bhairahawa and the field of Triyasi vegetable collection center. The local wholesalers, retailers, farmers, consumers, and representatives of collection centers were present in the discussion. The role of the researcher was to raise questions about the production and marketing system of the local markets, constraints and opportunities of the markets, and the needed activities to improve the existing system in order to receive remunerative benefits from the vegetable selling for elevating income level of the poor farmers. The limitations included: domination of the farmers by the wholesalers, deception of actual prices in front of the farmers by wholesalers, and fear of farmers regarding the revealing of actual constraints such as price fluctuation created by the wholesalers in the vegetable buying and selling processes. In order to remove these limitations, the researcher consulted them using consultation method and crossed check the data collected from the field. The resulting benefits included: introduction with each other, reduction of the distance between wholesalers and farmers, and discovery of actual constraints through open discussion by gathering more participants working in the same vegetable value chain. Besides this, consultation was used to collect data with value chain players and some supporter organizations, including service providers, and some private organizations and farmers' cooperatives. The researcher asked the questions related to the vegetable selling and buying processes and concentrated in the existing value chain.

**Research protocols****1. Farmers' Interview**

- Conduct unstructured interviews, write the answers of the interviewees in the provided spaces between the questionnaires in Nepali language, and translate them into English.
- Separate the data related to processes, markets, and groups related before analysis
- Use these data for describing marketing activities and fill in the value chain map
- Enter the lists of constraints in the computer based on the participants' answers and count the frequencies of them in the computer.
- The constraints with more frequencies were considered to be the logjams of the existing value chain.

**2. Focus Group Discussion**

- Raise the questions about process, activities, and constraints, including number of participants, market prices, margins, commissions, and total volume of the vegetables.
- Records the answers of the participants in the field notes.
- Preparation of participatory value chain map and identify different marketing channels within the existing value chain.
- Discuss about the constraints and opportunities of the value chain and define the activities to be conducted for the improvement of the value chain in the future.

**3. Consultations with supporting organizations and service providers**

- Discuss about the history of the programs, issues, and the local attempts to solve these issues.

- Gather literatures, consolidate the studies held in the past related to value chain, and discuss about needs of the local community, practice of the supporters, and the activities to be conducted for improving local situation of the value chain.
- Plan the field works.
- Review the Progress reports of the projects, history of the participants, opportunities of the programs, constraints of the value chain, and plan of the local organizations.
- Discuss about process of services delivery, needs, and interests of the local community, and the plans of the future.

**Figure: 5 Research protocol**

After data collection, data was framed based on the objectives of the study. The constraints indicated by the participants were recorded in the computer, and the frequency of each of the constraints was counted. Based on these frequencies, factors affecting the existing value chain were identified. Constraints with higher frequencies were identified as log jams for this particular value chain.

**Timeline:**

The timelines of this study were as follows:

Dec 8, 2015 – Committee meeting and finalization of the research proposal.

Dec 8-14, 2015 - Translation of interview questions into Nepali language

Dec 20, 2015- IRB approval for data collection

Dec 25, 2015 – Departure to Nepal from Blacksburg, USA

Dec 29-30, 2015 - Meeting with marketing officers from Department of Agriculture in Kathmandu, Nepal, for the collection of information about latest research and literary works from ANSAB and NARC.

Dec 30, 2015 – Departure to Syangja from Kathmandu

Dec 30, 2015- Jan 1, 2016 – Consultation with DADO, LDO, Agriculture Service Center, Dahathum, and Aandhikhola Community Service Center in district headquarter.

Jan 2, 2016 – Field work planning and selection of the farmers for interviews.

Jan 3- 20- Interviews with selected farmers and market observation in the local level; consultation with supporters, general public, and value chain players

Jan 20-27, 2016 - Meeting with supporter organizations, key value chain players, and district level governmental and non-governmental organizations.

Jan 27-Feb 5, 2016 – Rapport building with key value chain players.

Feb 8, 2016- Focus Group Discussion at Triyasi vegetable collection center.

Feb 14, 2016 – Arrival at Blacksburg, Virginia, USA

Feb 15-25, 2016 – Translation of the answers in English language and Data Analysis

Feb 26- March 25, 2016 - Journal article and report writing

April 07, 2016 – Submission of first draft of the project to graduate committee

April 08-29, 2016 – Incorporation of the comments and feedback

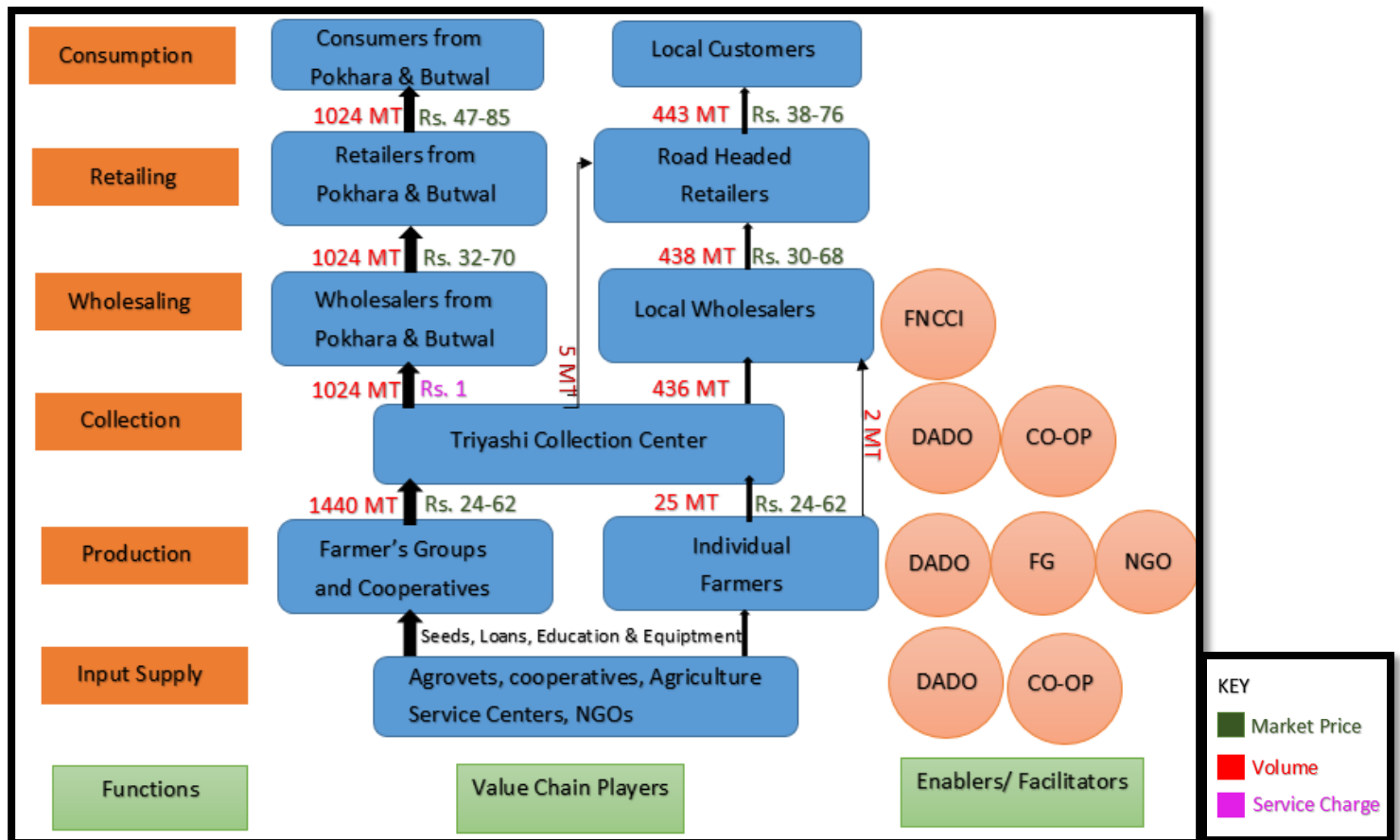
May 2, 2016 – Project defense

Chapter Three

Summary of Outcomes, Discussion, and Recommendations

Results

Marketing Activities within the Value Chain

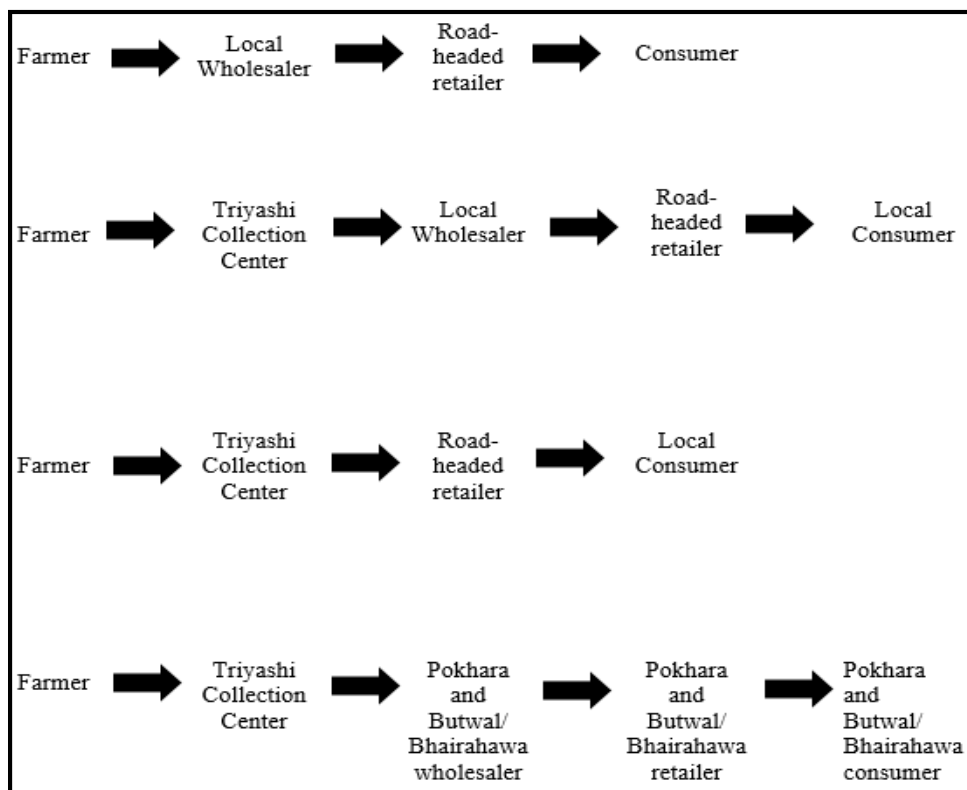


**Co-Op-** Cooperatives formed by farmers to provide services and input in their villages and local market.  
**DADO-** District Agricultural Development Office that is owned by Nepal Government to conduct agriculture related programs and provide services to farmers.  
**FNCCI-** Federation of Nepalese Chamber of Commerce and Industry, a private organization, which facilitates value chain players for their rights and responsibilities.  
**FG-** Farmer's Group in which farmers work together, share experiences, and provide support with each other to get remunerative benefits.  
**NGOs-** Non-Governmental Organizations which support value chain players in the product buying and selling process and contributes to farmers for conducting research, teaching, and training value chain players.

Figure: 6 Value Chain Map

This study focused on the overall value chain process and the activities that occurred during farmers' interviews. The respondents of the focus group discussion focused on the marketing as well as the production aspects within the value chain. The Agrovets, Farmers' cooperatives, Aandhikhola Community Service Center, Agricultural Development Bank, and Agricultural Service Center provide seeds, agricultural equipment, small and large size loans, and training programs for farmers. The farmers' groups, cooperatives, DADO, and NGOs enable farmers to provide essential services and motivate them to cultivate vegetables on their individual lands. Both farmers' groups and individual farmers produce 1440 metric tons and 25 metric tons of vegetables on their farms respectively.

After harvesting, farmers use *dokos*, local baskets made from bamboo, *plastic bags*, and *jute bags* to pack their grown vegetables. These vegetables are transported by jeeps and gravity ropeways. The transporters charge between Rs. 1-3 per kg to transport vegetables from rural villages to the Triyasi vegetable collection center based on the distance, season, vegetable type, and transportation type. Thus, farmers sell these harvested vegetables to local wholesalers, to the wholesalers from Pokhara, Butwal, and Bhairahawa, and to local retailers who are available in the Triyasi vegetable collection center. The Triyasi collection center facilitates the buying and selling process for both the farmers and wholesalers in the collection center with a service charge of Rs.1 per kg from farmers. The service charge for wholesalers is based on the volume of transacted vegetables. The farmers of Waling sell their vegetables, such as tomatoes and cauliflowers, to wholesalers at a price of Rs 24-62 per kg. After buying vegetables, wholesalers transport these collected vegetables using their private or rented jeeps and sell them to retailers through different marketing channels shown in figure 7.



**Figure 7: Marketing Channels in the Production Area**

Figure 7 shows that four types of marketing channels exist in the value chain map. The first, second, and third marketing channels are limited to the local level within the district and transact 30% of the vegetables from the total transactions of the annual market. In the first channel, local wholesalers buy 2 MT vegetables directly from farmers. Similarly, local wholesalers buy 436 MT vegetables from the collection center by using the second marketing channel. As a result, local wholesalers buy 438 MT vegetables per year from both the collection center and individual farmers and sell these collected vegetables to road-headed retailers who have vegetable stores to sell vegetables in the road-headed market areas. The wholesalers do not use any additional technologies and immediately sell their vegetables to road-headed retailers at Rs. 30- 68 per kg. Furthermore, road-headed retailers buy 438 MT vegetables from local wholesalers and out of 40 road headed retailers, 6 retailers also buy 5 MT vegetables directly



from the collection center through the third marketing channel. Hence, road-headed retailers sell 443 MT vegetables to local consumers at Rs. 38- 76 per kg (See Appendix-7). During this buying and selling process, the wholesalers and retailers receive Rs. 3 and 5 as a net margin respectively. Since this selling and buying is conducted in the collection center and the communication occurs immediately, prices are the same in all local level marketing channels.

The fourth marketing channel comprises more transactions and a larger portion of vegetables, encompassing 70% of the total vegetables that go outside the district. Through this channel, wholesalers from Pokhara, Butwal, and Bhairahawa buy 1,024 metric tons of vegetables from the Triyasi collection center at Rs. 24-62 per kg. The wholesalers transport all collected vegetables to their wholesale stores in Butwal, Bhairahawa and Pokhara. The wholesalers pay Rs. 3 for transportation costs, labor charge including load-unload vegetables and receive Rs. 3 as a net margin from a kg vegetables. The wholesalers then sell their vegetables at Rs. 32-70 per kg to retailers from these cities. Similarly, the retailers of these cities buy vegetables from wholesalers of these cities at Rs.32- 70, transport these vegetables to the retail stores and conduct grading based on their quality, and store the vegetables in the stores. The retailers pay Rs. 5 as additional costs for the vegetables, sell these vegetables to the consumers of these respected cities at Rs. 47-85 per kg, and receive Rs. 10 per kg net margin (See Appendix-6). The margin received by the retailers is higher in comparison to wholesalers because the retailers transport these vegetables from the wholesale market, conduct grading based on quality, and store their vegetables with higher risks of vegetables losses.

### **The Factors Influencing and Creating Log Jams in the Existing Value Chain**

Eight out of twelve farmers concentrated on the fluctuating market prices. Participant three asserted in an interview, "Selling prices can range from Rs. 24-62 per kg." Such a wide

range of values clearly indicates the price fluctuation. This assumption received a total frequency of 17. This not only benefits farmers but also initiates inadequate relationships with other value chain players and influences the farmers' groups' activities such as agreement, market information, technology transfer, and reduction of trust towards the wholesaler's offers during vegetable buying and selling process. This can discourage the number of farmers and enterprises in their villages which contributes to reduced production of vegetables. Similarly, Wholesalers often take advantage of farmers, who are unaware of market prices, by offering them lower prices for the vegetables to make a higher profit. Such behaviors have decreased trust between farmers and wholesalers. This affects grassroots farmers and raises conflicts on farmers and traders groups which is detrimental for group management.

Out of the twelve farmer respondents, eight farmers agreed that the use of traditional technologies in packaging of vegetables increases the losses and reduces the quality of vegetables. In this line of thinking, participant seven said, "The wholesalers reduces the market price of vegetables in Triyasi vegetables collection center because of reduced quality of vegetables." It received a total frequency of 14 during data analysis. SNV/MoAC (2011) also states, "Tomatoes have 33% and the cauliflowers have 14% losses during delivering vegetables from the farms to the end markets." Poor farmers emphasized that the farmers used *dokos*, local baskets made by bamboos, *plastic bags*, and *jute bags*, in order to pack vegetables which has led to losses of vegetables, decreased vegetable quality, and decreased vegetable weight. The replacement of traditional packaging system with improved packaging system helps decrease losses of these vegetables which is important in increasing quality of vegetables, maintaining vegetable's reasonable weight for increasing the profits of sold vegetables, and elevating the income level of rural poor farmers. The improvements on packaging system affect market prices

of vegetables, motivate farmers, and create opportunities for new part time and full time jobs in the village. The creation of jobs includes the farmers in the farmers groups and brings economic development while simultaneously increasing skills and introducing new technology.

Five out of twelve farmers focused their discussion on poor group management which has led to low performance of the farmers groups and cooperatives in the production area. It received a total frequency of 10. A farmer participant from lower caste exclaimed, “It is important to include lower caste members in the executive committee to bring unity.” Inclusion of poor and lower castes encourages the ownership of the planned activities and implementation of programs. A farmer participant from farmer’s cooperative asserted, “Poor group management has discouraged capacity building of farmers, disrupted communication among farmers and wholesalers, decreased cooperation among value chain players, led to inefficient record keeping, and increased conflicts amongst farmers in cultivating vegetables, organizing programs, and evaluating results.”

Finally, five farmers out of the twelve farmers from farmers’ groups stated, “The unavailability of quality seeds affects the existing value chain as a factor that has significantly contributed to a decrease in production.” It received a total frequency of 5. Improved varieties of seeds yield more vegetables from farms which leads to increased income of the poor farmers. The government has experts but lacks enforcement mechanism like Agrovets, who are concentrated in the district headquarter and road-headed markets because of instability of local government. The lack of communication prior to production between farmers and input suppliers encourages the low quality of input supplies like seeds that discourages the increased production. Increased production yields increased enterprises which lead to the economic development of the poor farmers.

**Discussion:**

The responses of eight farmers pointed to the lack of access to innovative technology for vegetable production and enterprises development. The absence of improved technology leads to the production of low quality and low quantity of vegetables. The trend in the local production shows the reduced quantity of vegetables based on the increasing areas (Triyasi Collection Center, 2015; MoAC, 2014 & 2015). Four out of twelve farmers focused on the lack of awareness about the correct usage of chemicals in the vegetable field leads to the over use of chemicals. This has decreased the quality of the soil and negatively affected human health (Sharma et al, 2013). However, the agricultural service center conducts a plant clinic every month in order to identify diseases of farms and recommend pesticides and/or insecticides to control these diseases and pests on time (DADO, 2015). Farmers from rural areas have not been able to benefit from the plant clinic because of their remoteness and the resulting lack of awareness. Additionally, low quality of seeds and chemicals result in the emergence of new diseases every year in the farms and vegetables (Dilli Koirala, personal communication, Jan 06, 2016). That plant clinic is not sufficient to provide services for identifying diseases and control procedures during the cultivation season. Finally, the production area is scattered; therefore, it is too difficult to control any diseases contracted in the farms.

ANSAB/SNV/ MoAC (2011) has mentioned that rural tomatoes have 33% and cauliflowers have 14% loss by the time they reach the end market. Acknowledging this, some respondents focused on the adherence to traditional technology in packaging and harvesting and lack of awareness as the log jams for the value chain. For instance, the tomatoes should be harvested when they are yellow in color, but in local practice, farmers harvest tomatoes after they have completely ripened (Binaya Shrestha, personal communication, January 15, 2016).

Such practices have significantly contributed to the loss of tomatoes. Farmers are unaware that harvesting late has caused the loss of tomatoes. Likewise, they use local *dokos* and *jute bags* to carry the produce that can only hold about 20-50 kg at once. This not only damages tomatoes, but can also lead to great production loss. An adherence to traditional practices has negatively affected the overall production and marketing system.

Vegetable losses during the loading and unloading process account for about 5-10% of the losses in the wholesale and 10-20% of the losses during the retail (Kaini, 2000, as cited by ANSAB, 2014). Such vegetable losses increase the marketing costs because of high demand and low supply rate. Likewise, two farmers mentioned that the farmers, wholesalers, and retailers want to sell their collected vegetables immediately in the market because of the fear of open sunlight and dry environment. These factors decrease the overall quality of vegetables, yielding less profit and return on investment for farmers. The farmers included another reality of the local market, which is the fact that wholesalers desire to buy the vegetable when the demand is high, but are unwelcoming when it comes to buying vegetables during times of low demand in the major cities like Butwal and Pokhara. Local wholesalers reduce the market price of vegetables based on the market prices of these cities when the outside wholesalers are absent. In this case, farmers are left with only two options: they must either sell their vegetables in low prices to local wholesalers available in the collection center or wait for the prices of vegetables to go up. A problem, however, is that waiting longer decreases product quality. For instance, putting vegetables in the sun for a long period of time dries them, which reduces not only their aesthetic value but also their weight; all of which contribute to losses for farmers.

Ten farmers highlighted market fluctuation as a distinct problem that has hindered the vegetable value chain. In the production area, cauliflowers and tomatoes have high market

prices, making them preferred by a number of farmers. This price fluctuation is initiated by wholesalers during the main harvesting season and can last for more than a week. Therefore, such situations can be avoided by establishing a cold store, which would help preserve the vegetables for a longer period of time. With the development of these vegetables, the value chain can sustain commercially as well as amongst smallholder farmers. The reality is that the market rate is fixed based on the prices of Pokhara, Butwal, and Bhairahawa. The wholesalers delivering produce to these cities reduce the prices in the vegetable harvesting season, and the price rises when the harvesting season is over. The inability of farmers to preserve vegetables for a longer period of time and therefore supply wholesalers with a higher quality of vegetables has decreased the trust between farmers and wholesalers in the local market.

Some farmers focused on the development of infrastructure as a factor influencing the value chain. As a result of the scarcity of irrigation channels, the suitable lands for vegetable farming are limited to small areas. It is noteworthy that some vegetable production lands in this production area are rain-fed, and therefore, farmers only cultivate vegetables in the rainy season. Establishment of irrigation channels in these areas increases areas of production, which yields greater production (Singh et al, 2013). Similarly, climate is also a significant factor affecting the production of commodities. Thus, three respondents focused on climate change as a constraint of the existing value chain. Globally, the temperature has increased by about 0.85 degrees Celsius, with the Himalayas currently warming up by about 1.5 degrees Celsius. This is three times more than the global average temperature from 1982-2006 (Shrestha & Bawa, 2014). The production pocket of vegetables is affected by climate change and has experienced floods, dry, and excessive rainfall. Likewise, agricultural roads are not fully developed to fit all seasons in most of the districts of Nepal (ANSAB, 2014). This is because the roads of hilly areas are affected by

floods during rainy seasons, and the local jeeps cannot run smoothly in the rainy season. Due to the condition of the local agricultural roads, farmers are compelled to hire local laborers at expensive wages, which is further decreasing profit amongst farmers.

Group management is another important factor in the value chain dynamics. The value chain is a joint process involving diverse groups, institutions, individuals, vegetables production and marketing processes, interactions, sharing, relationships, and influences of different factors (Singh et al, 2013). Management of groups of value chain players in this area are very poor because of illiterate farmers with diverse views, castes, and cultures. Poor group management signifies low levels of performances by the groups and institution, which cannot build the capacities of the members, ensure reasonable progress of the institutions, increase the quality of services, and improve overall motivation towards its goals.

**Conclusion:**

Nepal is an agricultural country with a great potential for vegetable production. Therefore, the development of agricultural activities can positively contribute to the country. The value chain approach seems to be suitable for developing economically viable, socially acceptable, and environmentally sustainable vegetable production for years to come. It is also beneficial in this case because there are many participants, and because the whole processes of vegetable buying and selling as well as enterprise development can be analyzed. On the process of value chain, there are various factors that are affecting the value chain processes leading to low performance of the value chain in Waling, Nepal. Therefore, this study was conducted to analyze these factors as well as log jams where there is some correction needed to receive the desired benefits from vegetable production and its businesses.

The value chain in Waling area is impacting packaging technology, creating market fluctuation, reducing trust between farmers and wholesalers, and causing scarcity of quality seeds. These factors have created constraints such as lack of awareness amongst farmers regarding the usage of chemicals and fertilizers, poor management of the groups and cooperatives, unavailability of enough traders or wholesalers in the villages, scarcity of all-season agricultural roads, lack of irrigation, and lack of cold store. In addition, the constraints include high local transportation costs in the hilly areas, climate change, price fluctuation, lack of awareness among farmers, and vegetable losses. The opportunities include the ability to produce quality vegetables in the local cold environment, demand for local vegetables by the India-Nepal border market, such as Bhairahawa, Butwal, etc., higher economic benefit from vegetables than other crops produced at the local level, and the possibility of local laborers in the rural villages.

The constraints such as the presence of traditional packaging, higher vegetable losses, and absence of awareness on farmers are creating logjams in receiving remunerative benefits. These constraints have produced high level of frustrations. This frustration has led to low production and thus reduces the number of enterprises in the local level. Similarly, vegetables are not diversified in the local level and therefore farmers do not have a lot of options for the selling of vegetables. Few options include wholesalers from Pokhara, Butwal, and Bhairahawa from outside the district. A few wholesalers from these cities are unable to satisfy the demand of customers. Since wholesalers are aware of the fact that farmers have fewer options, they dominate and try to exert control over farmers. With a fear of market fluctuation, farmers are compelled to sell their vegetables in the price given by wholesalers. Therefore, packaging in cardboard and plastic crates, establishing cold store, and maintaining relationships between



vegetable business parties through linkage should be implemented in order to elevate the income level of poor farmers.

**Implications:**

The results of this study will be applicable to both the public and private sector in value chain studies. This project will be applied to improve the marketing system for the related stakeholders and employed in the rural villages as well as city areas of the present world where people are cultivating vegetables and selling for their livelihoods. In the present world, farmers who are cultivating vegetables in the rural or country areas cannot be success without connecting with the cities areas for their economic development. Since this value chain process is a whole process in which more individuals and institutions are participating and adding value in the step by step creating more part time and full time jobs. It gives the emphasis for developing enterprises and learning new experiences from others. Linkage with another business parties introduces the several groups and individuals for conducting businesses sustainably. Regular communication has potential for developing product quality and improving the further process of the vegetable value chains. Likewise, it is not only applicable in the agricultural value chain, it is also helpful to apply another sector such as non-timber forest products, oranges, coffee, other fruits, etc. In addition, it will be applicable for these individuals, industries, business institutions, and organizations who are going to plan a new project in such areas of Nepal as well as other developing countries. It provides the new technology for packaging which saves the lost vegetables which is applicable for economic development of poor population existing in the country like Nepal where farmers are missing more profits and getting losses every year. The recommendations from this study will be guidelines for agricultural professionals to plan, implement, and evaluate the programs for developing the present world.

**Recommendations:**

A cold store should be established by farmers' cooperatives in Waling (somewhere close to the collection center) and should backstop the vegetables during price fluctuation by organizing local wholesalers and farmers. This way they can invest, share, and contribute to the cold stores and serve the poor farmers of the production area. In addition to this, local cooperatives can coordinate with all supporter organizations, including VDCs, Waling Municipality, DADO, and Aandhikhola Agriculture Service Center and support through funds and leverage. Local cooperatives can form the management committee and this committee can decide the service charge. Service charge should be different based on the value chain players, quantity of vegetables, and duration of usage. The received funds from these users can be used as maintenance and management funds in sustaining the cold store for the long term.

Traditional Packaging should be replaced with plastic crates and cardboard boxes that are available in major cities in lieu of traditional *dokos* and *jute bags* from the village level. Wholesalers should provide these packaging materials to farmers through the vegetable collection center and farmers' cooperatives. The cooperatives and collection center should, then, provide these packaging materials to individual farmers based on the volume of their vegetables. The farmers should pack vegetables in their village and transport to the Triyasi collection center. This will save the local materials while preventing vegetable losses which will be ultimately beneficial in elevating income level of the poor farmers. Wholesalers use these materials during transportation of vegetables and provide these boxes to retailers. The retailers will give them back after selling these products and the wholesalers will further give them to farmers. It will be a cyclical process and help reduce the losses of wholesaling and retailing which will be beneficial in increasing the market prices from vegetable producers to the retailers. Similarly, Agriculture Service Center should conduct awareness campaigns for farmers' groups, develop

local resource persons within these respective groups, and provide practical packaging knowledge to farmers by illustrating sample packaging through trainings.

A higher quality is extremely crucial for input supplies. Hence, it is important that agricultural professionals provide recommendations for latest and improved hybrid seeds. Agricultural Services Center should facilitate farmers' groups to order prior to production and encourage input suppliers like Agrovets to buy seeds from reputed companies with clear recommendations of tested varieties. Prior to production season the Agricultural Service Center, where experts are provided by the government in the related subjects, should supervise the Agrovets of the district in testing their input supplies such as chemicals, seeds, fertilizers, equipment, and pesticides. Awareness campaigns should be conducted to raise awareness about the correct usage of chemicals, tested varieties of vegetables, and correct usage of fertilizers.

### **Subject for Further Study**

Price fluctuation was a common constraint in the existing value chain in Waling, Nepal. Therefore, conducting market study in two levels would be useful. The first one should be conducted in the local level and emphasize vegetable processing industries. Similarly, the second one should be conducted outside the district and focus on the demand and supply of fresh vegetables as well as processed products. The vegetable processing increases the number of enterprises thereby creating part and full time jobs while also increasing local consumption which protects farmers during price fluctuation. Furthermore, the market study should acknowledge the demand and supply of time, season, required quality, cause, and essential technologies related to packaging, harvesting, and storing. This is vital in competing with the outside markets located in major cities within the country, as well as Nepal- India border markets. All of these yield an increase in market competition among buyers and help connect the

local production area with the potential market areas. Additionally, such market study will help find out the appropriate packaging method through feedback and conduct activities accordingly.

A study which finds out the appropriate technologies for packaging is beneficial in reducing losses of vegetables and contributes toward income elevation of rural poor farmers.

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### Appendices

#### Appendix 1: Year wise Area and Production of Vegetables in Syangja district

SN	Year	Area (ha)	Production (MT)	Yield( kg/ha)
1.	2010/2011	1,982	27,748	14,000
2.	2011/2012	5,790	66,444	11,476
3.	2012/2013	2,415	44,620	18,476
4.	2013/2014	2,569	45,550	17,727

Source: MoAC, 2012, 2013, & 2014.

#### Appendix 2: Year-wise Production and Selling of Study Area

Year	Production (MT)	Selling Price (Rs)
2009/2010	1206	21,417,000
2010/2011	2128.5	47,422,000
2011/2012	1695	43,615,000
2012/2013	1585	38,570,000
2013/2014	1605	41,335,000
2014/ 2015	1465	36,355,000

Source: Triyasi Vegetable Collection Center, 2015

#### Appendix 3: Costs and Benefits of Tomatoes at Waling, Syangja, Nepal.

S.N.	Description	Quantity	Unit price (Rs.)	Total (Rs.)
1.	Buying seeds	1 Packet	400	400
2.	Fertilizers	3 Bora	500	1,500
3.	Pesticides/ Insecticides	5 types with a spray	300	1,500
4.	Local materials such as jute and plastic rope, dried wood, bamboo, etc.		3,000	3,000
5.	Labor expenses in production	15 participants	300	4500
6.	Harvesting expenses	12 participants	300	3,600
7.	Buying local basket and rope			1,000
8.	Local transportation	1,200 kg	2	2,400
9.	Total expenses			17,900
10.	Income from tomatoes	1,200 kg	35 (Average price from 24-60 per kg)	42,000
11.	Profit (Income-expenses)			24,100

Source: Chandra Giri and Ramakanta Aryal, Sworek-7, Toridanda, Syangja

**Appendix 4: The Cost-benefit Analysis of Cauliflowers in Waling, Nepal.** (For 1 ropani land)

S.N.	Description	Quantity	Unit price (Rs.)	Total (Rs.)
1.	Buying seeds	1 Packet	400	400
2.	Fertilizers	3 Bora	500	1,500
3.	Pesticides/ Insecticides	4 types with a spray	200	800
4.	Local materials such as jute and plastic rope, dried wood, bamboo, etc.			0
5.	Labor expenses in production	15 participants	300	4,500
6.	Harvesting expenses	4 participants	300	1,200
7.	Buying local basket and rope			1,200
8.	Local transportation	1,200 kg	2	2,400
9.	Total expenses			12,000
10.	Income from tomatoes	1,200 kg	30 (Average price from 24-50 per kg)	36,000
11.	Profit (Income-expenses)			24,000

Source: Chandra Giri, Ramakanta Aryal, Toridanda, Sworek, Syangja

Uba raj Regmi, & Jaisara Regmi, Triyasi, Waling, Syangja

**Appendix 5: Constraints and Opportunities of vegetable Value Chain**

Type	Opportunities	Constraints
Input supply	Availability of agro vets to provide input supply Availability of service providers	<ol style="list-style-type: none"> <li>1. Lack of quality seeds</li> <li>2. Most of the agro vets are in district headquarters and road-heads.</li> <li>3. Gap of any agreements prior production</li> <li>4. Over use of fertilizers and chemicals</li> <li>5. Lower level of coordination among these service providers</li> </ol>
Production	Farmers have individual lands to cultivate vegetables	<ol style="list-style-type: none"> <li>1. Small size of vegetable plots with low volume of production</li> <li>2. Expensive local transportation</li> <li>3. Absence of youths in the village</li> <li>4. More costs of production</li> <li>5. Absence of irrigation at all- season</li> <li>6. Scattered production areas</li> <li>7. Lack of improved technology</li> </ol>

	More economic benefit than other crops in the local level with enough traditional knowledge	<ol style="list-style-type: none"> <li>1. Market price fluctuation</li> <li>2. Poor quality vegetables</li> <li>3. Lack of awareness on farmers</li> <li>4. More post-harvest losses</li> <li>5. Lack of appropriate packaging, grading and storage technologies</li> <li>6. Lack of unity of farmers</li> <li>7. Low bargaining power on farmers</li> </ol>
Marketing	<p>Demand from major cities as well as India-Nepal border markets.</p> <p>Availability of Market Information System (MIS). The production pocket is situated between two major cities such as Butwal and Pokhara.</p> <p>Possibility of product diversification.</p>	<ol style="list-style-type: none"> <li>1. High marketing costs.</li> <li>2. Lack of improved technologies in packaging and storage</li> <li>3. Lack of access of farmers with India-Nepal border market</li> <li>4. Poor quality of vegetables.</li> <li>5. Market price fluctuation</li> <li>6. Limited buyers</li> <li>7. Lack of product diversification</li> </ol>
Organization	Availability of farmers' groups, cooperatives, and collection centers, and networking	<ol style="list-style-type: none"> <li>1. Poor performance of farmers' groups</li> <li>2. Inadequate record keeping system</li> <li>3. Lack of coordination</li> <li>4. Politics</li> <li>5. Scarcity of trust between farmers and traders</li> </ol>
Finance	Presence of cooperatives, local saving and credit organizations, and Agricultural Development Bank	<ol style="list-style-type: none"> <li>1. Lack of business planning</li> <li>2. Problem in handling cash due to illiterate members.</li> <li>3.</li> </ol>
Infrastructure Development	Availability of lands for developing infrastructures	<ol style="list-style-type: none"> <li>1. Absence of cold stores.</li> <li>2. Insufficient irrigation at all villages in rain fed areas.</li> <li>3. All collection centers are in the road-heads.</li> <li>4. Lack of all-season agricultural roads.</li> <li>5. gravity ropeways are not sufficient at</li> </ol>

#### Appendix-6: Market Prices of Vegetables in Waling, Nepal through Fourth Marketing Channel

Value Chain Players	Descriptions	Received rate per kg (Rs.)	Costs per kg (Rs.)	Total per kg (Rs.)	Remarks

Farmers	Vegetables	24-62		24-62	Included local transportation costs Rs. 1-3 per kg, local basket, and jute bags in market prices
Received by local wholesalers from farmers per kg vegetables in Rs. 24-62 in the Triyasi vegetable collection center.					
Butwal and Pokhara Wholesalers	Vegetables		24-62	24-62	
	Transportation		2.5	2.5	Waling to Pokhara, Bhairahawa, and Butwal market
	Labor		1	1	500 per truck
	Margin for Butwal and Pokhara wholesalers		3	3	
	Materials such as rope, jute bags, etc.		0.5	0.5	
	Service charge to collection center		1	1	
Received by Butwal and Pokhara retailers from local wholesalers				32-70	
Butwal and Pokhara retailers	Vegetables		32-70	32-70	
	Transportation		1	1	
	Labor		1	1	
	Storage		3	3	
	Margin		10	10	Included 10 % vegetable loss
Local Butwal and Pokhara cities' consumers' prices by Butwal and Pokhara retailers				47-85	

Source: Farmers' interviews, focus group discussion in Waling, 2016.

**Note:**

The market prices are based on the prices of 2015/2016.

The market prices are especially focus to the commercial vegetables like tomatoes and cauliflowers.

### Appendix-7: Market Prices of Vegetables in Waling, Nepal through first, second and third marketing channels

Value Chain Players	Descriptions	Received rate per kg (Rs.)	Costs per kg (Rs.)	Total per kg (Rs.)	Remarks
Farmers	Vegetables	24-62		24-62	Included local transportation costs Rs. 1-3 per kg, local basket, and jute bags in market prices
Received by local wholesalers from farmers per kg vegetables in Rs. 24-62 in the Triyasi vegetable collection center.					
Local Wholesalers	Vegetables		24-62	24-62	
	Transportation		1	1	Waling to road-heads market
	Labor		0.5	0.5	500 per truck
	Margin for local wholesalers		3	3	
	Materials such as rope, jute bags, etc.		0.5	0.5	
	Service charge to collection center		1	1	
Received by road-head retailers from local wholesalers				30-68	
Road-head retailers	Vegetables		30-68	30-68	
	Transportation		1.5	1.5	
	Labor		0.5	0.5	
	Storage		1	1	
	Margin		5	5	
Local consumers' prices by road-head retailers				38-76	

Source: Farmers' interviews, consultation with farmers and entrepreneurs, and focus group discussion in Waling, January and February, 2016.

#### Note:

The market prices are based on the prices of 2015/2016.

The market prices are especially focus to the commercial vegetables like tomatoes and cauliflowers.

### Appendix: 8 Finding out the factors that are influencing the existing value chain

Constraints from respondents	Related to .....	Frequency (Times)	The factors that are Affecting the	Log jams in the Existing Value	Number of farmers
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			<b>Existing Value Chain</b>	<b>Chain and its rank</b>	
<ol style="list-style-type: none"> <li>1. Lack of new technology</li> <li>2. Insects and diseases</li> <li>3. improved technology</li> <li>4. Insect and diseases</li> <li>5. Diseases and pests</li> <li>6. Lack of improved technology</li> <li>7. Lack of improved packaging</li> <li>8. Lack of improved packaging</li> <li>9. Lack of technical knowledge</li> <li>10. Disease and pest</li> <li>11. Lack of improved technology</li> <li>12. Lack of improved technology including packaging</li> <li>13. Lack of crop rotation</li> <li>14. Presence of traditional packaging system</li> </ol>	Technological problems	14	Technology	Lack of improved technology in diseases and pests control and packaging- (1)	8 Disease & pest- 4 Improved technology- 7 Crop rotation- 1 Packaging- 5
<ol style="list-style-type: none"> <li>1. Absence of collection center in the village</li> <li>2. Lack of cold stores</li> <li>3. Lack of infrastructure development</li> <li>4. Lack of all-season irrigation</li> <li>5. Lack of irrigation</li> <li>6. Lack of irrigation</li> <li>7. Lack of irrigation</li> <li>8. Lack of all-season irrigation</li> </ol>	Infrastructure development	8	Infrastructure	Infrastructure development (4)	5 Collection center- 1 Cold stores- 2 Irrigation- 5
<ol style="list-style-type: none"> <li>1. Market price fluctuation</li> </ol>	Market Price, participants,	17	Market	Price Fluctuation (2)	12

<ol style="list-style-type: none"> <li>2. Price fluctuation</li> <li>3. Price fluctuation</li> <li>4. Price fluctuation</li> <li>5. Price fluctuation</li> <li>6. Price fluctuations</li> <li>7. Price fluctuation</li> <li>8. Absence of reasonable prices</li> <li>9. Expensive local transportation</li> <li>10. Lack of market</li> <li>11. Absence of market in the villages</li> <li>12. Lack of market information</li> <li>13. No market competition</li> <li>14. Availability of a few traders</li> <li>15. Cheating by traders</li> <li>16. Lack of enough wholesalers</li> </ol>	<p>Costs, and benefits</p>				<p>Price fluctuation-8 Expensive local transportation -1 Lack of market information-1 Inadequate market-2 Limited buyers-3</p>
<ol style="list-style-type: none"> <li>1. Unavailability of quality seeds</li> <li>2. Lack of quality seeds</li> <li>3. Lack of quality seeds</li> <li>4. Lack of improved varieties of vegetable seeds</li> <li>5. Lack of improved varieties of vegetable seeds</li> </ol>	<p>Input Supply</p>	<p>5</p>	<p>Services</p>	<p>Scarcity of quality seeds</p>	<p>5 Lack of quality seeds-5</p>
<ol style="list-style-type: none"> <li>1. Poor management of groups</li> <li>2. Lack of trust between farmers and traders</li> <li>3. Poor group management</li> <li>4. Lack of coordination among</li> </ol>	<p>Behavior of groups, institutions, and individuals</p>	<p>10</p>	<p>Value Chain Players</p>	<p>Poor Group Management (2)</p>	<p>10 Poor group management-5 Exclusion poor-2 Lack of coordination-3</p>

farmers and other market participants 5. Presence of a few lower castes in the executive committee 6. Majority of poor farmers 7. Politics					
1. Lack of awareness on farmers 2. Lack of awareness on farmers 3. Lack of awareness 4. Post-harvest loss. 5. Post-harvest loss 6. Lack of awareness 7. Post-harvest loss 8. Lack of awareness	Awareness	8	Teaching and Learning	-	5 Lack of awareness Post-harvest loss-3
1. Wet climate and floods 2. Climate change 3. Climate change 4. Wet environment	Climate	4	Climatic Factor	-	4 Climate change-2 Wet and floods-2
1. Lack of agricultural subsidies 2. Little subsidies of government 3. Inadequate Subsidies distribution	Government and its policies	3	Governmental Policies	-	3 Lack of enough subsidies-2 Inadequate distribution- 1
1. Lack of commercial cultivation 2. Reduced production 3. Lack of market-led production	Size of Cultivation	3	Production	-	4 Lack of commercial cultivation-1 Reduced production- 1 Lack of market-led production-1

Source: Farmers' interview in Waling, Syangja, 2016.