

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

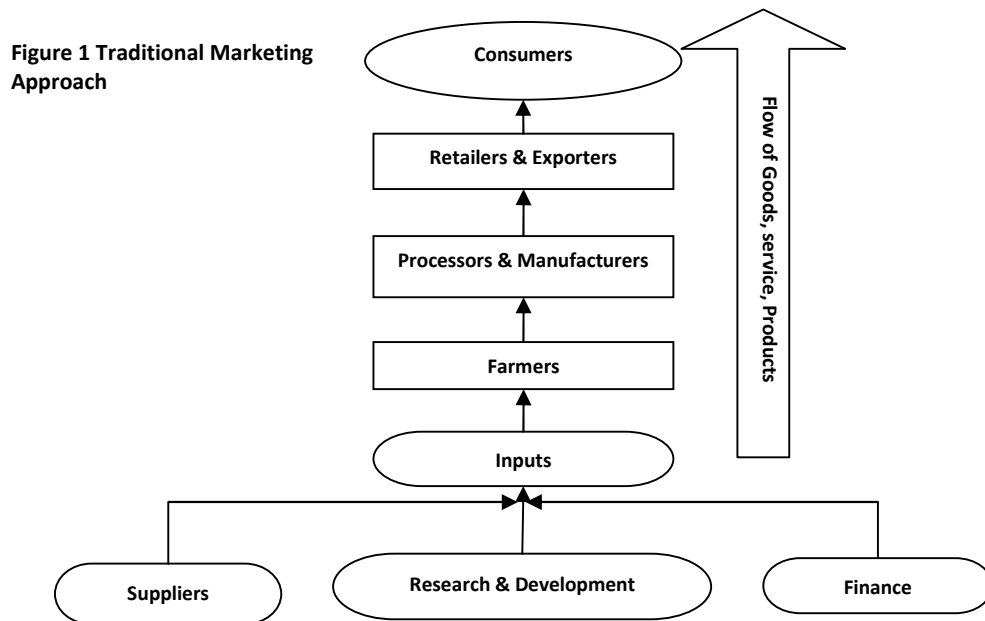
Nepalese economy is characterized by high dependency on primary sector and has high potentiality of RNR products such as Agriculture farming, Livestock, Minerals, Forestry and other primary sectors. Not less than 80% of population is engaged to these sectors directly or indirectly. Agricultural production and primary sector accounts 37.89% of the GDP of Nepal (ANR, 2070/71). Its contribution to national employment is 73.9 % (NLFS, 2008). Nepal has a favorable environment and natural resources for the production of variety of agro production such as rice, wheat, maize and other horticultural product like citrus, vegetables even off seasonal products. These all have high level of value chain enhancement opportunities and able to create significant contribution to national income and employment to rural population.

Despite these facts agricultural sector has been left neglected practically. All planning and vows for rapid modernization of agricultural sectors are remains on books of planning left waiting for practical implementation. High level of corruption and continuous struggle and insurgency, political instability and resistance to change on technology of different functions due to educational insufficiency has put hurdle to modernization of this sector.

Nepalese agricultural sector is mostly characterized by traditional and backward techniques on different level as production, marketing, income distribution and information and feedback level. High cost and misapplication of resources, low productivity, zero or negative marginal productivity are common features. Dualistic economy has posed more complexity on these subsistence sectors. Agricultural growth rate has been experiencing low and fluctuations. It's been projected 4.71 at 2070/72(Annual National Report 2070/71). Agricultural economic indicators have been continually giving inappropriate signal to economic forces and participants.

The scenario is slightly improving due to quick growth in telecommunication and other information technology. Need of transformation of agriculture sector from

subsistence farming to market oriented commercial farming is getting more and more urgent. Over the last few years, it has not been felt that remarkable development in



agriculture sector but with end of insurgency, increased access to information technology esp. in telecommunication and television networks and expansion of road networks like farm and feeder roads to remote areas, farmer are gradually moving from subsistence to commercialized ones. Since Nepal has most area of agro-production characterized by inaccessibility and marginality so, need to play in linking small cash crop with markets for their product. But traditional framework of value chain mechanism works on one way traffic and ignores the income distribution aspect so; the main aim of the study was to identify the bottlenecks which needed to be addressed in order to improve competitiveness. The study has adopted the Value Chain approach to map the subsector, identify gaps in support services and suggest areas of improvement. This study provides a critical overview of the existing production system, product delivery methods, trading practices and support services. It presents a descriptive analysis of the market looking at the production trends, prices, demand and supply conditions of country and the competitive advantage of citrus production of Chiti VDC of Lamjung which has already been declared as most prominent Pocket Area among 11 Pocket areas of Lamjung District.

Thirteenth interim three year plan has given top priority to productivity growth of agro sector and its diversification and commercialization with hydropower and other

energy sectors. To tap the objective of diversification and commercialization of agro sectors, one must identify its value chain and function of subsector's interplay and interdependency. Identifying partners and their stages of interplay, dependency and interventionist role to shape the real signal or addressing real economic and market forces has been really challenging in this dynamic and consumer oriented era.

A value chain is a connected string of companies, groups and other players working

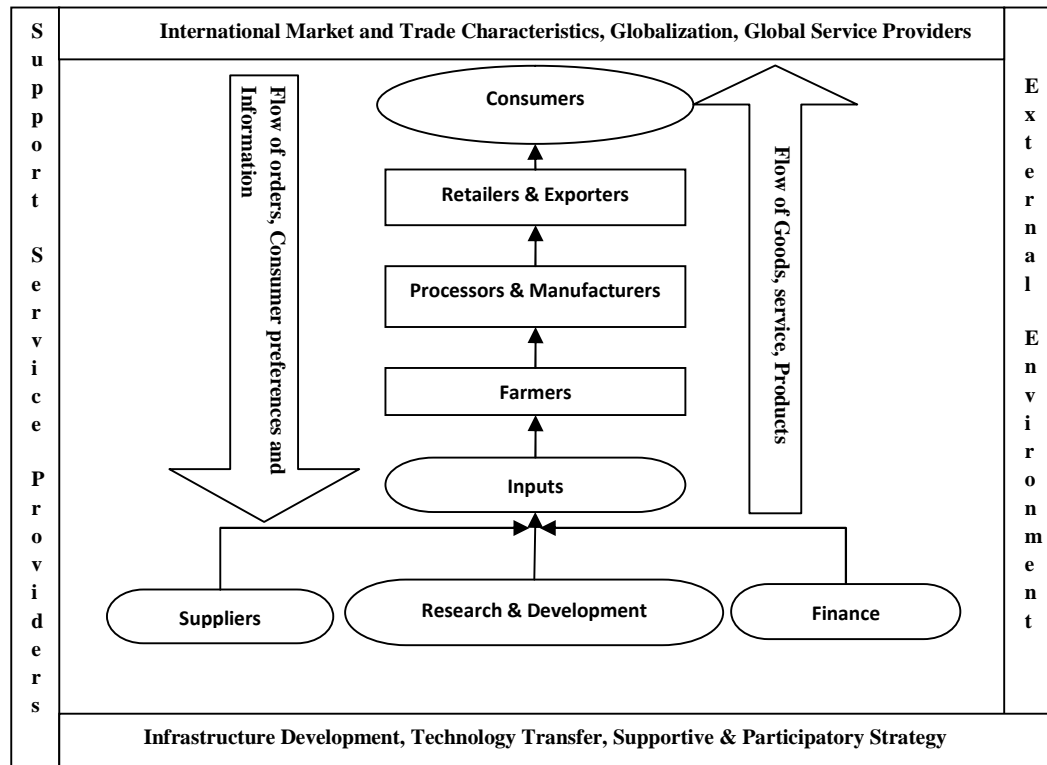


Figure 2 Value Chain Marketing Approach

together to satisfy market demands for a particular product or group of products. It links the steps a product takes from the farmer to the consumer. It includes research and development, input suppliers and finance. The farmer combines these resources with land, labor and capital to produce commodities. It follows a kind of two way synchronization in process input supplier to final consumption through different platforms. The term value chain describes the full range of activities that are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use. It covers all those activities, platforms and even intervention of different sub-sectors involving in moving products from farmer's field to final consumer's table.

Identifying and based on the framework and concept of value chain development. In this study has been held on CHITI VDC of Lamjung district which has been engaging on citrus production since 2030 BS. It has currently approximately 20-25 thousand bearing trees of Orange (orange is a member of citrus family and here, citrus is used interchangeably for orange) and about 180-200 Tonnes, per annum and generating 7 - 8 million rupees. In spite of such production traditional marketing chain has been experiencing by farmers so and this study is completely devoted to develop and connect two way relationships among all market forces.

## **1.2 Statement of Problem**

Despite the appropriate climate and rich biodiversity, primary industry including agriculture is characterized by traditional and backward state of affairs in each level production to final consumption. Even high degree of potentiality, comparativeness and competitiveness in terms of growth has failed to upgrade agriculture sectors from subsistence farming to commercial one. Citrus production of Nepal including Chiti VDC also can be identified in terms of these characteristics as discussed above. Need of commercialization of agro industry is getting urgent day by day because of increasing impact of globalization and dependency between aggregate economies.

Transformation of subsistence farming to commercial up gradation needs composed action on each level from input supply to final consumption. Current status of agro production follows traditional and backward mechanism which is insufficient to feed and launch appropriate signal to track the growth dynamics. Need of inner restructure of industry on each level and as a whole reorganization of supply chain is now intriguing issue. Like other secondary industry, primary industry must follow the path as per conceptual development of modern marketing. The conceptual development on marketing has gone far from mere traditional production concept which does not care the market signal/ feedback or consumer preferences and income distribution to holistic marketing characterized by integrated marketing, relationships management, multi way internal circulations, societal and performance marketing. An industry can create such consumer value of industry by managing its value chain. A value chain is a set of interlinked value creating activities performed by an industry. These activities begin with inputs, go through processing, and continue up to outputs marketed to consumers. But citrus industry of the area is unable to manage these chains and this

has further consequences on income distribution, relationship management. Multi-way internal circulation and performance based marketing management. some most intriguing issues can be drawn as follows.

Lack of identification and proper definition of VC operators and their function is initial issue. Systematic synchronization between operators is also missing. Support service providers or environmental factors of VC are not identified properly and their functioning in VC mechanism is sufficiently lacking.

Because of proper identification of subsectors such as operators and external environmental forces there is no space of proper value chain mapping of internal structure and overall industry.

Support service provider and their competitive and comparative studies has made proper VC component inefficient. Strength and weakness of chain industries or operators and opportunity for up-gradation and threat imposed on development by external environment must be identified and proper intervention strategy must be implemented to correct VC.

### **1.3 Objectives of study**

The primary objective of the study is to provide a descriptive analysis of the citrus value chain, identify the major constraints of the subsector, understand the business service provisions, and suggest specific areas of intervention to upgrade the value chain. More specifically, the study investigates the following 3 areas through various activities of citrus production of Chiti VDC ward number 2.

- A) identify citrus value chain operators and support service providers and general functions related with these subsectors of citrus production.
- B) construction of the citrus value chain map, current market and economic analysis of the VC.
- C) an analysis of the SWOT of VC components and subsectors, competitive/comparative Advantages and their constraints, and appropriate strategies to upgrade VC.

## **1.4 Significances of Study**

In the traditional selling system, farmers produce commodities that are "pushed" into the marketplace. Farmers are generally isolated from a majority of end-consumer and have little control over input costs or process received for their goods. The primary exception is where local farmers sell produce in local markets and where there is a direct link from farmer to consumer. In most traditional selling systems formers/producers tend to receive minimal profit. Any integration up or down the value chain can help. Examining current production and marketing system of this VDC clearly indicating toward complete dependent on traditional marketing chain. Market "Push" tends to be based on independent transactions at each step, or between each node. Products may often be sold into a crowded and competitive market. The farmers are largely isolated from the consumer, and from the demands and preferences of consumers. This is entirely responsible for the circumstances of low rate of return and very low functioning of sub-sectors. It leads to unhealthy and failure type of market mechanism and follows continuous falling patterns of life standards of farmers.

Lack of study and information of participant and agent inside the framework and other subsector which contribute, intervene and shape the value chain structure from outside, it has been difficult and complex to understand the real play of economy. These complexity and limited information always lead to misallocate resources, lower level of productivity, and inappropriate distribution of income and wrong signaling of economic forces which eventually lead to market failure creating misplacement and misbehavior of economic forces on real scenario. These circumstances eventually figure out wrong picture of economy or chain which is far from real circumstances of economy.

This study has aim to develop the actual and real marketing chain to tap all members and players of production to final consumption and reverse flowing mechanism of income distribution. This study has target of discovering the role of all player of citrus production to final consumption and interconnection of all player in all innovative platforms. It is very useful to find out target variable or player to intervene to track market situation for achievement of modern commercialized production and marketing. Further R&D program can be successfully implemented if real market forces are found and if real value chain is prepared. After establishing the structural framework of different participant on the basis of value chain and if any inefficiency found, corrective action can be possible to take by intervening through many player like government, financial institutions and other NGOs.

## **1.5 Limitations**

Despite the heavyweight character of the study it has following but very important limitation of the study.

- ) The concept of value chain development should be carried out on macro level at least capturing overall production and distribution of entire industry but here only one pocket area has been taken for the study.
- ) Lack of proper knowledge about this new concept of flow and play of different market forces lead to difficulty on way of trapping these forces in real term and identification of their role.
- ) Differentiating some kind of qualitative information and describing has posed some difficulty.

These limitation and hindrances have been removed as much as possible and made as study need as per rational ways.

## **1.6 Structure of the report**

First chapter of report deals with introductory parts of VC. It is concerned with general overview of economic condition of agriculture in Nepal and the area understudy and why value chain study is important to develop commercialization of Agriculture. Objectives to address the current issues and its significances with limitation of study itself have been discussed in chapter first. Second chapter is concerned with review of available literature related with VC studies. First part of chapter second is related with theoretical aspect of literature and rest examines previous empirical studies on different sectors on the basis of VC approach. Chapter three deals with research methodology, which shows how VC is applicable to the selected area and its selection, required and appropriate data collection, processing and interpretation is taken place. Introduction of citrus, world trend of citrus production with Nepal and area understudy has been presented in chapter four. Identification of subsectors and its function, construction of VC, analysis of SWOT of subsectors and required strategies and constraints are thoroughly discussed in chapter five. It sketches current status of VC in the area in terms of citrus production. Brief summary and conclusion of the whole report with recommendation to upgrade VC and increase competitiveness of subsectors has been drafted in chapter six.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Background

Value chain approach does not have long history. It is slightly new approach in business economics. Development of marketing thought has been always dynamic. Holistic and integrated marketing concepts are vital and necessary in such dynamic and consumer oriented marketing needs. So, VC approach is first described and developed for business management by Porter (1985). Since then, developed countries mostly USA and Canada are using VC approach approximately every industry including primary, secondary and tertiary. Nowadays analysis of VC development is necessary for any industry in such developed countries. Most of the countries of Asia and Africa are developing VC approach recently while analyzing flow of different product and services from creation to demolition.

#### 2.2 Theoretical Prospective

Porter (1985) has described there are two types of activities as primary and secondary. Primary activities are:

- ) Inbound logistics - involve relationship with input suppliers and include all activities to receive, store and disseminate the inputs
- ) Operations - include all activities to transform inputs to outputs (Products and Services)
- ) Outbound Logistics - include all activities required to collect, store and distribute the outputs.
- ) Marketing and sales - activities inform buyers about products and services induce buyers to purchase them, and facilitate their purchase.
- ) Service - includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered.

Secondary activities are:

- ) Procurement - is the acquisition of inputs, or resources, for the firm.



- ) Human Resource management - consists of all activities involved in recruiting, hiring, training, developing, compensating and (if necessary) dismissing or laying off personnel.
- ) Technological Development - pertains to the equipment, hardware, software, procedures and technical knowledge brought to bear in the firm's transformation of inputs into outputs.
- ) Infrastructure - serves the company's needs and ties its various parts together, it consists of functions or departments such as accounting, legal, finance, planning, public affairs, government relations, quality assurance and general management.

Organizations perform hundreds, even thousands of activities in general course of business but these activities can be classified into the above mentioned groups and subgroups. Analysis of these activities provides a theoretical framework for construction of the VC of firms and industries. Porter (1996) further improved generic VC model of (Porter, 1985) and breakdown VC to single activities The method allows the firm to understand which parts of its operations create value and which do not (Ketchen and Hult, 2007). This is basis for appropriateness of enhancing strategy for value creating activities and intervention strategy for non creating ones (Agrawal, 2010)<sup>c</sup>.

Later some important development has been done in VC approach such as method of application of VC in the firm or the industry by internal operators, support service providers and the third party analysis as well. Altenburg (2007) has suggests different approaches to conducts pragmatic VC analysis are as follows.

- ) Expert driven approach

Expert driven VC analysis approach is simplest method of conducting VC analysis of any business units. By observing, collecting and analyzing necessary data and information about business unit, experts conduct appropriate VC analysis of such business units from outside. In such cases, goal and objectives of VC analysis may be achieved quickly and very economically but there are chances of error in measuring

actual functioning of VC component from outside of framework. Individual expert, government and other NGOs generally conduct such analysis.

#### ) Participatory approach

In this method, analyst inserts him/herself into the mechanism as VC component but avoid the basic VC function. Analyst collects information, signals and other required data from inside the VC mechanism. Running workshops, grouping of participants and conducting several interviews, simulating VC processes and setting up forums for analyzing VC constraints are generally performed to enhance VC operator's collaboration and trust. It also intends to construct participator's own business ideas for identifying business opportunities and upgrading VC.

#### ) Partnership approach

In this approach, analyst or researcher is active operator or support service provider of VC mechanism. They function together with VC components. They play interventionist role on different level of VC. They insert themselves in particular level of VC and multilevel as well based on their goal and objective of analysis. Providing financial, management aid, launching research and information gathering programs, implementation of business ideas, enhancing operating efficiency, planning, motivating, controlling and other interventionist role are some usual functions.

Agrawal (2010)<sup>b</sup> has pinpointed why VC is most important need of modern marketing due to present dynamic concept of holistic and integrated marketing. Agrawal (2010)<sup>c</sup> has given detailed introduction, framework and process of VC analysis with SWOT analysis and Environmental Opportunity and Threat Profile for strategic options in context of Nepal. It has discussed how to analyze core competency of different sub-sectors of VC with external opportunity and threats. Agrawal (2010)<sup>a</sup> has described need and scopes and method of VC analysis, SWOT analysis and EOTP to set out efficient strategic planning for upgrading standard of VC components in context of Nepal.

According to Kalplinsky and Morris (2001) "the full range of activities which are required to bring a product or service from conceptions, through the different phases

of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposer after use”.

### **2.3 Empirical Prospective**

In context of SAARC region, VC approach is quite new. Some government entities and INGOs have conducted VC study in some agricultural sectors.

USAID (2003) has studied Afghanistan sheep farming and cashmere production on concept of VC and found significance difference of rate of return in traditional approach and VC approach with SWOT analysis. Bhutanese government conducted VC analysis for citrus farming. It identified sub-sectors of citrus VC and constructed VC map. It has also analyzed SWOT and EOTP. It found that modern post harvest handling can increase 20-30% net return to VC operators removing traditional one at 2009 through Ministry of Agriculture and Forestry.

In context of Nepal, VC approach is completely new concept in field of business management. Very little work has been done on this. Now PACT has made necessary to project development of VC through subsidy granted by it to different agro sectors. But lack of adequate knowledge it is not able to give satisfactory result. Mercycrop (2008) has studied VC finance which refers to financial products and services that flow to or through any point in value chain in order to increase in investment, growth or competitiveness for that value chain. This concluded that value chain finance is the provision of finance throughout the series (or chain) of transactions that result in the product arriving at market. From various case studies highlighted in this paper has concluded that providing poor and low-income people with access to formal finance, a financial service provider can reduce the liquidity and production constraints which is main cause of weak negotiating power of smaller producers. As a third party, the institution can also facilitate consensus building and align the incentives of different value chain actors, increase value chain competitiveness, and improve end products. USAID, ANSAB, NEAT (2011)<sup>a</sup> conducted the study of Ginger production which have been identified with intervention under the competitiveness component with collaboration with ANSAB. On this research paper, operators and support service providers of different sub sectors has been clearly defined, VC map for three region Eastern, Midwestern and Western region with SWOT profile and EOTP has been

constructed for these selected commodities. It is one of most systematically accomplished study which provides adequate information of those areas to be intervened through with off seasonal vegetables (USAID, ANSAB, NEAT, 2011)<sup>b</sup> as well on partnership approach where donor itself have played different active role. PACT (2012) under MoA studied Ginger VC with case of Midwestern region Nepal. It has followed partnership approach with necessary interventionist role for its own subsidized sector. In this report (PACT, 2012) Ginger VC has been constructed with objective of development of institutional relationship, finding out of actors/ subsectors of VC and major constraints, developing of sustainable solutions for efficient VC functioning and implementation. Bhattarai and Leduc (2009) conducted the appreciable study including gender factor in Bay Leaf VC. The study (Bhattarai, Leduc, 2009) has tried to analyze the gender-wise VC operation. The value chain approach implemented by the FECOFUN in collaboration with ICIMOD in a project in Udayapur, Nepal has contributed to more than doubling of household incomes – from 3,300 to 7,000 Nepalese rupees – in one year. Women have used the increased income to improve the living conditions of their households, investing mainly in food, clothes, and the education of their children, notably of girls. They have also used the money to invest in a share of the community cooperative. This (Bhattarai, Leduc, 2009) is an appreciable innovative work enabling engender factor on VC.

These are few research works concerned with analysis of VC but very crucial for VC for agriculture. In academic sectors increasing interest on pragmatic research like VC analysis, SWOT analysis and EOTP analysis can be sensed.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Research Design**

Since, the study has both quantitative as well as qualitative analysis so this study has been carried out with descriptive as well as exploratory approach. It is exploratory because it explores the current status and prospective for enhancement of structural framework of value chain covering input suppliers to final consumer of Chiti VDC citrus production.

#### **3.2 Rationale of Selection Area**

The main focus of survey is Chiti VDC ward number 2 because the 90% of citrus farming and production is concentrated here. This place is characterized by rugged, underdeveloped and marginal economic condition. These challenges makes in marketing of agro products. Every household of ward number 2 is engaging commercial production and citrus is main sources of income and employment but seasonal one. Approximately 180-200 tonnes and 5-6 million rupees per annum is continuously generated following traditional production and distribution mechanism.

Several Programs supported by PACT, FDD and CDP have been launched specially focuses on Nursery development for quality seedlings, training programs for optimum composition of biotic and chemical fertilizers and micro nutrients, uses of fungicides and pesticides, concerning post harvesting and marketing development. These kinds of active role played by most important agent of value chain have extensive impact on development of value chain. In this thesis, most of analysis of this thesis has been devoted to this program and try to find the impact of interventionist program like these contribute on development of value chain.

#### **3.3 Nature and Sources of Data**

Both qualitative and quantitative information has been analyzed as well as primary and secondary information has been used as required.

**Secondary Information** has been collected from concerned with market structure, average annual price index and market supply with projected demand and supply pattern from DADO, FDD, NCDP and KFVMDDB. PACT has provided VC report of subsidized sectors. Local financial organizations such as ADBL, NBBL has shared portfolio information on agriculture. Annual production and sales report of area understudy is provided by SOPS and SLNACO. Other local bodies, such as VDC has provided the status of physical infrastructure and demographic factors. Secondary information has also been collected from journal, books, newspapers, government reports and published research papers and other unpublished documents.

**Primary Information** has been collected by (1) observing people, places and practices, (2) interviewing actors and supporters of the citrus value chain.(3) Focus group discussions has been organized to get a collective view from participants about what they do and do not like about existing practices and how market linkages can be improved. **Observation data** has been collected by observing production and marketing practices, storage conditions and other market infrastructures. **Questionnaire data** has been collected through structured questionnaire about claim of financial institution's agriculture portfolio, current prices asking every member of SOPS. **Key Informant Interviews** has been conducted selecting from different subsectors such as VC operator (Citrus Grower and Contractors) and Support service providers (SLNACO and Financial Institution). Data and information concerning Cost of production and Value Addition on different level of VC has been collected with aid of SOPS and SLNACO analyzing previous results and current data collection from all its members constructing projected cost sheet and value addition sheet on annual basis through direct interviewing and preparing Income Statement. Monthly meeting and Annual General Meeting of SOPS and SLNACO has been used as primary data collection. Every major sales transaction has been provisioned to be recorded systematically at SOPS and SLNACO from all members.

### **3.4 Sampling Procedure**

Main focus of study is Chiti VDC ward number 2. It has population of 582 individuals with 80 household. Every head of household is member of Syaut Orange Production Society (SOPS) and SLNACO (Shree Laxmi Narayan Agricultural Cooperatives). So, all members of SOPS have been picked as census survey. Most of

the updated data is available to this society and SLNACO. Other player of value chain like financial institution, local contractors, wholesalers, retailers and other input supplier has been observed. Main market for selling product by contractors is Kalimati Fruit and Vegetable Market and secondary data has been reviewed from it.

### **3.5 Data Analysis and Construction of Value Chain map**

After collection and interpretation of both primary/secondary information has been analyzed qualitatively and quantitatively on the basis of information and need of study. Pure and applied mathematical devices and derivation has been used to develop required relationships. On the basis of relationships, descriptions and explorations the complete cycle of value chain map has been constructed. Play role of all possible members of chain and their interdependency has been developed graphically and descriptively. SWOT analysis and EOTP analysis has been constructed along with VC map.

## CHAPTER FOUR

### CITRUS AND PRODUCTION TRENDS IN NEPAL

#### 4.1 Citrus and Current Status

Citrus is a common term and genus (*Citrus*) of flowering plants in the rue family, Rutaceae. The most recent research indicates an origin in Australia, New Caledonia and New Guinea. Some researchers believe that the origin is in the part of Southeast Asia bordered by Northeast India, Burma (Myanmar) and the Yunnan province of China, and it is in this region that some commercial species such as oranges, mandarins, and lemons originally came. Citrus fruit has been cultivated in an ever-widening area since ancient times; the best-known examples are the oranges, lemons, grapefruit, and limes. Citrus fruits are among the most important fruits grown worldwide, especially in warm temperate and humid subtropical and tropical regions. Citrus refers to a range of evergreen shrubs and tree species, which are primarily grown for their fruit. Citrus fruits rank first in the international fruit trade in terms of value, and occupy the largest area under cultivation of all horticultural crops.

Citrus was described for the first time in Chinese literature in approximately 2000 B.C. According to most researchers, it was taken from Asia to North Africa and then to the southern part of Europe, where it would have arrived in the Middle Ages. From Europe it was carried to the Americas circa 1500.

Research and experimental studies to improve orange varieties began in the 19th century in Europe, and currently, the most productive citrus groves are in regions with tropical and sub-tropical climates, especially Brazil, the United States, Spain, other Mediterranean countries, Mexico, China and South Africa.

Research and experimental studies to improve orange varieties began in the 19th century in Europe, and currently, the most productive citrus groves are in regions with tropical and sub-tropical climates, especially Brazil, the United States, Spain, other Mediterranean countries, Mexico, China and South Africa. There are primarily two types; the sweet orange and mandarin. The "Mandarin orange" or mandarin is a small citrus tree (*Citrus reticulata* Blanco) with fruit resembling the sweet orange (*Citrus sinensis*). However, the fruit is oblate, rather than spherical, and roughly



resembles a pumpkin in shape. Mandarin oranges are sometimes grouped as "loose-skinned oranges" because their skins easily slip off the fruit (Herbst 2001). Their segments also are loose and easily separate.

#### **A) Nutritional aspects and uses**

Oranges are best known for their vitamin C content. One hundred grams of oranges contains 89% of the recommended dietary allowance (RDA) of vitamin C, 4% of vitamin A, 4% of Calcium as well as 1% iron. One hundred grams of oranges also contains 12 grams carbohydrate and 1 gram of protein. However, once cut or squeezed, the vitamin C quickly begins to dissipate, and after only eight hours at room temperature or 24 hours in a refrigerator, there is a 20 percent loss of vitamin C (Herbst 2001). In canned, bottled, or frozen concentrate form, the vitamin C content is greatly decreased (Herbst 2001). Oranges are also a good source of foliate, vitamin B1 and fiber (Bender and Bender 2005).

Generally a use of orange is for Juice and direct consumption on context of Nepal. But other important uses are Orange oil, Blossoms, Tea, Orange Blossoms Honey, Marmalade and Pickle.

Generally mandarin orange is common in context of Nepal. This value chain research concerned with mandarin orange and citrus is used interchangeably for mandarin orange.

#### **B) World trend of orange production**

Current global trend of citrus (Orange) production has shown moderate rise and fall on country wise but experiences steady rise in global trend. But mandarin production has fallen dramatically because of Citrus Greening (This disease is distinguished by the common symptoms of yellowing of the veins and adjacent tissues; followed by yellowing or mottling of the entire leaf; followed by premature defoliation, dieback of twigs, decay of feeder rootlets and lateral roots, and decline in vigor; and followed by, ultimately, the death of the entire plant).

**Table 1: Global Trends of Fresh Orange Production, Supply and Distribution**

**Oranges, Fresh: Production, Supply and Distribution in Selected Countries**  
( 1,000 Metric Tons) -

	2009/10	2010/11	2011/12	2012/13	Jan 2013/14
<b>Production</b>					
Brazil	15,830	22,603	20,482	16,361	17,750
China	6,500	5,900	6,090	7,000	7,600
United States	7,470	9,070	9,166	7,502	6,707
European Union	6,244	6,198	6,023	5,888	6,600
Mexico	4,051	4,000	3,066	4,000	4,900
Egypt	2,401	2,430	2,350	2,450	2,570
Turkey	1,690	1,710	1,650	1,600	1,700
South Africa	1,459	1,478	1,466	1,560	1,500
Morocco	873	904	850	784	1,000
Argentina	770	850	555	550	550
Vietnam	694	730	530	675	675
Australia	380	300	190	435	465
Costa Rica	370	325	370	325	315
Guatemala	132	150	150	150	150
Israel	148	100	118	73	100
Other	181	188	186	191	191
<b>Total</b>	<b>49,151</b>	<b>55,974</b>	<b>53,860</b>	<b>49,544</b>	<b>51,773</b>

Foreign Agriculture Service/USDA Office of Global Analysis, July 2014

### C) Citrus in Nepal

Nepal has wide range of diversity of climate and heavy endowment of natural resources. Nepal announced its hilly region or region which has altitude of 600-2000 is suitable for citrus production and average altitude of 1000-1500 is optimum for the production. It has temperate and subtropical climate which is considered favorable for mandarin oranges. Most of hilly region of Western Development Area is famous for mandarin production. But eastern hilly region like Dhankuta district is named as quality producer of Junar, Sweet orange and mandarin also. Generally most of hilly part of Nepal involve in production of Citrus.

Nepal produced oranges and sweet oranges worth Rs 11.50 billion in fiscal 2010-11, up 2.12 percent year on year. According to the Agriculture Ministry, production of citrus fruits, particularly oranges and sweet oranges, reached 230,173 tonnes.

Based on the current market price of Rs 50 per kg, the output is worth Rs 11.50 billion. According to the ministry's stats, 179,494 tonnes of oranges were produced in the last fiscal year, up from 174,868 tonnes in the previous year.

## Production of Mandarin Oranges Fiscal Year (2011/12)

**Table 2: Production of Mandarin oranges (2011/12)**

Sn	District	Production(Tonnes)
1	Syangja	11,571
2	Lamjung	10,525
3	Salyan	9,883
4	Tanahun	9,258
5	Gorkha	7,220
6	Terhthum	6,933

**Source: National Citrus Development Program, Fruit Development Directorate (Citrus Report 2013)**

Similarly, the production of sweet orange increased marginally to 50,679 tonnes in the last fiscal year from 50,518 tonnes in the previous year. The area where sweet oranges are grown rose 2.94 percent to 4,089 hectares in the last fiscal year. The output of sweet oranges jumped to 50,518 tonnes from 27, 846 tonnes in a decade. Sweet oranges are grown on 4,089 hectares. Sindhuli is the top sweet orange producing district. The district grew 15,258 tonnes of sweet oranges in 2010-11 followed by Ramechhap with 12,151 tonnes and Dhankuta with 2,300 tonnes. According to agro experts, demand for fruits surpasses output. Nepal contains varied climatic conditions suitable for growing fruits, and the area under cultivation is comparatively low.

Currently, the government provides a 75 percent subsidy on saplings of oranges, sweet oranges and other citrus fruits. The government has identified citrus fruits as a high value cash crop. In addition, the productive life of citrus trees is long, and planting them once provides continuous production for a long period which lures

farmers to grow them. According to government stats, the export of orange and sweet orange juice has been growing. China and India are the major market for Nepali juice

The yearly production has statistically constant production. It has not averagely deviated. But status of mandarin oranges the original one has failed to satisfactory status. Some Japanese and Chinese hybrid plant are being imported and produced. These hybrids are stabilizing average production because these have short duration of life and gestation period of production and other citrus varieties as well.

#### **D) Citrus production in Chiti VDC and Economic Characteristics**

It's been more than 5 decades Chiti VDC has been producing mandarin and sweet oranges in different scale. It has optimum altitude and climate for citrus production like 600-1200 meters altitude, subtropical climate with adequate water resources. Some 4-5 decades ago, it was produced for household use and in small scale of 30-100 Kgs per household and consumed. No one believed on orange production could be done on some big scale and generate income. But time changed, some young boys who made their path to capital city Kathmandu leaving their home around 5-6 decades ago returned with idea of agri-business and started to plant mandarin and sweet oranges despite their own family's prohibition.

Now things are different. The concept, agriculture can be commercialized has getting popularity. Technological progress, optimistic access to market, some sort of increasing productivity of cash crops like citrus and continuously decreasing marginal productivity of traditional crops like rice and maize has made rethink and search for alternatives. But condition of citrus is constantly deteriorating due to traditional technology, old marketing chain, and negligence of government bodies, global warming and Citrus Greening. Every ward of VDC was eligible and had significance contribution on total production of district but now situation has changed. Different circumstances specified above has featured in decline and destruction of industry and only ward number 2 is continuously producing.

The current data pattern of citrus production under ward number 2 has been continuously collected by Syaut Orange Producer's Society formed 1 decades ago. According to SOPS following yearly pattern can be derived

**Table 3: Yearly Production Of citrus of Chiti Ward No: 2**

Sn.	Year	Bearing Plants	Production in Kg	Average Price/Kg or Average Income/Kg	Total Income	Remarks
1	2009/10	8300	167700	26.50	4,444,050	
2	2010/11	8500	171,130	28.35	4,851,535	
3	2011/12	8000	157,900	28.75	4,539,625	
4	2012/13	7500	90,350	29.30	2,647,255	Production Falls due to heavy Hailstone
5	2013/14	7000	177,740	30.66	5,448,925	

**Source: Shree Laxmi Narayan Agriculture Cooperatives/Syaut Orange Producer's Society**

**Economic characteristics:** Being agro-industry and cash crop, citrus plantation has no adverse effect and environmental degradation. It has long period of continuous production and generation of income to farmer has significance effect on income distribution and poverty reduction. But continuous production definitely reduces fertility of soil. Generally, it takes 4-5 years to start production after plantation shows the barriers to entry character as per time element. In context of value chain mechanism, market structure of citrus is supply driven and demand pull as well because citrus is highly demanded and there is always short supply. But the balance or interaction between demand and supply is always lacking in term of market clearance such as short supply is unable to raise price and production. This shortcoming has been created because of traditional mechanism of market clearance of one way traffic between market orientation and income distribution. Products are pushed to market but no feedback except revenue of product. But in global context, it follows better value creation on each step and balanced value mechanism. But lack of functioning of value creation and required feedback of market structure lead to failure of price mechanism, income distribution pattern and demand-supply interaction function which is responsible to addressing market components, actors and whole structure at end and ultimately it lead to market failure in terms of income distribution and free flow of economic elements.

## **CHAPTER FIVE**

### **INTERPRETATION OF VALUE CHAIN MECHANISM**

Value chain analysis consists of identification of VC sub-sectors such as operators, support service providers and their relative functions. VC map sketches out the framework of subsectors in VC. Market analysis and economic analysis of VC definitely facilitates to SWOT of VC and strategic intervention units and relative strategies.

#### **5.1 Value Chain Operators, Support Service Provider and Their Functions**

Value chain operators and supporters are active participant of entire value chain map in different level. The success and failure of a value chain intervention depend principally on partnerships that are built between actors and support providers that participate in a particular chain (Lundy Et Al, 2004), so any further investigation and construction of value chain requires detail identification of and interaction between active operator and supporters of chain. In context of Chiti VDC the principal players are farmers who perform all function of production and harvesting, contractors who make formal/informal contracts or agreement and purchase at specified price, make delivery to wholesaler another chain operator like Kalimati Fruit and Vegetable market where products are sorted, graded and repackaged and finally sold to processors, retailers and even final consumption. Retailers or small fruit shoppers, mobile shoppers on rickshaw and bicycle deliver to final consumption. Processors further process products like juice, pickle and other finished products. Exporters are another chain operator who exports products and other processed products and importers of production is also one of operator of chain.

In context of Chiti VDC there are four main operators like Farmers, Contractors, Wholesales chain and Retailers are currently operating.

#### **A. Operators**

##### **i. Input suppliers and Their Functions**

Basically in rural production scale, factor inputs are owned by producer oneself like cultivated Lands, Labors, even capitals machineries, seeds plant production and

finally management. But some support service provider like Government, Cooperatives and other INGOs and NGOs, financial institution are active input suppliers in some sort of level.

### ***Unorganized labor input supply***

In context of this area under study, unorganized labor supply is basic feature of labor market. Without uniformity of cost and capacity, unskilled and locally availability are some other basic features of market. Most of the labor supply is organized and conducted by producer oneself with no specialization.

### ***Planting Material, Fertilizers, Herbicides and Machinery***

Citrus plants are generally produced in farmland owned by producer themselves. With the cooperation of District Agriculture Development Office and PACT, Laxmi Narayan Agricultural Cooperatives has constructed two screened houses for regular supply of plantation. More than 75% of fertilizers, herbicides and machinery supply are managed by producers from Kathmandu and other local market. Since three years PACT and DADO has been subsidizing study area for fertilization, insecticide and pesticide with machinery supply.

Organic and other compost fertilizer are produced locally by other agro sectors like Animal Husbandry sector like goat, cow sheep buffalo etc. Most of fertilizer supply has covered by organic and compost fertilizer locally produced. Other chemical fertilizer like DAP, UREA, POTASSIUM and other Multivitamins are imported from India by private business sectors and government with other Fungicides, Insecticides, and other required chemicals as well.

### ***Technical information, Advice and Assistance***

There is very limited facility of technical information and advice. DADO occasionally provides some training and demonstrations like post harvest handling and uses of multi nutrients and fungicides. But not enough assistance is available. Ministry of Agriculture Development and Fruit Development Directorate has launched program named Citrus Development Project in Chiti VDC and distributed fertilizer and micronutrient to this area equivalent to 1.3 million NRs on current fiscal

year 2013/14. And with collaboration of MOAD and National Citrus Development Program, Kirtipur has conducted training program for citrus farmer about using fungicide and other micronutrients and promised to continue the program. MoAD has implemented Orange Garden Reforms Program to all districts of Eastern Development Region scoping toward mostly affected area due to citrus greening and other malnutrition.

## ii. Citrus Grower/Producer and Their Functions

The primary and most valued actor of value chain are citrus producer/grower. Citrus producer can be grouped under two categories; one is subsistence producer who generally has less than 50 bearing citrus trees and another is commercial producer who has more than 50 bearing trees on their farmland. The study area, Chiti VDC ward number 2 has 55 hectares covered by citrus farming with around 7000 matured citrus plants among 9000 citrus plants belonging to 80 household. Every head of 80 household are member of Syaut Orange Producer's Society and Shree Laxmi Narayan Agricultural Cooperatives situated on same ward. Around 50% of cultivated land has been covered by citrus and rest of other are devoted to other crops like rice, maize and other citrus fruits and vegetables. But major part of income generation is governed by citrus in term of monetary value.

The average no of trees per household has been found to be 87.5 matured or bearing trees. 40 households have 50 or less than bearing trees. Other 20 farmers have 51 to 100 trees and other 16 has 101 to 200. Among remaining 3 household has more than 200-300 bearing trees including one of them has more than 400 bearing trees

**Figure 3: Number of bearing trees per Household**

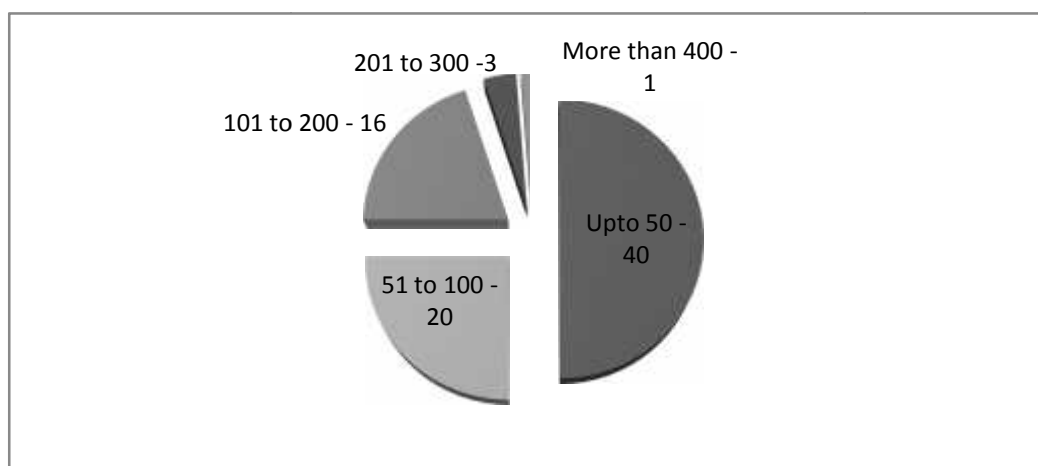




Figure reveals that small and subsistence farmer/producer has dominated citrus farming in the ward number 2. All producers who produce small or big scale both are inseparable part of value chain mechanism and have to perform certain and important functions which are described as follows.

### ***Land preparation for planting***

Generally farmers prepare land according to land terrain, farm size and other resources. It is recommended that there must be at least 10 meters gap between two plants. After digging pit of 3 are generally left 3-4 days at direct exposure of sunlight. But farmer rarely follow these and most of plantation are done at 5 meter gap.

### ***Planting Material***

Seedling is rarely used because it takes long time to be capable for full-fledged production. Two screen houses supply plants regular basis. These houses and farmers themselves use Budding/Grafting method instead of seedling. Citrus Budding/Grafting is any method which surgically connects a part of one plant to a part of another plant; the two then grow together to become a single plant. The top part, which will produce the branches, leaves, flowers, and fruit, the lower portion, which produces the root system and the very bottom part of the trunk, is known as the rootstock. Small piece of orange plant is used for upper part and plant of Trifoliate (Chinese bitter orange which is recognizable by the large 3–5 cm thorns on the shoots). Another mostly used method is Branch Rooting. For Branch Rooting, first of all branch of 1-3 cm diameter of healthy matured tree is selected and peeled off the band of branch near the node. Required hormone is spread and fertilized soil and moss is used to cover peeled area for 2-3 month. After 2-3 month branch produces roots on that area and is ready to cut off from parent tree to be planted on field. It is done before 2 month of monsoon and plantation of branch rooted and grafted/budded plants are taken place at monsoon period. Branch rooted and Grafted/Budded plants generally start production in very next year or 2<sup>nd</sup> year of plantation.

### ***Intercropping***

Intercropping is useful and has been another part of agro production on vacant area of citrus farm. But after trees become fruit bearing then it is not recommended for

intercropping. Farmers are continuously intercropping even after bearing trees. That definitely produces income to farmer but also has worsened the condition of citrus. Maize, Ginger, Finger Millet, Mustard and other vegetables are common for intercropping but seasonal. Intercropping generates around 20-30% of income in compare to Citrus.

### ***Application of Fertilizers, Micronutrient and other Chemical supplies***

Being rural area and application of traditional farming techniques, fertilization is composed of compost fertilizer generally made on own farm manure/animal manure and purchased from goat and other animal farms. These local bionic/organic fertilizers make more than 60% of total application of fertilizer. Now situation has been changed because of global environment, increased scale of production and intensive farming. Nitrogen secures bigger portion on chemical fertilizer supply as UREA and DAP. Potassium is least uses because of soil characteristics of Hilly region which does not need much potassium supply. After identifying needs of micronutrients like Zinc, Copper, Manganese, Iron, Boron and Molybdenum are being sprayed twice in a year. For protection for trees, Bordeaux Mixture (mixture of Cupper Sulfate and Agriculture Lime) the most needed fungicide for citrus plant is usually painted after harvesting. These chemical fertilizations, micronutrients and other supplies are subsidies amounts 1.3 million Rs for current fiscal year with the collaboration of MOAD and Citrus Crop Development Project via Citrus Farm Reform Plan. The expenditure on this head generally accounts 20-25% of income generation. Production of this area is still facing drastic deficiency because of lack of micronutrient and malnutrition.

### ***Irrigation***

Irrigation is major problem of this area. At least 75% of citrus farm faces shortage of irrigation. Bhirkuna Drinking Water Project which is currently supplying drinking water and irrigation purpose as well but this supply is not sufficient. Now, two major reservoirs with capacity of 47000ltrs and 50000ltrs for irrigation purpose have been built and will be in operation by end of current year.

### ***Plant protection measures***

In citrus family orange has the weakest immunity power among other plants. Citrus greening, Root and Trunk Dumping, Fungal diseases and diseases caused by malnutrition are very common. Citrus greening is incurable right now and very difficult to diagnose also. Production has fallen significantly due to citrus greening. Cutting and pruning of damaged branches, removable of highly infected trees, spraying fungicides and painting trunk and branches with Bordeaux mixture are very common.

### ***Harvesting of fruits***

Mandarin oranges are usually harvested from November to January. For optimum time for harvest is December month. Harvesting is done completely traditional way. Bare hands are used to pick fruits by pulling directly using bamboo ladders. No other cutting tools like fruit scissor are used but some contractor's uses scissor to pick high quality fruits with leafs to make attractive packaging. All harvested products are transported quickly to market place because of lack of store houses and cold stores. Some years ago fruits are directly loaded to trucks and trailers for transportation and due to poor post harvest handling wastages were very high. Now, plastic fruit cases are used before loading to vehicle that has reduced wastages and become helpful to keep quality constant from harvesting point to market places.

Mrs. Bhagawati Panta (Local Citrus Owner)

Box No: 1

Chiti VDC Ward No: 2 (Interviewed on 25th July 2014)

My husband Deergha Moorti Panta started planting small orange plant in 2030 BS after returning from Kathmandu having B.Sc. degree intending to commercialize and revolutionize farming. We have total 5 Ropani land where paddy had been planted and other 7 ropani land that had no irrigation facility so maize, finger millet and other grass could be grown. So he selected that 5 ropani land and planted around 350 plants which he had brought from Kathmandu distributed by Orange Crop Development Program, Kirtipur and some neighboring VDC like Dhimire and Bhotewadar where orange production was started in small scale. There was heavy resistance even our family and villagers calling him as insane person who had destroyed own farm land and misguiding youths to do same. But after 3, 4 years oranges started to bear fruits and generate 3times more income than other crops on same equivalent land that attracted other villagers to orange farming. Then, we also increased area of farming with other villagers. In 5-10 years there is more than 10000 new planting in same ward and other wards as well. Despite proper irrigation facility and other technical knowledge ward no 2 secured first Pocket Area announced by District Agricultural Development Office. Now, situation has changed.. Chiti VDC has lost more than 20000 bearing trees because of malnutrition, lack of technical knowledge, lack of irrigation and other diseases in last 10-15 years duration. Citrus greening is main cause of continuous destruction. We are not given any cooperation from government. We are always underpaid by local and outside contractors. There is always friction between local and outside contractors which led us to lose money, fraudulent and finally we have to accept lower price than prevailing one. We are facing continuous shortage of bionic fertilizers and chemical as well. We do not have enough market access. But now some government offices has given some technical cooperation and aids as fertilizers, tools and other supplies but are not sufficient to protect the industry. If same kind of decrement continues, these green citrus trees will be available in photos only in some 7, 8 years after.

### ***Transportation***

More than 80% of productions of area are sold to contractors. Contractors usually make seasonal visit and informal contracts to the farmers. Only few farmers supply product to fruit depot but syndicate on depot always disappoints farmer for direct approach to depot because of corrupt mentality and exercise of depot owner. Contractors usually make harvesting and transporting products to depot and other processors by paying monopoly price to products due to market imperfections. Lack of cold stores, farmer are compel to sell their product to contractors and perishable characteristic and time bound to harvest in time are another factor which creates monopsony.

### **iii. Intermediaries/ Contractors**

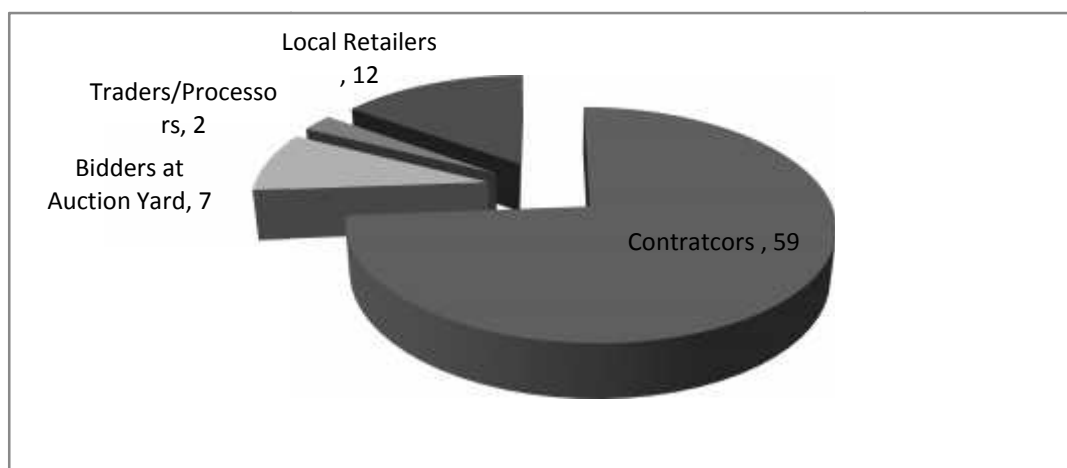
Generally farmer lacks of critical post harvest knowledge, technology and infrastructure. That's why they prefer to sell fruit per garden basis and per tree basis to local and outside contractors. Some farmers sell or make contract even far before harvesting season no matter, whether price is above or below market price.

Contractors play very important role in bridging the link between growers/farmers to traders. Farmers/Producers lacks adequate access to market, they are unable to sell their products to traders who are concentrated in towns. There is lack of well road facility to make safe transport of product. Some years ago, there were no roadways and farmers and even contractors were to compel to use human labor to the place where roadways connected. There was high degree of wastages while carrying by peoples. Even today farmer are not confident about political, physical and market circumstances to sell their product directly consumer and trader by delivering to trader's depot. That's why contractors function serves to these traders who do not have enough time to collect products from scattered and small producers and producers who do not have enough access to market place as well. Contractors usually make contracts to farmers even before fruit harvest and make payment to farmers certain amount in advance and that makes farmer some shy of relief from pest infestation, weather, road blockages and other political circumstances. Farmers can avoid harvesting and post harvest handlings activities but generally contractors offer much lower price to producers than farmer themselves would have fetched at

harvest time and made delivery to traders. By this way contractors make profit by their risk bearing capacity and sometimes incur losses due to political, climatic and market circumstances.

During the survey, among the 80 respondent 59 has sold to contractors, 2 to trader of Kalimati Fruit and Vegetable center Kathmandu by transporting themselves, 7 approaches to bidders of auction yard directly and rest 12 to local retailers.

**Figure 4: Supply Pattern of Produced Citrus**



Mr. Dhurva Shali Panta (Local Contractor)

Box No: 2

Chiti VDC Ward No: 2 (Interviewed on 1 August 2014)

I am school teacher and farmer with more than 150 bearing trees. Usually I sell my product myself in auction yard of Kathmandu. Since 15 years I have been reselling in same auction yard and directly other resellers. As a farmer I am facing continuous decrement on production due to Citrus Greening and other global natural degradation. But as a contractor, we also face several obstacles when harvesting and transporting. Not less than 5% of product always is being destroyed at time of harvesting due to lack of sophisticated tools and techniques. Unskilled manpower and transporting by human labor also make reduction on quality. While transporting most of roads are not in good condition, theft and road blockages due to weather and political reasons are another obstacles we usually face. At auction yard we have to face unhealthy exercise of yard owners. We always fail to sell our products at prevailing price because of inner setting of local customer and yard owner. They create artificial circumstance of oversupply, compel us to sell in lower prices to yard owner and immediately they resell to local distributor and retailers on prevailing price. If we try to sell to these distributor and retailer, they always refuse to purchase from us. These exercises are common in auction yard of Kalimati Fruit and Vegetable center and Balkhu Fruit Market as well.

Mr. Bishwanath (Outside contractor)

Birgung (Interviewed on 24 November 2013)

I often visit several production areas at harvesting seasons of fruit harvesting like Mangos, Apples, Grapes and Orange. I even travel to India for fruit importing. It has been very difficult to make purchases from farmers because I am not local. We outsiders usually pay more price than local ones and have to pay immediately. In spite of some known fraud by local farmers, labors and other we are compel to tolerate. Some outsider has made fraud to farmers so, they do not have enough confident over us and that situation made situation of undue advantages to local contractors. In auction yard, we always face unhealthy competition like monopsony by yard owner. They are just platform provider literally but they always take advantages of being local and having powerful market influence. There are some good platform provider also but most of time we get underpayment.

So it can be concluded that most of the respondent prefer selling to contractors. There is high percentage around 85% of selling goes to local and outside contractors. Others are not so significant in terms of monetary value. Farmers who have bigger bearing trees usually prefer to sell to contractors and smaller growers who has less than 20 bearing trees always sell local consumer and local retailers.

#### **iv. Traders on Auction Yard/ Depot**

Oranges produced in the area usually transported to Kathmandu. More than 90% products are sold to market of Kathmandu via Kalimati Fruit and Vegetable Market and Balkhu Fruit Market. Nowadays harvested oranges are packed on plastic crates and transported to auction yard. One plastic crate with oranges usually weights 20-23 Kgs. The demand/supply mechanism has most important role in auction yard. Supply side are lead by contractors who demonstrate their crates in open are of yard and purchaser like retailers, processers( Hotels and Restaurant, Juice and Pickle producer etc) and mobile small traders who sell on cycle and carts visiting different location gather and negotiate to fix price and quantity. Auction yard owners usually perform as platform provider and take certain commission for that function. They do not actively participate in price mechanism. But in reality they inefficiently control market variables and take undue advantages. They purchase themselves from contractors in lower price and selling that higher to other purchasers. They artificially make oversupply situation creating undue hurdle and influences in entry of purchasers and creates shortages on supply. These kind of unhealthy activities are usual in Kalimati Fruit and Vegetable Market and Balkhu Fruit Market as well.

#### **v. Retailers/Processers/ Exporters /Local Fruit Vendors**

Purchaser on auction yard contains around 50% are those who sell the products roaming different places caring the products on their carts and bicycles. They sell directly to final consumers and some processers and small fruit shops also. Most of their selling do not follow similar price but get fixed on negotiation basis. Most of them are door to door salesman. Other purchasers are processer like juice makers, hotel, restaurants and etc. Local fruit vendors/ shoppers are another important part. They usually sell directly to consumers via their shops/ supermarkets and other

supply stations. Exporters have not significant part because very lower or even insignificance purchasing for exporters are taken places on auction yard.

#### **vi. Final Consumers**

Final Consumer is at end of operating chain. In case of this chain, final consumer consists of local purchasers in production localities, domestic consumers at towns who purchase from local fruit vendors and processors. This chain does not have significant international market statistically. Final consumption consist of row fruit consumption which has major portion and processed one such as juice, pickle etc.

### **B. Support Service Providers**

On the environment part of mechanism which shape, intervene the chain are support service sector or subsectors. These subsectors are not active participant but have definite and significant impact and intervention to shape the chain. These are some subsectors or support service providers in studied area which are most responsible to construction of chain.

#### **i. Syaut Orange Producer's Society (SOPS)**

Identifying common needs and group collaboration to tackle obstacles of production, marketing and post marketing level, it was formed in 2057 BS which was quite informal grouping of all citrus grower of studied area. SOPS has given platform to Shree Laxmi Narayan Agricultural Cooperative (SLNACO) which has recently been formed under cooperative acts. After forming SLNACO it has very limited function. Before that it was responsible for bulk purchasing of fertilizers and other chemical supplies, conducting training programs and authorized connection to government organizations and NGOs.

#### **ii. Shree Laxmi Narayan Agricultural Cooperatives (SLNACO)**

SLNACO has been formed recently. It has objectives of promoting agriculture on this region esp. for citrus farming, cereal and vegetable production with cattle farming. Currently, it has given more and more focused on citrus farming but has started to engage on other agricultural activities. SLNACO has been supplying all required chemical fertilizers in low price, conducting training about using these fertilizer and

other harvesting techniques, managing subsidies granted by Government and NG organizations and other cooperative activities. It has recently distributed chemical fertilizer equivalent to Rs 1.3 Millions which has been granted by National Citrus Development Program through Orange Garden Reform Project. Three reservoirs, each has capacity of 50000 Ltrs is being constructed by SLNACO with collaboration with Bhirkuna Drinking Water Project, Thotnekhola Drinking Water Project and Chisapani Drinking Water Project which are currently supplying Drinking water to whole Chiti VDC. It has recently conducted training program with help of PACT and DADO for using insecticide, pest controlling and other use of fungicides. Construction of cold storage house has been under discussion for oranges to supply unseasonal supply which will increase income generation.

Mr. Ramesh Raj Panta

Box No: 3

President, SLNACO Chiti Ward No: 2 (interviewed on 10<sup>th</sup> August 2014)

I am also citrus grower and facing same consequences as other do. We understood a term collective effort too late. We started citrus farming since long time but couldn't understand the commercial nature of cultivation. We have missed a lot of opportunities which are essential to develop citrus. We formed Syaut Orange Producer's Society but it didn't function as satisfactorily as required. Farmers were not interested in collective effort because we couldn't understand what collective effort is. Right now most of orchards have been destroyed. Lack of multi vitamins, micronutrients, right combination of fertilizers and other antiseptic like fungicides and pesticides are main reason of orchard destructions. We were unable to diagnose many diseases evolved from malnourishment and other abiotic and genetic disorders. Now we understand the nature and specification of those diseases but it is too late to cure them. Now we have to save all remaining orchards for that SOPS has been changed to form SLNACO. We have new threat of Citrus Greening. The symptoms of citrus greening and other due to lack of required micronutrients such as zinc, copper, manganese, magnesium, molybdenum and iron follows same consequences and it is very difficult to distinguish between them. We are cutting trees in fear of citrus greening whereas that may be lack of micronutrient. We do not have sophisticated labs to indentify but we are continuously trying to overcome these limitations through collective effort. SLNACO is on move for citrus orchard reform and development. Supplying quality fertilizers and other inputs/required services, diagnosis of diseases, market development and development of collective bargaining are most essential function muse be accomplished as soon as possible. SLNACO has decided to construct cold storage and collection center for off seasonal advantages. It has collaborated with Birkhuna Drinking Water Project, Chisapani Drinking Water Project and Thotnekhola Drinking Water Project and decided to constructs three reservoirs with capacity of 50000 Ltrs each to facilitate irrigation for all citrus orchards. Training program about plantation, caring, using fertilizer and other chemicals, harvesting and post harvest handling for growers are regularly conducted with help of various organization. Despite small amount, SLNACO provides small quick loans to growers to facilitate. 2 screen houses is currently producing 5000 new mandarin plants grafted with trifoliolate and Japanese and Chinese oranges which have quick harvesting period. We are promoting these Chinese and Japanese oranges also to reform orange orchards.

### **iii. District Agriculture Development Office (DADO)**

DADO Lamjung is government effort to promote agricultural development in the district. It has announced the study area as most prominent Pocket Area among 11 pocket area of Lamjung for citrus production. Though DADO has not paid adequate



concern for citrus production, it has been rewarding farmers, conducting training on small scale, visiting those areas and other medium to connect those organization whose priority to invest on agricultural development through government agencies.

#### iv. Local Financial Entities

Agriculture Development Bank (ADB), Nepal Bank Limited (NBL) and Nepal Banijya Bank (NBB) are main financial institution to provide loan facilities. Other private banks and financial institution are also working in district level. ABD has granted more loan than any other under citrus farming. But these banks have very low loan facility and grant for long term projects like concerned farming. Only small vegetable farming has been granted small scale loan. Statistically they are completely negligible to grant on long term loan to these citrus farming. Among 80 respondents 5 household has been granted more than Rs 500,000 for long term. Others are not more than 100,000. Overall financial institutions of district has not adequate confident and policy to invest on long tern agriculture.

Mr. Milan Ghimire,

Box no: 4

Loan Officer (ADB Beshihahar, Lamjung) Interviewed on 21 April 2014

We have very little investment on citrus farming on these areas because of long gestation periods of projects. District Land Revenue Office has evaluated very low value of land under cultivation. It has ignored the value addition to land due to plantation. So, in studied area has value of 35000 Rs per Ropani which is quite low to be accepted as security/ collateral for granting long term and heavy loan. We have been trying to improve to portfolio toward agriculture but we have to follow certain procedures. But ADB has done much compared to other institutions.

Mr. Shantosh Neupane

Branch Manager (NBL Beshishahar, Lamjung) interviewed on 21 April 2014

We have granted agricultural loan to poultry farming and vegetable farming because they generate income on same year. But other horticultural farming has long gestation period and more than 5 million loan amount can be granted with permission of head office. Low valuation of land by Land Revenue office and weaker collateral are main reason to be hesitated to grant long term loan. NBL has launched low interest loan for agriculture such as 11% PA and we are granting to develop in field of agricultural commercialization. As you said we have to accept that we do not have higher portfolio on loan concerned to citrus farming. And another issue is to maintaining appropriate account. Loan applicants are unaware of keeping accurate Balance Sheet, Income Statement as per projected one. These are technical issues of low investment criteria.

Q: Do you think the current investment strategy of financial institutions of Lamjung toward citrus is really helping citrus production as they claimed? Total No: respondent: 80

77: No

0: Yes

3: Can't say

#### **v. Project for Agriculture commercialization and Trade (PACT)**

Since 2009, PACT has been functioning under Ministry of Agriculture Development (MoAD). It will continue till 2015. It has shown considerable interest on citrus farming of Eastern Development Region. It has granted Rs 300,000 for Citrus Garden Reform Project to SLNACO and subsidized for construction of 2 screen house on this ward for new plants production in fiscal year 2012/13. In current fiscal year of 2013/14 it has subsidized this area with micronutrient supply of Rs 1.3 million through SLNACO and Citrus Development Plan (CDP).

#### **vi. Ministry of Agriculture Development (MoAD)**

MoAD has launches several programs to support, develop and sustain agriculture sectors across the nation. PACT has done considerable job on commercialization of agribusiness, value chain development and sustainability of overall agriculture sectors. CDP and OGRP are important plans which are dedicated to citrus crop development. Since it is supreme responsible entity of agriculture development activities conducted by government it has very important role on value chain support on every level such as input supply to final consumption.

#### **vii. National Citrus Development Program (NCDP)**

MoAD has launched National Citrus development Program and Citrus Development Center located at kirtipur, Kathmandu through Fruit Development Directorate. NCDP has launched Citrus Garden Reform Program in 7 district of Eastern Development Region including Lamjung. It has primary objective of control of Citrus Greening disease which is major reason of continuous decline on citrus production. Citrus Development Center has provided seed of Trifoliolate which is usually used for grafting process to SLNACO.

These are some support sector which make outer environment of value chain. Sometime these organizations' function plays interventionist role on shaping of chain mechanism. Effort of these government entities are powerful enough to influence market structure to correct misguidance of mechanism, tracking growth forces and creating facilities for commercialization of agribusiness environment. These functions help to create healthy and competitive environment to single market forces to

function properly in course of value chain. Other financial entities can provide smooth and cheap funding to create higher value on each level of chain. Outside environment has important role on every mechanism like value chain as well.

#### **vii. Kalimati Fruit and Vegetable Market Development Board (KFVMDB)**

KFVMDB has provided Auction yard for fruit where not less than 80% fruit produced are sold. The fruit and vegetable market of Kalimati Kathmandu is major market place for citrus in Nepal. It has facilitated marketing of fruits and vegetables through developing satellite market and collection centers. It has objectives of establishment of market standards and other price regulations.

### **5.2 Citrus Value Chain Map, Market and Economic Analysis**

#### **A) Value chain**

A value chain is series or sequence of concerned business activities or functions performed by different actors from provision of specific input to particular product for primary production to processing, distribution, sales, final consumption and feedback mechanism as well. It is a kind of organizational arrangements connecting and coordinating producers, processors, distributors and other actors who perform these activities. It's called production chain and market chain as well.

The participants of citrus value chain in context of area as follows

a) Agro input suppliers/ Nursery. b) Citrus Growers. c) Contractors. d) Bidders/ Processors at Depot/ Auction Yard. e) Retailers d. Final Consumers.

#### **B) Value Chain Map**

Value chain map is visual representation of chain which includes various linkages among the citrus growers, input providers, transporters, contractors and traders with support service providers. It depicts the entire flow of citrus fruits in the market, activities carried out on each stage and the structure of actors and supporters in adding values. This map has three major components, A) VC Function on the different levels, B) VC operators of different levels, C) Support Service Providers on

different level. Operators and service providers can be clearly distinguished in the map on different level of value chain.

The fundamental function of whole chain is completed by Operators and can be classified following categories.

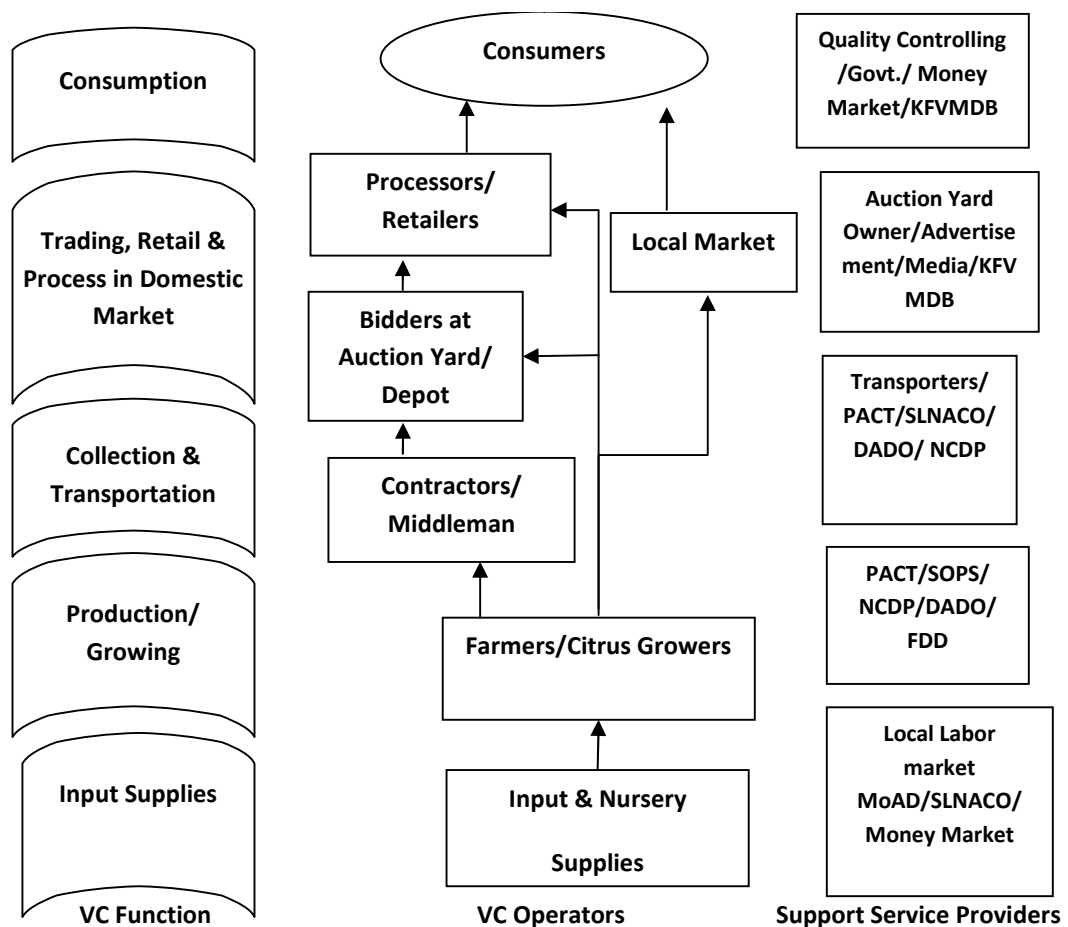
**Production:** The actors who directly connected with agricultural production including pre cultivation, cultivation and extractive or harvesting activities

**Post harvest handling and processing:** Actors whose works are post harvest handling (cleaning, sorting grading, packaging and transporting) and processing of basic goods to value added ones.

**Trading:** Actors having functions are related to buying and selling of the products.

They are owners of flowing products in different levels or products passes with them as Raw inputs, Semi-finished and Finished one.

Figure 5 : Value Chain Map of Citrus industry of Chiti VDC Ward No: 2



The Organization, Associations, Groups and other institutions who has interest on functioning of operators and create the environment, provides supports to them are VC supporters. They remain outside of VC but have significant impacts through operators. They can intervene the chain activities, correct the functions and smoothing flow of actions by providing different kind of services in different levels.

As depicted in map, there are some VC operators who can operate on different level. They perform many functions on VC as integrated VC operators such as Growers can arrange farms inputs, labors, seedlings, produce, harvest, transporting to auction yard or depot and sell the product. It means one operator perform different function on different level oneself.

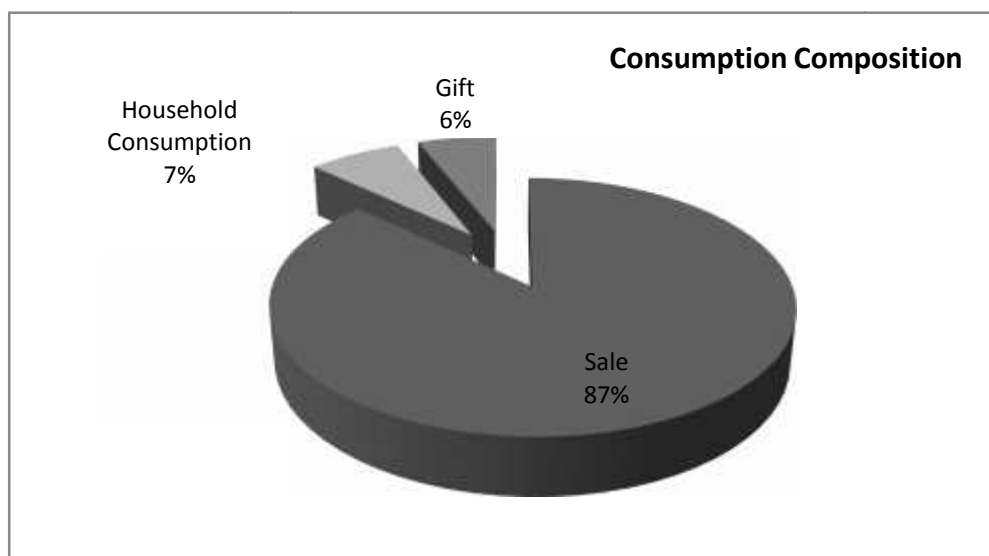
## **C) Market Analysis**

### **i. Market Structure**

Although market is sufficiently adequate for citrus producers are not able to take advantages over it because inefficient functioning of actors and insufficient market information system. Lack of export market, products end journey to national consumption. Although Nepal has export market for citrus but in context of study area, it lacks. That's why only domestic market is taken into consideration.

Citrus rules the fruit market in seasonal basis. it is taken as best fruit for health consideration. In spite of higher supply at harvesting season, demand also rise as supply rise and that lead to slight deviation on price only. Chiti VDC Ward number 2 does not have cold storage facility so, it sells all its products at harvesting season. In context of consumption composition 87% of production goes to market for sell, 7% of household consumption and remaining 6% for gift as per data provided by respondent.

**Figure 6: Composition of consumption**



## **ii. Marketing channels**

Marketing channels are those paths from which products pass through from producers to consumers. It describes the whole functions of individual and firms involved in producing to consumers table. In this context it consists of all process of making fruits or value added fruits available for consumption.

There are four important channels derived from above figure of VC.

### ***Channel A***

This is simplest channel where producer/grower/ farmer themselves sell their products to local market or supply to local retailers. During study it is found that small grower who has less than 10 bearing trees follows this channel. Some other big farmers also follows same channel but not significantly effective to disrupts other channels. In this channel fruits are sold as per piece basis. In fiscal year 2013/14 price per piece was Rs 3 per piece at start of October but at the end of January it rose to Rs 5. Approximately 12 household has sold approximately 9600 Kg of fruits at Rs 35/Kg. On average 1Kg orange consist of 8-12 pieces as per their sizes. Net income generation through this channel was Rs 336,000.

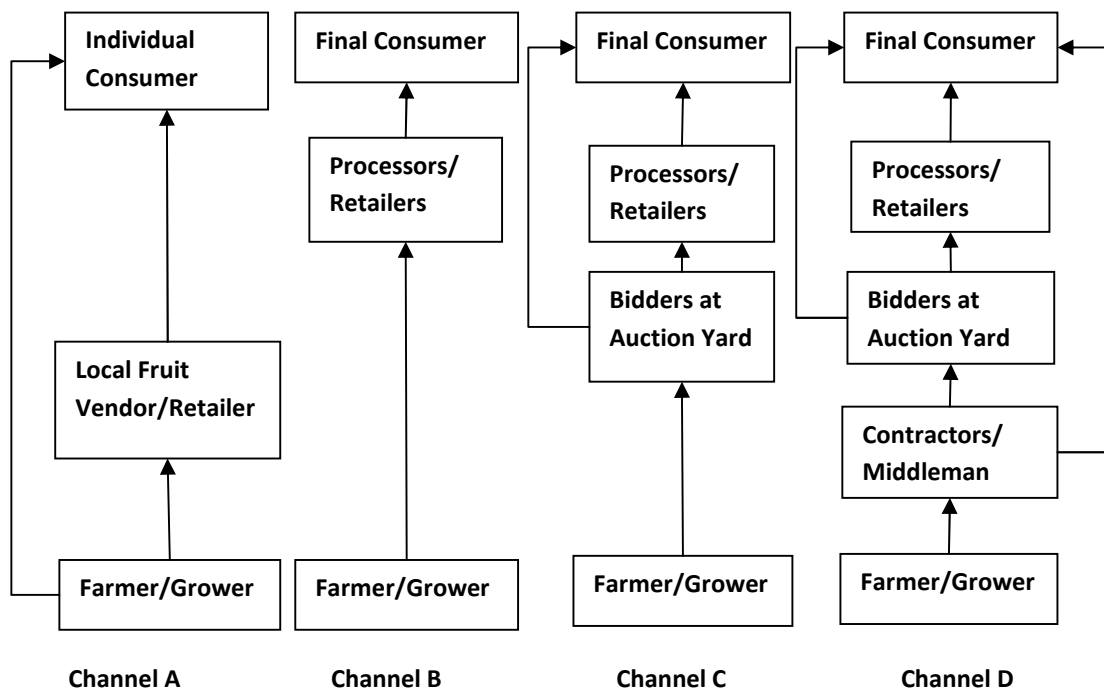
### ***Channel B***

In this channel producer/grower generally sell their products to processors or retailers after transporting to towns like Kathmandu, Narayangarh, Hetauda and other small towns. The buyers are generally juice makers, hotels & restaurants, resorts. In study it is found that two households sold 3680 Kg oranges at Rs 45/Kg in 2013/14. They harvested and transported products on their own cost to Kathmandu. This channel is least used for selling. Gross income generation via this channel was Rs 165,600. They incurred cost of harvesting and transportation was Rs. 25,000. Then Net income was Rs 140,000.

### ***Channel C***

In this channel producer/growers harvest and transport their products to auction yard and sell to the bidders and even to yard owners. These bidders and yard owners resell to retailers, local fruit vendors and processors. This is second most used channel by citrus growers of the area. 7 respondents followed this channel. Three of them harvested, transported to auction yard of Kalimati Fruits and Vegetables Market and rest to Balkhu Fruit Market. They have to pay certain amount 4-5% of sold amount to yard owners as their commission for providing auction yard. It is most inefficient channel because of crookedness of yard owner and their monopoly control on demand and price. In year of 2013/14 12,320 Kg fruits are sold through this channel. On average they were able to mark Rs 43/Kg (As invoices provided by these respondents to SOPS and SLNACO). Total Gross income generated through this channel was exactly Rs. 529,760. Cost of harvesting, transportation and commission of yard was 63,000. The Net income was Rs. 466,760.

Figure 7: Marketing Channels



**Channel D**

The most used and very common channel is Citrus growers sell their products to contractors and middleman who harvest and transports fruits to auction yard then rest of channel follows as channel c. some growers sell their fruits production even before ripening such as at month of September. They enter into the contracts to contractors/middlemen taking some advance. These contractors harvest the products as suitable time for them but they provide price as per current price of that time. Most of the growers follow this channel. 59 respondents out of 80 sold their products to contractors and paid according to current market price of contracting time. In 2013/14, Approximately 152,140 Kgs were sold through this channel. According to data provided by 59 respondent total incomes generated through this transaction Rs 4,526,165 with average price of 29.75 per Kg



## Quantity passes and Net Income generation through channels

Figure 8: Quantity passed through different Marketing Channels in Kgs (2013)

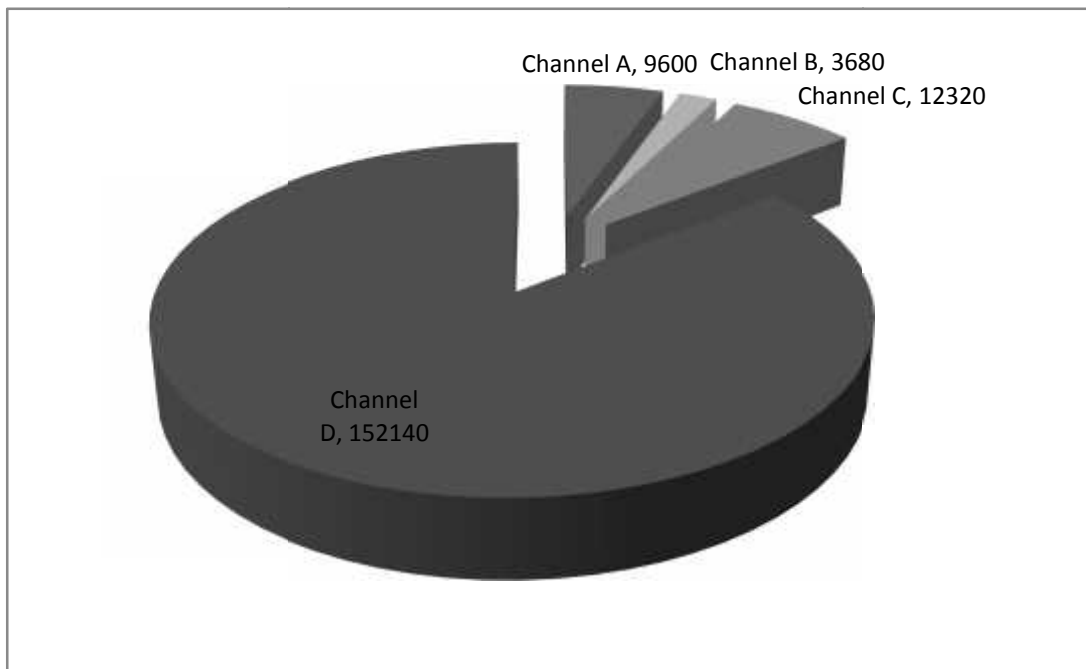
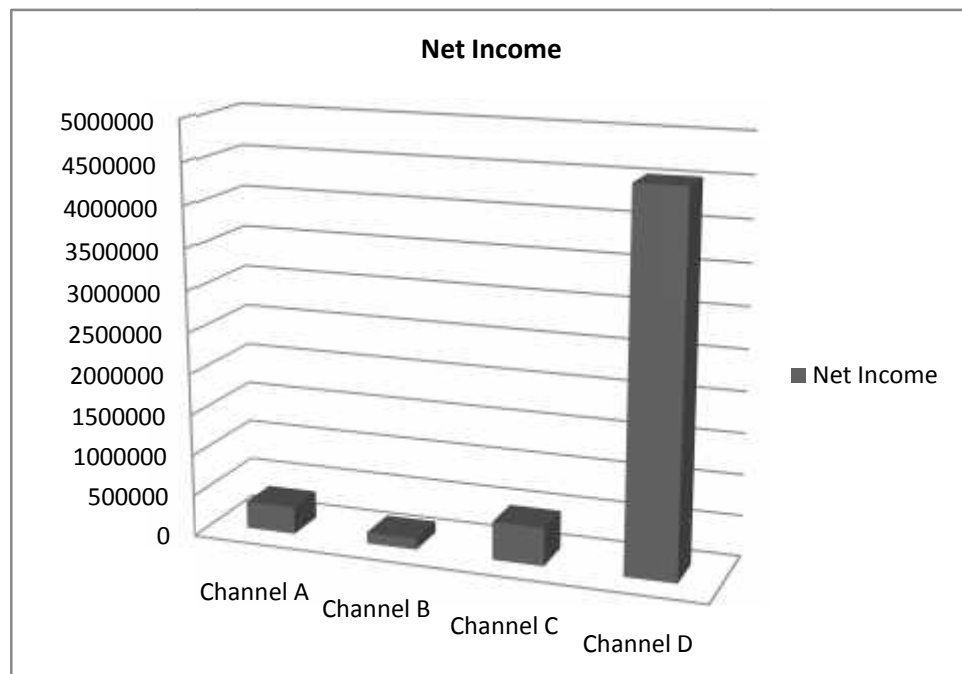


Figure 9: Net Income Generated through Different Channels (2013)



## D) Economic Analysis

### i. Price Dynamics

Price of orange differs with type of markets, types of oranges, harvesting times and other arrangements. In local market or through Channel A, growers generally sell oranges on per piece basis. In peak harvesting season the price was Rs 3 per piece on average. Prices depend on colors and sizes. In this channel, purchasers choose any bearing tree and they have to pick all pieces of that chosen no matter small or large and price is Rs 3. One person can carry 400-600 pieces with their bamboo basket.

In auction yard price varies greatly depending upon demand and supply with weather, political and other factor. Demand/Supply and weather is most intriguing factor on price fixation. Fruits are carried in plastic crates which contains 20-23 Kg net. One Kg of orange comprises 7 pieces if they are big, 13 medium sized and 23-25 small sized. In 2013 big sized oranges scored Rs 60 per Kg, medium was Rs 42 per Kg and Rs 15-23 for small ones. If weather deteriorates then prices falls dramatically.

Most growers or orchard owners sell their fruits to contractors on a per tree basis before harvest. Orchard owner/ farmer and contractors estimate about fruit production and sit on bargaining for final settlement of price of whole garden in agreement with date of harvesting and payment method. After deal, some amount is paid in advanced and other remaining agreed amount is paid in installment after harvesting and selling of fruits. The price of fruit depends upon size, quality and color of fruit itself. The orchards which are close to roadways get higher price and vice versa. These pricing mechanisms have been in practice for many years.

Farmers/growers have different opinions about pricing and contractors as well. Most of farmers are not satisfied with pricing and think that whoever outside or local both contractors cheat them by giving lower price. But after calculating uncertainty such as risks in harvesting, transportation and selling they are now satisfied with contractual system and pricing via this because they can stay relief after agreement from uncertainties.

Q: Are you satisfied with the price that you recently got for your products?

57: No

13: Yes

10: Can't Say

## ii. Cost of production

Cost of production varies places to places, farmers to farmers depending upon soil type, knowledge of cultivation, weather etc. But in this context, the study area in small and the production is concentrated with approximately similar soil type and irrigation facility.

According to respondents, average output per tree is 80 Kg. some big one has scored 200 Kg and small one such as trees of 3-4 years generally produces 30-40 kg or less. This year 2013 production was average and slightly satisfactory then previous years of productions

Generally, one mature tree is able to produce 7-10 plastic crates which contains 19-23 kg net each where as small one are able to make 1-3 crates. On averaging production data of single tree is 80 Kg provides by respondent and observation. Then estimated average cost of production of 100 kg on the basis of survey based on information provided by respondents and observation and its breakdown is as follows

**Table 4: Cost of Production per 100 Kg (2013)**

Sn.	Cost Component	Cost* Rs/100 Kg	Remarks
1	Seedling	260	Seeding cost is based on current price but most of trees were planted 20-25 years ago
2	FYM and other bionic fertilizer supply	375	Farm Yard Manure is available with farmers and local cattle farming such as goat, cow, buffalo, sheep and poultry are major suppliers of bionic fertilizer which is being purchased by farmer and make 50% contribution on cost. Current price of Goat Manure/ Big Bamboo basket is Rs 200. Whereas Buffalo and Cow' costs Rs 100 and 150 respectively

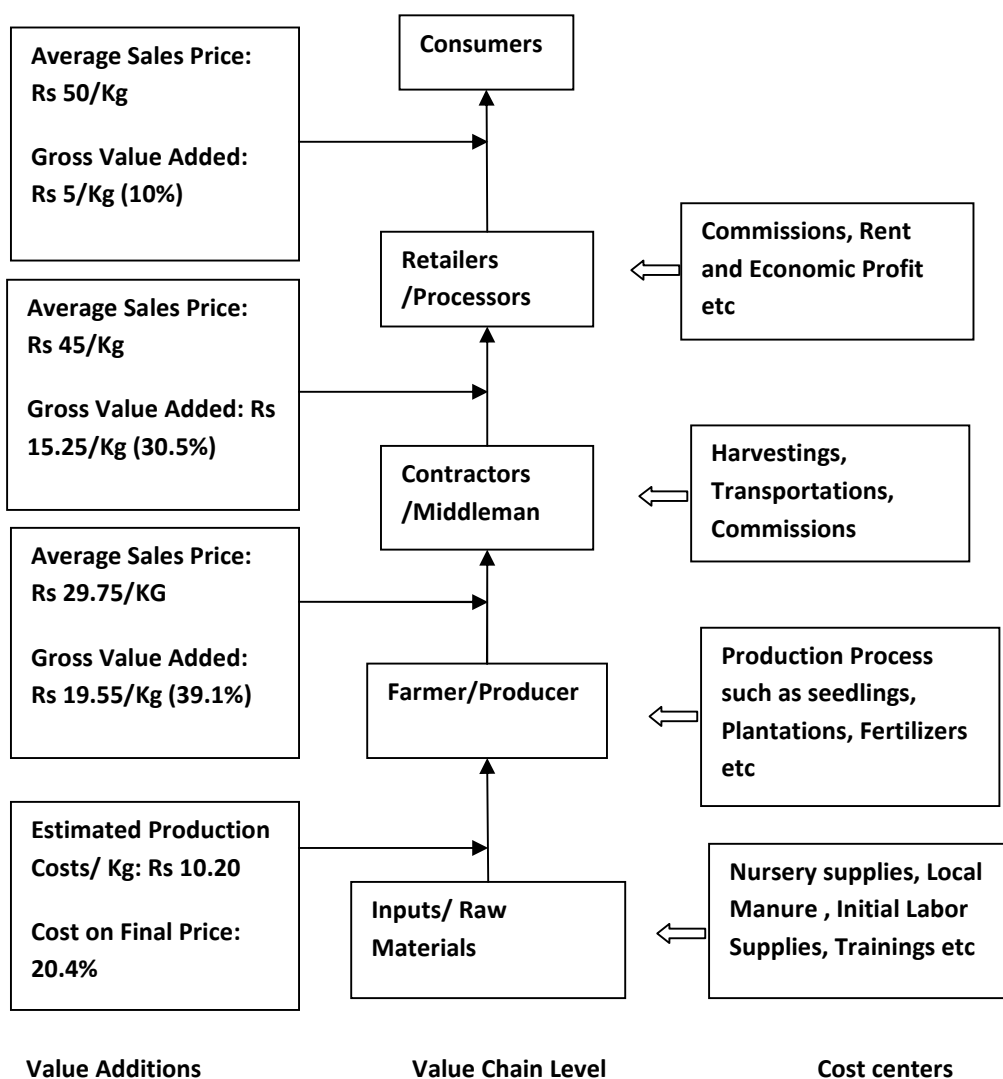
3	Preparation of Soil for Planting	55	
4	Planting	25	
5	Cutting, Pruning	35	
6	Chemical fertilization with Micro Nutrient supply, insecticides and Fungicides	75	Urea -35/Kg, DAP-55/Kg Potassium-40/Kg,  Micronutrient-1000/Ltr.  Bordeaux Mixture- 1500/Kg
7	Weeding	25	
8	Harvesting	145	Currently harvesting of a plastic crate is Rs 25
9	Sorting & Grading	25	
Total		1020	

*\*Costs are calculated based on figure provided by respondent in current survey with cooperation of SLNACO*

### **iii. Value Addition**

It is very difficult to estimate actual profit derived on each level and by actors because of inefficient marketing channels and inadequate information generation through channel and actors. Price differs significantly on the basis of size, color, quality and shine of fruit. Different actors use different method of measurement. Some orchards are closer to road facility and others are not. These dissimilarities always make estimation difficult.

Figure 10: Value Addition On each level\*



\*Value Addition Sheet is prepared with collaboration with Shree Laxmi Narayan Agriculture Cooperative

Generally oranges are sorted and graded in three categories before transported and selling as a) Large b) medium c) Small and another is Mix of them. Within each category price differs greatly and keeps on fluctuating. During the season of harvesting at beginning of November it was ranging Rs. 30-40 and reached to 60/Kg of large size, 45 for medium and Rs 20 for small at maximum at month of December and later in auction yard of Kalimati Fruit and Vegetable Market. But these prices are subject to fluctuate on daily basis due to weather, demand and supply conditions and other issues. Average prices of the year of 2013 of fruits/Kg passed through different channels are already mentioned with the help of data and invoices provided by respondent with cooperation of SLNACO.

The figure 11 represents the value addition at different levels and that is also estimated on the basis of interaction, surveys, observations and data provided to SOPS and SLNACO by different level such as farms, collection centers depot and auction yard.

### **5.3 SWOT Analysis, Constraints and VC promotional Strategies**

#### **A) SWOT Analysis**

SWOT (Strength and Weakness, Opportunity and Threat) analysis examines the efficiency of element with respect to outside environment. How the actor can adopt the uncontrollable factors with its capacity is major subject matter of SWOT analysis. SWOT analysis is very powerful tool for development strategy for any sectors. The critical issues of SWOT analysis are as follows

- ) What are the Strengths of sub sectors?
- ) What are the weaknesses of sub sectors?
- ) What are opportunities created by external environment to subsectors to move forward?
- ) What are external threats which hold subsector back?

After taking consideration of strength and weakness of subsectors and opportunities and threat of external environment or intervention, the following issues are raised on different levels

- ) Production system and movement of products in chain system.
- ) Business service provision and management in chain system
- ) Competitive advantages of all member of chain system
- ) Market access, infrastructure development, management of information, financial management

Interventions must be designed to nourish the strength and to correct weakness as well instead of mere addressing weakness and constraints. Similarly opportunity and threat are major external factors that influence subsectors. These external factors are creation of Political, Social, Economic, Demographic, Ecological, Legal and the Governmental forces. It means opportunity and threat are concerned with such

external environmental forces. These forces can cause on changing preferences toward business, change in business trends, rules and regulation changes and other political circumstances etc. These forces and circumstances can make subsectors to upgrade or move forward (Opportunity) and held back or downgrade (threat). The opportunities that are ignored may result in threat and the threats that are dealt appropriately can be turned opportunity.

**Table 5: SWOT Analysis**

Activity Levels(Internal)	Strength	Weakness
Production Level	<ul style="list-style-type: none"> <li>) Highly suitable climatic condition and soil quality</li> <li>) Unique quality and taste of traditional mandarin oranges</li> <li>) Most of bearing trees are Biju Biruwa (बिजु बिरुवा plants that are produced from Seed) which have long life and with genetic advantages</li> <li>) Farm land manure and other sources of bionic fertilizer like goat manure as well as buffalo, cow, sheep and chicken manure is adequately available locally.</li> <li>) Clean image of traditional cultivation regarding organic material use.</li> <li>) Agro inputs like small plants, labor and other tools are locally available. Farmers are well known about plantation and other care in growth of plantation.</li> <li>) Collective farming environment and cooperation</li> </ul>	<ul style="list-style-type: none"> <li>) Highly dependable on climatic factors such as rain water for irrigation and other disasters such as hailstone, drought etc</li> <li>) Biju Biruwa takes long period for production and genetic degradations are common in comparison to grafted one.</li> <li>) Lack of access to chemical fertilizers, insecticides, fungicides and micronutrients are responsible for not achieving full potentiality.</li> <li>) Lack of knowledge of diseases and modern cure and required chemicals</li> <li>) Short availability of product in harvesting season only reduces price benefit in off season and lack of other variety of oranges</li> <li>) Unorganized and unstructured input supply lacks uniformity in supply, price and periods.</li> <li>) Traditional techniques, lack</li> </ul>

	<ul style="list-style-type: none"> <li>) One of prominent citrus pocket area among 11 other in Lamjung</li> <li>) Orange Garden(Orchard) Reform Program, PACT, FDD, CDP and DADOs are continuously providing trainings and programs</li> </ul>	<ul style="list-style-type: none"> <li>of proper laboratory facility, knowledge and awareness about soil treatment, composition of fertilizer and its techniques of uses and tools.</li> <li>) Inefficiency in government and other organizations</li> <li>) Lower prices</li> </ul>
Distribution Level	<ul style="list-style-type: none"> <li>) Adequate market even in harvesting season</li> <li>) No excess supplies</li> <li>) Different marketing promotional and development activities launched by different organization including government agencies such as PACT, FDD, CDP etc</li> <li>) Quality assurances and availability of information about product to market.</li> <li>) Simple and specific marketing channel or chain</li> <li>) Easily accessible market and information including price, demand and supply.</li> </ul>	<ul style="list-style-type: none"> <li>) Traditional techniques and tools of harvesting</li> <li>) Higher rate of wastages while harvesting, post harvesting and transportation</li> <li>) Lack of access to market information by producers.</li> <li>) Inefficiency of promotional and development programs of different organizations</li> <li>) Low quality products from India (Nagpuri Orange) and inefficient differentiation with it.</li> <li>) One way marketing channels</li> <li>) Lack of proper signal to market forces</li> <li>) Few distribution channels</li> <li>) Shortages of manpower, tools, vehicles and information in peak marketing period.</li> <li>) Insufficient facilities in auction yard and depot.</li> <li>) Monopoly behaviors and manipulated market structures created by yard/depot owners.</li> </ul>



Feedback Level	<ul style="list-style-type: none"> <li>) Simple and understandable</li> </ul>	<ul style="list-style-type: none"> <li>) Inefficient reverse market information and feedback due to one way marketing channel</li> <li>) Poor income distribution</li> <li>) Market push channels</li> <li>) Ignorance toward market signals</li> </ul>
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External Environment	Opportunity	Threat
Ecological Economic Political Socio-cultural International Government Legal Etc	<ul style="list-style-type: none"> <li>) Since Nepal is agriculturist country, it has high potential in development of agriculture and cash crop like citrus production. There is always excess demand and citrus production is still under supply and it has massive potential.</li> <li>) Value added at production level is satisfactory.</li> <li>) Horticulture like citrus is really effective to increase in revenue than other traditional crops and to correct income distribution.</li> <li>) In price mechanism demand/supply factor has significance role.</li> <li>) Political interest on agricultural development increasing due to interested paid by globalization issues and international interest on it.</li> <li>) Political stability is sensed after long insurgency happened in nation</li> <li>) Farmers now sense united effort</li> </ul>	<ul style="list-style-type: none"> <li>) Known, unknown diseases and infections to plants are increasing day by day. Abiotic and genetic disorders like Frost, Chimera, and Sunburn etc. Root rot, Citrus Nematode , Bacterial Blast, Powdery m collapsing due to Citrus Greening which is completely incurable disease. Even USA has been failed to cure it and since 1998, Florida has been facing catastrophe and Brazil, China and India as well. Citrus canker is also wide spread</li> <li>) Negligence on quarantine while importing agro products, seed and others are responsible for that catastrophe.</li> <li>) Negligence shown by government, growers themselves toward has increased danger of elimination of industry.</li> </ul>

	<p>is effective to achieve collective targets via cooperative, production societies etc</p> <p>) Now society has realized agriculture can be commercialized and can be converted high yielding industry.</p> <p>) More and more middle class families also understanding the organic production and demand is raising.</p> <p>) Government has established different organization and executed different plans and project to develop citrus production and market development such as PACT, FDD, CDP, CORG etc. And has given high priority on horticulture as well as citrus on annual budget</p> <p>) International arena is also very attractive to supply because of globalization prospective. China and Bangladesh are highly interested to mandarin oranges</p> <p>) Financial institutions are interested investing on agro sectors in low interest rate and providing technical support as well as market development.</p>	<p>) Political instability has also given threats to industry esp. in harvesting season such as road blockages, riots and other activities. Because of perishable nature, products is most hampered by these activities by lowering prices, even whole harvestings goes destroyed.</p> <p>) Inefficient functioning of government organizations</p> <p>) Manipulated market caused by owner of yard/ depot make significance impact on income distribution. These players are continuously manipulating market mechanism to exploit more and more profit to middleman in the distribution channel because of their monopoly power to market.</p> <p>) Negligence of government sectors to improve trade relation to international area via exporting agriculture products esp. citrus products.</p>
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## B) Constraints

The most important constraints in citrus value chain are due to lack of access to quality material inputs, up to dated market information and lack of modern technology of farming. The intriguing constraints that can be figured out as a) Poor input supply (seedlings, fertilizers, unskilled labor, irrigation and other required

chemical supply), b) High rate of diseases, abiotic and genetic disorders and pests, c) poor management of orchard due to adequate scientific knowledge, d) Harvesting and poor post harvest handlings, e) Lack of infrastructure and social overhead capitals like roadways, cold storages, networks and collection centers etc. f) Limited access to credit facilities, g) Poor MKIS, h) Imperfect market behavior and manipulation.

Most of the constraints are interrelated and one constraint automatically leads to other constraints like poor seedling lead high rate of diseases and genetic disorders results to lower quality products, unscientific harvesting lead to loss on post harvest handling etc.

**Poor Input Supply:** The basic characteristics of input market is lack of uniformity, low quality, seasonal imbalances, supply shortages in time of high demand, unskilled labor uses etc. Low quality and infected seedling may cause genetic disorder and infection of diseases. Around thirties, Nepal imported seedling from China without quarantine to match the high demand of citrus also brought infected plants with Huanglongbin (Citrus Greening) to Nepal which is creating massive destruction of citrus. Poor and untimely supply of fertilizer and required chemical to control pest are also major problem. Irrigation is also depended upon natural rain but need of irrigation is high at drought. Lack of irrigation reduces the production in quantitatively and qualitatively as well.

**Diseases and Pests:** Due to Citrus Greening, situation is very critical now. More than hundred trees are being completely destroyed yearly. In Chiti VDC, every ward number 1-9 is involved in citrus farming with more than 25000 bearing trees. But right now excluding ward number 1 and 2, all orchards of other ward is completely destroyed by same evil. Powdery Mildew Infestation, Bacterial Blast, Citrus Nematode, Phytophthora Root Rot, Sooty Mold are common diseases to citrus and application of fungicides, pesticides and multi-nutrient can control but now the very critical diseases like Citrus Canker and Citrus Greening also infected the orchards which are almost impossible to be cured. Abiotic and genetic disorders such as Frost, Sunburn, Hail Damage, Wind Damage, Mesophyll Collapse, Mineral Deficiencies and Toxicities and Phytotoxicity etc are to be taken to considerations. Citrus fruit fly, Bug and Mite create huge loss to growers.

**Poor management of orchard:** Lack of adequate knowledge of management of orchard and traditional concept, they generally leave orchard growth on natural and automatic consequences. Most of farmer of the area have not followed scientific method of planting and caring of trees. Systematic use of fertilizer on timely basis, timely harvesting, identification of diseases and its correct measure, correct intercropping and cutting/pruning are given few attention.

**Poor harvesting and post harvest handling:** Harvesting techniques are mostly traditional and crude. Usually bamboo stairs are used to reach and bare hand to pick fruits. Pulling fruits from branches makes fruits loose cover creating small hole on fruit that reduce quality and perishes very quickly because mandarin oranges have very soft peel which can be removed very easily. Pooling of fruits on the ground after picking, grading with bare hand and loading to vehicle decreases quality and even destroy fruits. A use of scissor to pick fruits is not generally practiced. Now, plastic crates are used to grading and transported by trucks have become slightly successful to reduce wastages and maintaining quality. Roads of hilly region are not suitable for smooth transportation. Because of soft peel of mandarin oranges, wastages are high and reduction in quality is very common. With the help of survey, wastages while harvesting and post harvest handling reaches to 10-15%.

**Lack of proper infrastructure, roadways and other social overhead capital:** there is always lack of proper roadways, storehouse, cold storages, collection sectors and other network facility. These make reduction on quality, harvesting and post harvest handling wastages, obstacle on timely supply to market as well as supply of inputs and other required services. Harvested products are generally pooled in grounds under open sky before transportation to auction yard. Even in auction yard or depot, same process follows after unloading. Without facility of cold storages, producers are unable to take advantages of off seasonal price increment. Lacks of collection center, products are dispatched without uniformity. There is low level of marketing information system due to lack of proper networking mechanism.

**Limited availability of credit facility:** In spite of being agricultural country, financial institution and channels are not interested to investing in agribusiness. There is lot of legal formality and procedures which hurdle the smooth financing through organized money market or channels. Generally, horticulture need long time to start

full fledge production long term financing is needed to finance these but financial institution avoids such investment because of their current ratio and quick ratio need. Unorganized financial market is small and cost of such money market is generally very high.

**Poor MKIS (Marketing information system):** These markets are characterized by traditional one way market push mechanism. Feedbacks are not available on steps of channels. Lack of proper infrastructural component is also hinder smooth operation of MKIS. On every step only transfer of goods and payment in terms of that transfer are available. Demand condition, supply strategy, production function, pricing system and advertisement are not considered as requirement of marketing management. Adequate knowledge and infrastructure to support effective MKIS are always lacking.

**Imperfect market and manipulation:** This is most intriguing issue of agro market of Nepal. Income distribution is not as should be in channel. There is always low income for grower and middleman swipes more income because of monopolistic character at the end of channel. This unbalances are always become unable to signal to economic factors properly. Yard/Depot owners and middleman can control or manipulate the market and economic factors as per their interest and exploit or take advantages as per profit generation. They either create artificial shortages to buyers and raise price of product or create excess supply for grower and reduce the price and can create both circumstances. Growers and farmers are always entitled with lower price of their product. Barriers to entry into the market, learning experiences of long time, manipulation through corrupt behaviors are some ways to control market forces as per their control. Inefficiency, negligence and corrupt government regulation is responsible for such exercises

### **C) Strategies for Value Chain Promotion**

The current value chain of citrus is still facing following obstacle to become efficient value chain system.

- ) Traditional approach to Value chain
- ) One way market push strategy adopted at every level
- ) Component of monopoly and adverse distribution of income

- ) Inefficient value addition on some channels
- ) Lack of effective market intervention
- ) Negligence of policymaker toward VC approach
- ) Ineffective MKIS
- ) Lack of efficient feedback mechanism and trend
- ) Lack of commercialization of agriculture

These are some characteristic of current VC. Internal and external intervention in VC is lacking. Government, local money market, VC actors should consider about appropriate functioning, balance and distribution of responsibility and authority to correct balance the value addition on each step and income distribution with efficient feedback of MKIS.

#### **i. Objectives, Vision and Goals**

There are basically two parts in VC mechanism and objectives are related with

- ) Market orientation: Flow of products, services and information
- ) Income distribution: Flow of Income, consumer preferences and information

VC promotional strategy has objective of smooth, balance and efficient delegation of above VC components in both aspects

The VC promotional strategy has the vision of assembling all required component in VC, promoting all actors based on their comparative advantages, removing bottlenecks concerning efficient distribution of share and information in VC, tapping and exploiting all opportunities and managing threats in efficient ways to construct the optimum VC.

VC promotional strategy has goal of increasing production on one hand and the other is reducing costs of production improving market linkage through developing appropriate intervention strategies.

#### **ii. Formulation of Strategies**

The strategies for VC promotional can be classified as promotional, developmental and interventional in terms of function and strategies related vertical and horizontal

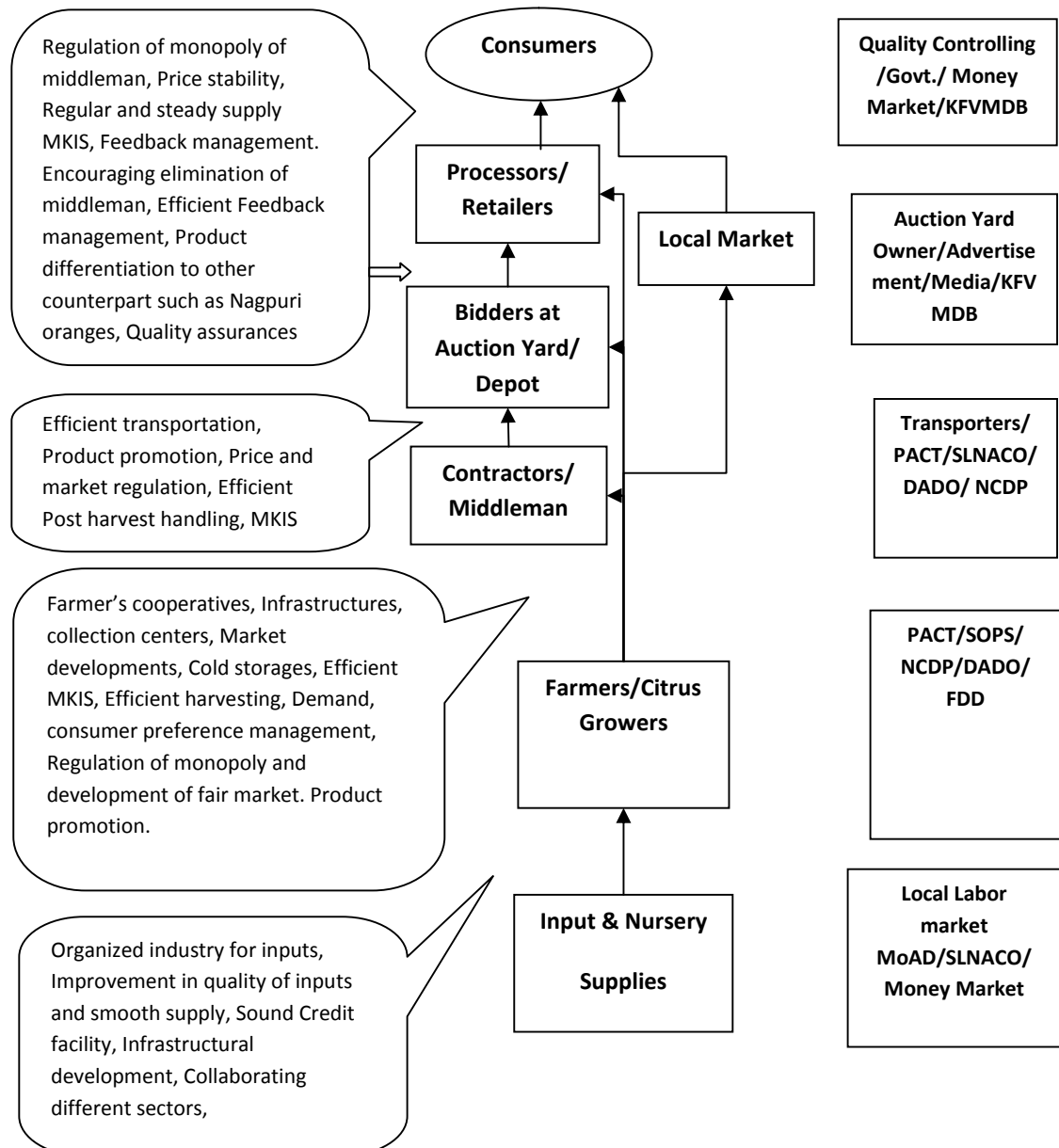
relationships. These strategies are subjects to apply in different level of value chain. In order to achieve those objectives and goals, there must be strong coordination between three pillar of economy such as public sectors led by government, development agencies and private business sectors. Investment in social overhead capital (SOC) from public sectors such as irrigation, cold storages and good roadways, regulation on trade and development of fair and efficient market mechanism and investment in modern technology and its development and delivery. Both linkages such as forward as well as backward linkage from private sectors to SOCs is need to structure value chain , create scale effect and correct the pre harvesting and post harvest processing and market opportunities. Value chain operators performing different function on different level or vertical relation and forms, organizations and institution including government engaged in particular level of Value chain or horizontal relation need to put collective effort to upgrade value chain. Cooperatives are needed to benefit scattered and small growers/producers because they can successfully and effectively approach to market as big suppliers through cooperatives. There must be regulation of monopoly behavior of depot/auction yard owners and no exploitation and fair market equilibrium by middleman must be guaranteed by government. The reinforcement program must be applied that strengthen the management capacity of farmer to manage efficiently their managerial function on every level such as orchard management, demand and consumer preferences and market approaches. Farmers must be trained or educated for adoption of new technology such as uses of grafted plants instead of biju biruwa, uses of required chemicals like micronutrients, fungicides, pesticides and uses of fertilizers, modern marketing approaches like correct post harvest handlings, improving fruit quality.

These action plans can be implemented by different actors and other support service providers. Every one of the chain mechanism should understand one's function and play part of it. From the following figure shows the interventions drawn to promoting value chain.

Promotional and developmental strategies enhance the existing capacity and continuous up gradation of chain. It motivates and initiates actors and sub sectors in slow chain reaction. It works indirectly to remove friction on smooth moving of chain

such as development of SOC lead to improve the function of subsectors. Support service providers like government promote industry indirectly with chain reaction of different steps. Intervention strategies generally focus on active participatory approach to VC. Regulation of market, Granting subsidies, Providing direct supervisions and advises on the field and mandatory contribution of agro sector on total investment portfolio of financial institution etc.

**Figure 11: Applications of Strategies on Value Chain**



As depicted in figure, various efforts are need in different level of value chain to correct the shortcomings and stable, fair and competitive chain mechanism.



- ) Encouraging private business investment on input supply which enables to farmer to reach to quality inputs such as quality seedlings, fertilizers, chemical supplies and market information as inputs etc.
- ) Adequate training and skill development programs about orchard management, pest control, consequences of lack of micronutrients and its uses, identification and control of diseases and market information processing.
- ) Developing efficient method of delivering of product from farm to depot/auction yard and postharvest handling.

Intervention strategy designed on every level of value chain can be classified as follows

**Table 6: Intervention Strategy designed on different levels**

Strategic Areas of Intervention	Specific Activities	Expected Outputs
Grouping And Cooperatives	<ul style="list-style-type: none"> <li>) Encouraging farmers toward group effort and cooperatives</li> <li>) Support the existing groups, functional societies and creating environment to form Cooperatives</li> <li>) Support Cooperatives via subsidies, grants and other required training and skill development program for efficient management and book keeping</li> <li>) Granting easy market access, tax rebates, discounts on purchase and program for enhancing the bargaining power of cooperatives.</li> <li>) Continuous monitoring and motivational program for cooperatives from government sectors</li> <li>) Allowing cooperative to easy access to foreign market and make trade contracts.</li> </ul>	<ul style="list-style-type: none"> <li>) Enhancement on market power.</li> <li>Skill development.</li> <li>High motivation.</li> <li>Skill development for better management.</li> </ul>
Input supplies	<ul style="list-style-type: none"> <li>) Raising awareness about importance of quality seedlings through training</li> </ul>	<ul style="list-style-type: none"> <li>) Higher production or output. Low rate</li> </ul>

	<p>program and other media</p> <ul style="list-style-type: none"> <li>) Introducing new types of seedlings and comparative advantage over traditional seedlings</li> <li>) Encouraging and developing private nurseries to maintain adequate supply of seedling and other required materials.</li> <li>) Regular monitoring by specialist to orchards and recommendation for required chemicals and micronutrients for disease and malnutrition consequences</li> <li>) Training for better management of orchard</li> <li>) Ensuring supply of adequate market information as input</li> </ul>	<p>of infections and disease. Lower cost of inputs and replacement.</p> <p>Timely supply of required inputs</p>
Production and Orchard Management	<ul style="list-style-type: none"> <li>) Providing specialist to field and maintaining regular visit to trace the current issue and provide correct measure</li> <li>) Developing the training plans about phenology of plants such as planting, flowering, fruit seeding and harvesting etc. and follow-ups</li> <li>) Encouraging growers to test soil quality and accordingly manage composition of different micro nutrients and uses.</li> <li>) Arranging periodic exposure visits to well managed orchard and motivate them to follow.</li> </ul>	<ul style="list-style-type: none"> <li>) Healthy and Best quality products. Skill development of management.</li> <li>) Higher awareness toward commercialization of agriculture</li> </ul>
Transportation and Post harvest handling	<ul style="list-style-type: none"> <li>) Promoting use of clipper and scissors to pick fruits instead of using hand picking.</li> <li>) Encouraging farmer and contractors to use of plastic crates to collect, store and transport harvested fruits to market places.</li> <li>) Providing training about proper method of grading and sorting of fruits</li> <li>) Establishing depots and collection centers nearby of farm</li> </ul>	<ul style="list-style-type: none"> <li>) Lower rate of wastage while harvesting and post harvest handling. Supply high quality product to market. Higher prices</li> </ul>

	<ul style="list-style-type: none"> <li>) Establishment of cold storages and providing management skill and market information to take off-seasonal advantages.</li> <li>) Encouraging fruit processing industries on concepts of public-private relationships.</li> </ul>	
Market Development and Regulation	<ul style="list-style-type: none"> <li>) Establishing efficient market information system about price, demand-supply condition and market dimensions</li> <li>) Regulation of price and development of fair market.</li> <li>) Eliminating element of monopoly created by middleman and depot owner and removing the manipulation activities by proper law and regulation.</li> <li>) Managing and developing efficient transfer of market information in both approaches.</li> </ul>	<ul style="list-style-type: none"> <li>) Remove monopoly element. Less exploitation of middleman. Farmer receive higher price.</li> <li>) Efficient market information system.</li> </ul>
Quality Assurances and Production differentiation	<ul style="list-style-type: none"> <li>) Promoting quality assurance and certification of class</li> <li>) Differentiating the local mandarin with other counterparts such as Nagpur orange and other types and informing all consumers with the help of different media.</li> </ul>	<ul style="list-style-type: none"> <li>) Product recognition,</li> <li>) Higher prices</li> <li>) High demand</li> </ul>

## CHAPTER SIX

### SUMMARY CONCLUSION AND RECOMMENDATIONS

#### 6.1 Summary

Nepal is still experiencing traditional technology on most of sectors. Primary and agriculture sector is important example. Traditional Supply Chain which always ignores the efficient income distribution factor. Citrus is one of most important horticulture production of world including Nepal. Lack of proper identification of modern Supply chain or VC has posed inefficiency and misallocation of income in distribution framework of industry.

Citrus industry of Chiti VDC has been producing considerable output compared to other farm output but it also under traditional mechanism in every level production to demolition of output. VC is modern business concept which is used to identify VC sub sectors and their function. A systematic VC map of citrus production follows from unorganized and limited input supply to farmers or citrus growers for production. There are four marketing channels on VC which are used to bring the products to final consumption. Support service providers works in different level of VC to facilitate VC operators to accomplish efficient functioning. External business environment always create opportunity and threats as well. Efficient matching of core competency with external opportunities and threats created by external environment can be achieved through systematic SWOT analysis. SWOT analysis of citrus production of the area has shown the current competitive status and potential with constraints. Analyzing environmental opportunity and threat profile and core competency of industry strategic units and area are indentified for intervention to shape VC to efficiency.

#### 6.2 Conclusion

This research is devoted to analyze the current situation of orange or citrus production of Chiti VDC, Ward number 2. This study definitely represent other areas also because other area of horticulture including citrus production has been experiencing same fate. Agro-production such as Horticulture, Vegetable and others in Nepal has very similar VC. VC approach is slightly new approach of study of lifecycle of any

product or service from creation to demolition in Nepalese context. But it is most important approach to understand fundamental problem of economy because it studies from pre-production of any goods and services and post final consumption as well. Even secondary and sophisticated sector has not given proper attention toward it.

Citrus production has experienced traditional market push chain mechanism including area under study. Certainly citrus production has increased life style of farmers in the area comparing to other agro production sectors such as cereal and other traditional crops. But current status has failed to address the real market factors. It happens due to lack of proper knowledge of efficient VC mechanism, its active operator and support service sectors, accurate synchronization and vertical and horizontal relations between subsectors and efficient feedback mechanism on every level of Chain. Study of Systematic VC, proper market structure and channels and economic analysis such as cost structure analysis, value addition patterns on different level and pricing mechanism are some most important issues that are not well identified. Due to these shortcomings production has not been backed by real market forces such as demand supply condition, consumer preferences and other input market circumstances.

Citrus production has definitely increases the lifestyle of local farmer of this ward. More than 5-6 million Rs enters into this ward every year where the cereal productivity was quite low. Citrus production has given a new dimension to the economy of this area. This study is concerned with citrus production only leaving other fruits, cereals and vegetables. In spite of high productivity and excess demand in market, citrus farming has not succeeded to break the shackles because of traditional framework of market push. Government and other development partner's approach are limited and unsatisfactory. Outbreak of different kind of fetal diseases like Citrus Greening is massive and uncontrollable. Now, in period of dynamic global economy, traditional product push to market approach is completely not enough to signal to economy. So we have to rethink, reorganized and restructure the industry and economy. In traditional VC approach does not consider the feedback or market information as input. As already mention above, commercial agricultural production should be able to use market information as input to production. It has to know all actors and their duties and responsibilities, functions and responses as well.

Identification of support service sectors and their role and impact on market structure, production process and information generation are quite important.

Based on these studies, we can map, analyze the citrus industry. The citrus industry is quite supporting pro-poor growth in the area. Climate of the area is suitable for citrus as main cash crop. However current value addition is quite inferior because current VC is underdeveloped. There are several reasons for such misfortune but it has high potentiality for development of well managed and sophisticated VC but certain effort must be made for optimum value addition.

### **6.3 Recommendations**

Business economy of Nepal including agriculture sectors is still backward. Traditional framework and mechanism is still in operation in production and marketing. To improve and upgrade traditional supply chain to modern VC is most needed. So, there are some important point can be drawn as follows for efficient VC mechanism

- ) VC sub sectors such as operators, support service providers must be defined and identified properly to place them in correct level. Their function and interdependence must be classified and analyzed
- ) Construction of VC in very systematic way trapping all sectors in proper synchronization. Participatory activities among VC component must be enhanced through motivating and controlling these components in scientific way. Reinforcement through efficient feedback program has to be properly managed.
- ) Environment scanning and scenario planning must be done regularly. Adopting efficient method for measuring external threat and unfavorable circumstances and exploiting those opportunities and favorable conditions with its resources must be done in proper ways identifying and developing core competency. Developing SWOT profile and EOTP analysis must be in such a way that can be compared with core competitive advantages of different sectors of VC.

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