Off- Season Vegetables Marketing Channels of Small Growers: A Case of Yampaphant, Tanahun, Nepal

Research project submitted to:

Larenstein University of Applied Sciences In partial Fulfillment of the Requirements for the Degree of Master of Development
Specialization – International Agriculture (IA)

By

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ACRONYMS

AEC	Agro-Enterprise Centre
AGDP	Agricultural Gross Domestic Product
APP	Agriculture Perspective Plan
CBS	Central Bureau of Statistics
DADO	District Agriculture Development Office
FAO	Food and Agriculture Organization of United Nation
GDP	Gross Domestic Product
GoN	Government of Nepal
Ha	Hectare
JT	Junior Technician
KFVMDB	Kalimati Fruit and Vegetable Market Development Board
MARD	Market Access for Rural Development
Masl	Meter above Mean Sea Level
MDD	Market Development Division
MOAC	Ministry of Agriculture and Cooperative
Mt	Metric Tones
NPC	Nepal Planning Commission
PRA	Participatory Rural Appraisal
VDC	Village Development Committee

GLOSSARY

Bari	Unirrigated upland
Brahmin	Sacred caste in Hindu religion, Aryan by origin
Chhetri	One of the cast group, Aryan origin
Dashain	National festival celebrated by Hindu in honor of goddess Durga the deity of Power falls in the month of mid Sept. to mid Oct.
Doko	Locally woven bamboo baskets, cone shaped designed to carry on the back, Popular in hilly region.
Gurung	Member of community of Tibeto burmen origin, mainly settled in the mid hills of country
Haat bazaar	A traditional weekly market held within the village
Khet	Irrigated land
Lower caste	socially deprived caste groups in Nepal mainly as, *Kami (B.K.), Damai, and Sarki (Nepali)*
Magar	Member of community of tibeto burman origin, mainly settled in the mid hills
Tihar	National festival celebrated by Hindu fall in the month of Mid-October-Mid. November.

EQUIVALENTS

Area

1 Hectare	= 20 Ropani
1 Ropani	= 500 sqm. (0.05ha.)

Weight

1 Metric ton	= 10 quintal

Currency

1€	=103 Nepalese Rupees

ABSTRACT

A study was conducted to analyze the marketing channels for off-season vegetables in Yampaphant of Tanahun district in 2007/2008. 25 off-season vegetable growers, 10 vegetable retailers from *Damauli,* and *Dumre* market, 5 middlemen and wholesalers were selected, interviewed with semi-structure questionnaires and analyzed. Existing marketing channels in the studied area were direct selling, selling to middlemen, and producer to consumers, farmers to retailers to consumers, farmers to farmers' group to retailer to consumers, farmers to middlemen to retailers to consumers and farmers to cooperative to retailers to consumers. Out of them, producer-middlemen-retailer-consumer was most common which share 60% of vegetable marketing in the study area. Marketing margin was higher by Rs.0.5/kg in organized producer in cooperative market than unorganized producers of Yampaphant, Tanahun.

The most common production constraints faced by farmers in the study area were outbreak of disease, lack of regular irrigation facility, inadequate insect and pest control measures (biological and chemical), insufficient supply of pure/hybrid seed and chemical fertilizers and inaccessibility of credit facility. Farmers were facing marketing constraints such as low price for their products, fluctuation of commodity price, absence of farmer's organization for collective bargaining in pricing for their product, reluctance to sell in organized market due to political reasons, lack of transportation facilities. Among these several constraints, insufficient supply of pure/hybrid seed, agricultural input/chemical fertilizers and credit were significantly associated with the location.

The profit margin for middlemen was found 50% of the farm gate price. To increase the profit margin of vegetable growers, selling through middlemen should be minimized and farmers' involvement in cooperative should be encouraged. In order to increase the strength of famers in marketing channels of vegetable, various farmers groups and cooperatives should be unified and one common platform should be formed for the purpose. Farmers' owned vegetable sales counters under cooperative should be established in Damauli and Pokhara. Furthermore, the off-season vegetable production technology should be promoted and disseminated through District Agriculture Development Office, Tanahun.

Table of contents

LIST OF FIGURES

LIST OF TABLE

LIST OF BOXES

CHAPTER 1: GENERAL INTRODUCTION

1.1 Background

This research on " Off- Season Vegetables Marketing Channels of Small Growers: A Case of Yampaphant, Tanahun Nepal" has been accomplished for the partial fulfillment of professional masters' degree of Van Hall Larenstein University of Professional Education, the Netherlands. This research aims to explore and provide insights about existing off-season/summer vegetable marketing channels adopted by small scale farmers in Yampaphant village of Tanahun district of Nepal. This research is based on the case study methods in which interviews, Focused Group Discussion (FGD), Key Informants (KI) and observation methods were used to collect primary information.

Due to continuous fragmentation of land, average land holding size of Nepal is decreasing. This phenomenon also exists in the study areas. Average land holding size was 1.11 ha in 1961/62 to 0.60 ha in 2006/7 (MOAC, 2008). Average family size is 5.44 (CBS 2006). In this research, small grower refers to the farmers whose land holding is less than 0.5 ha. Their production scale and marketing channels were taken into account for analysis.

Nepal, a small land locked agricultural country, is situated in between India and China. The total area of the country is 147181 sq.km and population is 23 million (CBS 2006). Despite its size, it has large geo-climatic variations ranging from tropical to the alpine climate. The country is administratively divided into five development regions, 14 zones and 75 districts. Village development committees (VDC) and municipalities are the lower administrative units in the districts. Currently there are 4000 VDC and 58 municipalities in the country. Ecologically, Nepal has been divided in to three regions- Mountain, Hill and Terai. Terai belt consists of about 23 percent of total land whereas the hill and Mountain consists of 42 and 35 percent of the total areas respectively. The terai is plain, fertile and productive land of Nepal. It shares a large portion (57%) of total cultivable land (CBS , 2006). Study area lies in hilly region at 425-500 masl.

This research aims at understanding marketing system of the small scale vegetable growers of vegetable and possibilities for improvement for the optimum functioning of the channel. In this study, marketing channel analysis for the fresh vegetables like bitter guards, sponge guards, cucumber and pumpkin produced in the summer season to supply as off - season vegetable in the Terai and nearby urban areas was performed. In Yampaphant, farmers like to produce cucurbits as an early-season vegetable so that they could get good price.

Production between March to June is considered as a off- season for cucurbit which is followed by regular production during rainy season. During this period (from March to June) there is no/or less production of cucurbits in the other parts of that area. This situation is an extra advantage for farmers of Yampaphant to sell their products in higher prices if they became to join their products in main streaming marketing channel. Small scale off-season/ summer vegetable growing on the one hand has high potential to reduce poverty and contribute to food security and that; on the other hand, limited and unorganized market access hinders the full development of this potential. Small scale

off -season/ summer vegetable farming is getting its popularity not only for self-nutrition and part time work which provides secondary source of income but also for its contribution in whole household economy. Some of the obstacles hindering full exploitation of small scale off-season / summer vegetable production from entering the market and thereby attaining its full potential are, for instance: lack of organization and co-operation among farmers due to spatial dispersion and diversity of social backgrounds, small scale production and their access to market. In absence of satisfactory marketing system farmers are deprived from satisfactory income and stop to cultivate vegetables for commercial purpose (Pokharel & Thapa 2007)

Analyzing and improving marketing strategies, utilizing new distribution channels, adding value to the products and shifting from subsistence farming to more commercial and multifunctional farming are ways to efficiently penetrate the market and increase the income of producers. Ultimately these practices contribute to strengthening and attaining potential benefits provided by off-season/ summer vegetable production.

The Government of Nepal (GoN) has emphasized the commercialization of vegetable in the identified pockets areas through a pocket package strategy program in its 10th five year plan (2002-2007). It was expected that, this strategy will be helpful for improving the income level of small scale farmers for poverty reduction. Despite the great potential of vegetable farming in Nepal, domestic producers face marketing problems such as lack of road access to market, reliable market information, price uncertainty and lack of infrastructure facilities for storage and processing of surplus products.

Marketing of vegetable crops is complex and it requires special arrangement due to perishable nature. As a result, supply of vegetable is subjected to various problems including wide fluctuation in prices. The vegetable marketing situation in Nepal is still in developing stages characterized by influences in demand and supply and price realization. Due to the imbalance production of vegetable and lack of market access and organized marketing system there is always a market accumulation and scarcity from season to season.

The outcome of the study will be a better aid to the farmers as well as planner to conceptualize the present scenario of marketing system of off-season/ summer fresh vegetable and farmer's dependency on off- season summer vegetable production.

1.2 Problem Statement

Concerted efforts have been made on the development of vegetable sector; still it is facing constraints, such as lack of marketing research on vegetable crops, which have hindered the rapid expansion of vegetable production on sustainable basis. In case of vegetable, the efficiency of marketing is crucial in determining the profits from the products. It is therefore, necessary to identify different marketing constraints along with production constraints to boost-up the production of vegetables (Hugar and Hiremoth, 1984 cited in Adhikari 2006). Vegetable growers of the study area claim that in the absence of institutionalized service, the price received by them is not remunerative. Traders and middleman are benefited from poor linkage between producers and consumers by providing low price at farm gate and more prices for consumers (Pokharel & Thapa, 2007). Existing vegetable marketing practices and market centre are poorly organized and rudimentary. Inefficient marketing system is a result of poor linkage and integration between marketing functionaries particularly in hill area (Gurung et.al 1996).

Therefore, in order to boost up the vegetable production and to raise the level of income of the growers, it is essential to improve the current marketing practices. Due to lack efficient market network, production in some places is surplus while there is a shortage of the same product in other places.

Vegetable marketing has become highly complex and difficult involving long marketing channels, a large number of middlemen, different types of physical, social, economic and facilitating marketing functions and services. Absence of organized marketing has been felt as one of the major bottlenecks in accelerating the progress of vegetable production. So it is essential to know what the existing cost of production is. How much marketing margin is found in vegetable marketing? In addition, it is essential to know how much profitability can be achieved from the major off –season/ summer vegetables.

1.3 Justification

An efficient marketing system can provide better prices to producers and improve the availability of competitively priced produce to consumers (Bernet et.al 2005 cited in Adhikari 2006). In some cases new markets or improvements to existing markets can help to overcome many marketing problems (Kaynak 1986 cited in Piya 2001). Before considering whether to carry out improvements to markets and what type of improvements to introduce is important. In this regard several bottlenecks in the vegetable marketing in Nepal are described by various authors. Among the various bottleneck of the vegetable marketing, systematic arrangement of marketing channels is one. This research aims at understanding and analyzing different marketing channels and assesses their strengths and weaknesses. Conclusion drawn from this study will be useful for all the actors in the channel to improve marketing channels of the vegetable crops by increasing of their profit margin.

“An understanding of the marketing system is essentially important for the identification of constraints in the system with a view to provide efficient services in the continuum of production/consumption chain. It is because an efficient marketing system minimizes the costs, and benefits all the section of society (Christopher et al., 1980 cited in Padberg et al. pp 15).

The first step towards identifying requirements for new or improved local markets is important, to understand how existing marketing functions (White, 2003).

Marketing systems should upgrade facilities to promote hygiene, reduce post-harvest losses, speed up the flow of produce and reduce transaction costs. Clearly, such developments will be easier for markets in rural areas than in others where traditional systems are under the most immediate threat from new systems like supermarket and hypermarkets. There is already some evidence of such a response, in People’s Republic China, Thailand, Singapore and Malaysia (Shepherd, 2005).

Traditional markets that sit back and wait for business to come to them will rapidly cease to be relevant. They have to explore ways to attract business by surveying their customers and identifying their needs. Market logistics may need to be re-examined, together with trading hours, in order to maximize the convenience for customers and minimize delay between harvest and sale.

1.4 The Research Objectives

Objectives of this research are:

1. To analyze marketing channels of vegetables produced by small farmers in Yampaphant village of Tanahun District, Nepal

2. To find out possible ways of improving the operation of the marketing channels.

1.5 Research Questions

1. What kinds of vegetable marketing channels exist in Yampaphant, Tanahun district?
2. How to improve the performance of the current marketing channels?

1.6 Organization of the Report

Chapter 1 deals with research agenda which provide introduction of the research, and general introduction of the study area, people and society. It discusses problem statement, justification, research objectives and research questions. Chapter 2 describes research methodology. In the final section research methods and data analysis approaches are discussed. Chapter 3 gives description and definitions of key theoretical approaches and concepts. Chapter 4 describes the agriculture transformation in Nepal focusing on the commercialization of agriculture by introducing vegetable production. Chapter 5 describes the location of the study area, key socio-economic characteristics and vegetable production. Chapter 6 examines marketing system of the vegetables with focusing on the vegetable marketing channels and makes reflection on the major research issues. It rearranges main points from the previous chapters and assembles them in a single story of understanding marketing channels of small vegetable growers in Yampaphant village. Finally, Chapter 7 presents summary, conclusion and suggestions. Outline of report shown in figure 1.1

Outline of the report

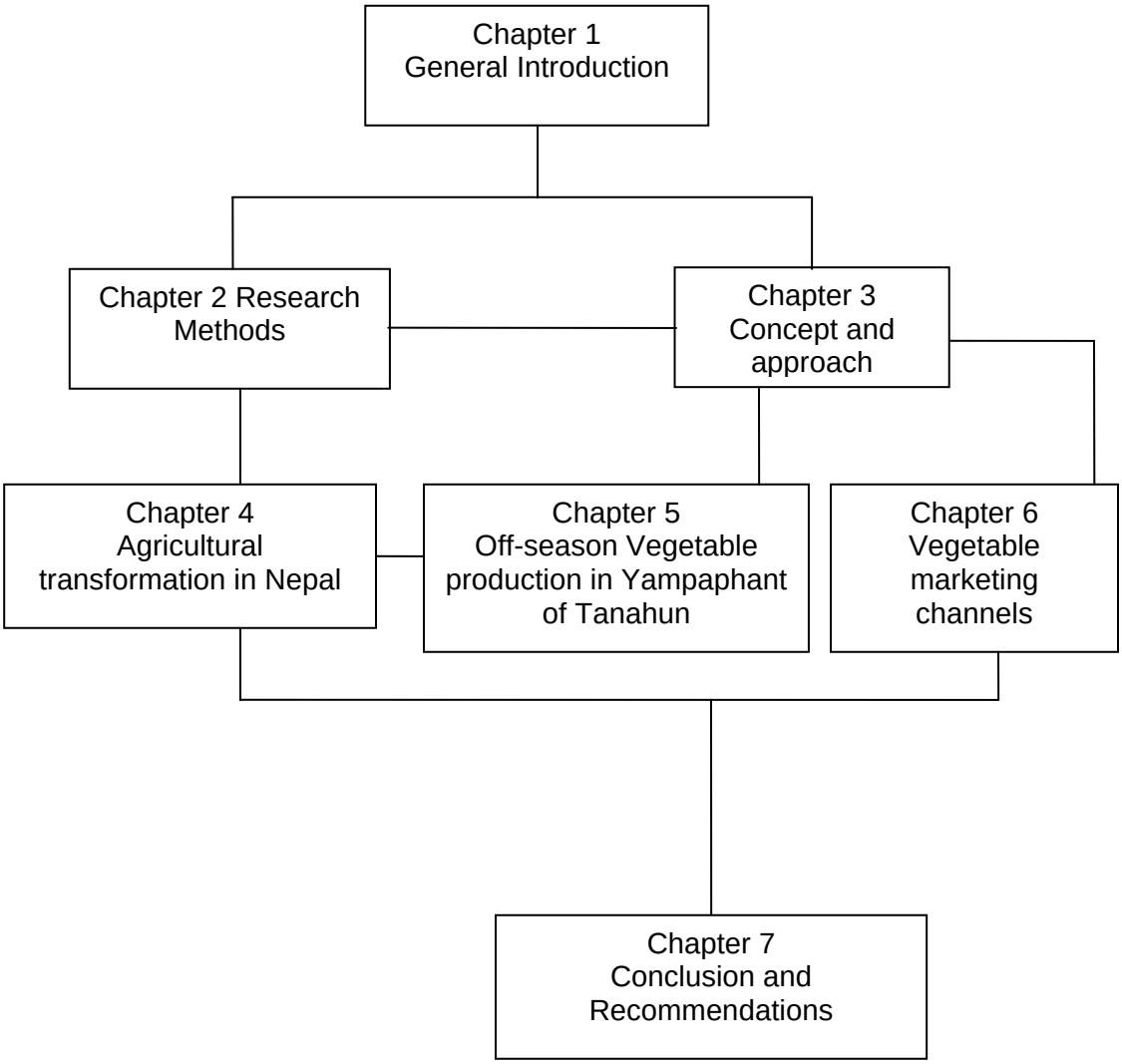

Fig. 1.1 Outline of the report

CHAPTER 2: RESEARCH METHODOLOGY

2.1 Introduction and Conceptual Framework

This research was based on the case study method. Case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context (Yin, 1984). In this method I used both survey and informal interviews with the targeted respondents. SSI questionnaire are shown in annexes 1. This thesis focused on marketing channel which are shown in oval round spaced of figure 2.1

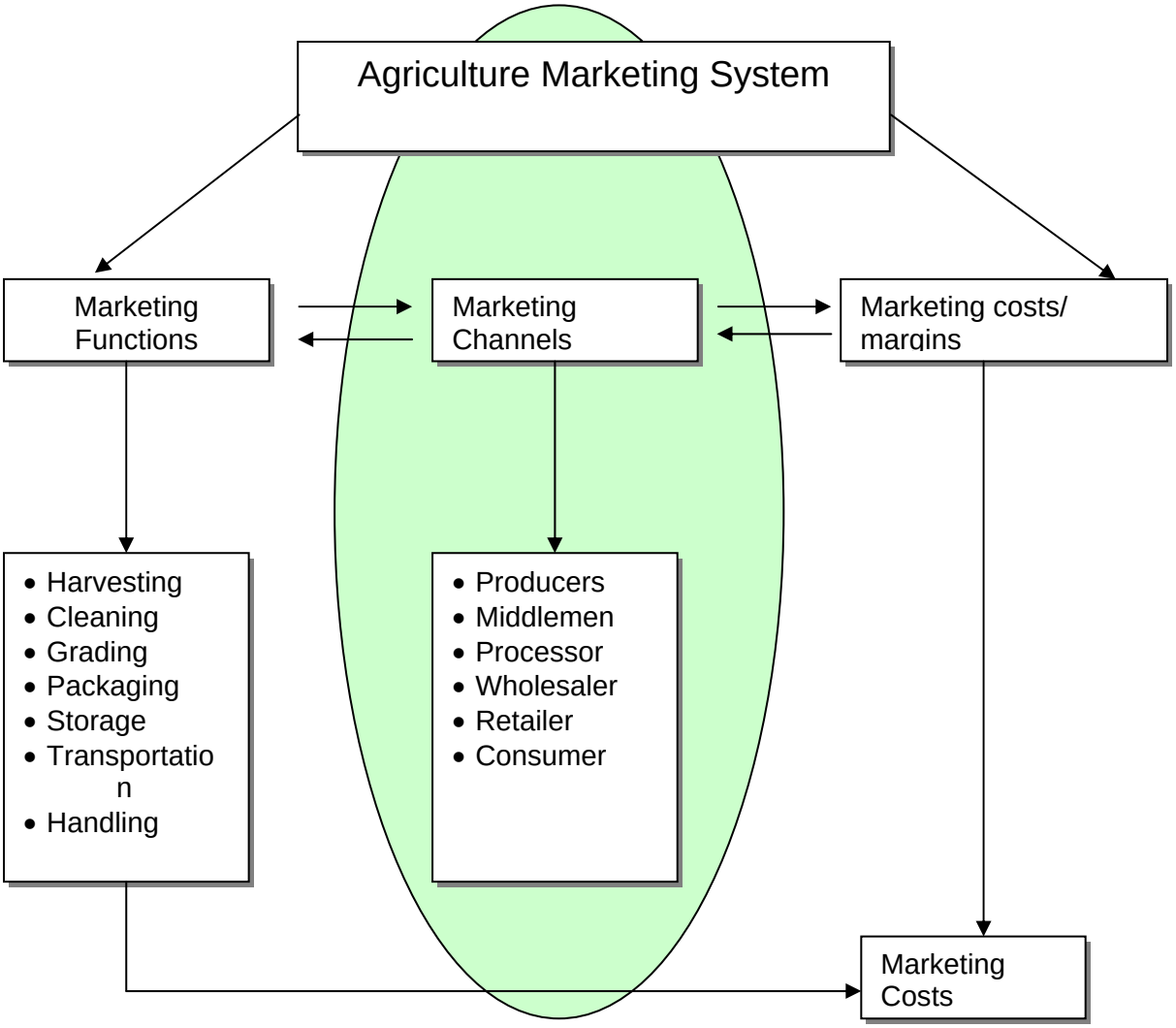

Fig.2.1 Diagram of Agriculture marketing system with the area of the study under marketing system.

The Integral Research Methodology is given in figure below

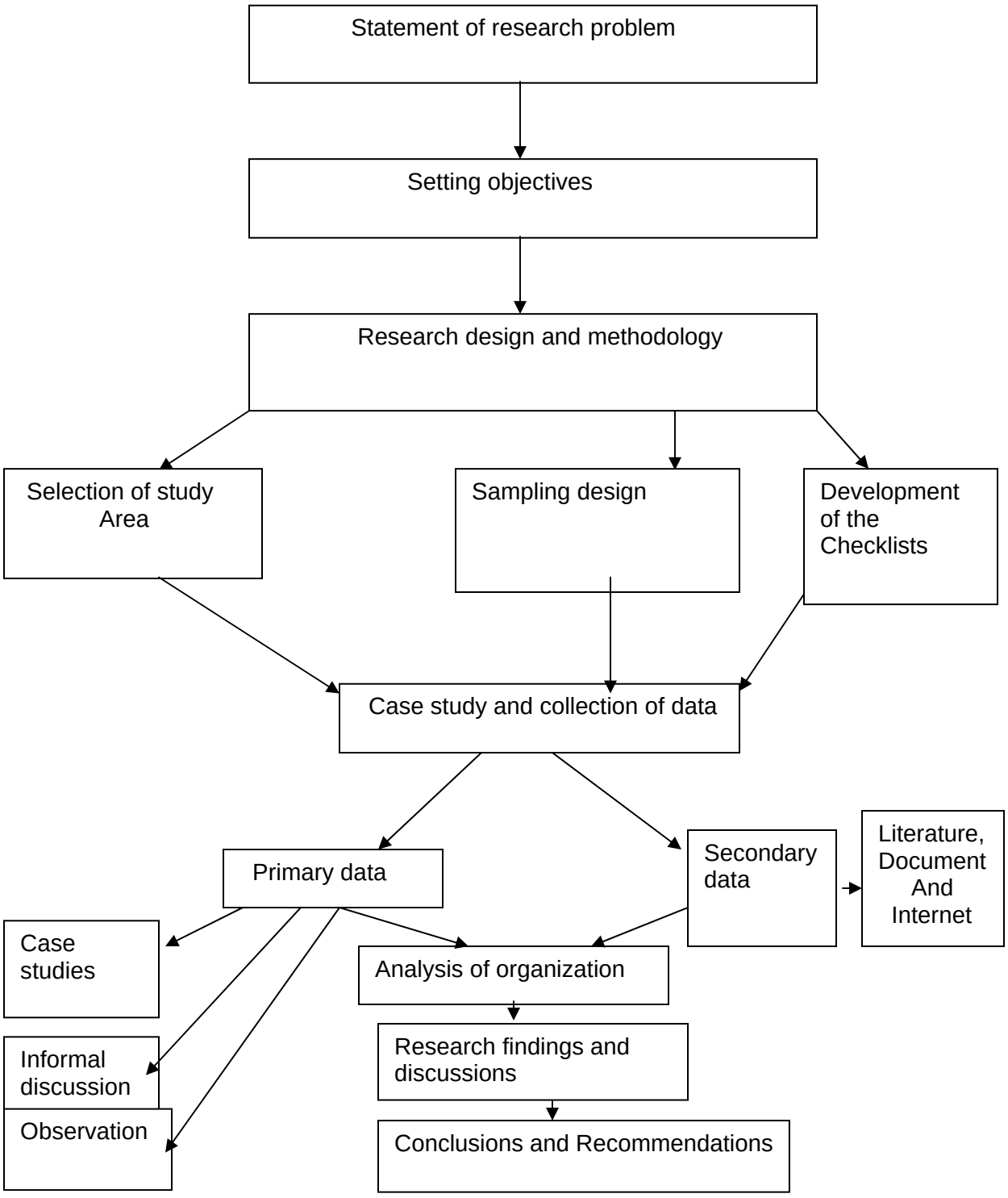

Fig.2.2 Outline of steps of methods used in the study.

2.2 Research and Observation Units

The study was conducted with the small scale vegetable growers in Yampaphant village. Research units were farm families and members and the actors involved in the marketing channel of off-season/summer vegetables such as middlemen, wholesaler, retailers and consumers. Similarly market and market places, collection centers and farm and farming activation were observation units in the study. (Respondents list are shown in 5.1 to 5.3 of annexes 5).

Random sampling technique was used to select sample households. Snowball sampling method was used to select relevant cases for the study. While interviewing people they were asked to identify other relevant informants and respondents. Informants were sometime interviewed more than one time if I felt further clarification and deeper responses.

2.3 Sample Profile

Total vegetable growers in the study village were 150 households. Out of this population 25 families were chosen randomly. Similarly, 5 vegetable retailers from each, *Damauli,* and *Dumre* market, 5 middlemen and wholesalers were selected for the study. The brief socio- economic descriptions of the study area based on the survey carried out in the specified random sample were given below.

Table: 2.1 Population and sample size

Cast classification	Casts	Total household in study area	Percentage	Sample Respondents
1. Upper casts	*Bhramen*	91	61	15
	Chhetri	15	10	3
2. Ethnic casts	*Gurung*	14	9	2
	Magar	17	11	3
3. Lower casts	*Viswakarm*	6	4	1
	Sarki (nepali)	7	5	1
Total		150	100	25

2.4 Data Collection Techniques and Triangulations

For data collection I used ‘a mix of different methods and sources’. The following were sources of information

a. Documents
b. Archival records
c. Interviews/ surveys
d. Participant observation: This was one of the most important sources of the information. I was living in the village with other community members. I was able to participate and observe vegetable marketing from the farm to the consumers.

e. Participatory research tools: Beside interviews and participant observation, I had employed other techniques of data collection collectively such as participatory mapping techniques and transact walking to know soil conditions, crops, livestock, forests, houses etc.

As mentioned above, data were collected from the multiple sources. The reasons for using multiple sources were to increase authenticity of the data through triangulation. There are four types of triangulation methods viz. data triangulation; investigators triangulation; theory triangulation and method triangulation (learned from qualitative research design course given by Sara Southold). Because of time limitation I did only data triangulation.

2.5 Data Analysis

Data analysis of the case study methodology is the least developed and hence the most difficult (Tellis, 1997). Two sets of data- qualitative and quantitative are used in this research. Analysis of quantitative data was much simpler and presented in the tables, graphs and charts. But organizing qualitative data was complex and time consuming. Actually analysis begins as soon as there is data collection (Weiss, 1994:151). Some kinds of the conclusions were made and written during the field work at the end of the day. But they are limited and superficial just useful to make decision about what to do in the next. Yin (1994) presented two strategies for analysis of the case study data. One is to rely on theoretical propositions of the study, and then to analyze the evidence based on those propositions.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1. Introduction

Previous chapters introduced research itself. Weak marketing channel for fresh vegetables in Yampaphant was taken as a problem on which research was based. This chapter aims to elaborate principles and concepts of marketing system used in this research.

3.1.1 Agricultural Marketing

There are many definitions of 'marketing'. Some definitions relevant to horticultural marketing are mentioned here. Marketing involves finding out what your customers want and supplying it to them at profit (Dixie, 2005). This definition stresses two important points: the marketing process has to be customer oriented and marketing, a commercial process, has to provide farmers, transporters, traders, processors, etc. with a profit otherwise they will be unable to stay in business. Marketing therefore involves identifying buyers and understanding what they want in terms of products; how they want to be supplied; operating a production-marketing chain that delivers the right products at the right time; and making enough profit to continue to operate.

Other definition of the marketing can be 'the series of services involved in moving a product from the point of production to the point of consumption' (ibid). This definition emphasizes that marketing is a series of inter-connected activities. In the case of horticultural marketing these include: planning production; growing and harvesting; grading of products and their packing, transport, storage, processing, distribution and sale; sending information from production area to market (e.g. products available, volumes) and from market back to producing areas (e.g. prices and supply levels, consumer preferences and changes in taste). All of these activities are links in the production marketing chain.

Agricultural marketing is one of the important branches of the marketing that deals with the exchange of agricultural goods. “The performance of all business activities involved in the flow of food products and services from the point of initial agricultural production until they are in the hands of consumers.”(Kohls and Uhl 1990 cited in Padberg et al., p12).

Marketing is the process of discovering and translating consumer needs into product and service specifications, or creating demand for these products/services and then expanding this demand. Marketing in vegetables is particularly important as up to 90-98% of the output of most vegetables is sold, except for root and tuber crops for which a significant proportion is saved for seed (Singh and Sikka, 1992), and vegetables produced in home gardens. Markets can be categorized by their degree of competition, i.e., from a perfectly competitive market to monopoly. A common approach to market research is to describe various marketing systems and compare their relative efficiency. Various actors engaged in different systems are listed, and their functions are described in each country report (Ali, 1998).
In this research, I used the concept marketing to signify the agriculture marketing. Further in the agriculture marketing this research is primarily based on the vegetable marketing by small growers in the village of Yampaphant, Nepal.

Vegetable marketing is a mechanism for co-coordinating production, distribution and consumption activities in the food chain. In this context, marketing includes the exchange activities associated with the transfer of property rights to commodities, the physical handling of products and the institutional arrangements for facilitating these activities (Kaynak 1986 cited in Piya 2001).

In this research these concepts of marketing and vegetable marketing implies that marketing of vegetable products begins at the farm when the farmer plans his production to meet specific demands and market prospects. The harvester's product can not usually go directly to the consumer. The production site is likely to be away from the place of consumption. Thus the transportation is required to bring the product. Vegetable production is generally seasonal while consumption is regular and continuous throughout the year. Thus, storage is required to adjust supply to demand. Similarly, a product is rarely in a form acceptable to consumers. It must be sorted, cleaned and processed in various ways, and must be presented to the consumer in convenient quantities for sale. Moreover, the farmer expects payments when his produce leaves his possessions. Some financial arrangement must be made to cover all the various stages until the retailer sells the product to the consumer. It is the vegetable marketing that provides such services between production and consumption (Awasthi, 2003).

3.1.2 Vegetable Marketing system

"Marketing system" is a primary mechanism for co-coordinating production, distribution and consumption activities in the food chain (Kaynak, 1999). In this context, marketing includes the exchange activities associated with the transfer of property rights to commodities, the physical handling of products and the institutional arrangements for facilitating these activities

Many marketing systems are reviewed in the literatures. From review of the literatures it can be concluded that marketing systems for vegetables are complex, and tend to vary across vegetable species, location, end use (fresh or processed), and destination (local, town, big city, or export market). However, it can be grouped into three general systems.

The first system engages a central wholesale market. This system is dominant in Taiwan, Korea, Malaysia, and Japan, and is being institutionalized in Thailand and Indonesia. It seems that with the development of an economy, this system evolves as an efficient vegetable marketing system. In case of Nepal this system of marketing operate in Kathmandu for vegetables coming from India and other countries.

The second system is the absence of any central wholesale market. Trade takes place in traditional sites in capital cities. No one person or group controls the trading. Typically, several price levels for a commodity prevail at any time. Thus, prevailing prices do not truly reflect consumer preferences. Several inter-agent transactions at the same marketing level can be observed (Librero and Rola, 2000). This marketing system still dominates in most developing economies, such as the Philippines, Thailand, Indonesia, India, Bangladesh, and Pakistan and also in Nepal.

In the third type of vegetable marketing system, farmers bring their produce to nearby markets and sell to retailers or directly to consumers. Small farmers, especially those on the periphery of big cities, practice this system. Producers have a direct link with

consumers and can adjust their produce according to consumer preferences. Farmers' markets, where producers can have a stall at minimal cost, are being set up in big cities in Indonesia and Malaysia to encourage this marketing system, which is pervasive in northern Vietnam and China. In this system, the producers' share of the consumers' price can be high, but marketing costs can also be high. For example, labor required for vegetable marketing in China accounts for about one fifth of the farm labor devoted to vegetables. The economic efficiency of this system is not clear, but it is certain that it limits expansion of vegetable cultivation. This system of vegetable marketing is prevailed in the study area.

Cadilhon et.al (2003:437) has proposed integrated model for the analysis of the vegetable marketing system. He has proposed domestic and legal factors; cultural and social factors; historical account of the area; geography and international trade policy and food market as major environment effecting agriculture marketing system. Within this environment food chain will be operating where transaction of the goods and services and interactions of the various actors occurs.

In this study, with the limited time for field work I took in consideration of national vegetable marketing policies and marketing channels into account for analysis.

3.1.3 Marketing Channel

Koths and Uhl (1985 cited in Deoju 2003) defined marketing channel as an alternative routes of product flow from producers to consumers. According to them marketing channels starts at the farmers gate and at the consumer's front door. Some of the products are processed on their way to end user while other products reach them without undergoing any form of changes. In case of the study area there are not any processing in between producers and consumers. Rather, while discussing with the consumers, they do some processing after purchase from the retailers. In their definition marketing channel is considered as alternative route, but in this study marketing channel is one which is the mainstream route for the product flows from the producers to the consumers.

Various types of marketing channels are discussed in the literatures. First, Conventional Marketing Channel (CMC) comprises an independent producer, wholesaler, and retailers. Each is a separate business seeking to maximize its own profits. Overall profits for the system remain low. No channel member has complete or substantial control over other members. This kind channel is dominant in the study areas. Kotler (1988), introduced the concept of vertical marketing systems (VMS) which comprises the producers, wholesalers and retailers acting as a unified system. VMS arose as a result of strong channel members; attempts to control channel behavior and eliminate the conflict that result when independent channel members pursue their own objectives.

"Anything that can be offered to a market to satisfy a want or need. Product that are marketed include physical goods, services, experience, events, persons, places, properties, organizations, information and ideas" (Kotler (2003) cited in Verhees 2005). This definition indicates diversity in products and distinction of products.

In the context of Nepal and the study area there are increasing numbers of vegetable marketing channels where farmers are selling their products directly to consumers or

through traditional shops or majority of fresh vegetable sold to the consumer still goes through middleman. Newly emerging vegetable marketing is an organized marketing system where co-operatives among producers play a vital role in the collection and wholesaling of their vegetables.

Singh (2005), identified four different types of marketing channels in Madhya Pradesh of India. They were 1) producers to retailers to consumers 2) producers to wholesalers to retailers to consumers 3) producers to local level collectors to retailers to consumers and 4) producers to local level collectors to wholesalers to retailers to consumers. Among them producer to wholesaler to retailer to consumer, where two middlemen are involved, was the largest chain used by 41.63% respondents of his study. In the case study area, farmers (producers)-middlemen-retailers-consumers' mode of marketing channels are most common.

The marketing channels for vegetables differ by the origin of the product. The products might come from local areas or other areas within the country, or they might be imported. Also, there are different systems for potatoes and other vegetables (Thapa and Poudel, 2003).

Thapa and Poudel, (2003), reported that farmers take their produce to the local market centers and sell either to retailers or direct to consumers at the local level. These simple marketing channels are found both in the Terai and in the hills region of Nepal. The market channels in this case are:

- Farmer-Retailer-Consumer
- Farmer –Consumer
- Farmer-Assembler-Retailer- Consumer

In a few production areas, the Agricultural Marketing Development Division of the Department of Agricultural Development has formed marketing groups in recent years. The following two channels are in use for vegetables supply from these areas:

- Farmer-Marketing Group-Wholesaler-Retailer-Consumer
- Farmer-Marketing Group-Retailer-Consumer

Vegetables imported from India are handled by commission agents who sell them to wholesalers in the Kathmandu market. Wholesalers then sell to retailers. For this the following market channel holds:

- Commission Agent- Wholesaler-Retailer-Consumer
- Farmer-Wholesaler-Retailer- Consumer
- Farmer-Assembler-Wholesaler-Retailer- Consumer

In this way there are varieties of the marketing channels depending upon scale of production, distance and sources of produce in Nepal. For the marketing of the vegetables in Nepal there are three main marketing channel followed according to the category of the vegetables (Thaplia, 2006). The leafy vegetables follow the first channel, the other fresh vegetables follow the second channel and for potatoes, onion, garlic which falls in similar category follow the third marketing channel.

- Farmer – Retailer/ consumer (leafy vegetables)
- Farmer/ Group/ Cooperative - Collection Centre - Intermediary – Urban wholesaler market - Retailer/ hawker/Indian wholesaler – consumer/exports to India (all fresh vegetables)
- India, Tibet, Bhutan – Importer – Urban Wholesale Market – Retailer – Consumer (mainly for potato, onion, garlic)

On the basis of their analysis marketing channels for vegetable crops, those are in functioning in Nepal and also relevant to this study is Farm-gate Selling, Selling to middleman and open market or direct marketing. These modes of marketing channels are discussed in chapter 6 of this report.

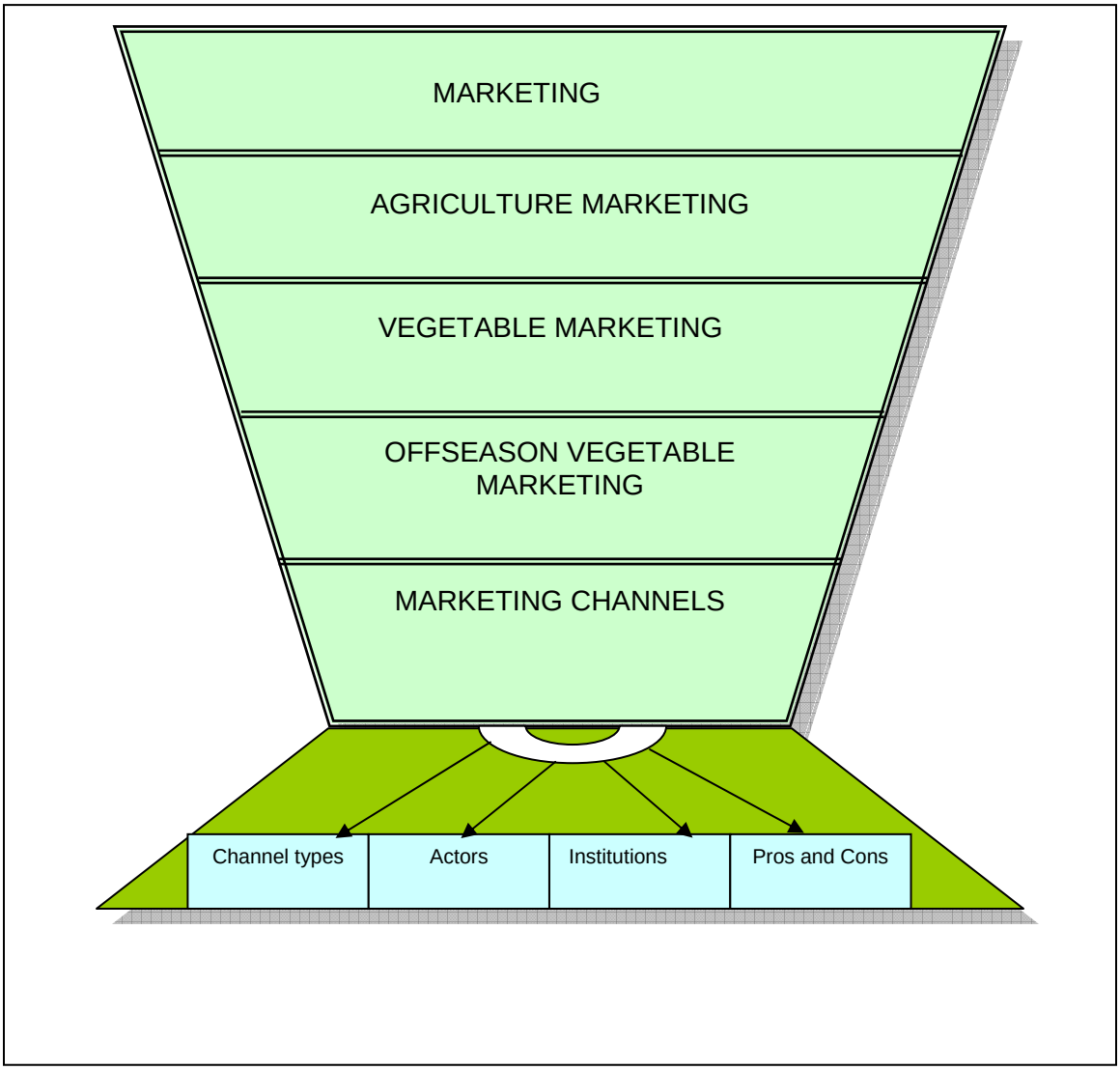

Fig 3.1 Conceptual framework for the study

3.1.4 Role of Vegetable Farming in Rural Livelihood

The concept of sustainable livelihoods is being widely used in studies on rural development and poverty disciplines. “A livelihood comprises the capabilities the assets (natural, physical, human, financial, and social capital) the activities and access to these (mediated by institutions and social relations) that together determines the living gained by the individuals or household” (Ellis, 2000). One of the important characteristics of this definition is that it looks at the connections between assets and activities which result from options people have. This idea of ‘activities as a result of options’ looks at people as active beings who make decisions on their livelihood strategies, while that of ‘innovator category and socio-economic characteristics’ in diffusion studies implies rather mechanistic relationship (Kawamura,2001).

The analysis of livelihoods does not only look at farmers’ adoption or changing the cropping system of a particular innovation option, but also considers other options as a livelihood strategy in a given context.

Capital assets analysis reveals much information about farmers’ asset status, which in turn, affects their livelihood activities. If some farmers particularly lack any one of the five assets and are prevented from engaging in activities to achieve positive livelihood outcomes, it is likely that this is the asset limiting their options for finding a root out of poverty and it is necessary to consider ways of raising the status of this particular asset. On the other hand, if some farmers are well endowed in assets but unable to engage in such activities, it is necessary to focus on conditioning factors such as social relations, institutions, organizations, trends and shocks.

Vegetable production can change the livelihood of rural farmers because the vegetable has high demand due to rapid urbanization and changing food habits, addition of new road networks which connect production areas to market, irrigation improvement, vegetable promotion by Government and NGOs, high and quick return, introduction of hybrid and improved varieties, relatively low economies of scale, micro credits availability from GO/NGOs, and institutions, cooperative marketing scheme initiation etc (Gerald, 2003). These developments are also observed in the study area.

From the perspective of Ellis, livelihood diversification by rural households to respond changing socio-economic conditions of the society is evident in Yampaphant. A family is engaged in the bundle of economic activities to sustain their livelihood. Multiple family enterprises are significantly increasing. In general cereal crops such a rice, wheat and maize provide food and vegetable farming are adopted to supplement food production which merely fulfill the household need for food and social and cultural obligations. White-collar jobs, Seasonal migration, working as laborer in agriculture and construction works are major sources of income for most of the families.

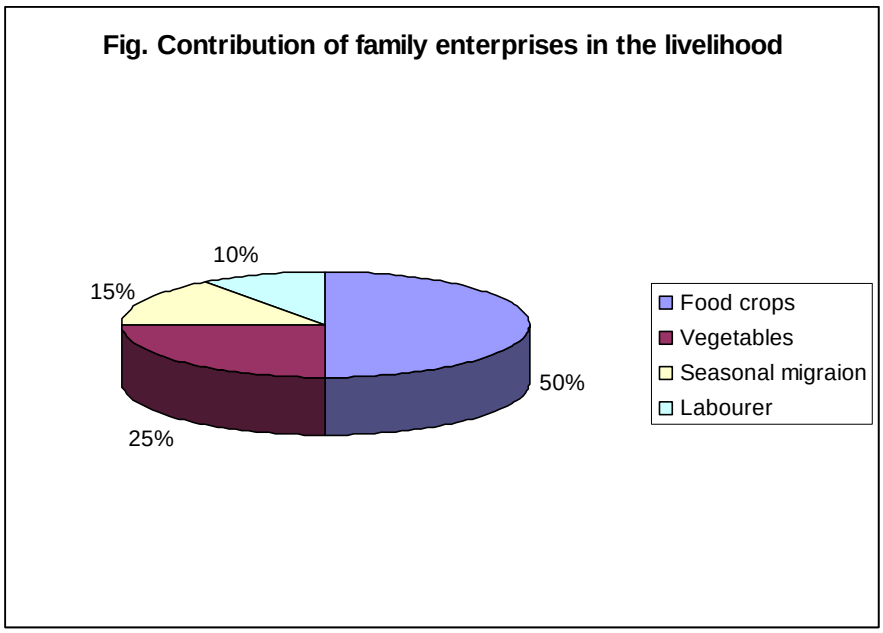

Fig. 3.2 income source structure in a household of the study area

In the study area (Yamphant) no single families were found with single job like in cities. FGD with the key informants concluded that 50 % of the household income needs are fulfilled from food production, 25 % from vegetable production, 15 % seasonal migration and 10 % are met through labor works. This is particularly relevant for food deficit families.

CHAPTER 4: AGRICULTURAL TRANSFORMATION IN NEPAL: AN OVERVIEW

4.1 Introduction

Nepal is a land-locked country located between India and China. It contains 8 of the 10 highest mountain peaks in the world, including Mount Everest (8848 m). Except for a small area of flat land in the south, the topography of Nepal is mostly hilly and mountainous. Some of its low lying areas are about 80 m meters above sea level. There is therefore extreme spatial climate variation in Nepal ranging from tropical to arctic climate within a span of about 200 kilometers. Geographically, Nepal is divided into five regions: Terai plan, Siwalik Hills, Middle Mountains, High Mountains and the High Himalayas (Table 4.1).

Nepal has a population of 23 million (CBS, 2006). Compared to other Asian countries such as India or Bangladesh, it has a relatively low population density. The population is mostly rural, with only 13.9 % living in urban areas (CBS, 2007). Population density is 176 people per square kilometer (MOAC, 2008).

The mountain and hill districts experience a range of climate types, from subtropical through temperate to alpine climates, with a wide variation in temperature and precipitation. The northwestern valleys of the country are rain shadow areas, where only minimal precipitation takes place, and mostly in the form of snow. However, monsoon rains are characteristic of the hills and the Terai of Nepal. About 6000 rivers and streams have made country Nepal, as one of the richest countries in the world.

Despite its natural beauty and enormous potential for agriculture and tourism, Nepal is one of the least developed countries in the world, with 82.5% of the population living below the international poverty line of $2 per day (World Bank 2003 cited in Adhikari 2006).

Agriculture is a main activity of the economy and this covers more than 60% of the population. About 80% of the total population depends on the forest for the daily fuel wood supply. It has large geo-climatic variations ranging from tropical to the alpine climate. Agro-ecological regions and their characteristics of Nepal are presented in table 4.1 below

Table 4.1 Agro-ecological regions and their characteristics (Nepal)

Region	Geology and soil	Elevation (masl)	Climate	Average temp.
Terai	Gently slope, recently deposited alluvium	200	Humid tropical	>25^0 C
siwaliks	Testing mudstone, siltstone, sandstone, steep slopes and weakly consolidated bedrock. tends to promote surface erosion despite thick vegetation	200-1500	Moist subtropical	25^0 C
Middle hill Mountains	Phyllite, schist's, quartzite, granite, limestone, stony and course textured soil. Conifer forests commonly found associated with quartize	1000-2500	Temperate	10-15^0 C
High Mountains	Phyllite, schist, quartzite, soil is generally shallow and resistant to weathering	2200-4000	Cool to subalpine	10-15^0 C
High Himalayas	Limestone and shale. Physical weathering predominates, stony soils.	>4000	Alpine to arctic	<0to 5^0 C

Source: CST (1997 cited in DADO Tanahun 2007)

4.1.1 Land Holdings of the Farmers

The land use pattern and land holdings in Nepal has very heterogeneous and diversity. The table below shows (table 4.2) 40.5 % of land holdings remained with the farmers who have below one hectares land holdings. Similarly, 27.5 % land is being owned by 1-2 hectares of landholders. The rest of the land goes to the group above 2 hectors. This shows that most of the farmers have small land holdings, which is considered as a big constraint for mechanization and commercialization of agriculture in Nepal.

Table 4.2 Distribution of Farm Holdings and Area by Ecological Region

Land holding	Mountains		Hills		Terai		Total	
	Holdings	Area	Holdings	Area	Holdings	Area	Holdings	Area
Landless	0.30	-	0.2	0.04	0.9	-	1.4	-
< 1 ha	7.80	3.5	37.8	17.00	23.0	10.0	68.6	40.5
1-2 ha	1.30	1.8	8.6	12.20	9.4	13.5	19.3	27.5
2-3 ha	0.20	0.6	1.9	4.80	4.0	10.0	5.1	15.4
3-5 ha	0.10	0.4	0.8	3.10	2.3	9.1	3.2	12.6
> 5 ha	0.05	0.5	0.3	3.10	1.2	10.3	1.55	13.9
TOTAL	9.75	6.8	49.6	40.24	40.8	52.9	100.0	100.0

Source: MOAC, 2007

4.1.2 Land Use for Cultivation

The land use for agriculture was increased sharply from 1971/72 to 1981/82. Because of rapid deforestation which took place due to the absence of government control as there was a sever political instability. Land use started to increase from about 11% to above 16%. After the year 1981/82 the increment rate was very slow and now it is constant at 18 %.(MOAC, 2005)

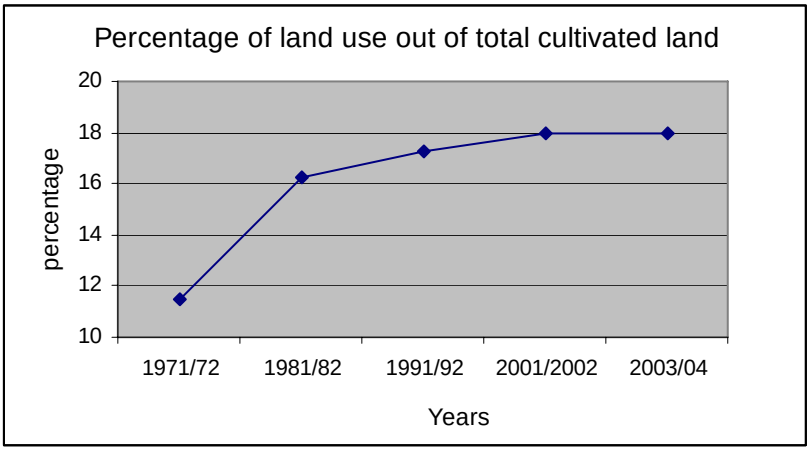

Figure4. 2 Land use for cultivation (Source: MOAC, 2005)

4.1.3 Agriculture Production Trend in Nepal

Despite the fact that Nepal depends predominantly on agriculture for its gross domestic product (GDP), the country started continuously facing acute food shortages problem. The productivity of major crops in Nepal during the early 1960s was higher than that in other South Asian countries. However, before 1990s, Nepal's agricultural productivity lagged behind that of other South Asian neighbors and could not cope the demand of food from own production. In the recent years, per capita production trend is showing in increasing trends. Indeed the agricultural productivity is far below the potential level: farming in Nepal has remained subsistence-oriented and use of costly inputs such as fertilizer, improved seeds, and year-round irrigation is low (Tiwari 2005 cited in Paudyal 2006). Since the Agricultural Prospective Plan (APP) implementation, irrigation facility has satisfactory increasing trends. The present situation of irrigated land is about 10000 hectares, which is 32% of the whole cultivated land of Nepal (MOAC, 2005). This gives the picture that more than two third of land is still based in rain fed farming. The irrigation is also a big constraint for assured farming which leads to restraining factor for commercialization.

Although priority for agriculture was considered as the first position in most of the national periodic plans, the expenditure in agriculture only started at a good level after the APP implementation. The increasing trend was continuous till 2001/02 but after that it started to fell down due to insurgency in the country. Government launched a programme "priority production agriculture credit" during this period. This program increase investment in agriculture which causes to increase production and productivity.

The positive trends in production of different crops might be due to the good investment in agriculture.

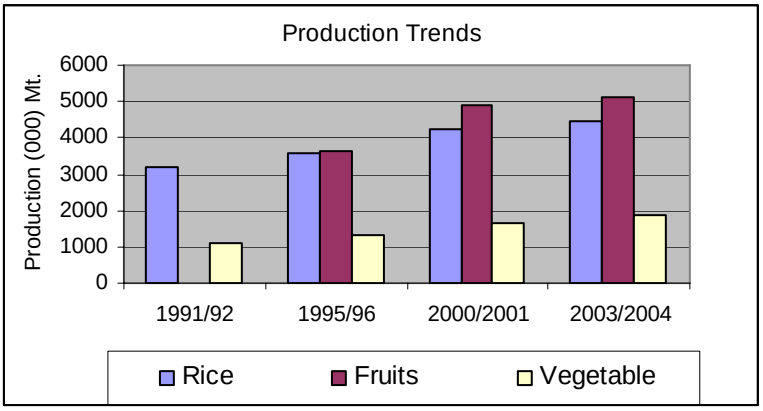

Fig. 4.3 Production Trends of different commodities in Nepal *(Krishi (agricultural)* Diary, 2006/7)

4.1.4 Growth and Development of Horticulture in Nepal

Nepal's economy is overwhelmingly dependent on agriculture. Approximately 32% of the country's GDP came from agriculture in 2000, down from 52% in 1990. Agriculture also provides a livelihood to nearly 81% of the labor force. In addition, because Nepal is a tourist destination, a significant fraction of foreign earned income is dependent on the country's natural resources. Tourism receipts in 2000 amounted to 15% of exports.

Nepal is one of agricultural country, as this sector contributes the livelihood to 76 % of the total population and 36% to the GDP of the national economy. Agriculture has been kept on the priority sector in most of the first national Five Year Development Plan. Despite these efforts, Nepalese agriculture can largely be characterized as subsistence and cereal based farming with low production and productivity and low per-capita income. The difficult physical terrain, lack of infrastructure supports, prevalence of subsistence farming, poor irrigation facilities and limited access to low cost agricultural technologies make the commercialization of agriculture difficult on one hand and high transportation cost and poor purchasing power hinder the development of the markets and raise the cost of expanding agriculture and agricultural trade on the other.

As stated above, diverse topographic features and climatic conditions in Nepal permit the successful production of a large number of vegetables. About 250 vegetable crops are grown in Nepal, of which more than 50 are common (Pun, 1987).

Awasti (2007) stated that vegetable production, productivity and growing area are increasing trend in Nepal. The trend is presented following table number 4.3

Table 4.3 Area, and production and productivity of vegetables in Nepal

Year	Area(ha)	Production(mt.)	Yield(mt/ha)
1990/91	140500	1074650	7.650
1995/96	144368	1327298	9.194
2000/01	157162	1652979	10.518
2005/06	189832	2190100	11.537
Annual growth rate	2.1%	4.97%	2.80%

Source: (MOAC, 2006 cited in Awasthi 2007)

Recognizing these facts, in mid 1990's, the Agriculture Perspective Plan (APP) was brought as a blue print of the agricultural development vision of Nepal that would work as a road map to all our plans for the next coming years.

The Government of Nepal has implemented vegetable production programs by categorizing the total vegetable area into three types of programs based on production and marketing potential. The Special Program was launched in irrigated areas with motorable roads and easy access to markets. In such areas, technology, inputs, credit, and other support were intensively provided to commercial vegetable growers by the government. The general program was implemented in other accessible areas of the country. Government support was limited to input supply and farmer training. The main objective of this program was to increase vegetable production for local consumption. A sizable vegetable area came under the Least Priority Program, in which the government provided limited extension support. This area benefited indirectly from technology dissemination in adjoining special and general program areas. Government recent strategies as indicated in APP are as follows-

- Government has been focusing to establishment of geographical unique production pockets of high value commodities like vegetable, fruits, milk and meat and provision of integrated package programs as a project form.
- Targeting the demand of vegetable, fruit, meat and milk product of urban areas and market centers.
- Cooperatives and contact farming are in focus to encourage with a policy to ensure ownership.
- Commercialization policies are under way to make private sector more participatory to substitute imports and increase the commercial product of exportable production.
- To make promotion of agricultural business the increased participation of cooperatives to supply the seeds (improved/hybrid), to provide micro credits and for collection, storage and sales of the produced goods.
- To expand markets road, suspension bridge and ropeway are in focus and market information system also considered as an essential arrangement for agriculture commercialization.
- Technology packages based on high value will be prepared and a package for enhancing farmers for entrepreneurship development will be made.

(Source: The 11th plan, 2008)

The plan is based on more demand driven (market led) approach than the previous plans, which was production oriented. The plan has clearly identified the rule of the game "competitiveness"; the competitiveness through comparative advantage in production and competitiveness through the marketing efficiency. The comparative advantage in production has been conceptualized by the production of high value crops

and commodities and their commercialization to attain scale of operation. Similarly, the competitiveness in marketing efficiency had been envisaged through promotion of agribusiness, development of market, market infrastructure and marketing system.

It is proved that there is high scope of commercialization in vegetable seeds, fresh vegetables, cardamom, zinger, tea, coffee and some other crops in Nepal. These commodities have not only scope for domestic market but also higher scope and potentiality for international markets. Realizing these facts, government has been focusing to the commercial vegetable production programs in different locations of the country. Government of Nepal launching off-season and main season vegetable production programs in hills and vegetable production programs in Terai. As mentioned in APP, the vegetable programs are concentrated in peri-urban areas, road head corridors and other area where there is more feasible. These programs are implementing in a pocket package strategy which means identify the potential pockets and give the programs in concentrated way that can show significant impacts.

To support the commercialization of vegetable, many supporting programs like establishment of collection centers, cooperative formation, wholesale and retail market establishment and broadcasting of market information from national/local radio are being practiced. Similarly, agricultural roads are also being constructed to make better connection to the pockets area with market centers.

This program has shown some positive impacts to the supply of vegetables in domestic markets. The import substitution is rapidly increasing and export of some vegetables to neighboring markets is already started. The figure below shows some positive trends of vegetable in Nepal.

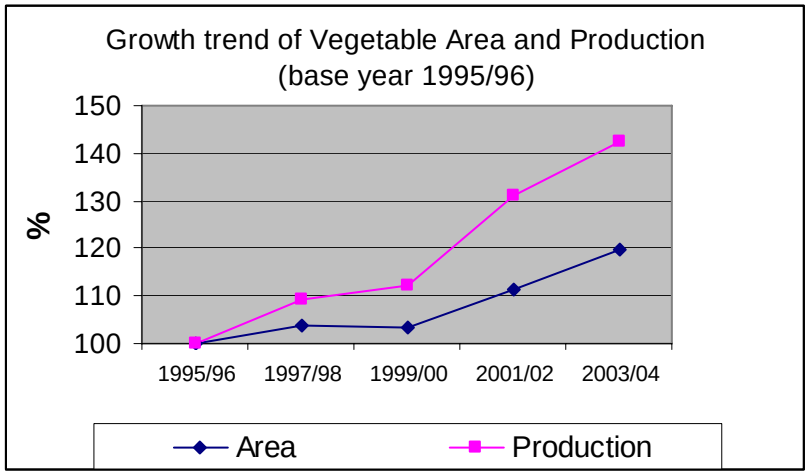

Figure: 4.4 Growth trends of vegetable area and production (MOAC, 2005)

4.1.5 Role of Women in Agriculture at Study Area

Women play an important role in the agricultural production process in Nepal. In study area out of total population 51.53 percent are women. Women are involved in all the aspects of crop production. Except heavy intermittent work like ploughing, fencing, land preparation and more technical works as fertilizer application, insecticide application and

marketing. Women are farmers too in their own right although they are not always so regarded. Women farmer importance in Nepalese agriculture is not only because of the enormous volume of work they carry out but also because a variety of agriculture activities are primarily their responsibility. In farming, the labor inputs of men are concentrated mainly during the land preparation and harvesting of crops. On the other hand, women farmers are not only heavily involved in agricultural operations, e.g. planting, weeding, manuring and harvesting but also in field preparation.
Nepalese women are still confined to their traditional role, have a lower status and are subordinate to men within socio-culture, economic, political and legal frameworks. Women are more confined to household chores and agriculture activities than are men in rural areas (shtrii shakti, 1995). Women are exploited and opposed due to the prevailing religious and cultural tradition (subedi, 1997). Women are mostly involved in Farm Yard Manure (FYM) application, planting, sowing, weeding, harvesting and post harvest operation, livestock and poultry rearing.

As a consequence of modernization in agriculture, there is a growing realization of the importance for a deeper understanding of the role of women in the context of both the farm and the household (bajracharya, 1994). The importance of marketing is increasing day-by-day due to commercialization and diversification in agriculture particularly around market area and road areas. Vegetables are considered as the high value crops as well as income and employment- generating sub- sector. These require greater attention for quick disposal in a systematic manner (Maharajan and Gautam, 1998). Nowadays, in those areas, where motorable roads are in proximity, the farmers are gradually changing their agricultural practices have been quite profitable to the farmers, who can sell their produces immediately in the urban areas. The inefficiency of the system is reflected by mismatching of production and marketing of vegetable due to which there is always a market glut and scarcity from season to season (Pradhan, 1998 cited in Piya 2001)

4.1.6 Off-season Vegetable Production in Nepal

Off-season vegetable farming is one of the potential sources of income and reliable means for the reduction of poverty and malnutrition persisting over the hills of Nepal (AEC, 2006). Off-season vegetable farming refers to the production of vegetables after or before their normal season of production by –

- Availing and using different agro climatic conditions,
- Adjusting the planting time,
- Selecting and improving the varieties,
- Creating the controlled environment by making plastic tunnels, polythene house, permanent glass-house etc

In context of Nepal, the diversified climatic conditions and the natural resource base are conductive to produce various crops including off-season vegetables. At present, more than two hundred vegetable species are grown in different climatic zones of Nepal and out of which fifty species and their varieties are grown on the commercial basis. (Awasthi, 2003)

The off-season vegetables produced within the country, especially in the peri-urban areas are marketed in the respective urban centers. However some attempts were made in past to export the tomatoes and capsicum in India and Bangladesh but due to the lack

of quantity, regularity, infrastructure facility and surplus production, these could not be accelerated in the following years. The east west highway corridor is considered as the most potential production area of such vegetables.

Hilly areas close to cities have special advantages in marketing their products and have been successful in reaping good income from the sales of the off-season vegetables especially capsicum, tomato and Cauliflower (ibid).

The market prospectus of off-season vegetables is very good both within and outside the country. Especially, in Bangladesh and northern border side markets of India. Nepal can tap these Indian markets especially for its hilly temperature off season products provided that cost and production in Nepal comes to be competitive.

The production season of off-season vegetables may vary depending upon climatic and topographic conditions of the pocket areas. However, the common season of growing of some major off-season vegetables in the hills of Nepal has given below:

Table: 4.3 common season of growing of some major off-season vegetables in the hills of Nepal

Types of Off- season vegetables	Growing season
Cabbage	Year Round
Cauliflower	January- March
Cucumber	April- November
Tomato	Year Round
Radish	January- March
Brinjal	Year Round
Summer Squash	March- May
Carrot	January- March
Swiss Chard	Year Round
Sponge guard	April - may
Bitter guard	April - may
Pumpkin	April - may

Source: AEC 2006

CHAPTER 5:OFF-SEASON VEGETABLE PRODUCTION IN YAMPAPHANT OF TANAHUN DISTRICT

5.1 Location of the Study Area

Yampaphant village, the study area is located in the Bandipur VDC, Tanahun district of Nepal. Prithvi highway pass through Yampaphant. The study area is located at 20 Km from the district headquarter to eastern the part of district and 5 km from the VDC office located in Bandipur. Study area is located at 425 to 500 masl (DADO Tanahun 2006).

Geographically, Tanahun district has expanded from 83^0 57' to 84^0 34' eastern longitude and 27^0 36' to 28^0 05' northern latitude and consist of forty six VDC and one municipality. Based on the population density it has been divided in 13 *Ilakas* (units). The highest spot lies at an altitude 2134 masl and lowest spot is at an altitude 360 masl. Population status are shown on annexes 3 (3.2 and 3.3) and maps are shown in annexes 4 (4.1, 4.2 and 4.3)

Fig.5.1 study area Yampaphant (Bandipur) VDC of Tanahun district

5.2 History of Off- Season Vegetable Production in Yampaphant Village

In Yampaphant village, concept of commercial vegetable production was introduced by the Lumle Agriculture Center(LAC) through its outreach research program. In 1987 LAC established vegetable production demonstration in the village (DADO 2006). During that time farmers were trained on vegetable production technology and they were freely

supported by seeds, fertilizers and other inputs to the selected farmers. Importance of vegetable in their diet was also taught to them. As a result a few farmers initiated vegetable farming in small scale using improved varieties and production technologies. These farmers started selling their surplus product to the neighbors and after few years they also started carrying their surplus vegetables in the nearby market. Looking at these farmers, others also started growing vegetables. Agro- vet center was established in the village to supply seeds, fertilizers and plant protection chemicals. About 15 farmers started growing vegetable for selling in the market till 1990s.

From 1994 when number of vegetable growers slowly increased up to 30 households, middlemen from the market started approaching farmers to get their vegetables in the village. It was also good for the producers that they were able to sell their produce in their own village. Many farmers started selling their vegetables to these middlemen. These middlemen collect the vegetables from collection centre and transport to the distance market.

In the years of 1994/95, few innovative farmers formed a group of vegetable growers in the village. Three of them were given the responsibility of marketing vegetables. LAC constructed collection center where galvanized sheet, weighing machine and other facilities were provided to the farmers groups in Yampaphant. Group members practiced to collect their vegetables in the collection center. The group farmers started to collect their vegetables in collection centre and transport to wholesale market in Pokhara city.

Some young farmers in the village encouraged and started assembling vegetable on individual basis. And also middlemen from Pokhara and nearby market places (Dumre, BeshiShahar, Dule Gauda, and Damauli) were gathered in the village to collect and transport the vegetables to the distance market. About 8-10 middlemen were active during that time.

After political change of Nepal during 2006/7, farmers in the Yampaphant village came together and discussed on the possibility of forming vegetable cooperative in the village. Two schools of thoughts surfaced. Some of the farmers wanted to establish new collection center at the end of the village while others opposed this idea. They were in favor of improving existing collection center and utilize the facilities. Informants reported that those farmers who supported the idea of construction new collection center at the end of the village. As a result, farmers were divided into two groups more or less in a same number.

Sixty four farming households came together and established a cooperative ' Andhimul Fresh Vegetable Production Cooperative Ltd". Rest of the 86 households who were of the mixed political background provided continuity to the existing 'farmers-middlemen-retailers-consumers mode of operation.

5.3 Caste and Ethnicity

Based on the Hindu mythology, Nepalese population is divided as lower and upper caste. Those communities who were affected by Hindu religion are called as ethnic group. According to Bandipur VDC (2008), in Yampaphant village 71 % of the total populations were from upper caste (*Bramhin and Chhetri*); 20% were from ethnic people and remaining 9 % were from the lower caste people (*Vishwokarma and Sarkee*).

Table: 5.1 Caste/ Ethnicity in the study area

Cast/ Ethnicity	Casts	Total household in study area	percentage
1. Upper caste	*Bhramen*	91	61
	Chhetri	15	10
2. Ethnic caste	*Gurung*	14	9
	Magar	17	11
3. Lower caste	*Viswakarm*	6	4
	Sarki (nepali)	7	5
Total		150	100

Source: Bandipur VDC (2008)

5.4 Education Level

Data on education level of the respondent indicate that 20 % were illiterate, 60% can just read and write having no any formal education, 12 % have got school level education and 8 % have college level education.

Table: 5.2 Education level (household head)

Social Groups	Illiterate	Educated			Total
		Literate	School	Collage	
1. Upper caste	2	12	2	2	18
2. Ethnic caste	2	2	1		5
3. Lower caste	1	1			2
Total	5	15	3	2	25
Percentage	20	60	12	8	100

Source: Own study

5.5 Community Resource Centers

There is one Secondary level school in the village and one child care center run by government. The village has rural road of five km. Study area has irrigation facilities with the paved canal of 3 km length. Similarly, electricity is available in the study area. For communication Nepal telecom(NTC) has provided five lane line and some youths also have cell phone which is more recent development. A Livestock and Agriculture Service Centers (LSC and ASC) are located in the VDC headquarter which is 5 km from Yampaphant. (Table 5.3)

Table: 5.3 Community resources in the study area

Community Resources	Availability
Secondary school	1
Grammen (villages)Agriculture Road	5 Km
Electricity	All households
Dairy cooperative	1
Child Care center	1
Irrigation	3 km
Telephone	5
LSC/ ASC	5 km far, *Ambu* VDC
Andhimul cooperative	1
Yampa Community Forest Users Groups	1

5.6 Food Sufficiency Status

Food self- sufficiency status of the sample households was studied. Data shows that of the total households under study 12 % of the population were food sufficient only for less than 6 months, majority of the people (68%) were food self- sufficient for 7-11 months and only 20 % of the households were able to produce food for 12 months or more. This data indicates that 80% of the households are food deficit who needs to purchase food from the market for food deficit months.

Table: 5.4 Food sufficiency level

Food sufficiency level	< 6 months		7-11 months		>12 months		Total
	No	%	No	%	No	%	No
1. Upper caste		0	15	88	5	10	20
2. Ethnic caste	2	67	1	6			3
3. Lower caste	1	33	1	6			2
Total No	3		17		5		25
%	12		68		20		100

Source: Own study

5.7 Land Holding

Majority of the people have small land holding. 52% households have less than 0.5 ha land where as 28 % of them have 0.6 to 1 ha and only 20 % of the households have land holding above 1 ha. From the group discussion with the farmers, there were no landless household and only two households have more than 2 hectare of land in the study area.

Table: 5.5 Land holding size

Social Groups	Land holding (ha)						Total HH no
	.25 - .5		.6- 1		> 1		
	HH no	%	HH no	%	HH no	%	
1. Upper caste	10	77	5	71	5	100	20
2. Ethnic caste	1	8	2	29			3
3. Lower caste	2	15					2
Total	13	100	7	100	5	100	25
Percentage	52		28		20		100

HH: Households Source: Own study

5.8 Market Centers and Their Distances

Major market centers for the vegetables of the study area were mostly cities located in the vicinity of the Yampaphant. Dumre, Damauli, Munglin, Beshi Shahar, Khairenitar, Dulegauda and Pokhara are major market centers which have black topped permanent road.

Table: 5.6 Major market centers

Market centers	Distance from Yampaphant (Km)	Type of road
Dumre	6	Blacktopped
Damauli	23	Black toped
Beshi Shahar	50	Blacktopped
Dulegauda	46	Blacktopped
Munglin	19	Blacktopped
Khairenitar	43	Blacktopped
Pokhara	70	Blacktopped

Source: DADO Tanahun (2008)

5.9 Production Aggregation*:*

The most fundamental challenge for small holder was to synchronize the production time among them in such way that traders can collect the product in sufficient amount to reduce his/her transportation cost. Aggregation requires that large numbers of smallholders produce uniform commodities and coordinate to link with traders at specific times and places. They grow same crops as every one else in their areas. They all plant and harvest at the same time.

Table: 5.7 Farming style and marketing practices at study area

Number of farmer	Total percent	Nursery for off season cucurbits	Transplanting	Crop protection From insect and pest	Harvesting	packaging method
24	96%	Nursery 1st week of Dec.	1st week of Jan.	Pesticide used	Last week of march to July ,Aug.	Bamboo basket and jute bag

Source: Own study, 2008

5.10 Cost of Cultivation: As the integrated and mixed farming system prevails in the study area, the recording of all fixed cost was not practiced by the small holders. Therefore, the variable cost items were included in the analysis of the cost of production. Most of the farmers use their family labor for cultivation to harvesting and which was included in calculation by estimating their contribution.

Table: 5.8 Cost of cultivation of off season cucurbit vegetables and gross income in study area (year 2008 mid. Aug.)

crops	Cost of cultivation Rs/0.05 ha.	Yield/0.05ha.(kg)	Average price /kg	Gross income (Rs)	Remark
Bitter gourd	3000	900	10.33	9297	
Sponges gourd	3000	900	10.33	9297	
Cucumber	3000	600	19.00	11400	Harvesting period March to July
Pumpkin	2000	600	10.60	6360	Harvesting period March to July
Total					

Source: Compilation of information (own study)

5.11 Average Farm Gate Price: Results shows that price was high in March and gradually decreases onward each month. Prices are shown below to compare with the price given by Kalimati Fruit and Vegetable Market at Kalimati, Kathmandu (National vegetable market place).

Table: 5.9 Average farm gate price of offseason cucurbit vegetable in Yampaphant, Tanahun (by mid. Aug.2008)

crops	Average price (Rs.)in						
	March	April	May	June	July	Mid. of August	Rs / kg
Bitter gourd	20	15	10	7	5	5	10.33
Sponges gourd	20	15	10	7	5	5	10.33
Cucumber	25	25	20	15	10	-	19.00
Pumpkin	15	15	10	8	5	-	10.60

Source: farmer's diary and questionnaire (own study)

Table: 5.10 Average wholesale price of cucurbit vegetable at Kalimati fruit and vegetable market Kathmandu (14 April 2007 to mid. April 2008)

crops	Average price (Rs.) in						Total	Average price Rs / kg
	March	April	May	June	July	August		
Bitter gourd	36.39	25.86	14.38	14.17	20.01	25.66	137.47	22.91
Sponges gourd	35.36	28.44	14.85	18.89	20.09	20.02	137.65	22.94
Cucumber	29.08	13.66	10.67	16.16	14.04	15.08	98.69	16.44
Pumpkin	11.49	10.55	9	13.54	13.59	17.89	76.06	12.67

Source: KFVMDB 12 April 2008

5.12 Cropping Pattern

Three types of cropping systems are prevailing (Thapa and Poudel, 2003). In hills areas of Nepal namely, maize-based, rice-based, and vegetable-based. However, the vegetable-based cropping patterns are important for farmers in the study area since vegetable farming provide cash income required for the family. Major crops grown in the monsoon season includes paddy in the flat terraces, maize in the sloppy un-irrigated areas and other land where water is not lodged, off-season vegetables such as tomato, cauliflower and cabbage are grown. Similarly in the winter season farmers produce potato, leafy vegetables, onions, garlic and wheat. Winter crops are seasonal. Farmers produce cucumber in the early spring and followed by off-season cucurbits such as bitter gourd, sponge gourd, green pumpkins and egg plant to supply in the cities as off-season vegetable.

Table: 5.11 Major cropping systems in the study area

First Crop (Winter)			Second Crop (Spring)			Third Crop (Monsoon)		
C	P	H	C	P	H	C	P	H
Wheat	Nov	March	Egg Plant	Feb.	April to	Paddy	July	Nov.
Radish	Jan.	March	Cucumber	Dec.	March	Maize	May	Aug.
Potato	Nov.	March-April	Bitter Gourd (Cucurbits)	Dec.	March	Tomato		
Onion	Dec.	April	Tomato			Caulis	Sept.	Jan.
Garlic	Nov	April	Sponge Gourd	Dec.	March	Cabbage	Oct.	Feb.
			Bitter Gourd	Dec.	March			
			Pumpkins	Dec.	March			

C: Crop; P: Planting Month; H: Harvesting Month

5.13 Cropping Intensity (CI)

It refers to the percentage of the total land used in a year. In the study area it was found that average CI ranged from 250 to 300 % depending on the availability of the irrigation water particularly during winter and spring seasons.

5.14 Planting Materials

Seed is the primary planting materials for majority of the vegetable crops. In the initial years of vegetable cultivation, farmers were using seeds of local varieties produced in their own field. Later after 1990s they started growing other improved and hybrid variety by purchasing seed from outside. In the recent years farmers were using hybrids varieties which are high yielding and resistant to the external environment. These hybrid seeds are availed to the farmers by agro-vets which come from the India based multinational companies.

5.15 Soil Preparation

Human labor is used for soil preparation in the study area. Land is prepared by pulverizing soils to allow easier root penetration, to facilitate mixing manure and fertilizer, and to help destroy harmful insects and pests. Crops such as cress, spinach, fennel, fenugreek, garlic, onion, and coriander are sown on sunken beds, and crops such as cauliflower, cabbage, broad leaf mustard, potato, radish, tomato, chili, and eggplant are planted on raised beds.

5.16 Planting and Nursery Management

The choice of planting technique is influenced by factors such as the type of vegetable, the schedule for marketing, the desired yield, and the shape, size or weight of the product. For example, carrot, radish, turnip, spinach, cress, coriander, celery, beans, and okra are sown directly. Eggplant, cauliflower, broad leaf mustard, chili, cucumber, and tomato are transplanted. Cauliflower, eggplant, and chili are also replanted for delayed production.
For the off-season vegetable seeds such as cucurbits are grown on poly pot inside the plastic tunnels.

Nursery seedbeds are generally preferred near the residence or in a safe corner of the main field. The nursery soil is given a fine tilt and weeds, plant debris, pebbles, chaff, etc., are removed. After preparing raised (in summer) or sunken beds (late winter), 2-5 kg/m^2 of well decomposed compost is mixed with the nursery soil. Seeds are usually broadcast and covered with a mixture of soil, ash, and compost.

5.17 Irrigation

The timing and quantity of irrigation water to be applied are influenced by conditions such as the type of crop produced, type of soil, temperature, stage of plant growth, etc. In Yampaphant, the soils are silt loam so both appropriate irrigation and drainage methods are important for successful vegetable production, especially during the monsoon and late winter seasons. Good drainage is essential in rice- based vegetable cropping patterns and for rainy season vegetable production. Crops such as cauliflower and cabbage, which are highly susceptible to high soil moisture, are planted on raised beds.

5.18 Soil Fertility Management

Farmers in the study area depend primarily on organic manure, either compost prepared from locally available organic materials or farmyard manure. Large amounts of both types are applied at the time of land preparation. In addition, farmers also use wood ash, cattle urine, leguminous crops, mulch, recycled weeds, etc., as part of soil fertility maintenance. Once farmers started growing vegetable commercially use of the chemical fertilizers has been increased. From the study, it was found that majority of the farmers apply 6 kg of Urea; 4 kg of DAP and 3 kg of Potash per ropani (0.05ha.) of land in addition to the traditional organic matters.

5.19 Weeding and Other Cultural Practices

Weeding is mostly done manually and no herbicide is used. Weeds are fed to animals or composted depending upon the distance of the farm from the household, the type of animal raised and the quantity and type of weeds gathered.

5.20 Plant Protection

Traditional practices used by farmers to minimize crop losses are use of resistant varieties (e.g. Hybrids), mixed cropping pattern, adjustment of planting time and use of wood ash, cow dung slurry, diluted cattle urine, and plant extracts.

Vegetable growers have traditionally practiced biological methods to control insects and diseases in vegetables. For example, when garlic, onion, carrot, ginger, basil, chive, and coriander are inter-planted with Cole crops and other vegetable crops, the incidence of feeding and sucking insects on vegetable crops is low. Mixed or companion crop planting also promotes the population of predators of most harmful insects. The following traditional intercultural practices are reported to control insects:

- Tobacco leaf extracts and washing soap solution for aphids and smaller sucking insects.
- Garlic, clove extract, and kerosene oil to prevent caterpillars, cutworms, and aphids.
- Leaf and leaf extracts of chinaberry as an insect repellent.
- However, such practices are being rapidly replaced by indiscriminate use of pesticides, causing concerns for public health and the environment. Common insecticides used in the study areas are- Malathion, BHC, DDT for insect control and crynoxil gold, Dithenium 45, Dymethorate 35EC, Novan, Hexcolon,Cerelation etc. were used for disease control.

These practices are taught to the farmers by extension worker from DADO Tanahun.

5.21 Moisture Conservation and Management

Farmers also practice moisture conservation methods, such as the use of residual soil moisture, shallow plowing, mulching, household waste water, etc. During the monsoon months, when precipitation is very heavy, farmers use raised beds separated by trenches for drainage. The study area has traditional irrigation system later improved by

District irrigation Office during 1995. Therefore in the study area there is year round irrigation facilities for majority of the lands.

5.22 Harvesting

Harvesting vegetables usually requires more labor than harvesting other food or cash crops. Most vegetables are harvested in more than one batch. Rainy periods and early morning hours are avoided for harvesting. Harvesting is done manually and farmers use local tools such as *Sikel*, spades, cutting knife etc. Usually bamboo baskets called *Dokos* are used for transporting vegetables in the collection center and market.

5.23 Processing and Storage

Usually in the study area, processing and storage of vegetables are not practiced by the farmers. They sold the vegetables on fresh to the consumers and to the middleman. Lack of storage and chilling facilities in Nepal has created opportunity for the farmers in the hills to sell their vegetables as off-season.

5.24 Credit Support

Results show that out of 25 households, 5 households (20 %) invest for this enterprise by taking production credits from Agricultural Development Bank Ltd (ADB Ltd.). ADB Ltd. is only one credit provider in the study area to provide loan to farmer for vegetable farming. Farmers need collateral to utilize the credit facility from ABD Ltd. and they should go to district head quarter (Damauli) to proceed for loan. Farmers experiences indicate that it is not profitable for farmers to take small amount (< Rs, 50000) of loan from this bank because it takes lot of time to complete all process to get loan and high expenditure for frequent travelling from project area to district head quarter made farmers reluctant to use bank facility. Thus, Farmers used to take credit either from neighbors or village landlords with high interest rate (24-36% per annum).

Table 5.12. Credit through Agriculture development Bank in Yampaphant

purpose	Number of farmer	Credit amount Rs. in '000'	Interest rate %
Vegetable production	5	200	10

Source: Own study

5.25 Labor Availability, Supply and Vegetable Farming

In the study area most of the activities are done manually without the use of machines. They use family labor and sometime hired labor as per of the need. Community mutual assistance for labor (*Parma*) does not exist in vegetable farming rather *Parma* is practiced only for cereal crops.

Ali et al, (2000 cited in Paudyal 2006) revealed that vegetables are more labor intensive than cereal crops. About 205 additional labor days were required to cultivate one hectare of vegetables in one season. This is equivalent to about one additional year-round job. The same pattern can be observed in individual crops. The conversion of one hectare of cereal land to vegetables will generate in two seasons about two labor jobs on a yearly basis. In the same line he further explained production cost was about three times higher in vegetables than in cereals. Despite excluding costs of family-owned resources, such as labor and manure, the proportion did not change. The high costs may be one of the major constraints in vegetable production. One similarity in vegetable and rice cultivation was that labor and fertilizer were the major cost items in each case. Labor shares in total cost, however, were lower and the shares of marketing, protective structure, and pesticides were substantially higher in vegetables than in cereals.

Kleinhenz, (1997) reported that vegetable production in tropical lowlands was estimated to be as much as five times more profitable than rice production on the same piece of land. Profitability of crop management technologies for vegetable production primarily was depended on the availability of labor and on the level of mechanization.

5.26 Change Agent / Extension and Vegetable Farming

In the study area extension activities are carried out by junior technician (JT) and junior technical assistant (JTAs) stationed in the Agriculture Service Centers (ASC) in the VDC headquarter 5 km from the Yampaphant. Training, demonstration, mini-kits and Integrated Pest Management (IPM), Farmer Field School (FFS) and farmer's observation tours are major extension activities carried out by extension agent in Yampaphant village

Hossain, (2005) found that extension agents contact significantly correlated with participation of women in income generation activities such as vegetable farming, cattle rearing, fish culture poultry rearing etc. Weinberger et al, (2005) explained high quality, sustained technical assistance is crucial to the success of commercial fruit and vegetable production, especially for farmers with little experience growing these crops. Cristoplos, (2003) paper indicated the present role of extension as it can contribute to creating and supporting opportunities for the poor through increased agricultural production/productivity and access to employment. Options for enhancing production and labor markets through technological change include identify their technology-related requirements and to select appropriate sources of advice, inputs and credit supply.

Agricultural extension: assistance to farmers to help them to identify and analyze their production proems and to become aware of the opportunities for improvement (Adams, 1982:xi cited in Leeuwis 2004)

5.27 Attitude and Vegetable Farming

Due to the promising price of vegetable crops and the basis of livelihoods, farmers in the study area were found positive to adopt the new technology on vegetable farming.
Majority of the respondents said that their positive attitude towards vegetable farming is concerned with the availability of the markets, seeds and higher prices in comparison of the food crops.
Hossain (2005) found that positive attitude of respondent was significantly correlated with participation of women in income generation activities such as vegetable farming, cattle rearing, fish culture poultry rearing etc. He further explained farm size, family income, agriculture knowledge, credit received, Daily time use and attitude towards participation were significantly correlated with participation of women in income generation activities.

Box 5.1

Mukti Nath panta is an active off-season vegetable grower in study area, according to his own word "I migrated here (Yampa) from *PHUJHEL, GORKHA* in 2048 BS, (1991) and then got remarried after the death of wife. My first wife died in 2050 BS(1993) and I have 2 daughters from her. Now I have altogether 4 daughters and a son; all of my children go to school. My eldest daughter is studying to become a STAFF NURSE.
Including schooling fees for my children my monthly expenditure comes around NRS10, 000/- and I manage all of it by selling vegetables and milk. I've been growing vegetables since 2049/50(1992/1993) Back then I used to take a *DOKO* full of vegetables to *mugling bazaar* and sell them. From the profit, I bought 4 *Ropanis* of irrigated land. Right now I have 2 buffaloes and a cow. I have taken nothing from my parental properties. Whatever I have is from vegetable farming. It has helped us live happily and even my wife and children love working at fields"

Interviewed with Mukti Nath Panta, Yampaphant, Tanahun
18 Aug. 2008

5.28 Risk Factors

In Yampaphant village major risks were concerned with the incidence of insect pests, rainfall, frost and political instabilities.
Weinberger et al (2005) indicated production of horticultural crops is often more risky, because these crops are much more costly to produce per hectare than traditional crops, and yields and prices are more variable than for staple crops. Resource-poor farmers may not attract. Ali (2003) indicated that the probabilities of losing money in vegetable cultivation are higher compared to such in rice. Therefore, vegetable cultivation is not risk-neutral, and resource poor farmers may not be in a position to take the risk of losing money.

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5.29 Problems and Constraints

In the study area farmers grow same crops as every one else in their area. They all plant and harvest at the same time, they all have to sell at rock bottom price. They don't check what special crops have demand in the market.

Availability of the quality seed, fertilizers and other inputs in time was found another problem in the study areas.

In the study area major problems and constraints to vegetable farming are concerned with the effective measures by using locally available technologies in an organic way to control insect pest and rural transportation system to bring vegetables in the road head.

Schnitzler and et al (1997 cited in Paudyal 2006) indicated that problems faced by the farmer were unfavorable climate such as too high night temperature, the presence of disease and pests and low availability of water for irrigation. Dijkstra, (1997) indicated despite the severe problem of pest and disease, horticulture corps was shown as a successful means for income generation. In the same report he also indicated that farmers were facing not only pest and disease problem but also a high cost and quality problem of inputs such as seeds, fertilizers and pesticides.

Tiwari, (2005) explained that the arid condition of the land and lack of irrigation facilities allow farmers only inadequate production from their farms. In addition, shocks such as heavy snowfalls and hailstorms damage standing crops. Similarly, frequent earthquake tremors, floods, and landslides take away their cultivable land, and progressively cause soil structure degradation. There had been several instances of a late monsoon and prolonged drought which is also affecting in the eastern regions as well as western region of Nepal.

CHAPTER: 6 DISCUSSION

6.1 Marketing Channel

Singh, (2005) identified four different types of marketing channels in which there is involvement of 1-3 middlemen in the entire process of vegetable marketing in Madhya Pradesh of India. They were 1) producers to retailers to consumers 2) producers to wholesalers to retailers to consumers 3) producers to local level collectors to retailers to consumers and 4) producers to local level collectors to wholesalers to retailers to consumers. Among them producer to wholesaler to retailer to consumer, where two middlemen are involved, was the largest chain used by 41.63% respondents of his study. Although in South East Asia marketing channels are rapidly jumping from traditional shops to supermarkets and hypermarkets, the great majority of fresh foods and vegetables sold to the urban consumer still go through wholesale markets (Cadilhon, 2003).

In study area, the well organized marketing channels described by these authors were not exist. Marketing of vegetables are carried out either farmers individually (*Doke)*, or through cooperative and selling to the middleman and directly selling to the retailers.

6.1.1 Transportation Access and Vegetable Farming

In the study area more than 85 % of the vegetables are sold and 15 % are used for home consumption and gifts to the neighbors. The farmers were practicing the transportation of vegetables in local means (Dokos) and the collected vegetables were transported to distance market by van, bus hood and trucks. (Project photos are attached in 6.5, 6.6, 6.7 of annex 6).

Omiti et al (2004) indicated that about half of the vegetables produced by farmers in Kakamega were consumed at home. The remaining half were sold either at the farm-gate to the middlemen or in the local markets. Due to high marketing costs such as on transport, access payments and other local authority charges, majority (50 per cent) of the farmers were selling their vegetables to middlemen at the farm gate. Transport was another significant constraint Kakamega farmers face in vegetable production and marketing.

Dijkstra (1997) indicated in Taveta of Kenya 74% of the respondents with access to irrigation water sold horticultural commodities but all the horticulture growing area were not accessible to transportation facility and farmers of that area still continued growing horticultural crops.

One of government policies in the 11th Plan in Nepal is to improve the agricultural marketing system through government and private sector participation (NPC, 2002). The Plan recognizes that unless appropriate marketing infrastructure is developed and other related support is provided, it will not be possible to increase vegetable production and consumption (TIP, 2006). Marketing of vegetables in the study areas are carried out in the following ways.

6.1.2 Farm-gate Selling

This is not a prominent market practice. However some farmers sell their vegetables to the buyers at the farm- gate. In this mode of marketing buying and selling of vegetables and other goods may be on an individual basis at the farm gate. Buyers go to the farm, usually at the fixed time given by producers or any time without any notice. In case of fruits, sometimes, the produce can be sold “on the tree” or “in the field” and the buyer arranges for its harvesting.

In the study area farmers collects their vegetables in their collection centre and buyers purchased their produces from these collection centers. There are two types of farm-gate selling one is unorganized farmers collection centers Yampaphant and other organized farmers (Andhimul fresh vegetable producer agricultural cooperative Ltd.) Yampaphnat. Comparatively farm-gate price is more in organized farmer’s collection centre than the unorganized farmer’s collection centers. Findings shown below(table 6.1 and 6.2)

It is found that, there are differences in the farm gate price of fresh vegetable in organized and non organized farmers groups. An organized farmers group is getting Rs.0.50/kg more price than their non organized colleague. The middlemen are also paying more money because these organized farmers are giving pressure to them. The other reason is that organized groups are giving regular supply of vegetables to the middlemen where as the supply of non organized farmers is not sure on the supply.

Table: 6.1 Average farm gate price of offseason cucurbit vegetable in unorganized farmer’s collection centers Yampaphant, Tanahun in 2008

crops	March	April	May	June	July	Mid. of August	Total	Average price Rs / kg
Bitter gourd	20	15	10	7	5	5	62	10.33
Sponges gourd	20	15	10	7	5	5	62	10.33
Cucumber	25	25	20	15	10	-	95	19
Pumpkin	15	15	10	8	5	-	53	10.6

Source: farmer’s diary and questionnaire

6.1.3 Group/ Collective Marketing

In other cases the sales are through marketing groups or cooperatives. The farmers in this case bring their produce in the collection center which is managed by farmers marketing management groups or wait for the trader at collection centers.

Table: 6.2 Average farm gate price of offseason cucurbit vegetable at cooperative Yampahant (Andhimul Fresh Vegetable Production Agricultural Cooperatives Bandipur -8 Yampaphant) 2008

crops	Price (Rs./kg)						Total Rs.	farm gate price (Rs / kg)
	March	April	May	June	July	Mid. of August		
Bitter gourd	20.50	15.50	10.50	7.50	5.50	5.50	65/6	10.83
Sponges gourd	20.50	15.50	10.50	7.50	5.50	5.50	65/6	10.83
Cucumber	25.50	25.50	20.50	15.50	10.50	-	97.5/5	19.5
Pumpkin	15.50	15.50	10.50	8.50	5.50	-	55.5/5	11.1

Source: Own study

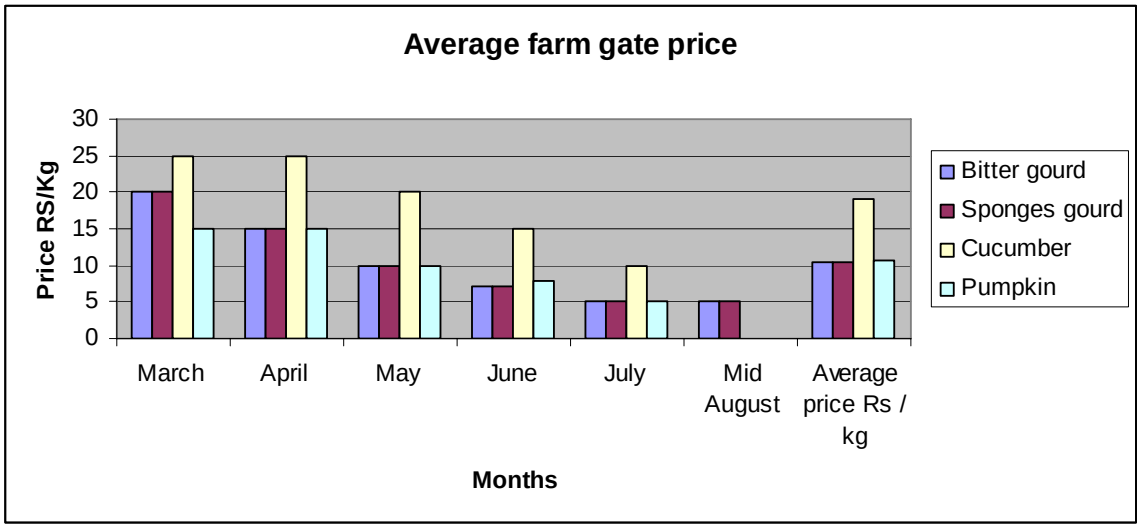

Fig: 6.1 Average farm gate price of offseason cucurbit vegetable at cooperative Yampahant (Andhimul Fresh Vegetable Production Agricultural Cooperatives Bandipur -8 Yampaphant) 2008

6.1.4 Direct Selling

In Yampaphant, 10 percent farmers preferably want to sell their products after harvesting by themselves and primary grading assuming that they will get good price for their produce. In this case after harvesting farmers do general grading and bring their produces in bamboo basket (*Doko)* in the nearby market on foot. In some cases they have permanent buyer in the *bazzar(local market)* and sometime they visit house to house carrying fresh vegetables in *Doko*.

Farmers travel from door to door to sell their produce, called *Doko* (bamboo basket designed to carry in the back of man/women). This can be time consuming and exhausting. Nowadays some farmers have improved it by using bi-cycle and motorcycle.

6.1.5 Selling to Middleman

Direct selling is being abandoned as the volume of produce increased. Farmers also found it time consuming and exhausting.

Selling to a middleman is an often adopted strategy by rural and small producers in developing countries including in Nepal. There are always surpluses of vegetables produced. It may not be possible/ profitable for producers to sell their products directly to consumers as they need to carry manually. Door-to-door selling also makes price setting difficult because farmers have little information regarding prices being charged by other sellers. In such a case they sell their products to a middleman who is willing to collect products from different producers and sell them to retailer to consumers. This provides employment and income to both producers and the middle person. Irrespective of volume a middleman collects products from producers and after getting considerable volumes he/she sells the collection by bringing it to the retailer's shop at market place. Price is generally negotiated between producers and a middleman. Selling to a middleman is also very common. A middleman collects products from farms far away from peri-urban areas and brings them to the market where demand is high.

Most of the small vegetable producers in adopt this strategy to sell their products. In the study area still there is no strong co-operative network and road access to farm is limited, middlemen are key persons to bring product into the market place.

Table: 6.3 Average selling price (middlemen to retailer) of Yampaphant's vegetable (till mid of August 2008)

crops	March	April	May	June	July	Mid. Of August	Total	Average price Rs / kg
Bitter gourd	31	23.25	15.5	10.85	7.75	7.75	96.10	16
Sponges gourd	31	23.25	15.5	10.85	7.75	7.75	96.10	16
Cucumber	36.25	36.25	29	21.75	15.5	-	138.75	27.75
Pumpkin	23.25	23.25	15.5	12.4	7.75	-	82.15	16.43

Source: information compilation (own study)

Note: According to middlemen's information they sell vegetables to retailer with 50 to 60 percentage margin in average on farm gate price. So, About 50 % price is increased on farm gate price to fixed average seasonal selling price.

1) Cucumber and pumpkin bushes are removed at the end of July and paddy were cultivated.
2) Generally, cucurbits vegetable prices go down in mid June to August because these times were regular producing season.
3) These old bushes produce small and unattractive vegetables

6.1.6 Producers to Consumers:

In Yampaphant village concept of commercial vegetable production was introduced by the scientists of Lumle Agriculture Center through its outreach research program. In 1987 LAC established vegetable production demonstration in the village. During that period farmers were trained on vegetable production and seeds and fertilizers were provided for free to the selected farmers. Importance of vegetable in their diet was also addressed to them. As a result a few farmers initiated vegetable farming in small scale using improved varieties and production technologies, farmers started selling their surplus product to the neighbors and after few years they also started carrying their surplus vegetables in the nearby market. Looking at these farmers, others also started growing vegetables. Agro-vet center was established in the village to supply seeds, fertilizers and plant protection chemicals. About 15 farmers started growing vegetable for selling in the market till1990s. During this time mode of marketing channel was direct where producers themselves use to bring their product to the consumers in the market.

6.1.7 Farmers-Retailers and Consumers:

From 1994 when number of vegetable growers slowly increased up to 30 households, middlemen from the market started approaching farmers to get their vegetables in the village. It was also good for the producers that they were able to sell their produce in their own village. But the number of middlemen during those times was very few (1 or 2 persons). Many farmers started selling their vegetables to these middlemen. But still some of the farmers were taking their vegetables by themselves in the market to the consumer directly

6.1.8 Producers-farmers' Group- Retailer and Consumers:

In the years of 1994/5, few innovative farmers formed a group of vegetable growers in the village. Three of them were given the responsibility of marketing vegetables. LAC constructed collection center where galvanized shed was constructed and weighing machine was provided to the farmers groups in Yampaphant. Group members decided to collect their vegetables in the collection center. The collected vegetables then taken to Pokhara city where they had contact with the retailers there. This kind of channel could operate only for 10 months. (respondents' information)

Since, vegetables market in Pokhara opens early in the morning 4 am and closes at 10 am, these farmers were supposed to bring their vegetables in the road head as early as 3:00 am to catch the buses going to Pokhara. During that time Nepal was facing frequent blockade and insecurities with the Maoist conflict. Since farmers did not have their own means of transportation, they finally decided to dissolve the group.

6.1.9 Farmers-Middlemen-Retailers-Consumers:

A new form of marketing channel developed. Some young men in the village started assembling vegetable on individual basis and also middlemen from Pokhara and nearby market places (Dumre, Beshishahar, Dulegauda, and Damauli). About 8-10 middlemen were active during that time. Respondents reported that about 60 % of the vegetable produced in the village were sold through the middlemen and remaining 30 % were sold to retailers.

6.1.10 Farmers-Cooperative-Retailer-Consumer:

After political change of Nepal during 2006/7, another from of marketing channel evolved. Comprehensive Peace Agreement between the Maoists and the Government of Nepal was signed and peace was restored. Afterward former rebel (Maoist) became public in the village. Farmers were politically differentiated. Some farmers were also pro-Maoists. With the changing political situation and ending of the 12 years conflict, farmers in the Yampaphant village came together and discussed on the possibility of forming vegetable cooperative in the village. Two schools of thoughts surfaced. Some of the farmers wanted to establish new collection center at the end of the village while others opposed this idea. They were in favor of improving existing collection center and utilize the facilities. Informants reported that those farmers who supported the idea of construction new collection center at the end of the village, mostly were pro- Maoist where as others were from other political parties. As a result, farmers were divided into two groups more or less in a same number.

Sixty four farming households came together and established a cooperative ' Andhimul Fresh Vegetable Production Cooperative Ltd". Rest of the 86 households who were of the mixed political background provided continuity to the existing 'farmers-middlemen-retailers-consumers mode of operation. After this there are two kind of marketing in function.

'Andhimul Fresh Vegetable Production Cooperative Ltd approached DADO, Tanahun for financial support for land improvement and irrigation. DADO provided 0.40 million rupees to the cooperative as an incentive. This money was utilized by farmers groups for tree plantation in the landslide area and constructed lined canal of 1 km long. They have also constructed collection center and storage house in Yampaphant. Cooperative Manager, Mr. *Rameshwor Lamichhane* reported that from the next growing season they have planed to sell improved seeds, fertilizers and other inputs to the farmers in the village at reasonable price. In the similar way this cooperative has also determined to purchase vegetables directly from the farmers and reach to the consumers in the big cities such as Kathmandu and Pokhara. Currently, this cooperative is trading vegetables in local markets.

6.2 Mode of Marketing Channels

In Yampaphant, concept of commercial vegetable production was introduced by Lumle Agriculture Center in 1987. At that time the only marketing channel was the direct one. Producers themselves used to sell their products directly to the consumers. When the production volume was increased some local people started to work as vegetable middleman. After 1998, when farmers started to unite in to groups those middlemen intensively intervene into groups for vegetables collection. They supplied such products to the retailers in city areas. After many development interventions establishments of vegetables collection centre and transport facilities made it easy to collect vegetable and transport to the city. Farmers were formed farmers Cooperatives and such cooperative took over the role of middle man .Some farmers who are disagreed to be member of cooperative, sell their produce to middle man.

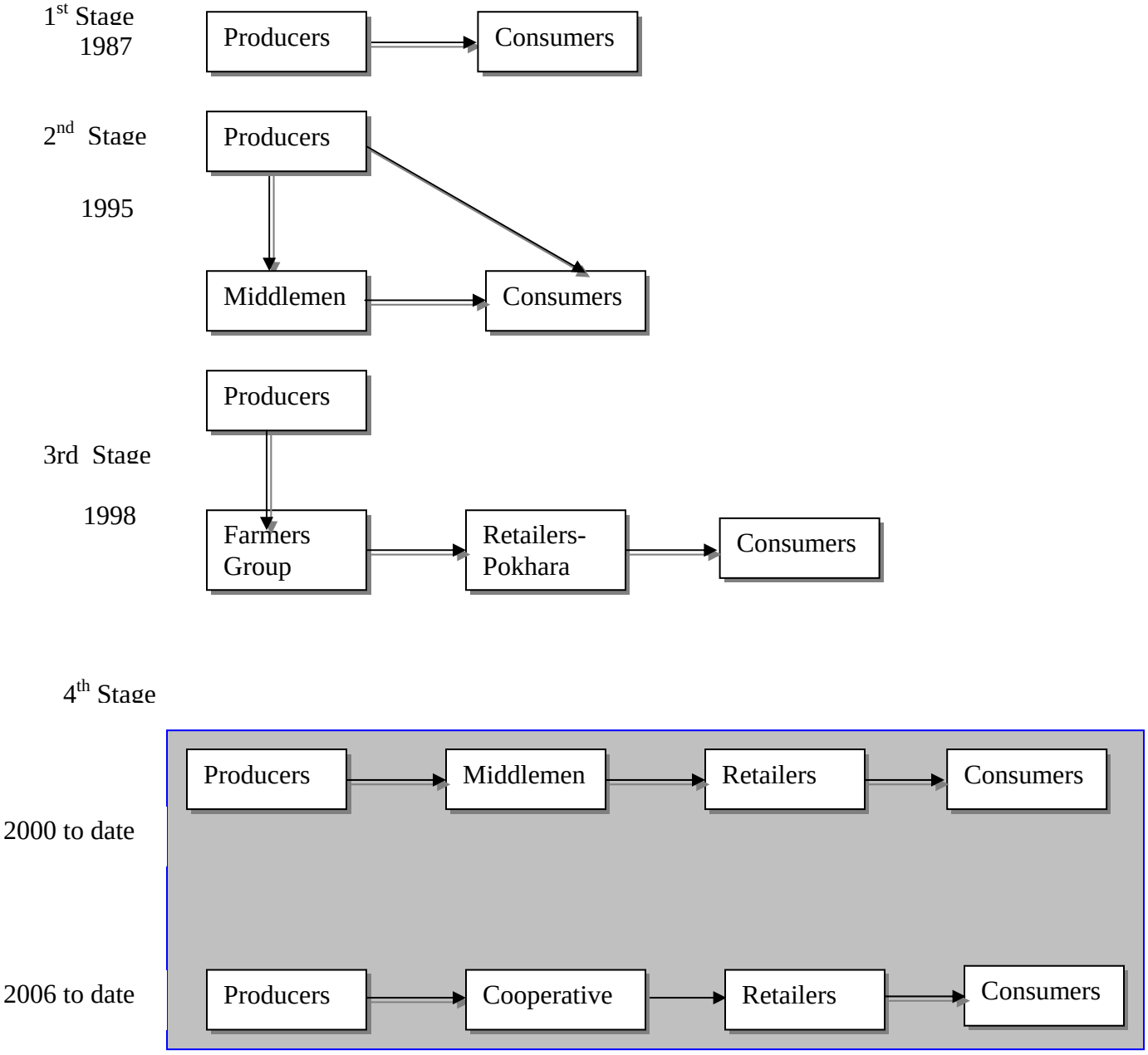

Fig.6.2 Mode of Marketing Channels

CHAPTER 7: CONCLUSION AND RECOMMENDATION

This section deals with the summary of the findings of this study and conclusion. This section also deals with some recommendation for further research.

7.1 Conclusion

Nepal has adopted Agricultural prospective plan and has given focus on the vegetable production. So it is one of the important high value crop for mid hill of Nepal, concentrated effort have been made on the development of vegetable sector but it is facing several constraints related to production and marketing, which have hindered the rapid expansion of vegetable production on sustainable basis. Considering this view on these aspects, this study was carried out to analyze the marketing channel of off-season/summer vegetable in Yampaphant, Tanahun. The specific objective were; to identify the marketing channel of off season/ summer vegetables, to estimate the marketing margin of these vegetable, to identify the constraints on vegetable production and marketing; and opportunities explored.

This study was conducted in Yampaphant, Tanahun. From this study area 25 vegetable grower, 5 middlemen, 10 retailers/ *doke* were selected randomly. Primary data was taken from producers and traders and other relevant and necessary information were collected from the secondary sources.

From the descriptive analysis of this study the majority household size of the respondents' was up to 9 Members and average family size of the overall respondent was 6 in general. This was higher than the national average of 5.44 (CBS 2006). In the particular case the average family size is greater in ethnic and lower casts. The family size of the study area varied from 3-9. From the educational attainment point of view, still there was 20 Per cent people were illiterate in the sample study.

Contributions of family enterprises in the livelihood are as 25 percent by vegetables, 15 per cent seasonal labor, 50 per cent food crop and 10 per cent labor migrations. The average land holding size was 9.72 Ropani (0.486ha.). The land holding size was varied from 1Ropani to 42 Ropani (0.05-2.1ha.).

The farmers were used only manual labor and indigenous plough for land preparation in the study area. In all site, all farmer use only family labor for production and marketing work. All farmers use chemical fertilizer and pesticides for offseason/ summer cucurbit vegetables. The source of irrigation was canal and sprinkler. In the year mid of Aug. 2008 an average production 999 Mt. and productivity of off -season cucurbits was 12-18 mt./ha. (vegetable block record of Yampaphant. presented in annex 3 of 3.4). National productivity (2005/06) was 11.537mt./ ha. (MOAC, 2006cited in Awasthi 2007)

Per unit cost of production for off season /summer cucurbits vegetable was Rs. 3000. per 0.05 ha. for bitter gourd, sponge gourd and cucumber and Rs.2000.per 0.05 ha for pumpkin.

From this study it was revealed that as per unit cost of production as same for all above listed off-season cucurbit vegetable. The market price of cucumber was higher than the other vegetable. Cucumber cultivation in 0.05 ha of land gives gross income of Rs 11400.00.

Every farmer grows same vegetable crops in their area. They all plant and harvest at the same time for their marketing easiness. Marketing channel was purely private system governed by producer and traders. Farmers sold their off-season / summer cucurbit vegetables either directly to the markets or through intermediaries. But cooperatives members collect their product in one place and sold to traders which can be termed as collective marketing by cooperatives. The means of transportation for their produce was bamboo basket and gunny bags. In the marketing channel of off-season/summer vegetable, the most common intermediaries involved were collector (middlemen) and retailer. So, mainly four types of marketing channels were prevalent in the study areas. Producer- Middlemen-- retailer – consumer type of marketing channel was most common followed by producer--retailer- consumer and the least common marketing channel was producer- collector (middlemen)- whole seller- retailer- consumer. The average marketing margin was higher in producer – consumer (self marketing in nearest market from production centre) method. Involvement of intermediaries or long marketing channel had large marketing margin and low producer share. The marketing channel is inefficient in the study area. Marketing channel differs between farmers which were governed by the farmers experience in marketing. The average marketing margins for unorganized farmers in the study area were Rs 7.00/kg for bitter gourds and sponge gourd, Rs 14.00/kg for cucumber and Rs. 7.26 for / kg. for pumpkin. In organized farmers group marketing margin was higher by Rs. 0.50 / kg than the unorganized farmers' marketing in each vegetable produce.
In vegetable production and marketing activities, both male and female play an important role. The studies revealed that female were more involved in light jobs in the field work like seed sowing, weeding, irrigation etc. Male were more involved in pesticide application, agricultural input marketing. Male and female jointly involved in decision making for the use of profit (saving).

The profitability is closely related to higher yield, lower cost of production and improved marketing as well as ensuring fair price of the produce. The research finding show that irrigation facility is not sufficient. Generally, main source of irrigation water are streamlets, these source would dried in dry season (i.e. March to June). The other constrain faced by farmer is the unavailability of pure seeds. Due to the poor quality seed in the market, farmers are discouraged in further expansion of area and further cultivation off season / summer vegetable.

The profit margin for the middlemen has been found higher (about 50%) and this is at the cost of the profit margin of vegetable grower.

7.2 Recommendations

Based on the findings of the study the following recommendations are made to the policy makers and other agencies who are directly or indirectly involved in the vegetable marketing development in Yampaphant, Tanahun Nepal.

- Establishment of cooperative owned sale counters in Damauli and Pokhara
- Expand cooperative (Andhimul Fresh Vegetable Production Agricultural Cooperative Ltd. Yampaphant, Tanahun) by encouraging all vegetable farmers to be members of the cooperatives and initiate saving and credit programme
- Involve DADO Tanahun effectively in promoting the vegetable production and marketing of small producers.

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Annexes:

Annex 1:

1.1: Check List for interview to farmers

Completed by:

Date:

Name of farmer/ Location of farm:

1. **Brief description of farm**:

Area of farm:

	owned	leased in	sharing	total
Irrigated area				
Non-irrigated area				
Total area				

Access to irrigation:

Use of inputs (equipments, labors, seed, fertilizer, herbicides)

Access over inputs?

2. Product information

Total yield

How much of your total production is sold?

Volumes sold annually

Seasonal

Off-season

Costs of production?

(Cultivation, seeds, fertilizer, irrigation, weeding and herbicides,

Pests and disease control, labor for seeding/planting, crop management, spraying, irrigation, harvesting, grading, packing)

3. Production
What are the main seasonal and off season vegetables grown for sale?

(Identify the main crop actually sold, rather than consumed and the total percentage of total output represented by market sale)

Production problems

Solutions

How farmers are marketing their vegetables?

4. Vegetable marketing

How are vegetables sold by farmers?

- Visit by trader to farm
- Selling in local market
- distance market
- Road side dwellers
- Cart vendors
- Others (if any)

- How does the farmer decide what prices to ask for?
- Who are the most important buyers of each product locally?
- Which buyers have the best reputation?
- Is there competition between buyers?
- When do buyers pay?

What are the comparative advantages for small scale vegetable growers from different marketing channel?

- Are any grading and quality standards are applied for different marketing system?
- (Size, color, moisture, variety)
- Differences in prices offered by different buyers
- Which buyers offers more price compared to others

If they sell their products by themselves how do they pack their products?

- 1
- 2
- 3
- 4

How is transportation organized and carried out?

What volumes are carried on each trip to the market?

What are the costs per package?

What are the transport problems faced?

What are the possibilities for improvement on existing strategies?

- Which factor you considered most important for improved transportation
- Type and size of packaging material,
- And how much does it cost?
- Storage arrangements, if any. Where, how and by whom?
- Is this summer/ off season vegetable crop profitable?
- Is there opportunity for selling more products?
- How can the profitability of the crop be improved?
- How do you know what price to sell your crops at farm?

1.2: Checklist for Semi- structured Interview (SSI) Vegetable retailers/*doke*

1. Information about market retailers

a. Name and Address:……

b. Age/ gender……

c. Type intermediation……..

d. How long are you with this profession?

e. Why did you select this profession?

2. Information about vegetable marketing

a) Value addition (Cleaning, grading, processing)

b) Primary buyer:

c) Secondary buyer:

d) Consumer:

e) End market place:

f) Volumes sold annually:

Name of vegetable	Bitter gourd	Spong gourd	cucumber	Pumpkin
Volume				

Selling price to retailer

Price in each month name of veg.						
Bitter gourd						
Sponge gourd						
cucumber						
pumpkin						

g) Payment mechanism (to collector/middleman and from retailers):

h) Annual transaction:

3. Price fixing process (Power perspective, conflict, negotiation, contract)

4. Relationship with the immediate buyer

a) Is there competition between sellers/*doke?*

b) How do you select buyer- Regularity, trust, more price etc?

i) Why did you select this particular buyer?

5. Information about market channel (Yes/ No)

a) Actors

Final Market place:

Consumer's behavior:

Consumer price:

How do you gather information about market? (Neighbor/ buyer/ media):

Marketing channel cost (Transportation/labor/commission/Time/packaging)

Problems in marketing (Technical, financial, institutional, social etc.)

Advantages and disadvantages of the existing market channel How it can be improved

1.: Interview with Agricultural Development Office Tanahun

Interviewer

Date

Contact

Position

Name

1) Since when marketing support extension programs are started?

2) What are they?

3) How these services are delivered to farmers ?

1.3: Checklist for Semi- structured Interview (SSI) Middlemen/wholesaler

1. Information about market wholesalers

a. Name and Address:…….

b. Age/ gender……

c. Type intermediation……..

d. How long are you with this profession?

e. Why did you select this profession?

2. Information about vegetable marketing

i) Value addition (Cleaning, grading, processing)

j) Primary buyer:

k) Secondary buyer:

l) Consumer:

g) End market place:

h) Volumes sold annually:

Name of vegetable	Bitter gourd	Sponge gourd	cucumber	Pumpkin
volume				

Selling price to retailer

Price in each month name of veg.						
Bitter gourd						
Sponge gourd						
cucumber						
pumpkin						

m) Payment mechanism (to collector/middleman and from retailers):

n) Annual transaction:

3. Price fixing process (Power perspective, conflict, negotiation, contract)

4. Relationship with the immediate buyer

c) Is there competition between buyers?

d) How do you select buyer- Regularity, trust, more price etc?

e) Why did you select this particular buyer?

5. Information about market channel (Yes/ No)

b) Actors

c) Final Market place:

d) Consumer's behavior:

e) Consumer price:

f) How do you gather information about market? (Neighbor/ buyer/ media):

g) Marketing channel cost (Transportation/labor/commission/Time/packaging)

h) Problems in marketing (Technical, financial, institutional, social etc.)

k) Advantages and disadvantages of the existing market channel

l) How it can be improved

1.4: Checklist for Semi- structured Interview (SSI)Market consumers

1. Information about market consumers

a. Name and Address:……

b. Age/ gender…….

c. Type intermediation……..

d.Payment mechanism (to retailer and *doke*):

e.Annual tentative consumption:

2.. Price fixing process (Power perspective, conflict, negotiation, contract)

i) Consumer price:

j) How it can be improved

k) Are there any bargaining at the time of vegetable purchasing?

3. Relationship with the immediate buyer

f) Is there competition between buyers?

g) How do you select buyer- Regularity, trust, more price etc?

h) Why did you select this particular buyer?

1.5: Interview with Agricultural Development Office Tanahun

Interviewer

Date

Contact

Position

Name

1) Since when marketing support extension programs are started?

2) What are they?

3) How these services are delivered to farmers ?

Annex 2: Definition of Concepts

The following definitions were used in study area as a term of reference

Market: A place where buyers and sellers interact and where buying and selling activities take place, a price that is determined for the product will prevail.

Marketed surplus: Marketed surplus is that quality of the produce, which the producer farmer actually sells in the market, irrespective of his requirements for family consumption farm needs, and other payments.

Marketing channels: the rout through which goods and services are marketed is called marketing channel.

Marketing margin: the difference between the consumer's price and producers price is known as marketing margin.

Marketing service: The marketing services, activities serve to transform the products into forms desired by consumers, deliver them to consumers at the right time and at right place.

Marketing system: consists of subsystems sectors, affected by physical, climatic, socio-cultural, technological economical and legal/political factors e.g. production sector, consumption sectors marketing channel sectors.

Efficient marketing: The movement of goods from producer to consumers at the lowest possible cost, consistent with the provision of services desired by the consumer, may be termed as efficient marketing.

Farm size: Refers to the area of farm a respondent cultivated, regardless of his tenure status.

Family labor: The family labor indicates the labor from the farm family. It is the main source of farm labor in case of small holders. Labor used on exchange basis also comes under family labor.

Household: Refers to a group of persons living together and sharing the same house, keeping kitchen and eating arrangement.

Hired labor: Hired labor is the number of labor other than family labor employed for farm work on payment basis. The wages may be in cash, kind or both.

Human labor: Human labor is one of the important cost components involved in crop production. It measured in terms of adult man day of eight hours. Human labor consists of family labor and hired labor.
Bullock labor: Bullock labor input labor input pair of bullock day of eight hours. Bullock service cost current market rate per pair of bullock per day. The ploughman separately included in the human labor.

Cost of production per unit area: it is sum of the fixed and variable costs incurred in crop production per unit area. The variable cost includes the family and exchange labor imputed at market price.

Fixed cost: Fixed cost is the cost that is not varies with size of enterprise. It includes land revenue, depreciation of tools, implements and interest on fixed assets.

Net profit: it is the difference between gross income and total cost

Total variable cost: Total variable cost is the cost incurred on item such as human labor, bullock labor, seed, manure, fertilizer, plant protection aids, transport charges etc.

Constrains: Those factors, which are hindering the marketing of vegetables, are considered as the constraints in this study

Annex 3: Data and tables

3.1: Area, and production and productivity of vegetables in Nepal

Year	Area(ha)	Production (mt.)	Yield (mt/ha)
1990/91	140500	1074650	7.650
1995/96	144368	1327298	9.194
2000/01	157162	1652979	10.518
2005/06	189832	2190100	11.537
Annual growth rate in %	2.1	4.97	2.80

Source: MOAC, 2006

3.2: Population distribution of Tanahun district

S.N.	Particular	Total population
1	**Total population**	**347165**
2	Male	165068
3	Female	182097
4	Total house hold	63120
5	Population growth rate	1.62
6	Average size of house hold	5.5
7	Population density	

Source: DADO, 2006, Tanahun

3.3: Population distribution of Tanahun district according to caste

Caste	M	B	G	C	N	K	D	S	T	Ku	Mu	O
Population (,000)	82	44.6	41.3	35.9	26.7	21	12.9	11.9	6.9	6.3	3.2	19.1
percent	26	14.2	13.1	11.4	8.5	6.9	3.9	3.8	2.2	2	1	6

M – magar N – Newar T – Thakuri
B – Bramen K – kami Ku - kumal
G – Gurung D – damai Mu - Muslim
C – Chhetri S Sarki O – Others

3.4 : Production and productivity of off season vegetable in Yampaphant, Tanhun

Name of the vegetable	Productivity mt. /ha.	Production mt.	remark
Bitter guard	18	405	From selling record
Sponge guard	18	324	,,
cucumber	12	180	,,
Pumpkin	12	90	,,
Total		999	

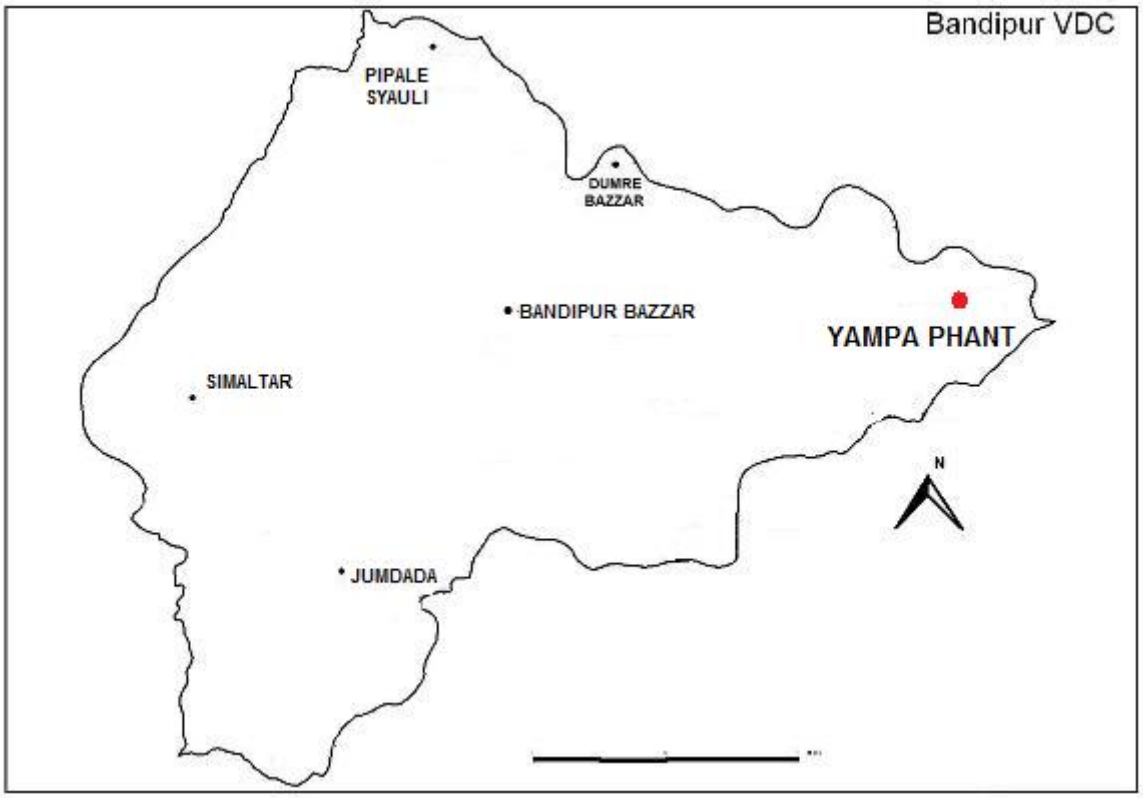
National productivity (2005/06) was 11.537mt./ ha. Productivity is higher than national productivity level

Annex 4: Maps

Annex 4.1 Map of Nepal

Annex 4.2 Map of study area Bandipur VDC of Tanahun district

Annex 4.3: Map of study area Yampaphant of Bandipur VDC.



Annex 5: Respondent list

5.1 Farmers list

S.N.	Name of the farmer	S.N.	Name of the farmer
1	Mr.Yagya bahadur lamichhani	14	Mrs.Sarmila nepali
2	Mr.Nanda maya gurung	15	Mr.Ramchandra adhikari
3	Mrs. Bimala dhakal	16	Mr.Shree kanta bhattarai
4	Mr.Lal bahadur nepali	17	Mr.Shree krishana ghimire
5	Mr.Basu dev bhattarai	18	Mr.Babu ram paudyal
6	Mr.Hari narayan paudyal	19	Mr.Gum bahadur magar
7	Mr.Keshave Prasad bhattarai	20	Mr.Ram Prasad lamichhani
8	Mr.pasupati pantha	21	Mr.Nande sarki (nepali)
9	Mr.Ram Prasad panta	22	Mr.Harke b.k
10	Mr.Taranath lamichhani	23	Mr.Ramkagi Nepali
11	Mr.Yek bahadur chhetri	24	Mr.Chudamani lamichhani
12	Mrs. Kamala dhakal	25	Mrs. Sabitri tiwari
13	Mr.Hari Prasad bhattarai		

5.2 Respondent vegetable retailers/doke list

S.N	Name of retailer	Working place	Working period	Remark
1	Mrs.Sarmila malla	Damauli	6 years	
2	Mr.Rudal Gupta	Damauli	12 years	
3	Mr.Brama Gupta	Damauli	12 Years	
4	Mr.Narayan Shrestha	Damauli	12 Years	
5	Mr.Rudra Prasad Neupane	Damauli	9 Years	
6	Mrs.Gyatri	Dumre	6 year	
7	Binod chaudhari	Dumre	7 Years	
8	Hari	Dumre	5,,	
9	Mrs.Krishana sharma	Dumre	6 ,,	
10	Hark Kumal	Dumre	7 ,,	

5.3 Respondent vegetable Middlemen/wholesalers

S.N.	Name of middlemen	Address	Remark
1	Mrs.Tika Bhatta	Yampa	
2	Mrs.Satya Devi	Yampa	
3	Hari Prasad Acharya	Damauli	
4	Denesh Sharma	Pokhara	
5	Krishana Gurung	Anbu	
S.N.	wholesaler	Address	Remark
1	Bishnu Prasad Shrharma	pokhara	
2	Ramkrishana Duwadi	,,	
3	Rudra Prasad Khanal	Dhading	
4	Ramchandra sharma	pokhara	
5	Ram binod Chaudhari	Gaushala	

5.4 Respondent Offices, NGOs, Institute and committee list

S.N.	Offices	Address	Remark
1.	Agriculture Development Office	Tanahun	
2.	Agricultural Development Bank	Tanahun	
3.	Bandipur Village Development commettee	Bandipur Tanahun	

5.5: Average family size (within 25 respondents)

Types of cast	Male	Female	Children	Total	Average size
Upper cast	20	33	53	112	5
Ethnic cast	9	7	8	24	8
Lower cast	3	5	8	16	8
Total	32	45	69	152	6

5.6: Middlemen level marketing cost and margin

Crops	A	B	C	D	E	F	G	H	I	J	K
Bitter gourd	10.33	16	1033	25	50	150	1258	5	95	1520	262
Sponges gourd	10.33	16	1033	25	50	150	1258	5	95	1520	262
Cucumber	19	27.75	1900	25	50	150	2125	5	95	2636	511
Pumpkin	10.6	16.43	1060	25	50	150	1285	5	95	1560	275

Source: data compilation from middlemen's questionnaire

A=Average farm gate price Rs / kg, B= Average selling price (to retailers)Rs / kg
C=Purchasing cost /Qt at farm gate, D= Cost of packaging /Qt. @(Rs)0.25 / kg.
E=Weighing/ loading cost /Qt. @(Rs) 0.50/kg, F Transportation/unload Cost /Qt.@(Rs) 1.5/kg, G= Total Marketing Cost /Qt. @(Rs)/ Qt. H= Vegetables wt. losses (Kg) 5% /Qt, I= Quantity Sold (kg), H= Vegetables wt. losses 5% /Qt, I= Quantity Sold (kg,

Annex -6: Pictures from Project Site

Photos 6.1: Researcher discussing with cooperative members

Photo 6.2: Agricultural input suppler at study area (Yampahant, Tanahun)

Photo 6.3: cooperative vegetable collection centre (Yampaphant, Tanahun)

Photo 6.4: Vegetable packaging in gunny bags and bamboo basket

Photo 6.5: Loading of vegetables for distance market (Pokhara)

Photo 6.6: Vegetables transport from production site to collection centre

Photo 6.7: Vegetables transport from production site to collection centre

Photo 6.8: Researcher discussing with DADO Office in Tanahun