CHAPTER - I

INTRODUCTION

1.1. Background of the Study

Nepal is agricultural country where 78% people are depending on agriculture. Agriculture is the main source of income in Nepal. Fruit production is an important branch of agricultural occupation .Which fulfils the need of households as well as it can be considered as a source of income. Different kinds of fruits are the sources of carbohydrate, vitamins and minerals. These diets help us to protect from different kinds of diseases and provide energy. So, nowadays, consumers are attracted to consume fruit rather than those foods which are the sources of fat and carbohydrate.68% of the total area in Nepal is covered by mountains region. A fruit's crop is suitable rather than cultivation for crops. Among fruit crops, orange production is a major job and source of income in hilly area. By this, soil erosion and landslide can also be controlled.

"Production and marketing" of any economy goods and services are as close as two sides of a coin. Generally, production is considered as creation of economic growth while marketing is supporter economic growth. Production is the act of transforming the factors of production in to the goods and services that the desired for consumption and investment. Marketing consists of all business activities involved in the flow of goods and services from the point of initial production until they are received by the ultimate consumer. Thus, agricultural marketing is a process by which the producers and buyers of agricultural goods buy together. The marketing process includes not only storage and

transportation activities of the middlemen but also encompasses all activities linking the consumers and the producers.

Agriculture is a primary sector of the economy in developing countries like Nepal. It provides foodstuff and raw materials to agro-based industries. It helps to increase national income through commercial fruit farming poultry farming and livestock keeping and large quality of cereal production. It also provides employment directly and indirectly .Orange is one of the most important agro- based commercial products not only in Nepal but all over the world.

In Nepal, citrus development programs were started along with the establishment of department of agriculture in 1982 B.S. An Indian citrus specialist H.C.D. pal was invited in 1999 B.S. for the purpose of scientific horticulture development many horticulture forms and stations that were established of their report submitted by Indian co-operation council in 2017 B.S. as a result it ,the citrus research. Sub-centre Pokhara (2018) and citrus research centre Dhankuta (2019 B.S) were established in order to promote citrus farming .These research centre recommended that orange would play significant role to uplift the economic status of the hilly region of Nepal (Shah, 1992). “Mid hilly region of Nepal ” was considered as main “citrus belt” in 2023-2024 and some efforts were made to develop Orange farming in that sector in 2029 B.S. (Paneru,1998).

Regarding the study area, the researcher has chosen Thumki VDC which is situated at Kaski district. From this VDC people can view Machhapuchre, Dhabalagiri, Annapurna, Fewa Lake, Begnas Lake, Rupa Lake, Sarangkot, Lamjung Durbar, and Pokhara valley. So this area is equally famous for tourism as well. The evergreen plants of oranges have

added the charm of beauty which has become the major attraction for tourism. On the other hand, orange production has become the source of income which helps to uplift the economic condition of the people. To make orange farming effective, different measures and steps are essential which would bring a great change in this area and it would uplift the economic condition too.

In Nepal, orange is harvested in all development regions. Basically it is harvested in hills in between 500m to 1500m.height from the sea level. But suitable height is 800m to 1400m from the sea level and suitable temperature is 5^0c to 35^0c (Karmacharya, 2063).

In Nepal, the total area covered by orange farming is 17494 hectare which occupies 62.52%of the total plantation area covered by citrus farming. The productivity of Junar is the highest (11.96M.T/Ha) than other citrus. The productivity of orange is higher (11.33 M.T/Ha) than the average productivity of all citrus in the fiscal year 2065/66 (table 1.1).

Table 1.1

Area, production and productivity of citrus (2065/66)

S.N	Particular	Total area(Ha)	Productive area (Ha)	Production (M.T)	Productivity (M.T./Ha)
1.	Orange	17494	9641	109277.1	11.33
2.	Junar	5524.1	3072	36735.5	11.96
3.	Lemon	4183	2439	20492.1	8.40
4.	Lime	599.5	550.7	4342.7	7.89
5.	Others	179.2	129.2	1027.1	7.95
	Total(citrus)	27979.8	15831.9	171874.5	10.86

Source: Annual report of Horticulture Development programme 2065/2066.Fruit Development Directorate, Kirtipur, 2066,187.

Kaski is one of the farmers' districts for quantitative and qualitative orange productions in Nepal. In Kaski district there are more than 40 VDC where orange is produced in a large scale. Among these VDCs Thumki Kristi, Bharatpokhari, Nirmal pokhari, Pumdi, Armala, Hamsapur are famous for the qualitative oranges.

1.2. Statement of the Problem

Agriculture is a leading sector of the economy in Nepal. It provides foodstuff to the consumers, raw materials to the agro-based industries employment to the skilled and unskilled manpower, foreign currency to correct the balance of payment. The role of agriculture sector on GDP is very important. The major problem facing by the economy of developing countries due to backwardness in agriculture sector are low income of people, low productivity unemployment, food scarcity and lack of law materials etc. Now a day, many people abandon their agriculture occupation due to low productivity which is the main problem of agriculture sector, lack of irrigation facility, credit facility, and expensive fertilizers are also problems in agriculture. Commercialization of agriculture is possible by solving these problems.

The population of Nepal is increasing and land for cultivation is decreasing. Increasing population is cause of unmanaged urbanization in plain area. Most of the plain area will have covered for habitat with in few years so proper policy should be implemented by the government to solve this problem. Now a day, people are shifting towards the plain area from hilly area is decreasing. Rural life may be comfortable by fulfilling basic infrastructures such as: road, electricity, drinking water, transport and communication, services in hilly area. Now a days skilled and unskilled main power are attracted towards overseas especially in gulf

countries for employment. In this way, local resources cannot be used properly .The basic problem is to identity the sustainable sector of employment in rural areas. The existing problem in rural hills is that how to earn income for subsistence, which may be mystery of poverty. Other problems are to identity the role of orange crops in income generation and poverty reduction. If farmers are facilitated by modern chemical fertilizer, cheap credit facility, technical services, they can improve their farming, their living standard and export trade. The problems of Orange farming involve the unfavourable climate storage facilities marketing problem, different kinds of diseases etc.

Because of budget and time constraints this study is confined to deal only with the following problems.

- The production situation of orange in selected area.
- The price situation of orange.
- The marketing situation of orange.
- The problems faced by orange producers in Thumki VDC and how these problems can be solved.

1.3. Objectives of the Study

The objectives of the study are follows:

1) To find out the production of orange in Thumki VDC
2) To identify the price situation of orange.
3) To identify the problems faced by orange production.
4) To identify the market situation of orange.

1.4. Significance of the Study

Nepal is a developing country where the economy is dependent on agriculture. In Nepal 68% of the total area is covered by mountains region, where fruit production is a major branch of agriculture. (Sharma: 2060, p. 163) Orange is choice able sector in fruit production. The present study is a case study of Thumki VDC of Kaski district regarding the production and marketing situation of Orange. The importance of this study is that this is the first analysis of Orange production and marketing situation based on primary and secondary data in Thumki VDC. This study has been dealt with the existing problems on orange productions and marketing system. The whole study based on observation, questionnaire and oral interview even it requires secondary data too. It helps to know about exact situation of orange farming.

1.5. Limitation of the Study

Due to various constraints, there are some limitations of the present study which are given as follows:

1. The study is limited with in a single VDC Thumki of Kaski district due to time manpower and budget constraints. Out of 835 households ,50 households who are engaged in Orange farming have been selected randomly for primary data collection (Record of VDF,Thumki,2066)
2. The study has been focused on Orange production and marketing on the basis of cross-sectional primary data and related secondary data.
3. Qualitative data are excluded from the study because of the measurement problem. At the same time physical unit of area and output are converted in to standard unit and in to monitory value.
4. The selected period of the study is one year (2009/2010)

1.6. Organization of the Study

This study has been divided in to five chapters. The abstract of each chapter is given below.

- The first chapter is introductory part of the study. It contains the back ground of the study, statement of the problem, objectives, significance, limitations and organization of the study.
- The second chapter it elaborates the literature review.
- The third chapter research methodology has been discussed with conceptual frame work, universe and sampling procedure, method of data collection including primary and secondary data, data processing and analysis procedure.
- The fourth chapter is related to data analysis. The sub chapters are back ground of the study area (district and VDC) production area, production and productivity of orange in Kaski, etc.
- The fifth chapter is the conclusion part of the study. It contains the summary, finding and suggestions.
- The bibliography, appendices and questionnaire are given at the end of dissertation.

CHAPTER -II

LITERATURE REVIEW

Few theoretical and empirical studies are available in the field of production and marketing of orange in Nepal. There are some research papers published by some institutions such as NEW ERA, FAO, and HMG/DEAMS. Some students of the rural Development, Sociology Economics, and Management have also written their thesis on the topic of "Orange production and marketing ".The review of the theoretical research on the agricultural production and marketing are presented here.

In economics, production means creation of utility. In the process of production factors of production are used to create new goods or services. Marketing is a bilateral process in which buyers and sellers are correlated. For the combination of producers and consumers, there may be mediators. As the numbers of mediators increase, marketing process becomes more complicated. Therefore, marketing is a social and managerial process. In this process both individuals and groups of people are involved. They can create exchange and offer the values of goods and services with others. There are five major components in a market; producer or seller, consumer or buyer place (destination for transaction), product (tangible goods or services) and price of the product.

There are different models of market which are defined as:

1. **Prefect Competition Market:** Perfect competition is a market structure characterized by a complete absence of rivalry among the individual firms (Koutsoyiannis, 1979, 154).
2. **Monopoly Market:** "Monopoly is a market structure in which there is a single seller, there are no close subsidies for the commodity it

produces and there are barriers to entry" (Koutsoyiannis, 1979, 171).

3. **Monopolistic Competition:** "Monopolistic competition is a market having large number of sellers with differentiated but close substitutes and absence of restriction on entry and exit of firms " (Cater and Sravely ,1985 ,quoted by Joshi,2058,227).

4. **Oligopoly Market:** Oligopoly is "a type of market structure in which a small number of firms supplies the major portion of an industry's output. In economic theory, the term oligopoly means a mixture of competition and monopoly" (Dictionary, 1973, 409).

International Review

FAO in its report focused on the citrus fruit Juice. The purpose of the report was to review the major developments, which have been taken place in 1984 to 1988 in production and consumption of citrus juice in particular concentrated juice, and to analyze the underlying factor responsible for the dynamic growth of international trade in these items. Finally, in view of the very fast expansion in output of citrus for processing and processing capacity in some areas, especially attention is given to the outlook for international trade and possible market problems, which could arise in the future[1].

The following agents from the orange agro-system suppliers of agricultural inputs (fertilizers, defensive, seeding, agricultural machinery and equipment etc) support services (transport labour, project etc) orange growers ; unit for processing concentrate juice; packing houses, second processing industries (food, animal feed, essential oils, juice bottlers from

abroad etc) wholesalers and retailers of food sector and the final consumer.

This report focuses mainly on the most important commodity of this agro-system, which is FCOJ (frozen concentrated orange juice).

The methodology relies on the concept of agro-system and competitiveness of an agro-system takes into account the vertically of the economic system and the combined impact of several factors. These factors are taken as drivers of competitiveness, and are closely related to the efficiency and efficacy of an agro-system. Taking the economic organization and technological environment, nine drivers of competitiveness were evaluating in this study. International trade policies, industry programs and special policies, domestic taxation, food safety and inspection services, technology, market structure and governance structure, firm management inputs, and storage and transport. These drives also guided the identification of strengths and weakness of the agro-system in order to take advantage of possible opportunities of increasing export to EU in face of scenarios of trade agreement which is a SWOT analysis.

Next section present a summary description of the international context in which the production, consumption and commercial flow of the agro-system main commodities are inserted section is presents the main aspect of orange agro-system competiveness in Brazil.

Citrus fruits are produced all over the world. According to UNCTAD, in 2004 there were 140 citrus producing countries. Around 70% of the world's total citrus production is grown in the Northern Hemisphere, in particular countries around the Mediterranean and the United States, although Brazil is also one of the largest citrus producers.

In the United States, citrus fruits for consumption as fresh fruit are mainly grown in California, Arizona and Texas, while most orange juice and grapefruit is produced in Florida. China could be a major player in the orange juice and processed citrus markets, except for high tariffs on citrus that make domestic sale more profitable. Though citrus originated in south-east Asia, current citrus production is low due to lower than average yields, high production and marketing costs and problems with diseases. Citrus production in most of Europe continues to decline, although the Clementine's produced by Spain are increasing in popularity among consumers.

Table: 1

Leading Orange Production Countries in the World (thousand tons)

Top ten total citrus fruits producers 2007 (tones) World's top producer in each category is given in grey						
Country	**Grapefruit**	**Lemons and limes**	**Oranges**	**Tangerines, etc.**	**Other**	**Total**
Brazil	72,000	1,060,000	18,279,309	1,271,000	-	20,682,309
China	547,000	745,100	2,865,000	14,152,000	1,308,000	19,617,100
United States	1,580,000	722,000	7,357,000	328,000	30,000	10,017,000
Mexico	390,000	1,880,000	4,160,000	355,000	66,000	6,851,000
India	178,000	2,060,000	3,900,000	-	148,000	6,286,000
Spain	35,000	880,000	2,691,400	2,080,700	16,500	5,703,600
Iran	54,000	615,000	2,300,000	702,000	68,000	3,739,000
Italy	7,000	546,584	2,293,466	702,732	30,000	3,579,782

Nigeria	-	-	-	-	3,325,000	3,325,000
Turkey	181,923	706,652	1,472,454	738,786	2,599	3,102,414
World	**5,061,023**	**13,032,388**	**63,906,064**	**26,513,986**	**7,137,084**	**115,650,545**
Source: Food And Agricultural Organization of United Nations: Economic And Social Department: The Statistical Division 2007.						

Orange Production in SAARC Countries

Ghosh and Singh in their book deal with the citrus production in south Asia in present condition. The authors have been made to review the current status of citrus production, constraints management, research and trade in different countries of south Asia. In depth analysis made in their directions clearly shows some commonalities of problem and prospects among the countries of south Asia.

The authors reveal that in south Asia, citrus is a very important crop comprising of six countries namely India, Pakistan, Bangladesh, Nepal, Bhutan and Sri Lanka. In south Asia two countries India and Pakistan shares 95% of total citrus production. Only in certain parts of India and Pakistan commercial sericulture exists and Bhutan and Nepal have traditional but expanding citrus industry.

The sweet orange production in **Sri Lanka** was kept at a low phase because the early agricultural policies in the country gave more prominence to the 63656288peasant cultivations such as rice and other field crops. Attention for the development of fruit sector was at a minimal. In this scenario the current extent of sweet orange cultivation is

about 3, 5000 ha with the annual average yield of about 1.7 Mt/ha, which is far below the average yield of 40 Mt/ha in the major citrus growing countries.

Currently Sri Lanka imports about 12,000 Mt. annually, of sweet orange to meet the local demand. It may be observed that more than 90% of the world sweet orange production is confined between latitudes 20 degrees and 40 degrees in both northern and southern hemispheres and only 10% between the latitudes 20 degrees north and south of the equator. Thus Sri Lanka being situated between 6 degrees to 10 degrees north of the equator does not come within a normal orange growing belt and the success of any large- scale cultivation is difficult.

However, there are certain factors which counteract this apparent disadvantage to a considerable degree as the country possesses it its highland areas the environmental conditions which approximate the temperate climate thereby providing suitable conditions for orange production.

In **India**, citrus is grown in 0.62 million ha. area with the total production of 4.79 million tonnes. The area under orange cultivation in India increased by 67% from 1.19 *lakh* ha. in 1991-92 to 1.99 *lakh* ha. In 2001-02 and the production increased by 57% (i.e. from 10.58 to 16.60 *lakh* tonnes). Oranges are mostly grown in the states of Maharashtra, Madhya Pradesh, Tamil Nadu, Assam, Orissa, West Bengal, Rajasthan, Nagaland, Mizoram, Arunachal Pradesh.

Pakistan is the sixth largest producer of Kinow (mandarin) and oranges in the world, with 2.1 million tons. Pakistan world mandarin and oranges market share during the year 1997 was 0.9 percent and 3.6 percent in terms of value and volume respectively. Pakistan is also the

largest producer of 'Citrus Reticula' variety (Kinow), this unique variety of citrus is indigenous to this part of the world. According to an estimate approx. 95 percent of the total Kinow produced all over the world is grown in Pakistan.

Bangladesh: Commercial cultivation of orange begins in Thakurgaon, Commercial cultivation of orange began in the district as farmers achieved success in cultivating the nutritious fruit. Over 1,000 farmers have brought 50 hectares of land under orange cultivation under a project of Department of Agricultural Extension for expanding orange cultivation. DAE has undertaken a project for expanding orange cultivation in 10 districts, including Thakurgaon, involving 16 cores till 2011.

Bhutan: Mandarin production and prices hit new high with the orange season nearing its end, a total of 17,208.084 metric tonnes of Mandarin were exported to Bangladesh and 1,395.207 metric tonnes to India as of February 19, according to records maintained by the Bhutan Agricultural Food Regulatory Authority (BAFRA). Exporters at the Toorsa orange depot in Phuentsholing said that they were satisfied with the prices the fruit fetched this season which jumped to a high of US$ 18 a box last week for the mill or big oranges.

Orange cultivation in **Nepal** is not considered as a main occupation and small orchards mainly in the Homestead Act as secondary sources of income to most of the growers. In order to develop the citrus industry in country, it is necessary to give commercial touch to the citrus business. The studies have shown that with Trans of sound production technology and its adoption, orange industry in Nepal should grow well and the Nepalese orange can make good in roads in India, Bangladesh and

Chinese town lying near the border even after meeting the needs of growing domestic market (Ghosh and Singh, 1993).

Lumle agricultural centre has conducted a study entitled production constraint of maintain in Western development Region in 1989. The study was based on the potential citrus growing areas of Syangja, Kaski, Tanahun, Gorkha and Lamjung districts and it indicates that the mid-hills are largely characterized by terraced upland and food grain crops like maize, millet, wheat and barley are mostly grown under rain fed conditions in these areas whereas it is experienced that man drain farming is economically more profitable than cereal crops under similar condition. Thus orange farming is found to provide a good source of cash income to the poor farmers of hill area, besides this it also help to protect environmental degradation.

The objectives of the study were to identity problems associated with citrus farming. To fulfil the objectives, a survey team was made which consisted of two horticulturists, one plant protectionist and a junior technician. To fulfil the above objectives, the following methodology was used.

Orange production area was chosen as special area to examine the enhancement in the income of rural household in western development region. Out of Kaski, Gorkha, Tanahun, Syangja, Lamjung, Manag, Baglung, Mustang, Parvat, Magdi, Gulmi, Arghakhanchi if Rupandehi, Nawalparasi, Palpa, Kapilvastu districts of western development region Syangja, Kaski, Tanahun, Gorkha and Lamjung were selected for the study. Especially data are taken from household. The tools used to collect data were questionnaire, unstructured interview, observation and case

study. Districts Development Reports was one of the main sources of secondary data.

The study was mainly concerned with the technical type of problems of disease. So many types of disease were found as the problem of orange production such as greening, root rot due to phytophthora, pink disease, fruit fly, fruit dropping due to green stink, bug etc. The study recommended removing the affected trees, to shift the citrus nurseries to higher but accessible areas and to involve government station in planting foundation trees completely free of greening. Mosher plants for grafting budding should be indexed poverty for certification and must be kept under good management (LARC 1989).

The present study is the first study of orange production and marketing of Thumki VDC of kaski district. There is no any prior study has been done about orange farming.

Tilak Bahadur Rai has conducted a study entitled "Orange Production and Marketing in Sikkim" in 2003. The specific objectives of the study are: to study the orange production and it's productivity, to estimate the extent of marketing of Orange by the farmers, to identify the marketing agencies, to study the pricing system and to suggest policy measures to encourage the Orange growers. Out of 150 households of commercial orange farmers, 36 households were taken as sample according to the size of orange orchards from five Gram Panchayat Units of Melli Constituency in south Sikkim, Primary as well as secondary data have been used in this study collected from structured questionnaire, informal interview and various publications of horticulture department and government offices.

The study has concluded that orange cultivation is very important and is more profitability crop which can be cultivated as intercropping with other cereal crop which can be cultivated as intercropping with other cereal crops. Moreover the production trend is good and the productivity of orange is at an increasing trend in the study area.

The problems identified by this study are as follows: problems of market, problem of credit facility, problem of cold storage and processing, problem of technical knowledge about orange cultivation.

The major findings of the study are:

i) Out of the total land owned by the farmers of the study only 5% land is used for Orange production.

ii) The major problems existing in the Orange production are price fluctuation, transportation problems, pests and diseases.

The study has made some recommendation to solve the problems which are: to develop the link between production and marketing centre to establish co-operative organization for marketing, to provide technical support to farmers, to make media effective as well as practicable for the information about marketing system. In the same way this study has also recommended to establish storage and processing centre and to provide credit facilities to Orange farmers.

Shrestha (1995) has conducted the study entitled "*The Role of Fruit Production in Rural Develop*" with the specific objectives of identifying socio-economic status, level of fruit crop production, economic contribution and farming of major fruit crops in the community. He has pointed out that agriculture is the major source of income of the people, which comprised food grain, fruit vegetables, livestock, poultry etc. He has identified 15 species of fruit crops that are mainly cultivated in

Bunkot VDC i.e. Mandarin (orange), Lemon, pear, mango, apple grapes etc. Among them orange has been found the prominent.

To fulfil the specific objectives the following methodology was used in this study. The sample comprised of 61 orange growers among 338 orange growers of the Bunkot VDC, in Gorkha district. The study was performed by collecting primary data. The primary source of data were orange farmers are knowledgeable persons. The study has also used secondary sources of information Benefit Cost ratio was the main tool used in the study to attain the objectives of the study.

The conclusion of this study is that the trend of fruit cultivation is very positive and the expansion was found most rapid in case of mandarin expansion of market, greater profit margin easy to grow, easy access to market due to construction of road network relatively low cost of production and increase in domestic demand for orange are the main factors that have encouraged farmers to increase orange farming in the study area. The farmers make handsome profit from orange farming but they generally make better profit lemon farming. He also found that the bargaining capacity of the producers is very weak; they are bound to accept the price offered by the brokers. So brokers made more profit than the producers.

The major findings of the study are:

i) The earnings from Orange were spent on fulfilment of daily requirement such as salt, oil, kerosene and clothing etc.

ii) The area under Orange cultivation was increasing continuously.

iii) The net profit from Orange is higher than any other crops product in the study area.

Thus the study has given some recommendations which are as follows:

Farmers should be oriented to use grafting techniques, as recommended by the technician, rather than seed to propagate orange seeding.

Scientific and improved harvesting and post harvesting practices should be oriented to the farmers.

Local co-operatives should be organized as soon as possible for the marking of fruits.

Quality plants, extension services, fertilized and plant protection measures should be provided at the reasonable price in appropriate time.

Kamal Bahadur Basnet has conducted a research entitled "*Orange Cultivation Problems and Prospects*" in 1998. The study states that farmers earn cash through selling orange. The change of farmer's life is influenced by orange cultivation. The study indicates that orange cultivation helps to raise the level of income of farmers and reduces the number of migration to urban area. This study shows that in the study area orange farmer's life style has been found changed significantly in comparison to a decade before. According to this study, 43 percent of the farmers have cultivated orange between 5 and above *Ropanis* of land followed by 27 percent of the farmers who have planted orange between 1 to 3 *Ropanis* of land. The broad objective of the study is to evaluate the orange cultivation and to find the problems and prospects of commercial and the orange farming.

Armala VDC of Kaski district has been selected for the study in which descriptive research design has been followed. Primary and secondary data were collected for the study in which the primary data was collected from orange growers and the secondary data from various

agriculture development officers, horticulture officers, agriculture research council and other concerned sectors. Out of 1012 households, 60 active commercial orange growers defined as universe in which 30 households (i.e. 50% of universe) have been selected as sample size through lottery method.

This study concludes that this research is helpful for the improvement and betterment of the present condition of the local farmers, who are facing a lot of problems like unsystematic market, lack of transportation facility, and lack of cold storage, lack of irrigation facility and fruit diseases and insects. The study indicates that the socio-economic condition of the respondents has been influenced by orange farming in the study area and agriculture development offices have helped them to plant orange. It has provided encouragement to the interested farmers.

The major findings of the study are:

i) There is extreme shortage of irrigation facility of the Orange growing area of the village.

ii) Major problem of the instability of the market price and its heavy fluctuations.

iii) Diseases and pests are limiting factor of production.

The study has made some recommendations to solve the problems of orange growers. According to the study, construction of motor able road is a must to have access to market. Government or agricultural development office must provide technical assistance or agriculture training for orange growers. Inputs like seedling, agriculture tools, fertilizer, chemical pesticides etc should be supplied in a subsidized price. Provision should be made to provide load from Agriculture Bank at a low

rate of interest. And provision should be made to provide loan in 'Group' without collateral. Farmers have to be motivated to cultivate fruit using integrated method of production. Government or non-government organization should develop a programme that can motivate poor farmers in cultivating orange (K.B Basnet, 1998).

Basudev Bhatta has conducted a study entitled "Orange cultivation in Gulmi district" in 1995. This study is of micro level and the study is focused on historical development, spatial distribution and production trend of orange. He has also explained physical as well as non-physical factors influencing to it[2].

The specific objectives of the study are: to show the historical development and spatial distribution of orange cultivations, to analyse the physical and non-physical factors influencing the orange cultivation, to compare investment and benefit of orange cultivation to cereal crops and to study the production trend.

To fulfil the above mentioned objectives, 265 households were selected out 5297 households from NayaGaon VDC of Gulmi district by applying simple random sampling and stratified sampling method. The research design for this study is of descriptive type. The study is based on primary as well as secondary information collected from villagers, school teacher, JTA and various offices related to the study. The researcher has used quantitative tools such as frequency table, diagrams and graphs; percentage figure has been applied to analyze the data.

The study has identified some problems such as bio-physical conditions, technical conditions, socio-economic condition, lack of good markets, transportation and storage facilities, disease and pests etc.

The study shows that the orange cultivation is more profitable than cereal crops which have also provided job opportunities for hill people. It also concluded that, despite the various problems its production trend is increasing day by day. The author believes that it should be developed from commercial point of view and the farmers should create an organization so that they can manage to enjoy reasonable profit. Efforts should be made to grow improved variety of seeds in the study area.

The major findings of the study are:

i) Out of the total land owned by the farmers of the study only 10% land is used for Orange cultivation.

ii) Out of total production 1% is kept for home consumption 70% for storage and remaining 82% they sale for the maintenance of their day to day life.

iii) The study shows not a single woman have received training on Orange cultivation.

The study has made some recommendations to solve the problems of orange growers such as, to establish the orange processing factory, systematic management of irrigation, improved variety of sapling, supply adequate agrochemicals, improved tools and provide storage facility. According to study technical knowledge and use of modern technique are essential factor for better production. The author has also recommended that J.T and J.T.A should frequently supervise in their service areas.

The study has concluded that the post-harvesting practice is still traditional, only some change has brought out by the establishment of cellar storage. Furthermore, the prospect of development of orange cultivation in NayaGaon is good (Bhatta, 1995).

Sundar Kumar Rai has done a research entitled "*A study of orange cultivation*" in 1998. The researcher has determined some special objectives for the study. The specific objectives are to analyze the main determinant of orange cultivation, to describe the orange farm size, their distribution and production trend, to highlight the problems and prospects of orange cultivation[3].

The study has focused on production constraints, marketing channels, price and demand situation of orange. The study shows that the orange production has slightly been increasing particularly due to the increasing number of farmers or plants and its relative importance is high in the market among cash crops. However the production has not increased proportionally to an increase in the farm area.

The researcher has taken interview from orange growers and concerned technicians, out of 638 households of Chhitang VDC, 96 households (i.e. 15 percent) were selected for interview. Primary as well as secondary data has been used in this study. Research papers, published and unpublished previous studies, CBS data, map and different publications were the source of secondary data. Similarly field survey, questionnaire and interviews were the source of primary data. Different statistical tools and quantitative technique have also been used to analyze the data.

The problems identified by this study are lack of irrigation, unavailability of improved seeds, lack of pesticides, insecticide, manure and chemical fertilizer, lack of transportation, marketing storage and processing facility. Besides this, lack of institutional support, lack of

timely supply of agricultural inputs, technical knowledge and diseases are other problems identified by the researchers.

The major findings of the study are:

i) The area under Orange cultivation was increasing continuously.

ii) The productivity of Orange is depending up on bio-physical condition as well as the use of agriculture inputs.

The study has made some recommendation which are as follows: supply agricultural tools and improved seeds, establish storage and processing industry, provide load facility at normal rate of interest, organized market for reasonable price of production, build motor able road for marketing orange and follow the modern technology. This study concluded that the socio-economic status of orange growers in terms of literacy, occupation, land holding size and food sufficiency is higher than non-growers (Rai, 1998).

Rudra Shrestha has done a study entitled "*A Diagnostic Study on Sweet Orange Marketing in Ramechhap*" in 2001. The study is focused on the production and supply situation of sweet orange. The study is an attempt to identify the weakness of the existing marketing system and suggests measures to improve the marketing system of *Junar* in Ramechhap. The specific objectives of the study are, to account the area under cultivation, to estimate the quantity of production and estimate marketable surplus, to analyze the existing overall marketing system and to identify the major problems in the marketing system.

The study was conducted by using primary as well as secondary information collected form concerned institutions, research report. The information was analyzed and presented in tabular and descriptive form. The study has identified major problem such as transportation that is

followed by custom/check points, cold storage, and damage of fruit during transportation, unnecessary burden on custom clearance.

The study has concluded that sweet orange is being produced in Ramechhap district with ought agricultural road network. The district is fully self-sufficient in supplying seeding. The study has found that 76 percent farmers use organic fertilizer. The study also concludes that Japan International Co-operative Agency (JICA) played most important role and contributed for *Junar* cultivation under horticulture development project.

The major findings of the study are:

i) The distribution of fresh Orange from the study area to the final consumer is being attended to by a chain of middle man at different stage eroding the producer's share in the consumer rupee.

ii) The participation of farmers in the market is negligible due to distance involved.

This study recommends some points for effective marketing system of Ramechhap *Junar*. The report suggest to establish the collection centre and cellar store in collaboration with private sectors, to construct main road up to Ramechhap Bazar across the district head quarter Manthali and to establish the close linkage between, middlemen, wholesalers and consumers (Shrestha, 2001).

NARC has published annual report. According to the reports that the citrus is one of the most important and popular fruits crops grown in

the hills of Nepal. It is grown commercially at different climatic condition like; tropical and sub-tropical and even in some favourable part of temperate regions. This reports focus that the core problem is the low production and low market price at harvesting time. It is caused mainly due to the small area under citrus, lack of suitable varieties for growing in different seasons. S Poor fruit quality and lack of suitable storage methods are the main reason for low market price at harvest (NARC, 1999).

The annual report prepared by HMG/DFAMS (1976) focused on production cost, production trend and existing market channels of majors fruits like orange, lemon, lime, banana and papaya in Kaski and Syangia districts. It has discussed only about favourable climate, suitability of soil, availability of natural resources like water, for the fruits cultivation. Its main focus was on the development of agro-forestry through orange farming in these districts. It has also pointed out the appropriation of citrus farming in neighbours districts like Kaski, Tanahun,Lamjung ,Parbat and Gorkha.

Another research about mandarin orange was done by NEW ERA (1989) in Dailekh. This research has pointed out the lack of the organised marketing system. However, it acknowledges the efforts of Non-government organizations (NGOs) and international Non-Government Organizations (INGOs) to improve marketing system. It has recommended that the producer of mandarin orange should get input on time. Processing industry should be established at farm level. Irrigation facility as well as transportation facility should be increased.

The study of Dhakal, Tripathi and Bhattarai (2007) discussed about the market survey which was under taken visiting 14 major markets of the

country during 2001/2003 to assess the marketing system, demand and supply situation and price behaviour of acid lime hill lemon in Nepal. This study showed that there were different types of traders involved in the marketing of fruits and vegetables including lime and hill lemon. They were suppliers, wholesalers, retailers, doke, four wheelers and others. Most of the traders were retailors followed by doke. This study showed that there were four major marketing channels involved in the distribution of lime and hill lemon from producer to ultimate consumers.

Channel 1: producers→ Retailers→ consumers

Channel 2: producers→ Wholesaler→ Retailers→ Consumers

Channel 3: producers→ Commission agent→ Wholesalers →Retailers →Consumers

Channel 4: Producers →Collectors→ Wholesaler→ Retailers→ Consumers.

This study showed that in marketing of lime and hill lemon in Nepal, the involvement of commission agent was not common. Among other channel, Channel 4 was the most dominant channel for distribution. This study has suggested to promote acid lime production and eventually to substitute the import of lime from India, there are some measures given such as immediate development of technologies for higher productivity, off-season production, post-harvest handling and processing of acid lime, and strengthening market facilities.

Laundari, (2004) made a study entitled on**" An economic analysis of orange production. A case study of Purkot VDC of Tanahun District"** The main objective of this study is to estimate the production function of orange. In linear and non-linear forms with labour, farm yard manure and chemical fertilizer as the main inputs of this study. This study

based on the primary as well as secondary data. The raw data collected through the study are converted into logarithmic form and are presented in regression analysis, hypothesis testing. The production function gives mathematic expression to the relationship between qualities of inputs and outputs. A Cobb Douglas production function is fitted to analysis the data collected[4].

This study is concluded that the manure is found to be the most significant variable in orange farming. Human labour also has significant role and has positive effect in most of the models. There is positive as well as negative effect of the chemical fertilizer in orange farming. The negative effect can be attributed its improper dies. F-statistics is positively significant in all models which indicates that the strong statistical relationship between inputs and output of orange. The value of R^2 shows the percentage of total variation of the production. Among all models R^2 has a high value of 0.093 in model I which is similar to that of Model II and IV. This lowest R^2 is in model IV and its value is 0.003. The some production elasticity is less than unity (1) in model I, II and III which indicated diminishing returns to scale.

The major findings of the study were:

i) The cultivation of Orange in the study area is down in the traditional basis which was not been commercialized.

ii) The net profit from Orange is higher than any other crops product in the study area.

iii) Manure was observed to be highly responsible to increase the productivity of Orange in the study area.

The study has made some recommendation to solve the problems which are: to develop the link between production and marketing centre to establish co-operative organization for marketing, to provide technical support to farmers, to make media effective as well as practicable for the information about marketing system.

All available studies have focused on cultivation and distribution pattern of orange problems of orange production and marketing technology and techniques of orange production and nursery plantation of orange in Nepal. Mandarin orange is grouped in citrus reticulate and it commonly called *Suntala* in Nepali. It is referred to be cultivated in humid and sub-tropical climate and soil condition of the hilly areas had attracted the farmers towards fruit production. Citrus cultivation would help to improve the economic condition of farmers to generate employment opportunity and ecological condition balance but for fruits cultivation needs patience and determination because fruit growing is a long term process. Transportation was taken manually in higher cost, the channel of distribution was very simple in the study area; farmers sold their product to local traders and retailers, few of them sold directly to the consumers at farm and local *Haatbazar*, price was fixed by the bargaining between the sellers and buyers. So the price differs among the market and buyers. Orange marketing system is very poor which leads to have low price to the producer because of the lack of administrative efficiency; the government and private agencies and lack of transportation and storage facilities.

CHAPTER -III

Research Methodology

Research methodology is an essential parts of thesis paper which forms the framework for obtaining all necessary inputs for the study, in the present study, the methodology includes conceptual frame work, sampling procedure, nature and sources of data, data processing and analysing procedures, analysis of data.

3. 1. Conceptual Framework

This study is a descriptive type, which is based on primary data collected by researcher from the farmers of Thumki VDC of Kaski district. Some secondary data have been taken from various related records and published sources of different offices. This study is limited only on production and marketing of Orange of Thumki VDC.

3.2. Nature and sources of Data

The primary data is the main foundation of this study. The primary data is collected through the direct personal interview method and field survey. Secondary information is collected from various publications of CBS, VDC profiles, DDC etc. Thesis and other different related sources are brought in to the study as the secondary data.

3.3 Sampling Procedure

There are 835 households in the Thumki VDC of Kaski district (record of VDF, Thumki, 2067). Out of which 100 households are engaged in orange farming and, holding productive and unproductive age of orange plants. (Field survey, 2067) Out of the total households about 6% households have been selected using simple random technique.

Altogether 50 households have been selected for interviewing from each house.

3.4 Data Processing and Analysing Procedures

The information's collected through questionnaires form primary sources have been tabulated in a master table. With the help of the table prices of orange plant cost of production, area occupied by orange farming activities and marketing activities producers income by Orange production and profitable market, etc. are observed in the VDC. By this total production and productivity can be calculated. The information collected from secondary sources in also presented for the analysis of area covered by citrus and Orange farming production and productivity of nation, development region, and district and VDC level.

3.5 Analysis of Data

Data collection, tabulation presentation and analysis help for drawing conclusion and making recommendation. Some statistical tools are used for the analysis of data. This study may identify major problems faced by Orange producers. Though, the study is based on a single VDC, which can be generalized for similar rural area of Nepal. This study plays significant role for the optimum utilization of unemployed human labour and natural resources. This study helps for government, policy formulation agencies, donors and any other concerned agencies as a guideline for District Agriculture office to expand their services in this area. Finally, this study will be a helpful guideline to encourage Orange producers and to promote market in Thumki VDC.

CHAPTER - IV

Presentation and Analysis

This chapter deals with the analysis of primary as well as secondary data focusing on production and marketing of orange and socio economic status of the study area. It shows the back ground of the study area and productivity and production of citrus and orange in Thumki VDC. It also deals about market features and orange marketing in the study area. Furthermore, issues of problems and prospects of orange production are also analysed.

4.1 Background of the Study Area

This study is confined to the Thumki VDC of Kaski District. Kaski lies in the Gandaki Zone of Western Development region of the country. This district is surrounded by Lamjung and Tanahun in East, Syangia and parbat in West, Manang and Myagdi in North and Tanahun and Syangia in South. The total Area of this district is 2017 square km. This district has four parliamentary constituencies, two municipalities and 43 village development committees (VDC). According to the census 2001 the total population of the district is 380527 out of which males and females are 184995 and 195532 respectively. The total number of households is 85075.Average family size4.47. Density of population is 188.66 per square kilometre in the Kaski District. (Kaski Bastugat Bibaran, 2067).

Most of the land in Kaski district is occupied by hills. There are some valleys and plain area which are better for cultivation. Thought there are many streams and rivers. Only 60.5 percent of the potential cultivatable areas are occupied by irrigated land.

The District's maximum rainfall was recorded in August (1701.7 mm) and minimum rainfall in November and December (0.0mm). During

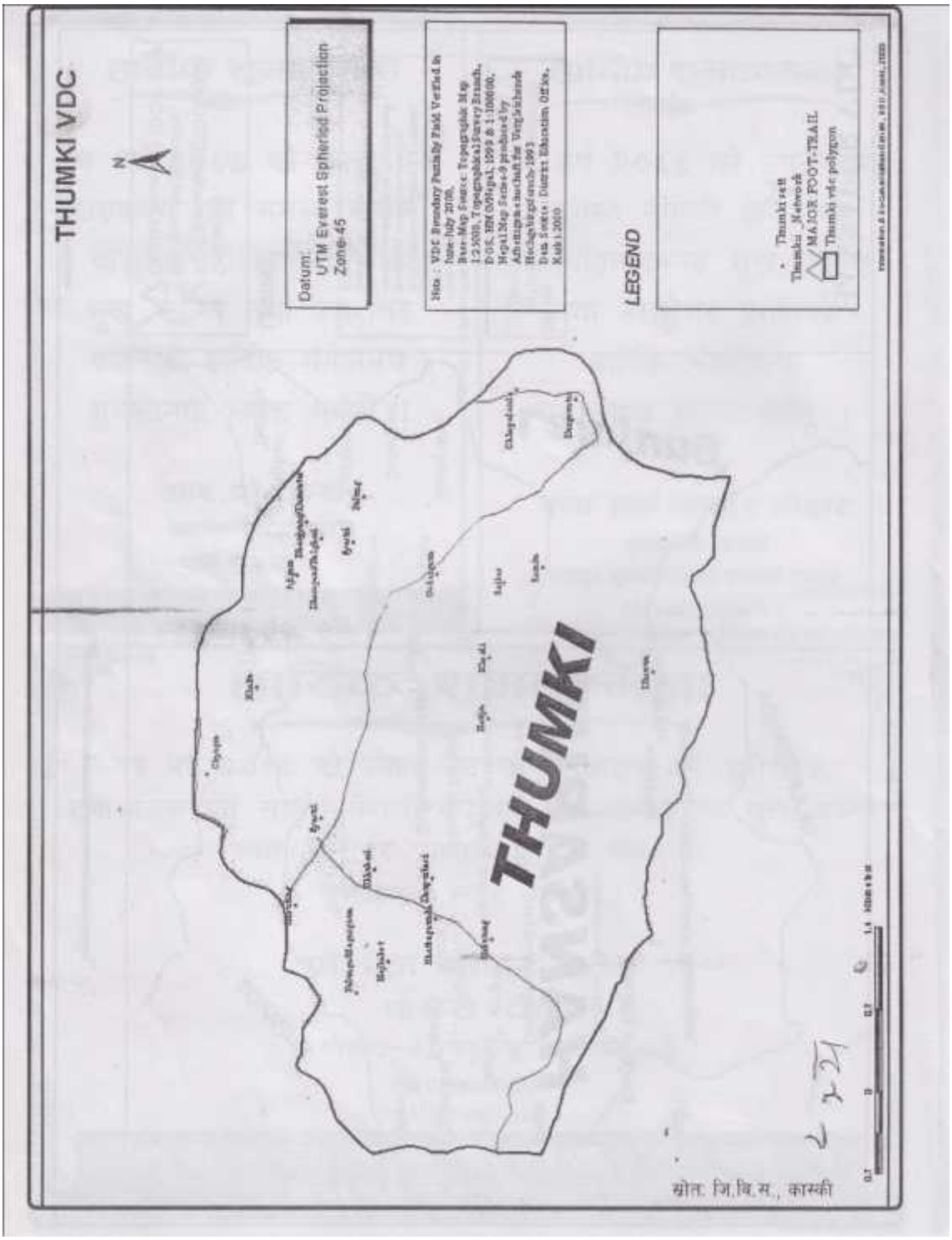
2009, the maximum temperature of this district is subtropical. (Kaski Bastugat Bibaran, 2067).

Age of fifteen years and above population is known as economically active population 58% people are economically active in Kaski district. Out of total economically active population 52.6%are engaged in agriculture. It is observed that the farmers grow maize, millet, wheat, paddy, potato etc. Some people are inclined towards commercial fruit like orange, banana, lemon, sweet orange, junar, guava, pineapple, lichee, papaya etc. Out of economically active population 32% people are engaged in governmental or private service, business activities and physical work activities and 14%people are engaged in other occupation (DDC, 2010).

All of the 43 VDCs and 2 municipality in Kaski district, Thumki VDC is large in terms of orange production. Thumki VDC lies to the eastern part of the Kaski district. This VDC is bordered by Lamjung district in east, Rupakot VDC and Lekhnath Municipality in west, Siddha VDC in south, and Hamsapur VDC in north. The latitude of this VDC is 28.7 to 28.13 north .and the longitude 84.7 to 84.12 east. The total area of VDC is 24.28 square kilometre. The altitude of this VDC is 450 metre to 1410 metre from the sea level. Most of the land of this VDC is covered by forest (29.56%). Only 70.44% land is used for cultivation (VDC profile, 2009). The information of map of Thumki VDC among wards is shown in the below map.

Map No 1.

Map of Thumki VDC Kaski District



The total population of Thumki VDC is 4034, among which 2,180 female and 1,850 male. The distribution of population by sex and wards is shown in the table 4.1

Table 4.1

Distribution population by ward and sex

Ward No.	Population		Total population
	Male	Female	
1	219	245	464
2	225	260	485
3	111	124	235
4	219	246	465
5	386	444	830
6	119	175	294
7	255	289	544
8	178	215	393
9	143	182	324
Total	1,854	2,180	4,034

Source: Kaski Bastugat Bibaran, 2067

Above table indicates the population of the VDC is various from 235 to 830 person per ward. Smallest ward is ward number is 3 and largest is ward number 5.Sex wise there are more females than male in all the wards of VDC.

Climate of Kaski district is dependent on monsoon. Thumki VDC is also dependent on monsoon.

4.1.1. Road and Transport

Thumki VDC of Kaski district is linked to GaganGaunda Bazzar by Thumki Marga. It is linked by Rupakot Marga with Rupakot VDC

too.Transportation service is not getting reliable. Passengers, bus service from Thumki to GaganGaunda Bazzar plays once a day. People have to carry their product on their back in order to in the market.

4.2. Analysis of Data

The present study is based primary data collected from the 50 orange producing households in Thumki VDC.

Table 4.2:

Distribution of respondents by cast

Caste	No of households	Percentage
Bahun	23	46%
Chettri	2	4%
Gurung	17	34%
Magar	2	4%
Newar	1	2%
Dalit	5	10%
Total	50	100%

Source: Field survey, 2067

Above table revealed that the numbers of Bahun is for higher than Magar, Chettri, Newar and Dalit but the numbers of Gurung is lesser than Bahun.

4.2.1. Cultivable and Orange Production Land

The Thumki VDC has only 24.28 hectare cultivable lands. Out of total cultivable land only 1.23% land is used for orange production. And 98.76% land is used for other purposes. (Table 4.3)

Table 4.3:

Cultivable and orange production land (in hectare)

Land for orange production	Other production	Total land
30(1.23)*	2398(98.76)*	2428(100)

*Bracketed figures Indicate percentage.

Source: Field Survey, 2067

4.2.2. Objectives of Orange Production

Out of the 50 households 28% households produce orange for business purpose, 22% households for consumption and 50% households for both the purposes. (Table 4.4)

Table 4.4: Objectives of orange production

Business	Households Consumption	Both	Total Household
14(28%)	11(22%)	25(50%)	50(100)

Source: Field Survey, 2067

4.2.3. Duration of Orange Farming

The farmers have been started orange farming since 5 to 40 years. The observed data have been classified in to six classes. (Table 4.5)

Table 4.5:

Duration of Orange Farming

Years	5-10	10-15	15-20	20-25	25-30	30-40	Total
No. of households	3	14	12	7	12	2	50
Percentage	6	28	24	14	24	4	100

Source: Field survey, 2067.

Most of the farmers (28%) have been found to farm orange 10 to 15 years and the least (4%) since 30 to 40 years.

4.2.4. Sources of Plant

Out of 50 households 19(38%) have used plants produced in their own nursery. Most of the farmers bought plants from Gorkha 9(18%) and lumle 8(16%). Some of them have received plants from Damauli and Baghumara. It is observed that planting of local plants are better than other sources of plants .Some farmers have received subsidies to purchase orange plants from village development program. (Table 4.6)

Table 4.6:

Sources of plant

Own nursery	Other Sources (62%)				
19(38%)	Gorkha	Lumle	Muglin	Damauli	Bahaumara
	9(18%)	8(16%)	5(10%)	4(8%)	5(10%)

Source: Field Survey, 2067

4.2.5. Price of Plants

Out of selected 50 farmers, 31 farmers are found to by orange plants. The maximum and minimum price of plant paid by the farmers Rs 30 and 3 respectively.

4.2.6. Number of Plants

The total number of plants is kept by the selected 50 households are found to be 7616.out of which plants 6736 (88.44%) are productive and 880 (11.55%) are unproductive .It is found that productive plants more than unproductive plants. Out of 50 households, 42 (84%) households have only seed plants and 8(16%) households have seed and grafting plants. (Table 4.7)

Table 4.7:

Numbers and Types of plants

Productive	Unproductive	Total	Types of plants	Households
6736(88.44%)	880(11.55%)	7616(100%)	Seed plants	84%
			Seed and grafting plants	16%

Source: Field Survey, 2067

4.2.7. Method of Plantation

It is found that the farmers are planting the orange in different shape and distance. They plant to adjust the maximum number of trees. In the study area, it is observed that most of the farmers (50%) apply Garakanla method for plantation and remaining 12%, 20%, 8% and 10% are used in track, rectangular shape, square shape and other methods. (Table 4.8)

Table 4.8:

Method of Plantation

Types of shape					
In track	Rectangular Shape	Square Shape	Garakanla	Others*	Total
6 (12%)	10 (20%)	4 (8%)	25 (50%)	5 (10%)	50 (100)

*Others indicate triangular and unmanaged shapes.

Source: Field Survey, 2067

4.2.8. Other Crops among Orange Farming

The irrigation is a problem in Thumki VDC. So that farmers have cultivated maize, millet, ginger, arum, and turmeric as a major cash crops. Similarly vegetables, coffee, onion, garlic, sugarcane beans paddy are also produced. (Table 4.9)

Table 4.9:

Others crops among orange farming

Crops	No .of Households	Percent
Millet	20	40
Maize	7	14
Arum	15	30
Ginger	25	50
Coffee	10	20
Beans	22	44
Garlic	8	16
Onion	2	4
Turmeric	30	60
Pear	9	18
Sugarcane	16	32
Vegetable*	15	30
Total	50	100

*Vegetables consists cauliflower, cabbage, green vegetables, radish, potato etc.

Source: Field Survey, 2067

4.2.9 Uses of manure and fertilizer

Most of the farmers in Thumki VDC, have been found to use organic manure, compost manure, dung of the hen (Shulee) in their farm for orange farming the out of total 45(90%) households used organic

manure (Gobar) and 5(10%) households have not used manure for orange.(table :4.10)

Table 4.10:

Uses of manure and fertilizer

Particulars	No. Of households	Percentage
Organic Manure (Gobar)	45	90%
Compost Manure	2	4%
Dung of the hen (shulee)	3	6%
None of them	5	10%

Source: Field Survey, 2067

4.2.10. Availability of Irrigation Facility

There is the problem of irrigation in the study area. Out of the selected 50 households 28 (56%) households never irrigate their farm. Only 12(24%) households have irrigation by pipes and remaining 10 (20%) households partially irrigate their farm by carrying pot (Table: 4.11)

Table 4.11:

Availability of irrigation facility

Particulars	No. Of households	Percentage
Irrigation by pipes	12	24%

Irrigation by pot	10	20%
No irrigation	28	56%
Total	50	100%

Source: Field Survey, 2067

4.2.11. Uses of Medicine and Poison

More than half of the orange producers use at least one medicine and poison to control disease and insects in their farm. Some farmers use local medicine like cows urine, liquid of ash-water and tobacco. Some of them use medicine for orange plant and fruit of orange such as Bordeaux mixture, Bordeaux paste, Nuvan, Metacide, Malathine, etc.

It is observed that 21 (42%) households do not use these medicines and poisons and totally defrauded for the approach of medicine. The most available medicine is Bordeaux paste, which is used by 12 (24%) households. (Table 4.12)

Table 4.12:

Uses of medicine and poison

S.No	Name of Medicine	No.Of Households	Percentage
1	Bordeaux Paste	12	24%
2	Bordeaux mixture	9	18%
3	Metacid	8	16%
4	Nuvan	3	6%
5	Malathiane	2	4%
6	CowsUrine	9	18%
7	Ash-water	6	12%
8	Tobacco	3	6%
9	Not used Medicine	21	42%

Source:-Field Survey, 2067.

4.2.12. Time of Weeding and Cutting and its Effect on Production

Out of the selected 50 households, cannot pay contemplation for weeding their orange plants and 20 households for cutting their orange plants wedding and cutting is done after harvesting specially in January, February and March. The farmers dig all-round the bottom of plants and put manure and filling the hollow. This is a technique of weeding. By this the improvement in quality and quantity of orange is obviously possible.12 households are scissors 16 households use small saw for cutting.

4.2.13. Suitable Place for Plantation

The farmers have some opinion for plantation, that is flat field is better than steeper field (mound) for plantation. Some farmers have better plants in middle point than the edge of the field. But some farmers have better plants in edges than the middle point .So that it depends on the geographical features of the land and the slope of land. Hence the farmers must identify about the composition and quality of soil, slope of land before plantation.

4.2.14. Main Diseases and Symptoms

Most of the farmers in the study area cannot identify the name of disease but they can say the symptoms seen in their farm. On the basis of symptoms, there are various kinds of diseases found (DADO record, 2067)

a. Greening Disease: - A kind of bacteria named citrussilla is a cause of citrus Greening disease. They shift the disease form diseased plants to healthy plants. There is no treatment of this disease. Preventive method is the measure to control this disease. Yellow

and small leaf, yellow measure vein of the leaf, small and dense fruit , half yellow and half green fruit, dry top to bottom respectively are the major symptoms of Greening. To destroy the diseased plant by fire to use seed plant, to use the plant which are produced above 1000 metre high from the sea level are the methods of prevention.

b. Gummosis: - A kind of bacteria is a cause of gummosis bottom of tree is the main symptoms of Gummosis. To appear gum in the bottom of tree is the main symptoms of Gummosis. Washing by potassium permanganate ($KMNO_4$) and using Bordeaux paste, this disease can be controlled.
c. Foot rot: - This is a bacterial disease. Decadences in the root, Yellow plant are the symptoms of this disease. Drenching by Bordeaux mixture, it can be controlled
d. Black Mildew and White Mildew: - If black dust (mildew) appears in tree, this disease is known as black mildew and white dust (mildew) appears in tree, is known as white mildew. For this disease, Bordeaux mixture and paste are useful for treatment.
e. Patero and Lahi: - Patero and lahi insects are the harmful insects for orange. Lahi attacks badly on young shoot of orange. Patero damages small fruits. Light trap and net can be used to kill and Thiodine can be spray to control.
f. Ant and Red Ant: - They make shelter by connecting the leaf of orange.
g. Steam Borer: - Steam borer makes the hole in the branch of orange tree.
h. Parasite plant: - Parasite plant grows in the branch of orange plants. The controlling method is to uproot the parasite plant.

i. Pink disease: - This is a kind of fungal disease of orange. White web can be seen in diseased part of the plant having pink colour. To be yellow leaf, to wither branch and leaf of orange, to slice the bark and seen gum are the symptoms of pink disease.

j. Padke disease: - To be small leaf and fruit, cannot ripe fruit in time, start to dry plant from the top are major symptoms of this disease.

To identify the disease exactly is a technical issue. So that the researcher presents the symptoms of diseases observed in Thumki VDC. It will help to the concerned agencies for further study.

It is observed that 48% farmers face the disease to dry top and branch, borer seen in branch, while falling leaf and black mildew diseased are faced by 24%, 18%and 20% respectively and other farmers face other difference disease.(table: 4.13)

Table 4.13

Symptoms of Disease or Diseases

S. No.	Particulars	No of farms	Percentage
1	Falling leaf	9	18%
2	To dry top and branch	24	48%
3	Borer seen in branch	12	24%
4	Black mildew	10	20%
5	White mildew	2	4%
6	Lahi/patero	8	16%
7	Ant and Red Ant	4	8%
8	Gummosis	2	4%
9	Foot rot	5	10%
10	Pink disease	4	8%
11	Padke	2	4%
12	Parasite plant	3	6%
13	Total	50	100%

Source:-Field survey, 2067

4.2.15. Methods of Selling Orange

In the study area, farmers use different methods to sell their oranges. There are 7 (14%) households producing orange for household consumption. Because of the few numbers of productive plants, they do not sell their products. Out of 50 households, 48% households sell orange in their house as contract system.7 (14%) households are retail seller. Only one household sell the orange in wholesale system. Others 22% households use miscellaneous system to sell their orange according to the circumstances. (Table 4.14)

Table 4.14

Methods of selling price

S.N	Particulars	No of households	percentage
1	Selling on contract in house	24	48%
2	Selling in retail system	7	14%
3	Selling in wholesale system	1	2%
4	Miscellaneous system*	11	22%
5	Not selling	7	14%
	Total	50	100%

*Miscellaneous denotes contract, wholesale and retail.

Source:-Field Survey, 2067

4.2.16. Basis of Price Estimation by Producer

Out of 50 households, 48% households sell their products in house as contract system. They have no systematic method for price estimation. Lump sum price for the whole farm is determined by the interaction between producer and trader or contractor. Producers try to guess either the number of orange, number of bamboo basket (doko) orange and crate or the weight (kilogram and quintal). But they cannot get suitable price of their products by this system. Out of 50 households 68% households estimates price on the basis of the number of orange, 4% on the number of baskets, 4% on the kilogram, 2% on the crates and 8% on the miscellaneous basis. But 14% have no response about it. (Table 4.15)

Table 4.15

Basis of price Estimation

S.N.	Particulars	No of households	Percentage
1	No. of orange	34	68%
2	No of bamboo basket	2	4%
3	Kilogram	2	4%
4	Crate	1	2%
5	Miscellaneous	4	8%
6	No response	7	14%
	Total	50	100%

*Miscellaneous indicate more than one basis.

Source: - field survey, 2067

4.2.17. Status of Selling in Desired Time

Most of the orange producers sell their products in their house on the basis of contract system. Out of 50 households, 64% households are able to sell their orange in desired time and 22% households are not able

to sell their products in desired time. 14% households do not sell their products. (Table 4.16)

Table 4.16:

Status of Selling in desired time

S.N	Particulars	No of households	Percentage
1	Selling in desired time	32	64%
2	Not selling in desired time	11	22%
3	Produce for household consumption	7	14%
4	Total	50	100%

Source:-Field Survey, 2067

4.2.18. Status of Satisfaction towards Selling Price

Out of 50 households 48% households sell their product in their form as a contract system to escape from market complication. The producer's satisfaction is not depends on suitable price of orange. Out of total 50 households, 62% households satisfy toward selling price and 24% households are not satisfied. But consumption 14% households produce orange for their own consumption (Table 4.17)

Table 4.17

Status of satisfaction towards selling price

S.N	Particulars	No of households	Percentage
1	Satisfied towards selling price	31	62%
	Not satisfied towards selling price	12	24%
3	Produce for household	7	

	consumption		
4	Total	50	100%

Source: Field Survey, 2067

4.2.19. Choice able Market to Sell Orange

The producers sell their output in their choice able market may be different than existing market. Out of 50 households, 34% households selected to sell in their own house, 26% households select wholesaler fruits market,14% households select in Pokhara, 8% households select local market and 4% households select *hat-bazaar* as a choice able market.14% households do not concern about because they do not sell orange in the market. The wholesale and fruits market located in Kathmandu, Kalimati and Pokhara are selected by the producers of Thumki VDC where they often supplied orange. One of the producers was kept stall in Lekhnath Grand Festival to sell orange in 2066 B.S (Table 4.18)

Table 4.18

Choice able Market to sell orange

S.N	Particulars	No of households	Percentage
1	Producer's own house	17	34%
2	Wholesale or fruits market	13	26%
3	Town special (Pokhara)	7	14%
4	Local Market	4	8%
5	*Hat-Bazaar*	2	4%

6	No response	7	14%
	Total	50	100%

Source: Field survey, 2067

4.2.20. Status of Support by Government and Non-Government Institution

Thumki VDC is declared pocket area of orange in 2060 by DADO, Kaski. But special programmes are not arranged in this area. Some programmes are rarely organized by DADO, Kaski. It is necessary to extend DADO's approach in Thumki, especially in ward no. Five, three, and eight. The farmers' inhabitant in these wards feels being neglected by DADO, Thumki. Out of 50 households in selected area 48% have not got any support by government and non-government institutions, 28% farmers have got supports grants to purchases tools and plants, 14% farmers have got loan facility for fruit farming by ADB, 6% farmers are facilitated for technical suggestion and supports by DADO Kaski.6% farmers have got prize and certificate for well done in orange farming. 18% farmers have got free charge medicine. Some farmers have got miscellaneous supports but some farmers have not got any support. (Table 4.19)

Table 4.19

Status of Support by Government and Non-Government Institutions

S.N	Particulars	No of households	Percentage
1	No support	24	48%
2	Grants to purchase tools and plants	14	28%
3	Loan facility by ADB	7	14%

4	Technical support and suggestions	3	6%
5	Free charge for medicine	9	18%
6	Prize and certificate	3	6%
7	Opportunities of training	4	8%
8	Training but not sufficient	16	32%
9	Not training opportunity	30	60%

Source:-Field Survey, 2067

Regarding the training availability, only 8% have got opportunity of training related to the orange farming while 32% have got training facility which is not sufficient. It means they have got only basic training.60% farmers have no opportunity of training. (Table 4.20)

Table 4.20

Training Facility

S.N	Particulars	No. of households	Percentage
1	Trained	4	8%
2	Partially trained	16	32%
3	No training	30	60%
	Total	50	100%

Source:-Field Survey, 2067

4.2.21. Necessity of Cold Storage

Availability of cold storage helps to the producers to confer reasonable price of their product as well as it helps for inter- seasonal price stabilization. It is beneficial for consumers too. So, the producers of Thumki VDC feel about the necessity of colds storage. Out of the

selected 50 households, 64% households have considered that cold store is essential and 6% households have expressed about the necessity of cold storage in future. 20% respondents have no knowledge about the concept and significance of cold store. But 10% households have not considered as essential. (Table 4.21)

Table: 4.21

Necessity of cold storage

S.N	Types of response	No of households	Percentage
1	Necessary	32	64%
2	Necessary in future	3	6%
3	No necessary	5	10%
4	No knowledge about cold store	10	20%
	Total	50	100%

Source:-Field Survey, 2067

4.2.22. Readiness in Participation for Cold Store

For the establishment of cold store in Thumki VDC, farmers are ready for participation. For this 74% households can help by labour donation, 34% households can help by monetary support (economic support). Only 6% households are ready for capital investment. 4% households can help by other ways 30% households are ready to help by more than one ways. (Table 4.22)

Table 4.22

Readiness in participation for cold store

Types of Participation	No. of households	Percentages
Labour donation	37	74%

Economic support	17	34%
Capital investment	3	6%
Other ways of participation	2	4%
More than on ways of participation	15	30%

*Other ways of participation indicate moral support and support by providing land.

Source: Field Survey, 2067

This table shows the high degree of readiness. But there are two major limitations for the establishment of cold store. It is more expensive to build and use cold store, on the other hand there is lack of technical support, financial support and awareness among producers. In rural area, cellar storage need to be promoted. In Nepal in a very limited scale some orange farmers store their products in cellar storage as well. Cellar storage works well in low temperature areas. Except ward no 5 and some part of ward no 3 in Thumki VDC, cellar storage may works well. In order to promote the construction and use of cellar storage construction subsidy is essential. A 1999 profitability analysis of a store of 2m x 2m x 2m size that can store 6000 oranges for mid hill conditions showed net profit of Rs 3000 for a three months storage period that is form November to January (Thapa, Saraf and Gaire)

Single chambered cold store can store one kind of commodity at a time, but multiple chambered cold stores can store more than one kind of commodities at a time. Since supplies of fruits come in small amounts the facility cannot be fully utilized. Electricity is a major operational cost for cold storages.

4.2.23. Production of Orange

The total production is 240 metric ton. The average production is 4.8 metric ton .The productivity of orange in Thumki VDC is 8 MT/Ha. It shows, there is higher productivity of orange in Thumki VDC.

Average production=

Productivity of orange =

Total output and average production is 4.8 metric ton and total outpu And Productivity of orange is 8 MT/Ha.

4.2.24. Total Income Earned by Orange Farming

Out of the selected 50 households, the maximum income of a household by orange farming is Rs 4, 50,000 and there are some households having no income at all by orange farming. The total income is Rs 33, 40,000 and the orange income of per household is Rs 66,800.

Average income of household =

= Rs. 66,800

4.2.25. Expenditure on Orange Farming in 2066

Out of the selected 50 household's expenditure for orange farming of the household is 40,000.There are 7 households having no expenditure for orange farming. They do not spend for manure fertilizer weeding and cutting medicine and tools. The total expenditure is Rs.4, 35,000 and average expenditure per household is 8700.

Average Expenditure of household =

= Rs. 8,700

4.2.26. Profit Estimation

In the selected 5o households engaged in orange farming, total profit is obtained by the difference of total income and total expenditure. The calculated total profit and average profit of the households are Rs 2905000 and 58100 respectively. This study shows that the farmers are success to earn 86.97% profit by orange farming. Though, there are so many constraints facing by orange farmers, this profit can be considered as the great achievements of agriculture sector. Let's be hopeful that more and more farmers will be attracted towards orange farming and be able to improve their economic condition or alive with higher living standard.

Total profit= Total income- Total expenditure

=Rs33, 40,000- Rs4, 35,000=Rs29, 05000

Average profit=Average income-Average expenditure

= Rs66, 800- Rs8, 700=Rs58, 100

Profit percentage =

=86.97%

4.2.27. Suggestions and Expectations of Farmers to the Government

At the end of the questionnaire, the researcher requests to the respondents for their opinions, suggestions and expectations that would help to develop orange farming. Most of the respondents have given more than one suggestion. Out of the 50 households, 44%have expected for Technical support and encouragement by the government.38% have suggested about necessary of training 28% have expected for diagnosis of disease, soil test and required treatment.22% have suggested for settlement of proper market, management of qualified plants fertilizer and tools including grants.20% have desired for investment, proper attention and care by farmers, also 4% desired for unity of all farmers for orange farming.20% have expended for irrigation facility and 16% for cold storage 8% respondents stressed on the management of insurance and loan facility.2% have stressed for necessity of security and orange processing system. By this, farmers can use fallen orange to make juice. Similarly 2% have suggested about proper transportation facility. (Table4.23)

Table 4.23

Suggestion and expectations of farmers to the government

S.N	Suggestion and expectation	No. of households	Percentage
1	Technical support and encouragement by the government	22	44%
2	Necessity of training	19	38%
3	Diagnosis of disease, soil test and required	14	28%

	treatment		
4	Settlement of proper market	11	22%
5	Management and qualified plants fertilizer and tools including grants	11	22%
6	Investment, proper attention and care by farmers	10	20%
7	Necessity of irrigation facility	10	20%
8	Necessity of cold storage	8	16%
9	Insurance and loan facility	4	8%
10	Necessity of security	1	2%
11	Management of processing system for fallen orange	2	4%
12	Unity of all farmers for orange farming	2	4%
13	Proper transportation facility	1	2%
	Total	50	100%

CHAPTER- V

SUMMARY, FINDING, AND SUGGESTIONS

5.1 Summary of the Study

The following facts have been summarised from the study

Introduction and relationship between" Production and Marketing" have been discussed in Chapter I. It gives brief sketch of orange farming in Nepal. Role and scope of orange farming have been discussed. Establishment of citrus fruit development centres and their contribution in the promotion of orange farming are also discussed.

The objectives of this study are to identify the production situation, market situation, and price situation of orange in Thumki VDC. This study has also aimed to identity the problems faced by orange producers and to give appropriate suggestion.

In Chapter II, some theoretical and empirical studies related to orange production and marketing are discussed. Concept on "production and Marketing and four definitions of different market structure are presented in this study. Seven unpublished thesis papers to the department of Economics, Management and Rural Development have pointed out some specific problems in orange farming. Three institutional research reports of FAO, HMG/DFAMS, NEW ERA, have pointed out about the production trend, productivity, market channels and problems of citrus farming.

"The world market for tropical horticulture production" a report published by FAO reviewed the production and consumption of citrus fruit. While preparing the report it also focuses on the agents of orange agro system suppliers. A report published by UNCTAD in 2007 reviewed

citrus fruit production and consumption. Around 70% of the world's total citrus production is grown in Northern hemisphere. The present condition of citrus production in south Asia is reflected in the study of Ghosh and Singh.95% of total citrus production is shared by India and Pakistan. In Nepal, citrus is not considered as a man occupation.

Chapter III is related to "Research Methodology" of the study. Orange producing 50 households have been selected by using simple random technique as a sample size. Primary data have been collected from structured questionnaire, interview and discussion. Secondary data have been tapped from VDF records, DADO reports, National sample census of agriculture (2001/2002) Kaski Bastugat Bibaran (2067,) reports of Horticulture Development Programme (2066/2067) and CBS reports.

Chapter IV has discussed the presentation and analysis of data obtained from field survey. In this chapter background of Kaski district is stated. The total area and irrigated land of kaski district are square 2017 square km and 201700 hectare respectively. The altitude and annual average rainfall of this district are 450 to 2325 m and 408 .27mm respectively. The climates of this district are subtropical, temperature and cold temperate where rainfall depends on monsoon. The total population, density of population and average family size are 3, 80,527 188.66 per square km and 4.47 respectively. The percentage of economically active population and population engaged in agriculture 58% and 52.6% respectively.

The introduction of Thumki VDC is also discussed in this chapter. The total area and irrigated land of Thumki VDC are 24.28 square km and 100 hector respectively. The altitude of this VDC is 450 m to 1410 m from the sea level where rainfall depends on monsoon and climate is

subtropical and temperate. The total population of this VDC 4034 recorded in 2067.

Analysis of collected data is also discussed in this chapter. In selected 50 orange producing households the total population is 336. The purpose of orange farming is business for 28% and business as well as household consumption for 25%. The farmers have been started orange farming since 5 to 40 years. 19% people households have used plants produced in their own nursery and 62% used plants produced by other farmers especially in Gorkha, Muglin, Damauli, Bahumara. The total numbers of plants is kept by the selected 50% households are found to be 7616. Out of which 88.44% are productive, 11.55% unproductive while 84% seed and 16% seed as well as grafting plants. Most of the farmers (25%) have applied Garakanla method, 12% in track and 20% in rectangular shape for plantation. The major crops among orange farming are maize, millet, arum, ginger, onion, beans, sugarcane and turmeric. It is observed that 90% farmers used organic manure (Gobar) 6% used dung of the hen, 4% used compost manure and 10% not used any manure for plantation.

Out of the 50 households, 56% never irrigate their orange farm, 24% have irrigated by pipes and 20% have partially irrigated by carrying pot. The percentage of farmers using Bordeaux paste, Bordeaux mixture and Cows urine on 20% 18% and 18% respectively. 16% farmers used Metacid in their farm for treatment of orange plants. Nuvan, Malathine, Ash-Water, Tobacoo are also rarely used as medicine. It is observed that planting orange at middle point is better than others but especially it depends on geographical features and slope of land. Citrus Greening, Root rot, Gummosis, Steam borer, Pink disease, padke, Black and White Mildew, Patero and Lahi and parasite plants are disease and insects for

orange farming. Out of the 50 households, most of the farmers 48% sell orange on contract in house and 14% sell in retail system. The producers estimate price of orange by guessing the number of orange in their farms. 64% farmers are able to sell their orange in desired time and 62% farmers are satisfied towards selling price. The major choice able market for producer of Thumki VDC is either their own house 34% or wholesale and fruits market 26%. Supporting programmes are not sufficient though this VDC is declared as pocket area. 48% farmers have not got any support, 28% got grants to purchase plants and tools and 14% have got loan facility for the development of orange farming. Few farmers have got technical support and suggestion 6%free charge medicine 18%, prize and certificate 6%. There are only 40% farmers who have got training facility. The total production is 240 M.T. The average production and productivity of orange is 4.8 M.T and 8 M.T/ HA. The total income of 50 households is Rs 33,40,000, the maximum income of per household is Rs, 4, 50,000 and minimum is 5,000 and the average income of per household is 66,800.

Out of 50 households the maximum expenditure for orange farming of the house hold is Rs 40,000. The total expenditure is Rs 4, 35,000 and average expenditure of per household is Rs 8700. The estimated total profit of orange farming in 50 households is Rs 29, 05,000 and average profit is Rs 58,100. This research work shows that the farmers are success to earn 86.97% profit by orange farming.

The suggestions and expectations of orange producing farmers are presented here which are technical support and encouragement necessity of training, irrigation facility, cold storage, insurance loan facility and security diagnosis of diseases soil test and treatment settlement of proper market.

5.2. Finding of the Study

This case study of "orange production and marketing" is located at Thumki VDC of Kaski district. There are 835 households in VDC, out of which 100 households engaged in is orange farming but only 28% households are engaged in purely commercial orange farming. The rank of Kaski district for the production, total plantation area and productivity of orange is second among 56 orange producing districts in Nepal.

5.2.1 Orange Production and its Constraints

The production of possibility of orange in Thumki VDC is very high though there are various constraints or problem facing by orange producers. There is a problem of irrigation but small sources are feasible for irrigation. Other problem is the impact of various diseases such as citrus Greening, Root rot, Black and White mildew, Gummosis, Pink diseases, Padke disease, steam borer, Patero and Lahi, Ant and Red ant other diseases under information, some disease are created by lack of irrigation. If sufficient irrigation facilities are regular check-up plants are managed, there will be more production and productivity will be increased. Some other problems are lack of training facility, diagnosis of disease, soil test and required plants, fertilizer and tools, lack of insurance and loan facility, unfavourable climate etc. The farmers have to build producer group so that they can get some facility and be able to solve some problems related to orange farming.

5.2.2. Orange Marketing and its Constraints

The concept of marketing has not developed in Thumki VDC yet. Production is necessary condition but not sufficient for economic development. The product should be sold at good price in order to maximize. More than half producers sell their orange on contract system in house. The average price received by the farmers is Rs 13.91 per kilo gram which is not reasonable price comparing with local market and whole sale market in Kalimati Kathmandu. It is found that the marketing situation is poor than the production situation in Thumki VDC. Lack of proper market facility, lack of cold storage, lack of proper transportation facility, lack of processing system, lack of information of recent price are the major problems facing by orange producers.

5.3. Recommendation

Following recommendation have been derived from the present study. It is recommended that the concerned organizations as well as government should take necessary steps to implement the recommendations of this study in the forthcoming days.

- As the higher productivity of orange in farming at Thumki VDC, is highly potential from the economic point of view because it provides the higher return of orange farming in the sample households. Therefore, the farmers are encouraged to produce orange.
- Irrigation facility is so weak in the study area. So there should be development of irrigation facility.
- The farming method is traditional, so modern technology and method should be launched. Training facility should be provided to the local farmers time to time.

- The government should provide the subsidy to loan and technical materials for the orange grower farmers.
- Link between production and marketing centres should be established.
- The government is suggested to ban the import of fruits till the national products cover its demand. It helps to correct the balance of trade.
- DADO, Kaski have to be serious to identify and to control the diseases, to provide the technical suggestion and training to the orange producers.
- Importance and benefits of the orange farming should be broadcasted by radio, TV moreover through FM channels (most of the people in the study area listen FM radio now a days)
- There should be establishment storage and processing industry, which may reduce to damaged fruits during the period of harvesting and marketing method.
- For the better production and to raise the productivity, the role of horticulture department most active and effective.

Bibliography

APROSC (*1989*): *Small Infrastructure of vegetable and fruit in Sindhuli District,* APROSC, Kathmandu.

Basnet, K.B (1998)"*Orange Cultivation Problems and Prospects"(*Unpublished Dissertation T.U.)

Bhatta, B.D (1995): "*Orange Cultivation in Gulmi District*" Unpublished Dissertation T.U.

CBS (2001/02): *National Sample Census of Agriculture,* HMG, National Planning Commission Secretariat, Kathmandu

DADP (2067): Jilla Kirshi Bikas Karyakarm Ra Tathayanka Ek Jhakak , 2067, Kaski.

DADO (2066/067): "*District Agriculture Data Book"* Kaski

DADO (2066/067): "*Jilla Parswachitra,"* Kaski

Dictionary (1973): *Dictionary of modern economics :(1973):* second edition, The Mc Grew-Hill-International Book Company, New York.

FAO (1988) *the world market for Tropical horticulture production*

FAO *economics and the Social Development paper food and agriculture organization of the* United Nations Rome

FDD (1985), *Fruit Development in Nepal* –FDD, Kathmandu Nepal

Government of Nepal (2009/2010*): Statistical Information on Nepalese Agriculture 2009/010,* Government of Nepal, Ministry of agriculture and Co-operative, Singha Durbar, Kathmandu.

http//:www.kuenselon.line.com//

Karmacharya, Basudev (2063):"*Nepal Ma PhalfulKheti Ra Kalami Garne Parbidhi*"(First edition) Mrs.Chandeshori Karmacharya, Kathmandu.

Kaski Bastugat Bibaran 2066/67, Branch Statistics Office, Kaski, Pokhara

Kautsoyiannis, A (1979): *Modern Micro Economies,* Mac Millan press limited in London.

Khanal, Thakur Prasad (2008):"*Orange Production and Marketing"*A Case Study of Tanahun district. An unpublished M.A Thesis Paper in Economics Department of PNC Pokhara.

LARC (1989) *"Production Constraints of mandrain in western development Region*" Voloume 2 Pokhara.

Laundari, Bishow Raj (2004*):" An Economy Analysis of Orange Production* "A case of Purkot VDC, (Unpublished M.A Thesis)

NEW ERA (1989), *Vlable processing Alternative and Effective Marketing strategies for Mandarin in* Dailekh. New Era, Kathmandu.

Panerus, S (1998): *The Production and Marketing of Orange in Ashrang VDC of Gorkha District.* A Thesis Paper Submitted to CDE, T.U., Kirtipur. Kathmandu.

Rai, S.K, (1998), *"A Study of orange cultivation in the Eastern Hill,* Unpublished Dissertation T.U

Rai, T.B (2003):"*Orange Production Marketing in Sikkim"* Unpublished Dissertation T.U.

Shah,Ram Badal (1992):*Citrus Fruit Trainer's Manyual,* HMG/DTA, Kathmandu.

Sharma, Nilam Kumar (2060): *Economics of Nepal* (Nepali edition) Pairabi Publication, Kathmandu.

Shrestha, B.M (1995) "*The Role of the Fruit Production in Rural Development"* (Unpublished Thesis T.U.).

Shrestha, Rudra (2001), *A Diagnostic Study on Sweet Orange Marketing in Ramechhap*, Unpublished Dissertation T U

Thapa P.K, Saraf. D. and Gaire, K.R (2001/003): *Commodity Case Study: Fruits*,

Through Website: www.googlescholar.com