

**AN ANALYSIS OF ORANGE FARMING IN TAKLUNG VDC,
GORKHA DISTRICT, NEPAL**

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CHAPTER I

INTRODUCTION

1.1 General Background

Nepal is an agro-based developing country. It is highly depended on agriculture. Agriculture contributes 33.7 percent on total GDP and more than 67 percent people are engaged in agriculture sector in 2013/14. Total agricultural land is 18 percent and the out of this 18 percent agricultural land, 27 percent land is in Terai which is more fertile and 73 percent is in Hill and Mountain where production is lower than Terai (MoF, 2016).

About 21 percent (3.2 million hectares) of the total land area of Nepal is used for cultivation and the principal crops are rice (45%), maize (20%), wheat (18%), millet (5%) and Potatoes (3%), followed by sugarcane, jute, cotton, tea, barley, legumes, vegetables and fruits (CBS, 2011).

The pattern of fruit crops cultivation differs considerably in different places owing to physical properties of land, climate, rainfall, temperature, hours of sunlight, cultural practices of the inhabitants etc. The technology and financial management along with the marketing management plays pivotal role in the production of any crop in a given context. The farmers pay more attention and allocate available land resources for growing food crops in majority of the third world countries including Nepal. Even the government agricultural policy is also generally related with food crops for food security of the people of the country. But gradually the importance of horticultural crops is realized by the people. It is also observed that the government of the developing countries too concentrates on horticultural products for both food security and health security. As a result the studies of fruit crops are extended in developing countries, so the farmers cannot overlook the importance of the production of the fruits crops also. For food crops, some specialized systematic marketing systems are developed in almost all of the developing countries while in developed countries for both food crops and fruits crop marketing system is well organized and highly developed. Proper handling, storage, gradation, packaging, transportation, quality maintenance etc. are important for perishable commodities like fruits. Fruit like orange cannot be stored for longer period and if properly not handled at the time of

pre harvesting, harvesting and post harvesting its quality is lost till it reaches from producers to the consumers.

The area under citrus fruits cultivation in Nepal is 30,790.3 hectare with total production of 2, 27,070.62 metric tons. The productivity of Citrus is calculated to be 11.36 metric ton per hectare. Citrus alone contributes about 35.21 percent of the total fresh fruits production of the country (Horticulture Development Programme, 2064/65). During fiscal year 2065/066, 74.23 metric tons of citrus fruits were imported in Nepal, despite the fact that we have climate as well as land topography very much suitable for citrus cultivation. Mandarin orange as well as Sweet-orange produced in Nepal has been proven of best quality. Thus there is need to explore the potentiality of citrus cultivation in Nepal for export promotion as well as import substitution.

Orange cultivation predominantly plays a very important role in the socio-economic condition of rural areas in Nepal. Orange is a seasonal horticultural fruit crop. Oranges are available throughout the year (peak time-winter) and grow on evergreen trees which are about 30 feet high and 20 feet wide. The flowers of the orange are white and blossom in spring, however the fruits appear only by winter. Once the trees are matured it gives fruits for 15-20 years.

In Nepal citrus is cultivated largely in the mid-hills with an altitude ranging from 750-1350 meter above sea level. Mid hills are generally characterized by terraced upland where citrus is grown under rained conditions. Monsoonal rain occurs from June to September. Erratic but small amount of rainfall also occurs in winter. Traditionally, citrus are grown for a long period of time. Prior to the establishment of horticultural farms in Nepal, citrus cultivation was limited to the homestead gardens.

In Nepal, the history of orange cultivation is very much old. Particularly, the history of orange cultivation in eastern region of Nepal is much older. It is supposed that the development of the orange cultivation has initiated from this region. But there is no concrete evidence development of orange cultivation. Before some decades there were only few plants of range in other villages except the place Taklung VDC of Gorkha district. The development of orange cultivation was gradually increased from the eastern region to the middle zone. The cultivation of orange has been professionally established in these two regions because of the proper height of 1000

meters to 1400 meter. Orange cultivation has been initiated in almost 54 districts. Among them 35 districts are famous for orange cultivation. Generally, cultivation of orange is done without proper guideline, training but they are in moderate quality. The result of orange cultivation shows the proper environment for orange cultivation is highly region. For, this role of government is important and government has been played the role of facilitator. Also orange industry should be established.

1.2 Statement of the Problem

Lower productivity and subsistence production in agriculture is the main concern of Nepal. Most of the economic variables are depended on agricultural sector in Nepal. Agriculture contributes 33.7 percent on GDP and 64.5 percent of people are used the agriculture as subsistence living. One forth of total population of Nepal is under the poverty line but multiple poverty indexes are 42.2 percent (MOF, 2016). By showing this fact, the agriculture contributes less percent on GDP and it cannot be succeed to reduce the poverty in Nepal. For this, many reasons are hidden behind it. So, for the enlarging the contribution of agriculture in economic growth and development there should be established the agricultural infrastructure and addressed the agricultural problems. The orthodox farmers who are still engage on traditional farming activities they should turned on modern farming system. Likewise, the major constrains of agriculture should be addressed. Such as, the barter system should be changed on monetized system, traditional tools and techniques of farming system should be replaced by scientific tools and techniques, spread the credit facilities, give sufficient and effective information in periodically.

Large number of farmer is engaged on cereal crops. The cultivation of cereal crops is only to being subsistence for generating the income of farmer they should bring on farming of cash crops. They should facilitate by trainings and give knowledge about high valued cash crops .For the uplifting of agriculture, promotion of cash crop is essential. There are immense prospects of cash crops. Among the propitious cash crops orange is one. There are various breeds of orange and cultivated on different area. Orange have been cultivating on various parts of Nepal either traditional or modern ways. Whatever the methods, this sector has been suffering from various problems with the immense prospects.

Orange farming is most important to generate income of rural people of central part of Nepal due to the suitable climate condition. Main areas of orange farming of central region are found in Lamjung, Tanahun, Kaski, Syanjya, Parbat, Myagdi and Gorkha districts. The trend of orange farming is increasing in the central part of Nepal but, they are not getting sufficient value of this orange due to lack of different problems like weak infrastructure. Traditional method, limited market etc. Which problems should be managed by the government to promote orange farming?

Orange cultivation is now occupying a prominent status in comparison with other horticultural products being cultivated in a district. It has become the main commercial crop in the region as it generates high income level for the farmers with low investment. Till a few years back, orange cultivation was being done more than 1200 hectares of land in the Gorkha district, but it has been reduced to the change of crop from orange to tea but some of the small tea growers have used the same land for both the crops using some modern concepts and technology. The agriculture department has taken some scheme and provides subsidies including storage, processing and marketing for the benefits of farmers.

In the context of Taklung VDC, most of the farmers use their own local seeds (plant), old technology method expensive fertilizer and they are suffering from the time of plantation to the marketing. Orange farming has immense significance to the agriculture and economy of Gorkha to uplift the economic standard of rural people. Due to the lack of knowledge of implantation of the appropriate process of orange production, lack of marketing facilities, diseases etc. lead to the lower the production of orange many weaknesses as the accessibility to market by produces itself is very low due to high cost of transportation etc. These are large number of middle men in the channel of marketing such as village trades, suppliers commission, commission agents, buyer's commission etc. in order to increase productivity of orange and improve the marketing system of orange, the study of orange farming is important.

Therefore, this study is oriented towards the investigation of the following research questions in Taklung VDC.

- 1) How is the production status of orange in Taklung VDC?
- 2) How is the marketing status of orange in the study area?
- 3) What are the problems and prospects of orange cultivation in Taklung VDC?

1.3 Objectives of the Study

The main objective of the study is to examine the problems and prospects of orange farming in the study area. The specific objectives of the study are as follow:

- To identify the orange production and cultivation status in the study area.
- To analyze the market of orange production of the study area.
- To examine the problems and prospects of orange farming in the study area.

1.4 Significance of the Study

This study is to visualize the orange production and marketing of the study area .It flash out knowledge about the orange production. In this context, this study is important to show the current problems which are found in the area of orange production .This study helps to make plan and strategies to improve the production of orange and what will be done for development of orange in future.

Most of the poor people are living in hilly region of Nepal. So, it is essential to uplift the socio-economic condition of those people. For this purpose, it is better to cultivate high value crops especially citrus product because of its favorable climatic condition. This is important to know the existing situation of citrus production, problems of such region and way of solution also. To some extent, this case study can be generalized for some of the hilly region of Nepal regarding the citrus production, particularly orange.

This research can be helpful for the improvement and betterment of the present condition of local who are facing a lot of problems like lack of transportation facility, lack of irrigation, fruit diseases, lack of systematic market, lack of cold storage etc. This research is based on field survey. The information generates a new concept with its own nature. Hence, this research can be helpful for future scholars, researchers, and students in the related field and as well as for the policy makers for formulating more effective and suitable economic policy, and NGOs and INGOs who are working in the concerned sector.

1.5 Limitations of the Study

The study has the following limitations.

- 1) Since the study of orange production is exclusively a case study area, it may not be generalized to all orange production.
- 2) The selected period of the study covers from 2000/01 to 2016/17 due to limitation of data from the local body.

1.6 Organization of the Study

The study is divided into eight chapters. The first chapter is the introduction that includes background of the study, statement of the problem, objective of the study, significance of the study, limitation of the study and organization of the study. The second chapter is the review of the literature which includes international context, Nepalese context and research gap. The third chapter is the research methodology that includes research design, nature and sources of data, sample period cover, population sample and sampling procedure, tools and methods of data collection and tools. The fourth chapter is the socio-economic characteristics of respondents. The fifth chapter is the orange production and cultivation in study area. The sixth chapter is about the marketing situation of orange. The seventh chapter include problem & prospects of orange production. The eighth chapter includes summary, conclusion and recommendation. Finally, appendix and reference follow the summary and conclusion.

CHAPTER II

LITERATURE REVIEW

To conduct the study, existing and related references were cited and analyzed through the review of literature. The reviews help to make the research qualitative and to identify the genuine problems. Related reviews about orange and citrus cultivation, problem of production and marketing situation are reviewed.

Though agriculture is the main occupation of Nepalese economy, horticulture has been initiated only to negligible extent. Mandarin (orange) is one of the most important species of genus citrus. There are some studies on horticulture as well as citrus in Nepal. Very little literature has been found on orange cultivation in particular. The main focus of all studies is placed on the problem of production and marketing situation. These studies indicate that there is favorable climate and soil condition for citrus cultivation in the hilly region and by providing the infrastructural and institutional development there would be great possibilities for its production. For the fulfillment of research objectives available materials relating to the orange cultivation have been reviewed.

2.1 International Context

Hayes (1960) has mentioned that citrus fruits are grown in tropical and subtropical regions throughout the world. It is mentioned that before the Second World War 650,000 acreage in USA, 254641 in India, 209,000 in Spain, 180,000 in Italy, 137,000 in Mexico, 103350 in Japan, 60,000 in South Africa, 55,000 in Brazil and 50,000 in Australia were used for production of Citrus. It is also estimated acreage of citrus fruits in the different part of India according to the report on the marketing of citrus fruits in India was in 1943- Madras 31,270, Madhya Pradesh 22947, the Punjab 17,150, Bombay 16,100, Assam 14,025, Coorg 10,071 and other provinces and states 18,148. From this information it is clear that in Assam citrus fruits were cultivated widely before independence.

Abbott (1970) pointed out the marketing channels and costs from growers to consumers through the various channels. The study pointed out that consumer prices for apple, orange and tomatoes in the United States show that the producers do not necessarily receive a higher proportion of retail price under the advanced marketing

system. It may take a larger margin to pay for the additional services it offers. From the retail price of oranges producer received 37 percent, while packing, grading etc. cost 14%, transportation cost 16 percent commission agents received one percent wholesale traders received 8 percent and the retail traders received 24 percent.

Bonavia (1973) prepared a comprehensive effort in 1973. The study consisted the objectives of the work on presentation of different figures concerning the size, shape of leaves, fruits and their variation in citrus trees of the countries. Altogether 259 plates of illustrations and short information about orange and lemon fruits type are systematically printed in the book. It is considered as a remarkable contribution in this sector. This work has helped to identify various orange and lemons grown in India, Ceylon and in Nepal as well.

Gupta (1974) evaluated the economic viability of an investment project where they estimated the (a) Pay-Back Period, (b) Net Present Value (NPV) (c) Internal Rate of Returns (IRR) (d) Benefit-Cost Ratio (BCR). Their findings were that the optimum size of orange groves is 1 to 2 acres since groves of this size are the most profitable ones. The pay-back period for investment in such gardens was seven years; the IRR is 45.9% the NPV at a 12 percent discount rate is Rs. 7,910 per acre and the benefit cost ratio at 12 percent discount rate was 2.64. The least profitable groves are those of size up to 1 acre. These gardens had a pay-back period of nine years an IRR of 29.3 percent an NPV at 12 percent discount rate of Rs.4, 260 per acre and a benefit cost ratio at a 12 percent discount rate of 1.85. Furthermore, the productive life of an orange tree is more than 24 years.

Food and Agricultural Organization (1975) concluded that a successful government official is one who builds many institutions to handle goods and services. The paper has further stressed that the government should take responsibility among others for agricultural development through infrastructures development, supply of inputs, extension programmes, and creation of marketing institution for agricultural goods. The government should pay attention in rural marketing though improved agricultural inputs, feeder roads. Government should ensure rural trading and it also should provide concessional agriculture credit to fruit producers. The government should manage institutional measuring system of fruits in rural areas. Government should organize practical training programmes for small and medium scale fruit traders in rural areas. Commodity handling technique, processing, storage, business,

management of efficient marketing is some of areas in which small and middle farmers need some expose. Government should strengthen their activities in the field of marketing research, information and forecasting data and possibilities for the future development in order to encourage wide spread participation in agriculture marketing. The paper has suggested that traders should be organized. The study should recognize new market, channels for extending information and technical assistance to trades. The study should collect information from various sources, discuss and seek advice from them and implement joint programmes and campaign with them. The mass media should also be encouraged to improve the image of private marketing entrepreneurs.

Singh (1981) provided important information about origin of citrus fruits, geography and climate, commercial importance of citrus fruits production of world, India and North East India from 1967 to 1978.

Rajput and Haribabu (1985) have reported that establishing origin of citrus fruit has been a matter of controversy. However, most of the taxonomists have an agreement that Himalaya region and South China are the places of origin for the citrus fruits. Therefore, the suggested origin of citrus is South East china. The precise centre of the origin has been considered the mountain parts in Southern China and Northeastern India including Southern Nepal where sheltered valleys and Southern slopes are protected from cold and dry wind and are exposed to summer monsoon. Many citrus species have their origin in the India. It has been considered that not less than 78 species of family.

Ghosh (1985) mentioned the important citrus growing areas. Soil-properties like soil reaction, soil fertility, drainage, free lime and soil concentration, etc., are some of the important factors that have determine the success of citrus. It thrives well in deep, loose, well aerated soils devoid of any hard pan layers of calcium carbonate in rooting zones. While dealing with the types of soil the article puts emphasis on those types which harm the health of citrus trees. For example over-moist soil, saline alkaline soil etc. It also mentioned the composition and uses of various citrus products and their industrial importance.

Singh (1990) discussed the climatic and soil requirement for citrus growing areas. It also mentioned about the method of citrus cultivation. One of the focal point of

discussion is that in the recent past the problem of citrus decline has been a real threat to the citrus industry, especially of mandarin orange in N.E. regions. Earlier estimates showed that during 1973-74, mandarin orange covered about 22.7 thousand hectares with an annual production of 160 thousand tonnes of fruits in the north-eastern region. The much reduced present day figures clearly indicate the gravity of the problem of declining mandarin orange in the region. In Meghalaya itself, from about 7 thousand hectares with about 48.5 thousand tonnes of fruit production during 1960-70, it has come down to about 4.8 thousand hectares with about 28 thousand tonnes of fruits. The important causes of decline of citrus in N .E. Region were mentioned in his work. Muhammad (1991) carried out an analysis of the technical efficiency of sweet orange production among small scale farmers in Onus State, Nigeria. A three- stage random sampling technique was used in collecting the data used for this study. The study shows that the number of stands and the size of sweet orange farms are the significant factors affecting sweet orange production in the area. About eighty eight percent variations in the output of sweet orange production was found to be due to the technical efficiency of the farmers. Technical efficiency of sweet orange production among the small scale farmers in the study area was found to be fairly high with a mean of 86.33 percent. The study recommended the need for the farmers to be assisted in setting up sweet orange plantation as a way of increasing the output in the study area.

Heneld (1994) concluded that the orange tree is small, spiny tree, typically growing to 7.5 m (25 ft), but occasionally reaching heights up to 15 m (50 ft), generally with a compact crown. Leaves are leathery and evergreen, and range from elliptical to oblong to oval, 6.5-15 cm long and 2.5-9.5 cm wide, often with narrow wings on the petioles (leaf stems). The fragrant white flowers, produced singly or in cluster of up to 6, are around 5 cm wide, with 5 petals and 20 to 25 yellow stamens. The fruit, which may be globose to oval, is typically 6.5 to 9.5 cm wide, and ripens to orange or yellow. The fruit skin (rind or peel) contains numerous small oil glands. The flesh or pulp of the fruit is typically juicy and sweet, divided into 10 to 14 segments (although there are seedless varieties) and ranges in color from yellow to orange to red. Hundreds of cultivars have been developed, which are grouped into 4 major categories by geography (Mediterranean oranges, Spanish oranges and characteristics (blood oranges, navel oranges).

Donald (1995) explained that the sweet orange reproduces asexually (apomixis through nucellarembryony); varieties of sweet orange arise through mutations. The orange is a hybrid, between pomelo (*Citrus maxima*) and mandarin (*Citrus reticulata*). It has genes that are 25 percent pomelo and 75 percent mandarin; however, it is not a simple backcrossed BC1 hybrid, but hybridized over multiple generations. The chloroplast genes, and therefore the maternal line, seem to be pomelo. The sweet orange has had its full genome sequenced. Earlier estimates of the percentage of pomelo genes varying from 50 percent to 6 percent have been reported. Sweet oranges were mentioned in Chinese literature in 314 BC. As of 1987, orange trees were found to be the most cultivated fruit tree in the world. Orange trees are widely grown in tropical and subtropical climates for their sweet fruit. The fruit of the orange tree can be eaten fresh, or processed for its juice or fragrant peel. As of 2012, sweet oranges accounted for approximately 70 percent of citrus production.

Silviya, (1996) explained that oranges, which are high in vitamins A and C and potassium, are eaten fresh or processed into juice, which can be consumed directly or further processed into concentrate, both used in numerous soda and cocktail drinks, punches, orangeades, and liqueurs (although many orange liqueurs are made from sour, rather than sweet, oranges, or from a combination). Orange fruits and peels are used in numerous desserts, jams and marmalades, candied peels, as well as cookies, cakes, and candies. Oil derived from orange peels, as well as flowers, leaves, and twigs is used as an essential oil in perfumes; orange seed oil may also be used in cooking or as a component in plastics. Orange blossoms produce more nectar than any other source in the U.S., and are important for honey production (more than 25 percent of honey produced in California is from orange groves).

Baruah and Kalita (2001) referred to the major privilege of orange cultivation from financial perspective. Comments were also made on its fruit value as well as medicinal value. However, the fact they observed is that in spite of being a profitable cultivation, a decline of interest has been noticed among the orange growers. Almost all the orange orchards were started long back; only a few orchards are established newly. Another major advantage pointed out in the article is that the orange plants remain productive for 50 years or more. In the context, orange plants are compared to tea plants during the last four or five years a tendency is seen to transfer orange

orchards to tea gardens. In Tinsukia district itself about six hundred hectare out of 1448 hectare of orange cultivated land is transferred to small tea gardens. The article also enumerates that profitability of orange production is higher than that of tea production per unit of land. In spite of being a convenient horticultural crop, growers lost their interest, as observed in the article, due to different diseases and the lack of a regulated market.

Anak (2001) established that profitability from orange is higher than other crops like paddy mustard, wheat, potato etc. Still, the return per hectare is lower mainly because the growers are not getting remunerative prices for their products. The farmers are exploited by the traders; a lion's share of consumer's rupee is enjoyed by the chain of traders and the growers are deprived of their due shares. She also pointed out that there remains a considerable potential for increasing the production of orange by rejuvenating the old orchards. By adoption of improved technology with application of appropriate doses of soil nutrients in orange area newly brought under cultivation and plantation of optimum plant population the return per hectare may be significantly higher. She has worked out the market structure, market functionaries, marketing channels from producer to consumer and price spread of oranges

Ruchal (2006) focused on the productivity and production trend of mandarin orange, the relationship between farm size, horticulture loan, and the cost benefit of orange cultivation. Moreover orange cultivation is fruitful occupation. There is high demand for oranges from neighboring market centers i.e. Gantok, Siliguri and Calcutta. The study also pointed that sometimes the farmers do not receive good returns. It is always the presence of middlemen who absorbs majority of the profit. However due to the lack of co-operation, facilities, transportation the farmers prefer garden selling. It is the small farmers who sell their products in the local market. The study found that the trend of orange, in term of area and production is increasing in the study area. As well as in term of cost and benefit orange cultivation is mostly beneficial in the study area. Orange farming provides more income to most of the households. Most of the farmer's are serious and they try to employ technological know hoe in orders to increase production moreover the government also seems drawing out policies for the betterment of farmers.

The above analysis made by Ruchal viewed that the potentiality for better marketing facilities is hampered by the interference of the middle man. As such the poor farmers

are not able to sell their product in the local market. Therefore, it would be much better for government or the NGO's or self – help groups to intervene and take needy action against such corruption.

Samuelson (2007) explained the law of diminishing returns holds that the producer would get less and less extra output if researcher employs additional doses of an input while holding other inputs constant. The law of diminishing returns is often observed in agriculture. If a farmer adds more labour, the fields will be more thoroughly seeded and weeded, irrigation ditches will be neater and scarecrows better oiled. At some point, however the additional labour becomes less and less productive. The third hoeing of the field or the fourth oiling of the machinery adds little to output. Eventually, output grows very little as more people crowd onto the farm; too many tillers spoil the crops. Diminishing returns is a key factor in explaining why many countries in Asia like Bangladesh are so poor. This is because there are so many workers per acre of land and not because farmers are ignorant or fails to respond to economic incentives.

Subba (2008) studied about the mandarin prefer warmer winters and higher rainfall. All the tropical and sub-tropical sub-mountain tracts with elevations from 600 to 1500m above mean sea level and rainfall ranging from 85 to 300cm uniformly distributed from March to November are suitable for its cultivation. The study pointed that mandarin orange can be grown successfully on a wide range of soils. For Sikkim Mandarin sandy and gravelly hill brown soil with slope seems to be ideal for cultivation orange trees are sensitive to high concentration of salt and cannot stand water-logged condition. The first three feet of soil are most important in orange growing as the study form the major feeding root zone of the tree. In Sikkim only one variety Sikkim Mandarin is cultivated in commercial scale. However, there are several distinct groups of Mandarin varieties available in India. The study differ from each other by fruit characteristics such as rind colour, fruit shape and size or by tree characters such as shape, nature of spread of branches etc. The study also points that there is no practice of irrigation citrus orchards in Sikkim.

Arial (2011) explored that the total global commercial production of oranges in 2010 was 69.4 million metric tons (mt), harvested from 4.1 million hectares of land. Brazil, which is the leading producer (with 19.1 million mt), produced more than twice as

much as the second-ranked U.S. (with 7.5 million mt). Other leading producers included India, China, Mexico, and Spain.

2.2 National Context

DFAMS (1976) focused on the production, cost and existing marketing channels of major fruits in these two districts. The objectives of the study are: to estimate the cost of cultivation of major fruits grown in these two districts, to estimate the total production and existing number of different fruits in general and those of citrus trees in particular and to study the existing marketing channels and methods of marketing as followed by the fruit growers in particular. Monsoonal rain occurs in winter. Traditionally, citrus are grown for a long period of time. Prior to the establishment of horticultural farms in Nepal, citrus cultivation was limited to the homestead gardens.

Knoor, Shah, & Gupta (1970) studied that mandarin is an important cash crops of the hill farmers. The government gives priority to expanding the citrus industry in Nepal. Consequently two Citrus Stations were opened in 1960 Pokhara and 1961 Dhankuta. The initial objectives of those stations were to produce sapling to increase the area under mandarin cultivation. During those period a large number of orange shaping were imported from India and were distributed to citrus growers in Pokhara.

Upadhaya (1979) attempted to analyze the supply and demand situation of fruits in various seasons. However, the improvement and achievement of fruit production is poor due to many problems like lack of organized markets and marketing information, lack of transportation and storage facilities etc. The study explains method of marketing of fruits and also tried to identify the major problems and remedies for the improvement of the market of orange in Nepal. And lastly the study has concluded by pointing out the fruit cultivation plays a significant role to achieve the major purpose of occupation in the eastern region of Nepal.

Chapagai (1987) concluded that surplus of orange fruits are sold without any kind of marketing concept. The brokers have been getting much benefit than the real producers. Thus the marketing margin to the growers has been found very low although the marketing channel is not so long. The physical infrastructural development for orange marketing is very poor which leads to have low price to the producers. Meanwhile the supporting institutional facilities i.e. credit, postal service, information, regarding price, demand and supply are very low and insufficient.

Bhatta (1995) focused on historical development, spatial distribution and the production trend of orange. This study has also explained the physical as well as non-physical factors influencing to it. This study has also tried to comprise the orange cultivation with cereal crops in the view point of investment and benefit and found that it is more profitable than cereal crops which has also provided job opportunities for hill people. Despite the previous problems its production trend is increasing day by day.

Rajbanshi (1997) studied in Mandarin orange farming in Manakamana VDC. The study focused on the production and productivity trend of mandarin orange. The study has found that the lack of organized marketing system as well as traditional management system of gardens is the main factor which has created hindrance in this field. The studies concluded that an orange fruits as a major fruits has become one of the important agriculture activities. He also explains about the various physical and non physical factor influencing orange farming and practices of post harvesting problems and assurance of diseases and pests. Farmers or owner made seller store for junar storage for five months period by using paddy straw leaves of pine for packing and storing the harvested orange.

Basnet (1998) found that 68 percent area of Nepal is covered by hilly region (height: 600meters-3000 meter). Due to suitable climate for mandarin cultivation, mandarin cultivation is expanding as very important cash crops in the mid-hill region of Nepal, where it offers an opportunity for high income per hectare in areas of acute land scarcity with favorable income generation, poverty reduction and positive environment effect. As mandarin is the major raw material for development of industries producing orange juice, jam, squash, jellies, marmalades, pickles, etc. In addition, environment benefits also get the high value of output per hectare. This study helps to withdraw marginal land from agriculture land and form the tree crops on slopes).

Shrestha (2001) 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.

Kafle and Rana (2003) found that lack of market information, lack of farmer's networks and lack of collection centers and market places as marketing problems of citrus in Gorkha district. They also found that lack of irrigation facility, not well managed nutrient system, problems of insect and diseases as production problems of citrus in Gorkha district.

Laundari (2004) made a study on orange production 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.

Thapa (2005) studied on the topic of orange cultivation in the western hill region of Nepal. The study has conducted research in Shanker Pokhari VDC of Parbat District. The main objectives of the study was to analyze the determinants of orange cultivation, and to explain the access to market by using the primary data collected from different respondents of study area. Moreover he has also pointed out that the orange cultivation was significantly raised the economic status of the study area. Due to the fluctuation in market price, role of middleman and unorganized market system basically creates the main problems to the people of the study area during the time of goods selling in market. Middlemen are the main profit earner than the producer. Lack of organized marketing system, storage facilities and processing industries are remarkable problems for the orange marketing. He also pointed that generally most of the orange orchards are small in size. in terms of literacy status, occupation, land holding size and food sufficiency the orange growers has better position. Moreover he has found that there is no systematic care and management in orange cultivation. The cultivation is more tradition. There is much lack of commercialization and modernization.

Rayamajhi (2005) stated that development of agriculture sector requires a balance improvement in the production and marketing. It is inefficient to improve the production side and neglect marketing side as the farmer's improvement is dependent

on the latter's development. Production may be the door to economic growth but marketing is the key that turns the lock. Marketing is also the most important multiplier of economic development.

Deoju & Rijal (2006) mentioned that citrus production is season based. Most of citrus production is from November to March. Cold storage of these produces is merely practiced. During off season, large quantities of citrus enter into Nepal market from India and Nepal's large sum of money goes outside which would otherwise enrich the poor communities residing in the rural hilly area. Though the production is in the increasing trend, but it is not in the satisfactory. The study views orange cultivation to be dependent upon seasons. The production is mainly concentrated between the months of November and March. As such orange is a winter crop. During March the orange crop is harvested. As well as the study makes a point in his study that offer March the summer season commences in Nepal but unfortunately cold storage is not available in many areas. This leads to wastage of a huge quantity of orange. Alongside the domestic market for orange is not also widely distributed. Similarly expert quality oranges are not produced. Hence, the system of marketing is not well managed. at the end huge quantities of oranges are imported from India to which an unnecessary expense is generated. Had proper management been initiated than a majority of farmers would have benefited from their produce. Therefore, the study focuses on the implementation of the needy infrastructure to expand and promote orange cultivation in Nepal.

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, Doko, four wheelers and others. Most of the traders were retailers followed by Doko. 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 and 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 promoting acid lime production and eventually Ministry of 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.

Shrestha (2009) said collective marketing is the best way of marketing which have strong bargaining power on price determination and the increase profit from the enterprise to the small holder farmer.

Kabas (2010) studied on post harvest loss of mandarin orange of Dhankuta district. Post harvest loss causes losses on farmers and also on country's economy. This also causes decrease in food availability. Dhankuta is a major citrus producing area with superior quality mandarin oranges. The survey data on production and quality of mandarins produced was not available. No information regarding the post harvest losses during harvesting, transportation and storage was available for mandarin grown in Dhankuta. Similarly, losses due to disease and pests were not known till that date. The study was conducted to estimate the post harvest loss of oranges particularly in trade route of Dhankuta-Dharan.

NARC (2011) identified both early and late variety of mandarin which are Okitsuwase, a early season variety which can be harvested in Ashwin to Kartik (October- November) and Khoku, a mid-season variety that can be harvested in Mangsir to Magh (November to January) and late season variety Murkott (a cross between mandarin and sweet orange) which can be harvested in Falgun-Chaitra (February to March). Introducing these varieties could solve the seasonal glut by extending harvesting time to get more income.

Ministry of Agriculture and Corporative (MOAC, 2012) conducted study in western hill of Nepal, which is the most potential region for mandarin production in term of area and production of the country. Lamjung district was purposively selected for the study. The reason behind the selection of the Lamjung district was that this district ranks no second in term of area and production of mandarin in Nepal with the total productive area 830 and production 10956 metric tons.

Lumle Agriculture Research Centre (LARC, 2014) conducted a study based on the potential citrus growing areas of Syangja, Kaski, Tanahun, Gorkha and Lamjung districts and it indicated that the mid-hills are largely characterized by terraced upland and food grain crops like maize, millet, wheat and barley. These crops are mostly grown under rained conditions in these areas whereas it is experienced that mandarin farming is economically more profitable than cereal crops under similar conditions. 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

Pokherel (2015) studied on impact study of RAPID ROAD sub-project based on primary data using tool focused group discussion and structured questionnaire his objective was to find the impact of RAPID ROAD in agriculture production and non-agriculture activities. The study found that rural road improvements are also under taken to promote agriculture products as well as shift in agriculture pattern to cash crops, particularly where lack of access had chocked agriculture output or marketing facility. By alleviating constraints in the movements of agriculture product, farmers revenue can increase and agricultural and non-farm rular employment can also increase, contributing to a decline in poverty.

NEW ERA (2016) 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. The study 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.

NARC (2017) pointed high potential of orange production. The orange resource can be used for selling as well as processing. The cultivation was increasing in Banskharka VDC. To add profit to the farm income, there was a need to enhance entrepreneurship culture. If selling could be enhanced and processing could be promoted, it could contribute to poverty reduction in Banskharka VDC, thereby creating employment in the locality reducing the migration in search of employment.

2.3 Research Gap

Previous researches are based on the sector of orange farming, development and its possibilities. But they are not enough to address in the modern agriculture technologies, invention and new geographic location and localities too. Few researches are based in particular area and areas. Those researches aren't addressing and possibilities in Gorkha district's farmers who are producing specially oranges. They are dependent in orange production. It's not addressed the problems and possibilities of modernization in agriculture market penetration and diversification in Gorkha's orange producer farmers.

The gap has been looked into socio-economic impact of orange cultivation in Taklung VDC of Gorkha district. The conclusion of the research is that the orange cultivation has a positive impact in rural economy. The socio-economy status of this study area is up-graded by orange production, but the people are not adopting the orange cultivation from commercial point of view. The impact of development does not seem to be encouraging. If the farmers develop it in an organized manner, it will remove their backwardness, poverty and illiteracy.

In the study area, after analyzing the different socio-economic parameters of farmers, the study concluded that the socio-economic status of orange growers is higher than non-growers. In terms of literacy status, occupation, land holding size and food sufficiency the orange grower has better position than non-grower. The orange cultivator is facing a lot of problems such as non systematic care and management in orange cultivation, lack of commercialization and modernization lack of irrigation facility, improved sapling, chemical fertilizer, aged chemical, insecticide pesticide. Instead of problem, farmers in the study are still optimistic for the future prospect orange. So this study has examined the socio-economic impact in study area.

Climate change, new market, marketing policies, Nepal governments recent agriculture policies new disease in orange farming are genius issues. But these issues are not researched in the way of micro analysis. So it is confirmed that the study has mentioned the problem, possibilities, potentiality of orange farmers in Gorkha district.

CHAPTER III

RESEARCH METHODOLOGY

This study had been carried out mainly on the basis of descriptive research design because the study had focused on to investigate the problems and prospects of orange farming in Taklung VDC of Gorkha District. This is the pocket area for orange cultivation in Gorkha district. The following reasons are the selection of Taklung VDC as the study area. Taklung VDC is one of the leading VDC for orange production in Gorkha District. No previous studies have been carried out in this VDC on this similar topic. Taklung VDC, being the neighbour VDC of researcher, the familiarity of various aspect of accessible and appropriate to collect required information for this study.

3. 1 Research Design

The research has been conducted under ‘Descriptive Research Design’ because the study systematically analyzes the situation of production, marketing, problems and prospects of orange production in Gorkha district take into account. It mainly concern about the foreign employment and remittance income. In the research work mainly primary data is used to clear most of the objectives and for more additional information secondary data is used like information about demography in the study area, geographical situation and trend of migration. In this research the simple statistical as well as scientific tools are used like percentage, frequency, average, table etc. on the basis of sampled respondent KIIs, FGD and PRA, pie chart and bar diagram (single and multiple) .

3.2 Nature and Sources of Data

An intensive field survey was conducted to obtained data and information for the study. However, information obtained from secondary sources was also used for the analysis. Secondary data or information has been derived from different relevant books, journals, reports, institutional publication and website.

3.3. Rationale of Site Selection

Nepal has almost 54 districts for the orange cultivation, among them Gorkha districts is really famous for orange cultivation. In Gorkha district, Taklung is also famous for

the orange farming. In this study, Taklung VDC of Gorkha district will be taken as a study area.

3.4 Sampling Procedure

The climatic condition of Taklung VDC is favorable for orange cultivation in Gorkha district i.e. 1, 2, 3, 4, 5,6, 7, 8 and 9 wards. It was really difficulty for collecting data from all households in term of time, money and labour. So, it can be expensive, quite tedious and time consuming. That is why a researcher has prepared random sampling method. Two hundreds fifty-four were taken as universe in Taklung VDC. The researcher had taken 57 households from Taklung VDC through simple random sampling method and all of the households are familiar to the orange cultivation. Most of the household fully depends on orange production.

3.5 Techniques of Data Collection

For the research both primary and secondary data were used. Primary data are collected from field survey; interview, observation, questionnaire and sampling. Likewise secondary data were collected from websites and internet, report of the NGOs/INGOs, relevant books, journal, magazine, and other related research literature. For the study, following techniques were used to collect primary data.

3.5.1 Interview through Household Questionnaire

To obtain the primary data face to face interview (unstructured and structured) was adopted, where the researcher directly talked to the respondents to know the fact of the rural women. It involves interaction between interviewer and respondents. The researcher was included this types of questions; general information, information about income, borrowing, expenditure, business activities, occupational change and empowerment.

3.5.2 Case Study

This method was used to explore the life pattern, activities and life history of the respondent. The case study supported to get immense information about rural women and their family member. The researcher used two case studies.

3.5.3 Informal Interview

During field study, informal interactions with a number of people were made. They were asked about saving and credit business informally. This technique was also useful to provide essential information about the activities of members.

3.5.4 Field Note

It is almost impossible to remember all the information collected during the field survey therefore field notes were recorded to remind later. During field survey both subjective interpretation of the situations and the raw interpretation of the fact were recorded.

3.6 Method of Data Analysis

Collected information was processed and analyzed scientifically with the help of computer software like excel as well as manually. Different tables are preparing for different socio-economic variables. Mathematical calculation and statistical operations and tests are performed for quantitative information. Qualitative information is presented in descriptive way. To visualize information different diagrams and charts are prepare.

CHAPTER IV

SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS

This chapter deals with the analysis of primary as well as secondary data focusing on production and marketing of orange of the study area. It shows the back ground of the study area and production of citrus and orange in Taklung 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 Selection of the Study Area

Gorkha district a part of province number 4 and is one of the 77 districts of Nepal and connected historically with the creation of the modern Nepal and the name of the legendary Gurkha soldiers. The district, with Pokharithok (Gorkha), later known as Prithivi Narayan Nagarpalika as its district head quarters, covers an area of 3,610 km² and has a population of 2,88,134. It is the location of the Manakamana temple. Also, the temples of great sage Gorakh Nath and goddess Gorkhkali temple is located in district, after which the district got its name. Four major rivers run with in the along it- the Chepe, Deraudi, Marsyangdi and Budhi Gandaki. Among two municipalities and sixty nine VDC in Gorkha district, Taklung is one. It consist nine wards. In such study area there are 5028 population with in 501 households. This VDC has full of various casts and ethnicity like Magar, Newar, Dalit, Gurung, Kshetri, Bramins.

Most of the land in Gorkha 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 32.8 percent of the potential cultivatable areas are occupied by irrigated land.

Age of fifteen years and above population is known as economically active population. 51 percent people are economically active in Gorkha district. Out of total economically active population, 62.6 percent 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, papaya etc. Out of economically active population 35% people are engaged in governmental or private service, business activities and physical work activities and 16 percent people are engaged in other occupation (DDC, 2017).

Out of the 43 VDCs and 2 municipalities in Gorkha district, Taklung VDC is large in terms of orange production. Taklung VDC lies to the southern part of the Gorkha district. This VDC is bordered by Chitwan district in south, Ghairung and Makaisingh VDC in east, Manakamana VDC in west, and Bakrang VDC in north. The latitude of this VDC is 27.91 and the longitude 84.63 east.

Most of the land of this VDC is covered by forest (31.63 percent). Only 69.37 percent land is used for cultivation (VDC profile, 2016). Forest is one of the important natural resources of Nepal. During the past few years forest was in state of rapid decreases. To control deforestation and to develop the forest, consumer groups have been found and many programme such as plant production and distribution, production of community forest implementation and evaluation etc have been conduct to enhance general awareness of the people in the forest sector. Many species of plants are found in Gorkha as well as study area, Taklung has the some dense forest, mixed forest, open bushes and green lands. Mainly Katus, Saal, Chilaune, Bar, Pipal, Salla, Simal, Baas etc are found in study area. Hence the study area is natural vegetation.

Soil constitutes the physical base for any agriculture enterprise. The three nutrients namely nitrogen, phosphorus and potassium contribute to soil fertility. Generally, three soil types are found in Taklung such as, sandy soil, red soil and mixed soil. The percentage of mixed soil is higher than sandy soil and red soil. Mixed soil is considered as appropriate soil for orange cultivation. So, the district agriculture development office has recommended cultivation of orange in this area.

The total population of Taklung VDC is 5028, among which 2796 are female and 2232 are male. The distribution of population by sex and wards is shown in the table 4.1

Table 4.1

Population Distribution by Ward and Sex

Ward No.	Population		Total population
	Male	Female	
1	346	404	750
2	161	188	349
3	595	803	1398
4	123	166	289
5	254	287	541
6	186	194	380
7	136	204	340
8	159	217	376
9	272	333	605
Total	2,232	2,796	5,028

Source: Central Bureau of Statistics, 2069

Table 4.1 indicates the population of the VDC varies from 349 to 1398 person per ward. Smallest ward is ward number 2 and largest is ward number 3. Sex wise there are more females than male in all the wards of VDC.

Climate of Gorkha district is dependent on monsoon. Taklung VDC is also dependent on monsoon.

4.2 Distribution of Population by Occupation

Agriculture continues to dominate as a major occupation of the economically active population in Nepal. About 60% of economical active populations are engaged in agriculture. So, agriculture is still predominating occupation in Nepal. The composition by occupation of the sampled household in Taklung VDC is presented in table.

Table 4.2
Distribution of Population by Occupation

S.N.	Occupation	Number of S.H.H.	Percent
1.	Agriculture	40	70.17
2.	Government Service	5	8.78
3.	Business	12	21.05
	Total	57	100.00

Source: Field Survey, 2017

The table 4.2 depicts that 70.17 percent of selected households were engaged in agriculture, where as 21.05 percent were engaged in Business and 8.78 percent were engaged in government service. Figure 4.2 shows distribution of population by occupation of the sampled household of Taklung VDC.

4.3 Cast/ Ethnic Structure by Population

Nepal has been described as a garden of various Caste/ethnic groups. In almost every part of the country the community is mixed and people of different Caste/ethnic group live together peacefully. Table 4.3 highlights the Caste/ethnic structure of population by sampled household of Taklung VDC.

Table 4.3
Ethnic Composition of Orange Producer of Sample Household in the Study Area

Ethnic Group	Number	Percent
Magar	32	56.14
Gurung	5	8.77
Newar	3	5.26
Chettri	2	3.51
Dalit	8	14.04
Gharti	7	12.28
Total	57	100.00

Source: Field Survey, 2017.

Table 4.3 shows the Caste/ethnic structure of population by sampled house hold by Taklung VDC. The table shows that the population of Magar is highest which is equal to 56.14 percent. The second highest Caste/ethnic group is Dalit, third highest Caste/ethnic group is Gharti. The table also show that in Taklung VDC 3.51 percent are Chhetri, 5.26 percent are Newar, 8.77 percent are Gurung. Figure 4.2 shows the ethnic composition of HHs of Taklung VDC.

4.4 Distribution of Population by Education

Education is a means through which human being may bring a better life. But one may get education either formally or informally. The informal education is dominated in primitive societies. As one moves from primitive to more civilized societies, the education process becomes more and more institutionalized and formal. In Taklung VDC, there are 7 primary schools and 2 secondary schools. For further study, students have to go district headquarter or out of the district. The literacy status of the sampled HHs shows their ability to adopt new technology and increase efficiency. The sample respondents were asked to identify their literacy status in three categories namely illiterate, literate but less than ten class of formal education and those above secondary school leaving certificate level. The distribution of respondent about respondents about literacy status is given below:

Table 4.4
Distribution of Sample HHS by Literacy Status and Caste

Education Level	Number of Sample HHs						Total HHs	Percent of HHs
	Magar	Gurung	Newar	Chhetri	Dalit	Gharti		
Illiterate	4	1	0	0	2	2	9	15.79
Literate	20	2	1	1	5	3	32	56.14
Above SLC	8	2	2	1	1	2	16	28.07
Total	32	5	3	2	8	7	57	100.00

Source: Field Survey, 2017.

The table 4.4 depicts the composition of population on the basis of education in HHs in Taklung VDC. The illiterate population is 15.79 percent, above school is 28.07 percent, and literate population is 56.14 percent.

Out of the total 57 sample HHs, 15.79 percent HHs are illiterate. The literate respondents make up 56.14 percent of the total respondents. Out of these 32 HHs are Magar, 5 are Gurung, 3 are Newar, 2 is Chhetri, 8 is Dalit and 7 is Gharti.

Very few respondents have been uneducated. The numbers of HHs members who have acquired education above SLC are Magar-8, Gurung-2, Newar-2, Chhettri-1, Dalit-1 and Gharti-2. Total number of HHs having education above SLC makes up 28.07 percent of the total respondents.

CHAPTER V

ORANGE PRODUCTION AND CULTIVATION IN STUDY AREA

5.1 History of Orange Cultivation in Nepal

Orange farming in Nepal started since ancient times for their own use but now farmers are being aware and start to orchards of orange as an instant cash crop. There are lots of possibilities in commercial orange farming at mountain region but only few farms grow the oranges in Nepal. Orange is a most eaten fruits as well as a third favorite flavor after chocolate and vanilla. Sweet oranges are the native fruit to northeastern India and most widely grown species of citrus. Orange trees are widely grown in tropical and subtropical climates for fresh sweet fruit, processed jam, juice and wine. Oranges are the fruit of the largest citrus species crop in the world, there are many Health Benefits of orange, it helps to prevent the cancer, kidney diseases, lowers cholesterol and risk of disease, boosts heart health, fights against viral infections, protects skin, relieves constipation, regulates high blood pressure, alkalize the body etc. Oranges are effective in both preventing and treating certain diseases like asthma, bronchitis, pneumonia, tuberculosis and rheumatism.

5.2 Total Production of Orange in Nepal

Due to the increase in the price and demand of orange in the market the supply is also increasing rapidly. Having high benefit for health and testy as a juice, it is becoming popular day by day among Nepali consumer. The trend of orange production in Nepal is given below:

The table 5.1 shows the trend of orange production in Nepal in last 17 years. In FY 2000/01 the total area of orange cultivation was 20673 hectors, out of these only 11892 hectors was productive area and total production of orange was 121665 metric ton. In FY 2001/02 the total area of orange cultivation was 22423 hectors, out of these only 12615 hectors was productive area and total production of orange was 130928 metric ton. In FY 2002/03 the total area of orange cultivation was 23663 hectors, out of these only 13312 hectors was productive area and total production of orange was 139110 metric ton. In FY 2003/04 the total area of orange cultivation was 24799 hectors, out of these only 13931 hectors was productive area and total production of orange was 148010 metric ton.

Table 5.1
Trend of Orange Production in Nepal

Year	Total area (Ha)	Productive area (Ha)	Production (metric ton)
2000/01	20673	11892	121665
2001/02	22423	12615	130928
2002/03	23663	13312	139110
2003/04	24799	13931	148010
2004/05	25910	14606	156956
2005/06	26681	15206	164075
2006/07	27980	15832	171875
2007/08	30790	19915	226404
2008/09	32322	22482	253766
2009/10	33898	22903	259191
2010/11	35576	23607	263710
2011/12	37565	24089	240793
2012/13	36975	23645	216188
2013/14	38988	25497	224357
2014/15	39035	25261	222789
2015/16	40553	24854	218447
2016/17	46328	26759	239773

Source: MOAD, Statistical Information on Nepalese Agriculture 2073/74

In FY 2004/05 the total area of orange cultivation was 25910 hectares, out of these only 14606 hectares was productive area and total production of orange was 156956 metric ton. In FY 2005/06 the total area of orange cultivation was 26681 hectares, out of these only 15206 hectares was productive area and total production of orange was 164075 metric ton. In FY 2006/07 the total area of orange cultivation was 27980 hectares, out of these only 15832 hectares was productive area and total production of orange was 171875 metric ton.

In FY 2007/08 the total area of orange cultivation was 30790 hectares, out of these only 19915 hectares was productive area and total production of orange was 226404 metric ton. In FY 2008/09 the total area of orange cultivation was 32322 hectares, out of these only 22482 hectares was productive area and total production of orange was 253766 metric ton. In FY 2009/10 the total area of orange cultivation was 33898 hectares, out of these only 22903 hectares was productive area and total production of orange was 259191 metric ton. In FY 2010/11 the total area of orange cultivation was 35576 hectares, out of these only 23607 hectares was productive area and total production of orange was 263710 metric ton.

In FY 2011/12 the total area of orange cultivation was 37565 hectares, out of these only 24089 hectares was productive area and total production of orange was 240793 metric ton. In FY 2012/13 the total area of orange cultivation was 36975 hectares, out of these only 23645 hectares was productive area and total production of orange was 216188 metric ton. In FY 2013/14 the total area of orange cultivation was 38988 hectares, out of these only 25497 hectares was productive area and total production of orange was 224357 metric ton. In FY 2014/15 the total area of orange cultivation was 39035 hectares, out of these only 25261 hectares was productive area and total production of orange was 222789 metric ton. In FY 2015/16 the total area of orange cultivation was 40553 hectares, out of these only 24854 hectares was productive area and total production of orange was 218447 metric ton. In FY 2016/17 the total area of orange cultivation was 46328 hectares, out of these only 26759 hectares was productive area and total production of orange was 239773 metric ton.

This shows that the total area of cultivation and production of orange is being increasing every year. The main reason of this is increasing demand of orange, increase in the awareness of farmers, increase of fertilizer facility and transport facility.

5.3 Orange Production in Study Area

The production amount of orange depends upon several factors. Weather is the most important factor for the orange production. Apart from weather, orange production depends upon the care of farmer and labors, irrigation, disease, injuries by insects. The total production of orange in Taklung VDC in 2017 is given below:

Table 5.2

Orange Production in Study Area

Wards No.	Total orange production in FY 2017(Kg)
1	113200
2	118500
3	85300
4	123200
5	87600
6	97500
7	158600
8	58900
9	73200
Total	916000

Source: VDC Profile, 2017

According table 5.2, the total production of orange was 916000 Kilogram in Taklung VDC in FY 2017. The production of ward no. 1, 2, 3, 4, 5, 6, 7, 8 and 9 were 113200, 118500, 85300, 123200, 87600, 97500, 158600, 58900 and 73200 Kg respectively. According to this VDC profile the Ward no. 7 had produce highest amount of orange 158600 Kg in fiscal year 2017. Due to higher level of awareness of farmer,

transportation facility, fertilizer facility and other facilities the ward's production was higher than other wards.

5.4 Types of Orange

There are many types of orange produced in Nepal. All oranges thrive in warm regions where the summers are warm and the winters are cool but the temperatures do not go below freezing. With their dark green leaves that stay on the tree throughout the year and their fragrant white flowers, oranges are considered among the most beautiful of plants. There are three types of oranges: sweet oranges, bitter oranges, and mandarins. Which are explained in detailed according to their characters?

A. Sweet Oranges

The sweet orange is believed to have originated in southern China and came to the Mediterranean region several hundred years after the bitter orange. Today sweet oranges are grown around the world but the largest crops are in Brazil, the United States and Mexico. Sweet orange are mostly commonly used for eating fresh and for juice. Bitter or sour oranges are used for making marmalade and orange-flavored liqueurs, and mandarins—which are also called tangerines and are not really oranges but a separate citrus—are used for eating fresh. Sweet Oranges have a sweet flavor—actually a blend of sugar and acid—and are round to oval in shape. There are three groups of sweet oranges:

- a. Common Oranges:** Common Oranges are the largest group of sweet oranges. They are sold as fresh fruit and almost all orange juice comes from Common Oranges. The Valencia orange—the most popular orange in the world—is a type of common orange. Other common orange varieties include Hamlin, Jaffa, Marrs, Parson Brown, Pineapple, and Trovita.
- b. Navel Oranges:** Navel Oranges are sweet oranges that develop a small second fruit within the larger fruit at the blossom end of the orange which is at the end opposite the stem. Where the second fruit develops is an indentation that looks like a human navel and thus the name. The Washington navel orange is the original and best known navel orange. Other navel orange varieties include Cara Cara, Fukumoto, Lane Late, Robertson, Skaggs Bonanza, and spring.

- c. **Blood Oranges:** Blood Oranges are similar in appearance to common oranges but the tint of their flesh and peels range in color from pink to red to purple. The juice of blood oranges is red with some more red than others. Blood oranges have a rich, berry-tinged flavor. The best known blood orange varieties are Moro, Sanguinelli, and Tarocco.

B. Bitter oranges

Bitter oranges originated in India and made its way to the Mediterranean region around 1000 AD. Today bitter oranges are mainly grown in Europe. Bitter or sour oranges are usually not eaten fresh because their flesh is tart to bitter tasting. The sour flavor of these oranges is a result of the fruits' acidic juices; the bitter is due to the essential oils. The best known bitter orange varieties are Bouquet de Fleurs, Chinotto, and Seville. The bitter orange generally resists cold better than the sweet orange and the mandarin is more resistant to cold than either the sweet or bitter orange. The bitter and sweet orange resist cold better than other citrus such as limes or lemons

Both the bitter and sweet orange were brought to the Americas by Spanish and Portuguese explorers in the 1500s. The mandarin was introduced into the United States in the late 1800s.

C. Mandarins

Mandarins are thought to have originated in southeastern China and spread throughout Asia in the tenth century and to Europe in the early 1800s. Today they are grown mainly in Brazil, the United States, Italy, Japan, and Spain. Mandarin oranges are a large and varied group of citrus that share several traits. Most notably, mandarins are loose skinned fruits—so loose that they are sometimes called zipper-skinned. Mandarins are also generally smaller and flattened looking, and they typically are sweeter than sweet oranges. There are many well known varieties of mandarins—some of which are also called tangerines: Clementine, Dancy, Encore, Fremont, Honey, Kara, Kinnow, Mediterranean, Pixie, Ponkan, Satsuma, and Wilking.

The difference between many oranges is the climates in which they are grown. Oranges originating in more tropical regions are thinner-skinned, juicier, contain less acid, and are paler in color than oranges grown in cooler or sub-tropical regions. The most flavorful oranges are grown in regions where the days are hot and the nights are

cool. Sugar forms during hot days and acid during cool nights to create the tastiest oranges.

5.5 Institutes and Organization Involves in Orange Development in Nepal

(A) NARC

Nepal Agriculture Research Council (NARC) was established in 1991 as an autonomous organization under "Nepal Agricultural Research Council Act- 1991" to conduct agricultural research in the country to uplift the economic level of the people. Which carrying following objectives:

- To conduct qualitative studies and researches on different aspects of agriculture.
- To identifies the existing problems in agriculture and find out the solution.
- To assist government in formation of agriculture polices and strategies.

(B) JICA

Aiming to achieve sustainable and equitable economic growth, Japan International Cooperation Agency (JICA) is providing assistance to construct roads, hydropower plants, water facilities and other infrastructure, develop the private sector, establish legal and other national and social frameworks, and strengthen administrative capacity, as well as supporting the reduction of poverty in rural areas through such areas as agriculture, education and health from 1978.

(C) Nepal Orange Cultivators Association

Nepal Orange Cultivators Association was established in 2005 A.D. It organizes and promotes orange cultivators for orange cultivation. It is an association of orange cultivators. It was very important role for the promotion of orange in Nepal. The association carrying two objectives as to develop the orange production in organized and systematic way and to identify the problems related to the orange farmer.

5.6 Types of Land under Orange Production

The use of land depends on the land available. Lowland, upland, pasture land and wet land are one type of land classification. Marginal wetland in the banks of river and stream is best for orange cultivation. Generally, pasture land and wet land is used for

orange cultivation first. Low land and upland which are prime land is cultivated only at last.

5.7 Total Area of Orange Production in Study Area

The orange is cultivated in all wards of study area of Taklung but we took only 7 wards to make study easy.

Table 5.3
Total Area of Orange Farming by Different Caste in Study Area

Word No.	Area of Orange Farming in Study Area						Total Area (Ropani)	Percent of Area
	Magar	Gharti	Newar	Chhetri	Dalit	Gurung		
3	200	0	10	0	20	25	255	18.48
4	175	10	0	20	30	10	245	17.75
5	150	30	0	0	10	15	205	14.86
6	50	0	10	0	30	35	125	9.06
7	210	0	25	10	20	0	265	19.20
8	110	15	0	0	0	20	145	10.51
9	90	0	5	10	10	25	140	10.14
Total	985	55	50	40	120	130	1380	100.00

Source: Field Survey, 2017.

Table 5.3 shows that the area of land in different wards of the study area by different castes. In all wards, the Magar households most of the land used for farming. They hold 200, 175, 150, 50, 210, 110 and 90 Ropani of the cultivated land in words 3, 4, 5, 6, 7, 8, and 9 respectively.

From the above table, on the basis of orange, we can conclude that ward number 7 is in 1st position, ward number 3 in 2nd position, ward number 4 in 3rd position and ward number 6 is in last position. Similarly, the Magar HHsholds1st position, the Gurung holds the 2nd position, Dalit HHS holds 3rd position.

5.8 Pattern of Major Crop

During study period, it was tried to find out whether other crop dominate orange cultivation or no. Before orange cultivation maize was the major crop. The distribution as a major crop before orange cultivation in selected household in Taklung VDC is shown in table.

Table 5.4
Distribution of Major Crop Before Orange Cultivation

S.N.	Size	Number of Households	Percentage
1.	Maize	44	77.20
2.	Vegetable	8	14.04
3.	Rice	2	3.50
4.	Millet	1	1.76
5.	Wheat	2	3.50
	Total	57	100.00

Source: Field Survey, 2017.

The table 5.4 recalls information regarding distribution as major crop before orange cultivation in the study area. It shows that 77.20 percent households have maize. Similarly 14.04 percent households have vegetable, 3.50 percent household have paddy, 1.76 percent have millet and 3.50 percent have millet plus maize. Figure 4.14 shows distribution as major crop before orange cultivation.

5.9 Land Covered by Orange Cultivation

The entire selected household in Taklung VDC cultivated orange. Total of selected households land about 31.41% of land is cultivated by orange. Therefore selected households farmer are devoted into orange cultivation. Orange cultivation is increasing in Taklung every year. Because of pocket area in Gorkha district for orange cultivation government have paying attention on Taklung. Table 5.5 shows the composition land covered by orange cultivation in selected households in Taklung VDC.

Table 5.5
Land Covered by Orange Cultivation

S.N.	Land Size (in Ropani)	Number of Households	Percentag
1.	0-10	25	43.85
2.	10-20	12	21.06
3.	20-30	9	15.78
4.	30-40	7	12.29

5.	More than 40	4	7.02
	Total	57	100.00

Source: Field Survey, 2017.

The table 5.5 indicates the relationship between total lands and Orange cultivated land of study area. It shows that 25 household have 0-10 Ropani land, 43.85 percent of their land is cultivated by orange, 12 household have 10-20 Ropani, 21.06 percent of their land is cultivated by orange, 9 household have 20-30 Ropani, 15.78 percent of their land is covered by orange, similarly 7 household have 30-40 Ropani, 12.29 percent land is covered by orange cultivation and 4 household have more than 40 Ropani, 7.02 percent of their land is cultivated by orange. Figure 4.15 shows land covered by orange cultivation in Taklung VDC.

5.10 Factor for Encouraging Orange Cultivation

Chandra Bahadur Rana is the pioneer of orange cultivation in Taklung VDC. He cultivated 10 orange plants for his own prospect. After producing the orange, then other villagers also interested to cultivated orange. Now people are cultivating orange for the professional point of view. Factors for encouraging orange cultivation in the related household in Taklung VDC are presented in table 5.6.

Table 5.6
Factor for Encouraging Orange Cultivation

S.N.	Responses	Number of Households	Percentage
1.	Self Motivation	48	84.21
2.	Demonstration effect	9	15.79
3.	Agriculture	0	0
4.	By NGO's Office	0	0
5.	Other	0	0
	Total	57	100.00

Source: Field Survey, 2017.

The table 5.6 depicts that factor for encouraging orange cultivation on Taklung VDC. 84.21 percent households were encouraged by self – motivation and 15.79 percent household and were encouraged by demonstrated effect. Figure 5.6 shows factor for encouraging orange cultivation orange cultivation.

5.11 Reason for Encouraging Orange Cultivation

Farmer of Taklung VDC has increased orange cultivation year per year. Most of the people of Taklung VDC have started orange cultivation for the commercial point of view. Most of the people of selected household depend on orange production. Table 5.8 shows the reason for encouraging orange cultivation in selected household in Taklung VDC.

Table 5.7
Reason for Encouraging Orange Cultivation

S.N.	Description	Number of Households	Percentage
1.	Attractive Market Price	44	77.20
2.	Higher Production	9	15.79
3.	Employments	1	1.75
4.	Lower Cost	1	1.75
5.	Other	2	3.51
	Total	57	100.00

Source: Field Survey, 2017.

The table 5.7 depicts the reason for encouraging orange cultivation market price, 77.20 percent households said attractive market price, 15.79 percent households said higher production, 1.75 percent households said for employment, 1.75 percent households said for lowest cost and 3.51 percent said other reasons.

5.12 Sources of Orange Plants

Orange plants are very important factor for the cultivation of orange because the improved seeds and plants give better product. Table 5.8 shows the source of orange plants in selected household in Taklung VDC.

Table 5.8
Sources of Orange Plants

S.N.	Description	No of households Before three year	Percent	No of household at present	Percent
1.	Local Nursery	52	91.23	48	84.21
2.	Self Nursery	5	8.77	4	7.02

3.	Agriculture office	0	0	5	8.77
	Total	57	100.00	57	100.00

Source: Field Survey, 2017.

The table 5.8 depicts the sources of orange plants of selected households before and after three years. Before three years 91.23 percent household have brought from local nursery and 8.77 percent households have brought from self nursery. But at present 84.21 percent households have brought from local nursery, 7.02 percent from self-nursery and 5 percent household have brought from agriculture office.

5.13 Availability of Inputs for Cultivation

Chemical fertilizer, pesticide, improved varieties seeds and agriculture tool are very important for orange production. These components play major role in the sector of agriculture. In the absence of this component our product may take bad role. So the farmer should know how to make use of these components in the orange cultivation. Table 5.9 shows the availability of chemical fertilizer, pesticide and improved seed in the selected household in Taklung VDC.

Table 5.9
Availability Input for Cultivation.

S.N.	Description	No of Households	Percentage
1.	Difficulty to get	19	33.33
2.	Difficulty to get in time	21	36.85
3.	No sufficient	12	21.05
4.	Easy to get	5	8.77
	Total	57	100.00

Source: Field Survey, 2017.

The table 5.9 depicts the availability of chemical fertilizer, pesticide and improved seeds in the selected households for orange cultivation. The difficulty to get it households is no sufficient is 21.05 percent and easy to get is it 8.77 percent. We conclude that majority of households feel difficult to get chemical fertilizer pesticide and improved seeds.

5.14. 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 5 (8.77%) 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 (21.05%) households.

Table 5.10
Uses of Medicine and Poison

S.No	Name of Medicine	No. of Households	Percentage
1	Bordeaux Paste	12	21.05
2	Bordeaux mixture	9	15.79
3	Metacid	8	14.04
4	Nuvan	3	5.26
5	Malathiane	2	3.51
6	Cows Urine	9	15.79
7	Ash-water	6	10.53
8	Tobacco	3	5.26
9	Not used Medicine	5	8.77
	Total	57	100.00

Source:-Field Survey, 2017.

5.15 Uses of Manure and Fertilizer

Most of the farmers in Taklung 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(78.95 per) households used organic manure (Gobar) and 2(3.51 per) households have not used manure for orange.

Table 5.11
Uses of Manure and Fertilizer

Particulars	No. of Households	Percentage
Organic Manure (Gobar)	45	78.95
Compost Manure	3	5.26
Dung of the hen (shulee)	7	12.28

None of them	2	3.51
Total	57	100.00

Source: Field Survey, 2017

5.16. Availability of Irrigation Facility

There is the problem of irrigation in the study area. Out of the selected 57 households 15 (26.32 per) households never irrigate their farm. 32(56.14 per) households have irrigation by pipes and remaining 10 (17.54 per) households partially irrigate their farm by carrying pot.

Table 5.12
Availability of Irrigation Facility

Particulars	No. of Households	Percentage
Irrigation by pipes	32	56.14
Irrigation by pot	10	17.54
No irrigation	15	26.32
Total	57	100.00

Source: Field Survey, 2017

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

Out of the selected 57 households, cannot pay contemplation for weeding their orange plants and 30 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 15 households use small saw for cutting.

5.18. 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.

5.19 Cost of Production

The term “cost” may be defined as the value received in exchange of goods and service excluding profit and distinguished from money, which is only the medium of exchange. However, the value of an article is itself and depends upon the marginal utility. In simple cost means the value of the inputs needed to produce any goods or service. This has to be measured in some units or numeral, usually money.

Every farmer should bear the cost of producing good and service, so for cultivating orange, the orange farmers should invest something at first, which determines the level of profit. During the period of cultivation to product, the farmers have to do different types of activities by investing time, money and labour as it selected household in Taklung VDC is shown in presented table.

Table 5.13
Cost of Orange and Others Crops Production

(In Ropani)

S.N.	Description	Orange	Vegetable	Paddy	Maize	Average of non orange
1.	Land preparation	1431.25	215	225	250	230
2.	Plant	211.875	95	117.5	112.5	108.33
3.	Sowing	135	63.33	675	75.75	68.86
4.	Manure	305.625	131.66	70	70.25	97.3
5.	Weeding	604.375	375	68.75	120.5	188.08
6.	Pesticides	290	243.33	23.75	154.5	140.52
7.	Harvesting	659.285	325	68.75	191.5	195.08
	Total	3637.41	1448.32	641.25	995	1028.17

Source: Field Survey, 2017.

The table 5.13 depicts the information regarding cost of orange and other crops cultivation. It shows that in order to produce orange the total amount Rs 3637.41 cost required in different activities such as for land preparation, plant sowing, manured, weeding, pesticides and harvesting. Similarly in order to produce vegetable the total amount Rs 1448.32. Cost is required in different activities such as for land preparation, plant, sowing, manure, weeding, and pesticides and harvesting. But in order to produce paddy, Rs 641.25 cost is required in different activities such as for land preparation, plant, sowing, manure, weeding, pesticides and harvesting, which is very low as compared to other activities. In order to produce maize the total amount Rs 995 cost is required in different activities such as for land preparation, plant, sowing, manure, weeding, pesticides and harvesting. The cost of production of orange is higher than other crops like maize, paddy, vegetable and average of non orange.

5.20. Provision of Training in the Orange Cultivation

Training is one of the most necessary components in any work for its success. Before a year government has not paying attention on Taklung VDC. Government has taken a few attentions. There is no well-developed technology in Taklung VDC. Table 5.14 shows the distribution of sample households by training.

Table 5.14
Distribution of Sampling Households by Training

S.N.	Description	Number of Households	Percentage
1.	Trained	17	29.82
2.	Untrained	40	70.18
	Total	57	100.00

Source: Field Survey, 2017.

The table 5.14 depicts that in Taklung VDC, the household of people obtaining training while orange cultivation is lowest, which is equal to 29.82 percent. The most of the people are untrained, which is equal to 70.18 percent.

5.21 Loan Faculties to orange production

Loan is one of the factors for the investment. More investment gives us more profit. So loan is the sources for the capital. A loan practice in Taklung VDC is in critical

condition because most of the selected farmers are ignorance of loan from ADB/N. Table 5.15 shows the loan practice in the selected households.

Table 5.15
Distribution of Loan Practices

S.N.	Description	Number of Households	Percentage
1.	Loan from ADB/N	20	35.08
2.	Ignorance about loan	37	64.92
	Total	57	100.00

Source: Field Survey, 2017.

The table 5.15 depicts that most of the people are ignorance of loan faculties, which is equal to 64.92 percent, and using loan facilities from ADB/N is lowest, which is equal to 35.08 percent.

CHAPTER VI

MARKET OF ORANGE IN THE STUDY AREA

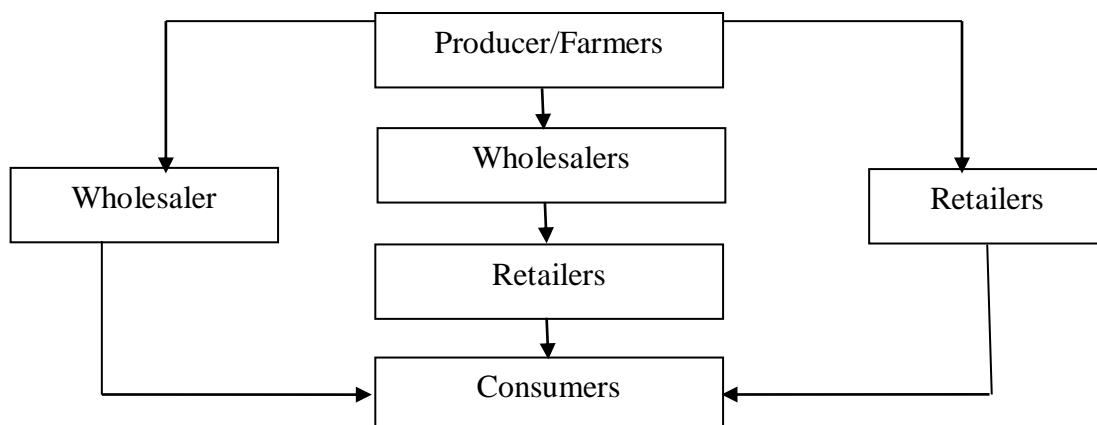
6.1 Market of Orange

Marketing channel is defined as a set of interdependent organization that help make a product or service available for use or consumption by consumer. The chain of intermediaries through which the various farm commodities pass between producers and consumers is called marketing channel. The existence of the orange farm depends on the marketing channel because the produced orange move form farm to ultimate consumers through various market intermediaries that operate in the marketing system and marketing efficiency.

The marketing channels of orange are shown in figure 6.1. Usually, three intermediaries are involved in the channel for orange-producers, wholesalers and retailers. Producer of orange sold their product to wholesalers and retailers. The wholesalers buy orange directly from producers and sell it to retailers for sometime directly to consumers. The retailers buy orange from wholesalers or directly from producers and sell it to consumers.

Figure 6.1

Marketing Channels of Orange Production



A. Producers

Farmers are the producers who are engaged in orange production and processing. Orange has been a major means to fulfil their needs. In order to fulfil the need of cash, they sell their need of cash; they sell their product to different buyers. Most of poor farmers sell their product in Mansir and Paush to maintain the daily necessary expenditures. But they can get handsome price from their product in this period because of the large supply of orange in the market.

B. Wholesalers

Wholesalers are those persons who collect orange from producers. Wholesalers generally buy a large quantity of orange directly from the producers. They collect orange from local businessmen, middlemen and collectors. Sometimes they collect orange themselves in the field. But they do not live in the VDC.

C. Retailers

Retailers consist of small and large for profit business that sell orange directly to consumers.

D. Consumers

Consumers of orange are a person or an organization who consumes the orange for many purposes.

E. Local Businessman

The local businessmen have their permanent ship in the VDC. They buy the orange from the farmers and also provide credit to the farmers in the period of economic crisis with view that in the future they could buy the whole production of the farmers. After collection the orange they sell it to the wholesalers at Kathmandu or Narayanghat. Generally they stock their collection for few months and wait for higher demand and price of orange. They have cannot sell the collected cardamom because of decrease is the price.

6.2. Methods of Selling Orange

In the study area, farmers use different methods to sell their oranges. There are 7 (12.28 percent) households producing orange for household consumption. Because of the few numbers of productive plants, they do not sell their products. Out of 57 households, 45.62 percent households sell orange in their house as contract system.8

(14.03 percent) households are retail seller. Five household sell the orange in wholesale system. Others 19.29 percent households use miscellaneous system to sell their orange according to the circumstances. (Table 6.1)

Table 6.1
Methods of Selling Price

S.N	Particulars	No of households	Percentage
1	Selling on contract in house	26	45.62
2	Selling in retail system	8	14.03
3	Selling in wholesale system	5	8.78
4	Miscellaneous system*	11	19.29
5	Not selling	7	12.28
	Total	57	100.00

*Miscellaneous denotes contract, wholesale and retail.

Source:-Field Survey, 2017

6.3. Basis of Price Estimation by Producer

Out of 57 households, 45.62 percent 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 57 households 42.11 percent households estimates price on the basis of the number of orange, 5.26 percent on the number of baskets, 26.32 percent on the kilogram, 8.77 percent on the crates and 7.01 percent on the miscellaneous basis. But 10.53 percent have no response about it. (Table 6.2)

Table 6.2
Basis of Price Estimation

S.N.	Particulars	No of households	Percentage
1	No. of orange	24	42.11
2	No of bamboo basket	3	5.26
3	Kilogram	15	26.32
4	Crate	5	8.77
5	Miscellaneous*	4	7.01
6	No response	6	10.53
	Total	57	100.00

*Miscellaneous indicate more than one basis.

Source: - Field Survey, 2017

6.4. 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 57 households, 61.40 percent households are able to sell their orange in desired time and 26.32 percent households are not able to sell their products in desired time. 12.28 percent households do not sell their products. (Table 6.3)

Table 6.3
Status of Selling in Desired Time

S.N	Particulars	No of households	Percentage
1	Selling in desired time	35	61.40
2	Not selling in desired time	15	26.32
3	Produce for household consumption	7	12.28
4	Total	57	100.00

Source:-Field Survey, 2017

6.5. Status of Satisfaction Towards Selling Price

Out of 57 households 48 percent 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 57 households, 63.16 percent households satisfy toward selling price and 24.56 percent households are not satisfied. But consumption 12.28 percent households produce orange for their own consumption (Table 6.4)

Table 6.4
Status of Satisfaction towards Selling Price

S.N	Particulars	No of households	Percentage
1	Satisfied towards selling price	36	63.16
2	Not satisfied towards selling price	14	24.56
3	Produce for household consumption	7	12.28
4	Total	57	100.00

Source: Field Survey, 2017

6.6. Choice able Market to Sell Orange

The producers sell their output in their choice able market may be different than existing market. Out of 57 households, 33.33 percent households selected to sell in their own house, 28.07 percent households select wholesaler fruits market, 15.79 percent households select in Kathmandu, 7.02 percent households select local market and 3.51 percent households select haat-bazaar as a choice able market. 12.28 percent households do not concern about because they do not sell orange in the market. The wholesale and fruits market located in Kathmandu, Kalimati and Narayanghat are selected by the producers of Taklung VDC where they often supplied orange. (Table 6.5)

Table 6.5**Choice able Market to Sell Orange**

S.N	Particulars	No of households	Percentage
1	Producer's own house	19	33.33
2	Wholesale or fruits market	16	28.07
3	Town special (Kathmandu)	9	15.79
4	Local Market	4	7.02
5	<i>Haat-Bazaar</i>	2	3.51
6	No response	7	12.28
	Total	57	100.00

Source: Field Survey, 2017

6.7. Road and Transport

Taklung VDC of Gorkha district is linked to Laxmi Bazaar by Taklung Marga. It is linked by Gorkha Manakamana Marga with Manakamana VDC too. Transportation service is not getting reliable. Passengers, bus service from Taklung to Laxmi Bazaar plays once a day. People have to carry their product on their back in order to in the market.

CHAPTER VII

PROBLEMS AND PROSPECTS OF ORANGE CULTIVATION IN STUDY AREA

7.1 Problems in Orange Cultivation.

Orange cultivation plays a significant role in the development of rural economy of the hill people. It can provide additional cash income to the farmers by generating so many employment opportunities. It can be the additional option to uplift the poor economy of the farmers. But fruit cultivation is still infantile and un-organized in Nepal. Thus there are so many difficulties in the orange cultivation.

Although climate condition of the study area is favourable for orange production, climate, records indicates that there have been seasonal hailstorm in the month of March, April and may causing damage to the plants and affect production. Lack of rainfall during the dry summer months and hailstorm also causes negative impact in orange production. Major constraints in orange cultivation as reported by the orange producer are described below:

7.1.1 Problems of Pests and Diseases

About 20 percent of the study area have pointed out that orange plants are suffering from various disease and pests. According to them these are serious problems of orange cultivation, As per the reports of the respondents, orange are mostly affected by diseases and pests. Like Powdery, Mildew (black and White), Patero (fruit sucking, Bugs), gabaro, Fengues, Citrus sylla, Leaf miner, Leaf mosaic, Leaf roller , black fly, leaf spot etc. Although 20 percent of the plants have diseases but they are not spread much. At present time diseases and pests time have not hampered that much but farmers and concerned authorities have to pay attention to eat otherwise it may go beyond their control. Main diseases are discusses as below:

- a. Greening Disease: - A kind of bacteria named *citrusvirescens* 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.

7.1.2 Problems of Irrigation

Irrigation is essentially the artificial application of water to overcome deficiencies in rainfall for growing crops. It is one of the most important factors for cultivation. Orange cultivation requires frequent and light irrigation in dry seasons. Watering orange plants before and after harvesting season makes the plant very healthy. However, in Taklung VDC there is lack of irrigation for orange cultivation. Mostly orange trees are planted dry and terrace suffers which seriously suffer from shortage

of water in dry season. It reduces the quality and quantity of orange production. There is great difference in production of orange between irrigate non-irrigate land.

7.1.3 Technical Problem

Fruit farming appears to be more technical than other field crops with respect to their particularly in the factorial requirement such as soil, climate, and cultivation practices. Inputs such as water, fertilizer, pesticide etc. have positive effect only when they are technically appropriate or optimal. For example, fertilizer application will exhibit its beneficial response under a definite set of condition. However in Taklung VDC, the farmer has no knowledge about such condition. They cultivate orange in traditional way. Technically they are very poor about modern management system of farm of orchards. The visit of JT and JTA is not sufficient. The farmers have no ideas about using chemical fertilizer, irrigation, pesticide, insecticide and so other usage. They have also reported the non availability of agricultural credit, lack of timely supply of agricultural inputs as well as lack of storage facility for their production. About 30 percent of the total households have been facing this type of problem.

7.1.4 Problem of Market

Lack of marketing facility is another vital problem faced by the orange growers in Taklung VDC. This type of problem is pointed out by the sampled households. There is no type of marketing facilities and organized co-operative sectors. Main market centres of the district are far from Taklung VDC. Due to inaccessibility of market centres and lack of experience about marketing system, local orange growers are not so much interested to sell their product by themselves in the market centres. Thus most of the orange growers are compelled to sell their products at their orchards to the middleman and brokers at low price. Only a few numbers of orange growers directly sell their products to the consumers in the market centres. Due to lack of road network and modern means of transportation the individual orange growers?

7.1.5. Problem of Storage

Every crop should properly store to provide long term security. Similarly, orange should be well separated after grading and packing storage is necessary when orange price is not high in the market. If there is not proper storage system it may be destroyed by insects and vermin etc. There should be a separate room for storage. But due to the lack of storage, the producer of this VDC sells their product in low prices.

7.1.6. Problems of Transportation

Among the major problems of cultivation in the study area, lack of transportation is the dominant one. There are some village roads which are not gravelled, however they have facilities to the orange growers to extent, but most of the orange orchards are not link with such roads. So the people in the study area are bound to use labour for transportation. Orange is carried on human back for a certain distance and by truck or small vehicles. Farmers have to pay Rs. 40-50 per *doko* (40-50kg) of orange to carry from the study area to the nearest road sides, and it takes 15 minutes to 1 hour per trip. Due to the unavailability of road and organized market system. The farmers have to insure extra monetary burden in the study area. Above 70 percent of the total farmers are facing this problems.

7.1.7. Problem of low Productivity and Low Price

About 10 percent of the sampled households have pointed out that the low productivity and low price of orange also being a major problem for orange cultivation in Taklung VDC. Here, orange cultivation is practicing traditionally. Due to lack of modern farm management system and improved technical implements, productivity of farm is very low. According to the orange growers, its production is fluctuating year by year, sometimes it has also decreased. In the same way the price of orange is not fixed. Due to lack of marketing facility, farmers have not received satisfactory price for their products but they are compelled to sell their products at low price level.

7.1.8. Grading and Packing

After the collection of oranges, grading is necessary in marketing. We should separate small, medium and large and their other conditions. But lack of knowledge about selection and grading the farmers of village are compelled to sell their product at lower price.

7.1.9. Lack of Price Mixing Mechanism

There is no mechanism to fix the price of orange. The producers are not getting the actual price of their product due to the fluctuation of orange price and hiding price by large business man in the market, which reduces incentives of the producers to produce more.

7.2 Prospects of Orange Cultivation

Though there are several problems of the orange cultivation and they limit the development of its cultivation, there are still sufficient possibilities to promote the orange production in Taklung VDC.

Citrus is one of the world leading fruits crops adaptable to varied range of location and cultural management. The diverse agro ecological variations determined by varied topography in mild hill region of Nepal right from Mechi to Mahakali ranging from 600 to 1400 meter favourable for cultivation. Citrus a major crop of Nepal recognized as high value crops. There are altogether 15 species of citrus reported 58 districts of Nepal.

Orange farming is one important source of income for this VDC. More than 80 percent people are involved in orange farming because it is easy to cultivate, profitable, use of wasteland and high opportunity of getting employment in their own land.

If we promote the orange farming system providing new technology, new skills, facility of loan, new medicine, there will be high possibility to increase the production of orange along with the productivity of the land. If we adopt environmentally favourable types of orange plants, there will be high possibility to increase the amount of orange and therefore cost will be reduce and profit will increase.

Due to favourable climate condition and increasing demand of orange, the local orange growers are still increasingly interested towards its cultivation. Although for the good achievement, it is necessary that governmental and private sector should be developed in this sector. Continuous cultivation of cereal crops resulted in the decline of soil fertility of land and increasing population pressure on marginal land creates various environmental imbalances which resulted so many kind of natural disasters i.e. landslide, flood, desertification, soil erosion etc. Thus orange cultivation plays an important role in balancing the declining environmental condition. On the other hand it has found more beneficial as compared to the cereal crops giving a good source of cash income. Moreover the cultivation of orange may generate additional employment opportunities establishing subsidiary industries i.e. picking, packaging, processing and

distributing etc. It will provide new employment opportunities to the people, which can help to reduce the problem of immigration.

Nowadays, continuously increasing population and development of tourism has encouraged the demand of fruit where as Nepal still imports fruits to fulfil the increasing demand of it. In this context, orange cultivation has better prospect not only in the study area but in the whole hilly region of country.

Particularly in case of Taklung VDC, the whole sample orange growers are agreed with its good future prospect. And more than 25 percent of non orange growers are also interested to cultivate it. More over they have informed that they will also try to cultivate it as soon as possible.

Because of possibilities, there is no doubt of its better prospect in the future in Taklung VDC. However, it is necessary to provide both infrastructural and institutional development for orange cultivation.

CHAPTER VIII

SUMMARY, CONCLUSION AND RECOMMENDATIONS

8.1 Summary

Orange cultivation predominantly plays a very important role in the socio-economic condition of rural areas in Nepal. Orange is a seasonal horticultural fruit crop. Oranges are available throughout the year (peak time-winter) and grow on evergreen trees which are about 30 feet high and 20 feet wide. Orange is an emerging major commercial cash crop of hilly district that has been cultivated from many decades from our country. The production and marketing of oranges has enormous potential in the study area despite a number of constraints being faced by the farmers.

In Nepal, the history of orange cultivation is very much old. Particularly, the history of orange cultivation in eastern region of Nepal is much older. It is supposed that the development of the orange cultivation has initiated from this region. But there is no concrete evidence development of orange cultivation. Before some decades there were only few plants of orange in other villages except the place Taklung VDC of Gorkha district. The development of orange cultivation was gradually increased from the eastern region to the middle zone. The cultivation of orange has been professionally established in these two regions because of the proper height of 1000 meters to 1400 meter. Orange cultivation has been initiated in almost 54 districts. Among them 35 districts are famous for orange cultivation. Generally, cultivation of orange is done without proper guideline, training but they are in moderate quality. The result of orange cultivation shows the proper environment for orange cultivation is highly region. For, this role of government is important and government has been played the role of facilitator. Also orange industry should be established.

The research has been conducted under descriptive research design. An intensive field survey was conducted to obtain data and information for the study. Two hundred and fifty-four were taken as universe in Taklung VDC. The researcher had taken 57 households from Taklung VDC through simple random sampling method. For the research both primary and secondary data were used. Primary data were collected through field survey; interview, observation and questionnaire

Education status is good in this VDC but the farmers are traditional and unknown about application of facilities and suggestions of a J.T. and J.T.A. The analysis found

that lack of agriculture experts, transportation, grading system price fluctuation etc. are the major problems of the farmers in the VDC. Attempts should be made by the government and the private sectors to show the problems of the study area. Likewise, means of communication should be used in such a way that farmers should be providing sufficient market information.

The major findings of the study are as follows:

- About 1380 ropani land is covered by orange farming in study area and the total numbers of orange farmers are 276 households.
- The demand and supply of orange in 2012 was 50011 and 45645 metric ton respectively in Nepal. In 2013 the demand and supply of orange was 60963 and 56431 metric ton respectively. Similarly, the demand and supply of orange in 2014, 2015 was 69987 and 65432 metric ton, 73390 metric ton and 68790 metric ton respectively. The excess demand of 2012, 2013, 2014 and 2015 is 4366 metric ton, 4532 metric ton, 4555 metric ton and 4600 metric ton respectively.
- Three intermediaries are involved in the channel for orange-producers, wholesalers and retailers. Producer of orange sold their product to wholesalers and retailers. The wholesalers buy orange directly from producers and sell it to retailers for sometime directly to consumers. The retailers buy orange from wholesalers or directly from producers and sell it to consumers.
- In the study area 174000 Kg orange was produced in FY 2012. Average price per Kg was Rs.4000 and Rs 6960000. The average income of people in this year was 120000. Next year increased from 174000 to 184300 Kg and average price decreased to Rs 3900 from Rs 4000 so total income reached Rs 7187700 in fiscal years 2013. Again the production was increased in 2014 as 201600 Kg. Similarly, in fiscal year 2016 the total quantity of orange production was 2078 quintal and average income of per HHs was Rs 150475.86.
- Farmers have no knowledge of few techniques about orange farming. They have adopted traditional method. Government is unable to provide skilful technician such as the services of J.T, J.T.A. improvised seeding and fertilizers etc.

- The total area of cultivation and production of orange is being increasing every year. The main reason of this are increasing demand of orange, increase the awareness of farmers, increase of fertilizer facility and transport facility
- Farmers have used waste lands bushes, pasture land, upland and low land also.
- There are various problems in production of orange faced by growers such as labour problems, insect & pest problems etc. Maximum growers faced climatic problems such as wind & storms, drought.
- The tray channel of Orange is very long as, there is no proper full transportation facility. Farmers have to use porters as a means of transportation so the cost becomes high.
- Orange needs continuous irrigation. There is no sufficient irrigation facility even though there are many sources of water in this VDC. It is not possible to be implemented by the private sector because of steep gradient of land.
- Local business man, money lenders and wholesalers are the main agent for selling oranges.
- There are various channels of orange marketing such as local retail marketing, urban retail marketing and wholesale marketing. Maximum respondents prefer wholesale marketing as they cannot go to distant market to sell off their produces directly in the hands of consumer. So, they lease out their orchards to the wholesale contractor before harvesting of the fruit.
- Lack of government facilities is one of the main reasons for decreasing production. The government is not aware to provide benefits or other important facilities to the cultivators of orange.
- The orange producers are suffered from different types of problems. The major problems are financial, pest and disease, storage, lack of irrigation, selection and grading, lack of transportation and lack of fertilizers.
- There is a lack of orange industry in Gorkha. From the analysis, it is found that many respondents want to set up orange industry, but they do not have afforded to do it. There are many factors responsible for which they are not able to set up orange industry such as lack of capital, fear of insolvency, lack of information etc.

- Farmers have used waste lands bushes, pasture land, upland and low land also

8.2 Conclusion

In the context of Taklung VDC, most of the farmers use their own local seeds (plant), old technology method expensive fertilizer and they are suffering from the time of plantation to the marketing. Orange farming has immense significance to the agriculture and economy of Gorkha to uplift the economic standard of rural people. Due to the lack of knowledge of implantation of the appropriate process of orange production, lack of marketing facilities, diseases etc. lead to the lower the production of orange many weaknesses as the accessibility to market by produces itself is very low due to high cost of transportation etc. These are large number of middle men in the channel of marketing such as village trades, suppliers commission, commission agents, buyer's commission etc. in order to increase productivity of orange and improve the marketing system of orange, the study of orange farming is important.

The forgoing discussion and analysis of data clearly concluded that production and marketing of oranges has enormous potential in the study area despite a number of constraints being faced by the farmers. The study highlighted that major thrust should be given on development of production, dissemination of new technology, assured input supply and strong marketing support.

The growers are experiencing number of problems both at the production and marketing level as they do not have pre-requisite resources and finance for expansion and strengthening of orange orchards. Moreover they had to face problems of certain diseases and insect and pest problems which damage the plants. The marketing of oranges in the study area has mostly been under monopoly traders and the whole market is controlled by some intermediaries who exploit the orange producers by purchasing the products at a very lower price and sale it to the consumers at higher price.

It is concluded that orange has a great contribution in making progress in the socio economic status of the farmers. The government and other institutions should concentrate more to make good policies and plans for the change and development of the orange production.

8.3 Recommendations

Orange is one of the major cash crops of Nepal which plays a vital role in the economy of the hilly people as well as in the Nepalese economy. But there are many problems existing in relation to orange cultivation, processing and marketing. Following are the suggestions based on the findings of the study:

- Farmers have planted different types of plants. They don't know which types of orange are suitable for their land. Thus soil should be checked by specialist and advice should be given to people regarding type of orange plants for them according to their fertility and kind of soil, structure land and altitude climatic condition of the area.
- The farming method is tradition in the VDC; Farmers are not facilitated by J.T. and J.T.A. So training, seminar, and workshop should be providing by the government through district agriculture development office.
- The irrigation facility is not enough in this VDC even though there are adequate sources of water. The government of local institution should pay attention towards it for modernized irrigation facility such as sprinkle system
- The marketing channel of orange is very long so trade lesson should be made systematic.
- Modern tools, chemical fertilizer, agro-chemicals and improved sapling are essential variables for better production. So it is necessary to provide such type of facilities in the study area
- Direct marketing should be encouraged among the orange growers which involve marketing of produce by the farmer directly to the consumers without any intermediaries. Direct marketing helps to generate the idea of market oriented production and increases profit of the producer. It promotes employment to the producer and enhances the consumers' satisfaction. It provides better marketing techniques to producers and encourages direct contact between producers and consumers. It encourages the farmers for retail sale of their produce also.

- There are more chances of disease and bacteria of the mother plant getting transmitted to the new plants. Therefore new plants should be acquired only from those sources which have been recommended by related experts.
- Some farmers have planted unsuitable types of orange, which do not suit the soil and conditions of land. For this, special plans with programmes, which promote the suitable types of orange, which is productive and healthy, should be implemented.
- The growers of orange should be encouraged to adopt some measures for value addition, including grading and standardization of the products according to size, shape and degree of ripeness & maturity. Presently, grading of oranges is done manually which time is consuming. Thus, mechanical grading devices need to be developed for this purpose.
- The provision of institutional credit and loans would encourage the growers to increase the productivity. Institutional credit in the form of crop loans should be provided in easy terms, so that the farmers are not compelled to take loans from the private traders on pre-condition of selling the produce at a low price. The state government may negotiate with the banking system in this regard.
- The study highlighted that major thrust should be given on development of production, dissemination of new technology, assured input supply and strong marketing support.
- In the same way, it is necessary to bring improvements in transportation facilities as well as in the extension of marketing management. To cultivate the orange in scientific it is necessary to increase the number of technical experts.

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