

CHAPTER ONE

INTRODUCTION

1.1 Background

Nepal is a small predominantly landlocked country located between India and China and with more than 28.5 million of population and 147,181 square kilometer of area, Nepal occupies 0.3 and 0.03 percentage of land area of Asia and the world respectively. In the northern hemisphere, Nepal is situated within latitude $26^{\circ} 22'$ N to $30^{\circ} 27'$ N and of longitude $80^{\circ} 4'$ E to $88^{\circ} 12'$ E. The altitude ranges from a minimum of 70 meters to a maximum of 8848 meters whereas the climate varies from tundra to polar. Mt Everest - the top of the world - is both the identity and glory of this Himalayan country. The average width (North to South) is 193 kilometers whereas the average length is 885 (East to West) kilometer. The country has great variety of topography which is reflected in the diversity of weather and climate simultaneously. Specifically, the country experiences tropical, meso-thermal, micro- thermal, and taiga and tundra types of climate. 60 to 70 percent of annual rain fall falls during the monsoon season (June to September) and the highest mean annual rainfall was 4070 mm. in Pokhara in 1989.

Nepal can be divided three geographical regions, each stretching from east to west across the country. The southernmost strip of land, the Terai, is bordered to the north by Himalayan foothills and to the south by the Ganga River. The area was originally covered with tropical vegetation, but has been almost completely covered to agriculture production. The Terai is now the breadbasket of Nepal and is covered with farms.

1.1.1 Agriculture in Nepal

Agriculture is the backbone of Nepalese economy where the agriculture sector absorbs more than 74 percent of the total labor force of the country and 60 percent of total population are employed in agriculture. It is a major source of GDP, which contributes 39 percent of the total GDP. It has been the major source of foreign currency and raw materials for agro- based industries also. To improve the living standard of the people at large, it is very necessary to exploit agricultural potentialities. The agriculture sector needs to have a change from subsistence status to an industrial and profitable business, so that productive employment and income are generated from this sector for the benefit of the poor people and serve the objective of alleviating poverty.

Agriculture has played important role in the economic growth of most nations up to and as they moved into the take off stage towards maturity in development. Agriculture continues to be the most important sector in the majority of economies of the world.

The agriculture sector plays a significant role to be self- sufficient in food supply and to supply raw materials for agro- based industries. For the desired changes in agricultural system adequate supply of chemical fertilizer, high yielding variety of seeds, improved animal breed, access to agricultural credit and irrigation facilities are the primary factors, so, agriculture sector deserves high priority in the public sector development programmed. This priority sector could help to overcome economic problems of the country (MOF, 2001).

There are different types of agricultural activities such as livestock rising, cash crop farming, cereal crop farming, horticulture, etc. The climate condition of Nepal is suitable for all types of agricultural activities lying in the sub- tropical temperature. Among them horticulture is an important sector in Nepalese agriculture where there are possibilities for development. The favorable soil and climatic condition of Nepal permits to grow almost all kinds of horticultural crops, which can contribute significantly to the economic development of the country.

Generally, total agricultural products consist of two main types: field crops and horticultural crops. Nepal produces different fruits under the horticulture. These fruits can be divided as tropical fruits, sub- tropical fruits and temperate fruits. The sub-tropical fruits are very important in our context; because of middle hill has such a climate. Among the various tropical fruits, citrus species are comparatively suited for the cultivation as per the agro- climatic conditions. Among the tropical species, mango, pineapple, jack fruit, litchi is specially grown in Churia Region of Nepal.

Nepal is an agrarian and a landlocked country which is full of geographical diversity with variety of climates and other physical features. Most of the export goods are agricultural products. Thus, Nepal is basically an agricultural country. But this sector has not been geared up yet. Traditional system of farming is still in existence with subsistence in nature. Domination of agriculture occupation is one of the characteristics of the developing countries. So, agriculture sector is very important to uplift the socio-economic status of the people. It is also the major source of livelihood for the people and backbone of the national economy of under developed countries (UDCs) like Nepal.

In fact, our socio-economic position is based on agriculture sector. In the context of our country, agriculture is a precondition to boost up overall development especially, in economic sector. But the state of the agriculture in Nepal has still critically bottlenecked its development. Consequently, agriculture in Nepal couldn't fluently lead on its growth path because of domination of cereal crops and very primitive practice.

The full potentiality of agriculture sector certainly plays a significant role in attaining self sufficiency in food supply by promoting export and supplies of raw materials for agro-based industries. For the desired changes in agriculture system, adequate supply of chemical fertilizer, high yielding variety of seeds, improved animal breed, access to agriculture credit, technical knowledge, training for farmers, irrigation facilities etc. are the primary factors. So, this sector deserves high priority in the public sector development programmed. This priority sector can help to overcome the economic problems of the country.

1.1.2 Fruit Production in Nepal

Fruit farming in Nepal is widely distributed to different agro-ecological regions as Nepal has on advantage of favorable climates and different topographical condition unique in the world. It has cool temperate zone, warm temperate zone, sub-tropical zone and tropical zones.

As such it has more than 55 species of different fruits grown commercially homestead and wild in Nepal. Out of these only a few fruit are found grown in commercially scale. These include guava, pears, peaches, lime, lychee, mandarin, papaya, apple, banana, mango and sweet orange etc. The total production area used for fruit production is estimated at 18008.95 hector and the total production has reach about 340199 metric ton. Out of the total production 25 percent accounts for citrus type of fruits and almost 30 percent of the total fruit (NPC, F.Y 2066/067).

Nepal is a mountainous country, 68 percent land is covered by hill. Most of the land is not plain and not suitable for growing food grain crops. But its agro-climatic condition and geographical location is favorable for growing a variety of fruit species. That requires tropical, sub-tropical to temperate climate, thus different fruit crops have been planted, in the country since many decades. These land are marginal for the cropping system which may be profitable for fruit farming, in the hilly region, fruit crops are made suitable and profitable then the other cereal cultivation. The demand of fruit has been increasing every

year. Every year fruit has been importing from India which is about 2.3 percent of the total import (HMG, ministry of agriculture).

The government has put forward the concept of “Corridor Development” from the fourth plan (1970-75) suggesting middle hill area as a suitable area for horticulture development. Additional stress has been given in the fifth plan (1975-1980) to the production of fruits with a view to maintaining ecological balance, providing nutritive value for people and discouraging import of fruits from India. Again the seventh plan (1985-90), has emphasized to the citrus development especially in some middle hill district as ‘Priority Programmed’ (Adhikari, 1992).

Present fruit production is insufficient to meet national demand and deficit is by improving fresh and preserve fruit product, mainly from India. There is a great possibility of increasing the production of fruits to meet internal demand as well as for export. The promotion of fruit growing offers promise for the development of several subsidiary industries like preservation, dehydration, packing, transportation and refrigeration. The development of fruit farming will help to generate additional employment especially in the hill where there is abundant labour and unemployment rampant. The various infrastructures coming up into the hill, it is necessary to generate more economic activities to make maximum use of them. Fruit farming may add a new variable to the economy of the hill, terai, inner terai and other region and may be a good resource of cash income to the farmers in those areas.

The hilly regions of Nepal like Dhankuta, Kaski, Dailekh, Bhojpur, Ilam, Myagdi, Parbat, Lamjung, Nuwakot, Gorkha, Sindhuli, Ramechhap etc are the main district for the different type of the temperate and tropical fruit cultivation like Junar, orange, lemon, lime, mango, litchi etc with view point of commercial aspects.

The mountain region like Mustang, Manang, Humla, Jumla, Kalikot, Dolpa, Bajura, Darchula etc are the famous for the temperate fruit cultivation like pineapple, walnut etc. and the Terai region Dhanusha, Siraha, Bara, Rauthat, Parsha, Sarlahi, Bardiya, Kapilbasthu etc. are the very famous district for tropical fruit and vegetable cultivation.

1.1.3 Contribution of Fruit in National Economy

The contribution of fruits in the national economy of Nepal is very small as the production area covered by fruit is only 1.7 percent of the total agriculture land utilized in Nepal. The total quantity produced and the average yield of fruits is also relatively lower.

But this is one of the economically important crops after cereal, pulses, oilseed and vegetables. The annual return from fruit farming is much better than that of cereal grains, oilseeds and pulses. Although wide varieties of fruit are grown in this small country, much of the fruits grown particularly in mid hill, high hill, and mountain region and summer area are having market accessibility problems. Hence, farmers with good access to road have been able to get a very good income from the fruit farming in the remote areas have not been able to get similar economic returns.

1.1.4 Import and Export of Fruit and Fruit Product

As fruit produced within Nepal are not accessible to the urban area where needed, almost 30 to 40 percent of the demand of the urban population of 33 million (average per capita consumption of 22.8 Kg/year) is still met through imports of fresh fruits and semi processed/ processed products from India, China and many other countries(See table). From India major fruits imported are banana, apple, sweet orange, pomegranate, orange, grapes, mango etc. Due to the open border, it is difficult to establish actual quantities imported. The amount of import is far more than the figure available through statistical records.

On the export front, every year a small quantity of orange, pears and sweet orange comes across the Indian border and watermelon, mango and orange are exported to Tibet(Autonomous region of China) statistics are unavailable. Export of processed fruit products is insignificant.

Table 1.1: Fruit and Fruit Products Imported from Overseas and India 2009/2010

S.N	Product	Value in Rs(Million)	Countries from where Fruits Imported
1	Edible fruits and nuts from overseas	1177	China, Singapore and Indonesia
2	Prepared/ preserved olive	.322	China, UK, Spain
3	Olive	0.012	Korea, Malaysia
4	Sugar preserves	0.593	Singapore , USA
5	Jam/ Jellies	2.744	Australia, Germany, UK
6	Fruit juice	10.35	Brazil, Thailand
7	Fruit pulp	1.167	Philippines, South Africa, Bangladesh
8	Fresh fruit from India	81	India
Total		2173.2	

Source: Agriculture Communication Department 2009/2010

1.1.5 Tropical Fruit Cultivation in Nepal

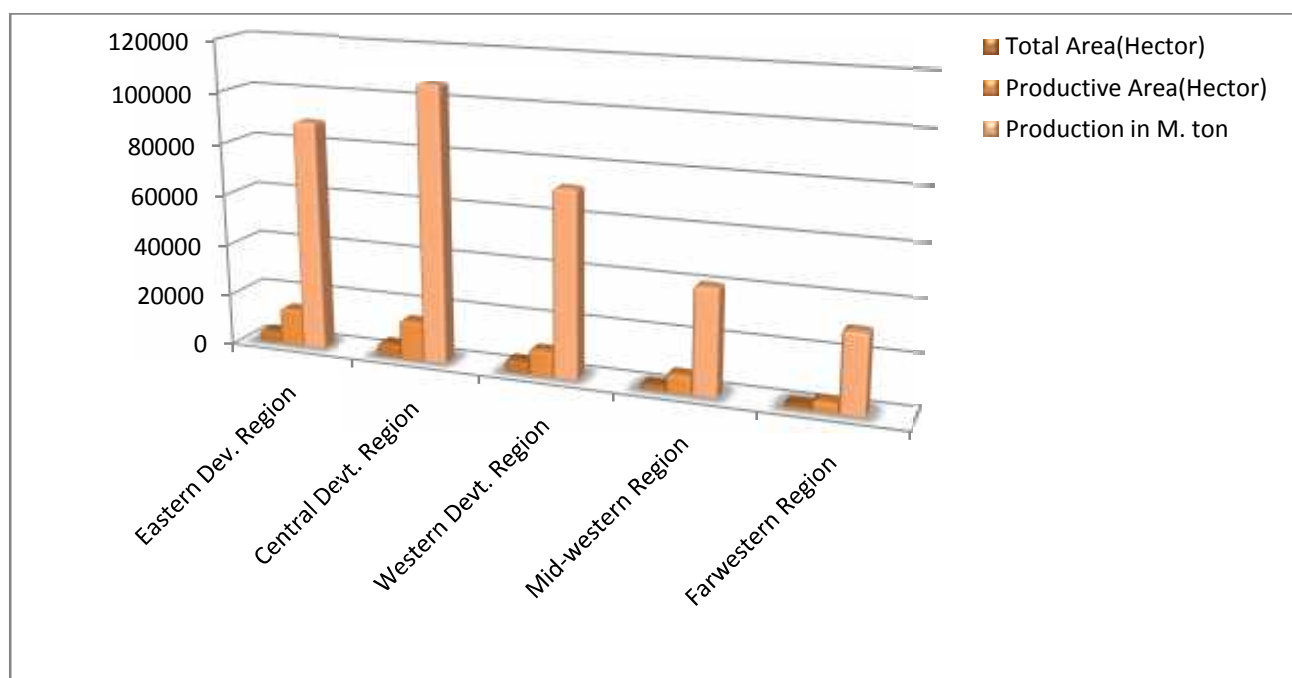
So far as tropical fruit cultivation is concerned, about 59 districts of Nepal are cultivating it with view of commercial aspects, and many of other districts climates is also found to be better for the tropical fruit cultivation in Nepal.

Table 1.2: Tropical Fruits Cultivated Area, Productivity and its Production in Nepal

S. N	Devt. Region	Total Area(H)	Prod. Area(H)	Pdvt. M.ton/H	Prod. M.ton
1	Eastern Devt. Region	4547.58	14383	6.21	89327
2	Central Devt. Region	5198.00	15250	7.009	106891
3	Western Devt. Region	4878.30	10041	7.187	72174
4	Mid-western Devt. Region	1992.34	7176	5.720	41051
5	Far western Devt. Region	1392.73	4039	7.614	30756
Total		18008.95	50889	33.74	3040199

Source: Horticulture Devt. Programme Kirtipur, Annual Report 2066/067

Figure No. 1: Citrus Cultivation Area and its Production in Nepal



Source: Citrus Development Center, Kirtipur, Annual Report 2066/67s

Table 1.3: Production of Tropical Fruits in Nepal

Fruit	Total Area (H)	Productive Area(H)	Productivity M ton	Productivity M ton/H
Mango	25673	1667	12735	7.6
Banana	7267	5813	91042	15.7
Guava	4394	3251	37402	11.5
Papaya	2764	2211	31060	14.0
Jack fruit	2246	1595	18972	11.9
Pineapple	949	708	10073	14.2
Litchi	4505	2558	19713	7.7
Chestnut	2727	2265	4266	1.9
Coconut	354	177	355	2.0
Avocado	9	0	0	0
Total	50889	35246	340199	9.7

Source: Horticulture Devt. Programme Kirtipur, Annual Report 2066/067

1.1.6 Tropical Fruit Cultivation in Sindhuli District

The Other region of Nepal like Siraha, Saptari, Sunsari, Morang, Jhapa, Dhading, Nuwakot, Kabrepalanchoke, Udaupur, Dhanusa, Kailali, Kanchanpur etc. are the main districts for the tropical fruit cultivation with a view point of commercial aspects but Sindhuli is very famous for citrus and tropical fruits also.

Sindhuli, which is very famous for tropical fruit cultivation, is on of the six districts of the Janakpur zone of Nepal.

Healthy mind can work more efficiently than unhealthy one. Balance diet is essential for healthy mind and vitamins are also necessary components. So not only for the economic development but also for the development of body and mind, to maintain good health and for reproduction vitamins are essentials which can be obtained from fruits for quick recovery of health after sickness. One has to depend upon artificial source of vitamins which are not only costly but have also side effects. Thus to increase the efficiencies of human resources for economic development the consumption of fruit is important. Being a source of vitamin fruits is very important for the above mentioned purposes.

Total area is occupied by Sindhuli districts is 2477.09 sq. kilo meter. This is covered by hills, forest, rivers, streams, fields, pasture land etc. This district has grate verity of topography, which is reflected in the diversity of weather and climate. This district has topography type of climates. The elevation range from 168-2785 meter and the temperature is 3.5 degree Celsius at minimum level to 37 degree Celsius at maximum level and average rainfalls is 2000-2100mm. It is one of the richest countries in the world in terms of bio-diversity due to its unique geographical position and altitudinal variation. So that here is great opportunity for different types of agriculture farming and any other cash crops like fruits, vegetables, herbs etc. Large part of Nepal has been covered by the hilly areas. There is sufficient terraced upland in this region where crops like paddy, mages, wheat and others are cultivated rained crops. These lands are marginal for the present cropping system which may be profitable for fruit farming. In the hilly region, fruit crops are made suitable and profitable then the other cereal cultivation.

The climate of tropical fruit cultivation is found in the range of 167 m to 1000 m of altitude but the favorable attitude is 79 m to 740 m. The appropriate temperature is 5⁰ to 35⁰ Celsius, which is found in Sindhuli district. So, many of the farmers of different VDCs like Dadiguranse, Ranibas, Nipene, Bhadrakali, Lampangtar, Harshai, Sirthuli,

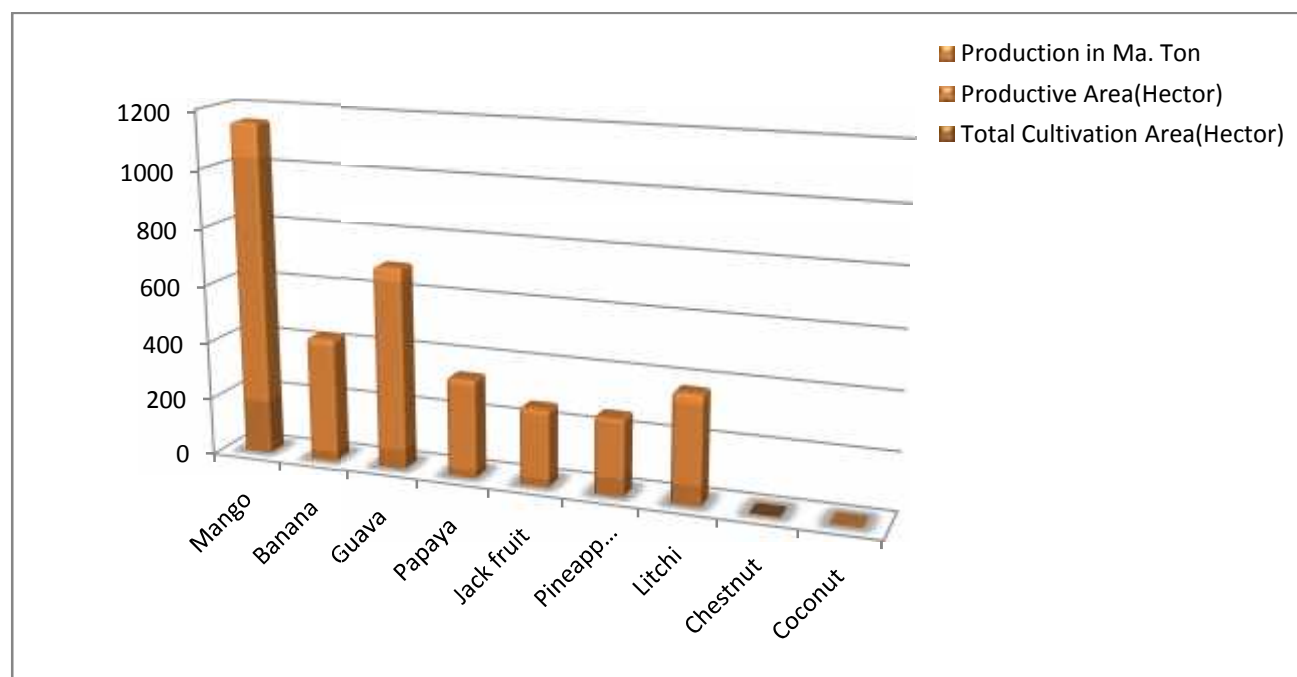
Dudhauli, Tadi, Ladhavir etc. are involved in tropical fruit cultivating with a view of commercial aspects. The total cultivated area, with varieties of tropical fruits, their productive area and production of Sindhuli district is given table no. 1.4.

Table 1.4: Area and Production of Tropical Fruit in Sindhuli

S.N	Fruit Verities	Total Area Under Cultivation(Hector)	Productive Area(Hector)	Production in metric tons
1	Mango	184	850	121
2	Banana	33	374	26
3	Guava	65	587	48
4	Papaya	26	294	21
5	Jack fruit	27	220	19
6	Pineapple	61	188	15
7	Litchi	69	272	35
8	Chestnut	0	0	0
9	Coconut	2	0	1
Total		467	287	2784

Source: Horticulture Devt. Programme Kirtipur, Annual Report 2066/067

Figure No. 2 Area and Production of Fruit



1.2 Statement of problems

As an agro-based and developing country the government of Nepal has given higher priority is agriculture. Government involvement in agriculture sector in Nepal started from 1937 with the establishment of the agriculture council. Since then, several steps were taken for the agriculture development in the country. In tenth five year plan, this sector is taken a major tool to alleviate poverty.

Nepal being rich in its natural resources, it is still poor from economic aspect. So many development efforts have been made, but the results have not been as expected. Being an agricultural country, agriculture production is determined by monsoon. Thus, due to low productivity as well as low capital formation the balance of trade is also unfavorable.

Our agriculture system is not modern. The highly illiterate people are engaged in agriculture sector. The population growth has increased rapidly. The agriculture productivity has not increased in proportion to the population. The inefficient traditional method of cultivation and the production of food grain cannot cope with the increasing population. Therefore, for solving their problems of unemployment, the people of hilly region must cultivate high value crops like citrus fruits. In view of geographical and great climatic diversities of Nepal, there exists a great prospect of the production of seasonal fruits. Due to the population growth, the concern for nutritious food increases in the number of foreign tourists and the fast growing urbanization have necessitated to increase the products of horticulture crops in order to meet the increasing demand. Fruit production can contribute stable income generation for rural farmers. It can assist in transforming the traditional cereal crops oriented farming system to commercial and appropriate agricultural activities.

Sindhuli has a great variety of topography which is reflected in the diversity of weather and climate. This direct experiences tropical, sub-tropical and measothermal types of climates which is suitable for fruit farming, Most of the farmers of five VDCs (Ladabhir, Dudhauri, Tadi, Lampantar, Sirthauri, Harshai, Ranibash, Nipane, Bhadrakali, Ranichuri, Dadiguranse) are involved in different types of fruit (Mango, Litchi, Jack Fruit, Pineapple) farming with a view of commercial aspects.

At present, farmers are attracted to grow the Pineapple, Litchi, Mango and Jack Fruit. In this fruits Jack Fruit is use for vegetable purpose also and it is used for the treatment of the Piles. In many parts of the district, farmers are cultivating these fruits for the

commercial purposes. Instate of the profitable fruit production, there are many problems in the way of fruit cultivation such as lack of proper modern techniques, lack of transportation facility, lack of proper market, lack of knowledge and cold storage. Even them the Fruit production has helped the farmers' socio-economic condition to rise up.

The main attention of the study is to focus on socio-economic impact of fruit on growers in the study area. The study area is facing the problem of landslides and erosion. Fruit production can help to prevent or reduce there soil erosion and landslide besides helping to balance the eco-system from the fruit farming small farmer can get more income then from other crops it is also labour motive and will provide employment opportunities for farmer and other in packing, transportation, store house, processing and marketing etc.

In this study area, farmers may not be fully aware of the problems of different disease and insects. So the agriculture marketing requires the infrastructural development and improvement of the marketing system. Find out the all types of problem of fruit farmers.

1.3 Objectives of the study

The general or basic objective of the study is to give some reflection on various aspects of the fruit production, marketing system and its change of the people on the study area. The specific objectives are as follows:

-) To find out the prior condition of socio-economic life of people in study area.
-) Analyze the socio-economic change of the people in study area.
-) To assess problems and prospects of tropical fruit cultivation.
-) To find out some measures for the improvement of socio-economic life of the fruit farmers.

1.4 Significance of the Study

Fruit farming is expanding as a very important cash crop in the middle zone of Nepal, where it offers an opportunity for higher income per hectare in areas of acute land scarcity with favorable income generation, poverty reduction and positive environmental effects. Fruit is one of the major raw materials for the localization and development of industries producing orange juice, jams, squashes, jellies, marmalades, pickles etc. The secondary employment potential in processing and marketing is large. These products as well as the fresh fruit can be exported and can compete in foreign markets also. In

addition, environmental benefits as well as the high value of output per hectare help to withdraw marginal lands from farming cereal crops and tree crops on slopes. This study is justified since no research has been conducted on fruit cultivation in Dadiguranse VDC of Sindhuli. This study will be helpful for the farmers to improve their present socio-economic condition regarding market, transportation, storage, irrigation, diseases and insects problem. It will be useful for the local people, researchers, planner, administrator as well as policy makers, and to those who are interested about it.

1.5 Limitation of the Study

A study carried in a limited sphere of time and budget cannot comprise all the aspects related to citrus fruits farming. Therefore the present study is not free from limitations. The major limitations of the study are:

-) The study is based upon a limited number of households due to time and budgetary constraints. Therefore sample households cultivating fruits have been taken as the representative of the Dadiguranse VDC Ward no. 2,4,6,8 and 9.
-) The details of seedling and plantation techniques were not considered in the study, because of the lack of long term continuous seasonal records of farming.
-) The researcher being a student has not been able to increase sample size by including sufficient number of respondents due to budget and time constraints.
-) This study has mainly focused on fruit cultivation, only mango, litchi, pineapple and jack fruit has been selected for the study.
-) The detail of soil quality and rate of soil erosion could not be analyzed due to limited time, expertise and financial support.
-) The study of food and other cash crops have not been made.
-) This research was prepared as a project work report to be submitted in the partial fulfillment of the requirement for M. A. degree in Rural Development.

1.6 Organization of the study

The study is organized into seven chapters. The first chapter deals with introduction, second literature review, third research methodology, fourth with demographic characteristics of sample households, fifth with socio-economic impact of fruit production, sixth chapter with problem and prospects of fruit production and seven chapter with summary, conclusion and recommendation respectively.

For the first chapter of introduction part which includes introduction about country, agriculture in Nepal, fruit production in Nepal, contribution of fruit in national economy, import and export of fruit and fruit products, tropical fruit cultivation in Nepal, tropical fruit cultivation in Sindhuli district, statements of the problem, objectives of the study, significance of the study, limitation of the study and second chapter includes literature review. For the third chapter the research methodology part which includes selection of the study area, data collection technique and tools and data analysis. In the fourth chapter analysis of setting of the study area like introduction of the study area, demography condition like, education, crop production, fruit production, price trend, availability of tools and technique etc. In the fifth chapter describe the socio-economic impact of fruit production in farmer's daily life style. In the sixth chapter problem and prospects of tropical fruit cultivation are included at last seven chapter summary, conclusion, recommendation of the research study has been presented.

CHAPTER TWO

LITERATURE REVIEW

Different type of studies on fruit production, especially tropical and sub-tropical fruit production in Nepal has been done earlier. The main focus of all these studies is placed on the problems regarding sustainability of production; some of the studies are focused on socio-economic change. But not a study on the tropical fruit production and socio-economic change in Nepal. Some of the literature of socio-economic change is remarked like animal husbandry and socio-economic change, electricity and socio-economic change is available.

Pineapple, Litchi, Mango, Jackfruit, guava are the main tropical fruits and it is successfully grown in the middle part of Sindhuli and other sector of country. Dandiguranse VDC from Western part of Sindhuli district is selected as the study area, for research and for this fulfillment of research objectives available materials relating to the fruit cultivation have been reviewed.

2.1 Conceptual Review

Similarly, Nepal has earned substantial amount of foreign exchange from the exports of processed fruits. The study reports that Nepal has earned Rs 5.9 million from the exports of processed fruits in the same FY (No-Frills Consultants, 1989). This clearly indicates the market opportunity for processed Nepalese fruits in both the domestic and exports markets. One of the examples can be taken as the emergence of fruit juice in tetra packs. One such juice manufactured by a joint venture company, is gaining popularity in Indian market also. However, it has been reported that the number of industries that drive most of raw materials from the domestic sources are few (Thapa et. al 2004). In an example, Thapa says, a food and beverage industry imports concentrated mango pulp from India for its mango drink product; and another company, which is known for its herbal products, imports concentrates of pineapples and orange juices from Brazil and mango pulp from India for their brand of juices. Similarly, even industries that used traditional products like maize, wheat, tobacco and mustard have begun to import raw materials. (Upadhyaya, 2004)

A study about horticulture was conducted by S.D. Chaudari in 1975 entitled “A Brief Outline Plan for Horticultural Research and Development in Nepal”. In this study, it is

indicated that although topographically and climatically Nepal is an ideal horticultural country, in actual practice, horticulture plays very insignificant role in the agricultural economy of the country. The study shows the prospect of horticultural crops of commercial importance even without irrigation in steep slopes which can protect watersheds to soil erosion and help to preserve ecosystem.

HMG/FAO has jointly sponsored a training workshop entitled proceeding of “Small Farmers Marketing Extension Training Workshop” at Pokhara in 1987. In this training workshop D.N. Manandhar presented a paper on “Production of Fruit and Marketing Needs of the Farmers in Nepal. The paper focused that fruit production plays a vital role to fulfill the basic needs of the people. Fruits are valuable sources of nutrients particularly vitamins and minerals required for a balanced diet. Fruit growing provides more income per unit area as compared to food grains. He has also mentioned about the main strategies to achieve the needs. There are so many constraints in fruit production and marketing such as lack of financial investment, highly perishable nature, lack of technical knowledge and shortage facilities. Similarly, there is lack of processing industries, grading, packing and prompt marketing information. Thus, for removing these problems, this study has recommended the following measures

-) There should be conducted a fruit production and marketing survey.
-) There should be developed the total market Haat, Bazars and fruit collection centre,
-) Wholesale market should be established.
-) Grading and packing system should be developed.
-) Well organized marketing system should be developed.

A study conducted by the JICA Study Team in Nov 2000 shows that the total domestic demand for fruits in the year 2000 stands at 505 thousand Mt, which is expected to grow to thousand Mt by 2005, 600 thousand Mt by 2010 and 663 thousand Mt by 2015. In which component would come from the domestic supplies, however, to meet our total demand (both domestic and exports) we still need to depend on imports from India. This clearly the domestic market has an ample space to absorb the expanded domestic production. The study has not projected any growth of the exports market, despite the fact being potential to export some of fruits like citrus and apple. Thus, there is still for the expanded production of the fruits especially in case of apple and citrus. The large portion

of expanded production could come from the increased productivity as the fruit productivity of Nepal (10 Mt/ ha) is half of that of India i.e. 20 Mt/ ha (Thapa *et al.*, 2004)

A study conducted by APROSC in 1999 for Exploring Market Potential of Selected High Value Commodities in Mid-Western Development Region of Nepal has reported that marketing cost is highly shaped by the access to road head that links to the markets. Generally, the high marketing cost is due to high transportation cost and the cost of damage incurred during the transportation. In an example for transporting mandarin, one of the most important HVC of MWDR, from farm gate to the road heads the porters is the only means. Further, the marketing cost ranged between 200 % to 300 % in a case of the mandarin marketing from Sallyan and Dailekh farm gates to the consumers of Tulsipur/ Ghorahi and Birendranagar respectively. The mandarin produced in Dailekh is sold on an average retail price of Rs 16 per kg at Birendranagar and the mandarin produced in Sallyan is sold at Rs12.50 per kg in Tulsipur/ Ghorahi out of which the farmers' margin stood at 34.4 % and 25.8% respectively. Similarly, the transportation cost shared 13 to 16 % while cost of loss/damage during transportation shared as high as 8 to 10 % (APROSC, Exploring Market Potential of Selected High Value Commodities in Mid-Western Development Region, Nepal. 1999).

ICIMOD (1989) has best focused its attention of production and productivity of horticulture crops diversification of horticultural research. Most of the experts emphasized the important a scientific approach to the development of mountain horticulture as an essential farming systems. They also highlighted the important of importance of income generation from horticulture crops of the region are citrus and temperate fruits, vegetables. Most of the experts have reported the large number of barriers get discourage from growing horticulture crops because of initial heavy investment long gestation period inappropriate technology and market imperfection. Thus the experts concluded and gusseted that the following efforts should be lunched for better promotion of horticultural crops.

-) Organized and efficient marketing system should be developed.
-) Identification of proper location of market is also necessary.
-) Integrated horticulture development programmed should be lunched effectively.

-) Incentive should be used to encourage farmers to adopt scientific cultivation techniques.
-) To certain of employment opportunities agro based industries should be established at farm level.
-) Price information system should be developed.

HMG/DFAMS has made a study on “Fruit production in Kaski and Syangja” in 1976. The study has 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.

The study confirmed that the favorable climatic and soil condition of the hilly areas had attracted the farmers towards fruit production and also suggested that various support service programmers are necessary for providing supplementary means of additional income generation for the farmers. The study has also pointed out some of the difficulties of farming fruits. The main barriers pointed out by this study, for producing fruits in these two districts are: lack of administrative efficiency, lack of co-ordination between the government and private agencies and inadequate transportation and storage facilities (HMG/DFACMS, 1976).

Lumle Agricultural Research Center has conducted a study entitled “Production Constraint of Mandarin in Western Development Region” in 1989. The study was based on the potential citrus growing areas of Syangja, Kaski, Tanahun, Gorkha and Lamjung districts and it indicates that the mid-hills are largely characterized by terraced upland and food grain crops like maize, millet, wheat and barley are mostly grown under 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.

The objectives of the study were to identify problems associated with citrus farming. To fulfill the objectives, a survey team was made which consisted of two horticulturists, one

plant protectionist and a junior technician. To fulfill the above objectives, the following methodology was used.

Orange production area was chosen as special area to examine the enhancement in the income of rural household in western development region. Out of Kaski, Gorkha, Tanahun, Syanja, Manang, Lamjung, Baglung, Mustang, Parvat, Magdi, Gulmi, Arghakhanchi, Rupandehi, Nawalparasi, Palpa, Kapilvastu Districts of western development Region Syangja, Kaski, Tanahun, Gorkha and Lamjung were selected for the study. Especially data are taken from households. The tools used to collect data were questionnaire, unstructured interview, observation and case study. District Development reports was one of the main sources of secondary data.

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

Food and Agricultural Organization (FAO) has presented “The Role of Government in Agricultural Marketing” in 1975. It concludes 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 programmers, and creation of marketing institution for agricultural goods.

The paper has suggested that traders should be organized. They should recognize new market, channels for extending information and technical assistance to trades. They 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.

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 (FAO, 1975).

2.2 Review of Related Literature

(SINA 2003-04) The fruit in Nepal can broadly be grouped into three categories as sub tropical, tropical (or summer) fruits and winter fruits (deciduous fruits). In term of production the tropical fruits are the most dominating one and then come the citrus fruits followed by the deciduous fruits. In the tropical fruits category the production of mango has biggest shares. Similarly, the mandarin orange has the biggest share in citrus production category and applies major item in deciduous fruits category. Ranking each fruits in the total production of fruits, the mango shows the biggest share of production (20%), and then follows mandarin orange (16 %), banana (11 %), sweet orange (6 %), apple (7 %) litchi (3.2 %) and lemon (0.67 %) among the major fruits. This report Signe the types of fruit and the demand of fruits also (Statistical Information on Nepalese Agriculture 2003/04).

HMG/Department of Food Agriculture and Market Service (DAFM) has conducted a study on topic A Socio-economic Study on the area around prithivi high way in 1979. In this study Five VDCs Manakamana from Gorkha, Sisuwa from Kaski, chhang VDC from Tanahun and Jivanpur and Benighat from Dhading district were taken as sample VDCs. In the report presented it was stated that in some regions, the facilities of transportations encouraged to some extent the cultivation of cash crops and fruits.

In conclusion of the report it was remarked that roads have a remarkable effect on the development of the production forces of agriculture. Road provides the opportunities for increasing income and boosting the socio-economic condition to the people (HMG/DFAM, 1979).

Kantipur daily newspaper has published an article written by Prabhakar Grimire. The article was focused on the orange production and its impact. The writer says that most of the Nepalese people expected governmental help even for small piece of work. But in

contrast to the citizen of east northern part of Chitwan demonstrate their power and become an example of country.

According to writer, around thousand plants are planted in 40 Bigha and more than 50% plants are giving their product now the orange of this area is not only quantitatively productive, people of this area are earning around 18lakdhs rupees per year from orange farming and the main market of the orange of this area is Mugling Bazar. (Prabhakar Ghimire, 2004).

In a study conducted by MDD, 2000, tried to assess the cost of marketing mandarin orange and apple from the two major transit points of Nepal, Birgunj and Bhairahawa, to near by Indian markets at Patna and Gorakhpur, revealed that the purchasing price at Nepalese market represents 25 to 33 % of the wholesale market price received at Indian wholesale markets. Similarly marketing cost ranges between 39 to 40 %, in which transportation cost stood between 14 to 16% while loss during transportation at 8 to 9% resulting marketing margin from 28 to 36 % of the price received at the near by Indian wholesale market centers (MDD. DOA, Study of High Value Commodities Marketing in Indian Market Centers, Harihar Bhawan 2005.)

FDS, (1998) has been point out "History and people" Fruit trees are a familiar sight on many farms and in home gardens. In Europe, fruit has long been farmed intensively and most successfully on very small units. What are the possibilities, locality, to farm fruit on a small scale with the aid of existing experience and technology.

The fact that fruit trees have been planted over extensive areas is an indication that such trees are adaptable to a greater or lesser degree. The tendency to plant fruit trees on larger units and to specialize in different kind of fruit has caused many farm orchards to decline and fall into disuse. On economic fruit farms there have also been great changes. If the farmer is considering selling his fruit on the national or export market, factors such as orderly supply, storage, quality control, effective marketing and the accompanying increased costs will necessarily be include in the planning of the enterprise. In order to keep the costs as low as possible, the crop size must be considerably increased to cover these increased costs.

Fruit production is expected to rise from last year's 705,000 MT to 725,000 MT in 2010. Also expected is an ordinary growth in cultivation area from 70,653 hector to 70,932 hector. Increase in commercial banana, pineapple farming and massive rise in orange

production are also the reasons that are estimated to contribute to overall fruits production. Mango production thought is estimated to decrease a little as compared to the previous year. In the report, expected production rate of fruit is not increase in Nepal. But banana, mango, pineapple production is massive raise in the country (NES 2010-11).

The European and other markets for pineapple, avocados, mango, papayas and banana expanded considerably during 1980s decade. The markets reviewed grew by some 75 percent for avocado, 63 percent for mango and 98 percent for pineapple. This study clear out the picture of fruit marketing of the world, so the probability of fruit farming is the great opportunity for under develop countries like Afghanistan, Kango, Ethiopia, Nepal etc. In this report dose the promotion for tropical and sub-tropical fruit cultivation and production like our country (ITC, Geneva, 1997).

Though agriculture is the main occupation of Nepalese economy, horticulture has been initiated only to negligible extent. Fruit is one of the most important factors of agriculture development. 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, marketing and socio-economic situation of fruit farmers. These studies indicate that there is favorable climate and soil condition for tropical and sub-tropical fruit cultivation in the hilly and churia region and by providing the infrastructural and institutional development there would be great possibilities for its production.

APROSC (1982) has published an article "Feasibility Study of High Value Cash Crops Project" this study indicates that land and climate situation of the hill region are favorable for the fruit but the farmer are not doing so as much. This study has sound that two major problems are in production practices. The first is marketing and other is production. This study highly focused that fruit marketing is adversely affect by import of fruit from India, Bhutan and China, because Nepal has not storage and transportation facilities and processing facilities industry. Main barriers for production process of fruit are inadequate production credit and technical assistance problems of bacterial disease greening and subsistence farming. The study has made the following recommendations for achieving good harvest. Provision of credit, training and extensive education and marketing

facilities such as storage and transportation are necessary to the fruit growers and both government and farmers should be made interest in development of fruit farming.

APROSC had conducted a study in 1989. This study has explained different aspects of citrus production in the mid Hills of Nepal. The study has identified that the nation's policy for developing citrus farming programme is still unsuccessful due to the poor performance of institutional support related to the citrus development programme. On the basis of land use, it has indicated that the citrus production is limited. However, the potentiality of citrus production in mid hill is still higher than the cereal crops. Citrus production according to this study can provide tangible as well as intangible benefits to the country. Increase in income is the tangible benefit that citrus farming provides whereas improvement in the environment is the intangible benefit that it provides. Further it has suggested that effective governmental effort should be lunched practically to develop this field (APROSC, 1989).

A Book of Thirty-three articles created by 16 different authors was edited by Edward Hyams and A.A Jakson in 1961. Bolded with a handsome title “The Orchard and Fruit Garden” (a new pomona of hardy and sub tropical fruits). The entire literature is targeted to survey contemporary achievements in the growing of fruits familier in the temperate zones.

The editors arranged chapters separated with devotion on soil, climate grafting and pruning techniques. The book has been able to provide a bunch of information on noted fruit types. The present study is benefited from Jafferson’s work in general information of the sub-tropical fruits though this work doesn’t deal with citrus in a separate category, it gives partial information about them (Hyams and Jakson, 1961).

In 1995 B.M. Shrestha, has conducted a study entitled “The Role of Fruit Production in Rural Development” with the specific objectives of identifying socio-economic status, level of fruit crop production, economic contribution and farming of major fruit crops in the community. He has pointed out that agriculture is the major source of income of the people, which comprises food grain, fruits, vegetables, livestock's, poultry etc. He has identified 15 species of fruit crops that are mainly cultivated in Bunkot VDC. The main are: mandarin (orange), lemon, pear, mango, apple grapes etc. Among them orange is found prominent to be the one in Bunkot VDC.

The sample comprises of 61 orange growers among 338 orange growers of the Bunkot VDC of Gorkha district. The study was performed by collecting primary data. The primary source of data was orange farmers and knowledgeable persons. The study has also used secondary sources of information. Benefit-cost ratio was the main tool used in this study to attain the objectives of the study.

The conclusion of this study is that the trend of fruit cultivation is very positive and the expansion was found most rapid in case of mandarin. Expansion of market, greater profit margin, easy to grow, easy access to market due to construction of road network, relatively low cost of production and increase in domestic demand for orange are the main factors that have encouraged farmers to increase orange farming in the study area. The farmers make handsome profit from orange farming but they generally make better profit from lemon farming. He has found that the bargaining capacity of the producers is very weak. They are bound to accept the price offered by the brokers. So brokers made more profit than the producers. Thus, the study has given some recommendation such as: farmers should be oriented to become commercial, farmers should be oriented to use grafting techniques as recommended by the technicians rather than seed to propagate orange seedlings, scientific and improved harvesting and post harvesting practices should be oriented to the farmers, local co-operatives should be organized as soon as possible for the marketing of fruits, quality plants, extension services, fertilizer and plant protection measures should be provided at the reasonable price in appropriate time, training should be provided to the orange growers (B.M Shrestha, 1995).

Another study was conducted by New Era entitled “Effective marketing strategies for mandarin in Dailekh” in 1989. The study has indicated that mandarin farming could be a major source of cash income to enhance the level of income of the farmers of the district but unfortunately, the orange growers have not been able to gain reasonable return from the production of this fruit. Various factors may have contributed to this situation, the perishable nature of orange, very poor and old age transportation facility, inappropriate storage methods, problems of processing and marketing etc. Despite of a few attempts made by different government and non-government agencies, it is still true that the orange growers have not been able to reap returns that enhance their level of income, the study indicates.

The objectives of the study were to examine the existing orange farming practices, marketing situation, to assess the existing mandarin processing facilities and to prepare a plan of action and recommend alternative strategies for resolving the marketing problems of orange.

The study has identified many problems of orange production and presented in detail. But here, only some of the important problems identified by this study are reported. They are, lack of improved cultural practices in orchard farming, lack of input supply, lack of information about proper time table of farming orange, inappropriate uses of fertilizer, insecticide and pesticide, unawareness of the quantity and quality of the product, low quality product due to lack of irrigation facilities, inappropriate and inefficient techniques of harvesting, grading, packaging and a vary low return received by the farmers due to a high transportation cost. A lack of trained manpower is also one of the notable problems for this occupation.

The study has also given various recommendations for removing the problems related to the orange cultivation such as, to provide transportation and irrigation facility, technical knowledge, to develop price information system and to establish processing industries at farm level (New Era, 1989).

Y.K. Chapagain has conducted a study entitled “A study on Orange Marketing in Bhojpur, its Present Position, Problems and Prospects” in 1987. In this study, the researcher has argued that the orange marketing is one of the ways to uplift the rural economy of mid-hills. According to him orange is one of the most suitable fruits that can be farmed in this area and only an efficient marketing technique can derive economically justifiable return to the orange farmers. Hence efficient marketing can fulfill the necessities of the orange farmers. The objective of this study was mainly concerned with the problems of production and marketing of orange farming.

A special area of Bhojpur district was chosen for the study in which 81 households out of 300 households were selected randomly to collect information and some simple statistical tools and techniques like, measure of central tendency, percentage, bar-diagram, pie chart, were used to analyze the information.

Some of the main problems of the study area identified by this study are: unequal distribution of income, a low level of employment opportunities, a high population pressure on land, ecological misbalances etc. The extent of these problems, according to

the study, has to be reduced and can be reduced by persuading the farmers to farm orange in the study area.

However, the study has shown that the cost of marketing is very high. Hence, to improve the situation, the study has recommended to develop market information system, storage facilities and to provide credit facilities to orange growers from the organized sectors (Chapagain, 1987).

Annual Report- NARC (1999) has noted that the citrus is one of the most important and popular fruit crops grown in the hills of Nepal. It is grown commercially at different climate condition like tropical and subtropical, and even in some favorable parts of temperate regions. This report focuses that the core problem is the low production and low market price at harvesting time. It is caused mainly due to the small area under citrus, lack of suitable varieties for growing in different seasons. (Early, medium and low) and poor management practices. Poor fruit quality and lack of suitable storage methods are the main reasons for low market price at harvesting period (NARC, 1999).

A study entitled “Orange Production in Syangja District” was done by Janga Bahadur Gurung in 1995. The main purpose of this study was to evaluate the profitability of orange production. The study states that to improve the economic condition of hilly region, horticulture is most important occupation.

The objectives of this study were to find out: the present condition of socio- economic life of the orange growers, present status of production, consumption and marketing of orange, profitability and to assess the role of supporting institutions in orange production.

The study has concluded that orange growers are optimistic about better prospect of orange farming. The climate condition of the study area is favorable for orange production but most of the lands are used to grow food grain crops like maize, millet, wheat etc. which are less beneficial than orange production. It also indicates that due to suitable climate condition horticulture is profitable for hilly region.

The study was conducted by using primary and secondary data. Primary data were collected from Orange growers and secondary data were collected from Agriculture service centre, horticulture offices and libraries. Out of 275 households, 33 households (12%) were selected in the study in which different quantitative tools and techniques were used to analyze the information.

The study has identified some problems such as: inadequate marketing, technical assistance, irrigation and storage facilities, disease and pests, short supply of agricultural inputs, labor, institutional credit and poor transportation facility.

To encourage the orange growers of the study area as well as hilly region for better production the study has recommended to establish horticulture station, modern cold store and processing factory, provide cheap transpiration facility, institutional credit and to manage broad extension services.

CHAPTER THREE

RESEARCH METHODOLOGY

Methodology is the most important aspect of research work. Reliable and relevant study is possible only by applying scientific method. In this chapter, the methodology of this study is presented. The methodology includes selection of the study area, definitions and concepts of the terms and variables, research design, source and nature of data, sampling procedure and data collection instrument, method of data analysis and the limitation of this study. The primary purpose of this chapter is to discuss and design the framework for the research.

3.1 Rational for the selection of the study area

Dadiguranse VDC of Sindhuli district has been selected as the study area in this research project. Various research works have been carried out in different parts of Nepal. The central part of Nepal, especially the mid-hilly and churia area is one of the famous fruit production areas of Nepal. Tropical and sub-tropical fruit (mango, litchi, pineapple and jack fruit) cultivation has been practicing in Dadiguranse VDC since long. The researcher of this study being a student, time and money are two main constraints. To minimize the cost and time of collecting data and to finish thesis within the time limit of the university, the researcher has selected Dadiguranse VDC where he has his own house. Therefore there is less chance of facing problems and difficulties for finding detailed information in various aspects of the study area. The purpose of selecting the Dadiguranse VDC is on the basis of area coverage, diversified places among the pocket area, easy accessibility for the researcher and expecting as representation of the district as a whole. Thus, the selection of the study area is justified and is also convenient for researcher too.

3.2 Research Design

Research design is a logical and systemic plan prepared for directing the study, which helps the researcher to study in related area working on the topic of fruit production and socio-economic change in Sindhuli, a case study of Dadiguranse VDC, and ward no. 2 only. The plan and structure as well as strategy of the study are conceived in proper manner. Maximum effort has been made to obtain answer to research questions validly and objectively. The framework of the research has been designed both exploratory and

explanatory research have been designed to collect accurate information of socio-economic condition, marketing of fruits, trend of fruit farming, problems and prospects of fruit cultivators farmers.

3.3 Sampling Procedure

There are 976 households in Dandiguranse VDCs area and 531 households in the ward no. 2, 4, 6 8 and 9. Hundred households taken out of the total 531 households from five wards. The researcher takes twenty households from each ward. Hundred household take from the different caste groups and fully depended in the fruit cultivation as a purposive sampling.

Thirty people were interviewed to serve as key informants ten teachers from the schools, five horticulture technician and five local representative one from each ward. All of them familiar to the fruit farming and detailed information related to the condition of fruit production, economic benefit and changing the process of social condition of the farmer.

Table 3.1: Ward wise Distribution of Sample Size.

Ward No.	No. of H.H	Sample size %	Sample H.H. in round.	Percentage of sampled H.H.
2	114	20	23	20.17
4	61	20	12	19.67
6	59	20	12	20.33
8	204	20	41	20.09
9	59	20	12	20.33
Total	497	20	100	100

Source: Field survey, 2068.

3.4 Techniques and Tools of Data Collection

The structure questionnaire, unstructured interviews, participant observation and focus group discussion method is applied for collected the data.

3.4.1 Structure questionnaire Survey:

To generate the accurate (Primary) data from household survey of the fruit cultivators, structure questionnaire was prepared. The respondent was requested to fill up

questionnaire. In case of respondent, who can't fill up the questionnaire the question was asked to the respondent and answer was filled to collect the require information.

3.4.2 Unstructured Interview:

Fruit farming can play the main role for improve the socio-economic status of farmer? This study was collected the primary data from key informant, semi or unstructured interview method and checklist. The interview had been taken to cross check for data obtained from questionnaire. The informants were interviewed on the basis of socio-economic impact of fruit cultivation.

3.4.3 Field Visit and Observation

Field visit of the study area had done based on the participant observation, which helped to enrich the qualitative and quantities data collection. In this, researcher observed the daily life of people by watching and listing to their conversation. This was done during interviewing people, talking with them. This was done to know the actual condition of respondents, the condition awareness of people, socio-economic status of the farmer, fruit production trend and its marketing condition etc.

3.4.4 Focus Group Discussion

The focus group discussion was helped in the separate wards with the active participation of women, man and school children. This discussion was focus more on fruit farmer, who was benefited well from fruit cultivation. The chick list was used for this technique.

3.5 Data Analysis

The quantitative data obtained from questionnaires were analyzed using simple statistical tools. The collected qualitative information is presented in descriptive data way. The various information obtained is presented in appropriate table and figures. They are categorized and tabulated according to the objective of the research.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Background

Sindhuli district lies in the mid hill region of central development region. Different association has been added in the name of sindhuli district. Long time ago, King named "Sindhul" came have for religious penance, and after his name Sindhuli was named. Area around the Sindhuli headquarter is called "Siddhasthali" which is named after siddhasthali temple which lies 11 k.m. far from headquarter of sindhuli district. The word Siddhasthali was corrupted finally and named as Sindhuli (VITOF 2068).

Sindhuligadi is a very famous historical place for Anglo-Nepal war. Still now there is a big old place made by Rana rulers with a big yard of Tudikhel and various historical spots and equipments are yet in patient in Sindhuligadi. The headquarters of Ramechhap and Sindhuli districts are clearly seen from this spots. It is said that in the clear day of monsoon, Janaki Mandir of Janaki Dham, can also viewed from Sindhuligadi. It is also linked with the B.P High way made from the aid of Japan.

It is one of the less developed and backward districts where majority of the people live a rural life and most of them are poverty striven. Most of the district covered by hill and some part is covered by chure, they lie behind the Mahabharat range and this region is comparatively suitable for cereal crops. Most part of the district is covered by stretched land and steep hill; horticulture can be the only respective occupation for the people in this district since citrus fruit culture is greatly favored by the climate and soil in the hill region. Many VDCs in district have seen the occupational cultivation of citrus very promising.

The district has the great variety of topography, which is reflected in the diversity of weather and climates. The elevation ranges from 168 to 2785 m. and the temperature is 3.5⁰ Celsius at minimum level to 37⁰ Celsius at maximum level, and annual rainfalls is 297 mm. (F.Y 2065, District Profile)

Dadiguranse VDC in the districts being a leading for tropical fruit production can serve as a very good model VDC. Total part of this VDC is covered by the Churia region. The Madhasi people are called "Churiamai" or "Churia God", because of Churia place is the

sources of water for this people. The total area is cover 5501 hector by its VDC and its VDC is situated in the beach of Marin Stream. The climate of tropical fruit cultivation is found in the range of 0 (sea level) to 542 m. of altitude but the favorable altitude is 305 to 366 m. The appropriate temperature is 5⁰ to 35⁰ Celsius, which is found in Dadiguranse VDC. So many farmers of the different VDCs like Ladabhir, Dudhaule, Tadi, Lampangtar, Sirthauli, Harshai, Ranibah, Nipane, Bhadrakali, Ranichuri and Kamalamai municipality etc are involved in tropical fruit cultivation with a view of commercial aspects. The study area is one among the 53 VDCs of Sindhuli district. It is one of the 53 village development committee (VDCs) of Sindhuli district excluding on Kamalamai municipality. The selected study area is only the tropical fruit like mango, pineapple, jack fruit, litchi etc cultivation area of Dadiguranse village development committee. The study area is situated 10 km far from the district headquarter. The VDC is bounded on the East by Kamalamai municipality in the west by Mahadevsthan. On the North border of Mahottari and Sarlahi districts and Southern boundry is Amale and Bhadrakali VDC.

Tropical fruit production is not a new practice in Dadiguranse VDCs and it has been very popular sense some year. For the promotional activities UNDP, ADB and other I/NGOs are more focus became some year. Although the actual time is not recorded. According to the local cultivators when in the Inner Terai the malaria is eradication, after that time the people are live in this area and farming the different types of tropical fruits like mango, litchi, jackfruit and any others delicious fruits. Some tears ago they are cultivated the fruit for the purpose only self consumption but at they are cultivated for commercially purpose and changed their socio- economic life style.

4.2 Demographic Characteristics

Demographic characteristics mean these activities which are related and concerned with population activities are included in demographic characteristics. Total population compositions of the population are included in demographic characteristics. Thus it shows the population activities mathematically.

4.2.1 Total population of the Sample Households

The total population of the sample households is 617 and it is presented as the basis of different composition.

4.2.2 Age and Sex of the members of the Sample Households

The population activity refers to the different aspects of the people living in a certain society or country. Age composition is a process of studying the population activities. Because the total population is divided into different age group and sex composition divided into male and female in any society. The age and sex composition of the sample households in Dadiguranse is presented in table.

Table 4.1: Age and Sex of the members of the Sample Households

Age	Male	Female	Total	Sex Ratio
Below 10 yrs	57	44	101	129.54
10-59	201	247	448	40.89
Above 59	41	27	68	151.85
Total	299	318	617	94.02

Source: VDC Office 2068

Table 4.1 shows the age and sex structure of population out of hundred households, total 617 population, out of which 299(48.46%) are male and 318 are female (51.53%). the sex ratio for total population is 94.02 male per 100 female.

The sex ratio varies form 129.54 below 10 years 40.89 in 10 to 59 years and followed by 151.85 in above 59. On the average 6 people live in each households of the study area. The maximum populations are found in 10 to 59 yrs.

4.2.3 Literacy of the Study Area by Population

Education is also a basis of studying the characteristics, such as quality of the living standard, level of awareness of the people. Out of 617 total population of the sample households 82 number of people are illiterate, which is 13.2 percent of the people of the total sample population. 104 numbers of the people are general literate; it is 16.8 percent of the total population of the sample households. 223 people mostly children have gone to school, 121 have passed S.L.C, 46 people have passed I.A, 37 people who passed B.A and 4 people passed M.A. level. At present total 11 educational institutions is in the VDC.

Table 4.2: Literacy of the Study Area by Population

S.N	Level of Education	No. of Population	Percentage
1	Illiterate	82	13.2
2	General literate	104	16.8
3	School	223	36.1
4	S.L.C	121	19.6
5	I.A	46	7.4
6	B.A	37	5.9
7	M.A	4	0.6
Total		617	100

Source: Field Survey 2068

4.2.4 Ownership of Land of Sample Households

In the context of Nepal, the system of division of property, land is getting divided smaller and smaller pieces, thus the land holding capacity is also decreasing generation after generation. The following table shows the state of the total ownership of land of the 100 sampled households.

Table 4.3: Ownership of Land of Sample Households

Land holding(In Ropani)	No. of Households	Percentage
<5	23	23
5-10	31	31
10-15	20	20
15-20	17	17
>20	9	9
Total	100	100

Source: Field Study 2068

Table 4.3 shows the land holding pattern of sample household in the study area. In the study area the land is measured in ropani. Out of 100 households, 23 percent people have below 5 ropani and 31 percent have 5 to 10 ropani, 20 percent people have 10 to 15 ropani, 17 percent people have 15 to 20 ropani and 9 percent people have more then 20 ropani land.

4.2.5 Family Size of Sample Households

The total number of the family member is called family size. Most of the family, Nepal has large size, but the average family size of Nepal is 4.5 members (CBS: 2001). It means and average of 5 to 6 member live in one family in Nepal.

Table 4.4: Family Size of Sample Households

Member of Family	Households	Percent
0-4	32	32
5-7	59	59
9+	9	9
Total	100	100

Source: Field Study 2068.

Table shows the average family size of sample households is 6.1 members per family. Generally joint family system is found in study area. This is evident in most of the rural society in Nepal.

4.2.6 Occupational Structure of Sample Households

Occupation is the main source of income generation in the context of Nepal. Most of the people of Nepal are farmers; because of Nepal is an agriculture country. In our country government job is very secure for future. In the study area people are engage in different kinds of job.

Table 4.5: Occupational Structure of Sample Households

Occupation	Agr i.	Small Industry	Tra de	Govt. Job	Private Job	Foreign Emp.	Others	Total
No. of HHs	52	9	5	11	7	11	5	100
Percentage	52	9	5	11	7	11	5	100

Source: Field Survey 2068

Table shows in the study area more than 50 percent households are engage in agriculture sector. This is kept highest role. Other occupation are governmental job and this sector 11percent households are engaged, in the private job 7 percent households are engage, 11 percent households are going foreign countries for job, in small trade like shopkeeper, mill an other sector in 5 percent people are engage. In the study area 2 percent households are related with industries like poultry farm, contractor, small construction company etc.

and 5 percents households is related other sector like fire wood collection, jajamani, fisheries and any other field.

4.2.7 Food Grain and Vegetable Production

The total area of VDCs is 5501 hector and 1018 hector land is productive area. Mainly people of Dadiguranse cultivated paddy in low land near Marin Khola bank. In F.Y year 2064 the VDCs cover total irrigated land is 286 hector. Much steep land is used for fruit cultivation in the area. People are cultivated other many food grains like millet, maize, and wheat in rain fall area of the VDCs. They are also cultivated other cash crops like turmeric, pea, buckwheat (Phaper), brown and black lentil etc. Some vegetable like cauliflower, cabbage, potato etc are also grown in study area of VDCs.

Table 4.6: Food Grain and Vegetable Production in Sample Households

Food Grains	Quantity
Paddy	More than 3200 muri
Maize	More than 1500 muri
Barley	More than 600 muri
Vegetable	More than 200 Quintal
Others	More than 190 muri

Source: Field Survey 2068

4.2.8 Cultivated Land of Sample Households

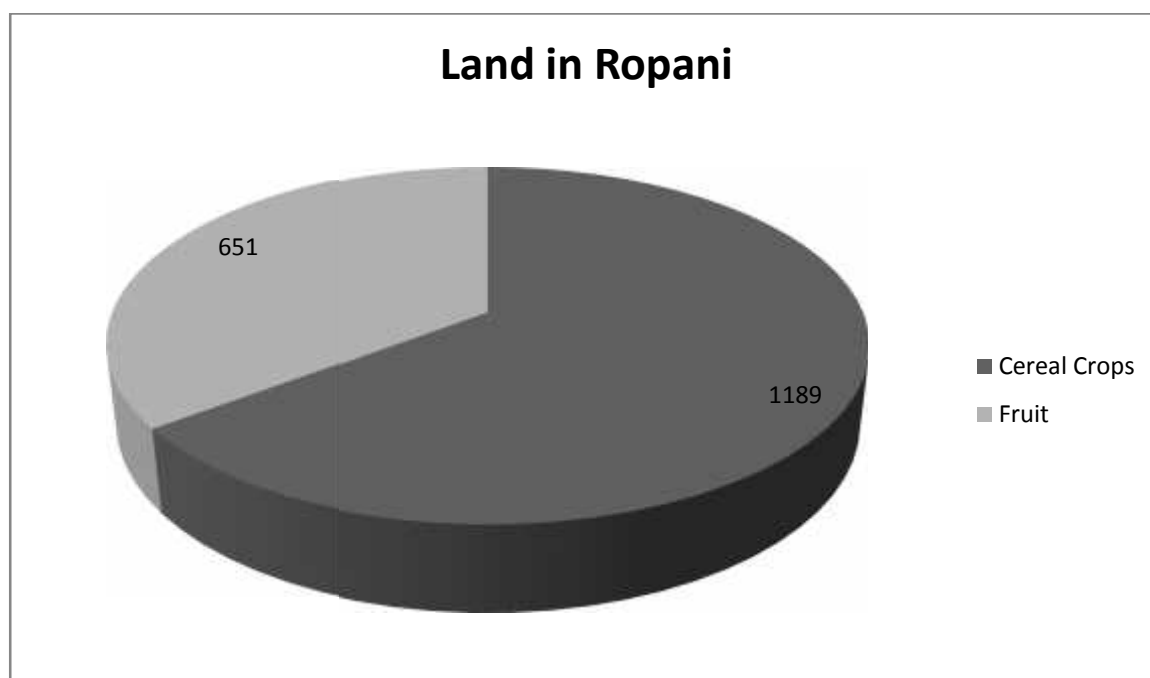
Out of the total cultivated land food grains (cereal crops) covers 1189 ropani and Fruit cultivation covers 651 ropani. Most of the people of the study areas are getting conscious of fruit cultivation. The soil condition of the VDCs, is also suitable for tropical fruit cultivation, but the fruit cultivation cover less land then cereal crops cultivation. It is because of the clay soil and plain land is used for only cereal crops.

Table 4.7: Cultivated Land of Sample Households

Description	Land in Ropani	Percentage
Cereal Crops	1189	65.9
Fruits	651	35.0
Total	1804	100

Source: Field Study 2068

Figure No. 3: Cultivated Land in Study Area



4.2.9 Cultivated Land by Fruits Cultivation (Only tropical fruits Mango, Litchi, Jack fruit, Pineapple and others)

In the context of study area, very suitable land for tropical fruit cultivation most of the house holds are cultivate mango, litchi, pineapple and jack fruit, some house holds are cultivated coconut, chestnut, guava, banana, pista etc but they cultivated in less number of land.

Table 4.8: Cultivated Land by Fruits Cultivation

Fruit Cultivated Land in Ropani	No. of Households	Percentage
0-3	27	27
4-7	42	42
8-10	22	22
10 over	9	9
Total	100	100

Source: Field Study 2068

Table shows that about land covered by mango, litchi, pineapple, jack fruit and other fruit cultivation, out of the hundred households 42 percents households have 4 to 7 ropani land

is used for cultivation of fruit and only 9 households cultivated fruit in more than 10 ropani.

4.2.10 Food availability in the study Households

Food is the most important factor for the sustain life. Our country is famous for agriculture but our cereal crops production is very low then other country. We are used imported food in many part of our country. Hilly region is the area of food deficit, people of that areas use the subsidy food by the government. But the study area is a normal area of food growing.

Table 4.9: Food availability in the study Households

Description(In month)	No. of Households	Percentage
>12	58	58
9-12	22	22
6-9	11	11
<6	9	9
Total	100	100

Source: Field Survey 2068

Food means sometime we eat for survival and sufficiency means enough amount of food to eat for survival.

Table 4.9 illustrates that 58 percent have, no any cost for survival mean they have not starvation. Some households in the study area they are land lord and more then hundred muri crops is selling in the market and surrounding people. 22 percent households are able to meet their food 9 to 12 months of their own agriculture land. Similarly 11 percent households have food for 9 to 6 months and 9 percent of people have food for less then 6 months and they bought the crops by selling the fruit. It is included that people have not fulfilled their food requirement from their own agriculture production.

4.2.11 Trend of Fruit Production

Fruit production is not new practices in Dadiguranse VDCs and it has been popular since some year. Although the actual starting time is not recorded. According to local cultivators generally start in eradication of the dieses malaria. Initially it has been cultivated for self consumption. After some time the trend of fruit production due to sustainable climatic condition, suitable soil, altitude and profitability of its cultivation.

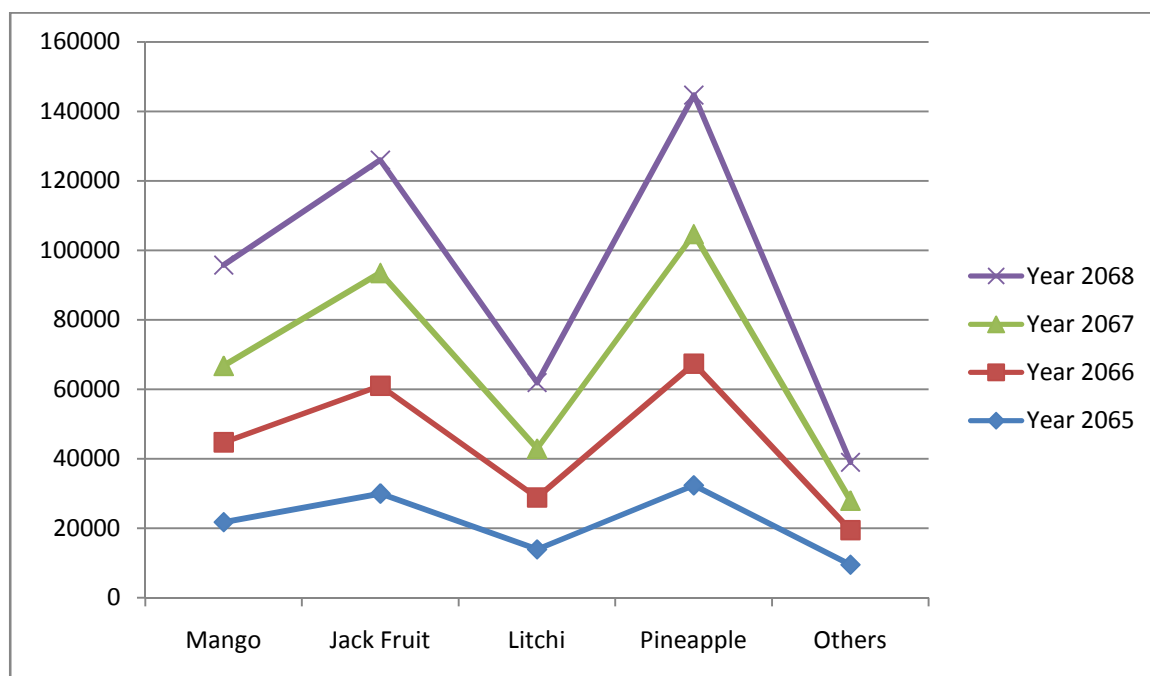
The production of fruit has been slightly increasing particularly due to the increasing number of farms or plants and its relative's importance is high in the market among cash crops. However the production is not proportional to the increasing rate of farms. But it is fluctuating year by year due to some constraints such as drought, hailstone, storm, disease and pests etc. Thus the production of fruit is in fluctuation but there is an increasing trend in general.

Table 4.10: Trend of Fruit Production in the Sample Households

Fruits	2065	2066	2067	2068
Mango	21,750 Kg	23,000 Kg	22,000 Kg	29,000 Kg
Jack Fruit	30,000 Kg	31,000 Kg	32,500 Kg	32,500 Kg
Litchi	13,900 Kg	15,000 Kg	14,000 Kg	19,000 Kg
Pineapple	32,360 Kg	35,000 Kg	37,300 Kg	40,000 Kg
Other	9,500 Kg	10,000 Kg	8,500 Kg	11,000 Kg
Total	1,07,510 Kg	1,14,000 Kg	1,14,300 Kg	1,31,500 Kg

Source: VDC Office and Field Study 2068

Figure No. 4: Trend of Fruit Production in Four Years



The table shows that the total fruit production of the total sample households in last four years present on the table. The productivity of fruit is increasing normally in the last year. In B.S 2065 the total production of fruit is 1, 07,510 Kg, and B.S 2066 in the study area

the production of fruit is 11, 40,000. In the year 2067 the production of fruit is decreasing, because of this year is not normal for the farmer. In the flowering season of the fruit hailstorm, insect and wind does the impact for the fruits plant. But this year fruit price is increase the before year. The last year total production of fruit is increasing. Total 13, 15,500 Kg fruit is produce in the study area.

4.2.12 Fruitvale area, plant and Selling Rate of Fruit in Four Years

In the context of Nepal the agent is active in the season of product selling. They are used different types of tricks for buying in fewer prices. In the season of production the demand of fruit is automatically increase but the agent is active between the farmers wholesaler, retailer and consumer and gets a lot of money. The farmer is not success for the delivery of fruit, so farmer give large amount fruit in low price, and farmer get very low cost of the labor.

Selling price is fixed by bargaining. The growers do give extra fruit to the traders to their farm. But the wholesale buyer and retailer fix the price at every time when they do take them fruits to the markets. So the price with them too varies with time. In this sense growers who can wait a long time can get better price then others. But generally, when the crop is ready it is difficult to wait. Even the farmers have to sell their produce forcibly to the buyers. The reason is that the fruit is perishable and lack of storage facility in the study area. They are compelled to sell their produce at minimum price.

Table 4.11(A): Fruitvale area and plant

year	Area in Ropani	No. of fruit plant & shrubs	Production in Kg
2065	309	3,000	1,07,510
2066	430	4,050	1,14,000
2067	530	5,100	1,13,300
2068	651	5,900	1,31,500
Average	495	4,517.75	11,65,775

Sources: Field Visit 2068

Table 4.11(B): Total Income in Last Four Year

Fruit	2065		2066		2067		2068	
	Price/ Kg	Total Income	Price/ Kg	Total Income	Price/ Kg	Total Income	Price/ Kg	Total Income
Mango	15	326250	20	460000	25	550000	25	725000
Jack Fruit	15	450000	15	465000	20	650000	30	975000
Litchi	35	486500	35	525000	40	560000	50	950000
Pineapple	15	485400	15	525000	20	746000	25	1000000
Other	15	142500	15	150000	20	180000	20	220000
Total	1890650		2125000		2686000		3870000	

Source: Field Visit

Table 4.11 (A) and (B) shows that there are 3,000 fruitable plants in F.Y Year 2065 in which the total area under fruit cultivation was 309 ropani and the total production of fruit was 1, 07,510 kg. Total income of the household in 2065 was 18, 90,650 in rupees and average price of 1 Kg was Rs17.58. The table also depicts that the area of fruit cultivation has been increase in the study area that is to say the area increased to 340 ropani in the F.Y Year 2066 from 309 ropani in 2065. Total production is 1, 14,000 in Kg and the income were in Rs 21, 25,000. The average price was in this year 18.64 Rs respectively.

4.2.13 Extension Services Provide by JT/JTA

At the district level different types of supportive institution are involve in fruit cultivation like, agriculture service center, agriculture development bank, UNDP, District agriculture development office etc. The main support needed for fruit cultivation is provision of improve seeds, plant, technical support, Pesticide, lone etc. Government provided some service like JT/JTA to the farmer at the farm level in the study area. However in practices, they have not able to serve the problem accounted by the fruit cultivation. The farm level in the study area. But in practices these services have only stressed the use of modern technique in fruit cultivation but they could not explain properly about the problems in practical field according to the report of fruit farming.

Table 4.12: Extension Services Provide by JT/JTA in Sample Households

Extension Service	No. of Households	Percentage
Yes	47	47
No	53	53
Total	100	100

Source: Field Survey 2068

Figure No. 5: Extension Services

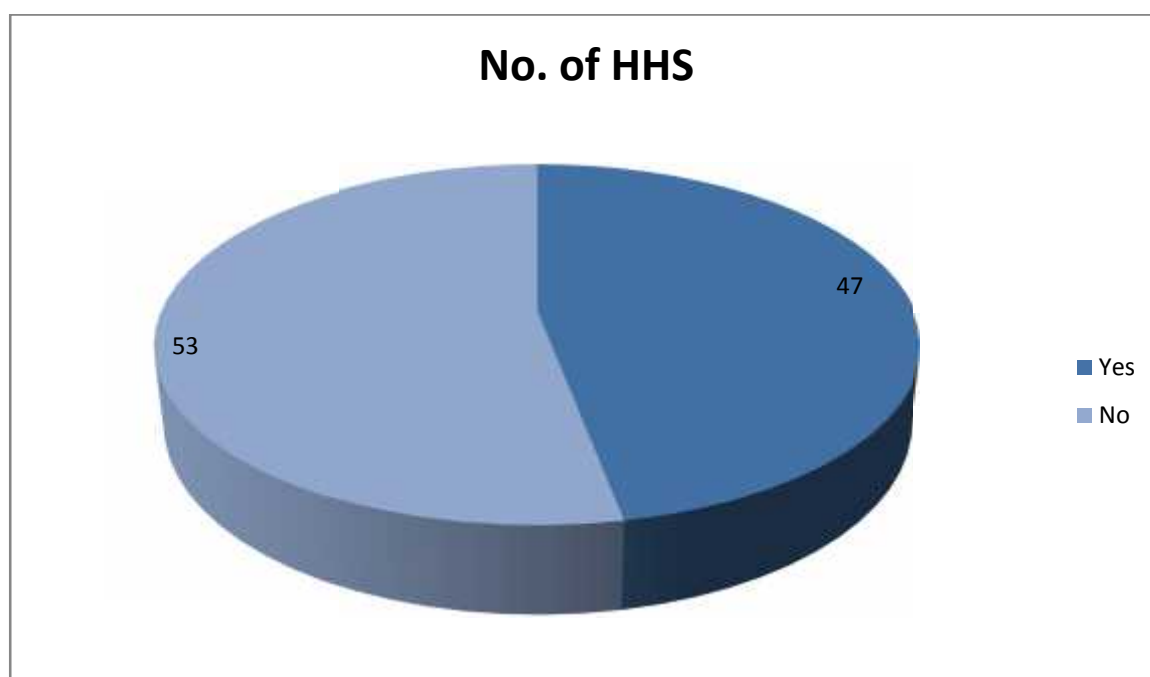


Table shows that about 47 percent households are getting help from extension services and other 53 percent of households said that they have not any help from them.

There is an agriculture service center "Krishi Sewa Kendra Kapilakot", which is 11 K.M far from the study area. Which provide extension service for eight VDCs of the district such as Kalpabrikshya, Kapilakot, Dadiguranse, Hariharpur, Pipalmadi, Kyaneshower, Mahendrajhadi and Mahadevsthan VDCs. According to the respondents they could not visit JT/JTA frequently due to the lack of appropriate condition and facility services.

4.2.14 Credit Facility

Only Agriculture Development Bank has provided loan facility for fruit cultivation to the farmer in research area. This bank has provided loan facility for different purpose such as planting of fruit, to protect and to grow the orchard. This type of credit facility has played the vital role in production process in the study area. Only 32 percent people have taken

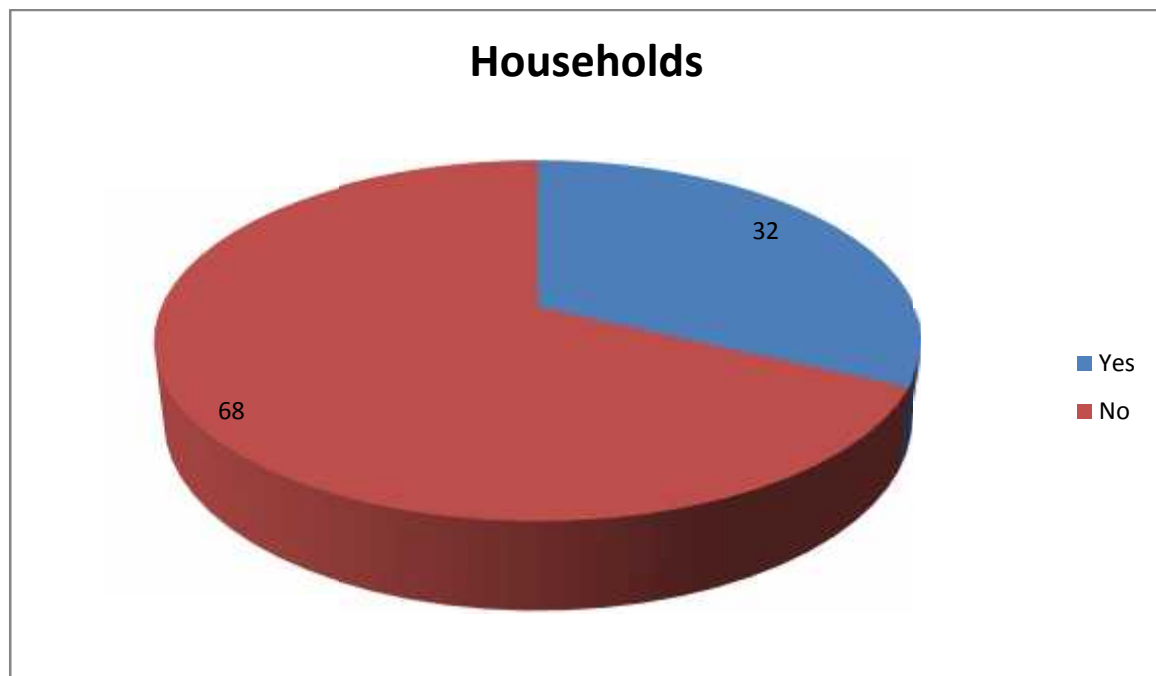
loan from Agriculture Development Bank and 68 percent farmers are deprived from this facility.

Table 4.13(A): Loan Facility by Sample HHs from ADB/N

Loan Facility	Households	Percent
Yes	32	32
No	68	68
Total	100	100

Sources: Field Visit 2068

Figure No. 6: Loan Facility



The table indicates that most of the farmers are not benefiting from credit facility. Farmers are willing to take loans but 32 percent farmers replied that the system of loan distribution of bank is complex procedure and unnecessary administrative difficulty about 18 Percent respondents' answered the interviewer about the high interest rate. Similarly about 40 percent farmers are ignorant about this type of financial assistance. It is mainly due to illiteracy poverty and lack of public awareness programmes. About 11 percent people consider that institution facility is far from the farm level.

Table 4.13(B): Causes of Avoiding Loan Facility from ADB/N

Causes	Households	Percent
Administrative difficulty	41	41
Higher interest rate	18	18
Unknown to the facility	30	30
Far from the study area	11	11
Total	100	100

Sources: Field Visit 2068

Fruit cultivation required high initial investment and this is difficult for the poor farmers following measure can to some extent enable the farmers to take much benefit in this sector.

- 100 percent loan advancement.
- Loan should be provided without collateral albeit.
- Subsidized interest rate.
- Consumer loan should be provided during the gestation period.
- Production loan should be cheap.

4.2.15 Livestock Raising

Livestock is an integral part of agriculture. It is also an important economic activity of all regions, which supports to earn cash to the farmers. It plays a vital role in enhancing agriculture productivity, farm power and income for households and nutrition for family. In Dadiguranse VDC, most of the farmers keep at least two buffalo. In the same way goats and poultry are also common. Cow and buffalo are kept for milk and manure, where as goat and poultry are kept for meat and eggs. The types and number of livestock is given in table.

Table 4.14: Number of Livestock in the Sampled Households

S.N.	Animals	Total number of animal	No. of households
1	Cow/ox	53	34
2	Goat/sheep	605	66
3	Buffalo	130	56
4	Pig	36	3
5	Poultry	180	9

Source: Field survey, 2068.

Table 4.15 shows that almost all the farmers keep large stock of animals usually at least two buffalos. Cows and buffalos are basically the source of milk in the study area whereas ox is used to plough the agricultural field. Farmers used to prefer the dung of cattle and goats in their field. Cows are usually kept by Brahmin and Chhetri community in the study area for the purpose of milk, Goats which is another sources of income is kept by 95 percent of the sampled households in the study area. Hence, directly or indirectly animal husbandry supports to earn cash to the farmers, who are specially engaged in agriculture.

CHAPTER FIVE

SOCIO-ECONOMIC IMPACT IN STUDY AREA

Social change is automatically determined by economic factors and economic factor promote for social factor, so that social change and economic change are co-related.

It is no doubt that the trended of fruit production has change enough in community life style of that study area. Their quality of life has been increased from the fruit farming then before. Some years ago they were low level of living standard. They were no physical facilities, toilet, irrigation, agriculture tools and transportation. But now all of the above things are available their. And the people are benefitted with the knowledge and accessibility and they are utilizing them vigorously.

According to key informant's people of the Dadiguranse, they used to go neighbor VDCs and in the district headquarter, Kathmandu and India to seek employment. They had taught their children in government school because of lower income. When some years ago B.P Highway is crossed near the VDCs and Marin Path is crossed the area, they were facilities from transportation. But the facility of transportation is supportive factor of changing the socio-economic life. Government and any other agencies had not conducted any effective programmed to boost the socio-economic condition of people. When the farmer started fruit cultivation themselves they had improved their socio-economic status from its production. Before the fruit production the roof of their houses were made by mud tile at present they are convert the roof by cement tile and tin. Some years ago in Dadiguranse only one land line telephone services is available but at time in every house seen color T.V and every person use the mobile phone. Their house is seen cleaned and some people are started to plant flowers in the garden of their houses. So they have changed their life style. They left other occupation and followed the fruit cultivation. All these are the features of the standard of living, so the status of their life has been shown with following data given below.

5.1. Housing Condition

The house is used for safeties of the people. When men earn lot money he thinks firstly, I use this money for the golden house and other expectation or demand is increasing day by day.

Table 5.1: Housing Condition of the Selected Households

Types of House	Number of Households	
	Before 4 Years	At Present
General Wood House	100	0
Improve Wood House	0	98
Pakki cement	0	2
Total	100	100

Source: Field study 2068

Table 5.1 shows; it is clear that 98 percent of household is made by wood, bamboo piece, mud and stone. In the one steps is made by mud and stone and the out side of the house is plastered by cement. They use the wood is maximum, because the wood is available in similar price in the surrounded area of the VDCs and Dadiguranse area in also. Four years ago total house is made by general wood and mud; stone only after at present 98 percent households is improve by different types of tools and technics. In the study area only two houses is made pakki or RCC pillar system. That is the positive signal of improve life of people in that area. For this process fruit production has played most important role in Dadiguranse.

5.2 Drinking Water Facilities

In the study areas people are used different sources of water in before and present time. The table indicates the situation of drinking water sources.

Table 5.2: Drinking Water Facilities in Sample Households

Sources	Number of Households		Change in Percentage
	Before 4 Year	At Present	
Khola	76	3	-96
Piped Water	7	88	1157.14
Well	17	9	-47.05

Sources: Field Study 2068

Table 4.2 shows that the people used stream, well, piped water for the purpose of drinking water. At present they are facilities from piped drinking water. When the people of the study areas they are aware by different training and information, so they are not used the open sources of water. At present the use of well and khola is decreased by serially 96 percent and 47.05 percent respectively. Only for drinking purpose, the consumption of

piped water is increased by 1157.14 percent. It is concluded that the clean drinking water has been kept significant role of the people's health. People used piped water for the irrigation in fruit nursery and plants from the income of fruits. They used piped water for drinking purpose too. Government has also been donating some budgets for clean drinking water.

5.3 Use of Toilet or Sanitation Facility in Sample Households

When the people daily used the toilet or systematic sanitation the environment is cleaned every day but who used the open toilet that people are suffering from the different types of diseases like malaria, diarries and any other infection also.

Table 5.3: Toilet or Sanitation Facility in Sample Households

Types of Toilet	No of Households		Change in Percentage
	Before 4 Year	At Present	
Open	17	7	-58.82
Deep Hole	51	34	-33.33
Modern	32	59	84.37
Total	100	100	

Sources: Field Study 2068

Sanitation is one of the most important indicators of living standard of the people. The above table shows that the using of open and deep hole toilet has been decreased 58.82 percent and 33.33 percent on the other hand use of modern toilet has been increased by 84.37 percent respectively. People increased their income from fruit production which made them invest in education. Then they visited different places for their training of fruit production. Due to the increasement in education of villagers, they started to built modern toilets in their village.

5.4 Employment opportunity

In the context of Nepal and other countries all people thinks that the employment opportunities is the most important factor of life standard or life style. In the people of study area many people wants government job, some people are wants private job like NGO/INGOs and any other sector also they wants the job.

Table 5.4: Occupation of Head of the Family in the Study area

Occupation	No of Households		Change in Percentage
	Before 4 Year	At Present	
Agriculture	72	52	-27.77
Secondary Business	3	11	72.72
Service Govt.	13	17	30.76
Service Non Govt.	12	20	66.66
Total	100	100	

Sources: Field Visit 2068

Nepal is pre-dominantly agriculture country. Table 5.4 shows that out of 52 households, their occupation is agriculture, before the 4 year 72 households are used the agriculture sector for occupation after 4 years the ratio is decreasing respectively, because of fruit production is comparatively more beneficiary then cereal crops. Similarly, other occupations are government and non government job, and business. At the time the business sector is used for occupation and the ratio is increasing day by day in Dadiguranse. People are interested in this area more than other occupations. Because it is the cash crops. This has attracted the young generation too. At present In Dadiguranse 7 co-operative started the juice factory and some people are engaged in factory.

5.5 Fuel Used

The sources of fuel are very important for the human life as well as other living beings. Before 4 years, they used to use fuel wood in the context of research area, because fuel wood was easily available. Nowadays, due to the concept of community forest, fuel wood is not easily available in the study area. Therefore, people are using alternative source of fuel such as bio gas, LP Gas and so on. The following table describes more about this.

Table 5.5: Fuel Used for Cooking

Source	No of Households		Change in Percentage
	Before 4 Year	At Present	
Forest source	87	33	-62.06
Bio Gas	9	51	46.66
LP Gas	4	18	350
Total	100	100	

Source: Field visit 2068

Table 5.5 shows that out of 100 house holds survey, before 4 years 87 percent households depend on forest for the heating and cooking, 9 percent households are depend on biogas plant and only 4 percent household are use LP gas for the purpose of heating, cooking and so on. They spend the money for LP gas which is earned by fruit production. At present people are ewer for the use of jungle resource and they are minimum kg forest resource used. The construction level of Biogas plat is increasing day by day because of the gobar is available in the area is simply. Animal husbandry and toilet is help used the biogas. In the study area electricity is available but no one has used it for cooking and heating. It means until they have depend on fuel wood for cooking as before. These people have electricity they do not used it for the substitution fuel wood purpose. But they use the branches of fruits as their fuel wood. But they use the branches of fruits as their fuel wood.

5.6 Earned Rupees by Fruit in Sample Households

Price is most important factor of fruit production and marketing system. Price of fruit also base on the demand and supply.

Table 5.6: Earned Rupees by Fruit before Four year and at present

Description	Earn Rs	Year
Before four year	18,90,650	2065
At present	38,70,000	2068

Sources: Field visit 2068

Table 4.6 shows, total sample households had earned Rs 18, 90,650 from the fruit production before the four years in 2065 B.S. The income has increase and reaches Rs 40, 00,000 in 2068 B.S. It shows that the fruit production of Dadiguranse have changed their economic life. The income activities have been rapidly increasing in the last four year. The rate of fruit production has been increased. But the price of fruit has not been increased much.

5.7 Selling Method

Fruit is sold by different methods. The big volume of fruit is not sold in the market in some years ago the large volume of fruit is used for only make alcohol and traditional type of used. But the time is going, so the system of fruit selling is change. In the study area only 16 percent growers sell their produces in the market. More then about 84

percent growers sell their produce in the orchard. The following table shows the actual facts from how they dispose the product.

Table 5.7: Selling Method of Sample households

Description	Households	Percentage
Pre harvest contract	32	32
Whole sellers	16	16
Retailer/ Local Trader	52	52
Total	100	100s

Source: Field Visit 2068

Growers themselves pick up and take the fruit to the market to sell them and generate the money required to purchase for their necessities goods. The above table shows that most of the selling occurs at the farm where pre harvest contractor's and local trader came to buy at orchard.

5.8 Availability of Agriculture tools and Instruments

Tools are the goods; it is used for easy work and it save time and money of farmer in any process of fruit farming. For fruit farming different types of tools are used in much time like technical facility, fertilizer, and pesticide etc.

Table 5.8: Availability of Agriculture tools and Instruments

Description	No of Households	
	Before 4 year	At Present
Difficult to get	41	15
Not in time	4	6
Not sufficient	49	18
Easy to get	6	61
Total	100	100

Source: Field Visit 2068

Table 5.8 shows that it was difficult to get necessary tools and instrument and the supply was not quite sufficient, but so difficult to get these things. The better availability of seeds, plants and chemical fertilizers has helped in improving the state of fruit cultivation and enhancing the productivity. But at the time District Agriculture Development Office, Sindhuli is giving more emphasis for fruit production on the study area. So, the farmers are easily getting the different supports for fruit production.

5.9 Education Condition of Sample Households

Education is the main eyes of all men. Who people get the education they are spent the success living standard of any mod of the life. But who men can not get the education; they are spending the conservative life style and them beliefs in tradition.

Table 5.9: Education condition of Sample Households

Description	No of Households	
	Before 4 year	At present
Govt. School	76	33
Private School	24	67
Total	100	100

Source: Field visit 2068

Table 5.9 shows, the majority of the sample households have given their first priority to spend money in the education of their children. This means that the people of sample house holds are very interested to invest the major part of income in the educational field. Some of the parents of the sample households are illiterate. These illiterate parents have sent their children to study in modern private school. They invested the income of fruits in the study of their children. This is the positive aspect of fruit production.

5.10 Social Behavior and Co-operation

Social behavior means that behavior which people show as the members of the society. Regarding change in the social behavior. Because of the process of fruit production they travelled and visit some part of the country. At that time they contact with many other people and interaction, sharing many things related to fruit production and cultivation.

The fruit producers of the study area have earn money from fruit production and they have improved their economic condition. Sociologists say that social change is automatically determined by economics factors. So improved economic condition has helped to change the social behavior of the people of the study area.

The people of the study areas are interested in co-operation for the all types of social work and maintained heritage of the Dadiguranse.

5.11 Use of Money

In the study area the amount of money, they spend 14 households admitted to have spend more or less the same amount of money before and after fruit cultivation, while 86

households admitted to have spend very little money before fruit production. They have started to spend more after their economic condition had improved from fruit cultivation; consequently, they all have better socio-economic status today as compared to the prior to fruit cultivation. They are used the money for the personal benefit and standard maintain process.

5.1.12 Dressing

Dressing is a symbol of civilization. Better dressing is the symbol of high economic condition. The people of Dadiguranse have earned money from the fruit production. They have bought standard and high quality cloths for the family. Strong and stable economic condition is very important for carrying various activities in every day life. The people of Dadiguranse used to wear simple clothes before fruit production. When they started to produce fruit in large scale, the economic status of people improved significantly. They used to wear just some cloths for whole season and when they started to get returns from the fruit, they became capable of buying new seasonal clothes. They through they should wear new and clean clothes could help to maintain higher prestige.

5.1.13 Travelled and Food Habits

The fruit producer of Dadiguranse has travelled to many place of the country to participate in training and for exclusion for the aid of the fruit cultivation. Out of the sample households 36 households are already trained in the fruit cultivation. The trained people of the sample households got some opportunities to know more about other food habits. Any thing this is invented and put into practices in one area of society can be spread through out the society or introduce into other. Biscuits, noodles are diffused in Dadiguranse. Because of the people of Dadiguranse travelled in the many part of the country for the fruit related purpose. In travelling and training the fruit producer of the study areas, got some improved seeds of fruit and vegetable as a sample. They diffused this type of seeds in Dadiguranse. They planted new type of fruit and vegetable and ate. So, diffusion has also helped to change the food habit. These people of Dadiguranse brought home some other food grains and fruit which were distributed from the agriculture office as samples. This had also helped to their food habit.

5.1.14 Treatment

Health is a greatest wealth of human being. Money is something but wealth is every thing. The same thing has been applied in Dadiguranse. People in this area used to go to

Dhami, Ghankri when they became ill in the past. Gradually, they started to go to health post. Now, people of this study area go to health post and private clinic. The rate of going there has been increasing. People these days go for Ayurvedic treatment, because of the side effect of antibiotic medicine. For all type of the treatment process the income is used from more or less then fruit production.

CHAPTER SIX

PROBLEMS AND PROSPECTS OF FRUIT PRODUCTION

6.1 Problems and Prospects

Fruit cultivation plays a significant role for promoting rural economy of the Nepal. It can provide additional cash income to the farmers by generating many employment opportunities. Despite a suitable topography for the cultivation of fruit, fruit cultivators are found to have many problems in the study area. Consequently, area under fruit cultivation and its productivity have not been increased significantly. Hence, an attempt has made to analyze major problems faced by fruit cultivators with regards to various aspects of its production.

Market plays a significant role for the fruit cultivation. The well organized marketing system does not only encourage the farmers to increase their fruit production but also assumes a return of their investment. Production pattern depends on the effective marketing organization to bridge the gap between the producers and consumers. But Nepalese rural market is unorganized due to the various causes. In this regard, the market of Tropical fruit is not free from various problems.

Although climatic condition of study area is favorable for fruit production, climatic records indicates that there has been seasonal hailstorm in the months of March, April and May causing damages to the plants and affects production. Lack of rainfall during the dry summer months and hailstone also causes negative impact in fruit production. Main problem in fruit cultivation as reported by the fruit producers are described below:

- The main problems are:
- Lack of institutional support
- Market problem
- Transportation problem
- Lack of cold store and ware house
- Lack of processing facility
- Lack of modern knowledge
- Lack of harvest knowledge

6.1.1 Technical Problems

Fruit farming appears to be more technical than other field crops with respect to their particularity 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 responses under definite sets of condition. However, in the study area the farmers have no knowledge about such condition. They cultivate fruit in traditional way. Technically they are very poor. They are not aware of the modern management system especially with regards to orchards. The farmers do not have proper ideas of using chemical fertilizer, pesticide, insecticide and above all water. They have also reported the non availability of agricultural credit, lack of timely supply of agricultural input as well as lack of storage facility for their production. According to the respondents 76.26 percent of them are facing technical problems.

Technically low priority has been accorded to fruit research in this area, because of this reason farmers of this area are not familiar with high quality tools and improved technique that can be in fruit cultivation. They are using traditional methods in fruit farming. J.T. and J.T.A. provide insufficient services to the real practitioners. Most of the farmers have to face inadequate supply of chemical fertilizer, pesticides and insecticide. Due to the lack of knowledge farmers do not use water fertilizer, pesticides and other inputs timely as well. Because of these problems fruit growers have not been able to reap the monetary benefit they are supposed to. More than 76 percent of the sampled households reported that they are facing the above mentioned technical problems.

6.1.2 Problem of Transportation

Among the major problems of fruit cultivation in the study area, lack of transportation is the dominant one. The study area linked to market Sindhulimadi and Hetuda by track routes only. In the rainy season the road be very dangerous and in the stream large volume of water flow. There are some village roads which are not graveled. However, they have facilitated to the fruit growers to extent but most of the fruit orchards are not linked with such roads. So the people in the study area are bound to use labour for transportation. Fruit is carried on human back for a certain distance and then by truck or small vehicle. Farmers have to pay some rupees per Doko (40 to 50 kg) of fruit to carry from the study

area to the nearest roadsides. And it takes 15 minutes to one hour per trip. Due to the unavailability of road and organized market system the farmers have to incur extra monetary burden in the study area. About 73 percent of total farmers are facing this problem.

6.1.3 Problem of Market

Farmers are facing the difficulties of marketing in the study area. There is no marketing facility such as weekly or monthly Haatbazar. Similarly, there is no marketing collection centre and no marketing information centre as well. There are limit organized co-operative bodies providing marketing facility.

The nearby urban areas, Waling municipality and district headquarter Sindhuli, absorb only a small fraction of the total product. Hence, the main market center is Terai and Kathmandu which are 72 km and 565 km far from the study area. Similarly, most of the fruit growers do not have any marketing experience. Hence, they are not interested to sell their product in the market by themselves. Thus, most of the fruit growers are compelled to sell their products at their orchards to the middlemen or contractor usually at a lower price than the marketing price. In the study area, no one has sold their products by themselves to the consumers in the market. Total 32 percent of them have sold their products to the preharvest contractor and 68 percent of the sampled fruit growers have sold to the middlemen, retailer and local trader at their orchards.

6.1.4 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 fruit cultivation. Fruit cultivation requires frequent and light irrigation in dry season. Watering fruit plant before and after harvesting season makes the plant very healthy. However, in Dadiguranse VDC, there is lack of irrigation facility for fruit cultivation. Mostly fruit trees are planted in dry and terrace surface which seriously suffers from shortage of water in dry season. It reduces the quality and quantity of tropical fruit production. There is great difference in production of fruits between irrigated and non-irrigated land. The production of fruits is 10.2 metric ton per hectare on the irrigated land whereas the production is 8.5 metric ton per hectare on non-irrigated land. Only 11.18 percent of the sampled households have got irrigation facility in the study area.

6.1.5 Production and Price Constraints

Fruit growing involves high initial investment and requires a longer gestation period as compared to other food crops. Tropical fruit is highly perishable nature. Due to the lack of modern farm management system and improved technical implements, the productivity of farm is very low. According to the fruit growers, their production fluctuates year by year. About 24 percent of the sampled households have pointed out that the low productivity of fruit and fluctuating trend of production are two major problems in the study area.

Similarly, due to the lack of marketing facility there is no fix price of fruit. About 72 percent of sampled households have reported that they have to sell their products in low price. It is due to the lack of organized marketing system. There is no storage facility in the study area. So, the farmers are bound to sell at the price offered by the brokers. The farmers usually do not command any bargaining power due to lack of storage facility.

6.1.6 Problems of Diseases and Pests

About 32 percent households of the study area have pointed out that fruit plants are suffering from various diseases and pests. According to them these are serious problems of orange cultivation. As per the reports of the respondents tropical fruits are mostly affected by diseases and pests like Mealy bug(*Drosicha mangifera*), Mango stone weevil(*Sternochetus mangifera*) in mango, litchi bug in litchi, patero (fruit sucking Bugs), Gabaro, Fungus, leaf miner, leaf mosaic, leaf roller, blackfly, leaf spot etc. Although 32 percent of the orchards have diseases but they are not spread much. At present time diseases and pests have not hampered that much but farmers and concerned authorities have to pay attention to it otherwise it may go beyond their control.

6.1.7 Other Problems

1. Fruits being perishable commodity require a special attention in post harvest activities like picking/ harvesting, product preparation and packaging and transportation. Lack of agricultural marketing extension services to improve harvesting, post harvest handling and creating market orientation.
2. Scattered Production Area: The mango bears the largest share in total fruits production in study area. Also by area it occupies 27 % of total fruit cultivation. However, the production area for both the tropical fruits (mango and litchi) are scattered throughout the

tropical climate regions. Hence to fully explore its industrial use potentiality, mango needs to be grown in concentrated and large pockets of land providing sizable quantity, required quality and variety in as demanded by the market/ industry etc.

3. Fruits quality (taste, flavor, color, texture, shape and size) is not only one of the vital attributes to fetch the good market price but also fulfill the industrial requirement as a part of establishing vertical linkage. Thus selection of the most appropriate variety for the location or area is one of the principal factors to determine the aforementioned features. Besides, fruits crop have a long gestation period and hence quality regulation and assurance of varieties purity of the saplings of fruits is one of the most critical factor for the development of fruit crops, however, it is severely limited in our case. And there are several such cases of poor quality fruit production.

6.2 Prospect of Fruit Cultivation

Even though there are several problems in cultivating fruit in the study area, there are still sufficient possibilities to promote the tropical fruit production. Though the above mentioned problems. Limit the development of fruit production but the area coverage of tropical fruit production. For the good achievement, it needs that that both governmental and non governmental sector should be increased in this sector. There are available upland which are used for cereal crops can be more beneficial by fruit production. Decline of soil fertility of land and increasing population pressure on marginal land creates environmental problems. So the cultivation of the tropical fruit has been found more beneficial as compared to the food grain crops giving a good source of income and it would protect the environmental problem also.

Due to the favorable climatic condition and increasing demand of tropical fruit, the local growers are still increasingly interested towards its cultivation. It is necessary that the governmental and private sector should be interested in developing fruit farming. 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 results many kinds of natural disasters i.e. landslide, flood, desertification, soil erosion etc. Thus tropical fruit cultivation plays an important role in balancing the declining environmental condition. On the other hand it has been found more beneficial as compared to the cereal crops giving a good source of cash income.

Moreover the cultivation of fruit may generate additional employment opportunities to the people, which can help to reduce the problem of immigration.

Other aspects, from the marketing of the tropical fruit may be increase additional employment opportunities establishing the subsidiary industries such as picking, packing, transportation, processing and storage etc. There will provide new employment opportunities to the people. From this it would reduce the problem of migration from the study area to other facilitated areas.

Now a day, continuously increasing population and development of tourism has encouraged the demand for fruit, whereas Nepal still imports fruits to fulfill the increasing demand of it. In this context, tropical fruit cultivation has better prospect not only in the study area but also in the whole hilly and inner terai region of the country.

Particularly in case of Dadiguranse VDC, the whole sampled fruit growers are agreed with its good future prospect. And more than 37 percent of non-fruit growers are also interested to cultivate it. Moreover, they have informed that they will also try to cultivate it as soon as possible.

In this regard, tropical fruit cultivation has better prospect in future in the study area but there should be provision of necessary infrastructural and institutional development at farm level of tropical fruit cultivation.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATION

7.1 Summary

Tropical fruit plantation in Dadiguranse VDC has started a long time ago and some old plants can still be seen there. At present it has become one of the important agriculture activities in the study area. However, but inspire of many efforts of different institutions of government of Nepal and other organizations, it is still true that the returns to the fruit growers have been at limited level and this economic activity has not enhanced the level of income of the farmers to a desired level. Identification of crucial factors related to production, distribution and processing of tropical fruit must be the starting point to devise ways to resolve the existing problems. With these perspectives this study was undertaken to provide appropriate suggestions to improve the production, processing and marketing system.

The main objective of research is to through some light on the tropical fruit production and socio-economic change in the Dadiguranse VDC of the Sindhuli district. Many media newspaper and other communication have described the different types of fruit production and income from it. But this description did not tell anything about the socio-economic change in the people of Dadiguranse. An attempt has been made in this study, to describe various aspects of the tropical fruit production in Dadiguranse and the socio-economic change caused by it in the people of Dadiguranse VDC.

In this study, data has collected from the structured questionnaire, unstructured interview, observation and focus group discussion. The research design in this research was exploratory as well as descriptive. The primary and secondary data were made use of in the study.

There are 976 households in Dadiguranse and 517 households in five wards (in ward no.2, 4, 6, 8 and 9). 100 households are taken out of the 517 households as purposive sampling. Thirteen people were interviewed. The total population of the sampled households is 3224, out of this 1588 (49.25 %) are mail and 1636 (50.74 %) are female. The main income source of 52 houses holds (52%) are agriculture and other 48 households (48%) of the sampled householdsare Dadiguranse is other sector service.

Data was collected in the basis of participant observation during the field visit and Sindhuli district profile 2066-067.

There are 3,000 fruitable plants in F.Y Year 2065 in which the total area under fruit cultivation was 309 ropani and the total production of fruit was 1, 07,510 kg. Total income of the household in 2065 was 18, 90,650 in rupees and average price of 1 Kg was Rs17.58. The table also depicts that the area of fruit cultivation has been increase in the study area that is to say the area increased to 340 ropani in the F.Y Year 2066 from 309 ropani in 2065. Total production is in the F.Y year 1, 14,000 Kg and the income in Rs was 21, 25,000. The average price was in this year 18.64 Rs respectively.

Climatically this study area is suitable for tropical fruit production and it is a new activity for this area on a commercial basis. Production area and produced quantity of fruit is gradually increasing. Inter cropping in tropical fruit orchard has been a farmers compulsion for survival. However, inter cropping is trained to be more beneficial then single fruit cultivation in their farm. The production of tropical fruit in the study area has been busted up.

Majority of the households (60%) said that higher production in comparison to other cereal crops has the main reason for fruit cultivation and the government agency (Agriculture Office) encouraged them to cultivate tropical fruit. 48 percent of the respondents have been growing tropical fruit some years ago.

Most of the households (84%) have used their upland (Bari) for tropical fruit like mango, litchi, jack fruit, pineapple and others fruit farming. Dalit respondents have used 0-3 ropanis of their land for it. Maize and paddy were the major corps before fruit. 52 percent of households reported that agriculture is the main income source of them on which fruit shares the highest amount.

The farmers were found interested to increase tropical fruits cultivation because of higher production and cash crop. Tropical fruit production has helped to boost up the socio-economic status of farmers of the study area. Their income has increased, which helped them to save surplus money. After tropical fruit cultivation, 26 households of selected households are able to save surplus money in different financial institutions for the purpose of future uses. The average income of the farmers by fruit is 18906.5 in the B.S 2065 and 38700 in 2068. Comparatively this rate is seen very low, because of the price is very low in the grower area. They have been selling their fruit. The selling rate of mango

4 years ago Rs 15 per/Kg and at present Rs 25 per/Kg. Selling rate of jack fruit is before the years 15 rupees per/Kg at present Rs 30 per/ Kg. And normally the price is increasing, but not sufficient the price of labour.

The fruit production of Dadiguranse has helped to improve the socio-economic condition like, fooding, clothing, housing, health and hygiene, education status etc. have changed after fruit farming. In the past, the people of Dadiguranse would consider the land for paddy, maize and other cereal crops production and they use to watch cattle farming, education and employment or occupation of the bridegroom. But at present, they don't consider this thing much they look for a well managed fruit farm. The people consider tropical fruit cultivation as a standard occupation compared to others. The awareness of the people has increased in Dadiguranse. They are seen to unite and they have done some work of social welfare and community development. That is the positive side of the people.

The Fruit farmers are facing a lot of problems such as transportation to market, different diseases of fruits etc. Some farmers have got training in regard to fruit farming but they have not applied the knowledge in a proper manner. Some farmers have got loan from the Agriculture Development Bank. Different agricultural inputs for fruit farming are not available in time.

Nepal, as an agro-based country, agriculture sector is very important factor to uplift the socio-economic condition of rural people. Agriculture is the major source of livelihood for the people and backbone of the country. So, the hilly part of the country is suitable for the high value crops like tropical fruit (Mango, Jack Fruit, Litchi, Pineapple, Guava, Coconut, Chest nut etc). Only then, it is possible to exploit the agricultural potentiality of the country. That generates good income to the rural farmers and is helpful in positive and sustainable change in the quality of life of rural people.

7.2 Conclusion

This study has concluded that the study area is climatically suitable for the tropical fruit cultivation and recently starts in commercial basis. The quantity of production, area of plantation is increasing. But the price of the fruit is not sufficient at present. It shows that there is a sound production condition. The production of the fruit would be double in some years after fruiting. There is no special grading and packing system, which are carried in doko and plastics case. Moterable road do not exist in the study area but there is

a plan Marin Path, for moterable road in the near future. It would be positive impact to the existing situation after completion.

The price of fruit has been increasing very slowly and nominal. The market price is increasing which is in favor of traders. In this connecting farm gate price is very low. It means high margin of price goes on the pocket of middleman, working as a commission agent and wholesaler. It does not encourage the growers.

Fruit cultivation had coverage of 309 ropani in 2065 B.S, which increased and reached 650 ropani in 2068. The income from the fruit production had also increase year after year. The total sample households had a net production of 1,31,500 Kg fruit in 2068 B.S, which earned them Rs 38,70,000.

Regarding the socio-economic condition it has been found that the people of study areas have undergone changes in their socio-economic condition. The attitude of the people towards education has become positive and they have started sending their children to modern dressing. They have changed their food habit and housing structures. The perception of the people on primary health care and sanitation has been increased. The income of the study area Dadiguranse has been increasing year after year. Because of the accelerated economic growth due to the fruit production, the people of Dadiguranse have under gone a significant socio-economic change.

7.3 Recommendation

From the study no widely recognizable specific recommendation can be made because of the study done under the restricted number of variable and suitable sample size. The study males the following general recommendation is on the basis of the total research efforts in the particular area covered by the study.

-) The major problems of the farming in this region are related to technical support and serves, agriculture inputs, transportation, irrigation, ware house facilities and suitable marketing system.
-) A survey should be conducted to identify major diseases and pests on tropical fruit in this VDC and proper trial should be conducted to determine feasible methods of controlling these diseases and pests.

-) Chemical fertilizer and plant protection chemicals are required for better production of fruit. It should be made readily available in the district or in the nearby markets.
-) Farmers should be establishing small scale cottage industrial units for producing semi processed products or primary products from fruit.
-) Farmers should be encouraged to form their co-operative organization to produce quality fruits and develop business skills to sell their products.
-) The fruit farming method is traditional, so modern technology and method should be launched.
-) The existing system of marketing is not systematic. Because of far located main market centers most of the growers are being exploited by middlemen. So, emphasis must be given for the development of organized marketing system and should be supporting price policy for farmers and there should be fixed margin for the middleman.
-) A participatory systematic uplifting programmed targeted to fruit cultivations should be organized. At present a direct investment from government side is not sufficient enough for the improvement of fruit culture that is why an organization for the development of fruit farming is necessary.
-) There is glut at the harvesting season in the study area but there is lack of processing factory. So provide the farmers from government, I/NGOs level.
-) For the adequate programming and planning on tropical fruit research, development activities and setting up technology. Government and the concerned authority should provide the technicians to conduct the workshops, required instruction programs and training to the farmers to avoid the enplaning management of the cultivation of fruits orchard.
-) Due to the limited time and resources, many other aspects of the fruit cultivation in Dadiguranse VDC are not included in this research. So, other interested scholars should conduct more research works in those fields.