CHAPTER – I

INTRODUCTION

1.1 Background of the Study

Nepal being an agricultural country most of the people depend on agriculture. Main source of food, income even employment is agriculture. The agriculture has large number share on gross domestic production (GDP). It provides food stuff and raw material to agro based industries. It helps to increase national income through various ways such as production of food grains, commercial fruit farming, livestock and poultry farming etc. It also provides employment and semi skill manpower either directly or indirectly.

Government past efforts to increase agricultural productivity and productivity were fundamentally guided towards promoting intensive use of green revolution based technologies and off- farm agricultural inputs such as fertilizer pesticides and improve verities/breeds and planting materials (Pokharel, 2012).

Average use of chemical fertilizers and pesticides in Nepal (G.C. and Katawal, 2011) is still very low (32kg/ha and 142gm/ha/year respectively). But unbalanced and over use of pesticides in some crop and production pockets particularly in commercial vegetables grown for urban market has been a major concern at present with increased awareness about harmful effect of pesticides on human environment health an organized movement towards organic agriculture was initiated from date 1980s by =nongovernment organization (Adhikari and Shrestha 2011). At present several governments organization NGOs farmer and entrepreneurs are involved in promotion of organic agriculture in Nepal. The market of organic agriculture product is increasing over the years in Nepal. At present it is assumed that organic products worth of at least 7 million us $ are sold per annum in Nepal and demand along with number of farmers involved in organic production are continuously ever increasing (Newa, 2011).

"Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycle and social biological activity. It is used on minimal use of off-farm inputs and enhances ecological harmony" (National organization standard board).

Various local organic practiced by institution and farmer in organic farming sector. Organic tomato farming is also one of the major commercial vegetable crops in Nepal. The earliest tomato were little sour berries that grew on low bushes in dry sunny places in the Andes mountain in south America beginning about 350 million years ago. The word "Tomato" comes from the Spanish "Tomate". Tomatoes were first used as food by Mexicans. There are hundreds of tomato varieties from marble-sized grape or cherry tomatoes, to juicy salad tomatoes, meaty paste tomatoes, and huge, sweet, beefsteak tomatoes. Their colors range from deep crimson to orange, yellow, green, purple, and chocolate.

The tomato is consumed in diverse ways including raw an ingredient in many dishes, sausages, salad and drinks. Nepal is small and landlocked country but it has diverse climate, so Nepal has huge potentiality of different farming. Tarai region is best suited for tomato farming including low and mid hills. But nowadays it is becoming increasingly attractive for cash generation in the high hills also. Nepal has fertile soil which is suitable for organic tomato farming. Most of the area is covered by villages. All the villages have tradition of growing animal. The wastages (animal dung) are the best organic fertilizer for organic farming which will be easily available because of animal farming. This helps in healthy and testy crop cultivation. Most of the farmers are illiterate in Nepal so they do not have new technology of farming but due to long term experience of farming they have indigenous knowledge and technology about organic tomato farming. For example "Gaut" is spread over the crop which acts as pesticides. Organic farming needs to be carefully handled so it requires more people which are easily available because so many people are unemployed in Nepal. This helps in income growth and decrease the rate of foreign employment. We need to promote this type of farming, Nowadays health has become main concern for the people. Thus people are attracted towards organic tomato farming and its product.

That is why organic tomato has large demand in Nepali market. This type of farming helps in increase of income, self-employment, and healthy life, tasty and natural foods. So let all the sectors, including individual private and government think about utilization and promotion of organic tomato farming. Be the first to start it. Different type of threats are coming in organic tomato farming .One obvious threat factor is competition from other countries with similar advantages especially India. As Indian

government provides subsidy to the farmers and they could produce some quality product in less cost and it is likely that such products could produce Nepali market. Despite the flaws and due problems, organic farming is growing in a very speedy manner these days.

It is believed, in conclusion, that Nepalese farmers are more committed for the organic farming compared to other South Asian countries. But nowadays particularly youth are distracting from the agriculture field. They think once they have some academic degree, it's not good to work in agriculture field and playing with mud plough etc. is not feasible option and move out of the village in search of employment. Due to lack of standard guidelines and lack of clear vision of government is one of the serious drawbacks for the slow development of organic tomato farming in Nepal

Nepalese political situation is also one of the major threats in putting debar to the organic movement. Relentless government, lack of policies, weak governance system etc. are exacerbating problem, no guarantee on the price of organic products is another threats to the organic tomato growers. Until and unless farmers are assured with the handsome price of the organic products farmers will not be motivated more and asking them to go through organic production remain another threat. India is mainly an agricultural country, where agriculture contributes to about 14.6 percent in gross domestic product (GDP) and support over 58 percent of nation's population for livelihood (GOI, 2010). The recent economic and trade liberalization are exerting heavy pressure on India's land resource partitioning in sectors such as forestry, agriculture, pasture lands, human settlements and industries. Thus, the coupled effect of meeting food demand under limited arable area and toxin-free agricultural produce have become an important forcing factor for countries like ours to explore possibilities for opting 'conventional agriculture', the dominant farming approach promoted by most government and agribusiness groups throughout the world or 'organic agriculture' a holistic production management system which is supportive to environment, health and sustainability. Organic farming system emphasis on the use of organic matter for enhancing soil properties, minimizing food chain associated health hazards and attaining closed nutrient cycles, the key factors for sustainable agriculture (Cardelli et al., 2004).

1.2 Statement of the Problem

Agriculture is very important for developing countries like Nepal. Most of the people depend in agriculture occupation, which has large impact on economic level of country. The diverse climatic condition of Nepal has huge potentiality of different types of farming. Almost all the districts have practiced different type of farming among which Lamjung district is suitable for access of water, market etc. Bajhakhet is a village development committee in Lamjung District in the Gandaki Zone of western Nepal. At the time of the 1991 Nepal census it had a population of 3177 people living in 625 individual households. Banjhakhet which is one of the biggest ward of Besisahar Municipality of Lamjung district has practiced organic tomato farming due to all these facilities. Organic tomato farming is easy in this village because of its easy irrigation system, near to market, due to large number of labor available in village, fertile land and also indigenous knowledge of local people.

Although having such potentiality of organic tomato farming in this village it is difficult to find the farmers who have awareness about organic tomato farming. Farmers have many problems which are neither identified by government nor by local people. In this village potentiality of organic tomato farming is not uptimumly explored. So this research has been conducted in micro level to understand the prospects and probability of organic tomato farming in Banjhakhet village.

1.3 Objectives of the Study

The general objectives of the study are to explore organic tomato farming potentiality and challenges in Beshishahar Municipality-10 of Lamjung district. The specific objectives are

- To assess the level of awareness among the farmers about organic tomato farming
- To explore potentiality of organic tomato farming
- To identify the challenges faced by organic tomato producer.

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1.4 Importance of the Study

It is necessary to diversify agriculture in Nepal. There is a need to bring considerable cultivated land under cash crop. Organic tomato production has contributed a lot to the local farmers in improving their socio- economic life. This study focuses on the condition of the organic tomato farmers who are facing numerous problems like lack of technical knowledge lack of irrigation, lack of proper fertilizer pesticides etc. In this study production of tomato in Lamjung district has been analyzed. If the government does not have proper knowledge about the tomato production, it cannot develop good plan, policy or program relating to it.

This research is based on field survey. This report assist student on the corresponding field related study and research. It is expected that the information generated from this research will be useful for policy makers, planners, administrators and implementers as well.

1.5 Limitation of the Study

Each and every study has its own limitation. This study has also some limitation. This present study has been based on limited people of Besisahar Municipality ward no: 10 of Lamjung district. So this study was covered only single village. And the generalization may not valid to other villages of the country. The unit of sampling adopted in this study is small. The sampling unit cover all the population and number of organic tomato farming. The study has been intensive rather than extensive.

1.6 Organization of the Study

The study has been divided into six chapters. The first chapter presents the introduction, statement of the problem, objectives, importance and limitation. The second chapter is related to the review of related literature. The third chapter presents about the methodology adopted while collecting data. Likewise, Fourth chapter presents about the overview of the study area. The fifth chapters deals about analysis and interpretation of Survey data and also examine the potentiality and problems of organic tomato farming. The sixth chapter is related to the conclusion part of the study. It contains the summary, findings and suggestions.

CHAPTER – II
LITERATURE REVIEW

Literature review is essential to conduct any research work so for this study review of different literature has been done under two different sections the conceptual and review of empirical studies.

For this study different available books journal previous research work report acts articles, published, unpublished and documents related to the subject are reviewed.

The concept of organic farming is based on a holistic view point. Nature is more than just the separate individual elements into which it can be split. Principles and ideas of farming are found in the science of ecology, the interrelationship of living organism and their environments. Organic farming largely excludes synthetic inputs pesticides herbicides and fertilizers and focuses on sufficient biological processes such as composting and other measure to maintaining soil fertility, natural pest control diversifying crops and livestock. Organic agriculture gives priority to long term ecological health, such as biodiversity and soil quality, contrasting with conventional farming, which concentrates on short term profit gains. (Trewavas, 2001)

Organic agriculture is one of the approaches to sustainable agriculture development practice today which is ecologically safe economically viable and socially acceptable. As been widely accepted, it is a holistic production management system that emphasizes on the use of management practices accomplished by using agronomic, biological and mechanical methods in preference to off- farm inputs and as opposed to using synthetic materials to fulfill any specific function within the system. Of which, the soil is of central importance, and the primary goal is to optimized the health and productivity of interdependent communities of soil life, plants, animals and human being. Prohibiting the use of genetically modified organism, it avoids or largely excludes the use of chemical pesticides, herbicides, fertilizers, growth regulator, hormones and antibiotics. In several ways, the system can help to promote and enhance healthier agro- ecosystems including biodiversity, biological cycles and soil biological activity. In reality, organic farming is a content system approach based on the perception that tomorrow’s ecology is more important than today’s economy. (Scialabba, 1999)

Growth of organic agriculture requires producers' and consumers' awareness, availability of sound infrastructures and consumers' willingness to pay for the organic products. Nepal, being a developing country, definitely majority of the consumers is not well off. However, a large chunk of consumers are clustered in and around urban areas of the country and they could pay for the organic products provided quality is assured. Market potentials are mainly determined by consumer expectations of the product attributes, which are attached to the product such as quality, price, certification, quality also consumers' awareness of health, food safety, environmental, and technology issues related to food products as well as the industrialization of agriculture and globalization, have been identified as diversification factors of food consumption. There is the need to investigate wider prospective of organic farming through producer' and consumer view point. (Ramesh et al, 2005)

Tomato (Lycopersiconesculentum Mill.) is one of the most important vegetable crops grown from subsistence to commercial scale in Nepal. Tomato can be grown in winter, spring and rainy seasons. The crop is grow in winter in the Tarai and inner-Tarai and can be grown in two seasons, spring and rainy in the low and middle hills of Nepal. Tomato was used to be grown only in the rainy season in the hills at subsistence level. However the introduction of improved exotic verities makes it possible to grown the crops in the spring seasons as well- Both spring and rainy seasons tomatoes are a major source of income to the vegetable grower of the hills, since they get an off season market price. Total area and production of this crop in Nepal is 10,530 ha and 72,657 t, respectively with an average productivity of 6.9 t ha-1 (Shrestha and Ghimire 1996), which is very low as compare to the experiment yield of tomato in the country.

Tomato has acquired the status of world most popular vegetable crop due to its wider adaptability to various agro climatic conditions. At present tomatoes rank third net to potato and sweet potato in terms of global vegetable production (FAO, 2002).

There are several factors limiting tomato productivity among which tomato yellow leaf curl virus has been identified as one of the most important biotic constrains for rainy season tomato cultivation in Nepal. Both spring and rainy season tomatoes are found infected with yellow leaf curl virus and a high incidence of the disease was observed during the rainy season in the western hills of Nepal. The popular tomato variety, NCL 1 for the rainy season is highly susceptible to TYLCV. Since this variety covers

majority of tomato growing areas during rainy season in the western hills, large losses due to the disease have been experienced by the farmers every year. The presence of the disease in the western hills was for the first time, suspected in 1992 in CL 1131(now NCL 1) a popular rainy season tomato variety at Kudule, Baglung. However, the authentic confirmation of the disease was done only in 1994. The incidence of the disease was just 1 to 2% at the third and the fourth picking in 1992 and hence, it was consider as a disease of very low profile at that time. The subsequent annual monitoring of the disease in commercial tomato growing areas of the western hills revealed an increased incidence and severity associated with significant yield losses up to 95% because of an early appearance of the disease right from pre-flowering stage. Since then the disease has been considered in high profile at Agriculture Research Station, Lumle. Extensive monitoring of the disease have been carried out to find out the incidence of the disease, associated yield losses and to assess the need for research on TYCLV management. This paper presents the results of the field monitoring and laboratory analysis work on TYLCV in the western hills during the rainy seasons from 1995 to 1997 (PPD,1995).

Consumption of organic food products is the best remedy to prevent the numerous health hazards, caused by conventionally produced foods, the global market has experienced exceptionally high growth in organic foods in the United States Europe and small (Piyasiri and Ariwardana,2002). However, in developing countries, the growth of organic sector is quite slow and faces tremendous challenges. Nepal's organic agricultural production has a relatively short history. Adaptation of organic farming is quite slow, market for organic products is not well developed and no market statistics are available in Nepal (Bhatta et al 2008)

There have been some signs of changes in agriculture sector of Nepal in the past few years. Some youths are going abroad in lack of opportunities for income and jobs while others are trying to reap benefits from the opportunities in the country. Increasing involvement of the youths in commercial farming of vegetables must be mentioned while talking about those making efforts to capitalize on such opportunities. Land used for vegetable farming increased by 1,355 hectares to 246,392 hectares in the fiscal year 2069/70 with production rising by 2,868 tons to 33,000 tons, according to the Vegetable Development Directorate under the Department of Agriculture.

Attraction of youths toward both seasonal and non-seasonal vegetables is rising now while the market is also expanding. Youths are now starting commercial farming of green vegetables by bringing in new technologies and methods. Commercial vegetable farming is growing in the rural areas of Kathmandu and surrounding Kavre and Dhading. Vegetables produced have also got the market and the farmers are also earning well. This trend is rising even outside Kathmandu Valley. Farmers in a few districts are even earning hundreds of thousands through riverbed farming.

But the middlemen still dominate vegetable market which means the farmers are not getting the right price for their products. The farmers, who have failed to establish direct relation with the market, are being cheated. Import of green vegetables is rising every year even though the government report is showing an increase in the area of land used for vegetable farming. Vegetables worth Rs 5.32 billion have been imported in the first 10 months of the current fiscal year, according to the Nepal Rastra Bank (NRB). Data shows that domestic production is meeting just 60 percent of the total demand for vegetables. This shows that proper inter-relation among production, consumption and market has not been established. Domestic production can meet the demand if the products were to get proper access to the market, farmers are provided better seeds, fertilizers and skills, and access to agricultural loans is increased. This can also help improve the income level of farmers.

There is a sort of revolution in production of tomato in recent times. While tomato has been produced in Kavre, Sarlahi, Dhanusha, Mahottari, Makwanpur, Surkhet and other districts, it is now commercially produced even in Kathmandu Valley. Attraction for farmers toward tomato is increasing as Sirjana and Samjhana strains developed by agricultural scientist Dr. Kedar Budhathoki while at the Nepal Agricultural Research Council (NARC) can be cultivated in tunnels, and can provide yield across the year. Tomato farming has also brought about a massive change in the financial state of farmers. The number of farmers doing tomato farming by leasing other's land has increased now after Budhathoki showed that up to 22 kilograms of tomatoes can be produced in a single plant inside plastic tunnels. Over 10,000 families are estimated to be involved in tunnel farming of non-seasonal vegetables in the Valley. Farmers state that tomato production has doubled in comparison to the last year when it had fallen. Over-production obviously has affected the market price. But the farmers have

dumped around seven tons of tomatoes on the road protesting lack of fair price. They demand that they be allowed to export tomato. We should not take the demand to be allowed to export when production is more than domestic demand otherwise. The government must address the demand of farmers to remove the quarantine hassles while exporting to India. Farmers should also seriously think about the suggestion of government officials that they should pick raw tomatoes and send to the market to ensure adequate time to allow export before they rot. Establishment of industries to produce tomato sauce, tomato juice and other products can also solve the current problem (www.karobardaily.com 2013)

Tomato in Ddifferent Countries

Etymology

The word "tomato" comes from the Spanish *tomate*, which in turn comes from the Nahuatl word *tomatotl* /aːˈtomatl it first appeared in print in 1595. A member of the deadly nightshade family, tomatoes were erroneously thought to be poisonous (although the leaves are) by Europeans who were suspicious of their bright, shiny fruit. Native versions were small, like cherry tomatoes, and most likely yellow rather than red. The tomato is native to western South America and Central America.

Mesoamerica

Aztecs and other peoples in Mesoamerica used the fruit in their cooking. The exact date of domestication is unknown: by 500 BC, it was already being cultivated in southern Mexico and probably other areas. *The Pueblo people are thought to have believed that those who witnessed the ingestion of tomato seeds were blessed with powers of divination*. The large, lumpy variety of tomato, a mutation from a smoother, smaller fruit, originated in Mesoamerica, and may be the direct ancestor of some modern cultivated tomatoes.

Spanish distribution

Spanish conquistador Hernán Cortés may have been the first to transfer the small yellow tomato to Europe after he captured the Aztec city of Tenochtitlan, now Mexico City, in 1521, although Christopher Columbus, a Genoese working for the Spanish

monarchy, may have taken them back as early as 1493. The earliest discussion of the tomato in European literature appeared in an herbal written in 1544 by Pietro Andrea Mattioli, an Italian physician and botanist, who suggested that a new type of egg plant had been brought to Italy that was blood red or golden color when mature and could be divided into segments and eaten like an eggplant—that is, cooked and seasoned with salt, black pepper, and oil. However it wasn't until ten years later that tomatoes were named in print by Mattioli as *pomid'oro*, or "golden apple".

After the Spanish colonization of the Americas, the Spanish distributed the tomato throughout their colonies in the Caribbean. They also took it to the Philippines, from where it spread to Southeast Asia and then the entire Asian continent. The Spanish also brought the tomato to Europe. It grew easily in Mediterranean climates, and cultivation began in the 1540s. It was probably eaten shortly after it was introduced, and was certainly being used as food by the early 17th century in Spain. The earliest discovered cookbook with tomato recipes was published in Naples in 1692, though the author had apparently obtained these recipes from Spanish sources. In certain areas of Italy, such as Florence, however, the fruit was used solely as a tabletop decoration before it was incorporated into the local cuisine in the late 17th or early 18th century.

Italy

The recorded history of tomatoes in Italy dates back to 31 October 1548 when the house steward of Cosimo de' Medici, the grand duke of Tuscany, wrote to the Medici private secretary informing him that the basket of tomatoes sent from the grand duke's Florentine estate at Torre del Gallo "had arrived safely." Tomatoes were grown mainly as ornamentals early on after their arrival in Italy. For example, the Florentine aristocrats Giovanvettorio Soderini wrote how they "were to be sought only for their beauty" and were grown only in gardens or flower beds. The tomato's ability to mutate and create new and different varieties helped contribute to its success and spread throughout Italy. However, even in areas where the climate supported growing tomatoes, their proximity of growing to the ground suggested low status. They were not adopted as a staple of the peasant population because they were not as filling as other fruits already available. Additionally, both toxic and inedible varieties discouraged many people from attempting to consume or prepare them.

Unique varieties were developed over the next several hundred years for uses such as dried tomatoes, sauce tomatoes, pizza tomatoes, and tomatoes for long term storage. These varieties are usually known for their place of origin as much as by a variety name. For example, Pomodorinodel Piennolo del Vesuvio is the "hanging tomato of Vesuvius". Five different varieties have traditionally been used to make these "hanging" tomatoes. They are Fiaschella, Lampadina, Patanara, Principe Borghese, and Re Umberto. Other tomatoes that originated in Italy include San Marzano, Borgo Cellano, Christopher Columbus, Costoluto Genovese, and Italian Pear. These tomatoes are characterized by relatively intense flavor compared to varieties typically grown elsewhere.

Varieties of Tomato

There are around 7,500 tomato varieties grown for various purposes. Heirloom tomatoes are becoming increasingly popular, particularly among home gardeners and organic producers, since they tend to produce more interesting and flavorful crops at the cost of disease resistance and productivity. In 1973, Israeli scientists developed the world's first long shelf-life commercial tomato varieties.

Hybrid plants remain common, since they tend to be heavier producers, and sometimes combine unusual characteristics of heirloom tomatoes with the ruggedness of conventional commercial tomatoes.

Tomato varieties are roughly divided into several categories, based mostly on shape and size.

- "Slicing" or "globe" tomatoes are the usual tomatoes of commerce, used for a wide variety of processing and fresh eating.
- Beefsteak tomatoes are large tomatoes often used for sandwiches and similar applications. Their kidney-bean shape, thinner skin, and shorter shelf life make commercial use impractical.
- Oxheart tomatoes can range in size up to beefsteaks, and are shaped like large strawberries.

- Plum tomatoes, or paste tomatoes (including pear tomatoes), are bred with a higher solids content for use in tomato sauce and paste, and are usually oblong.

- Pear tomatoes are pear-shaped, and are based upon the San Marzano types for a richer gourmet paste.

- Cherry tomatoes are small and round, often sweet tomatoes generally eaten whole in salads.

- Grape tomatoes, a more recent introduction, are smaller and oblong, a variation on plum tomatoes, and used in salads.

- Campari tomatoes are also sweet and noted for their juiciness, low acidity, and lack of mealtimes. They are bigger than cherry tomatoes, but are smaller than plum tomatoes.

http://www.flavourfresh.com/historyoftomatoes.htm.(2009)

Research and Field Experience in Tomato Fertility

In a California study, soils well prepared with cover crops (legumes or legume-grass mixtures, grown during the winter preceding all other cash crops) and composted poultry manure showed no yield response over four years of replication as compared to conventionally based two-year rotation (tomato and wheat) and four-year rotation (tomato, safflower, corn, bean).Yields averaged 70 to 80 t/ha across the treatments. However, greater inputs were needed in the organic treatments, such as higher levels of irrigation because of greater infiltration rates, whereas the conventionally managed soils had poor infiltration rates. The total nitrogen inputs were also greater, applying twice the amount of nitrogen (N) to the organic as the conventional system in the last two years of treatment. High N input suggested N immobilization or insufficient decay by the microbial community. Many studies have shown that providing N via cover crops and/or composts can provide adequate fertility; however, this study demonstrates that total N inputs cannot rely on cover crops and/or composts alone. (Clark et al., 1999)

In an Iowa study, two natural soil amendment/fertilizer products were used in an organic tomato production trial as a comparison to tomato plants that received no soil amendment. Chilean nitrate, also known as sodium nitrate, was applied at a rate of 40 pounds N/acre acre plus composted manure at 160 pounds N/acre. Cinagro™ was used as the other treatment at the application rate of 200 pounds N/acre. Results of the amendments were much the same: the tomato plants treated with the fertilizers were taller and had more leaves than the unfertilized soil. Flower, fruit number, and yield were numerically greater in the fertilized plots as compared to the untreated soil. No differences were statistically shown between the two amendments. (Delate et al., 2008)

In a two-year Ohio study, fall-applied organic composted cannery waste (40% tomato processing byproducts, 20% duck manure, 20% municipal yard waste, and 20% reed canary grass straw) at a total of 26 t/ha in 1996 and 35 t/ha in 1997 produced 33% higher yields of ripe tomatoes than the no amended conventional plots that were receiving supplemental nutrient fertilizers. In addition, the composted cannery waste incorporated into organic tomato plots reduced the incidence of anthracnose root rot when disease was severe in the conventional plots. The organic plots also seemed to have better water retention than the conventional plots during two unusually dry months of the year when they received no supplemental irrigation. (Abbasi et al., 2002)

In a long-term field experiment set up in North Carolina, three tomato subplots were amended each May with synthetic fertilizers (for the conventional method), cotton-gin trash, and animal manure (poultry and swine manure) at a rate of 67 kg N/ha. A fourth subplot consisted of rye/vetch green manure at a rate of 45 kg N/ha. Results showed that microbial biomass and microbial activity were generally higher in organically, rather than conventionally, managed soils with cotton-gin trash being the most effective, followed by animal manure, rye/vetch, and the synthetic soil. Likewise, the highest extractable carbon (C) and N levels occurred in plots amended with cotton-gin trash, followed by animal manure, rye/vetch, with the conventional plot showing the least amount of extract-able C and N. Cotton-gin trash, animal manure, and rye/vetch treatments increased soil moisture by 25% to 58%, 11% to 13%, and 8% to 12%, respectively, compared to the synthetic fertilizer treatment. In addition, data showed that mulching the plots enhanced the soil microbial biomass N and potential N supply by 45% compared to the amended organic plots not mulched. (Tu et al., 2005)

Nepal Produces Veggies Worth Rs 45 Billion Annually

KATHMANDU, January 25, 2015 Nepal produces vegetables worth Rs 45 billion annually, according to Nepal Vegetable Crops Survey (2009-2010). And, Rs 9 billion is invested in vegetable farming every year. The report says that around 70 percent of Nepal's total household is involved in vegetable farming.

The first of its kind survey reveals interesting facts about vegetable farming in the country—description of vegetable holders, total area for vegetable cultivation, expenditure on vegetable farming, total production and uses of vegetables, and farmers' access to agricultural services.

The survey carried out by the Central Bureau of Statistics (CBS) with assistance from the Asian Development Bank says that vegetables are cultivated in 232,295 hectares of land in the country.

Tarai is the major vegetable growing area with an annual production of 1,437,921 tons, followed by hilly region with 1,261,041 tons. As per the survey, total annual production of vegetables in Nepal is 2.82 million tons. Of the total output, 39 percent (1.10 million tons) is used for household consumption and 61 percent (1.71 million tons) for sale. However, of the total vegetable farmers, only 18 percent are engaged in commercial farming.

In terms of cultivation area, production and value, cauliflower is the number one vegetable crop. A total of 404,580 tons of cauliflower is produced in 33,172 hectares of land in the country. According to the survey, cauliflower worth Rs 6.5 billion is produced annually in Nepal. Other major vegetable crops in terms of production are tomato (317,657 tons), cabbage (302,067 tons), pumpkin (166,424 tons) and radish (164,076 tons).

According to the survey, cauliflower, tomato and cabbage are the major money-spinners among vegetable crops. It says most commonly sold vegetables are cauliflower (339,273 tons), tomato (283,999 tons) and cabbage (269,294 tons). "As cauliflower, tomato and cabbage can be cultivated throughout the year, it is natural that they are the top three vegetables," said agro-expert Tulasi Gautam.

Although the Tarai region produces and sells more vegetables, vegetables grown in hilly region have better value. According to the survey, vegetables produced in hills in a year are valued at Rs 21.79 billion, whereas Tarai products are valued at Rs 21 billion. "The reason behind the difference in value is vegetables in hills are produced during rainy reason when prices are

relatively higher," said Gautam. In terms of value, cauliflower tops the chart. It is followed by tomato, cabbage, asparagus bean, cucumber and broad leaf mustard (Rs 2 billion each).

A majority of vegetable farmers in the country are self-financed with only five percent taking loan for vegetable farming. Around 55 percent of the farmers rely on informal sectors for loans.

Among those taking loans, only 24.3 percent take loans from banks. Relatives and friends are the largest sources of loan for the farmers. "Farmers are still relying on traditional loans with high interest rates. This means they are not earning up to their potential," said Puskhar Bajracharya, a member of the National Planning Commission (NPC). "There is a need for expanding banking services in rural areas to encourage farmers."

Interestingly, 15.1 percent of farmers have taken loans from co-operatives. It shows that agriculture cooperatives and agriculture and fruits cooperatives are emerging as major sources of financing.

A total of Rs 9 billion is invested in vegetable farming in the country annually. The largest portion of the amount (Rs 2.3 billion; 26 percent) is invested for purchasing organic fertilizers followed by purchase/production of seeds (22 percent) and land preparation (16 percent). The rental cost of land is the highest in Tarai, according to the survey.

There are 55 vegetable crop groups identified in the survey. Vegetable farming is slowly emerging as the major source of income for farmers with 12 percent of them saying that income from vegetable farming is sufficient for a year. According to the survey, on an average, five months' expenditure can be maintained by the income form vegetable farming. The survey revealed that almost half of the vegetable farmers (48 percent) use pesticides (insecticides or fungicides). The use of pesticides was observed most prominently (72 percent) in the Eastern and Central Tarai.

According to the survey, organic vegetable farming is still in its nascent stage in the country. Of the total vegetable farmers, only eight percent use organic pesticides, while 92 percent use chemical pesticides. Uttam Narayan Malla, director general, CBS, said the survey will be of a great help for planners, policy makers and researchers for the development of vegetable crops.

Top five vegetable products

Vegetable	Production in tonnes
Cauliflower	404,580
Tomato	317,657

Cabbage 302,067

Pumpkin 166,424

Radish 164,076

www.ekantipur.com, 2015

There exists good opportunities for organic tomato farming in the urban and peri-urban areas of the country as most the affluent consumers have been agglomerated around cities and cites are the popular destination for the tourists. Some specialized markets have started selling organic products. There is immense scope for the organic products to be delivered to India and other countries provided quality standards have been maintained.

Growing awareness among the educated circle and increasing purchasing power goods provide the ramification towards organic tomato farming development. Organic tomato farming requires more labor input than traditional modern farming methods. Thus, Nepal which has very large amount of labor unemployment and under employment will find organic farming an attraction. Moreover the problem of periodical unemployment will also get mitigated because of the diversification of the crops their different planting and harvesting schedule resulting in the requirement of the relatively high labor input ecotourism in increasingly becoming popular and organic farms could turn into favorite spots. Protection of the ecosystem, flora, fauna and increased bio-diversity and the resulting benefits to all human and living things are great advantages of organic farming which are yet to be properly accounted for.

CHAPTER-III

RESEARCH METHODOLOGY

Research methodology is an essential part of the thesis paper which forms the framework for obtaining all necessary inputs of the study. In the present study the methodology includes research design, nature and sources of data, sampling procedure, data collection techniques and tools, data processing, analyzing methods and presentation.

3.1 Research Design

This study was carried out mostly on the basis of descriptive research design as because the study was done focusing on potentiality and challenges of organic tomato farming in the study area. The study had tried to explore and cover all aspects of organic tomato farming and its role for the rural development in the study area.

Besides, the study had made an attempt to describe the thing related to organic tomato farming such as history of organic farming; potentiality and challenges of this farming and awareness among the farmer and consumer about this farming have been described. Thus, this study can be categorized as both descriptive and exploratory.

3.2 Rational of the Selection of the Study Area

Organic tomato farming has higher potentiality in the village Banjhakhet of Lamjung district. This district is located at west development region has suitable climate for agriculture. Its fertile land, access of irrigation, cool enviroment helps the farmer to cultivate and market its product. This is why this district has large area covered by farming but Banjhakhet village highly practiced organic tomato farming. It is located nearby headquarter Besishahar,Lamjung district so it will accessible to conduct research. Different types of ethnic caste live in this village. Among of them there are Gurung, Tamang, Chhetri, Dalit etc. They are attracted towards organic product due to its advantages. I choose this area to find out their thinking and to aware janjati and Dalit about organic tomato farming and how its lifts life standards because of high cost of organic products.

3.3 Nature and Sources of Data

Socio economic data are collected for the study. The collected data are both qualitative and quantitative nature as needed. Qualitative data like photos, observation and interview were collected and Quantitative data like number of consumer, farmer related data, social status data etc. also have been collected. Both primary and secondary data sources are used to describe and analyze the study area. The primary data have been collected through structured questionnaire. Interview and direct apparition also have been applied to collect primary data, whereas secondary data has been collected from different published and non published written documents from individuals, experts and organization related to the tomato farming sector.

3.4 Sampling Procedure

The universe of the study was the people of the, Besisahar Munipality ward no 10- Banjhakhet village of Lamjung district household having organic tomato farming and other informative local people had chosen. According to District Agriculture Development Office, Lamjung(2017), 25 households being engaged in organic tomato farming. For the research 25 households having organic tomato farming have been chosen. Census method was used for sampling procedure of having organic tomato farming. Another 25 households are consumers of organic tomato have been chosen randomly.

3.5 Data Collection Tools and Techniques

To collect primary data, the structured questionnaire, semi or unstructured interview and observation methods has been applied.

3.5.1 Household Survey

To generate accurate and realistic data structured questionnaire was prepared to be asked to fill up by local people, where as those respondents who are unable to fill up the questionnaire, the question were asked to the respondents and answer were filled up to collect the required information.

3.5.2 Key Informant Interview

The primary data was also collected from the key informants using the semi or unstructured questionnaire interview method on the basis of prepared checklist. Information was being collected from key informant interview with 10 members of different local organization or group. Information related to role played by organic tomato farming in development of by improving the social economic condition of rural farmers was collected by this method. It has also helped to examine the potentialities and challenges of organic tomato farming in study.

3.5.3 Observation

Observation approach was used to observe the real scenario of the local life which helped the research to understand the socio-economic gap prevailing in the study areas. Organic tomato farm had observed or visited for trace out overall condition of organic tomato farming e.g. irrigation system, application of technology, road transportation, accessibility of market etc, had observed.

3.6 Method of Data Analysis

Data collected have been analyzed with the help of computer program, where simple statistical tools like table, graphs, have been used for data analysis and descriptive methods have been used for qualitative data.

CHAPTER IV

OVERVIEW OF THE STUDY AREA

4.1 General Background of the Lamjung District

Lamjung district is one of the districts of Gandaki zone lies within western development region of Nepal whose headquarter is known as Besisahar. It covers the area of 1692 sq.km. This district is neighbor to Gorkha, Manang, Kaski and Tanahun. CBS (2011) has recorded population of Lamjung as 167, 724 with total households of 42,079.

District headquarter Beshisahar is connected with all weather roads, many of the villages are connected with seasonal roads operating during dry season. The village located in the central part of the district on either side of the road to district headquarter are connected with national grid supplied electricity connectivity. Some of the villages in the northern remote part of the district still remain away from electricity supply while some remote villages like Dudhpokhari, Bichour, Ilampokhari, Kolki and Pachok have managed to generate electricity from local rivers through micro hydroelectricity technology.

Lamjung is known with its natural resources. Abundant water resources from the perennial rivers flowing from the Himalayan range have the capacity of generating electricity that can greatly contribute to meeting the growing energy need in the country. Already there are three power plants connected to the national grid, if harnessed properly these rivers can greatly transform the lives of the people in the district while facilitating a significant scale of industrial and economic growth in the country. Marshyangdi, Chepe, Nyadi, Khudi, Dordi, Madi and Midim are some of the rivers that carry the potential. Lamjung is also rich with fertile land, forest and herbal resources. Because of its astounding natural beauty the district carries a great potential for tourism industry (http://coppades-olg.org/tag/vdc/).

Bajhakhet is the developing village of Besisahar Municipality of Lamjung district in the gandaki zone western Nepal. According to 2011 Nepal census survey it have a population of 2844 (Male 1309, Female 1535) people living in 718 individuals households. Bhajhakhet is located east to the Marsyangdi River and Besishahar headquarter. Most people of this village are engage in agriculture and animal husbandry. Most of the households are indigenous. They have own culture religion and language. Shree jana jagriti secondary school one of the secondary school of the

village which is the sole provider of education and periphery since about one decade. It is easily transported to Besisahar bazaar of lamjung. It is one of the most beautiful and fertilizer places of the mid lamjung.

Electricity

70 Megawatt Mid-Marsyangdi Hydroelectricity Project (MMHEP), the second largest hydropower project in the country has been operating since December 14, 2008. PM Pushpa Kamal Dahal had inaugurated the project. The project was started in June 2001 with joint investments of the government of Nepal and Germany and Nepal Electricity Authority,Upper Marsyangdi Hydroelectricity Project is currently under construction with the help if Chinese government.

Communications

Lamjung is connected with GSM, CDMA connection by Nepal Telecom and Spice Nepal. Land lanes are common in town areas. Almost each VDC is provided with one land line or CDMA phone. CDMA and GSM mobile phones are common in many villages and towns due to easily available.

Internet

Lamjung is recently connected with ADSL which is much faster as compared to dial up. Recenty, Wi-Fi has been made available by Broadlinkin Besisahar. Lamjung has print Medias likeLamjung highlights, Antarangetc to name a few. At present lamjung has two stations Marshyangdi 95 MHz and Radio Lamjung 88.4 MHz (op.cit.).

Languages

Lamjung district have people from different caste, bahun, chettri, newar, gurung, magar. Major languages used in this district are Nepali, gurung, and magar as Nepali language being national language is spoken by majority of total population, whereas this district is dominated by Gurung community that's why Gurung language is used by maximum people. Magar community is another populated ethnic group so magar language is also used in this district (http://www.myholidaynepal.com/places/Lamjung.html).

Transportation

Road transportation is one of the easiest and accessible ways to reach Lamjung. Prithivi highway (200 km) that extends up to Pokhara city passes through Dumre, From Dumre its 42 km right to reach Besisahar headquarter of this district in total it's about 180km from Kathmandu city. Airways can be used to reach this district, firstly Kathmandu to Pokhara 20 minutes flight and from Pokhara to Lamjung using roadway through Dumre.

Geography and Climate

Lamjung district offer various types of geographical features and climatic diversities within a short distance covered i.e. Upper tropical climate zone to Trans-Himalayan, it is illustrated in following table to be understand clearly.

Table no.4.1 Geography and Climate

Climate zone	Elevation Range	% of Area
Upper Tropical	300 to 1,000 meters 1,000 to 3,300 ft.	18.5%
Subtropical	1,000 to 2,000 meters 3,300 to 6,600 ft.	34.0%
Temperate	2,000 to 3,000 meters 6,400 to 9,800 ft	20.3%
Subalpine	3,000 to 4,000 meters 9,800 to 13,100 ft.	14.1%
Alpine	4,000 to 5,000 meters 13,100 to 16,400 ft.	8%
Nival	above 5,000 meters	3.6%
Trans-Himalayan	3,000 to 6,400 meters 9,800 to 21,000 ft.	1.3%

Source:http://en.wikipedia.org/wiki/Lamjung_District

4.2 About study area

Bajhakhet is a village of Besisahar Municipality of Lamjung district. Gandaki zone of western Nepal. According to CBS (2011) this VDC have 718 household, with total population of 2,844 in which male are 1,309 and female are 1,535.

Table no.4.2 Population Distribution by Caste Wise

Caste	Total	Male	Female
Cheetri	444	201	243
Brahman-hill	109	51	58
Magar	66	28	38
Tamang	451	212	239
Newar	13	4	9
Kami	266	128	138
Rai	15	10	5
Gurung	1043	472	571
Damai/Dholi	191	97	94
Sarki	114	47	67
Gharti/Bhujel	191	97	94
Others	13	6	7
Total	2844	1309	1535

Source: CBS, 2011

From the given table it can be determined that this Besisahar ward no 10, is mainly dominated by Gurung community as followed by Tamang, Cheetri, Kami, Damai/dholi, Gharti/Bhujel, Sarki, Brahman-hill, Magar, Rai, Newar respectively.

Table no.4.3 Ward-Wise Population Distribution

Ward	Household	Population		
		Total	Male	Female
1	141	576	273	303
2	36	178	82	96
3	48	222	99	123
4	32	93	51	42
5	39	123	53	70
6	146	539	245	294
7	71	276	118	158
8	129	520	245	275
9	76	317	143	174
Total	718	2,844	1,309	1,535

Source: CBS, 2011

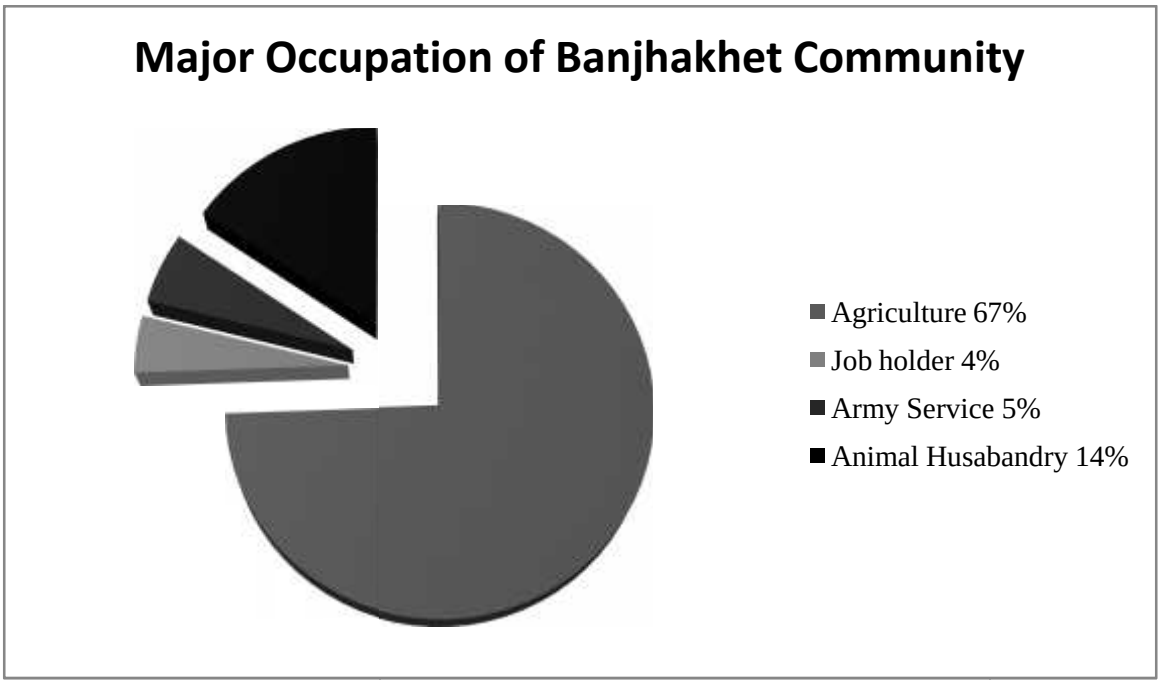
Above table illustrates the total population of the Besisahar ward no 10 in accordance to ward presented by CBS. From the above table it can be learned that ward-1 has highest population having 576 people where as ward-4 have 93 people only. Highest household belongs to ward-6 and least to ward-4, 146 and 32 respectively.

Most of the people of this area have engaged themselves in the agriculture sector, beside that people are in different other sectors like animal husbandry, army service, involved in different official jobs.

Ethnics community dominates the study area so many of the households of ethnic have at least one family member involved in the army service, that is in British army, Indian army, and in

Nepal army. During the study period it was observed that most of the households practices preparing ‘radi’ a homemade woolen carpet prepared by the wool of sheep. Some people have started fish farming, and some have been doing commercial off season vegetables farming in plastic tunnel, cow farming by the group of this community can be taken as another example of people being aware about commercialization of traditional way of animal husbandry.

Figure no.4.1



Source: Field Survey, 2014by NFIN

Above figure helps to understand us that most of the people are engaged in agriculture sector as their major occupation as 67 percent people are in this sector. Mostly paddy, wheat, millet, potato, organic tomato, green vegetables, beans etc. are cultivated.4 percent are job holder, 5 percent in army service and 14 percent have been engaged in animal husbandry.

CHAPTER V

DATA PRESENTATION AND ANALYSIS

The study was carried out in order to learn the potentiality and challenges of organic tomato farming in Besisahar-10 area. So in this chapter those data which are acquired from the field study in terms of collecting primary data are analyzed and interpreted. Tabulation of the data and in some cases graphical presentation is done for the clear interpretation of the data.

5.1 Socio-Demographic Characteristics

In this section socio-demographic characteristics of the sample population are interpreted. Generally sample populations are tabulated on the basis of their social and demographic characteristics.

5.1.1 Population Structure

Population is the major component of any research. During the study some people are selected as sample population, such sampled population sketches our real report. The sample population composition of this study has been presented under the table;

Table 5.1: Sample Population Structure of the Study Area

Streams	No. of Respondents	Percentage (%)
Respondents having organic tomato farming	25	41.67
Respondents consumers of organic tomato farming	25	41.67
Respondents involved in different sectors	10	16.66
Total	60	100

Source: Field Survey, 2017

Table presented above shows the sampled population for the study, which shows that respondents from household having tomato farming and consumer of tomato farming 41.67 percent and 41.67 percent respectively and respondents from different sectors are 16.66 percent.

5.1.2 Gender of Respondents

Gender is the range of physical, biological, mental and behavioral characteristics pertaining to, and differentiating between, masculinity and femininity. Depending on the context, the term may refer to biological sex (i.e. the state of being male, female or intersex), sex-based social structures (including gender roles and other social roles), or gender identity.

During the study, respondents were both male and female, questionnaire were asked to respondents randomly without pre mind-set whether to ask for male or female. So the findings of the respondent's gender are presented in following table.

Table No.5.2: Gender of the Respondents

Gender	No. of respondents	Percentage (%)
Male	26	43.33
Female	34	56.67
Total	60	100

Source: Field Survey, 2017

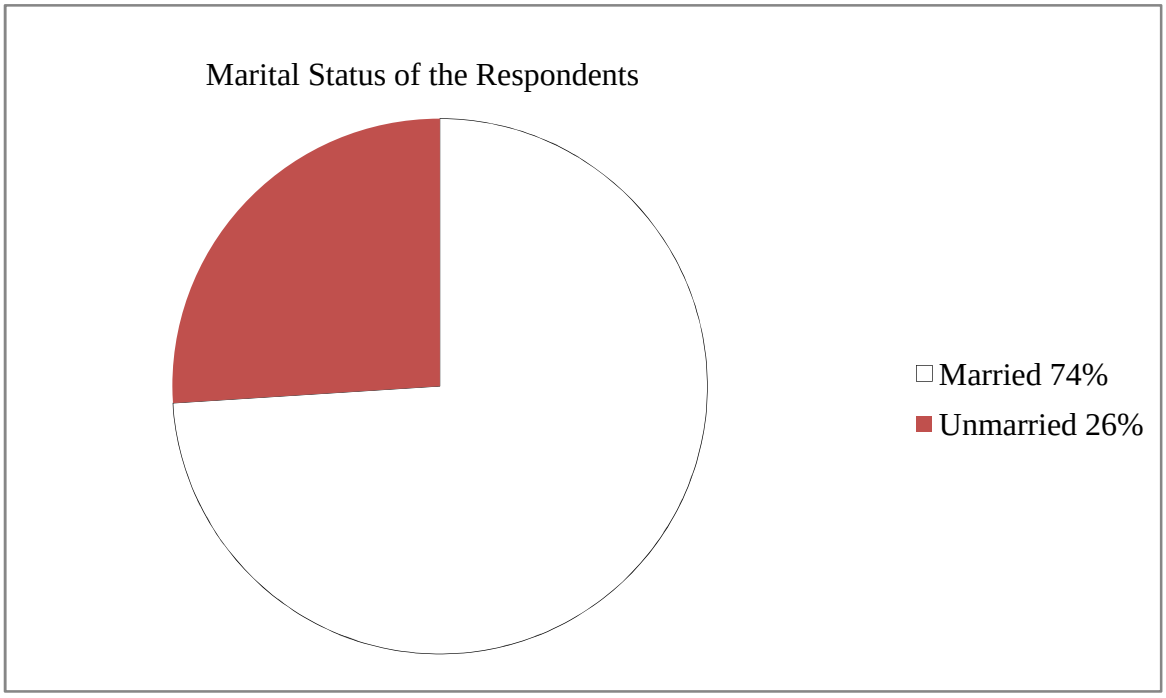
From the above table it can be understood that among the total respondents 43.33 percent were male and 56.67 percent were female who were chosen as sample for collecting information to fulfill the primary data needed for the study. From the above table it is known that female respondents are more than male.

5.1.3 Marital Status of the Respondents

Marriage is a socially or ritually recognized union or legal contract between spouses that establishes rights and obligations between them, between them and their children, and between them and their in-laws.

The definition of marriage varies according to different cultures, but it is principally an institution in which interpersonal relationships, usually intimate and sexual, are acknowledged. In some cultures, marriage is recommended or considered to be compulsory before pursuing any sexual activity. When defined broadly, marriage is considered a cultural universal..

Figure No.5. 1: Marital Status of the Respondents



Source: Field Survey, 2017

In above figure small quarter shows the unmarried portion of the respondent i.e. 26 percent and bigger quarter represent the married respondent i.e. 74 percent of the total sampled population.

5.1.4 Religion of the Respondents

A religion is an organized collection of beliefs, cultural systems, and world views that relate humanity to an order of existence. Many religions may have organized behaviors, clergy, a definition of what constitutes adherence or membership, holy places, and scriptures.

The practice of a religion may also include rituals, sermons, commemoration or veneration of a deity, gods or goddesses, sacrifices, festivals, feasts, trance, initiations, funerary services, matrimonial services, meditation, prayer, music, art, dance, public service or other aspects of human culture. Religions may also contain mythology. The word religion is sometimes used interchangeably with faith, belief system or sometimes set of duties.

Generally study area is dominated by Ethnic community who follows Buddhism, whereas Dalit and Chhetri who was chosen as sample follows Hinduism.

Table No. 5.3: Religion of the Respondents

Religious Background	No. of the Respondents	Percentage (%)
Buddhism	42	70
Hinduism	18	30
Total	60	100

Source: Field Survey, 2017

According to presented figure 42 respondents who belong to Mangolian family i.e 70 percent of respondents follow Buddhism and remaining 18 out of 60 i.e. 30 percent are follower of Hinduism.

5.1.5 Education Status of the Respondents

Education in its general sense is a form of learning in which the knowledge, skills, and habits of a group of people are transferred from one generation to the next through teaching, training, or research. Education frequently takes place under the guidance of others, but may also be autodidactic. Any experience that has a formative effect on the way one thinks, feels, or acts may be considered educational. Education is commonly divided into stages such as preschool, primary school, secondary school and then college, university or apprenticeship.

Education is the key to any success. It is the cornerstone of the development also. Higher the level of the education means better will be the opportunities. The education level of the local respondents has been listed on the following table;

Table No. 5.4: Education Status of the Respondent

Levels	No. of Respondents	Percentage (%)
Illiterate	10	16.67
Literate	34	56.66
Above SLC	16	26.67
Total	60	100

Source: Field Survey, 2017

From the above tabulated data it can be learned that 56.66 percent of respondents were literate, whereas 16.67 percent couldn't read and write, remaining 26.67 percent have passed SLC and few were University students.

5.1.6 Age wise Distribution of the Respondents

During the study sample were chosen from the various age backgrounds, so the sampled respondents are separated here below in four different categories i.e. below 30, 31-45, 46-60 and above 61which is presented in tabulated form.

Table No.5.5: Age wise Distribution of the Respondents

Age-group	No. of Respondents	Percentage (%)
Below 30	13	21.66
31-45	21	35
46-60	16	26.67
Above-61	10	16.66
Total	60	100

Source: Field Survey, 2017

Above table explains that from the total respondent age below 30 were 21.66 percent, age group 31-45 were 35 percent, age group 46-60 were 26.67 percent and age group above 61were 16.66 percent respondents. From the sampled population it can be determined that mid-aged people are more than the young and enthusiastic population aged below 30.

5.1.7 Caste Wise Distribution of Respondents

Caste is a form of social stratification characterized by endogamy, hereditary transmission of a lifestyle which often includes an occupation, ritual status in a hierarchy and customary social interaction and exclusion based on cultural notions of purity and pollution Banjhakhet area is mostly dominated by ethnic community, so most of the respondents were from Gurung community, whereas some respondents were from Chhetri community or Dalit community too. So following table is presented to see the caste distribution of the respondents.

Table No.5.6: Caste Wise Distribution of the Respondents

Caste	No. of the respondents	Percentage (%)
Chherti	11	18.33
Gurung	44	73.33
Dalit	5	8.34
Total	60	100

Source: Field Survey, 2017

As illustrated in given table it can be learned that 73.33 percent respondents from the sample population were from Gurung community, 18.33 percent from Chhetri, and 8.34 percent from Dalit.

5.2 Level of Awareness among Farmers about Organic Tomato Faming

During the study sample farmers were chosen from different educational background like educated and uneducated. So in this sample of level of awareness we categorized it in to five levels. i.e. healthy, high nutritional value etc.

TableNo.5.7: Level of Awareness among Farmers about Organic Tomato Farming.

Description	No. of respondents	Percentage (%)
Healthy	7	28
High nutritional value	4	16
Free from chemical pesticides and fertilizers	6	24
Animal friendly techniques	5	20
I don’t know	3	12
Total	25	100.0

Source: Field Survey, 2017

Above table explains that 28 percent farmers said organic tomato is healthy,16 percent went in favor of high nutritional value, whereas 24 percent thinks it is free from chemical pesticides and fertilizer,20 percent said this type of farming is animal friendly and 12 percent have no idea about this type of farming. Thus, this table clearly shows farmers are more awareness about organic tomato.

5.2.1 Main Purpose of the Organic Tomato Cultivation

Most of the peoples of Beshishahar Municipality-10, have started organic vegetable faming from the commercial point of view. Among of them most of the farmer are organic tomato farmer. Many people are engaged in commercial organic tomato production. Somebody was found in the Tomato cultivation for just consumption purpose.

Table No.5.8: Main Purpose of the Organic Tomato Cultivation

S.N	Description	No. of Respondent	Percentage (%)
1	Only for commercial production	16	64
2	For self-consumption and commercial production	9	36
	Total	25	100

Source: Field Survey, 2017

According to this table Main purpose of the organic tomato farming is only for commercial production was found 64 percent and self-consumption and commercial production was found 36 percent..

5.2.2 Consumers Knowledge about Organic Tomato

When we start any kind of business first of all we can know about consumer awareness about this business which is we are going to start. The table below sows that most of the consumers taste about organic product.

Table No.5.9: Consumers Knowledge about Organic Tomato

Description	No. of Respondent	Percentage (%)
Health for me and my family	8	32
Taste good	8	32
Fresh	6	24
Saving resources for next generations	3	12
I don’t know	0	0
Total	25	100

Source: Field Survey, 2017

The data revels that 28 percent households says that organic tomato is health for me and my family like that 32 percent households says that taste is good, 24 percent households says that fresh, 12 percent households says that saving resource for next generations , 4 percent says that it has fashion, and nobody says that I don't know.

5.3 Potentiality of Organic Farming

5.3.1 Land Holding Size

Nepal is a developing country. Many people are uneducated but day by day population ratio is increasing. Nepal has own rule and system one of them is dividing of property in Nepal. Because of the system of division of property in Nepal, land is getting divided in smaller and smaller units. 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 fifty sampled households.

Table No 5.10: Land Holding Size

S.N	Land Description (Ropani)	No. of Respondent	Percentage (%)
1	0-5	21	35
2	5-10	26	43.33
3	10-15	8	13.33
4	Above 15	5	8.34
	Total	60	100

Source: Field Survey, 2017

According to the table 35% of households have 0-5 ropani land, 43.33 percent of households have 5-10 ropani land, 13.33 percent of households have 10-15 ropani land and only 8.34 percent households have more than 15 ropani of land. So we can analysis that land is smaller than smaller day by day.

5.3.2 Cultivated Land for Organic Tomato Farming

The study area is fertilizer and easy to access to Besisahar Municipality so many people are cultivated their land by food grain and other crops. The accessibility of fertilizer, transportation, communication, hybrid seed etc facilities encourages the people to cultivate their land.

Table No 5.11: Cultivated Land for Organic Tomato Farming

S. N	Cultivation land (in ropani)	No. of Respondent	Percentage (%)
1	0-2	12	44
2	2-4	6	28
3	4-6	4	16
4	Above 6	3	12
	Total	25	100

Source: Field Survey, 2017

According to the table, 44 percent respondents have 0-2 ropani cultivated land and 12 percent respondents have 6 to above ropani cultivated land for organic tomato farming. That's why we can say that there is highly potentiality of organic tomato farming.

5.3.3 Average Production of Per Year

Table No. 5.12: Average Production of Per Yyear

Production (Kg)	No. of Respondent	Percentage (%)
0-100	11	44
100-200	7	28
200-300	4	16
300 to above	3	12
Total	25	100

Source: Field Survey, 2017

According to the above data, 44 percent respondents were producing 0-100 kg organic tomato, 28 percent respondent were producing 100-200 kg, 16 percent respondents were producing 200-300 kg and only 12 percent respondents were producing 300 to above organic tomato in their farm.

5.3.4 Income from Organic Tomato Rs/ Year

Nepal is an agriculture country. Most of the Nepal's people are farmer. In these day people are interested to change their traditional farming system into the commercial farming. In study area farmers are gaining more profit from commercialization of organic tomato farming than other income source. So that, respondent number of organic tomato farming is more than other occupation.

Table No.5.13: Income from Organic Tomato

Average Income (R.s/Year)	No. of Respondent	Percentage (%)
0-25,000	8	32
25,000-50,000	8	32
50,000 to above	9	36
Total	25	100

Source: Field Survey, 2017

The above data shows that, 32 percent of respondent earn average Rs.0-25000 per year, 32 percent of respondent earn between Rs. 25000 to Rs. 50000 per year, 36 percent of respondent earn above Rs. 50000 per year. Good price of organic tomato play positive role in economic status of tomato farmer. This data shows that earning from organic tomato farming is increasing.

5.3.5 Benefit from Organic Tomato Farming

Majority of sampled households believe that they are getting comparative benefit from organic tomato, whereas, few farmers believe that cereal and food grain production is more beneficial than organic Tomato. The table below shows the farmer’s view in this regard.

Table No.5.11: Benefit from Organic Tomato Farming

S. N	Description	Respondent	Percentage (%)
1	From Cereal Crops	5	20
2	From Organic tomato	20	80
	Total	25	100

Source: Field Survey, 2017

According to above table 20 percent of farmer believed that cereal and food grain production is more beneficial than organic tomato farming. And 80 percent of farmer believed that they are comparative beneficial more than cereal crop. The majority of respondent said they are satisfied

from tomato farming, when they cultivated the cereal crop in same land the production was just for consumption. But equal quantity of land tomato gives more output than cereal crop. So, organic tomato is more beneficial than cereal crop.

5.3.6 Selling Price of Organic Tomato

Farmers always want the reasonable price of their tomato. In this sector farmer invest their money, time and hard work to produce the tomato. According to the respondent and key informant person tomato price is depending on season. If farmer produce tomato in rainy season, than they can get good price. Majority farmers of Beshishahar Munipality-10, they produce their tomato in rainy season. This place is also suitable for rainy season to produce of tomato because the cool environment. In this season they sell tomato in expensive price. According to the respondent 76 percent were found satisfy from the selling price of organic tomato and only 24 percent of respondent were found not satisfy from the selling price of organic tomato.

5.3.7 Employment Opportunity

Agriculture sector always needs the large number of labor. From ready to land for plantation to production period, tomato farmers need the help of labor. According to the respondent, most of the labor service necessary for farming is supplied by farmers themselves and it does not cost to them. Few farmers are hiring some labor. Most of the tomato farmers, their own family members are involve in tomato farming. That is plus point to take more benefit from this field. So it gives employment opportunity to the unemployment family member and local labor. Therefore, we can say that, it is one of the good aspect of the organic tomato farming in study area

5.3.8 Family Members Engaged in Organic Tomato Farming

Nepal is an agriculture country. Many people are involving in farming sector. The major occupation of many people has faming. So the majority of family members are engaged in farming. In study area, their family members also have engaged in farming. This is shown as given below.

Table No.5.15: Family Members Engaged in Organic Tomato Farming

S.N	Person/ HHs	Number of Respondent	Percentage (%)
1	1	6	24
2	2	12	48
3	3 to above	7	28
	Total	25	100

Source: Field Survey, 2017

According to the respondent there is at least one person involved in farming is 24 percent, at least two persons involved is 48 percent and three or more people involved in 28 percent. The respondent said that, they were spend their all day in farm to care tomato, for irrigation purpose, use the pesticide and sell the tomato in the local market. Sometime they hire labor so the local people were also employing from the farm. In conclusion we can say agriculture helps the reduce unemployment problems.

5.3.9 Main Sources of Income

Nepal is an agriculture country. Most of the people of Nepal are farmer. The main source of GDP is Agriculture. According to respondent and key informant person, agriculture is the main source of income. So the main occupation for the study area was agriculture. Most of the people of the study area were involved in agriculture.

5.3.10 Irrigation System

Irrigation is the backbone of the agriculture system. Without irrigation we can't produce any kind of cash crop. The production of tomato depends on the good facility of irrigation system. Tomato is one of the cash crops who needed the good supply of irrigation. In the study area, there was good irrigation facility. The village is near to Bhachowk river. According to the respondent and self observation 44 percent were using the water from Bhachowk river, 28 percent were using the pipeline irrigation for their farm, 12 percent were still depending on the rain water and 16 percent were used the new technology of irrigation, in type of irrigation farmers collect the water in plastic pond and they used the water when they needed.

5.3.11 Demand of Organic Tomato

Demand of the organic tomato is increasing due to the awareness of the people. People are use tomato in their kitchen for daily consumption. There is no any kitchen without tomato in every

house, restaurant and hotel etc. People use the tomato in different items of food like curry, salad, achar, ketchup etc. According to the farmers and local people Beshishahar-10, is near to Besishahar bazaar so the demand of tomato is increasing day by day. Beshishahar is the gate of Manang. Manang is famous for tourism industry. In autumn season the demand of organic tomato was high. Demand play positive role to encourage to farmer, so study area highly potential for organic tomato faming.

Generally, all the potentiality has some challenges. Similarly, tomato farming also has some challenges. However it has bright potentiality in the study area as well as hilly region of western part of Nepal. Commercially, it is more profitable than other cultivation of traditional cereal crops. Topographically and climatically, the study area is suitable for tomato production. At the same time there is not serious problem in labor facility also. Though very few tomato producer reported the problem of labor, it was very small numbers. So, it has better economic prospects for the cultivation of tomato farming. Thus if all the farmers of the study area grow the tomato plant instead of other prevailing traditional crops like maize, millet etc., they can certainly receive better income. Better income helps them to improve their economic status by improving educational status, health status, social status etc.

The production of tomato has not only given the better income for tomato producer, it has also created additional employment opportunities for people at various levels such as orchard operations, transport media, storage and processing factory, technical personnel etc. This would also be helpful to check the out migration as many people migrate either permanently or temporary in search of employment opportunities. The prevailing situation of disguised unemployment can also be removed to some extent by growing tomato farming.

5.4 Challenges of Farmers in Tomato Farming

To find the problems connected with tomato growers is also one of the objectives of this study. All the respondents were asked to explain about the problems at tomato production based on their experience. Different respondents mentioned different challenges facing by them. The challenges are categorized into two groups as general problems and problems of disease and insect pest as described below.

5.4.1 General Problem

Organic tomato farming has been a new experience for traditional and ignorant farmers. On the one hand, most farmers have no knowledge about farming and on the other hand, government and other agencies have not been able to provide effective service to tomato farming.

It is obvious that road transportation is very important. The majority of farmers have established tomato farm without road transportation facility. In the observation period , lack of transportation facility was seen as the main problem in tomato farming. Most of the farmers carry their fertilizer, seeds, and tomato in bamboo bucket. Lack of knowledge and training (tomato cycle training) was seen as the major problems in tomato farming. The majority of farmers have not proper knowledge and training. Such training must be provided by the government or tomato related agencies. Due to the scarcity of technical knowledge, most of the cropping patterns are traditional in nature. According to the respondent the process of land preparation and layout, nursery establishment, use of fertilizer or compost and pesticide etc are traditional.

5.4.1.1. Access of Road Transportation

Road transportation is one of the most important infrastructures of development. In tomato farming transportation play the vital role. Without transportation we can't supply fertilizer, seeds, pesticide etc in the farm. After production we can't easily transport the goods to the market. Beshishahar -10 is the hilly area so there were not enough roads to vehicle facility. According to the respondent the plantation period of tomato they faced many difficulties to transport the fertilizer, animal dung, pesticide etc in farm. After the production lack of vehicle road, they transport tomato through bamboo bucket for selling in market. Some farmer hire potter to transport tomato and some farmer transport tomato by themselves. In observation period I saw that, farmers were using the bamboo bucket and potter to transport the tomato in market. Some farmers were carried animal dung and pesticide in bucket. So that, cost of transportation of organic tomato is high, which problem is facing by farmers in study area.

5.4.1.2. Training about Organic Tomato Farming

Organic tomato is new in agriculture sector. So the farmers needed the training about organic tomato. Training shows the proper and right way about organic tomato cultivation. It helps how to establish tomato nursery, how to land preparation, which kind of fertilizer are good to use, how to prevention diseases and insects etc. The numbers of trained and untrained farmer are shown below table.

Table No. 5.16 Training about Organic Tomato Farming

S.N	Description	No. of Respondent	Percentage (%)
1	Trained	8	32
2	Untrained	17	68
	Total	25	100

Source: Field Survey, 2017

According to the table 32 percent of respondent were trained for organic tomato farming and 68 percent of respondent were untrained for organic tomato farming. Many of the people are untrained so there have been risks.

According to the table, untrained farmer are more in this sector so there is high chances of risk because they have no modern knowledge about making nursery, plantation and about prevention of disease and pests.

5.4.1.3. Application of Modern Technology

Nepal is an agriculture country. Many people are involved in agriculture but the lack of new technology the output is less than input. In developed country they use new equipment and machine in farming, it is faster and more profitable than labor based farming. In indigenous technology that is labor based so the cost is high but the use of modern technology saved the money and time. Nowadays modern technology is essential part of farming. Developed country are used the modern technology in farming so their production is high in small quantity of land. But in our country the lack of modern technology our production is just for survival.

Table No.5.17: Application of Modern Technology

S. N	Description	No. of Respondent	Percentage
1	Applied	10	40
2	Not-applied	15	60
	Total	25	100

Source: Field Survey, 2017

The table state that 40 percent household applied modern techniques in their farming and 60 percent households said that not applied. In observation time mulching system, drop irrigation system, tractor, plastic pond was shown. According to data most of the respondent has no any equipment of modern farming technology.

5.4.1.4 Insurance Facilities

Most of the farmers any key informant person complain about the lack of insurance of organic tomato farming. Farmers invest money to buy improved seed, fertilizer, modern materials and equipment though taking loan from different sources but sometimes if plant of tomato were affected by known and unknown disease. Then there is no any kind of insurance facilities. So tomato farmer were getting big loss and many other new comer were afraid about this. If insurance facility provides properly then tomato farmer get encourage doing best in this field.

According to farmer policy maker and government should have to made good policy, rules and regulation. And Insurances company also should have to be work in favor in tomato farmer. That can be make big new change in tomato farming. Many new comer should get encourage in this filed by those good system. Therefore, we can say that it was the biggest problems of this field and that should have to need solve.

5.4.2. Problems of Disease and Insect Pests

Due to the lack of technical knowledge and technical assistance, tomato growers are facing so many problems of disease and insect pests. The problem of insect and pests also depend on season. The problem of insect pests was the main reason of low productivity and low quality of tomato. The main problem of insect pest was 'Gabaro'.. The next serious disease was ‘Fal kuhine ra Jharne Roga’, 'daduwa' households were facing this problem. This is also serious problems for tomato farming. Almost all farmers are being discouraged from tomato farming due to the helplessness in controlling most harmful diseases and insects. About eighty-two percent farmers were suffered from insects and disease in the survey area. Farmers cannot afford sufficient amount for the cultivation and pest control. Due to the problem of collateral they couldn't lend money from banks and financial institutions. It needs good amount of capital for introducing scientific methods, fertilizers, skilled labors, transportation etc

5.4.2.1 Main Insects and Disease in Organic Tomato

Most of the farmers in the study area could not identify the name of disease but they can say the symptoms seen in their farm. On the basis of symptoms, various kinds of diseases were report

Table No.5.18: Main Insects and Disease in Tomato

S. N	Description	Respondent	Percentage (%)
1	Daduwa	8	32
2	Fal kuhine ra jhane rog	9	36
3	Gabaro	5	20
4	Kira lagne	3	12
	Total	25	100

Source: Field Survey, 2017

From the selected respondent the main disease in tomato farming seems falkuhinene ra jharnerga, 32 percent, 20 percent farmers are suffering from "Gabaro", 36 percent are affected by Daduwa and 12 percent seen insect problem.

5.4.2.2. Problems of Seasonal Disease

The problems of organic farming is suffering from the many kinds of diseases, the diseases are different from the season. The verity of diseases is different on the different stage of tomato. The table below shows the time period of tomato when they has affected..

Table No.5.19: Problems of Seasonal Disease

S. N	Description	No .of Respondent	Percentage (%)
1	Before Flowering	4	16
2	Flowering Period	9	36
3	Fruiting	10	40
4	Not any time	2	8
	Total	25	100

Source: Field Survey, 2017

From the above table it can studied that 16 percent tomato farm are suffering from the diseases before flowering, 36 percent tomato farm are suffering from the diseases in the period of flowering, 40 percent in the period of fruiting and 8 percent are not suffering from the any diseases. According to the respondent they are untrained so they have no good idea to how to prevention the diseases. So there is need the training about organic tomato farming.

5.4.2.3 Methods of Prevention of Disease

This data reveals that sixty percent households have been using indigenous methods. Very few (13.3percent) households have been used modern methods, whereas thirty three percent households did not use any method to prevent from disease.

Table No.5.21: Methods of Prevention of Disease

S. N	Methods	No. Of Respondent	Percentage (%)
1	Indigenous	13	52
2	Modern	9	36
3	Both (Indigenous and Modern)	3	12
	Total	25	100

Source: Field Survey, 2017

According to above table, 52 percent respondent were used indigenous method for preventing of disease, 36 percent were used modern method and remaining 12 percent respondent were used both (Indigenous and Modern)

CHAPTER VI

CONCLUSION, FINDINGS AND RECOMMENDATION

6.1Conclusion

This study gives a clear picture of the situation of organic tomato farming in Besishahar-10. Banjhakhet is one of the villages that have huge potentiality of farming development, so the study is conducted in order to find the potentiality and challenges of organic tomato farming in the study area, to assess the level of awareness among the farmers about organic tomato farming, to explore the potentiality of tomato growers, to identify the challenges of organic tomato faming. From the previously mentioned finding, it can be concluded that Banjhakhet has huge potentiality of organic tomato farming. This area is geographically and climatically suitable for tomato farming. This sector has significant impact on the quality of life. Number of people has changed their economic and social life. Organic tomato also creates the employment opportunity. Though the study it has found that organic tomato farming has lot of potentiality instead of having lot of challenges in this sector, like lack of transportation facilities ,lack of insurance facilities, high price of needed modern materials, lack of skill and knowledge, lack of training about organic tomato farming etc. This is also serious challenges for organic tomato farming. They are not getting proper support from state sector. These problems hinder in development of this sector but these problems have solution.

Despite having many challenges this place has more potentiality for developing this area as organic farming sector. This area has great future to be developed as organic tomato farming place in near future if the challenges and constraints are mitigated in the proper way

6.2 Findings

Agriculture is the main source of employment in Nepal which provides food for the fast growing population. Due to this reason the development planners in Nepal have laid down much emphasis on agriculture development programs for the provision of better agricultural inputs, land reform, land resettlement, agricultural credit, agricultural extension services, irrigation etc. In spite of these planned efforts, improvement in the agricultural sector is rather disappointing. In these days commercialization of vegetable farming is becoming major source of income, where

many farmers have been attracted towards it. Unfortunately, the commercialization of tomato farming has not been able to gain reasonable returns from the production process. Thus this study has made attempts to access the level of awareness among the farmers about organic tomato farming in study area and explore potentiality and identify the problems of organic tomato farming in the study area.

In the Hilly region of western part of Nepal including the study area, where the climatic condition is favorable, the tomato farming could be a major source of cash income. Unfortunately, the tomato growers have not been able to gain reasonable returns from the production process. Thus this study has made attempts to evaluate the profitability of tomato production compared to the prevailing pattern of food grain like paddy, maize, wheat, millet. Tomato production has become one of the most important alternative ways of earning in Banjhakhet, where many farmers have been attracted towards Tomato cultivation.

The study area has huge potentiality of organic tomato farming. The people of study area not totally aware about organic tomato farming. The positive are given below.

- Good irrigation system
- High Price of tomato
- Create the employment opportunities
- Comparatively more benefit from cereal crop
- Easily accessibility of labor
- Near to market

Major challenges are given below.

- There is no any insurance facility.
- Problems of Diseases and Insect pests.
- Need the bridge construction in Marshyangdi River which easily connect with Banjhakhet's road transportation

6.3 Recommendations

Western Hill of Nepal is considered as suitable area for tomato, which is one of the most important cash crops. Its development would help increase farmers income to a great extent. . Based on the findings and conclusion, following suggestions have been made:

- The government should take some action for the transportation facility to all the parts of village.
- The modern machines should be distributed in low price to the farmers to ensure the organic compost for the maintenance of quality production.
- One of the most important things is that farmers should be given the confidence that the produced tomato can be sold at reasonable price at reasonable time.
- After studying different aspects, it is concluded that we can develop and expand the tomato plantation area and launch package program in selected area to make organic farming more reliable and trustworthy.
- In Nepal, organic tomato is a cash crop that's why technical knowledge is lacking over here. To make technical manpower efficient, there should be a provision of abroad training to related personals.
- The district level and village level tomato production group should be supported by giving them technical, economic, physical and other helps. They are the real organization of field workers.
- Make the good strategy of Insurance Facility.
- The way of tomato production, marketing management and way of taking, should be advertised through newspapers, pamphlet, slide, radio, T.V. etc.
- To give continuity to the referred work and to develop work in systematic way, tomato planting project is needed. Provision of soil testing should be made available.
- In order to generate the healthy and qualitative samplings, a well-managed nursery should be established.
- The government should establish an organization that involves in research and development in tomato plantation and farming. This institution would fully be responsible for studying climate, soil quality, samplings quality etc. The other aspects of research

would be the preparation of compost manure; protection of the plants, irrigation etc. This institution would work in co-ordination with Nepal Agriculture Research Council (NARC) and Agriculture Department etc.

ANNEXES: I

QUESTIONNAIRES

Questionnaires for households having organic tomato farming

1. Personal Introduction

   Name……..

   Age……..

   Sex……

   Occupation……

   Religion……..

   Family members…….

2. What is your educational status?

   a) Illiterate b) Literate c) Above SLC

3. When did you start organic tomato farming?

   …….

4. What is your major income source?

   a) Business and organic tomato farming.

   b) Animal husbandry and tomato farming.

   c) Job holder and tomato farming.

   d) Others.

5. Do you know about organic tomato farming?

   a) Yes b) No

6. How did you know about organic tomato farming?

   a) News paper b) Television / Radio c) Agriculture office d) Training

   f) Others.

7. Have you got training about organic tomato farming?

a) Yes b) No

8. If yes, from which organization?

a) Government b) Co- operative c) INGOs/ INGOs d) Other

9. How would you describe organic tomato?

Knowledge about organic tomato	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Don't Agree
Healthy						
High nutritional value						
Tomatoes are grown in harmony with nature						
Free from chemical pesticides and fertilizers						
Produced with environmentally						
Animal friendly techniques						

10. How many members are engaged in organic tomato cultivation from your family?

……

11. Do you think government bodies have been helping to develop organic tomato farming?

a) Yes b) no c) don't know

12. If yes, what kind of materials/ equipment did you get?

a) Plastic tunnel b) Drop irrigation pipe line c) Plastic pond

d) Seed, fertilizer and pesticides e)Money f) All of them

13 From which cultivation do you get better benefits from same area of land?

a) From the cereal crop b) From organic tomato

14. What kind of irrigation system do you apply?

a) Pipe line b) Rain water c) Boring d) Plastic pokhari d) Others

15. Is your economic status increased due to this farming?

a) Yes b) No

16. Is it helps to reduce unemployment problem?

a) Yes b) No

17. Are you satisfied from selling rate?

a) Yes b) No

18. If no, why?

a) Rate of seed and fertilizer is higher than selling rate of organic tomato

b) Rate of labor wage is higher than selling rate of organic tomato

c) Same selling price between organic and non organic tomato

d) All of above

19. How much your average income per year from the tomato farming?

…….

20. Do you always get market to sell organic tomato?

a) Yes b) No

21. How far the market for selling organic tomato?

a) Below 500m b) 500-1000m c) 1000m to above

22. Do you think organic tomato farming is better than non organic tomato farming?

a) Yes b) No

23. If yes, why you think organic tomato farming is better than non organic tomato farming?

a) High rate of selling price b) Environment friendly c) Easy to produce d) Good for health e) All of them

24. What kinds of method do you have used to reduce the disease of organic tomato farming?

a) Indigenous b) Modern

25. Do you apply any new technology in your organic tomato farming?

a) Yes b) No

26. How did you invest in organic tomato farming?

a) Self invest only b) Completely loan c) Partial loan

27. If you invest through loan, from which financial source did you get loan?

a) Co- operative

b) Rural Bank/ Agriculture Bank

c) Borrowing from relatives/ villagers d) Other

28. Did you felt difficulty to get loan?

a) Yes b) No

29. If yes, what kind of difficulty did you face?

a) High interest rate

b) Lengthy process

c) Far from access

d) Others

30. What types of insects and disease did you faced in this organic tomato farming?

……

31. Do you use any kind of pesticide, chemical and vitamin in your tomato?

a) Yes b) No

32. In your opinion what should be done to solve the problem of this sector and encourage those farmers or new comers?

…….

33. Do you suggest other household to start organic tomato farming?

a) Yes b) no

34. At last if you have any other information that I forgot to ask please?

……

(Thank you for your valuable time)

ANNEXES: II

Questionnaire for Consumer of organic tomato

1. Personal introduction.

   Name…….

   Age……

   Sex…….

   Occupation…….

   Religion……..

   Family members…….

2. What is your educational status?

   a) Literate b) Illiterate c) Above SLC

3. What is your major income source?

   a) Business b) Job holder c) Farming d) Others

4. Do you know about organic tomato farming?

   a) Yes b) No

5. Have you started to consuming organic tomato?

   a) Yes b) No

6. Approximately when did you start buying organic tomato?

   a) More than 5 years b) 1-3 years

   c) Last year d) Last 6 months

7. Who is generally responsible in your house for the organic tomato shopping?

   a) Yourself b) Other person

   c) Yourself and another person together

8. I buy organic tomato because……

Reason of buying organic tomato	Agree	Neutral	Disagree	Don't know
Health for me and my family				
Taste good				
Fresh				
High quality				
saving resources for next generations				
It has positive image				
It is fashion to consume				

9. What kinds of differences did you find between organic and non-organic tomato?

……

10. Did you find organic tomato expensive than non-organic tomato?

a) Yes b) No

11. If yes, then why do you buy organic tomato?

…….

12. Do you want to start growing organic tomato in your house?

a) Yes b) No c) Don’t know

13. Do you think your area has potentiality for organic tomato farming?

a) Yes b) No

14. Is organic tomato easily accessible in your area?

a) Yes b) No

15. Have you ever suggested others to buy organic tomato?

a) Yes b) No

16. Where did you get the information about consumption of organic tomato?

a) Media b) NGO c) Friends and relatives d) Others

17) Do you feel confident about purity of organic tomatoes while buying?

a) Yes b) No c) Doubtful

18) Do you have any other opinion than what I asked?

……

(Thank you for your valuable time)

ANNEXES: III

Key Informant Guidelines

1. Introduction.

   Name: ……..

   Age: …….

   Education: ……

   Occupation: …….

   Designation: …….

2. In your opinion is this place is suitable for organic tomato farming?

   a) Yes b) No

3. If yes, why it is suitable?

   ……

4. If no, why it is not suitable?

   ……

5. Which is main problem of organic tomato farming?

   a) Same price of organic and non-organic tomato b) Transportation c) Diseases and insects d) Irrigation e) All of above

6. What should be done to solve that kind of problem?

   ……

7. What should be done by government or related sector for organic tomato farmer or this sector to make commercialize?

   ……

(Thank you for your valuable time)

ANNEXEX: V

Photos

Nursery of Organic Tomato Farmi

 New Mulching System

Drop Irrigation System

Organic Tomato

Ready to Sell in the Market

ANNEXES: IV

Observation Checklist

1. Condition of road and Transportation
2. Tunnel Management
3. Use of Equipment
4. Irrigation System
5. Types of Fertilizer
6. Types of Pesticide
7. Geographical Condition

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ANNEXES: I

QUESTIONNAIRES

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1. Personal Introduction

   Name……..

   Age……..

   Sex……

   Occupation……

   Religion……..

   Family members…….

2. What is your educational status?

   a) Illiterate b) Literate c) Above SLC

3. When did you start organic tomato farming?

   …….

4. What is your major income source?

   a) Business and organic tomato farming.

   b) Animal husbandry and tomato farming.

   c) Job holder and tomato farming.

   d) Others.

5. Do you know about organic tomato farming?

   a) Yes b) No

6. How did you know about organic tomato farming?

   a) News paper b) Television / Radio c) Agriculture office d) Training

   f) Others.

7. Have you got training about organic tomato farming?

a) Yes b) No

8. If yes, from which organization?

a) Government b) Co- operative c) INGOs/ INGOs d) Other

9. How would you describe organic tomato?

Knowledge about organic tomato	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Don't Agree
Healthy						
High nutritional value						
Tomatoes are grown in harmony with nature						
Free from chemical pesticides and fertilizers						
Produced with environmentally						
Animal friendly techniques						

10. How many members are engaged in organic tomato cultivation from your family?

……

11. Do you think government bodies have been helping to develop organic tomato farming?

a) Yes b) no c) don’t know

12. If yes, what kind of materials/ equipment did you get?

a) Plastic tunnel b) Drop irrigation pipe line c) Plastic pond

d) Seed, fertilizer and pesticides e)Money f) All of them

13 From which cultivation do you get better benefits from same area of land?

a) From the cereal crop b) From organic tomato

14. What kind of irrigation system do you apply?

a) Pipe line b) Rain water c) Boring d) Plastic pokhari d) Others

15. Is your economic status increased due to this farming?

a) Yes b) No

16. Is it helps to reduce unemployment problem?

a) Yes b) No

17. Are you satisfied from selling rate?

a) Yes b) No

18. If no, why?

a) Rate of seed and fertilizer is higher than selling rate of organic tomato

b) Rate of labor wage is higher than selling rate of organic tomato

c) Same selling price between organic and non organic tomato

d) All of above

19. How much your average income per year from the tomato farming?

…….

20. Do you always get market to sell organic tomato?

a) Yes b) No

21. How far the market for selling organic tomato?

a) Below 500m b) 500-1000m c) 1000m to above

22. Do you think organic tomato farming is better than non organic tomato farming?

a) Yes b) No

23. If yes, why you think organic tomato farming is better than non organic tomato farming?

a) High rate of selling price b) Environment friendly c) Easy to produce d) Good for health e) All of them

24. What kinds of method do you have used to reduce the disease of organic tomato farming?

a) Indigenous b) Modern

25. Do you apply any new technology in your organic tomato farming?

a) Yes b) No

26. How did you invest in organic tomato farming?

a) Self invest only b) Completely loan c) Partial loan

27. If you invest through loan, from which financial source did you get loan?

a) Co- operative

b) Rural Bank/ Agriculture Bank

c) Borrowing from relatives/ villagers d) Other

28. Did you felt difficulty to get loan?

a) Yes b) No

29. If yes, what kind of difficulty did you face?

a) High interest rate

b) Lengthy process

c) Far from access

d) Others

30. What types of insects and disease did you faced in this organic tomato farming?

……

31. Do you use any kind of pesticide, chemical and vitamin in your tomato?

a) Yes b) No

32. In your opinion what should be done to solve the problem of this sector and encourage those farmers or new comers?

…….

33. Do you suggest other household to start organic tomato farming?

a) Yes b) no

34. At last if you have any other information that I forgot to ask please?

……

(Thank you for your valuable time)

ANNEXES: II

Questionnaire for Consumer of organic tomato

1. Personal introduction.

   Name…….

   Age……

   Sex…….

   Occupation…….

   Religion……..

   Family members…….

2. What is your educational status?

   a) Literate b) Illiterate c) Above SLC

3. What is your major income source?

   a) Business b) Job holder c) Farming d) Others

4. Do you know about organic tomato farming?

   a) Yes b) No

5. Have you started to consuming organic tomato?

   a) Yes b) No

6. Approximately when did you start buying organic tomato?

   a) More than 5 years b) 1-3 years

   c) Last year d) Last 6 months

7. Who is generally responsible in your house for the organic tomato shopping?

   a) Yourself b) Other person

   c) Yourself and another person together

8. I buy organic tomato because……

Reason of buying organic tomato	Agree	Neutral	Disagree	Don't know
Health for me and my family				
Taste good				
Fresh				
High quality				
saving resources for next generations				
It has positive image				
It is fashion to consume				

9. What kinds of differences did you find between organic and non-organic tomato?

……

10. Did you find organic tomato expensive than non-organic tomato?

a) Yes b) No

11. If yes, then why do you buy organic tomato?

…….

12. Do you want to start growing organic tomato in your house?

a) Yes b) No c) Don’t know

13. Do you think your area has potentiality for organic tomato farming?

a) Yes b) No

14. Is organic tomato easily accessible in your area?

a) Yes b) No

15. Have you ever suggested others to buy organic tomato?

a) Yes b) No

16. Where did you get the information about consumption of organic tomato?

a) Media b) NGO c) Friends and relatives d) Others

17) Do you feel confident about purity of organic tomatoes while buying?

a) Yes b) No c) Doubtful

18) Do you have any other opinion than what I asked?

……

(Thank you for your valuable time)

ANNEXES: III

Key Informant Guidelines

1. Introduction.

   Name: ……..

   Age: …….

   Education: ……

   Occupation: …….

   Designation: …….

2. In your opinion is this place is suitable for organic tomato farming?

   a) Yes b) No

3. If yes, why it is suitable?

   ……

4. If no, why it is not suitable?

   ……

5. Which is main problem of organic tomato farming?

   a) Same price of organic and non-organic tomato b) Transportation c) Diseases and insects d) Irrigation e) All of above

6. What should be done to solve that kind of problem?

   ……

7. What should be done by government or related sector for organic tomato farmer or this sector to make commercialize?

   ……

(Thank you for your valuable time)

ANNEXEX: V

Photos

Nursery of Organic Tomato Farmi

 New Mulching System

Drop Irrigation System

Organic Tomato

Ready to Sell in the Market

ANNEXES: IV

Observation Checklist

1. Condition of road and Transportation
2. Tunnel Management
3. Use of Equipment
4. Irrigation System
5. Types of Fertilizer
6. Types of Pesticide
7. Geographical Condition

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ANNEXES: I

QUESTIONNAIRES

Questionnaires for households having organic tomato farming

1. Personal Introduction

   Name……..

   Age……..

   Sex……

   Occupation……

   Religion……..

   Family members…….

2. What is your educational status?

   a) Illiterate b) Literate c) Above SLC

3. When did you start organic tomato farming?

   …….

4. What is your major income source?

   a) Business and organic tomato farming.

   b) Animal husbandry and tomato farming.

   c) Job holder and tomato farming.

   d) Others.

5. Do you know about organic tomato farming?

   a) Yes b) No

6. How did you know about organic tomato farming?

   a) News paper b) Television / Radio c) Agriculture office d) Training

   f) Others.

7. Have you got training about organic tomato farming?

a) Yes b) No

8. If yes, from which organization?

a) Government b) Co- operative c) INGOs/ INGOs d) Other

9. How would you describe organic tomato?

Knowledge about organic tomato	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Don't Agree
Healthy						
High nutritional value						
Tomatoes are grown in harmony with nature						
Free from chemical pesticides and fertilizers						
Produced with environmentally						
Animal friendly techniques						

10. How many members are engaged in organic tomato cultivation from your family?

……

11. Do you think government bodies have been helping to develop organic tomato farming?

a) Yes b) no c) don’t know

12. If yes, what kind of materials/ equipment did you get?

a) Plastic tunnel b) Drop irrigation pipe line c) Plastic pond

d) Seed, fertilizer and pesticides e)Money f) All of them

13 From which cultivation do you get better benefits from same area of land?

a) From the cereal crop b) From organic tomato

14. What kind of irrigation system do you apply?

a) Pipe line b) Rain water c) Boring d) Plastic pokhari d) Others

15. Is your economic status increased due to this farming?

a) Yes b) No

16. Is it helps to reduce unemployment problem?

a) Yes b) No

17. Are you satisfied from selling rate?

a) Yes b) No

18. If no, why?

a) Rate of seed and fertilizer is higher than selling rate of organic tomato

b) Rate of labor wage is higher than selling rate of organic tomato

c) Same selling price between organic and non organic tomato

d) All of above

19. How much your average income per year from the tomato farming?

…….

20. Do you always get market to sell organic tomato?

a) Yes b) No

21. How far the market for selling organic tomato?

a) Below 500m b) 500-1000m c) 1000m to above

22. Do you think organic tomato farming is better than non organic tomato farming?

a) Yes b) No

23. If yes, why you think organic tomato farming is better than non organic tomato farming?

a) High rate of selling price b) Environment friendly c) Easy to produce d) Good for health e) All of them

24. What kinds of method do you have used to reduce the disease of organic tomato farming?

a) Indigenous b) Modern

25. Do you apply any new technology in your organic tomato farming?

a) Yes b) No

26. How did you invest in organic tomato farming?

a) Self invest only b) Completely loan c) Partial loan

27. If you invest through loan, from which financial source did you get loan?

a) Co- operative

b) Rural Bank/ Agriculture Bank

c) Borrowing from relatives/ villagers d) Other

28. Did you felt difficulty to get loan?

a) Yes b) No

29. If yes, what kind of difficulty did you face?

a) High interest rate

b) Lengthy process

c) Far from access

d) Others

30. What types of insects and disease did you faced in this organic tomato farming?

……

31. Do you use any kind of pesticide, chemical and vitamin in your tomato?

a) Yes b) No

32. In your opinion what should be done to solve the problem of this sector and encourage those farmers or new comers?

…….

33. Do you suggest other household to start organic tomato farming?

a) Yes b) no

34. At last if you have any other information that I forgot to ask please?

……

(Thank you for your valuable time)

ANNEXES: II

Questionnaire for Consumer of organic tomato

1. Personal introduction.

   Name…….

   Age……

   Sex…….

   Occupation…….

   Religion……..

   Family members…….

2. What is your educational status?

   a) Literate b) Illiterate c) Above SLC

3. What is your major income source?

   a) Business b) Job holder c) Farming d) Others

4. Do you know about organic tomato farming?

   a) Yes b) No

5. Have you started to consuming organic tomato?

   a) Yes b) No

6. Approximately when did you start buying organic tomato?

   a) More than 5 years b) 1-3 years

   c) Last year d) Last 6 months

7. Who is generally responsible in your house for the organic tomato shopping?

   a) Yourself b) Other person

   c) Yourself and another person together

8. I buy organic tomato because……

Reason of buying organic tomato	Agree	Neutral	Disagree	Don't know
Health for me and my family				
Taste good				
Fresh				
High quality				
saving resources for next generations				
It has positive image				
It is fashion to consume				

9. What kinds of differences did you find between organic and non-organic tomato?

……

10. Did you find organic tomato expensive than non-organic tomato?

a) Yes b) No

11. If yes, then why do you buy organic tomato?

…….

12. Do you want to start growing organic tomato in your house?

a) Yes b) No c) Don’t know

13. Do you think your area has potentiality for organic tomato farming?

a) Yes b) No

14. Is organic tomato easily accessible in your area?

a) Yes b) No

15. Have you ever suggested others to buy organic tomato?

a) Yes b) No

16. Where did you get the information about consumption of organic tomato?

a) Media b) NGO c) Friends and relatives d) Others

17) Do you feel confident about purity of organic tomatoes while buying?

a) Yes b) No c) Doubtful

18) Do you have any other opinion than what I asked?

……

(Thank you for your valuable time)

ANNEXES: III

Key Informant Guidelines

1. Introduction.

   Name: ……..

   Age: …….

   Education: ……

   Occupation: …….

   Designation: …….

2. In your opinion is this place is suitable for organic tomato farming?

   a) Yes b) No

3. If yes, why it is suitable?

   ……

4. If no, why it is not suitable?

   ……

5. Which is main problem of organic tomato farming?

   a) Same price of organic and non-organic tomato b) Transportation c) Diseases and insects d) Irrigation e) All of above

6. What should be done to solve that kind of problem?

   ……

7. What should be done by government or related sector for organic tomato farmer or this sector to make commercialize?

   ……

(Thank you for your valuable time)

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Drop Irrigation System

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Observation Checklist

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