

**POTENTIALS AND CONSTRAINTS OF ORGANIC
POTATO FARMING**

A Case Study of Molung -4 Okhaldhunga District, Nepal

**A Thesis Submitted to
The Central Department of Rural Development,
Tribhuvan University,
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Degree of the Master of Arts (M.A.)
In
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RECOMMENDATION LETTER

The thesis entitled '**Potentials and Constraints of Organic Potato Farming : A Study of Molung- 4, Okhaldhunga District, Nepal**' has been prepared by **Indira Khatri** under my guidance and supervision. I hereby forward this thesis to the evaluation committee for final evaluation and approval.

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19 Dec, 2017

APPROVAL LETTER

The thesis entitled '**Potentials and Constraints of Organic Potato Farming : A Study of Molung- 4, Okhaldhunga District, Nepal**' submitted by **Indira Khatri** in partial fulfillment of the requirements for the Master's Degree (M.A.) in Rural Development has been approved by the evaluation committee.

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DECLARATION

I hereby declare that the thesis entitled '**Potentials and Constraints of Organic Potato Farming: A Study of Molung- 4, Okhaldhunga District, Nepal**' submitted to the Central Department of Rural Development, Tribhuvan University, is entirely my original work prepared under the guidance and supervision of my supervisor. I have made due acknowledgements to all ideas and information borrowed from different sources in the course of preparing this thesis. The results of this thesis have not been presented or submitted anywhere else for the award of any degree or for any other purposes. I assure that no part of the content of this thesis has been published in any form before.

Indira Khatri

Date: 2074/9/4

19 Dec, 2017

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Indira Khatri

Abstract

'Potentials and Constraints of Organic Potato Farming: A Study of Molung- 4, Okhaldhunga District, Nepal' is representative of the reality Main thrust of the study is to assess the level of awareness among the farmers about organic potato farming , to identify the problems faced by potato growers and to explore potentiality of organic farming.

Present study was carried out mostly on the basis of exploratory research design as because the study was done focusing on constraint and potentiality of organic farming in the study area. The collected data were both qualitative and quantitative. Both primary and secondary data were used to describe and analyze the study area. Interview and observation are main tools of data collection.

This area has a different challenge which stands as hindrance in the pace of organic farming development in this area. Lack of sufficient irrigation facility was seen as the main problem in organic farming most of the farmers were dependent on rain water. The majority of farmers have not proper knowledge and technical assistance; potato growers had been facing so many problems of disease and insect pests, no reasonable price of products. This is also serious problems for organic potato farming. They are not getting proper support from state sector.

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 potato farming place in near future if the challenges and constraints are mitigated in the proper way.

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List of the Key Informant

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- 3. Shyam Tamang Molung -4, Dhdapakha**
- 4. Rohit Kuwar Molung -4, Rupetar**
- 5. Rina Rana Magar Molung -4, Jarayotar**
- 6. Gita Pariyar Molung -4, Kulkhola**
- 7. Kusum Bhujal Molung -4, Rupetar**
- 8. Surya Prasad Dahal Molung -4, Khatri Gauan**
- 9. Nirmala Ghimire Molung -4, Dhdapakha**

ABBREVIATIONS/ACRONYMS

ADB	=	Asian Development Bank
CBS	=	Central Bureau of Statistics
FAO	=	Food and Agriculture Organization
GDP	=	Gross Domestic Production
GOI	=	Government of India
HHS	=	House Holds
NARC	=	National Agricultural Research Council
NGO	=	Non-Governmental Organization
NPC	=	National Planning Commission
NRB	=	Nepal Rastra Bank
SLC	=	School Leaving Certificate
VDC	=	Village Development Committee
FYM	=	Farm Yard Manure
CWDS	=	Community welfare and Development Society
NPG	=	Nepal Permaculture Group
ECOSCE	=	Ecological Service Center
NECOS	=	Nepal Community Support Group
CPB	=	Colorado Potato Bettle
PLH	=	Potato Leaf Hopper

CHAPTER – I

INTRODUCTION

1.1 Background of the Study

Organic farming is a strategy to reduce food output by removing tools like fertilizer, herbicides, insecticides, fungicides. It allows use of chemicals like rock phosphate that contain excessive amounts of fluorides and naturally occurring but contaminated sulfur, while not allowing chemically pure sulfur and chemically pure phosphate because those chemically pure products have been purified, ie they are not naturally occurring. <http://www.ers.usda.gov/data-products/organic-production.aspx>

Organic agriculture could be self-sustaining if all the droppings of the people eating the food were getting back to the land from which the food was grown. But rules for organic farming would not allow that to happen simply because we cannot assure ourselves that all the people producing those droppings are eating strictly organically.

Organic farming is the process of growing plants without chemical fertilizers, insecticides, and fungicides. To market a product as organic you need 3 years of documented land use (no chemicals) prior to the first years planting. Organic farming will produce a better final product than conventional farming. However, conventional farming is much more practical and costs less than organic. Chemical fertilizers work as well as organic fertilizers but cost about half as much. So the main point is conventional farming will get you higher yields, usually faster growth, and a good final product. Organic farming is more management intensive and requires more labor but will give

you a better final product. Organic produce has fewer fertilizer salts and alkaloids and is generally healthier for you. Some crops such as corn, wheat, and many other major crops can't be produced organically due to cost and management practices.
: <http://www.ota.com/organic/mt/business.html>.

Organic potato 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 potato farming. Be the first to start it. Different type of threats are coming in organic potato 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.

Educated youth think that 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 potato farming in Nepal

1.2 Statement of the Problem

Organic potato production is one of the most rapidly developing sector of Nepalese agriculture. 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 Molung -4, Okhaldhunga district is suitable for it due to its plain land infrastructure, access of water etc. Organic potato farming is easy in this areas because of its easy transportation, information technology, due to large number of labor available in village, fertile land and also indigenous knowledge of local people.

Although having such potentiality of organic potato farming in Molung, it is difficult to find the farmers who have awareness about organic potato farming. Farmers have many problems which are neither identified by government nor by local people. In is potentiality of organic potato farming is not upto the maximum explored. So this research has been conducted in micro level to understand the prospects and probability of organic potato farming in Molung -4 Okhaldhunga.

In modern day vegetable farming is done not just for the consumption in the family but also income generating purposes. In Molung – 4 it can be found that most of the lower and middle class families are drowned in the web of the poverty. If any other family members are involved in the commercial vegetable farming the poverty situation is comparatively less than other families. So commercial organic potato farming is playing vital role to income generation in the study area.

In the context of Molung, organic potato farming is an important and productive form of agriculture. Commercial organic potato farming is the effective to generate the income source. Organic potato farming help to improve the economic status of the rural poor farmers. It is a good source of income for the farmers to earn in a short period of time and in less investment we can improve economic condition and that leads the overall improvement of their daily livelihood. So that, commercial Organic potato farming is the one essential alternative sector for rural income generate.

The study of the commercial Organic potato farming to generate income structure of rural areas has yet not been carried out by any of the researchers in the Molung -4 . So, it is

believed that this study will be equally useful to the interested readers, students and concern persons and among other institutions who desire to get knowledge and information about the relationship between commercial organic potato farming and income generate. Similarly it will provide the trend of commercial organic potato farming to generate income structure of rural residents.

Likewise the commercial Organic potato farming has support in the Economic Change of the Molung however there is no study done on the factors which has transformed their livelihood. Thus through this study researcher will find which factor in their livelihood has been changed. The researcher will study on the potential and prospects of organic potato farming of the study area. Present research intended to analyze the problem and prospect of organic potatoes farming. Present inquiry is intended to these and similar questions.

1.3 Objectives of the Study

The general objectives of the study are to explore organic potato farming potentiality and challenge in Molung -4, Okhaldhunga district. The specific objectives are.

1. To assess the level of awareness among the farmers about organic potato farming.
2. To identify the problems faced by potato growers.
3. To explore potentiality of organic farming.

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 potato farming in Nepal played the vital role to introduce Molung -4 Okhaldhunga district. Organic potato production has contributed a lot to the local farmers in improving their socio- economic life. This study focuses on the condition of the organic potato 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 potato in Molung -4 Okhaldhunga district has been analyzed. If the government does not have proper knowledge about the potato 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

Efforts will be made to obtain reliable and accurate data and information from the respondents. This study is an academic research based for partial fulfillment of master's degree in Rural Development. Present study will be organic potato farming only. This study will be focused on its problem and prospects of organic potato farming. This present study will be based on and limited to the people of Molung -4, of Okhaldhunga district. The study is very specific like that of case studies. So the conclusion will be drawn from the study might not be conclusive. The conclusion will not be generalized for the whole. But the interferences might be valid to some extent to those areas, which have similar geographical area, socio-economic and environmental settings. This study will be limited to the Molung -4, of Okhaldhunga district so the findings may not be generalized in national level.

CHAPTER – II

LITERATURE REVIEW

Literature review is an important process of research work which helps us to bridge the gap between the existing problem and past research work in subject matter. Review of the related literature refers to the study of theories from the previously carried out researcher studies etc. In other words the study of other related topics that help the desired topic to be effective and more experimental is called literature review. This section includes the previously done researcher report, objective, method, and findings of these researchers that can help the present researcher to develop new ideas and identify the new aspects of the research problems.

2.1 Theoretical Review

Organic farming refers to ecologically-based production systems used to produce food and fiber. Organic farming may be most widely known for what it is not; however, *it is more important to define organic farming by what it is*. Organic farming can be defined by the proactive, ecological management strategies that maintain and enhance soil fertility, prevent soil erosion, promote and enhance biological diversity, and minimize risk to human and animal health and natural resources. Many kinds of farm products are produced organically including vegetables, fruit, herbs, grains, meat, dairy, eggs, fibers, and flowers. Available at: <http://www.ers.usda.gov/data-products/organic-production.aspx/>

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)

Concept Organic farming endorses the concept that the soil, plant, animals and human beings are linked. In philosophical terms organic farming means “farming in sprits of organic relationship”. In this system everything is connected with everything else. Therefore, its goal is to create an integrated, environmentally sound, safe and economically sustainable agriculture production system (Adhikari & Shrestha: 2011)

Since organic farming means placing farming on integral relationship, we should be well aware about the relationship between the soil, water and plants, between soil-soil microbes and waste products, between the vegetable kingdom and the animal kingdom of which the apex animal is the human being, ÿ between agriculture and forestry, between soil, water and atmosphere etc. It is the totality of these relationships that is the bedrock of organic farming. Concept of Organic Farming The farmer manages self-regulating ecological and biological processes for sustainable and economic production of products. Organic farming systems are based on development of biological diversity and the maintenance and replenishment of soil productivity. The soil in this system is a living

entity. The total environment of the soil, from soil structure to soil cover is more important. It must have to be protected and nurtured at all cost. (Trewavas, 2001)

Concept of Organic Farming Feed the soil, it will feed the crop. The soil's living population of microbes and other organisms are significant contributors to its fertility on a sustained basis. It conserves soil fertility and soil erosion through implementation of appropriate conservation practices. Key characterization of organic farming in relation to soil fertility and crop production Concept of Organic Farming Protecting the long-term fertility of soil by maintaining soil organic matter levels, fostering soil and biological activity and careful mechanical inversion, ó Plant nutrients supply through relatively insoluble nutrient sources (organic sources) made available by the action of soil microbes, Meeting crop need of nitrogen through nitrogen fixation by leguminous crops in the cropping systems and recycling of farm organic materials including crop residues and livestock wastes, ó Importance of crop rotation, natural predators, resistance varieties and other agronomic manipulations of plant protection including weed management, and Biodiversity management, soil and environmental health. Concept ó Natural ecosystems can be a model for organic farming systems. The natural ecosystems neither use any input nor demands unreasonable quantities of water (Dimitri & Oberholtzer. 2009).

Organic farmers can learn a lot from studying the interactions in natural ecosystems such as forests. The entire system is based on intimate understanding of nature's ways. The system does not believe in mining of the soil of its nutrients and do not degrade it any way for today's needs. Organic production systems Concept of Organic Farming Nutrients flow Nutrient cycles in forests Recycling nutrients in organic farms Soil fertility Soil fertility in forests Soil protection in organic farms Diversity Diversity in

forests Crop diversity in organic farms Self-regulation Eco-balance in forests Bio-control in organic farms Nutrient cycles in forests ó Trees and other plants take up nutrients from the soil and incorporate them in their biomass (leaves, branches etc.) (Adhikari & Shrestha, 2011). The nutrients go back to the soil when leaves fall or plants die. Part of the biomass is eaten by various animals (including insects), and their excrements return the nutrients to the soil. In the soil, a huge number of soil organisms are involved in the decomposition of organic material which makes nutrients available to the plant roots again. The dense root system of the forest collects the released nutrients almost completely. Recycling nutrients in organic farms Organic nutrient management is based on biodegradable material, i.e. Plant and animal residues which can be decomposed. Nutrient cycles are closed with the help of composting, mulching, green manuring, crop rotation etc. Farm animal can play an important role in the nutrient cycle: their dung is of high value and its use allows to recycle nutrients provided with the fodder. If carefully managed, losses of nutrients due to leaching, soil erosion and gasification can be reduced to the minimum. This reduces the dependency on external inputs and helps to save costs. However, nutrients exported from the farm with the sold produce need to be replaced in some way (Bhatta, Doppler & KC: 2008).

Concept of Organic Farming Soil fertility in forests ó Soil and its fertility both together constitute the centre of the natural ecosystem. A more or less permanent soil cover prevents soil erosion and it helps to build up soil fertility. The continuous supply of organic material feeds a huge number of soil organisms and provides an ideal environment for them. As a result the soil becomes soft and capable of taking up and storing large quantities of water (Bhatta , Doppler & KC: 2008).

Concept of Organic Farming Soil protection in organic farms Organic farmers give central importance to the maintenance and improvement of soil fertility. They stimulate the activity of soil organisms with organic manures and avoid harming them with chemical pesticides. Mulching and cover crops are used among other methods to prevent soil erosion. Concept of Organic Farming Diversity in forests Forests host a high diversity of plant varieties of different size, root systems and requirements. Animals are also part of the system. If one organism drops out, it is immediately replaced by another one which fills the gap. Thus space, light, water and nutrients are used to the optimum. The result is a very stable system, Concept of Organic Farming Crop diversity in organic farms Organic farms grow several crops including trees, either as mixed cropping or in rotation. Animals are an integrated part of the farm system. The diversity not only allows optimum use of the resources but also serves as an economic security in case of pest or disease attack or low market prices for certain crops (Lind, 2009). Concept of Organic Farming Eco-balance in forests ó Pests and diseases do occur in natural ecosystems, but they rarely cause a big damage. Due to the diversity it is difficult for them to spread. Plants usually can recover from an infestation on their own. And many pests are controlled by other organisms such as insects or birds. Concept of Organic Farming »Bio-control in organic farm ó Organic farmers try to keep pests and diseases at a level which does not cause economic damage. The main focus is on supporting the health and resistance of the crop. Beneficial insects are promoted by offering them a habitat and food. If pests reach critical levels, natural enemies and herbal preparations are used (Dimitri & Oberholtzer, 2009).

Concept of Organic Farming Back to nature Concept of Organic Farming Organic farming wants to follow the law of nature. Does it mean that organic farms must be as close to natural systems as possible. Within the organic movement one will find farmers who focus on natural farming, and others who take a purely commercial approach. The majority of organic farmers probably somewhat in between these two extremes. Most farmers will expect to get sufficient production from the farm to make a living. For them the challenge is to follow the principles of nature to achieve a high productivity. Organic farming –a system approach Concept of Organic Farming Conventional farming puts its focus on achieving maximum yields of a specific crop. It is based on a rather simple understanding: crop yields are increased by nutrient inputs and they get reduced through pests, diseases and weeds, which therefore must be combated. Organic agriculture is a holistic way of farming: besides production of goods of high quality, an important aim is the conservation of the natural resources fertile soil, clean water and rich biodiversity. Organic farming is not a step back to traditional methods but a modern approach. Become familiar with the advantages, but also with the limitations of organic farming (Dimitri & Oberholtzer. 2009).

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. (Adhikari & Shrestha, 2011)

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. (Lind, 2009)

Organic farming is the technique which calls for extension of knowledge vis-a-vis skills among the end users. Unfortunately government extension service remains quite rudimentary in the study area despite its peri- urban location. As a matter of fact many farmers have only vague ideas about organic farming and its advantages as against the

traditional and modern farming methods. Albeit many have been involved in organic production, their way of managing organic farm may not justify organic standards. Similarly majority of the consumers replied that they had heard of organic vegetables and known the significance of it, however, most of them lack of knowledge about their availability. This finding is in concordance with that of (Sharma, 2005) who reported that 63% of the respondents knew about organic products while 375 of the respondents did not. This indicates that awareness programs about organic products could be an effective way of promoting among consumers

Agriculture is one of the major contributing sectors in Nepalese economy that shares 36% in the GDP at 1984/85 constant price (MOAC, 2007) and provides employments to two-third of the economically active population (MOAC, 2006). The government, through the past development plans, has made significant efforts to increase agricultural production and productivity. However, the efforts have not yielded results to desired levels due mainly to difficult topography, poor infrastructural development and high level of farm poverty (NPC, 2007). Nepalese agriculture is predominantly characterized by traditional knowledge based subsistence type with low productivity. The agricultural systems in the mountain comprise 2/3rd of the nation's geographical area and largely integrate crops livestock to traditional knowledge and locally available resources. With very low productivity, the systems are largely organic by default for maintaining soil fertility and production. Most of the farmers in the high mountain and majority of the in the middle mountain do not use chemical inputs in their farming. The use of agro-chemical such as fertilizers and pesticides is becoming important only to the commercial agriculture pockets recently being developed in the accessible areas. With introduction of

improved agronomic and composting practices, bio- fertilizers and bio-pesticides, there is greater possibility of converting the systems to organic types with little effort. Farmers in the Terai are producing crops in combination of both indigenous and conventional knowledge system (Sukhpal, 2006). Organic farming with low productivity is adopted in few areas. In Nepal use of pesticides and fertilizers is wide spread in commercial production areas due to conventional agriculture based market and infrastructure development. Pesticides and fertilizers consumption is increasing at a faster rate with intensification of farming business regardless of their detrimental effects on human and environmental health. Indiscriminate use of the agro-chemicals has, in consequence, initiated several problems such as pest' resistance to pesticides and resurgence due to elimination of their natural enemies, environmental pollution, toxic residues in food and feed materials, depletion of soil fertility, disruption of ecosystem, animal and human health hazards and other economic losses. This forces to think alternative strategies towards sustainable agriculture development and preserving eco- system. (Pant, 2011)

Organic means the land is maintained without chemical pesticides, animals bred without steroids, fertility hormones or excessive antibiotics. It means that you're not ingesting lots of chemicals from the food that mainstream food does contain. People who have a problem with organic farming are almost evil. Why attack something that only benefits us all. People severely underestimate the negative consequences associated with introduction of massive amount of deadly chemicals into our soil and inevitably into our water supply. If you have the ability to observe your environment like myself, you will notice algae blooms which starve the water of oxygen, killing plants and animals in local rivers and ponds in proximity to urban developments with "treated" lawns and

landscapes. High levels of nitrogen and many other chemicals which adversely effect marine life, and subsequently all life which relies on the marine life for food and habitat. Secondly food crop-producing land that is heavily treated with insecticide and fertilizer holds residuals of these deadly substances for years to come, and our food contains traces of those substances designed to kill bugs and repel pests. I don't want to eat that stuff, maybe some people do. Coral reefs are starting to suffer from pollution and runoff. Anything we put on the ground we might as well put in our mouth. A lot of people dont understand that, they think you can pour chemicals on the ground and never pay the price for it, but they're wrong. Every part of this landscape and habitat must be respected. The poisons do not disappear, they just travel through the ground until they end up back in us. Organic farming is reducing the poison we put on the earth and in our bodies. (Available onlineat: <http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib58.aspx>)

Contract Farming System in Nepal is one of the pioneers in contract farming in Asia. The Nepal state has actively promoted this mechanism of agricultural production and marketing coordination since the mid-2010s. Introduction Contract farming is an arrangement between the primary producer/s and the agribusiness firm in order for the latter to procure a certain pre-agreed, quantity and quality of produce at a particular price and time from the primary producers. It can be only a pure procurement transaction, extending into supply of inputs or even beyond. This is happening as good quality, sufficient, timely, and cost effective raw material is a prerequisite for any successful agribusiness firm, whether co-operating in the domestic or international market. (Sukhpal :2006)

Components of Organic Farming : There are assumptions throughout the organic literature of differences between organic and conventional systems with respect to their effects on soil physical properties, soil insect fauna and nutrient flow within the soil, crop health and nutritional value of the harvested crop. Different components of organic farming are as follows:

Crop and Soil Management : Organic farming system encourages the use of rotations and measures to maintain soil fertility. Carefully managed soil with a high production of humus offer essential advantages with respect to water retention ion exchange, soil erosion and animal life in the soil. Green manuring and inter-cropping of legumes is another important aspect for biological farming systems not only in regard to weed control but also in reducing the leaching of nutrients and in reducing the leaching of nutrients and in reducing soil erosion. A green cover throughout most of the year is one of the main goals of such farming methods. Depending on the green manure mixture or the legumes used for under sowing, there may be an increased soil organic matter soil N₂ as well as in other nutrients.

On-farm Waste Recycling: Increase price of chemical fertilizers has enabled organic wastes to regain an important role in the fertilizer practices on the farm. Good manure management means improved fertilizer value of manure and slurry and less nutrient losses composting of all organic wastes in general and of farm yard Manure (FYM) or feedlot manure in particular is important in organic farming.

Non-chemical Weed Management: Weed management is one of the main concerns in organic agriculture. Generally, all aspects of arable crop production play an important role in as system approach to problems. The elements to consider in preventing weed problems are crop rotation, green manuring, manure spreaders may also be useful in weed control.

Domestic and Industrial Waste Recycling: Sewage and sludge use for crop production can form an importing component of organic farming if treatment and application methods are improved further.

Energy Use: In the energy requirement for production measured per rupees of produce for organic farms is only one third of what it is for their conventional counterparts. Because Chemical fertilizer and pesticides are not used by organic farmers, the comparison of total energy input/ha with total energy output favors organic farming systems.

Food Quality: Food quality is one of the main issues, which concerns both scientists and consumers. Nitrates in water and farm produce, pesticides residues, keeping quality and physiological imbalances are some of the important aspects of food quality. Organic food production tends the practice near to its natural state as possible. Because of which the foods are more potent and nutritious.

Ecological Agriculture: The growing concern about environmental degradation, dwindling natural resources and urgency to meet the food needs of the increasing population are compelling farm scientist and policy makers to seriously examine alternative to chemical agriculture.

The History of Organic Farming in Nepalese Context: Organic agriculture was first appeared as one of the priority sectors in Nepalese agriculture since the 10th Five Years Plan (2059/060-2063/064). But nowadays various institutions, individuals and farmers are emergently engaging in this field. There are various local organic practices; some practiced from the ages and some innovating new practices by farmers themselves. At present, some organic products such as coffee, tea, honey, large cardamom, ginger etc. are exported to international market. Various institute and individuals think that organic movement in Nepal is quite slow in motion due to lack of clear vision of the government and distorted information flow from the different developmental projects.

Since early nineties, the organized movement towards organic agriculture was initiated in Nepal by the non-government sector basically under the influence and support of external organizations. Many non-government organizations were established since then to promote this approach in the farmer's field. Some notable organizations are INSAN established in 1986, Community Welfare and Development Society (CWDS) in 1992, Nepal permaculture Group (NPG) in 1992, Ecological service center (ECOCENTRE) in 1994 and Organic Nepal in 2001.

In Nepal modern technology has been implemented for the development of agriculture. It has history of using chemical fertilizers and fertilizers and pesticides for the last 35 years. Because of that, farmers of Nepal are still far from all the negative effects of inorganic method. More than 75% of population of our country depends upon agriculture. So the development of agriculture is necessary for the overall development of the country.

Organic farming in Nepalese context is not an uncommon word itself. Over a century, resource poor farmers are doing such practices in traditional way which is similar to organic farming. These farmers' knowledge and skills about organic farming would be positive point for promoting organic farming in Nepal. Besides, the ecological advantages have proved that Nepal has potential to produce quality organic fruits, vegetables, tea, coffee, cardamom, vegetable seeds, mushroom, honey and medicinal plants & herbs.

It is believed that Nepalese farmers are more committed for the organic farming compared to other south Asian countries. But now a day's particularly youth are distracting from the agriculture field. They think once they have some academic degree, it's not good to work in the agriculture field and playing with mud, plough, FYM etc. is not feasible option and move out from the village in search of employment. Only few farmers are convinced that organic agriculture is possible and the organic pesticides and fertilizers can also contribute in better production as compared to the chemical inputs.

During the fiscal year 2066/067, Government provides only 24 corers of subsidies in organic manures and certification process of organic products. Under this limited budget farmers are confused which part of organic agriculture is to expand by the government sector.

There are some example of organic farming and the organic products that got popularity in domestic and international markets such as tea, coffee, honey, ginger, cardamom, and medicinal herbs etc. Individual farmers, institutions and GON had initiated different promotional activities of organic farming but these activities are not coordinated and

documented properly. One organization is unaware of other's initiatives and achievements. At the same district, different institutions are working on this sector on their own way. Organic farming in Nepal is extended and initiated in different approaches for the completion of development projects. In Nepal, the traditional cultivation practices were basically organic since antiquity and introduction of inorganic compounds in the production system started since the beginning of road network, markets and intensification of production system for the markets. The intensification process has led to the over and irrational use of chemicals causing serious harmful effects on the human and environmental health as well necessitating the promotion of organic agriculture movement to conserve nature, maintain agricultural sustainability and ensure quality food supply.

Chemical fertilizers were introduced in Nepal since early seventies with the increasing wish of the younger farmer and the use of chemical pesticides were accelerated during early eighties with the introduction of Metacid. In the beginning, bags of chemical fertilizers were distributed freely to the farmers and various methods were employed by the government to promote their use in the field. Though the average rate of chemical fertilizers and pesticides use in Nepal is low (32 kg and 142gm/ha.yr) its dose per crop in particular area is very high. Different ecological zones of Nepal have different percentages share of total chemical inputs used. Terai contributes the highest percent of chemical use i.e. 62% followed by mid hills which is 27% and Kathmandu valley and high hills contributes 7% and 4% respectively (STSS, 2002).

Most of the land had been degraded during the last 25 years in the agricultural environment of Nepal. For example land area covered with acidic soil has risen from

36% to 61% STSS, LARC, 2002). Almost 98% of the soil is deficient in organic matter and the amount of available Nitrogen, Phosphorus, Potassium in soil is also decreasing (STSS, 2002). Additionally, more than 10,000 hectares of agricultural land in Nepal has been deserted during this time. Although, clear statistical data is unavailable, hardening of soil, drying of water resources and erosion of crop and general biodiversity are the major changes experienced by farmers. In total, there are clear symptoms of degradation of agricultural environment in Nepal. However other research also show that such situations are more positive in organic and sustainable farms (NPG, 1998). Similarly it has also been found in Switzerland, that after 20 years of organic agriculture, production has increased and the intensity of disease decreased significantly,

However, since early nineties, the organized movement in towards organic agriculture was initiated in Nepal in the non-government sector basically under the influence and support of external organizations. Many non-government organizations were established since then to promote this approach in the farmer's field. Some notable organizations are INSAN established in 1086, Nepal Community Support Group (NECOS) established in 1986, Community Welfare and Development Society (CWDS) in 1992, Nepal Permaculture Group (NPG) in 1992, Ecological Service Center (ECOSCENRE) in 1994 and Organic Nepal in 2001.

In the beginning, the government sector was reluctant to accept the concept of organic agriculture as improving agricultural productivity through increased use of chemical fertilizers, pesticides and high yielding varieties was the approach of the government. All the national education, research, extension and communication systems were concentrated in favor of chemical based agriculture. However, it was gradually realized

that the irrational use of these chemical are equally harmful to the environment and the first public sector recognition of organic agriculture in Nepalese agriculture was recorded in the 10th five years plan (NPC, 2003). Now-a-days consumers are very conscious about their health and environment so they are even willing to pay 15-20% more for the organic products (Sharma 2008).

Though sounds as a new terminology, 'organic farming' is not a new concept in Nepalese context, where a very high percentage of agriculture farming is by default organic in nature. This is a good prospect of organic farming development in Nepal. Over a century, dominantly resource poor and subsistent farmers are practicing organic farming in traditional way. As a common phenomenon in Nepalese agriculture system, every farm family keeps a few pair of goats and chickens, a pair of bullock, one or two cows or buffaloes integrated with crop farming. Despite a prealling argument that whether such farming can be called an organic or indigenous knowledge based transforming the system to organic is not difficult in Nepal.

There are increasing number of article and news related to Organic agriculture in the present day's newspaper and magazines. These articles are very helpful to know about the present situation and condition of organic agriculture of the country.

2.2 Most important key to growing organic potatoes

Seed is the most important key to growing any organic crop, and that's especially true for potatoes. There's a wide variation in seed potato quality, and certified seed potatoes will always do best in terms of yield, storage and overall quality.

How do you grow your seed potatoes? We start with tissue-cultured, diseasefree mini-tubers that are produced in a greenhouse or hydroponically. We plant them in spring, and after a couple of generations we have enough to sell. Currently, we cultivate two to four generations each of 23 varieties.

Growing Organic Potatoes Potatoes are a pretty easy vegetable crop to grow, but they aren't the easiest to grow using organic methods. That's because they are prone to quite a few insect pests and diseases that can be a challenge to manage organically. They also require relatively high levels of available nutrients in order to obtain good yields.

A study by Cornell University (Farm Ecosystem and Management Factors Contributing to Pest Suppression on Organic and Conventional Vegetable Farms) compared several wholesale potato farms in New York. Yields on organic farms were found to be lower than yields on conventional farms, in large part because of damage by potato leafhopper, but profits were higher because organic potato prices were higher than conventional prices. Even with a price premium, good organic growing practices are needed in order to assure decent marketable yields.: <http://orgprints.org/10506/01/willer-yussefi-2007-p1-44.pdf>

It Starts with Seed. Organically grown 'seed' potatoes are considerably more expensive than their conventional cousins. The national organic standards require the use of organic seed (and vegetative propagates like tubers) unless they are 'commercially unavailable'

Consult your certifying agency as to how they are interpreting that phrase, since the USDA has not yet defined it. At the very least, you will need to show that you made a

good faith effort to locate the type and quantity of organic seed that you need to plant.

<http://orgprints.org/10506/01/willer-yussefi-2007-p1-44.pdf>

Variety Selection. Choosing varieties is very important for marketing, storage and pest management reasons. Obviously, you need to grow what your customers like - if you can't sell the crop then it hardly matters if was able to tolerate diseases or last through the winter.

There are so many potato varieties to choose from. A few that are common in Northeastern organic markets are Chieftain, Norland, Superior, Yukon Gold, Carola, Yellow Finn, Russian Banana, All Blue, and Caribe, but many other varieties are grown.

Weighing the pros and cons of a variety can get complicated. For example, according to the University of Idaho, Norland is an early round red variety that produces good yields, with moderate resistance to common scab but it's relatively susceptible to Verticillium and tends to lose color and weight in storage. Russet Burbank has good storage, processing, and culinary qualities but it's susceptible to environmental stresses leading to tuber defects, and it may not yield as well in the east. Yukon Gold has a high level of consumer acceptance and name recognition but it's susceptible to internal tuber defects and common scab.

Jim and Meg Gerritsen grow organic seed potatoes at Wood Prairie Farm in northern Maine. For growers with insect problems they recommend Prince Hairy, a variety that has tiny hairs on its leaves. That helps it resist Colorado potato beetle (CPB), potato leafhopper (PLH) and flea beetles. Some growers do not like the taste of Prince Hairy,

and it is also susceptible to scab. Maybe Elba is a variety to try since it has high scab resistance, tolerance to tuber late blight, and seems to tolerate PLH relatively well <http://orgprints.org/10506/01/willer-yussefi-2007-p1-44.pdf> Soil management. As with most crops, adding organic matter to the field can improve soil quality for potato production. However, with potatoes, if the organic matter is too fresh it may lead to soil borne diseases like scab and Rhizoctonia. And while it's common knowledge that lowering the soil pH can help avoid problems with scab, most organic producers grow potatoes as part of a diversified vegetable rotation, so lowering the soil pH is not a viable way to control potato scab since it negatively impacts the yield of other vegetable crops. <http://ofrf.org/organic-faqs>.

To avoid diseases such as Verticillium and insects such as potato beetle, fields should be rotated out of solanaceous family crops (tomatoes, peppers, eggplant, tobacco) for at least 3 years. To minimize potato beetle pressure, it is ideal to plant potatoes a long distance from last year's fields, and if possible to have a road or river between the two.

Legume cover crops should not be grown ahead of potatoes, since this can encourage scab, nor should sod crops, since they may increase wireworm populations. On the other hand, small grains, corn or sorghum-Sudangrass may benefit a potato crop that follows. In Maine, some growers have used Japanese millet as a cover crop in the year prior to potatoes in an effort to reduce Rhizoctonia, which causes symptoms on potato skin that looks like 'dirt that won't wash off.'

Many organic growers do not apply compost directly before planting potatoes, in order to keep scab pressure down. Instead, potatoes occupy a place in the rotation where they can

use residual nitrogen from heavier applications of organic matter amendments in previous years.

Potatoes produce a lot of biomass, so it makes sense that they have relatively high N, P and K requirements. To meet soil test recommendations, organic growers may need to apply more bagged nutrients to potatoes than to most other vegetable crops. Placing these materials in the row prior to planting is one way to minimize cost and avoid feeding weeds between the rows (Willer and Yussefi: 2008).

Pest Management. Mechanical weed control is relatively easy in potatoes, because they are hilled. But don't delay; cultivate shortly after the plants emerge, then hill frequently, at no more than 2-week intervals, until the canopy closes. This usually keeps weeds from getting a foothold.

CPB and PLH are the two main insect pests for most organic producers. One you can see easily, and the other one may take you by surprise. CPB overwinters adjacent to potato fields and the emerging adults are hard to miss, hanging out on the plants and laying eggs that soon hatch into slug-like larvae. Both adults and larvae can be killed with an organic formulation of Spinosad. Small larvae can be selectively controlled with a product containing the B.t. bacterium that is toxic only to CPB and their close relations. Unfortunately, there are currently no organically-approved formulations of B.t. for use on Colorado potato beetles.

Potato leafhopper does not overwinter in most locations but arrives on the wind. The damage they cause is called hopperburn, and it makes the foliage to go down early in the

season, reducing yields. Because PLH are somewhat hard to see due their small size and light green color, they are often not detected by growers until populations are quite high and a ‘cloud’ of them appears when plants are brushed. Scouting leaf undersides and axils is the best way to note their arrival and have time to treat before they build up.

Organic insecticides are not particularly effective, but growers have had some success with combinations of neem extract and pyrethrins. Good coverage of foliage is crucial.

http://organic.colostate.edu/documents/Thilmany_paper.pdf.

Potatoes are subject to many diseases and physiological disorders. Early and late blight, potato scab, rhizoctonia, and hollow heart all commonly affect organic as well as conventional producers. Timing can also help, for example, the threat of late blight can be minimized by growing early varieties that mature before windborne late blight spores become common. Prompt harvest (along with use of disease-free seed) can minimize infection by Rhizoctonia because a lot of infection occurs after the vines die. Hollow heart, a disorder caused by too-rapid growth, can be minimized by close spacing and relatively early harvest. : <http://www.extension.org/organic%20production>

What is the Value of Organic Products to Consumers?

Researchers have studied consumer preferences for, willingness to pay for, and perception of value of organic products. Organic consumers are diverse in age and gender as well as social, economic, and educational status. They purchase organic products for a variety of reasons including taste, environmental and social benefits, and a belief that organic products are healthier (Willer and Yussefi, 2008)..

CHAPTER-III

RESEARCH METHODOLOGY

This part reveals the way and methods used to conduct this study. Any empirical work requires sound methodology. Natural sciences have their own method based on objectivity and practical research. Since present study is also an empirical research on Organic Potato Farming in Mulung. It requires a scientific method for the study. Therefore for conducting the present research principles and methods of science have been adopted. As for traditions in Rural Development research field-work based scientific method has been adopted.

A research design has been planned on the basis of scientific method used in social science especially sociology. Only within last two or three hundred years has the scientific method become a common way of seeking answers about the natural world. Science has become a source of knowledge about the social world even more recently, yet in the brief period since researcher began to rely upon the scientific method; researcher has learned more about the world that had learned in the proceeding ten thousand years. The spectacular explosion of knowledge in the modern world parallels use of the scientific method.

3.1 Research Design

This study was carried out mostly on the basis of exploratory research design as because the study was done focusing on constraint and potentiality of organic farming in the study

area. The study was tried to explore and cover all aspects of organic farming and its role for the rural development in the study area.

Besides, the study was made an attempt to describe the thing related to organic potato farming such as history of organic farming; potentiality and constraint 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 potato farming has higher potentiality in the Molung -4 Okhaldhunga district. This district is located at Eastern Development region has suitable climate for agriculture. Its fertile and plain land, access of transportation helps the farmer to cultivate and market its product. This is why this district has large area covered by farming but Molung -4 highly practiced organic potato farming. District so it is accessible to conduct research. Different types of ethnic caste live in this village. Among which called higher caste (Brahaman, Chettri, Newaretc.) are literate so they are attracted towards organic product due to its advantages. On the other hand Janjatis and Dalits are not aware of it. I choose this area to find out their thinking and to aware janjati and Dalit about organic potato farming and how its lifts life standards because of high cost of organic products.

3.3 Nature and Sources of Data

Socio economic data was collected for the study. The collected data were both qualitative and quantitative. Both primary and secondary data were used to describe and analyze the study area. The primary data was 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 unpublished written documents from individuals, experts and organization related to the potato farming sector. Data collection was both in qualitative and quantitative nature as needed. Qualitative data like observation and interview were collected and Quantitative data like number of consumer, farmer related data social status data etc. also have been collected.

3.4 Sampling procedure

The universe of the study was the people of the Molung -4 Okhaldhunga district, household having organic potato farming and other informative local people chosen according to quota sampling as well as random sampling was also applied in order to take household survey.

Among 381 households in Molung - 4, for sampling procedure 100 households having organic potato farming was chosen randomly. A random sampling is a sample that is chosen randomly. Present researcher has choosen simple random sampling method to avoid bias. It is not quite as simple as it seems: chooseing a random sample is not as sample as just picking 100 people from

farmers, consumer and sellers of organic potato in Molung. The first step present researcher was divided the population into exclusive subgroups such as cast, sex, economic background. Same proportion was applied in the sampling process. Finally, the researcher selects subjects from the various subgroups while taking into consideration the proportions noted in the previous step.

3.5 Data Collection Tools and Techniques

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

3.5.1 Interview

Interviewing is one of the major methods of data collection in qualitative research. It may be defined as a two-way systematic conversation between an interviewer and an informant, initiated for obtaining information that is relevant to a specific study.

Furthermore, it can be defined as a face to face verbal. Interchange in which one person, the interviewer, attempts to elicit information or expression of opinion or belief from another person or persons.

An interview is a spoken exchange of information and it is an excellent method of gaining access to information about events, opinions and experiences.

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 was asked to the respondents and answer was filled up to collect the required information.

3.5.2 Observation

Observation methods are powerful tools for gaining insight into the situations and are a more useful means of gaining understanding about the phenomena and processes involved in a given situation. Similarly, it allows the researcher to access the context

within which participants act, behave and interact in their 'natural' setting or situations. Hence, direct and indirect observational method has been conducted for the collection of data in this study. Observation method plays a vital role both to understand the situation, facts, systems, behaviour etc. and also to check and justify the answers given by the respondents by their facial expression, body language, outlook etc. and helps to justify and answers provided by them and further facilitate to understand and judge whether the information is truth or not to a large extent.

3.5.3 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. The interview was taken as cross checking for data obtained from questionnaire. The information was collected from farmers, consumers, and labor involve in organic potato farming. List of the key informants are given in Appendix.

3.6 Reliability and validity of the data

Primary as well as secondary data were used in this study. Primary data was collected during the field study and secondary data is taken from documents and related literature. This study is related to organic potatoes farming. The data was first hand and it was real because the researcher was taken interview personally. Validity and reliability of the tools were maintained by related literature review. A research guide and exports has consulted for research study and review of the questionnaire. Validity and reliability of the tool has maintained by pre- testing.

3.6 Method of Data Analysis

The data was analyzed in two ways; descriptive and analytical. Descriptive analysis consists of concrete description about the growers and their farm product regarding available sources of data. It further presents the input to output feedback of the cultivation to identify the problems of the growers. In the analytical method, the study presents an execution weather the potato cultivation is increasing or decreasing. It deals with comparative analysis about the cultivation to fulfill the above mentioned objectives

CHAPTER- IV

ANALYSIS AND INTERPRETATION

The Okhauhunga District is one of 75 Districts of Nepal and is located in the Eastern part of Nepal. There is high potential in organic agriculture. People are engage in organic farming as well as non-organic farming.

Potato Nutrition: Potatoes provide the carbohydrate; potassium and energy that we need to perform at our best. More energy-packed than any other popular vegetable, potatoes have even more potassium than a banana. Plus, there's a potato option to fuel your body and brain throughout the day — whether you lead an active lifestyle or are competing with elite athletes.

One medium potato with skin provides 620 milligrams or 18% of the recommended daily value (DV) of potassium per serving and is considered one of the best foods with potassium. Skin- on potatoes rank highest for foods with potassium and are among the top 20 most frequently consumed raw vegetables and fruits. Potassium is a mineral that is part of every body cell. It helps regulate fluids and mineral balance in and out of cells and in doing so, helps maintain normal blood pressure. Potassium is also vital for transmitting nerve impulses or signals, and in helping muscles contract.

4.1 Socio-Demographic Characteristics

The study was carried out in order to learn the potentiality and constraints of organic Potato farming in Molung 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.

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.

4.1.1 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 4.1: Sample Population Structure of the Study Area

Streams	No. of Respondents	Percentage
Respondents having Potato farming	30	30
Respondents consumers of organic Potato farming	48	48
Respondents involved in different sectors	22	22
Total	100	100

Source: Field survey, 2017

Table presented above shows the sampled population for the study, which shows that respondents from household having Potato farming and consumer of Potato farming 30 and 48 respectively and respondents from different sectors are 22.

4.1.5 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 61 which is presented in tabulated form.

Table No.4.4: Age wise Distribution of the Respondents

Age-group	No. of Respondents	Percentage
Below 30	24	24
31-45	32	32
46-60	18	18
Above-61	26	26
Total	100	100

Source: Field Survey, 2017

Above table explains that from the total respondent age below 30 were 24, age group 31-45 were 32, age group 46-60 were 18 and age group above 61 were 26 respondents. From the sampled population it can be determined that mid-aged people and old people are more than the young and enthusiastic population aged below 30.

4.1.6 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 Molung area is mostly dominated by Brahman community, so most of the

respondents were from Brahman community, whereas some respondents were from Tamang community or Dalit community too. Beside few sampled population belongs to Magar community. So following table is presented to see the caste distribution of the respondents.

Table No.4.5: Caste wise Distribution of the Respondents

Caste	No. of the respondents	Percentage
Brahman/Chhetri	68	68
Tamang	12	12
Pariyar	8	8
Magar	12	12
Total	100	100

Source: Field Survey, 2017

As illustrated in given table it can be learned that 68 respondents from the sample population were from Brahman/ Chhetri community, 12 from Tamang, 8 from Pariyar and 12 from Magar.

4.1.7 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. 4.6: Education Status of the Respondent

Levels	No. of Respondents	Percentage
Illiterate	16	16
Literate	60	60
Above SLC	24	24
Total	100	100

Source: Field Survey, 2017

From the above tabulated data it can be learned that 60% of respondents were literate, whereas 16% couldn't read and write, remaining 24% have passed SLC and few were University students.

4.2 Level of awareness among farmers about organic Potato farming

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.4.7: Level of awareness among farmers about organic Potato farming.

Description	No. of respondents	Percentage
Healthy	10	33.3
High nutritional value	4	13.3
Free from chemical pesticides and fertilizers	8	26.7
Animal friendly techniques	4	13.3
I don't know	4	13.3
Total	30	100.0

Source: Field survey 2017

Above table explains that 33.3% farmers said organic Potato is healthy,13.3% went in favor of high nutritional value, whereas 26.7% thinks it is free from chemical pesticides and fertilizer,13.3% said this type of farming is animal friendly and the same percentage have no idea about this type of farming. Thus, this table clearly shows farmers are more awareness about organic Potato.

4.2.1 Main Purpose of the Organic Potato Cultivation

Most of the households of Molung have started organic Potato farming from the commercial point of view. Out of the total hundred sampled households, thirty percent households are engaged in the organic Potato cultivation from the commercial purpose.

Table No.4.8: Main Purpose of the Organic Potato Cultivation

S.N	Description	Households	Percentage
1	Self-Consumption Only	6	20.0
2	Commercial Production	10	33.3
3	Both(Consume/Commercial)	14	46.7
	Total	30	100.0

Source: Field survey 2017

According to this table Main purpose of the organic Potato farming is self-consumption was found 20%, commercial production was found 33.333% both found 46.666%.

4.2.2 Production during the Last Three Year (in kg)

Table No. 4.9: Production during the Last Three Years

Production Kg/HHs	Year 2071	Year 2072	Year 2073
0-150	4	6	4
150-1000	6	6	14
1000-1500	8	12	6
1500-above	6	6	6
Total	24	30	30

Source: Field Survey-2017

Out of sampled households 6 households did not produce organic Potato during year 2071. The data shows the increasing trend in organic Potato production. The number of farmers producing 150-1000 kg organic Potato is increasing from two households in 2072 to three households in 2073.

4.2.3 Income from Organic Potato Rs/ Year

Table No.4.10: Income from Organic Potato

Income R.s /Year	2071	2072	2073
0-40000	2	5	3
40000-80000	2	3	2
80000-120000	4	2	3
120000-160000	3	3	3
160000-above	1	2	4

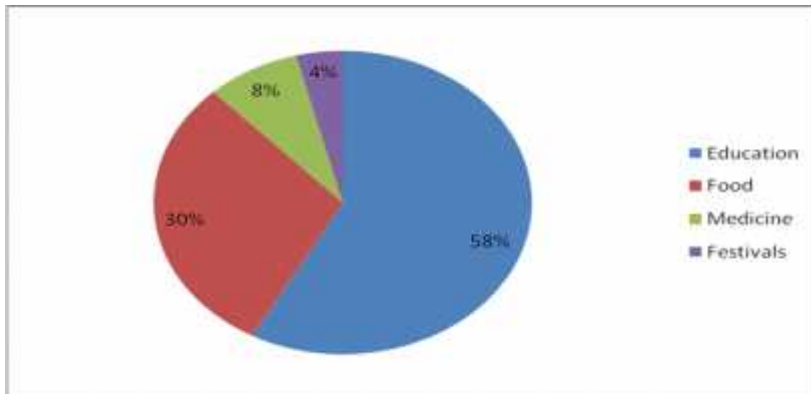
Source: Field Survey, 2017

Table 4.10 shows that income from organic potato farming is satisfactory. It is slightly increasing rate. Income of 2073 is more than the year of 2071.

4.2.4 Pattern of Expenditure in Sampled Households (based on 1st priority)

The people of Molung VDC have spent their income in education, food, medicine, festivals and religious occasions. But the priority of their spending seems varied. Farmers in the study area have given different priorities to different expenditure headings. Some people have given priority to food, some people have given priority spending in religious occasions, ceremonies and festivals, those which do not have problem in food catering activities, have spent their income in the ceremonies, festivals and the education, but those which have some problem to cater food spent in food grains.

Figure No. 4.2: Pattern of Spending



Source: Field Survey-2017

According to this figure peoples are spend 58% their money for education, 30% for food, 8% for medicine and 4% for festivals.

4.2.5 Comparative Benefit from Organic Potato Farming:

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

Table No.4.11: Comparative Benefit from Organic Potato Farming

S. N	Description	Households	Percentage
1	From Cereal Crops	14	46.7
2	From Organic Potato	16	53.3
	Total	30	100.0

Source: Field Survey-2017

53 % respondents believe that they are getting comparative benefit from organic Potato, whereas, few farmers believe that cereal and food grain production is more beneficial than organic Potato.

4.2.6 Influence of Organic Potato in Economic Condition

Out of sampled households forty percent households have feel good influence on economic condition, sixty percent households have feel general and nobody have felt that the organic Potato farming did not contribute any more to improve economic condition.

Table No.4.12: Influence of Organic Potato in Economic Condition

S. N	Description	Households	Percentage
1	Good	12	40
2	General	18	60
3	No	0	0
	Total	30	00

Source: Field Survey-2017

40 % respondents are influence of organic potatoes farming are feeling good where as 60 % are feeling normal

4.3 Potential of organic farming

4.3.1 Land Holding Size:

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 hundred sampled households. It shows that an average household owns lands between 10-20 Ropanni.

Table No 4.13: Land Holding Size

S.N	Land Description (Ropanni)	Households	Percentage
1	0-10	28	28
2	10-20	46	46
3	20-30	10	10
4	30+	16	16
	Total	100	100

Source: Field Survey-2017

Only 16 % respondents have more than 30 Ropanni of land 10 % respondents have 20 – 30 Ropanni. 46 % respondents have 10-20 Ropanni of land and 28 % respondents less than 10 Ropanni of land.

4.3.2 Cultivated Land for Food Grains and Other Crops

Normally Hilly areas of Nepal have limited cultivated land due to difficult geography as well as low quality of soil of the land.

Table No 4.14: Cultivated Land for Food Grains and Other Crops

S. N	Cultivation land (in Ropanni)	Households	Percentage
1	0-10	24	24
2	10-20	46	46
3	20-30	12	12
4	30+	18	18
	Total	100	100

Source: Field Survey-2017

Out of total cultivated land 24 percent House Holds (HHs) have 0-10 Ropanni land, 46 percent HHs have 10-20 Ropanni land, 12 percent HHs have 20-30 Ropanni land and 18 Percent HHs have 30 above Ropanni land.

4.3.3 Consumers taste about organic product

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 shows that most of the consumers taste about organic product.

Table No.4.15: Consumers taste about organic Potato

Description	Households	Percentage
Health for me and my family	12	25.0
Taste good	16	33.3
Fresh	12	25.0
Saving resources for next generations	6	12.5
It has fashion	2	4.2
I don't know	0	0
Total	48	100.0

Source: Field Survey-2017

The data reveals that 25% households says that organic Potato is health for me and my family like that 33.3% households says that taste is good, 25% households says that fresh, 12.5% households says that saving resource for next generations , 4.2% says that it has fashion, and nobody says that I don't know.

4.3.4 Family size of the Respondents

Members of the immediate family may include a spouse, parent, brother and sister, and son and daughter. Members of the extended family may include grandparent, aunt, uncle, cousin, nephew and niece, or sibling-in-law.

Family sizes of the sampled population were determined from the sample respondents who were representing household having Potato farming households consumers any other sector. So the following table shows the family size of the respondents:

Table No.4.16: Family size of the Respondents

Family member	No. of respondents	Percentage
Below 3	30	30
3-5	50	50
Above 5	20	20
Total	100	100

Source: Field Survey, 2017

So from the above table it can be determined that family having 3-5 members were of 50 respondents, whereas family whose members were less than 3 were 30 respondents, and 20 respondents were from the family whose members were more than 5.

4.3.5 Farmers engaged in farming

Most of the youth do not like to engage in the farming. Educated as well as sound economic condition's families are not so much interested in the farming for business proposes.

Table No.4.17: Members engaged in farming

S.N	Person/ HHs	Number of Households	Percentage
1	1	18	18
2	2	66	66
3	3+	16	16
	Total	100	100

Source: Field Survey-2017

Of the total households there is at least one person involved in farming in eighteen percent households, at least two persons involved in sixty-six percent households and three or more people involved in sixteen percent households.

4.3.6 Major Occupation of the Respondents

Most of the people of the study area were involved in agriculture beside some of them are found to be engaged in different other sector as well. From the sampled population they were distributed in following tables on the basis of their involvement in different occupation.

Table No.4.18: Major Occupation of the Respondents

Occupation	No. of the respondents	Percentage
Farming	60	60
Teacher	12	12
Private job holder	8	8
Animal husbandry	20	20
Total	100	100

Source: Field Survey, 2017

60 % respondents are engaged in Farming as a major occupation where as 20 % respondents are involve in animal husbandry. 12 % are involved as teaching whereas only 8 % respondents have private job.

4.3.7 Main Sources of Income

Agriculture is the main occupation of the Molung areas so it is the main sources of income.

Table No.4.19: Main Sources of Income

S.N	Income source	Households	Percentage
1	Agriculture	80	80
2	Agriculture + Service	20	20
	Total	100	100

Source: Field Survey-2017

Agriculture is the main sources of income of the study area. 80 % respondents reported that agriculture is the main sources of income whereas only 20 % respondents have income from service.

4.3.8 Irrigation System

Irrigation is the main problem of agriculture in the Molung areas. Better irrigation is essential in the organic potatoes farming areas.

Table No.4.20: Irrigation System

S. N	Description	Households	
		Before Five Year	At Present
1	Pipe	4	32
2	<i>Plastic Pokhari</i>	0	26
3	Rain Water	96	42
	Total	100	100

Source: Field Survey-2017

Five years back, for irrigation purpose out of sampled households four percent farmers had piped water, no-one had plastic ponds and ninety-six percent farmers were depend on rain water for irrigation. But now thirty-two percent farmers have piped water for irrigation, twenty-six percent farmers have plastic ponds and forty-two percent farmers are still depending on rain water for irrigation.

4.3.9 Sources of Organic Plants

The easy availability of plants has also helped in extending the organic cultivation. Due to the easy access of plants has helped the people of Molung to be motivated to organic cultivation. About eighty-four percent farmers get plants from local nursery.

Table No 4.21: Source of Organic Seeds

S.N	Sources	Households	
		Before 5 year	At present
1	Out of Districts	26	0
2	Local Areas	74	84
3	Own House	0	16
	Total	100	100

Source: Field Survey-2017

Now, present research area is self-depend in the organic seeds of potatoes in comparison of before five years.

4.3.10 Access of transportation

Transportation is very important for farming. In the study area, there was enough road and vehicle facility for transportation.

Table No.4.22 Access of transportation

S. N	Description	Households	Percentage
1	Access of road	100	100
2	Not access of road	0	0
	Total	100	100

Source: Field survey2017

According to this table all sample households said access of road in their place. So this place is very suitable for farming.

4.3.11 Facility of information technology

Information technology give information for farmer about organic farming.so it makes easy their farming.

Table No.4.23

Facility of information technology

S. N	Description	Households	Percentage
1	Use	100	100
2	Not use	0	0
	Total	100	100

Source: Field survey2017

This table shows that every households get facility of any kind of information technology.

4.4 Problem of farmers in Potato farming

4.4.1 Lack of Training in the Organic Potato Farming

Regarding the training availability 26.7 percent have got opportunity of training related to the Potato farming while 73.3 percent farmers have not got any opportunity of training. According to the farmers, they have been given training such as about soil management, nursery management etc.

Table No. 4.24 Lack of Training in the Organic Potato Farming

S.N	Description	Households	Percentage
1	Trained	8	26.7
2	Untrained	22	73.3
	Total	30	100.0

Source: Field Survey-2017

73 respondents have not get chance to take training about the potatoes farming. Only 26 % respondent's got chance to get training of potatoes farming.

4.4.2 Satisfaction status from Selling Price

Out of sampled households forty percent households seem satisfied with selling price of organic Potato, whereas sixty percent households are not-satisfied with selling price of organic Potato.

Table 4.25 Satisfaction status from Selling Price

S. N	Description	Households	Percentage
1	Satisfied	12	40
2	Not-satisfied	18	60
	Total	30	100

Source: Field Survey-2017

40 % respondents are satisfied from the selling price where as 60 % are not satisfied.

Cost of the production is high in organic farming.

4.4.3 Not application of Modern Techniques in farming

Modern technique is essential part for farming, especially in organic Potato farming. But only few farmers use modern techniques, so they are worried about their farming system.

Table No.4.26: Application of Modern Technique in Potato Production:

S. N	Description	Households	Percentage
1	Applied	12	40
2	Not-applied	18	60
	Total	30	100

Source: Field Survey- 2017

The table shows that 40% household applied modern techniques in their farming and 60% households said that not applied. So we conclude that lack of modern techniques in their farming

4.4.4 Causes of Not Application of Modern Techniques

The role of modern techniques and tools are significance in organic Potato. Modern tools and techniques help producing quality Potato and also reduce the number of labors. But, as discussed earlier very few people are using it's mainly because people have very few knowledge about it and machine are not available easily. Of the total 30 households only two household has modern equipment, Remaining 28 households lacking such equipment. The main reason behind the lack of such modern machines is lack of knowledge about such equipment. Other reasons are as follows:

Table No.4.27: Causes of Not-application of Modern Techniques

S. N	Description	Households	Percentage
1	Lack of Knowledge	8	28.6
2	Unavailability of Instruments	12	42.8
3	Too Risky	8	28.6
	Total	28	100.0

Source: Field Survey-2017

42 % respondents are interested to use modern techniques but unavailability of instruments is the main problem for them. 28% are not using modern techniques due to lack of knowledge. 28 % feel that it is risky so they are not using modern techniques.

4.4.5 Main Insects and Disease in Organic Potato Plantation

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 reported.

Table No.4.28

Main Insects and Disease in Potato Plantation

S. N	Description	Households	Percentage
1	<i>Potato leaf roll</i>	6	20.0
2	<i>Verticillium wilt</i>	8	26.7
3	<i>Black dot</i>	12	40.0
4	No any disease	4	13.3
	Total	30	100.0

Source: Field Survey-2017

Of the selected households main disease in Potato farming seems “Black dot”. Forty percent farmers are suffering from it. 26.7 percent are affected by *Verticillium wilt*, twenty percent are affected by and 13.3 percent " potato leaf roll" haven't seen any kind of problem.

4.4.6 Problems of Seasonal Disease

The table below reveals that the Potato farming is affected by disease during fruiting season. About sixty of farmers were suffering at this stage of cultivation. Very few farmers were suffering before flowering.

Table No.4.29: Problems of Seasonal Disease

S. N	Description	Households	Percentage
1	Before Mature	4	13.3
2	In the Time of Mature	8	26.7
3	Fruiting	12	40.0
4	Not any time	6	20.0
	Total	30	100.0

Source: Field Survey-2017

Normally at the time of the mature potatoes may chance to attack by the seasonal disease especially in the time of the winter.

4.4.7 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.4.30: Methods of Prevention of Disease

S. N	Methods	Households	Percentage
1	Indigenous	16	53.3
2	Modern	4	13.3
3	Not any methods	10	33.3
	Total	30	100.0

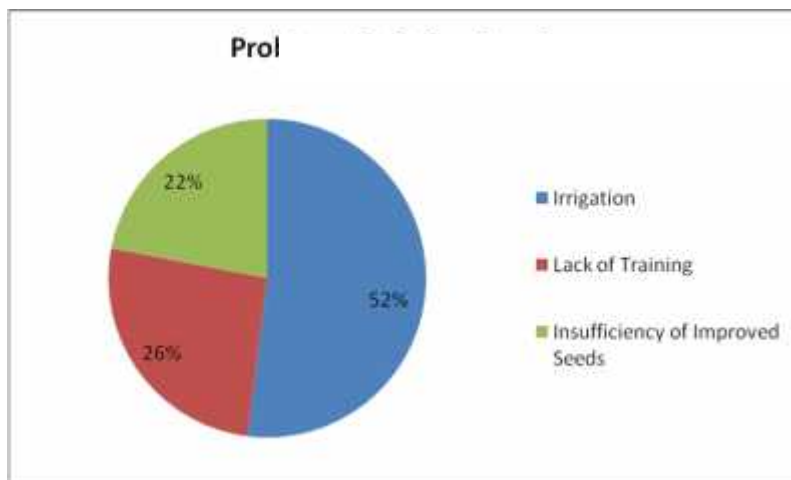
Source: Field Survey-2017

Indigenous methods also are used for prevention of the diseases. For instance Daduwa is not properly care after the attraction of the disease.

4.4.8 Problems of Organic Potato Production

This chart below reveals the fact that irrigation is the major problem in Potato production. Fifty-two percent households have irrigation problems. Twenty-six percent do not have Potato related training and twenty-two percent have not sufficient improved seeds

Figure No.4.3: Problems in Organic Potato Production



Source: Field Survey-2017

Irrigation is the main problem in the Molung areas for farming. 52% land don't have good irrigation facilities. Similarly there is not training. Better and improved seeds is also another problem in the study area.

4.5 PROBLEMS AND PROSPECTS

4.5.1 Problems

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

4.5.2 General Problems

Organic potato 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 potato farming.

It is obvious that irrigation is very important. The majority of farmers have established potato farm without irrigation facility. Lack of irrigation facility was seen as the main problem in potato farming. Most of the farmers have not any irrigation facility on their farm. Very few area of Molung were facilitated with plastic ponds and some people of Molung were facilitated with piped water supply and they have also managed water for irrigation and drinking purpose, but there are still some people who have lot of difficulties relating to irrigation facilities in organic Potato cultivation. Lack of knowledge and training (potato cycle training) was seen as the major problems in potato farming. The majority of farmers have not proper knowledge and training. Such training

must be provided by the government or potato related agencies. Due to the scarcity of technical knowledge, most of the cropping patterns are traditional in nature. Land preparation and layout, nursery establishment, use of fertilizer or compost and pesticide etc. are the areas that farmers should be trained and consulted. Therefore, training is necessary in the study area as well as district level in order to make them familiar with potato technology. Though there are some institutions to provide training to potato farmers, but it is not sufficient to impart potato cycle and leadership trainings.

5.5.3 Problems of Disease and Insect Pests

Due to the lack of technical know-how and technical assistance, potato growers are facing so many problems of disease and insect pests. The problem of insect pests was the main reason of low productivity and low quality of potato. The main problem of insect pest was (*Black dot*) which was reported by forty percent households. The next serious disease was "*Verticillium wilt*". About twenty-six percent households were facing this problem. The problem of "*Potato leaf roll*" was reported by twenty percent of the total sampled households.

This is also serious problems for potato farming. Almost all farmers are being discouraged from potato 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. The service provided by ADB/N is not sufficient to meet the requirement.

4.5.4 Prospects

Generally, all the prospects have some problems. Similarly, potato farming also has some problems as mentioned above. However it has bright prospects in the study area as well as mid Tarai region of eastern part of Nepal. Commercially, it is more profitable than other cultivation of traditional cereal crops. Topographically and climatically, the study area is suitable for potato production. At the same time there is not serious problem in transportation facility also. Though very few potato growers reported the problem of transportation, it was very small numbers. So, it has better economic prospects for the cultivation of potato farming. Thus if all the farmers of the study area grow the potato 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 potato has not only given the better income for potato growers, 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 potato farming.

By growing potato plant, the environmental balance can also be maintained by checking the, soil erosion, drought, floods which the problem are facing by Tarai well as other regions of the country.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of the Study

In the Molung village, Eastern part of Nepal including the study area, where the climatic condition is favorable, the potato farming could be a major source of cash income. Unfortunately, the potato growers have not been able to gain reasonable returns from the production process. Thus this study has made attempts to evaluate the profitability of potato production compared to the prevailing pattern of food grain like paddy, maize, wheat, millet.

Potato production has become one of the most important alternative ways of earning in Molung, where many farmers have been attracted towards Potato cultivation.

All respondents have land in the study area but inequality was found in the study area. Most of the plants of potato were found yet to be productive and many of them were just starting to bear potato beans.

Thus, if farmers invest some amount at the initial stage of farming, it gives regular return for long period.

The potato growers reported about many other problems connected with farming such as lack of knowledge and training, lack of technical support, lack of leadership development training, problems of insect and disease, financial problems etc. In order to minimize this

problem of farming people express need of good government policy and some of the farmers expressed the need for potato farming insurance.

5.2 Major Finding of the Study

Among the sample population 68 respondents from the sample population were from Brahman/ Chhetri community, 12 from Tamang, 8 from Pariyar and 12 from Magar.

It can be learned that 60% of respondents were literate, whereas 16% couldn't read and write, remaining 24% have passed SLC and few were University students. Main purpose of the organic Potato farming is self-consumption was found 20%, commercial production was found 33.333% both found 46.666%. Among the sample population 53 % respondents believe that they are getting comparative benefit from organic Potato, whereas, few farmers believe that cereal and food grain production is more beneficial than organic Potato.

Only 16 % respondents have more than 30 Ropanni of land 10 % respondents have 20 – 30 Ropanni. 46 % respondents have 10-20 Ropanni of land and 28 % respondents less than 10 Ropanni of land. Out of total cultivated land 24 percent House Holds (HHs) have 0-10 Ropanni land, 46 percent HHs have 10-20 Ropanni land, 12 percent HHs have 20-30 Ropanni land and 18 Percent HHs have 30 above Ropanni land. It can be determined that family having 3-5 members were of 50 respondents, whereas family whose members were less than 3 were 30 respondents, and 20 respondents were from the family whose members were more than 5. Total households there is at least one person involved in farming in eighteen percent households, at least two persons involved in sixty-six percent households and three or more people involved in sixteen percent households..

Agriculture is the main sources of income of the study area. 80 % respondents reported that agriculture is the main sources of income whereas only 20 % respondents have income from service. Five years back, for irrigation purpose out of sampled households four percent farmers had piped water, no-one had plastic ponds and ninety-six percent farmers were depend on rain water for irrigation. But now thirty-two percent farmers have piped water for irrigation, twenty-six percent farmers have plastic ponds and forty-two percent farmers are still depending on rain water for irrigation. Indigenous methods are also used for prevention of the diseases. For instance Black dot is not properly care after the attraction of the disease. Irrigation is the main problem in the Molung areas for farming. 52% land don't have good irrigation facilities. Similarly there is not training. Better and improved seeds is also another problem in the study area.

Organic potato 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 potato farming. It is obvious that irrigation is very important. The majority of farmers have established potato farm without irrigation facility. Lack of irrigation facility was seen as the main problem in potato farming. Most of the farmers have not any irrigation facility on their farm. Very few area of Molung were facilitated with plastic ponds and some people of Molung were facilitated with piped water supply and they have also managed water for irrigation and drinking purpose, but there are still some people who have lot of difficulties relating to irrigation facilities in organic Potato cultivation. Lack of knowledge and training (potato cycle training) was seen as the major problems in potato farming.

The majority of farmers have not proper knowledge and training. Such training must be provided by the government or potato related agencies. Due to the scarcity of technical knowledge, most of the cropping patterns are traditional in nature. Land preparation and layout, nursery establishment, use of fertilizer or compost and pesticide etc. are the areas that farmers should be trained and consulted. Due to the lack of technical knowledge and technical assistance, potato growers are facing so many problems of disease and insect pests. The problem of insect pests was the main reason of low productivity and low quality of potato. The main problem of insect pest was (*Black dot*) which was reported by forty percent households. The next serious disease was "Verticillium wilt". About twenty-six percent households were facing this problem. The problem of "*Potato leaf roll*" reported by twenty percent of the total sampled households. This is also serious problems for potato farming. Almost all farmers are being discouraged from potato 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. The service provided by ADB/N is not sufficient to meet the requirement. By growing potato plant, the environmental balance can also be maintained by checking the, soil erosion, drought, floods which the problem are facing by Tarai well as other regions of the country.

5.3 Conclusion

Molung is one of the villages that have huge potentiality of farming development, so the study is conducted in order to find the potentiality and constraint of organic potato farming in the study area, to assess the level of awareness among the farmers about organic potato farming, to identify the problems of potato growers, to explore potentiality of organic potato farming. From the previously mentioned finding, it can be concluded that Molung has huge potentiality of organic potato farming. This area is geographically and climatically suitable for potato farming, at the same time there is no problems of transportation facility, in this area most of the people have tradition of animal husbandry. The wastages (animal dung) are the best organic fertilizer for organic farming which will be easily available. This farming is easy in this village because different types of facilities are available like information technology, availability of large numbers of labor, fertile land and indigenous knowledge etc.

This area has a different challenge which stands as hindrance in the pace of organic farming development in this area. Lack of sufficient irrigation facility was seen as the main problem in organic farming most of the farmers were dependent on rain water. The majority of farmers have not proper knowledge and technical assistance; potato growers had been facing so many problems of disease and insect pests, no reasonable price of products. This is also serious problems for organic potato farming. They are not getting proper support from state sector.

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 potato

farming place in near future if the challenges and constraints are mitigated in the proper way.

5.4 Suggestions

Molung is considered as suitable area for potato, 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 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 potato can be sold at reasonable price at reasonable time.
-) After studying different aspects, it is concluded that we can develop and expand the potato plantation area and launch package program in selected area to make organic farming more reliable and trustworthy.
-) In Nepal, organic potato 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 potato production group should be supported by giving them technical, economic, physical and other helps. They are the real organization of field workers.

-) The way of potato 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, potato 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.

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QUESTIONNAIRES

Questionnaires for households having organic potato farming

1. Personal Introduction

Name.....

Age.....

Sex.....

Family members.....

2. What is your educational status?

a) Educated b) Literate c) Illiterate

3. Since when did you start organic potato farming?

.....

4. What is your major income source?

a) Business and organic potato farming.

b) Animal husbandry and potato farming.

c) Job holder and potato farming.

d) Others.

5. How did you know about organic potato farming?

.....

6. How many members are engaged in organic potato cultivation from your family?

.....

7. Have you got training about organic potato cultivation?

a) Yes

b) No

8. If yes, from which organization?

.....

9. How would you describe organic potato?

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

10. Do you think government bodies have been helping to develop organic potato farming?

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

11. Do you suggest other household to start organic potato farming?

- a) Yes b) no

12. What types of problems did you face in this farming?

.....

13. How did you manage financed for organic potato farming?

.....

23. In your opinion who is the responsible person to develop your area as organic agriculture?

.....
.....

24. What efforts are made from this side?

.....

25. What kinds of role does it play in decrease of environment pollution?

.....

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

.....

QUESTIONNAIRES FOR CONSUMERS AND OTHER SECTOR PEOPLE

1. Personal introduction.
Name.....
Age.....
Sex.....
Occupation.....
Family members.....
2. What is your educational status?
a) educated b) illiterate c) literate
3. What is your occupation?
a) business b) job holder
c) farming d) others
4. Have you started to consuming organic potato?
a) yes b) No
5. Approximately when did you start buying organic potato?
a) more than 5 years b) 1-3 years
c) Last year d) last 6 months
6. Who is generally responsible in your house for the organic potato shopping?
a) yourself b) other person
c) yourself and another person together

7. I buy organic potato because.....

	Strongly agree	Agree	Neutral	Disagree	Strongly 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						

8. What kinds of differences did you find between organic and inorganic potato?

9. Did you find organic potato expensive than inorganic potato?

a) yes b) no

10. If yes, then why do you buy organic potato?

11. Do you want to start growing organic potato in your house?

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

12. Do you think your area has potentiality for organic potato farming?

a) yes b) no

13. How has organic potato positively affected in your health?

14. Is organic potato easily accessible in your area?

a) yes b) no

15. What kind of role can you play to promote organic potato farming?

16. Have you ever suggested others to buy organic potato?
a) yes b) no
17. Where did you get the information about consumption of organic potato?
a) Media b) NGO c) Friends & relatives
d) Others
- 18) If organic potato is not available for a while, you prefer inorganic potato or stop consuming it?
.....
- 19) Do you feel confident about purity of organic potatoes while buying?
a) yes b) no c) doubtful
- 20) Is the supply of organic potato adequate for the consumer?
a) yes b) no c) do not know
- 21) Do you have any other opinion than what I asked?
.....

(Thank you for your valuable time)