# UNIT I

# INTRODUCTION

## 1.1 Background of the Study

Agriculture has long been in the mainstream of Nepali society; the topography and natural resources of Nepal are quite suitable for agricultural production. Though its topography determines only 28% of cultivable land, 21% is cultivated land and the remaining 7% is uncultivated land (AITC, 2020). Agriculture is the base of the national economy. In Nepal, 60.4% of the population still adopts agriculture as their livelihood (MoF, 2020) Agriculture shares 26.2 % ofthe country's total GDP. Thus, agriculture is the base of the national economy(AITC, 2020). Despite falling, agriculture remains by far the larger sector of the economy. It regards as the main source of food, income and employment for the great majority of the population. It comprises various components such as cereal, vegetables, fruit, oilseed, fish and so on. However, sericulture as a cash crop contributes little to GDP. Although, it is considered a vehicle for poverty reduction and employment generation, especially in rural areas of Nepal.

In Nepal, for achieving higher economic growth, agriculture and sericulture should be taken into parallel with each other (APP, 1995). Silk is an agro-based industry. It involves the rearing of silkworms (Bombyx mori) of various varieties for the production of raw silk, in which the yarn is obtained out of cocoons spun by certain species of insects (Sharma, et al., 2021). Sericulture is a labor-intensive agro-based rural industry that produces incomes on a seasonal basis and generates employment (Akram, 2016).

Sericulture is a significant source of employment for rural people. In Nepal, agriculture and agro-based industries play a vital role in the improvement of the rural economy. Limited availability of land, limited cash returns and agriculture being confined to one or two seasons in the year have made villages to look for supporting rural industries such as sericulture (Rai, 2006). Sericulture broadly comprises inter-linked activities such as food plant cultivation, maintenance to feed the silkworms, silkworm rearing to produce the silk cocoons, reeling the cocoons for unwinding the silk filament, yarn making, weaving and processing of fabric (Ahmed

and Rajan, 2011). Sericulture in Nepal is not a traditional vocation of Nepalese farmers but mulberry plants are not new to Nepalese geography.

Sericulture is the art of rearing silkworms for the production of silk and bi-product. It involves mulberry cultivation, silkworm rearing and post cocoon activities that result in silk yarn production. Sericulture in Nepal has a relatively short history. It has been 45 years since sericulture was introduced in Nepal and it still struggles to compete in the international market. In Nepal, mulberry plants can commercially be cultivated at the height of 500-2000 metres from tropical to sub-tropical climates. Mulberry is a tree species, upon which schemes for rural development of semi-arid regions can be developed. Nine sericulture governmental farms and stations have been established at different locations for the promotion of this enterprise. At present, sericulture programs are being implemented intensively in the districts of Nepal including Ilam, Dhankuta, Sunsari, Kabhre, Kathnmandu, Dhading, Chitwan, Tanahu, Kaski, Syangja, Palpa, and Dhanusa (Akram, 2016). The following are the five major activities that need to succeed of sericulture in Nepal.

- Establishment and management of mulberry gardens,
- Production and supply of mulberry saplings,
- Production and supply of silkworm eggs,
- Raw silk yarn production, processing and marketing and
- Silkworm rearing, high-quality cocoon production and its marketing

Sericulture has a positive impact on the environment since it encourages the plantation of mulberry plants and increases vegetation and green land, which in turn brings about the positive effect of controlling or reversing desertification. As the roots of mulberry plants are very profuse and robust, they are very helpful in holding soil firmly and preventing soil erosion effectively. Mulberry is a common name for a family of mostly woody flowering dicot plants, widespread in the tropics, with some extensions into temperate areas, and for its representative genus.

Silk is new agro-business technology for various parts of the mid-hill region such as Dhankuta, Dhading, Palpa, Syangja, Parsa, Gulmi, Kavre that had been targeted as a tool for poverty reduction. 38 Districts of Nepal from Central Midlands of the Mid Hills altitude ranging from 750 to about 1500 meter, the slopes and valleys between the Mahabharata range and

Shiwalik ranges (Kathmandu and Pokhara valleys) are declared to have topographic and climatic feasibility for sericulture(Sattaur, 1994). Sericulture has boundless advantages like high employment potential, provision of a platform for assisting rural economics, short gestation hence quick returns, women amiable and empowering occupation, eco-friendly and can stand out as an ideal scheme for weaker and vulnerable sections of society. Expectations for high-value bivoltine silk as a new non-traditional export product that aims to remunerate and improve the income of Nepalese farmers including small-scale farmers and farmers along the perimeter are sky-high. The most important and beautiful benefit of silk is that it can be practiced on small to medium-sized land following marginality (Shrestha et al., 2012).The importance of sericulture was realized when the sericulture development program began well in a planned way with the establishment of a nucleus sericulture farm at Khopasi in Kavreplanchowk district in 1974/75 under the name of industrial entomology project.

## 1.2 Statement of the Problem

Sericulture is an integral part of rural life.The silk industry has a lot of socio-cultural and traditional linkages in India and plays a vital role inthe rural economy and hence, the aboriginals are practicing sericulture simultaneously with agriculture for base livelihood (Thangavelu, 2002; & Mahapatra, 2009). Sericulture farming in Nepal is seasonal so that farmer can use their leisure time to earn cash. The federal structure of Nepal can also be an opportunity for sericulture development in Nepal. Silk farmers practicing sericulture are met with several challenges that could potentially destroy their harvest. From a farmer's perspective, the major problem of the sericulture enterprise development in Nepal is due to the lower price of the cocoon and somewhat monopoly market of the cocoon. Farmers have to still dependent on government farms for the marketing of the produce cocoon. Farmers around Kavre take help from the Sericulture Development Centre, Khopasi. Different production problems were perceived differently by silk-growing farmers in the study areas. The financial problem got the first priority followed by problem of low technical knowledge, attack of insects (armyworm, stem borer) and occurrence of diseases. Marketing problems include lack of transportation as the main problem followed by monopoly in price fixation, lack of awareness to domestic consumers and finally absence of middlemen to ensure the consistent supply. There is a lack of access for marketing the produced cocoon and it seems like there is a monopoly in cocoon marketing.

There is the problem of flacherie and viral disease especially in the fifth stage of the larva.Viral infections in the larvae may result in the shrinkage of their bodies. They may also start giving off an unpleasant odour.The pebrine diseases can infect the eggs, resulting in their death before the hatching of the larvae. Any larvae affected by this disease develop dark spots and become lethargic.Viral infections in the larvae may result in the shrinkage of their bodies. They may also start giving off an unpleasant odour.The muscadine infection caused by fungi, can cause the larvae to become extremely feeble and eventually die.The larvae of dermestid beetle can bore into the silkworm cocoons and eat the pupe. Silk mites produce a toxic substance that kills silkworms.Some mites produce a toxic substance that kills silkworms.

The lack of progress becomes clear if we compare sericulture in Nepal with that of neighboring countries. Several development nations like China, India, Brazil, Thailand, Vietnam, Indonesia, Egypt, Iran, Sri-lanka, Philippines, Bangladesh, Nepal, Myanmar, Turkey, Papua New Guinea, Mexico, Uzbekistan, and some African and Latin American countries have taken up sericulture to employ the people in the rural area (FAO, 2003).

As long as the human desire for silk garments continues, the sericulture activities remain in demand for sure. Silk naturally produced by animal fiber is the queen of textile. Sericulture involves agriculture, art and industry. Silkworm rearing is an art in the hands of rural people. Among the different agricultural products produced and exported from Nepal, silk is growing as a competitive one. Despite the poor performance of sericulture enterprises in Nepal, it can be a way to provide gainful employment, economic development and improvement in the quality of life to the people in the rural area. And therefore, it can play an important role in the anti-poverty and prevents the migration of rural people to the urban area in search of employment. Sericulture has flourished as a cottage industry in many countries.Sericulture is a significant source of employment for rural people. Only a few studies were earlier attempts to find out the economic prospects of sericulture at the local level. This study is mainly focused on the problems of sericulture, its contribution to farmers' livelihoods and its present condition. Thus, this study mainly surveyed the following research questions.

1. What is the present condition of sericulture in the study area?
2. How sericulture farming is useful to promote the farmers' livelihoods?
3. What are the problems of sericulture farming in the study area?

## 1.3 Objectives of the Study

The general objective of this study is to examine the role of sericulture in the development of the local economy. However, the specific objectives of the study are as follows:

1. To examine the socio-economic condition of the respondents in the study area.
2. To assess the role of sericulture in the livelihoods of local people in the study area.
3. To describe the problems and constraints ofseri-culture industry in the study area.

## 1.4 Importance of the Study

The majority of Nepalese people fulfill their basic needs through forest resources. In developing countries like Nepal, local resources play a vital role in local economic development. Additionally, the sericulture industry, as a part of agriculture, would help people's way of life. To overcome the existing poverty and slow industrial development; strong capital formation is inevitable. It is possible only when we extend the sericulture industry in an agro-based economy like Nepal, it creates multiplier effects in local economic system. In this way, this study provides basic information to the planner, and policymaker while developing a development plan and budget at local, provincial and national levels. Sericulture industries have become significant private financial resources for households in countries of origin of migration, especially in third world countries. Sericulture has become a subject that is provoking interest to development experts, policymakers, implementers and researchers in the development area owing to its enormous contribution to the most economical in the developing world.

## 1.5 Delimitations of the Study

Almost all the studies have some sort of limitation due to time, money and availability of data constraints, this truly is not an exception to this fact. So, this study was the following limitations:

- The study was based on a small sample size thus, it was not helpful to make general conclusions.

- This study concentrates on fact findings and mainly covers the major role and problems of sericulture in the local household economy.
- As this study is academic and limited to time and resources.
- Simple statistical tools were used to analyze the data and draw a conclusion.

## 1.6 Organization of the Study

This thesis was organized into five chapters. The first chapter includes the background of the study, statement of the problem, objective of the study, the significance of the study, delimitation of the study and organization of the study. Chapter two contains the required literature review. The third chapter deals with the required research methodology. Chapter four contains the interpretation and analysis of data. Finally, chapter five deals summary, conclusion, and recommendations.

# UNIT II

# LITERATURE REVIEW

## 2.1 Thematic Review

### 2.1.1 Meaning of Sericulture

Sericulture is an agro-based industry. It involves rearing of silkworms for the production of raw silk, which is the yarn obtained out of cocoons spun by certain species of insects. Sericulture is an activity to produce raw silk based on rearing silkworms fed on leaves from mulberry plants or from Asan and Arjuna trees (Tasar) occurring in natural forests. Sericulture is the cultivation of silk through rearing of silkworm. Sericulture also includes the practical aspects such as increasing productivity of land as well as labour, stabilization of cocoon production, improvement of silk yarn, fabric and generating profitable income for rural farmers. Sericulture provides remunerative employment for family members and economic benefits to farming households. Silk as the Queen of textile fibre has always been in high demand for its strength, smoothness, healthy and environmentally friendly fibre. Silk is witnessing a new era of global demand, which may rise in the next millennium. Asia is the home of sericulture and is often referred as the starting point of the ancient Silk Road. It is recorded that the domestication of silkworms originated somewhere at the foothills of the Himalayas (Gurung, et al., 2015).

Sericulture or silk production is the breeding and management of silk worms for the commercial production of silk. In other words, sericulture deals with a series of events that include the rearing of the silkworms on mulberry plants, collection and processing of silkworm cocoons to extract raw silk fibers from them and the production of commercial silk. There are several commercial species of silk worms but very few are commercially exploited.

Sericulture can be an alternative land base production system, which improves land productivity, and increases the income of smallholder farmers. The major benefit of the sericulture especially Tasar is the employment generation to the people especially in forest areas like tribal. Income from the forests leads to a sense of protection and conservation of areas. The major activities of sericulture comprise of food-plant cultivation to feed the silkworms which spin silk cocoons and

reel the cocoons for unwinding the silk filament for value-added benefits such as processing and weaving.

The country report on Nepal was presented by Mr. Jagadish Bhakta Shrestha. Sericulture has a long history in Nepal. About 65.7% of the populationdepends on agriculture which contributes to 38% of the GDP (MoF, 2020). Nepal has currently established the Directorate of Industrial Entomology for sericulture enterprise. There are number mulberry varieties being grown for sericulture. The climatic condition including temperature, rainfall pattern and humidity are ideal for mulberry cultivation and bivoltine silkworm rearing. Presently the income from sericulture is about Nepalese Rs. 78,000/- from 0.5 hc, of mulberry from 4th year onwards. Mr. Shrestha reported a serious problem of mortality of silkworms in 4th and 5th larval stages due to which the sericulture industry has declined the country.

There is a strong need for training and human resource development in Nepal's sericulture sector. (SAARC Agriculture centre, International Sericulture Commission). The study of rearing of silkworm for commercial purpose or for silk thread is known as sericulture. The physiographic and climate condition of Nepal especially mid-hills and high hills region are highly suitable for silkworm rearing. The history of silkworm rearing was originated from china around 2500 years ago.The rearing of silkworm started during the time of Judhha Sumsher. The official rearing of silkworm began in 2052 B.S from Kavre Districts. The main objective was to improve the livelihood of the poor farmers. But the case is not as expected. Lack of capital, technical skills and assistance and manpower are the causes for its restricted farming (GRNC).

### 2.1.2 Meaning of Silk

Man is always inquisitive for silk products. Silk is an animal protein fibre secreted (produced) by the silkworm larva for spinning of the cocoon. This cocoon provides a protective shell (shelter) for the soft and delicate caterpillar to pass the pupal stage inside it and metamorphose into an imago (moth). Silk yarn is obtained from the silk cocoons. The Queen of Textiles, spells luxury, elegance, class and comfort. Mankind has always loved this shimmering fibre of unparalleled grandeur from the moment Chinese Empress Shiling Ti discovered it in her tea cup. silk is made of proteins secreted in the fluid state by a caterpillar, popularly known as 'silkworm'. These silkworms feed on the selected food plants and spin cocoons as a 'protective shell' to

perpetuate the life. Silkworm has four stages in its life cycle viz., egg, caterpillar, pupa and moth. Man interferes this life cycle at the cocoon stage to obtain the silk, a continuous filament of commercial importance, used in weaving of the dream fabric.

**Figure 2.1 The picture of the Silk**

### 2.1.3 Stage of Silk Production

Though all four types of silkworms have different food plants and agro-climatic zone but the basic life cycle is almost the same. The stages of production are as follows:

1. The silk moth lays eggs.
2. When the eggs hatch, the caterpillars are fed food plants leaves.
3. When the silkworms are about 25 days old, they are 10,000 times havier than when they hatched. During feeding period, the silkworm goes 4 to 5 times in molt which is its property to shed its skin as it grows alarmingly fast in size.
4. They are now ready to spin a silk cocoon.
5. The silk is produced in two glands in silkworm's head and then forced out in liquid form through openings called spinnerets.
6. The silk solidifies when it comes in contanct with the air.

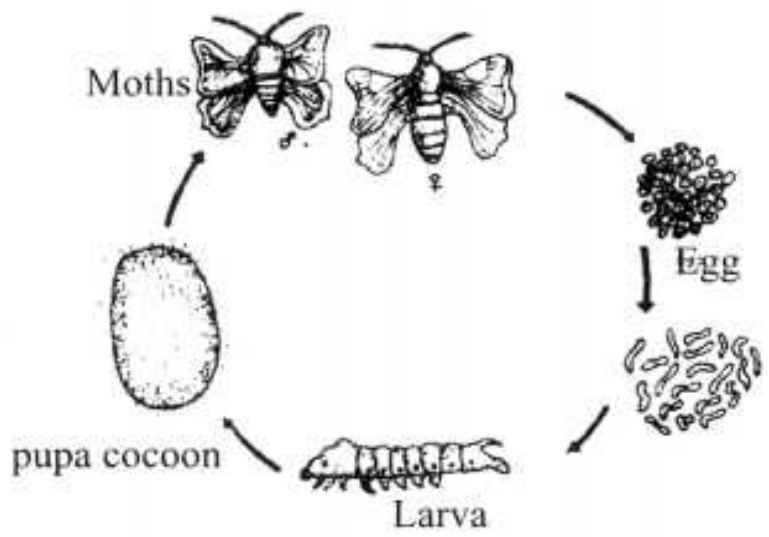



**Figure 2.2 Stage of Silk Production**

7. The silkworm spins approximately 0.8 km to 1.5 km of filament and completely encloses itself in a cocoon in about two or three days. The silk is obtained from the undamaged cocoons by boiling the cocoon to find the outside end of the filament. The live pupa inside the cocoon dies due to building.
8. The silk filaments are then wound on a reel. The silk at this stage is known as raw silk.
9. In order to continue the life cycle not all cocoons are preserved and the moth is allowed to come out and lay eggs so that the life cycles is continued for the next crop are season.

### 2.1.4 History of Sericulture

The history of silkworm rearing was originated from china around 2500 years ago. Sericulture or silk production from the moth, Bombyx mori has a long and colourful history unknown to most people. This insect is the only living species of family Bombycidae and has been domesticated for so long that it is possible that there are no survivors in the wild any longer. According to the Chinese records, the discovery of silk production from B. mori occurred about 2700 BC. It is believed that empress Si-lung-Chi was asked by emperor Huang-ti to find the cause of damaged mulberry leaves on trees in their garden. The empress found white worms eating the leaves. She noticed that they were also shiny cocoons around themselves. A cocoon dropped in her cup of tea and silky threads separated from the cocoon. Silk industry began in China where the source

of silk was kept a secret for more than 2000 years. After some time, China lost their monopoly in silk production, sericulture reached Japan through Korea and then to other countries. Sericulture has been growing in India as an agro-based industry playing a vital role in the improvement of rural economy.

## A. World Raw Silk Production

The total world raw silk production during 2011 was about 1,31,479 MT. The bulk of world‟s silk yarn is produced from mulberry silk which accounts for 95% of world silk production. Mulberry sericulture had been successfully used by two of the world‟s most populous countries i.e. China and India with population of 1.31 billion and1.132 billion people respectively (World Population Bureau, 2007). The two nations had successfully integrated mulberry sericulture into their agricultural productions. According to 2009 world Mulberry Raw silk Production, China leads with a total silk production of 1,04,000 MT (79.10%) while India stands second with 23,060 MT (17.54 %) in the global silk production. In Pakistan, sericulture industry has limited growth mainly due to poor quality of mulberry leaves and silk seed. Thus the cultivation of mulberry is one of the most important factors in the production of silkworm eggs, rearing of silkworm cocoons and on the whole in the entire operation of sericulture. The silk worm (Bombyx mori L.) is domesticated insect, which feeds exclusively on mulberry leaves to produce raw silk in the form of cocoon. The silkworm has been extensively utilized as model organism in biological studies as well as for economic gains. Commercial rearing of silkworms has been in practice for over 5000 years in different parts of the world (Nagaraju & Goldsmith, 2002) and an estimated 4310 silkworm germplasm strains are being reared worldwide (Goldsmith et al., 2005). The life cycle of silk worm is greatly influenced by environmental stress and nutrition particularly during larval period. Relative humidity (RH) affects all stages of the insect. The revival of sericulture in Pakistan requires the production of good quality silk seed with resistance to diseases and ability to cope with environmental stress. Day to day change in weather during the larval rearing poses great threat to the cocoon crop. The larval growth of silkworm is under direct influence of temperature and humidity. Silk worm larvae spun best quality cocoons at 22°C and 65% RH (Ramachandra et al., 2001; Srivastava et al., 2007; Suresh Kumar et al., 2008). Many sericigenous insect species have been extensively exploited for the extraction of silk protein fibers due to high commercial value.

## B. Sericulture in Nepal

The rearing of silkworm started during the time of Judhha sumsher. Sericulture is an imported commodity and was promoted mainly by government sectors since 1930s. There are nine government farms for the promotion of sericulture in Nepal. Among them, the sericulture development centre, Khopasi is the central farm and the other eight farms are provincial. In Nepal, farmers mainly practice mulberry-based sericulture. The geographical diversity of the country provides the opportunity for sericulture farming in Nepal. In Terai (100 to 750 m) and hilly (750 to 1500) are the appropriate places for sericulture farming in Nepal. The ministry of agriculture and livestock development stated that the area of mulberry cultivation is 1411 ha with a cocoon production of 30 MT in the year 2016 (MoAD, 2019). Even with the advent of new bivoltine sericulture technologies, sericulture productivity is still low in Nepal.

The official rearing of silkworm began in 2052 B.S from Kavre Districts. The main objective was to improve the livelihood of the poor farmers. But the case is not as expected. Lack of capital technical skill and assistance and manpower are cause for its restricted farming. But with the same technology sericulture productivity is changing fast with an upward trend in India (Shukla 2012). In Nepal, there is not only lower productivity of sericulture but the number of farmers is still in decreasing trend. Even though the production of the cocoon is in decreasing trend, the demand for mulberry cutting is increasing. Most of the mulberry garden is used for livestock fodder in Nepal. There is a demand for 2 million mulberry cutting per year. This issue demands the study of the benefit-cost of sericulture in a rural farmer's economy. At the same time, there is a change in nature, quantity and cost of input required. Because of this, it is very much imperative to know the sericulture economics and it is highly essential to motivate the new farmers to take up sericulture and increase their income.

The importance of sericulture was realized when sericulture development program began well in planned way with the establishment of a nucleus sericulture farm at Khopasi in Kabhrepalanchowk district in 1974/75 with the name of Industrial Entomology Project. Currently there are 9 governmental sericulture farms under the Directorate of Industrial Entomology Development (DOIED) all over the country. They act as resources centers for silkworm rearing and sericulture development for providing required technical and physical inputs. The present global scenario clearly indicates the enormous opportunities for the Nepalese

silk industry. The need of the hour for Nepal is to produce more bivoltine silk with reduced cost of production to meet the growing demands of quality silk. The domestic production of raw silk in Nepal is not enough to meet the domestic demand and surplus for export demand. It is estimated that against the demand of around 4.0 mt. The gap of nearly 246 MT of raw silk in demand per annum is mainly high silk in demand per annum is mainly of high-grade quality mulberry raw silk, which is not being produced in the country to the extent required.

### 2.1.5 Livelihood Activities

Livelihood activities may be composed of, for instance, water fending, year-around or seasonal formal-sector employment, informal trading or sale of labour, home gardens and food processing, borrowing, scavenging, stealing, and begging. Livelihood may be categorized as farm, off-farm and non-farm, include local or international migration, involved elderly household members or children and can be legal or illegal (Chambers, 1997). To address poverty, it is important to understand these multiple activities in the context of livelihood and livelihood diversification. For Ellis (2000), livelihood includes natural, physical, human and financial goods, and social capital. Facilities to access these goods determine rural families´ livelihood and well-being. The author emphasizes that livelihood and profits are not the same, but are strongly related because individual and familiar structure and level of benefits will determine the access to these means of income and will convert them into better-off. An essential characteristic of rural families in developing countries is their adaptation ability when it concerns survival, it means they are able to change their way of living due to the changes on the circumstances that they will face, especially strategic changes in their living and its features as well as their activities´ impact on the environment.

### 2.1.6 Defining Livelihoods in the Nepalese context

Defining livelihoods in the Nepalese context: The concept of livelihoods has gained prominence and traction in recent years through debates about rural development, poverty reduction and social protection. It has become clear that definitions of poverty and wellbeing based solely on income or the ability to meet basic needs do not incorporate the multidimensional complexities of poverty. Indeed, it is perhaps what Chambers and Conway (1992) implied when defining sustainable livelihoods as: comprising the capabilities, assets (including both material and social

resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. The importance of capturing multidimensionality is also evident in DFID's (2002) framing of sustainable livelihoods, which posits that people's livelihoods will improve if they have:

- an access to basic rights established through international conventions and access to high-quality education, information, technologies and training, and better nutrition and health
- a supportive and cohesive social environment
- a secure access to, and better management of, natural resources
- a better access to basic and facilitating infrastructure and financial resources
- a policy and institutional environment that supports multiple livelihood strategies and promotes equitable access to competitive markets for all.

Defining livelihoods in the Nepalese context is not straightforward. The term means different things to different people –as is often the case in contexts of conflict and fragility (Upreti and Müller-Böker, 2010) –and, from a programmatic perspective, it is possible to identify a number of different frameworks in operation in Nepal. Among the dominant frameworks that are used to analyze livelihoods and help design interventions is the Sustainable Livelihoods Approach (DFID, 2002), which conceptualizes livelihoods as being comprised of five capitals: human, natural, financial, physical and social. Another widely used framework in Nepal is the Rural Livelihoods System (RLS) approach, which takes into account people's emotional base and subjective orientations. Elsewhere, CARE's livelihoods model looks at patterns of production and consumption, as well as shock and stress, while OXFAM's framework includes capability enhancement and policy changes for livelihoods improvement (Pokharel, 2010). Although different in some respects, these frameworks tend to incorporate analyses (or at least considerations) of social exclusion and inclusion that open up important questions about power relations and structures. However, for the most part, the frameworks mentioned above fail to take people's aspirations and orientations in life into account.

## 2.2 Theoretical Review

There are various modern financial management and performance measurement theories on SMEs that have been used over the years. Wickham (2001) indicates that an entrepreneur seizes an opportunity to utilize the existing market environment to do business differently for economic gain or mere psychological satisfaction. It represents the potential to serve customers better than they are being served at present. Chambers and Conway (992) define livelihood as comprising "the capabilities, assets (Stores, resources, claims and right of entry) and activities required for a means of living")- Capabilities refer to social networks and individual or collective endowments or achievements such as education and skills. Assets include natural, physical, financial and social capital. Activities are the actual undertakings of the individual or household in earning or making a living.

### A. Agriculture Transformation Theories

Nepalese agriculture is characterized by dominance of small and marginal farm holders following traditional and indigenous farming technology which is regarded as low yielding technology. Farming is a way of life-based on long-establish tradition. It is a cultural characterization of the way people live.Traditional agriculture is the institutional set up which deals with the ownership of land legality of tenureship and share of home consumption in agricultural production.Traditional agriculture has some technical properties. Agriculture is a gateway point of economic development. Novel prize winner T. W. Schultz developed this theory in his well-known book entitled "Transformation of Traditional Agriculture (1964). The best strategy for economic growth and development (Agri Modernization). Thus, farming-based wholly upon the kinds of factors of production that have been used by farmers for generation can be called traditional agriculture (*Lekhi, 2005*).

Can low-income communities based on traditional agriculture increase agriculture production substantially by an efficient allocation of the agricultural factors of production presently at their disposal?Which type of agricultural factors of production are primarily responsible for the large differences among countries in the success of the agricultural sector in contributing to economic growth ? Under what conditions does it pay to invest in agriculture? Out of these three questions, the first and third are of fundamental and core of the problem of transformation of traditional

agriculture (*Lekhi, 2005*).Size and nature of land is not a matter of discussion but farmer's capacity. If farmers have good ideas and skill, they can produce much crops in inferior land.

In course of agriculture development and population, series of studies have carried out, focusing on the interrelationships between population change and economic development, and between population growth and food supply.Malthus explained population growth based on law of diminishing returns. Malthus did not consider the increase in technology in the developed world. Boserup equally focused on population, environment, and technology. She stressed that successive change in technology has an important influence on population size.The theory of agrarian change developed by Ester Boserup is more clear and complex than that of any of her forerunners. She argued that population pressure is a major cause of change in land use, agricultural technology, land tenure systems, and settlement pattern. In her opinion 'population growth is independent of food supply and that population increase is a valuable source of agriculture change. Intensification and diversification in cropping pattern is a principal means of increasing agricultural production/output.

**B. Signaling Theory**

Signaling theory rests on the transfer and interpretation of information at hand about a business enterprise to the capital market, and the impounding of the resulting perceptions into the terms on which finances made available to the enterprise. In other words, flows of funds between an enterprise and the capital market are dependent on the flow of information between them (Emery et al, 1991). Keasey et al. (1992) writes that of the ability of small enterprises to signal their value to potential investors, only the signal of the disclosure of an earnings forecast were found to be positively and significantly related to enterprise value amongst the following: percentage of equity retained by owners, the net proceeds raised by an equity issue, the choice of financial advisor to an issue (presuming that a more reputable accountant, banker or auditor may cause greater faith to be placed in the prospectus for the float), and the level of under pricing of an issue.

## 2.3 Empirical Review

Sericulture in India is a fairly organized activity and is largely rural-based and labor intensive. Cultivation is spread over 22 States, covering 172000 hect. Across 54000 villages operating

258000 handlooms and 29340 power looms (Dewangan et al., 2011a) Sericulture play very effective role in the utilization of the natural resources in a most effective manner for socio-economic upliftment with livelihood, employment and income generation (Malik et al., 2008). Sericulture is a potential sector of the agriculture to raise economic status of the farming community and also earning foreign revenue (Thapa and Shrestha, 1999). Sericulture is an integral part of rural life, practiced by about 1.5 lakh rural farmers in the states of Jharkhand, Chhattisgarh, Orissa, Madhya Pradesh, Utter Pradesh, West Bengal, Bihar, Maharashtra and Andhra Pradesh (Shetty et al., 2007). Silk industry has lot of socio-cultural and traditional linkages in India and plays a vital role on rural economy and hence, the aboriginals are practicing sericulture simultaneously with agriculture for base livelihood (Thangavelu, 2002; Mahapatra, 2009) .

Some entrepreneurs are earning Rs 1,50,000 per year, said project protection officer Nilesh Kunwar. Silkworms were given to farmers at Rs. 25 per box of worms. Each box of worms produces 20-50 kg of raw materials and each kg of raw materials cost Rs 212. Farmers with low income and no land have greatly benefited from the business as silkworms can be reared four times a year based on the regulation of temperature needed for worms and the cultivation of mulberry trees. The Japanese Assistance Agency, JICA has been providing technical services and cooperation for the promotion of sericulture including rearing worms growing mulberry trees and keeping the worms in dry habitat. JICA has also deputed local volunteers for promoting cultivation and necessary technical assistance said JICA Alumnae Association Nepal vice-president Dilli Ratna Shakya adding that the agency would extend its technical cooperatives as per the need and convergency of farmers to this business. He added that if sericulture was adopted on a massive scale, it would benefit all those rural people who do not have adequate land (Sing, 2008).

Fairly good numbers of references are on record about livelihood opportunities and employment generation. Tropical tasar sericulture is the rearing of wild silkworms for production of tasar silk and it provides livelihood to tribal’s in India (Suryanarayana and Shrivastava, 2005). Sericulture is the activity of low investment and high output (Benchamin and Jolly, 1987). The tasar silkworm is a boon to its rural tribal rearers as their livelihood linked with the collection and sale

of nature grown tasar cocoons (Nayak, 2000). Sericulture activities provide a perfect choice for the women because of the very nature of the activities that can take place close to the habitation.

## 2.4 Policy Review

The government of Nepal, Ministery of Agriculture and livestock development, Sericulture Development Center identified high-value cash crops as an important means of poverty alleviation and rural development including the reduction of gender imbalance and promotion of environment conservation. The government's commercial agriculture development program laid emphasis on sericulture development as one of the major components although Sericulture Development Programs have been categorized into prioritytwo.The mulberry coverage is spread in the southern lowlands and the central midlands of the country.Sericulture Development Center has following main strategies.

1. To expand the scope of sericulture farming and promote commercial agriculture in sector of animal husbandry, fishery, coffee farming while expanding the scope for silk insect farming.
2. Provide practical training and education to silk farmer through special task force formed by the organization. The organization also aim to introduce batter technology to increase the productivity.
3. Increase the production through cross breeding of insect in peak season of spring and autumn.
4. Develop a community of 30-35 houses area for Kimbu plant. Community with more than fifty thousand Kimbu Plant will be considered for model project. The organization plan to produce at least one ton cocoon in one season through fifty box of insects distributed in the area.
5. To promote commercial silk insect farming. The organization plan to establish Kimbu Farm Garden in each area and build model for low cost shed for insect farming and run programs.
6. Encourage private sector engaged in silk business to purchase required raw material from local farmer and continue promotion throughout.

**Work Policy (Short Term & Long Term)Undertaken in Sericulture DevelopmentCenter**

The following are the major working policies in relation to agriculture development focusing silk farming.

1. To extend the silk farming area, give priority to existing farming area and expand kimbu farming in neighboring villages.
2. To strengthen and renovate the old CRC building and provide healthy *Chauki Kira* to the farmers.
3. Small insect (*Chauki Kira*) will be distributed to the community of farmers by facilitating local level consultants and supervision of the office.
4. Provide grant for the construction of shed to the farmers who have capacity of farming two boxes or more insects.
5. To facilities the improvement of insect farming for farmers who have insects farming of two boxes or less. The organization aim to make arrangements for such farmer to upgrade existing insect shed.
6. Campaign will be initiated to maintain kimbu garden, farming shed, and distribute materials for farming.
7. To ensure success in production of cocoon in natural environment during suitable two month season of spring.
8. To conduct the program, establish the model Kimbo Garden in each village area and develop cost-effective insect shed.
9. Eliminate diseased insects and provide sufficient nutrients to insects in farm.
10. The organization plan to produce a documentary film to highlight the work done, activities performed and training. The documentary will be broadcasted through radio, television and newspaper.

## 2.5 Conceptual Framework

A conceptual is defined as an element of the scientific research process in which a specific concept is defined as a measurable occurrence or in measurable terms that basically gives a clear meaning of the concept. According to Mugenda and Mugenda (2003) conceptual framework is a diagrammatic presentation of the relationship between dependent and independent variables.

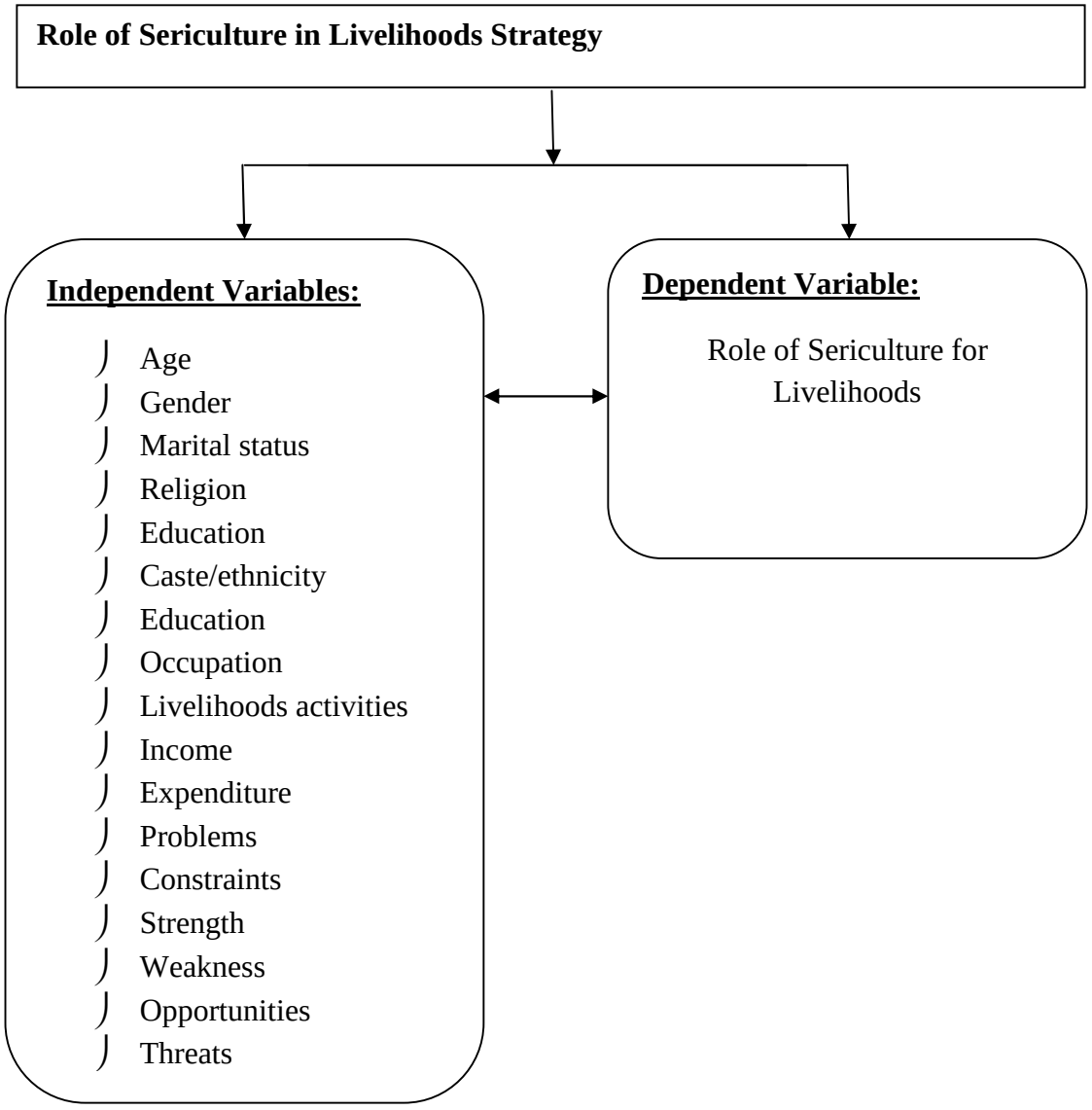



**Figure 2.3 Conceptual Framework of the Study**

A wide range of success factors, through a number of conceptual frameworks, are featured in the contemporary literature, but there is no unifying theory to incorporate all aspects of small business success. To make matters worse, their importance appears to be relative and varies with the business environment, that is, the industry and country these enterprises operate.

# UNIT III

# RESEARCH METHODOLOGY

## 3.1 Rationale of the Site Selection

The selected site for this research is the sericulture development centerKhopasi, Kavre. The organization was established in the year 2032/2033 in Khopasi, Kavre as Bewashayik Kit Biyan Ayojana. Currently, the organization is known as a sericulture development center. The organization has established office and stations in Syangja (2041/42), Dhankuta (2050/51), Dhunibesi (2052/53), Bndipur (2061/63), Itahari (2061/62) and chitpol. Theorganization has identified the area suitable for silk farming throughout Terai to Hilly Region and is active in these areas. Thus, the area is considered the study site.

## 3.2 Research Design

The approach used within the design were questionnaire, observational study, and survey. Questionnaires were used to know the individual strengths and impact of sericulture in their personal living. Observing the scenario of the center, workers and talking to a certain number of people in the surroundings make to know more about sericulture. It helps to know more about the impacts of sericulture on people's life. The dissemination of information on technologies largely depends on the perception of the farming community farmers that have engaged in sericulture are quite positive about sericulture as an alternative to traditional cash crops. This study has adopted a descriptive research design. Descriptive research is used to describe and mention historical practices. It has been helpful to describe the phenomena of this study. This study has also tried to explore new information about the impacts and challenges of sericulture in the study universe. The research design is shown as per the following figure.

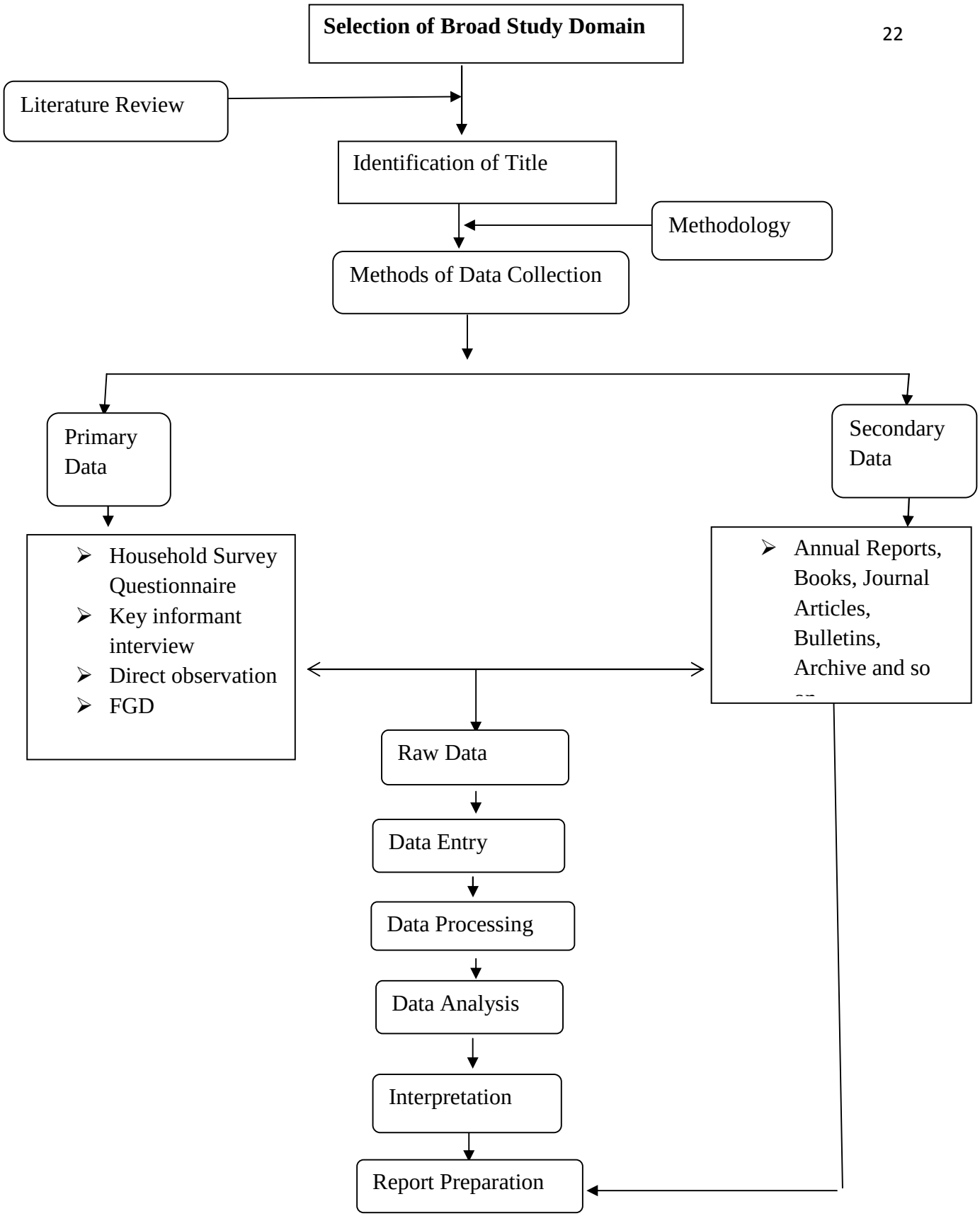



**Figure 3.1 Flow chart of Research Design**

## 3.3 Nature and Source of Data

Both primary and secondary data were collected directly through a survey with the workers of the center other respondents were selected in the surrounding of the study area. Some of the information and data were collected with the help of administrative officers. Data are collected mainly from field surveys, using observation, interviews and key informant interviews. The primary information has been collected through field survey using different data collection methods such as case study, observation, questionnaire survey and interviews. Similarly, the secondary data has been collected from impacts of sericulture relate organizations, libraries, publications, books, journals, blogs, websites, literature, published and unpublished papers, and articles.

## 3.4 Universe, Sample Size and Sampling Procedure

This research is concentrated on the role and problems of sericulture at Khopashi, Kavre. The sericulture development center Khopasi, Kavre and the farmers who involve in this organization were the study population. According to the Municipality Profile 2076, there were 902 households under ward no. 10 of Paunauti Municipality. Among them, 65 households were actively involved in sericulture. Out of 65 farmers households,25 households who involved in sericulture were taken as sampled and interviewed through the purposive sampling technique. Following the sampling technique, the necessary data were collected by administering pretested questionnaires to members of the Sericulture Development Divison (SDD), Khopasi and a set of checklists and questionnaires to the selected respondents of the study area for primary data collection.

## 3.5 Tools and Techniques of Data Collection

### 3.5.1 Household Survey Questionnaire

A questionnaire, based on the research question, was developed. The survey was carried out in 25 households purposively. The survey includes a list of questions that are both open-ended and closed-ended questions. The questionnaire was based on the objective of the research which aimed to gather both qualitative and quantitative data. The objective of the research is to know about the conditions of sericulture in the research area, the perception of people towards sericulture. Thus, 25 respondents were surveyed.

### 3.5.2 Key Informant Interview

An open-ended interview guideline was used for the key informant interview. The researcher interviewed a total of ten actors, which included NGOs, community-based groups, government representative, women group, youth club, political leader and social leader.

### 3.5.3 Focus Group Discussion

Focus group discussion became very compatible during the field survey and success to achieve reliable information. In course of time, lists of households were prepared for the focus group discussion. One effective focus group discussion has been carried out. Members of the group were Mayer, Ward Chairman, Women Health Volunteer, Social Worker, Teacher and Local Political leader. The size of group was ten. Focus group discussions become very successful to get the holistic views with respect to impact of sericulture on livelihoods pattern of local farmers in the study area.

### 3.5.4 Participant Observation

Observation also helped in getting knowledge on more about sericulture. Observing while talking to some of the workers from the center, their gestures and the way they speak a lot about how they are benefited from the sericulture farming in their society. The information and data are not only possible through the interview so observing the working environment also helps to gain knowledge and information.

## 3.6 Analysis of Data

The collected data has been presented and analyzed in different ways in this study. Qualitative data which are collected in the form of words have been presented in a descriptive way to strengthen the argument and analyze them in a logical way. Similarly, quantitative data, which are collected has been classified first on the basis of their nature and can be presented in the tables and percentage. After the presentation of the data, they have been analyzed and interpreted in the logical way. Data were presented in graphical forms using various tools like tables, and figures. Descriptive statistics have been used in the analysis. The general perception and findings from all the categories of respondents. Data interpretation has been followed in each response to questions after data presentation in various figures.

# UNIT IV

# ANALYSIS AND INTERPRETATION OF DATA

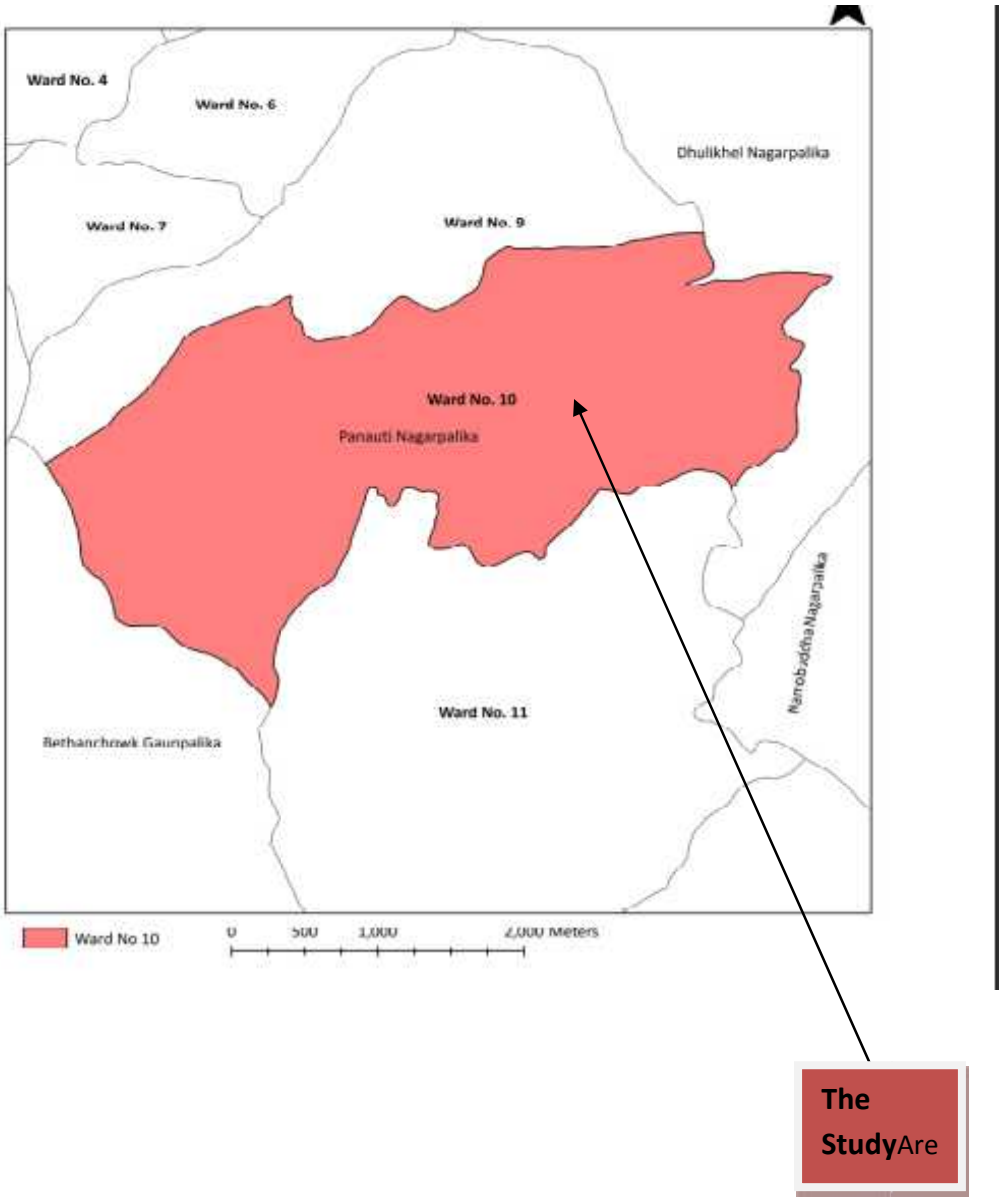
## 4.1 Introduction to Sericulture Development Center Khopasi, Kavre

The selected site for this research is the sericulture development center Khopasi, Kavre. The organization was established in the year 2032/2033 in Khopasi, Kavre as "Bewashayik Kit Biyan Ayojana." Currently, the organization is known as a sericulture development center. The main program of the organization has been the protection and conservation of silk insects, commercial silk production, shipment storage and distribution management. The organization has established office and stations in Syangja (2041/42), Dhankuta (2050/51), Dhunibesi (2052/53), Bndipur (2061/63), Itahari (2061/62) and chitpol. The organization has identified the area suitable for silk farming throughout Terai to Hilly Region and is active in these areas. The main objectives of the organization are to:

- Promote commercialized silk farming by integrating with existing agriculture and animal husbandry.
- Improve the living standard and income of local farmers through silk farming.
- Promote the existing silk businesses to use silk produced in Nepal and ultimately replace the need to import silk.
- Production of silk insects and cocoon.
- To commercialize silk farming by incorporating it in traditional agriculture and animal husbandry system.
- Improving livelihood by increasing the income of the farming community through commercial silk farming in the traditional agricultural system.
- To support the management of the indigenous silk industry by replacing the import of silk yarn for the established silk textile industry in Nepal.
- To increase the production and productivity of silk cocoons.

The main program of this office is conservation of silk insects, commercial silk production, storage and distribution. Over the last few years, crossbreed silk flowers have been produced by

crossing the pure verities that have been considered good in maternal resource conservation. Thus, the Silk Development Centre is becoming self-reliant in silk flower production. The main programs of this center are maternal resources conservation of silkworms, commercial silk flower production, cold storage, manpower development, dissemination and distribution of new technologies.



## 4.2 Socio-Demographic Profile of the Respondents

### 4.2.1 Population Composition by Caste/Ethnic Group

Nepal is a country steeped in socio-cultural diversity. Its population was divided into a number of known and unknown, caste and ethnic groups of which at least 125 have been formally identified (CBS, 2011). The most ordinary classification and the most ancient divide them into four main castes. The first is Brahmins, second Kshatriyas, third Vaisyas and the fourth the Sudras. Nepal is common garden of four castes and thirty-six sub-castes. People belong to various castes have in the study area. The following data shows the caste/ethnic composition of the sampled households in the study area.

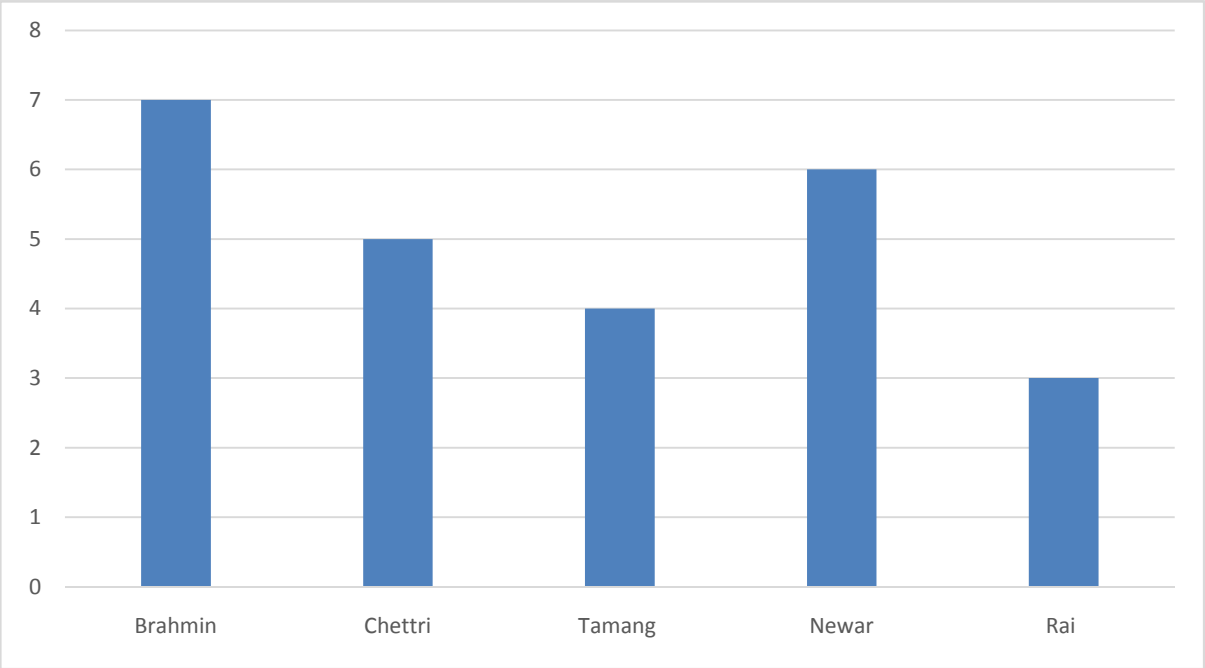
**Table 4.1: Distribution of Respondents by Ethnicity**

| Ethnicity | Number | Percentage |
|---|---|---|
| Brahmin | 7 | 28 |
| Chettri | 5 | 20 |
| Tamang | 4 | 16 |
| Newar | 6 | 24 |
| Rai | 3 | 12 |
| **Total** | **25** | **100** |

Source: Field Survey, 2022

Regarding ethnicity the respondents were divided into Brahmin, Chettri, Tamang, Newar and Rai. And mostly people found Brahmin and Newar groups. The table 4.1 showes that the high portion of respondents is from Brahmin which is28% and 16 % of respondents are from Tamang, 24 % of respondents are from Newar and 12 % of respondents from janajati or Rai.

**Figure: 4.1 Distribution of Respondents by Ethnicity**




### 4.2.2 Sex and Age of the Respondents

The socio-demographic profile has included many social aspects here to depict the current survey and its situation regarding farmers who are involved in sericulture activities in the study area, the Khopasi Kavre. It has included many topics like the distribution of respondents by sex, age, religion, ethnicity, occupation, family size, marital status and education.

**Table 4.2: Distribution of Respondents by Sex**

| Sex | Number | Percentage |
|---|---|---|
| Male | 11 | 44 |
| Female | 14 | 56 |
| **Total** | **25** | **100** |

Source: Field Survey, 2022

In this study, the respondent's gender groups are classified as male and female which is presented. Table 4.2 shows sex compositions of the respondents. There are 56% female and 44% male respondents. The age groups of the respondents are presented in table 4.3.

**Table 4.3: Distribution of Respondents by Age**

| Age Group | Number | Percentage |
|---|---|---|
| 16-59 | 20 | 80 |
| Above 61 | 5 | 20 |
| **Total** | **25** | **100** |

Source: Field Survey, 2022

The respondents were divided into five groups. The questionnaires were asked to the respondents aging from 16 to above years. Then it was divided into two groups 16-59 and above 61. The data showed that 80% of respondents were economically active i. e. (16-59) and the remaining 20 percent of respondents were above 61 years.

### 4.2.3 Religious Status of the Respondents

Religion can be defined as a belief system. In Nepal, most of the people follow the religion that their forefather adopted. It is a social institution that plays a vital role in human society. Belief over the supernatural power in order to achieve peace, salvation is taken as religion. Religious activities may differ from culture to culture and religion to religion. Respondents believe in different religions and follow distinct cultural behavior. Most of the population believes in Hinduism then other religious faith. The religious status of the respondents has been presented as follows.

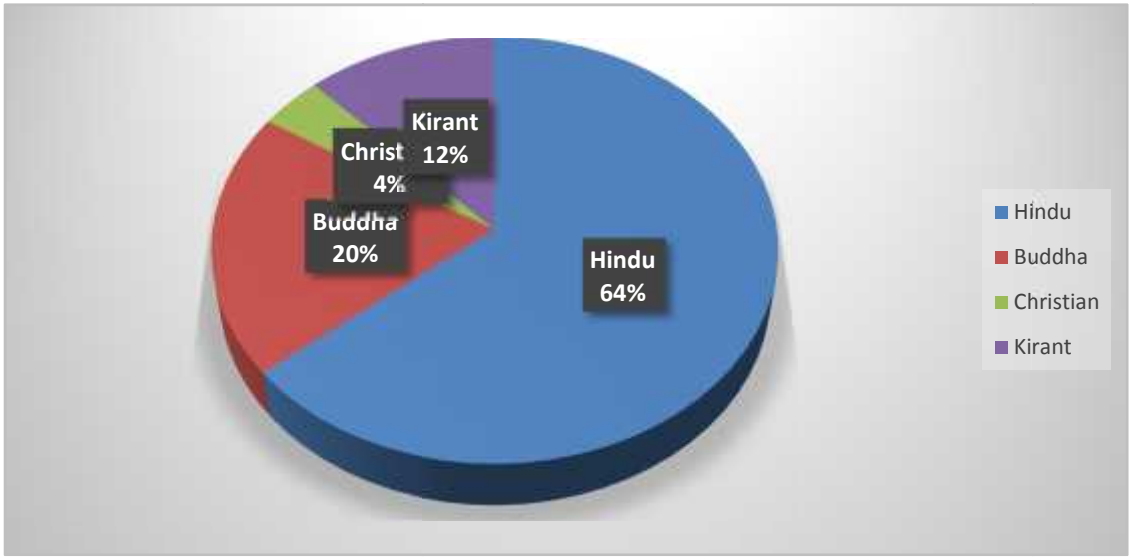
**Table 4.4 Distribution of Respondents by Religion**

| Religion | Number | Percentage |
|---|---|---|
| Hindu | 16 | 64 |
| Buddha | 5 | 20 |
| Christian | 1 | 4 |
| Kirant | 3 | 12 |
| **Total** | **25** | **100** |

Source: Field Survey, 2022

The respondents were divided into four main and other religious groups. The questionnaires were asked to the respondents following different religions like Hinduism, Buddhism, Christianity and Kirant. The study showed that 64% of respondents followed Hinduism,20% of respondents followed Buddism, 12 % of respondents followed Christianity and 4% of respondents followed by Kirant respectively.

**Figure. 4.2 Religious Status of the Sampled Respondents**



### 4.2.4 Nature of Family

Family is a social institution. It is a group of people united by the ties of marriage, blood constitution or single household, interacting and inter, communicating with each other in their respective and father, son and daughter, brother and sister creating a common culture, under the study area, mainly there are two types of family, i.e., nuclear and joint family. The nature of households in the study area can be shown from the following table.

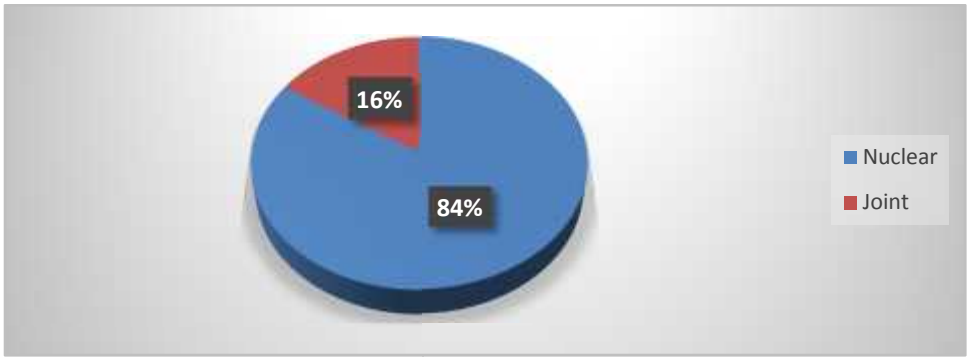
**Table 4.5 Distribution of Respondents by Their Family Size**

| Nature of Family | Number | Percentage |
|---|---|---|
| Nuclear | 21 | 84 |
| Joint | 4 | 16 |
| **Total** | **25** | **100** |

Source: Field Survey, 2022

Table 4.5 shows that majority of respondents belong to nuclear family, which contains 84 percent. It means 52 households belong to nuclear family. In the same way 5 households still live in joint family which occupies 16 percent. It means out of 25 sampled HHs, 21 respondents have to attached under nuclear and 4 respondents have attached with joint family.

**Figure. 4.3 Nature of Family of the Sampled Respondents**



### 4.2.5 Educational Status of the Respondents

Education is the key for self-development. It provides not only the opportunities for jobs but also aware self- rights, duty and responsibility toward country and country people. It is generally recognized that literacy level is a good proxy for the level of socio-economic development of the communities concerned Education is our aggrandizer. It is a way of socio-economic transformation. It is a single panacea against the ignorance. Degree of social development of any society determine by the educational status of the population. Literacy is an important indicator of Human Development Index (HDI). The educational status of the respondents has been presented as follows:

**Table 4.6 Distribution Respondents of Education Status**

| Education Status | Number | Percentage |
|---|---|---|
| Illiterate | 4 | 16 |
| Literate | 3 | 12 |
| Primary | 8 | 32 |
| Secondary | 3 | 12 |
| High Education | 7 | 28 |
| **Total** | **25** | **100** |

Source: Field Survey, 2022

The research also tried to find out the educational status of the respondents in the study area where it had found that most of the people have completed their study up to primary level, few has completed high education then few have just completed secondary level education and few are literate and few are found illiterate during research. The table 4.6 shows that the most of the respondents have completed primary level of education which is of 32%, then 28% respondents

have completed high education and 12% respondents have only completed secondary level and literate as well whereas illiterate respondents are of 16% and others are in rare of number.

## 4.3 Role of Sericulture in the Socio-economic Development and Livelihoods

Sericulture has emerged as the most important cash crop with minimum investment, low gestation period, high employment potential and highly remunerative return. Thus, it offers livelihood generation as one of its major potentials particularly the rural people. Sericulture is suitable for every section of society including a big farmer or a landless aged person irrespective of man or a woman. It involves simple technology, which is easy to understand and adopt. Thus, Sericulture has provided downstream employment and income generation in rural and semi-urban areas, high participation for low-income and socially under privileged groups.

### 4.3.1 Level of Income

Today, it is changing. Now a day both male and female in individual household starts different economic activities to generate income for their betterment. They spend their time in a working place and contribute to the family income and reducing poverty. In addition, men are also involved in additional work. It is not surprising as micro and small enterprises have a role of job creation. The main important thing is to generate sufficient income for the family and the question of sustainability. Does the profit satisfy the family members or are they looking for additional work. The survey that collects the data on consumption and expenditure is used to understand how much does the enterprises contribute to poverty reduction. The level of income of the sampled respondents is presented as per the following table.

**Table 4.7Income of the Respondents**

| Yearly income (in Lakh) | Respondents | Percentage |
|---|---|---|
| 1-10 | 16 | 64 |
| 11-20 | 6 | 24 |
| above 21 | 3 | 12 |
| Total | 25 | 100.00 |

Source: Field Survey, 2022

The table 4.7 shows that 64 percent population fall in the majority of yearly yearning in the range of 1-10 lakh, 24 percent earning in the range of 11-20 lakh and 12 percent yearly earnings in the range of above 21 lakh respectively.

### 4.3.2 Level of Expenditure

Income and expenditures are the foundation of any business. The definition of income and expenditures encompasses different areas and types of transactions, as different professional disciplines see them in ways relevant to their specific situations. Understanding the different types, especially expenditures, enables companies to record financial data more accurately. Amount of income determine the size of expenditure which is given by the following table.

**Table 4.8 Expenditure Pattern of Respondent by Household (Yearly)**

| Yearly Expenditure (in Lakh) | Respondents | Percentage |
|---|---|---|
| 1-5 | 15 | 60 |
| 6-10 | 7 | 28 |
| Above 10 | 3 | 12 |
| Total | 25 | 100.00 |

Source: Field Survey, 2022

The expenditure condition of the household has 60 percent in the range of 1-5 lakh, 28 percent in the range of 6-10 lakh, and 12 percent in the range of above 10 lakh respectively. The indicator of economic system is not only the income but also the expenditure description. It is most necessary that a strong source of income must be present to live in a secure environment. High income is the indicator of economic prosperity and low income brings all kinds of discomfort. In the study area the major economic sources of the respondent in community were leather-based work, agriculture and service. Today many people those have low income have a difficulty to lead their life with only one job. They should do extra work either as employed or run their own business on the side.

### 4.3.3 Role of Seri-culture inLocal Livelihoods

Small business played a vital role to improve livelihoods and reducing poverty. As an agriculture based industry, seri-culture provides valuable way to improve farmer's livelihoods. The data collected from the field supports that the economic conditions of the farmers have been considerably improved especially after they started it as a major occupation. The role of seri-culture in livelihoods is sown in table 4.9.

**Table 4.9 Role of Sericulture in Improving the Livelihoods**

| Variables | Respondents | Percentage |
|---|---|---|
| Improve livelihood | 21 | 84 |
| Occupation | 4 | 16 |
| Total | 25 | 100 |

Source: Field Survey, 2022

Table 4.9 demonstrates the main reasons to keep small business in the study area. Among all, 84 percent of the respondents argued that the sericulture business helps to promote their livelihoods.Similarly, 16 percent of respondents argued that seri-culture helps to improve the livelihoods and professional occupation.

### 4.3.4 Employment Generation

Sericulture is the part of the agriculture activities in the country. It generates more employment opportunities when compare to other industry, especially in rural and semi- urban areas. Sericulture is a labor-intensive industry in all its phases. It can generate employment up to 11 persons for every kg of raw silk produced. Out of which more than 6 persons are women. Low gestation Sericulture operations require very low investment for their initial establishment. Mulberry takes only 6 months to grow for commencement of silkworm rearing mulberry once planted will go on supporting silkworm rearing year after year for 15- 20 years depending on management provided(Field Survey, 2022).

### 4.3.5 Women Empowerment

Sericulture is an extremely labor-intensive industry and occupies a pivotal position from the point of providing employment and additional income to weaker sections. In this context, the transformation of sericulture industry from subsistence type of operation to a modern scientific system requires the attention of all major players like policy makers, administrators, and personnel associated with the industry. Here, the word personnel mainly refers to women laborers who are the full-time workers and who look after silkworm rearing and management and whose contribution is more than that of men in this area.Sericulture provides tremendous opportunities to the women in the rural areas particularly in silkworm rearing and reeling activities with reference to income. 60 percent of the women employed in down- stream activities of sericulture in the country (Field Survey, 2022). This achievement is possible because sericulture sector starting from mulberry garden management, leaf harvesting and silkworm rearing. Women in Nepal participate in a variety of economic activities.Seri-culture is an ideal occupation for weaker section of the society because low gestation, higher returns. Acres of mulberry garden and silkworm rearing can avoid maximum labourers and save wages in the sericulture sector of the state. Tasar silkworm process can offer supplementary gainful employment for tribals compare to other sericulture activities (Field Survey, 2022).

### 4.3.6 Environmental Friendly Profession

Sericulture sector is an eco- friendly activity because as a perennial crop with good foliage mulberry contributes to soil conservation and provides greenery. Waste from silkworm rearing can be recycled as inputs to garden. Development programmes initiated for Mulberry plantation are mainly in upland areas where un-used cultivable land is made productive. Income generation Sericulture is an income generating agro-enterprise in the mid hill region to alleviate poverty, through increasing rural women employment and their income, and thus, has been given due priority by Agriculture Perspective Plan. Sericulture is a potential sector of the agriculture to raise economic status of the farming community and also earning foreign revenue (Field Survey, 2022).

## 4.4 Problems and Constraints of Seri-culture Development

Sericulture is an agro-based and economically rewarding enterprise consisting of several sets of activities and plays a predominant role in shaping the economic destiny of the rural people with lot of employment potentially. The production process of silk fabric contains a long chain of interdependent operations i.e, cultivation of mulberry, silkworm seed production, silkworm rearing, silk production, twisting, warp and weft making, dyeing and printing, spun silk production, finishing of silk fabric, designing of silk garments,etc., that provides medium of live hood to rural and semi-urban people. Nepal is blessed with favourable climatic conditions throughout the year and availability of human resource remained the advantage to the Indian silk industry. Sericulture provides rich dividends with low investment and portable return within short gestation period and provides employment throughout the year. It is obvious that, Sericulture plays a pivotal role in the economic development of the country by generating employment, income, as well as foreign exchange.

The Nepalese sericulture industry is currently facing several other problems, which have restricted full utilization of its potential. In sericulture, the production and productivity of quality cocoon largely depend on the healthiness, growth of the silkworm larvae and suitable environmental conditions. The following are the key constraints of sericulture in the study area:

1. Inadequate facilities for continuous egg production.
2. Lack of technical support for mulberry cultivation and silkworm rearing.
3. Absence of funds from supporting agencies to meet farmers' credit needs.
4. Lack of training programs for farmers and inservice training of staff.
5. Inability of department of agriculture to use trained staff for sericulture development.
6. Mulberry saplings are distributed annually to a certain number as per fixed targets but afterward their care or management is lacking. It also lacks packaged technology for the small farmers.
7. No separate rearing house is there to rear silkworms thus leading to high mortality and low productivity.
8. Sericulture in Nepal is not growing rather it is limping. In reality, sericulture lacks dedication and honesty in getting service from all concerned sectors.

9. Sericulture is a complex component of agricultural and industrial vocations and it requires simple but timely delivery of technical services, care and managements.
10. Similarly, the institutional strength in terms of grainage management, inputs delivery, and intensive Sericulture facilitation services during rearing and harvesting is not adequate.
11. In the government sector also, the trained and experienced sericulture technicians are often deployed in areas other than sericulture.
12. The overall mulberry garden management is poor with poor quality leaf production resulting too low cocoon productivity.

Nepal silk yarn is of poor quality, which not only affects our competitiveness in the world market, but has also resulted in a preference for imported yarn in the domestic market. Though the Nepalese breeds have the potential to produce the good quality of bivoltine silk, the problem arises due to lack of:

1. appropriate mountages
2. grading system for cocoons
3. quality leaf due to insufficient inputs to mulberry garden;
4. quality-based pricing system as well as use of young age silkworms;
5. strict disease control measures
6. sufficient thrust on the adoption of improved technologies (Field Survey, 2022).

## 4.5 SWOT Analysis

Strength, weakness, opportunities and threats (SWOT) analysis highlights an overview of silk production in the various stages of the value chain. It identifies all the strengths, weaknesses, opportunities and threats throughout the process. SWOT analysis is presented by the table 4.10.

**Table 4.10 SWOT Analysis of Sericulture throughout the Production and Marketing**

| **Strengths Weaknesses** | **Weakness** |
|---|---|
| ⁾ Climatic suitability.<br>⁾ Increasing demand in local, national as well as international markets.<br>⁾ Governmental assistance and support.<br>⁾ Availability of land favorable for mulberry cultivation.<br>⁾ Formation of Farmer's Group and co-operatives for better production<br>⁾ Availability of family labor.<br>⁾ Trainings, seminars related to quality processing accessibility<br>⁾ Handmade silk products.<br>⁾ Better channels and linkages for cocoon collection. | ⁾ Shortage of input supply.<br>⁾ Lack of technical knowledge on production andmanagement.<br>⁾ Land fragmentation.<br>⁾ Variation in silkworm quality.<br>⁾ Decreased level of productivity.<br>⁾ Less coordination among the development agencies.<br>⁾ Shortage of water supply in different areas.<br>⁾ Inadequate out-reach and follow-up of extension programmes.<br>⁾ Inferior quality of processing machines.<br>⁾ Less availability of expertise in marketing. |
| **Opportunities** | **Threats** |
| ⁾ Better scope for the increment in production and productivity.<br>⁾ Availability of land for sericulture in mid hills and inner terai. | ⁾ Risks of pests(ants) and diseases(muscardine)infestation.<br>⁾ Higher production cost.<br>⁾ Uncertified silk being sold in market. |

| | |
|---|---|
| ⎫ More interest of farmers towards silk.<br>⎫ Growing demand in markets.<br>⎫ Various institutions (public and non-governmental) working in this sector.<br>⎫ Quality improvement in silkworm egg through university and governmental research.<br>⎫ Availability of markets for selling fresh ccocoons. | ⎫ Variation and inconsistency in volume and quality of production.<br>⎫ Very less research in quality processing technology.<br>⎫ Government monopoly in silkworm eggs production.<br>⎫ Comparatively cheaper cocoons from other countries.<br>⎫ Less price for other synthetic silk-like fabrics. |

# UNIT V

# SUMMARY, CONCLUSION AND RECOMMENDATION

## 5.1 Summary

Nepal is a country steeped in socio-cultural diversity. Its population was divided into a number of known and unknown, caste and ethnic groups of which at least 125 have been formally identified (CBS, 2011). The selected site for this research is the sericulture development center Khopasi, Kavre. Regarding ethnicity the respondents were divided into Brahmin, Chettri, Tamang, Newar and Rai. And mostly people found Brahmin and Newar groups. In this study, the respondent's gender groups are classified as male and female which is presented. This study shows that there are 56% female and 44% male respondents. The questionnaires were asked to the respondents aging from 16 to above years. Then it was divided into two groups 16-59 and above 61. The data showed that 80% of respondents were economically active i. e. (16-59) and the remaining 20 percent of respondents were above 61 years. The study showed that 64% of respondents followed Hinduism, 20% of respondents followed Buddism, 12 % of respondents followed Christianity and 4% of respondents followed by Kirant respectively.

It means 52 households belong to nuclear family. Education is our aggrandizer. It is a way of socio-economic transformation. It is a single panacea against ignorance. Most of the respondents have completed primary level of education which is of 32%, then 28% respondents have completed high education and 12% respondents have only completed secondary level and literate as well whereas illiterate respondents are of 16% and others are in rare of number.

Sericulture has emerged as the most important cash crop with minimum investment, low gestation period, high employment potential and highly remunerative return. Thus, it offers

livelihood generation as one of its major potentials particularly the rural people. About 64 percent population fall in the majority of yearly yearning in the range of 1-10 lakh, 24 percent earning in the range of 11-20 lakh and 12 percent yearly earnings in the range of above 21 lakh respectively. The expenditure condition of the household has 60 percent in the range of 1-5 lakh, 28 percent in the range of 6-10 lakh, and 12 percent in the range of above 10 lakh respectively.

As an agriculture-based industry, sericulture provides valuable way to improve farmer's livelihoods. Among all, 84 percent of the respondents argued that the sericulture business helps to promote their livelihoods. Similarly, 16 percent of respondents argued that seri-culture helps to improve the livelihoods and professional occupation. Sericulture is the part of the agriculture activities in the country. It generates more employment opportunities when compare to other industry, especially in rural and semi- urban areas. Sericulture is a labor-intensive industry in all its phases. It can generate employment up to 11 persons for every kg of raw silk produced.Sericulture provides tremendous opportunities to the women in the rural areas particularly in silkworm rearing and reeling activities with reference to income. 60 percent of the women employed in down- stream activities of sericulture in the country. This achievement is possible because sericulture sector starting from mulberry garden management, leaf harvesting and silkworm rearing. Women in rural Nepal participate in a variety of economic activities.

Sericulture provides rich dividends with low investment and portable return within short gestation period and provides employment throughout the year. The Nepalese sericulture industry is currently facing several other problems, which have restricted full utilization of its potential.

Inadequate facilities for continuous egg production, lack of technical support for mulberry cultivation and silkworm rearing, absence of funds from supporting agencies to meet farmers' credit needs, lack of training programs for farmers and inservice training of staff et car major problmes. Mulberry saplings are distributed annually to a certain number as per fixed targets but afterward their care or management is lacking. It also lacks packaged technology for the small farmers.No separate rearing house is there to rear silkworms thus leading to high mortality and low productivity.

## 5.2 Conclusion

Sericulture has emerged as the most important cash crop with minimum investment, low gestation period, high employment potential and highly remunerative return. Thus, it offers livelihood generation as one of its major potentials particularly the rural people. Sericulture is suitable for every section of society including a big farmer or a landless aged person irrespective of man or a woman. It involves simple technology, which is easy to understand and adopt. Thus, Sericulture has provided downstream employment and income generation in rural and semi-urban areas, high participation for low-income and socially under privileged groups.

Sericulture is a traditional small scale cottage industry with potential of better commercial opportunities to the rural households. There should be more prospects to strengthen the extension of farmers by providing them the good quality and disease resisted silk seed for improved production of cocoon and raw silk.

Sericulture creates gainful employment for women and aged persons at homes at minimum risk. Women members get a steady source of income from tasar silkworm rearing during a period when no work is available in the neighborhood. Thus, the income from sericulture not only helped to maintain their family during lean agricultural season, but also ensures continuance of education to their children and boosted the morale of these tribal women through self-employment. This sector is not only important for generating rural employment and preventing rural migration but also for role in protection and preservation of ecology, heritage and socio-

cultural values. Thus, the analysis clearly establishes the importance of sericulture over other crops in the generation of fresh employment opportunities in rural areas.

### 5.3 Recommendations

In conclusion, this study relies heavily on the extant literature work. Therefore, based on the findings from this paper, it is suggested that the future studies should involve empirical research that would involve qualitative research purposely to explore views and experiences of sericulture entrepreneurs. The following would be the key recommendations for further betterment of sericulture business.

- The government should give them compensations for the losses incurred in this occupation due to diseases and the negative impact of natural factors
- There should be enough loan facilities for the improvement of their occupation which is still more beneficial
- The government should be encouraging them to make clothes along with sericulture occupation
- Provision of refresher training programme for the silkworm rearers
- Focusing on use of new technology

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## Appendix: A

### Schedule Questionnaire for Households Survey

Code number: . . . . . .

Respondent Name: . . . . . .

Place of interview: . . . . . Date: . . . . . .

**A: Background Information**

1. Age

a. 0-15 years ( ) c. Above 61 years ( )

b. 16-59 years ( )

2. Sex

a. Male ( ) b. Female ( )

3. Marital status

a. Married ( )

b. Single ( ) c. Separated ( )

c. Widow ( ) d. Divorced ( )

If married, how many children do you have? ……

4. Family Type

a. Joint ( ) b. Extended ( ) c. Nuclear( )

5. Religion

a. Hindu ( ) c. Christian ( )

b. Buddhist ( ) d. Muslims ( )

6. Educational level

a. Can read and write ( ) b. Cannot read and write ( )

If, can read and write

a. Informal education ( ) d. Primary level ( )

b. Secondary level ( ) e. Higher secondary level( )

c. Bachelor and above ( )

7. Any other occupation other than farming

a. Home maker ( ) c. Agriculture ( )

b. Business ( ) d. Services ( )

**B: Economic and Livelihoods Information**

8. Land ownership

a. Own

b. Rental

c. Both

9. How many members of the family are involved in the Sericulture industry ?.....

10. How many months do you work for the Sericulture industry?.....

11. Who provided the training?.....

12. Do you have knowledge about of Sericulture industry with Modern Technology?

a. Yes ( ) b. No ()

13. Do you find the prices are reasonable?

a. Yes( )b. No ()

If Not why? ……

14. What is the optimal yield in the area?..... Ropani/season

15. What is the average yield in the area?.....Ropani/season

16. Type of irrigation facilities?

a. Canal () d. Deep boring ()

b. Pumping () e. Rain Fed ()

c. Others ()

17. Do you have alternative sources of income?

a. Yes ( ) b. No ( )

18. What percentage of you rely only on income of Sericulture industry? ……..

19. What is the major source of livelihood of the family?

a. Services () c. Agriculture ()

b. Business () d. Other .....

20. What is your family annual income (monthly or yearly): Rs……

21. What percentage does Agriculture Share on it?.....
22. What are the major crops in farming?
    a. Cereal/grains () b. Cash crops ()
23. What percentage does Sericulture industry share in entire Agriculture income?.....
24. Purpose of Sericulture industry produced?
    a. Commercial purposes () b. Subsistence farming ()
    b. Both ()
25. Is Sericulture industry revenue relevant for households' income?
    a. Yes () b. No ( )
26. Are you/r or family engaged in any groups, cooperative etc?
    a. Yes ( ) b. No ( )

if yes what is it? And how?……

27. Do you have road linkage in farm area?
    Yes ( ) b. No ( )
28. What kind of school does your kid study in?
    Government ( ) d. Private ( )
    Govt. Aided ( ) e. Religious non- formal ( )
    Recognized private ( )
29. Did it make any other changes in their day to day life after having benefit of the Sericulture industry? ……
30. What are the problmes of Sericulture industry ?
    ……
31. What are the constraints of Sericulture industry?
    …….
32. What are the strength of Sericulture industry?
    …….
33. What are the weaknesses of Sericulture industry?
    ……
34. What are the opportunities of Sericulture industry?
    …….

35. What are the threats of Sericulture industry?

……..

Appendix: B

Photography


Photos: Sericulture development center, Khopasi, Kavre