

Master's Thesis on
CHANGING SCENARIOS OF AGRICULTURE AND
LIVELIHOOD OF THE CHEPANG COMMUNITY OF
GORKHA, NEPAL

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ABSTRACT

Chepangs being one of the indigenous nationalities of Nepal are still marginalized in many aspects. This research investigates the changing aspects of agriculture and livelihood among the Chepang community residing in Taklung, Gorkha, Nepal. The study aims to examine the current cultivation pattern with highlights of past agricultural practices. In addition, the research tries to foster all possible livelihood strategies of the Chepang people for their living with a glimpse of land use pattern change and the probable reasons behind it. The research employs mixed methods i.e., both qualitative and quantitative methods to produce the desired data. Household surveys, key informant interviews, and focus group discussions forms the major primary sources, and published research, unpublished research, government reports form secondary sources of data for this research. In addition, remote sensing data is utilized to generate land use pattern change in the past two decades in the study area. Chepangs are one of the underprivileged groups of people in various developmental aspects such as health, education, transport, employment opportunities, and many more. For many centuries Chepangs relied on shifting cultivation hunting and gathering for their livelihoods. However, after the formulation of new laws related to forest resources management, Chepangs were restricted from the utilization of forest resources. Hunting was made illegal after the enactment of laws which acted as a major transition phase for the changes in their life and livelihood. Later, when their access to forest resources was severely restricted, they could not utilize forest resources for continuing the shifting cultivation, and hunting was banned so they had to change their cultivation pattern into a permanent one. Chepang people from the study area have restriction in the forest resources consumption, and utilizing the forest patches for cultivation is no longer possible, which has led to the disappearance of the shifting cultivation trend in the community. People in the present context are cultivating staple crops for food and cash crops for commercial purposes. However, paddy cultivation has been declining in recent years because paddy requires more irrigation. This research investigated the dynamic aspects of Chepang's livelihood, and found that still more than 80% of the people are involved in agriculture. However, only agriculture is not enough to sustain their livelihood and Chepangs are diversifying their livelihood strategies these days. Diversified livelihood bases are helping them to fulfill the needs of their family members. Those who are considered to follow agriculture for their livelihood have shifted towards cultivating income-oriented crops which have very good income value in the market. From the analysis of remote sensing data of the study area, there are noticed changes in

the land use pattern in the area. When analyzed in detail the factors behind land use change, the major reasons are changes in the forest policy due to which forest patches were no longer allowed for cultivation and out-migration of the Chepang people. Chepangs are migrating these days to the bigger city areas for better employment opportunities as agriculture alone is not enough to sustain their livelihood. Hence, rural out-migration is one of the factors behind land use changes in the community. This study mainly focused on analyzing the changing aspects of agriculture and livelihood and found that the agricultural system has drastic changes, and they are diversifying the income sources including intensive cash crop cultivation for their livelihoods.

Keywords: *Chepangs, Agriculture trend, Livelihood diversification, Land use change*

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LIST OF ABBREVIATIONS

CBS	Central Bureau of Statistics
CBFM	community-based forest management
COVID	Coronavirus Disease
GIS	Geographical Information System
GoN	Government of Nepal
HD	Human Development Index
HH	Household
ICIMOD	International Center for Integrated Mountain Development
INGO	International Non-governmental Organization
KII	Key Informant Interview
NTFP	Non-Timber Forest Product
UiB	University of Bergen
USGS	United States Geographical Survey
VDC	Village Development Committee

CHAPTER I: INTRODUCTION

1.1 Background

Nepal is a landlocked country where most people have agriculture as their major occupation. Nepal is divided into three geographical divisions: Terai, Middle-Hills, and Himalayas. Many people residing in middle hill areas still depend on farming for livelihood. However, the sustainability of farming has been a challenge for policymakers and development agencies. The land degradation problem induced by intensive farming on steep land, deforestation and other natural phenomena poses the food and livelihood security of local farming communities in fragile conditions in the middle hill areas of Nepal (Shrestha et al., 2004). Different forms of intensive to semi-intensive land use systems have been in practice in the hilly areas of Nepal. Among them, shifting cultivation is the one which is practiced basically in hilly areas of the country. The selected research site for this research, i.e., the Chepang community residing in Taklung, a village in the Gorkha district of Nepal, also lies in the hilly region of the country. According to Regmi et al., (2005), a shifting agriculture system is practiced by Chepangs and other ethnic people living in hilly districts of the country, and the local language of this form of agriculture is called Khoriya farming (Dhakal, 2000). The labor-intensive agricultural production system is still common throughout the country. It is accompanied by land scarcity, eventually challenging the life and livelihood of thousands of smallholder rural farmers (Sunam and McCarthy, 2016). Middle hills of Nepal constitute a maximum number of people dwelling in it and they still depend on subsistence agriculture for a living (Acharya et al., 2008). Many governmental and non-governmental organizations are trying to promote suitable agricultural technology that can promote the sustainability of farming in the middle hills of Nepal. However, many of the indigenous communities, like Chepangs, continue the shifting cultivation as they are still deprived of technical knowledge about the alternatives. Many rural households still depend on shifting cultivation for food security and to meet the local dietary needs (Mukul, 2011). The swidden land use is expected to disappear in areas that are greatly exposed to socio-economic and institutional support but are still practiced in rural livelihood where no such facilities are available (Mukul and Byg, 2020). In the study area of this research i.e., the Chepang community people of Taklung are engaged in shifting cultivation and utilize forest patches and resources for their livelihood but proper rules and policies related to forest resources consumption and conservation are still lacking.

Shifting Cultivation and Present Context

Dhakal (2000:93) defines shifting cultivation as “Shifting cultivation in general, is a system of farming in which cultivation fields are prepared by cutting down the natural vegetation, letting them dry and burn them off”. Dhakal (2000) stated that “Shifting cultivation fields are generally used not more than two years at a time, after which the farmers leave the plot fallow and move to a new area and repeat the same process”. In Nepal shifting cultivation is denoted by vernacular terms such as Lose, Bhasme, Dash, and Khoriya Kheti. ‘Swidden cultivation’ and ‘slash and burn’ farming are also called shifting cultivation (Gurung, 1999). This mode of cultivation is also a traditional mode of adaptation to the local cultural and environmental situations (Gurung, 1999). Under shifting cultivation, commonly termed as Khoriya farming, generally steep to gentle land surface is cultivated using the slash and burn technique, due to which this farming system was also known as slash and burn farming in the local community of Chepang people. Patches of forest land are first cleared off and dried vegetations is burned subsequently before sowing the crops. After completing one or two cycles of crops the land is abandoned for a few years. In that time, Chepang farmers clear other patches of forest and clear the vegetation for cultivation purposes. Many researchers have pointed out that shifting cultivators are mostly unsecured, marginalized and often they rely on wild and uncultivated plants for subsistence (Aryal et al., 2009; Regmi et. al., 2005). Shifting cultivation practiced with reduced fallow periods, reduces vegetation cover which increases the chances of soil erosion and hence, puts the livelihood of shifting cultivators at risk (Rasul and Thapa, 2006)

In the context of Nepal, very few studies have been carried out on shifting cultivation (Shrestha, 1989; Bajracharya et al., 1992; Subedi, 1994, as cited in Dhakal, 2000). These studies focus on the economic and ecological aspects of cultivation practices, but the studies with shifting cultivation being an integral part of the people who practice it as the major source of their livelihood is lacking (Sharma, 2012). This research tries to focus on the shifting cultivation practices of the people in the Chepang community of Taklung Gorkha for sustaining their livelihood based on the mixed method of quantitative and qualitative research techniques like household surveys, Key informant interviews, and focus group discussion for the collection of primary data. Published research papers and articles, unpublished research, reports, and local governmental information books from local governmental authorities are utilized for collecting the secondary data. Also, demographic information, educational status, occupational status, and land holdings are collected through primary and secondary sources, and the current cultivation trend is analyzed to learn more details

about the shifting cultivators in the study area. As mentioned by Sandsurkt (n.d.) as cited in Dhakal (2000:97), There are two general views regarding shifting cultivation which are drawn from the anthropological perspectives, First, is the normative view which focuses on the negative aspects of shifting cultivation: low productivity, extensive land requirement, and unwanted environmental effects. The second view in shifting cultivation is the rational response to the prevailing ecological and cultural conditions. This study follows the concept that the area resembles the second view of shifting cultivation.

Along with shifting cultivation, the sustainability of hill farming has been one of the major challenges for both government as well as non-government organizations working in Nepal. Shrestha et al., (2004) mentioned that in middle hills areas of the country, land degradation problems induced by intensive farming on steep slopes, deforestation, and natural phenomena pose the food and livelihood security of the local farming communities in fragile conditions. To achieve sustainability, farmers should adopt ecologically, economically, and socially suitable practices. Even though the farmer decides to adopt land-use options available in their locality often marginal farmers like Chepangs are forced to adopt low-returning and ecologically unsustainable agricultural practices due to a lack of technical knowledge and management skills for innovative agricultural technology. Similarly, in the middle hill areas of Nepal such as Taklung, Gorkha, people are practicing the low-returning and ecologically fragile farming systems. In addition, in the case of Nepal, a fallow period in shifting cultivation has been reduced drastically from about 15-20 years to just 2-3 years (Dhakal, 2000) mainly due to the state-led land tenure policies which have put the life and livelihood of rural farmers in fragile condition.

The physical condition of the agricultural land in the study area was found to be fragile even though the soil contained a good proportion of boulders and pebbles (Figure 1). There were landslides in several areas during the field survey in the research area. The farmland of the Chepang community is characterized by steep slopes, rugged terrain, thin layers of topsoil, stony, and low productivity. The permanent cropping field is carved to bench-like terraces in the study area (Figure 2) and other remaining land parcels are still in slope condition. It is noticed that the life and livelihood of Chepangs have changed and have become more settled just a century ago as mentioned by Gurung (1995:32). In ancient times, Chepangs adopted hoe to plow, forest to farm and caves for hunting (Rai, 1985). In addition to that, the Chepangs including from the study area, generally used to

depend upon hunting, gathering, and fishing for livelihood in ancient times. However, nowadays, they have newly adopted subsistence farming mechanisms and still follow a very simple hoe and plow culture cultivating very few varieties of upland food crops. But still, the soil texture and environmental condition in the research area makes it difficult for the desired outcomes from the cultivation techniques that the Chepang people are following these days.



Figure 1: Fragile slope used for cultivation in the study area



Figure 2: Permanent Cultivation land (Terraces) in the study area

The Chepangs

Nepal is a small country bordered by two giant nations i.e., China in the North and India in the East, West, and South. Despite its small area, Nepal possesses extreme variation in landscapes from 60 meters to 8848 meters above sea level. This has led to further diversity in climate, flora, fauna, and resources and diversity among people based on their culture and well-being. The tiny country inhabits 125 ethnic/caste groups with distinct social origins, languages, cultures, and lifestyles (CBS, 2011). The Chepangs are one of the ethnic groups living in the country's Southern-Central region. Chepang people are categorized as a highly marginalized indigenous group which is analyzed based on their economic status and threatened cultural identity by Nepal Foundation for Development of Indigenous Nationalities (World Vision Advocacy Forum, 2009).

The traditional dwelling areas of the Chepang people constitute the southern part of Dhading, the western part of Makwanpur, the northern part of Chitwan, and the southern part of Gorkha. The region where Chepangs live constitutes the steeper slopes of the Mahabharat range at an elevation of 500 to 1200 m (Bista, 1967:118). The Chepang people are believed to have an ancestral affinity with Tibetans (Bista 1967). They are extremely marginalized ethnic people and have their ethnic

language which also resembles one of the Tibeto-Burman strains. The tentative district-wise population percentage of Chepangs is listed in Table 1.

Table 1: District Population percentage of the Chepang

District	Total Population (%)
Gorkha	6
Chitwan	38
Makwanpur	37
Dhading	18.5
Other districts	0.5

Source: Adhikari, 2023

In the present context, Chepang communities are not only limited to these four districts but are found scattered across almost half of the nation. However, almost 99% of the Chepang population live scattered in these four districts. According to Adhikari (2023), 38% of the Chepangs live in the Chitwan district, 37% in the Makwanpur district, 18.5% in the Dhading district, 6 % in the Gorkha district, and the remaining 0.5% in the neighboring districts such as Tanahun, Lamjung, Parsa and Kathmandu. There is a story about Chepang history which says that in the past, they were known as “Praja” but now they like to be called as “Chepangs” instead of Praja because Praja does not reflect their traditional identities. The Chepangs have no fixed religious practice, but they claim themselves as animists and respect the shaman as the Guru (Path Founder) of the society. However, nowadays they have started to follow main religions like Hinduism and Buddhism as their neighboring communities. Chepang tribe people like to live close to nature. In ancient times, Chepang people lived semi-nomadic lives in the dense forest of Mahabharat Hill. Chepang men used to go hunting wild animals, birds, and fish, and women used to take care of small children at their temporary homes which they would abandon after a short period (Gurung, 1995). None of the Chepang people were known to live outside of their traditional region even until 1990 as stated by Gurung (1995). It is a well-known fact that Chepangs are still economically backward when compared to other social groups of people living around their territory (Bista, 2013). Furthermore, there have been visible changes in livelihood and cultivation aspects of the community over time and this is the exact case in the selected site for this research.

The major characteristics of Chepangs include Poverty, illiteracy, lack of self-sufficiency, food security, and lack of resource ownership (Piya et al., 2011). Due to ignorance, administrative requirements, and official procedures, many Chepangs still do not have citizenship. Chepangs used to clear random forest areas and cultivate in those patches due to which they still do not have legal documents of land ownership of the land which they have been cultivating for a long time. The little volume of land on which they have official title is poor in quality and infertile and the food crops produced from the land are not enough for the whole year round. During the phase of food scarcity, Chepangs depend on forest resources and gather wild edibles like tubers, yams, and fruits (Piya et al., 2011). However, their access to forest resources has been severely restricted due to unfavorable state-led policies, which in turn threaten the traditional life and livelihood of Chepangs (Uprety and Adhikari, 2006).

Chepangs worship the forest as their god and are considered guardians of the forest. Chepangs are believed to have lived a semi-nomadic life following hunting and gathering. In this sense, agriculture is supposed to be a comparatively newer phenomenon for them (Bhattarai et al., 2003). Hodgson (1874:45) mentioned that Chepangs in Nepal is supposed to be “living entirely upon wild fruit and the produce of the chase”. After almost a century, a comprehensive study of Chepangs by Rai (1985) reported that though Chepangs still practice a good deal of hunting and gathering, their main basis of livelihood is agriculture in the present context and some of the Chepang community also practices shifting cultivation too. However, the Chepang people slowly started to end the shifting cultivation practices and involved themselves in permanent agriculture in terraces after their access to forest was restricted due to the introduction of new government policies; mainly after enactment of the Private Forest Nationalization Act in 1957. Under this new policy act, all the previously used forests under traditional rights were given government ownership. Later after the enactment of the Forest Act 1993, the government ownership in such forests was strengthened and there was the introduction of the community and leasehold forest concept after which hunting and gathering from forest areas were restricted which led negative impact on the tradition of the Chepang community as they couldn't continue shifting cultivation of forest patches and hunting and gathering of forest resources any longer. Restriction in shifting cultivation in forest patches and hunting and gathering led to the transition of their livelihood to sedentary agriculture in the study area and almost all the Chepang communities throughout the country.

Land use change and livelihood of Chepang community

Indigenous people of Gorkha and several other places in Nepal have been occupying their traditional knowledge in several ways for their livelihood. They have been foraging medicinal herbs, wild food materials, and several other herbs that constitute the resources of the forest. Rijal (2008) revealed that Chepangs have rich knowledge about the use of different plants for medicinal purposes. Rijal (2008) also highlighted that the continuity in dependency of the Chepangs on such biological resources is guided by spiritual belief, economy, and limited alternative health facilities. The case is quite like the selected research area of this paper as people rely on the nearby community forest for collecting useful biological resources including wild food and medicinal herbs. As mentioned by Rijal, (2008), any changes in the socio-economic activities can pose a significant threat to the traditional knowledge and the resource base of the area and hence there should be proper involvement of local institutions in managing the forest resources legitimizing the traditional knowledge and practices which will ultimately preserve the Indigenous knowledge in the tradition of utilizing forest resources, collecting wild food from the forest or in the cultivation pattern in the study area. This research tries to focus on how the Chepang people of Taklung village are dependent on forest resources for the fulfillment of their basic needs.

The Chepang people are found living mainly in middle-hill areas of the country. The Chepang people's perception and practices in agriculture have been traditional despite the ever-repeating impacts on the environment. Nepal is no exception in the process of land abandonment and land abandonment has emerged as one of the most critical challenges to agricultural and food security (Hussain et al., 2016). From the perspective of the study area, the majority of the Chepang people rely on agriculture as the primary source of living. The influence of non-tribal interaction and modern lifestyle has led to rural out-migration and farmland abandonment acceleration in the study area. Agricultural land is being abandoned in the study area and left uncultivated for a longer duration of time, due to which there is natural growth of bushes and trees in such areas and has increased the forest area in comparison to past decades (Figure 10: Land-use map 2020). As mentioned by Hussain et.al., (2016), agriculture in most parts of the country except Terai is characterized by low productivity, subsistence farming, limited access to markets, high climate vulnerability, terrain constraints, and high cost of food production and transportation.

The most accepted definition for livelihood is the one given by Chamber and Conway (1992) “a livelihood comprises the capabilities, assets (including both material and social resources) and

activities required for the means of living”. This definition has been followed by many researchers from academic institutions and development practitioners (see Murray, 2001; Bhandari and Grant, 2007). Livelihood deals with the resources available in the community and how they are utilized for living by the community members. Livelihood outcomes are determined by the livelihood strategies adopted by the household or an individual. Livelihood strategies that the local people utilize for their living are the diverse actions that are intended to meet the desirable needs for their survival. Scoones (1998) identified three broad aspects of livelihood strategies i.e., agricultural intensification/extensification, livelihood diversification, and migration. This research has also focused on these factors for analyzing the livelihood strategies of the study area.

In the community, low agricultural productivity and small landholdings mean that farming alone is not a sufficient source of livelihood for rural households to meet the increased cost of health, education, and other basic services (Poudel et al., 2014). Although they do have good access to the market for their surplus fruits, grain, vegetables, beans, and so on these days through the existing feeder road which connects the village to the nearby Prithivi Highway, the income from the market is not enough for their livelihood. They have very good access to seeds and knowledge from their ancestors regarding agriculture is an advantage, they also have access to medicinal herbs from forests which they also sell when they have a surplus of them. These are also the sources of income, they generate cash income by selling the surplus agricultural products supporting their livelihood, and this paper will analyze all possible sources of their current livelihood. The preliminary screening of the study area found that rural households like the Chepang community from Taklung are diversifying their livelihood by exploring non-agricultural income opportunities.

People in recent contexts have also been relying on new livelihood strategies. People are more educated and are changing their income-oriented activities to best support their families economically and socially. Chepang people are also noticed migrating from their villages to bigger city areas in search of better opportunities for jobs, education, and a better lifestyle. Chidi (2015) mentioned in detail depopulation and rural land abandonment in the mid-hill areas of Nepal and found that the population in the rural village areas is decreasing and is causing impacts such as land use change, land abandonment fallow lands, and wild vegetation.

This paper is focused on determining the changes in agricultural patterns with a focus on shifting cultivation practices and types of crops used for cultivation in the study area and analyzing the

changing scenarios of the livelihood basis of the community. The study was conducted in Taklung Village Ward no. 5, which lies in Sahid Lakhan Rural Municipality of Gorkha District in Nepal. This paper primarily aims to determine whether the Chepong community is still practicing the ancient shifting practice or not, to determine the cropping pattern at present and to analyze the aspects related to agriculture of the Chepong community based on field observation, Key informant interviews, and Questionnaire survey with the local people. The overall agricultural aspects and livelihood strategies of the Chepong community are studied and analyzed and have been presented in the report in the following sections.

1.2 Argument/ Thesis Statement

The Chepong community of the research area lies in Taklung, which is a village situated in ward no. 5, in Sahid Lakhan Rural Municipality of Gorkha district, Nepal. Taklung is situated in the middle hill region of the country. In the study area, the Chepong community people have been following traditional shifting cultivation practices for a long time, and in the recent context, they have also integrated the new modified permanent agricultural system into their farming culture. Shifting cultivation was practiced by the majority of households few decades back and the present scenarios of it will be discussed in later sections of the research. Chepong people during preliminary survey mentioned that to cope with the changing environment they have been following traditional shifting cultivation. There have been some visible changes in the farming culture in the study areas in the last two decades whole detailed study to identify these changes is still unknown and hence, the focus of the research is to determine past agricultural practices and the present cropping pattern and to analyze the advantages of the current cropping pattern to the local livelihood through questionnaire survey. This study also intends to analyze the social as well as ecological aspects of society and their interlinkage with the well-being of the Chepong community. To determine the changes in cropping patterns and the overall agricultural system, identify the effectiveness of new cultivation patterns in livelihood enhancement of the community and foster the diverse livelihood strategies of the Chepong community is the main motive of this research.

The Chepong people also depend on forest resources for their livelihood. The forest forms an internal part of Rural livelihood in Nepal. Forest products not only provide the rural population with basic needs like food, fuel, fodder, and litter but also provide wild food during the periods when there is a food shortage and they are out of stored grains before the new harvest time (Khatri-

Chhetri and Maharjan, 2006; Piya et al., 2011). Many non-timber forest products also have medicinal (Rijal, 2008) and socio-cultural values (Aryal, 2007). Besides these basic uses, some rural households also sell non-timber forest products as a source of cash income in Nepal (See Chhetri and Gupta, 2006; Kunwar et al., 2009). The Chepang people, including those in the research area, have depended on forest resources since ancient times for their subsistence livelihood. The role of forest resources in the enhancement of the livelihood of the Chepang people from Taklung is still unknown. Hence, this research has focused on identifying the role of forest resources in their life and livelihoods. In addition to that, Chepang people in the study area are diversifying their income sources these days for their livelihood and this process has led to land use changes in the area. Hence, this research is also focused on identifying the changes in land use and tries to analyze all the diversified income sources from the study area.

1.3 Objectives

General Objective

- To study the changes in agricultural patterns (shifting cultivation) and livelihood basis of the Chepang community

Specific objectives

- To study the changes in the land use pattern of the study area in the past two decades
- To determine the present cropping patterns of the community
- To analyze all the livelihood basis and agricultural trends of the Chepang community for their well-being

1.4 Research Questions

This study used past theories as the major basis for developing the major research questions for framing the entire research process. The research questions of the study on which the entire research is focused are listed below:

1. How is the shifting cultivation trend of the study area in the present context
2. What are the current agricultural and livelihood trends in the project area
3. What are the changes in land use patterns and the driving forces behind them
4. What is the perception of Chepang people towards current agriculture and livelihood trends and how has it changed over two decades?

1.5 Organization of the Thesis

The thesis has been organized into a total of six chapters. The first chapter provides a general background to the conducted research, the major research objectives, and the research questions. The second chapter presents the major findings and concepts that are used in the study based on the relevant literature reviews. The third chapter explains the detailed methods and procedures used in the research and various tools that have been utilized to acquire specific information. Also, the chapter discusses how the researcher collected data and the obstacles faced during the data collection phase. The fourth chapter illustrates the study area and its geographical location in the country. Furthermore, this chapter highlights the results obtained from the household survey and collected demographic and social data from the Chepang community. The Chapter also analyzes the results from household surveys, land use change data from remote sensing, and demographic data from the Central Bureau of Statistics and discusses the results with context to the specific aims and objectives of the research. The fifth chapter concludes the obtained results discusses topics about the objectives of the research and generates concluding statements from the research. The sixth chapter discusses the future research scopes and recommendations of the probable research areas for the researcher with similar topics in the future.

1.6 Limitation of the Thesis

There are a few limitations to this research which are listed:

- The field survey could not be conducted in the proposed time which delayed the household survey data collection.
- The research was conducted during the COVID-19 pandemic and a new variant was spreading at that time due to which the main researcher could not attain the household survey for data collection.
- The household survey was conducted randomly with one member of the household and the general perception of the whole family was drawn.
- The land use change of only the study area could not be extracted due lack of a high-resolution satellite image of the specific site but the map of the whole Sahid Lakhan Rural Municipality was extracted to generalize the land use pattern in the specific site and the classification was supported by the google image obtained through Google Earth Pro for the specific site.

CHAPTER 2: REVIEW OF EXISTING LITERATURE

The theories from the past literature form the main pillar of this research. The existing theories on Chepang people have contributed to understanding the subject matter of the research in a better way and understanding the context where the research has taken place, which collectively is an integral part of the research. This chapter has given highlights on relevant theories relating to the topic of this research and is intended to provide insight into the Chepang community, their agricultural behavior, and their overall livelihood aspects concerning the available theories. A glimpse of the changing situation will be provided in the light of agriculture, land use, and livelihood.

Existing Research on Chepangs

There is no documented history behind the Chepang people, so their native place of origin is still unclear, however, it is accepted that they are one of the oldest communities of Nepal living in Central and Southern parts of the country. As mentioned by Pandit (2001) origin of the Chepang people is a controversial issue. There are many myths behind the Chepang people's life and livelihood system. Gurung (1995) mentioned that Nepal being a heterogenous country with various ethnic groups at different levels of development constitutes some tribes like the Chepang community below the mainstream in developmental aspects and requires special consideration for development. If not, they will get very minimal benefit from the developmental activities.

The word "Chepang" originated from the original word 'Che-Wang' in which the word "Che" means bow and "Wang" means 'arrow' which collectively produces a combined meaning of an ethnic community living on the top of mountains and hunting with dog, bow, and arrow (Dhungel, 1994). So, the people who live in caves or stone with bows or arrows are known as 'Chewang' which ultimately became "Chepang" in the later phase. The Chepang people are believed to have lived a semi-nomadic hunter and gatherer life and used to range the forests of Nepal until the last 100-150 years ago (Hodgson, 1848). Hodgson later (1874) described that Chepang people entirely depended upon wild fruit gathering and hunting for their livelihood. Also, after almost a century, Rai (1985) reported that Chepang people still practice a good deal of hunting and gathering. Many scholars from home and abroad identified etymological meaning for Chepang and Dhungel (1994) identified them as people living in the stony land. The term 'Chepang' refers to the hill tribe community living in the Mahabharat hills of Central Nepal. The Chepangs were officially named

Praja by the former His Majesty's Government of Nepal but nowadays they don't like and use the term 'Praja' to designate them instead, they like to be called "Chepangs" which they find more reflective of their tradition and culture. Chepangs are the most publicized group of people for their anthropological importance (SEACOW, 1997:5). Janajati is the ethnic nationality under tribal nationality as defined by the former His Majesty's Government of Nepal and Chepangs claimed themselves as janajati (Chepang, 2002:1). Chepang people have their own geographical location, culture, dialects, tradition, norms, and values. In recent years, their inhibition has been confined to the environs of the Lesser Himalayas of four adjoining districts i.e., Gorkha, Chitwan, Makwanpur, and Dhading. Chepangs people's homeland is usually characterized by sloping hillslopes, erosion-prone soil, and undulating landscapes in the Central part of the Lesser Himalayas. However, due to the changes in their life and livelihood and living standard upliftment, Chepang people have also been migrating to the Terai and major city areas of the country.

Agriculture is a newer phenomenon for the Chepang people (Bhattarai et al., 2003). It is a well-known fact they have recently moved into sedentary agricultural practices, but still, a good volume of people follow shifting cultivation for their livelihood. Hence, Chepangs people's lives and livelihoods are governed by major issues such as shrinking forest resources, lack of food, and lack of other basic amenities (SEACOW, 1997). Rai (1985) mentioned that agriculture forms the main basis for livelihood in the Chepang community and still practice Khoriya/ shifting cultivation. Agricultural intensification has been practiced in the Chepang community for increment in sources of cash income. Published research on agricultural intensification views the process as the primary reason contributing to negative impacts on the surrounding environment, like soil erosion, soil fertility loss, biodiversity loss, soil pollution, and water and atmospheric pollution (Ananda and Herath, 2003). However, intensification does not necessarily indicate negative consequences, but might also result in positive benefits to society (Upadhyay, 2004). Hence, whenever the term agricultural intensification arises in any specific area, the question of positive or negative impacts becomes a very important issue for discussion. In Nepal, the livelihood of hill farmers is intensively linked to water and land resources (Brown and Kennedy, 2005). Agricultural intensification can contribute to economic development, but still intensified agriculture is practiced only in selected areas of Nepal where there is motorable road access, market access and opportunities, other institutional development, and usually close to urban areas (Brown and Kennedy, 2005). These factors might affect crop intensification either isolated or in combination with other factors with

either short-term or long-term effects on the environment. In the recent context, agricultural intensification is practiced especially in the rural middle hill areas of Nepal. In such areas, increased production per unit area means only meeting the increasing food demand of their household and uplifting their living standard. Farming by the Chepang people is often practiced in the marginal land and the production is not enough for them for the whole year round. In such cases, during the food shortage period, Chepangs depend upon forests to gather wild edibles like tubers, yams, and fruits (Piya et al., 2011a). However, the formulation of government policies has restricted the control over and access to forest resources which in turn threatens their traditional life and livelihood (Uprety and Adhikari, 2006).

Chepangs and farming system approach

In the present context, Chepang people are no longer isolated entirely in the remote hills but are slowly cooperating with the presence of outsiders, government bodies, NGOs, and the market (Gurung, 1995). Chepangs people are ending their semi-nomadic life moving out of the jungle and spreading over different towns in the Southern and Central parts of the country. Janajati and Dalit Study Center (2009) designated that this transformation through out-migration is an integral part of their new livelihood system that is mainly based on physical labor in non-agricultural sectors. Researchers have defined the farming system approach in different ways and one of them is Turner and Brush (1987), who defined Hunting gathering and shifting cultivation are the least labor-intensive land uses, but with increasing population and shorter fallow cycles, it will gradually necessitate a transition to the more labor-intensive permanent cultivation. This approach has a broader holistic approach and is a descriptive concept (ibid). This approach tries to make the researcher understand and analyze the complexity of concepts of agriculture and its changes in social, economic, and agricultural decision-making. Turner and Brush (1987) mentioned that based on the scale, the farming system is categorized into two levels; micro (individual household) or the macro (village or community level). In this research the farming system approach has been used to study case studies that describe a representative range of agricultural systems, comparison of the systems and address the factors which bring changes to the system. The focus is placed on the dynamics of micro-level agricultural units with various levels of investigations from individual households' level to the community level (Turner and Brush, 1987).

Several scholars have tried to classify the farming system and the most widely used is the classification done by Turner and Brush (1987:6). They classified the system into three major

categories i.e., output intensity, Technology type, and Production type. As mentioned by (ibid) all their components are interrelated with each other and if any one of the components changes the effect will be seen on other components as well. The output intensity of agriculture is assessed by the 'yield or production per unit area and time' which generally measures quantitative units like weight and calories. The measure depends upon the types of production and cultivators in question (ibid). For calculating the accurate output intensity detailed study of production per unit area and long period is required. The second component of the farming system is the technology type of cultivation which ranges from Paleotechnic to Neotechnic agriculture. Here, Paleotechnic designates traditional agriculture involving labor intensive and seeds input rather than technology, while Neotechnic designates modern agriculture with high outputs like soil nutrients, irrigation, pest control, mechanization, and genetic materials rather than only human labor (ibid:8). Turner and Brush (1987) explained that almost all the farming systems have mixes of paleo and neotechnic input that can make difference in ratio based on input and output intensity. The third component is the production type, and it involves "produce either for direct consumption (produced for the consumer) or for the market (commodity production)" (ibid:8). It deals with the structure of economic factors for agriculture and the decisions of farm units. Turner and Brush (1987) defined that most of the households in developing economic peasants produce crops for their subsistence and some for market. Production of only non-market crops is exceedingly rare (ibid:9) so in most of the farming system the combination of both subsistence and commodity production is practiced. The main aim of the farming system approach is to understand the livelihood of farmers and their interrelationship with other units which forms a modern-day sustainable livelihood approach. In this research, all three classified approaches of farming system approach have been applied except quantification of the output agriculture as it requires a long duration of time, and it has been linked with the sustainable farming approach.

Agricultural trend and the Chepang community

A few decades back, the Chepang people used to rely on hunting, gathering, and cultivating forest patches for their survival. Shifting cultivation is the process of cultivating the forest patches after clearing and burning forest vegetation for a short duration of time (a few years) and shifting to another forest patch for cultivation and favoring the regrowth of the secondary vegetation in the abandoned land (Dhakal, 2000). Shifting cultivation can lead to land degradation due to intensive farming on the steep land, deforestation, and other natural phenomenon which can pose a threat to the livelihood security of local farming communities in the middle hills of Nepal (Shrestha et al.

2004). Chepang farmers have been relying on shifting cultivation for their livelihood for a long time. Mukul and Byg, (2020) explained the crucial role of swidden cultivation for the life and livelihood of smallholder farmers who have limited off-farm opportunities and in those areas where there are scarce alternative land use options. They discussed in detail the transition from traditional swidden cultivation to permanent sedentary agriculture by the Chepang people and the factors that governed these changes are biophysical, socio-economic, and institutional factors. Sharma (2012) analyzed the shifting cultivation trend and practices in Chepang communities from the rural villages of Nepal. The practice of shifting cultivation is considered to reflect the old practiced indigenous knowledge which is accumulated through several trial-and-error methods and the balance between product harvest and ecological residence and agroforestry (Sharma, 2012). The emphasis was given to the significance of understanding the traditional agricultural practice of shifting cultivation reflects the history, culture, and everyday life of the Chepang community. The Chepang people live in rugged mountains with stony soil, which is very less fertile, hence, the food production is not sufficient for them year-round and they need to search for alternative sources for their livelihood which have changed the swidden cultivation patterns in several areas of the country. Factors affecting changes in swidden cultivation include water scarcity, poor yields, limited off-farm income opportunities, and government policies Mukul and Bygg, (2020). Kafle (2011) found similar results after analyzing the changing trend of shifting cultivation concerning Nepal and discussed the changes based on the available information. The evidence discussed that the unsupportive policies and policy ignorance dimensions have resulted in the changing of the cultivation pattern by the poor indigenous communities. The author also stated that there are shortened fallow periods and yield decline in shifting cultivation and hence there is a need for empirical studies to understand and develop feasible scenarios for further development. Kafle (2011) also disclosed that there is increased poverty and land degradation in shifting cultivation areas and the main reason behind this is due to the unsupportive policies.

Agriculture forms the major source of livelihood, but in most cases, it is not sufficient to provide food for the year-round. Chepangs thus depend on a diversified livelihoods strategy comprising agriculture, livestock, wage labor, collection, and sales of NTFPs, skilled and salaried jobs, and remittance (Piya et al., 2011b). Chepangs are often described as the guardians of the forest. Chepang people practiced shifting cultivation and cultivating forest patches after clearing vegetation for a short duration of time. The forest patch after a few years of cultivation becomes exhausted and then is left uncultivated for natural regrowth of the vegetation. Meanwhile, they

used to clear and cultivate the nearby forest patch. However, after the formulation of a new government policy i.e., the enactment of the Private Forest Nationalization Act in 1957, all the forest areas that had been used from the past under traditional rights were included under the ownership of the government. This act put restrictions on hunting and gathering activities and shifted the cultivation practices of the Chepang people.

This posed an adverse effect on the traditional system of the Chepang livelihoods where they could no longer practice hunting, gathering, and cultivating the forest patches for their everyday living. The Chepang people who used to cultivate the forest patches do not have the legal document of land ownership due to which the forest patches were categorized under government ownership and the patches remained uncultivated within the forest areas. Later, around the 1970s cadastral survey was conducted in the areas where Chepang people were dwelling to register the land they were cultivating, and this registered their permanently cultivated land as private properties but failed to register the traditional Khoriya (land used for shifting cultivation) Patches as the private property. Furthermore, the Forest Act 1993 was enacted which further strengthened the government ownership of forests. This forest act further introduced the concept of community and leasehold forestry which ultimately banned all hunting and gathering, and cultivation of forest patches became illegal within the forest areas. This has led to the transition of Chepang's livelihood to sedentary agriculture, ending almost all their shifting cultivation practices. The Chepang people generally grow maize, millet, buckwheat, black gram, soybeans, and mustard in the upland areas, and their traditional Khoriya patch is used during shifting cultivation. Also, they grow rice, wheat, and vegetables if they own lowland or irrigation facilities in their uplands. Only a small percentage of the Chepang households are fully food self-sufficient in the study area. Although agriculture forms the mainstay of their livelihood, Chepangs still depend largely upon forest resources, and wild and uncultivated plants play an important role in their subsistence source of food and income. Although Chepangs have reduced forest-based hunting and gathering and shifted to a permanent agriculture system, the contribution provided by forest resources to the livelihoods of Chepang has remained significant (Piya et al., 2011). Also, as there are subsequent NTFP markets nowadays, NTFP has been an important source of cash income for many Chepang communities (Maharjan et al., 2010).

Chepangs and the Forest Resources

The relationship between indigenous peoples and forests is integral and diverse. Anderson, (2001) explained the interrelationship between forest and indigenous people is influenced by factors like demography, values, market access, and many more. The Chepangs are facing challenges due to decreased forest area and reduced species for livelihood. Chepang people are more dependent on forest resources compared to non-Chepang communities. Rijal, (2008) highlights that the Chepang in the mixed population are left with very minimal of their traditional habits in terms of food, clothing, and cultivation practices. The lack of involvement of indigenous knowledge in national/governmental documents can lead to the loss of knowledge and affect biodiversity and vice versa. To avoid this loss, traditional forest management and utilization should be included in the national policy and institutional setups for access to resources and benefit sharing. The lack of acknowledgment and lack of policies to preserve the knowledge of the Indigenous people may lead to negative effects on biodiversity and the knowledge about medicinal herbs might be confined to the traditional healers and elderly people resulting in a lack of knowledge sharing to the future generation as mentioned by (Rijal, 2008). The author also mentioned that a lot of plants used by the Chepang community still need documentation. Underutilized and neglected plant species from the forest have a relatively high significance. In essence, they have high nutritional values, free of cost, readily available, and can be a better source of income especially for marginalized people (Azetsop and Joy, 2013). These food sources serve as an alternative source of food supply for those where cultivation of staple crops is least feasible and hence, will contribute to alleviating the food insufficiency problems. (Tyagi et al., 2017). Despite having high importance for food and nutrition values, these crops are generally neglected due to a lack of market opportunity and government policies (Adhikari et al., 2017). Rijal, (2011) gives an insight into the conditions under which Chepang peoples can effectively conserve the forests fulfilling their needs for their livelihood based on community-based forest management practices (CBFM). Indigenous communities like Chepang gather various kinds of biological resources from the forest for their livelihood. There are many studies related to the role of NTFPs in the livelihoods of the Chepang community one of which is Magar, (2008) which reports that in the Chitwan district NTFPs contribute 18.14% of the total household income. NTFPs-related studies are carried out in the areas where there is the majority of the Chepang population (Maraseni et. al., 2006; Pandit, 2008). However, Maraseni et. al., (2006) focuses on the distribution of profit margin for two NTFPs, and Pandit (2008) gives insights into NTFP collection and management practices under government or community forest management systems. But both studies fail to focus deeply on

the Chepang community and discuss how the Chepang community depends directly upon the NTFPs for cash income as these studies focus only on the collection of NTFPs rather than discussing their role in uplifting the living standard of the Chepang people.

Cash crops and the Chepang community

Chepang people after being involved in permanent agriculture, are now more focused on transforming agricultural behavior to improve their living standards. Gautam (2011) highlighted the transformation of the agricultural system in Illam, which is also a hilly region like Gorkha, has affected the food security in Illam. The focus is given on how cash crops contribute to changing the sources of food, the pattern of food production, and the diet of the farmers. It also highlights how cash crops increase the income level of households and change their food preference. Research documents the transformation of subsistence agriculture into cash crop-oriented production near the periphery of urban centers for high-income yield. It has been several decades since the farmers have been shifting from cereal crops towards cash crop cultivation, but cash crops are common mainly in urban territories and villages with road access and market access (Gautam, 2011). Nepal and Thapa (2009) analyzed the factors determining agricultural commercialization and mechanization in the urban center of Morang. They found that the urban centers help facilitate agricultural commercialization by creating an increased demand for food and agricultural products and supplies necessary stuff like seeds and manure for agriculture. Market-oriented agriculture has a positive impact on the socio-economic condition of the people living in the area. Nowadays, agricultural intensification is becoming the key socio-economic measure because it increases the wealth and social status of the farmers (Dahal et al., 2009). There are several factors behind the commercialization of agriculture which includes population pressure, market, technology, employment opportunity, income, transportation facilities, government policies, and institutional development (Ananda and Herath, 2003). Aase et al., (2010) studied the significant changes in the agricultural system in Manang Nepal over a few decades and found that the introduction of new crop species with commercial values is being tried out. Thapa (2013) focuses on how the transformation of subsistence agriculture to commercialized cash crops contributes to food security in developing countries like Nepal, which is driven by the integration of markets, development of roads, urban areas, and demand for supplies as well as technology and innovations in the agriculture sector. However, the research fails to address what are the factors that motivate farmers to convert to commercial farming in rural areas.

Chepangs and the Sustainable Livelihood Approach

The sustainable livelihood approach was developed a long time back around the 1990s by Norman (2002:8) and since then it has been used to address the livelihood of the farmers. Several components including migration and market form the ground for this approach. The sustainable livelihood approach emphasizes complex activities, sets of assets, entitlements, and social relationships that are managed by the households to improve the productivity for sustainable livelihood. There are many livelihood studies conducted based on the sustainable livelihood framework. Sustainable livelihood is defined as a livelihood that comprises the capabilities, assets, and activities that are required for living, and it becomes sustainable when it can cope with the changes experienced maintaining itself and providing sustainable livelihood opportunities for future generations (Chamber and Conway, 1992 in Bessant, 2006:63). In the sustainable livelihood framework, there are five livelihood assets i.e., human assets (knowledge, skills, physical capabilities), natural assets (Land, forest, water), financial assets (Remittance, saving, wage), physical assets (Production, transportation, shelter) and social assets (relations, networks) as described by Carney (1998:7). In general, sustainable livelihood approach analyses the people's access to resources, their different activities for livelihood, and the relationship between them at every level whether it is micro, intermediate, or macro level (Adato and Meinzen-Dick, 2002). The Sustainable livelihood approach highlights people's lives through several aspects and assumes that people themselves have assets and capabilities to achieve the goal for their livelihood. This approach has a dynamic concept that recognizes the changes due to both external movement and results from the people's activities (Adato and Meinzen-Dick, 2002). Researchers have been using a sustainable livelihood approach in agricultural research for a long time. Farmers' decisions for production are governed by factors like institutions, resources, and other assets. Institutions and processes affect how individuals use their assets in pursuit of their livelihood strategies. Livelihood strategies are the combination of activities that people pursue to achieve their objective of livelihood as mentioned by Scoones (1998). Scoones (1998) identified the livelihood strategies of the rural people. First is the agricultural intensification or extensification where the rural farmers invest or increase the labor input in the farm and farmers cultivate more land to increase the yield. Second is livelihood diversification where farmers diversify their livelihood to off-farm income-earning activities and migration where people temporarily or permanently move away to seek a livelihood in a new place. The livelihood strategy of Scoones (1998) mainly focused on the rural

farmers and not on other native rural nonfarmers of the village. Piya et al., (2011) identified six sources of livelihood which include farming, wage laboring, forest resources, handicrafts, skilled non-farm jobs, and remittance. Piya et al., (2011) highlighted the need for and importance of diversification in livelihood strategies and policies and mentioned that development efforts should focus more on improving farming access to forest resources and promoting non-farm opportunities for achieving sustainable livelihood of the Chepang community. The paper suggested that there should be multi-sectoral development projects to improve the socio-economic status of the highly marginalized indigenous communities like Chepangs. Also, these kinds of projects should be based on the knowledge and understanding of their socio-economic characteristics and issues of their livelihood. Similarly, to fulfill the need for objectives of this research, the research will follow assets of the sustainable livelihood approach and try to explain how the Chepang community is changing their livelihood and analyze their overall livelihood aspects in detail.

Land use change (Rural outmigration and land abandonment)

The changing patterns of land use and population are very complex due to the diverse topographical features in the hills of Nepal. It requires an in-depth analysis of the relationship between population change, land use change, and shrinkage of cultivation land under certain physical constraints. In the last two decades, heavy outmigration of the population from rural hill and mountain areas has resulted in growing land use change issues and land abandonment. Outmigration of farmers from mountain and hill areas of Nepal to urban centers, plain areas, and foreign countries has been increasing during the last two decades creating labor shortages in hilly areas, and cultivation land shrinkage due to land abandonment is common in such areas. Conversion of land such as cultivated land into barren grassland, shrubs, and forest (vegetative) areas is increasing day by day (Chidi, 2015). Location-specific policies and interventions are essential for sustainable natural resource management and for proper land-use balance in the area. Remittance contributes significantly to the national and local economy and in the study area for this research. However, outmigration hurts agriculture because it leads to a shortage of labor for farm activities (Hussain et al., 2016). Labor shortages socio-economic changes in the community and outmigration of farm labor are the major socio-economic driving forces behind agricultural land abandonment (Zhang et al., 2014). However, comprehensive theories explaining the relationship between labor migration and agricultural land abandonment are still lacking. Microlevel studies of outmigration from rural areas of Nepal also indicate agricultural land abandonment in the rural villages of Nepal. Hussain et al., (2016) reported that 26% of farm households in the Koshi River basin faced frequent

labor shortages during critical agricultural activities due to outmigration of active household members i.e., the youths. Agricultural land abandonment has emerged as one of the critical challenges to agriculture and food security Hussain et al., (2016). Labor shortage concerning outmigration is reported across the country but mainly in hills and mountain regions, where agriculture is highly labor-intensive with limited mechanization options which has resulted in agricultural land abandonment. Also, land abandonment/agricultural land abandonment is also the result of unsuitable environmental conditions (see Rey Banayas et al., 2007), low farm productivity (See Lieskovskv et al., 2015), and unfavorable agricultural policy (see Renwick et al., 2013).

In Nepal, agricultural land is being abandoned at an unprecedented rate. Pyakurel et al., (2010) stated that Nepal was once a food-exporting country until the 1970s but now has become a net food-importing country. The total arable land in the country is around 21% and the Himalayan region is facing a growing food shortage (Hobbs et al., 2009). Some recent studies show that agricultural land is being abandoned or underutilized even though much of the population depends on agriculture for their subsistence (Adhikari et al., 2017; Pain et al., 2014) and where the food security crisis is at its peak due to shortage of food materials. The arable patches of agricultural land owned by farmers are being abandoned and the process has even accelerated in the past 15 years after the country experienced the Maoist War which led to political transition and instability (Poudel et al., 2014). Chaudhary et al., (2020) analyzed how likely farmland abandonment is increasing in the hilly and mountainous region of the country. The research highlights that 23.9% of total cultivated farmland is being abandoned in a decade. Several factors triggered farmland abandonment but the settlement pattern and poor accessibility to physical services were considered major driving forces for farmland abandonment in Nepal. Also, the study highlights that farmland abandonment led to negative effects on the eco-environment and society including geomorphic damage, fragmentation of farmland, and impact on society in terms of food production and socio-cultural practices.

2.1 Research Gaps

There are many published research papers based on shifting cultivation practices by the Chepang community in the rural mid-hill districts of Nepal but not exactly in the proposed study area of this research. Almost all the research papers focus on and recommend the documentation of indigenous knowledge and involve them in policy-making procedures to preserve the indigenous knowledge of the elderly people for future generations. Published papers also highlight that the indigenous

knowledge is based on the Chepang community which should be well preserved at the National level owing to the present lifestyle of the Chepang people. Research papers related to livelihood analysis of the Chepang community indicate warning signs for depopulation and land abandonment in many rural mid-hill areas where the Chepang community resides and highlight the need for improvement in government concerns in their residential areas. In addition to that, a good volume of research mentioned that Chepang people these days are diversifying their income sources to uplift their livelihood and to meet the food security of their households. In the recent context, due to the process of income diversification, there has been increased migration and land use change issues generated in the Chepang communities. However, the livelihood strategies of the Chepang community of Taklung Gorkha have not been studied yet, and not the agricultural trend of the community.

CHAPTER 3: MATERIALS AND METHODS

3.1 Study area for my research

The selected site of research is Taklung village which is situated in Sahid Lakhani Rural Municipality of Gorkha District in Gandaki Province of Nepal. The village lies in the Northern-Central region of the country. Taklung lies in ward no. 5 of Sahid Lakhani Rural Municipality (Figure 4). Taklung village can be reached by feeder road which connects the village to Prithivi Highway. The feeder road connecting the village with other cities of the district is often fragile in monsoon time and is prone to soil erosion due to which the Chepang village can lose transportation access during monsoon time. Chepang community is a small indigenous community that resides within ward no. 5 of Taklung and has a total population of 476 among which 229 are male and 247 are female (CBS, 2021). Figure (3) indicates the study area where the research was conducted.

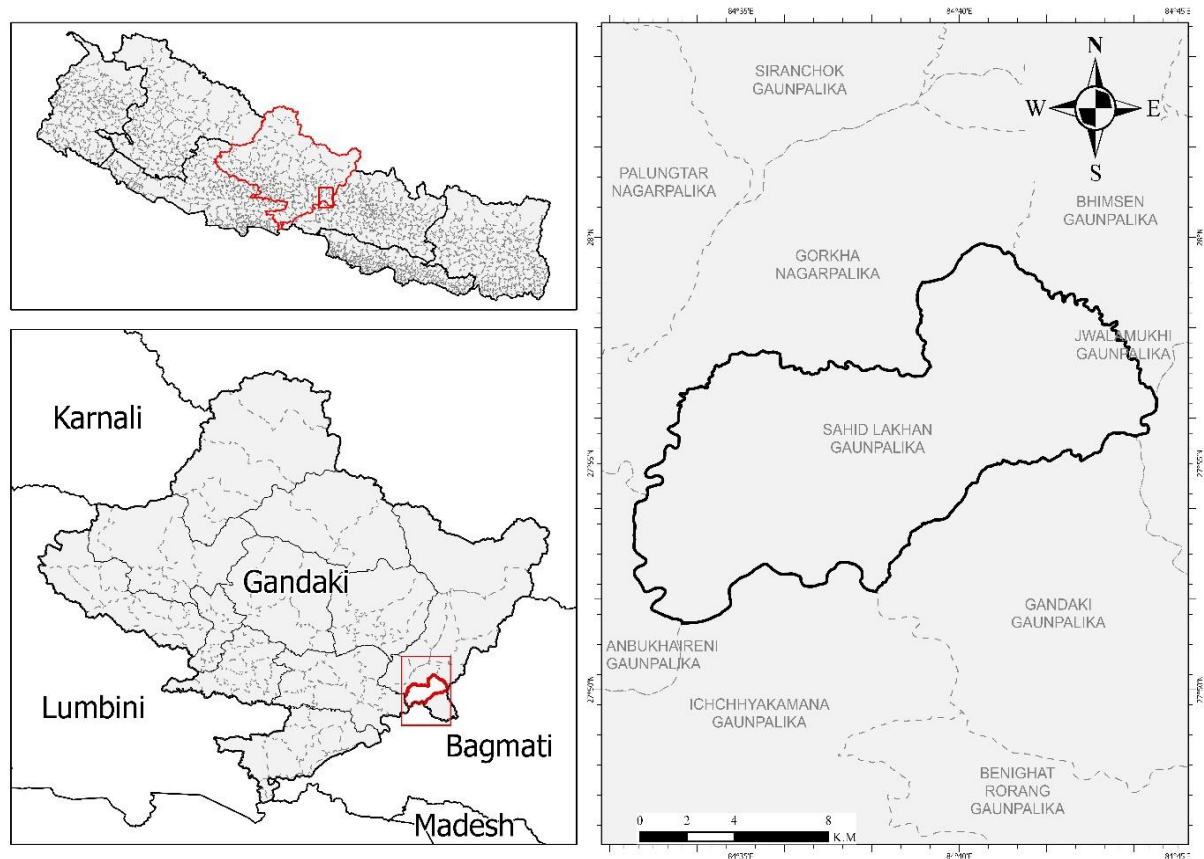


Figure 3: Map of the study area



Figure 4: Sahid Lakhan Rural Municipality with all the wards

(Source: Google image retrieved 18th January 2024)

The Google image (Figure 4) was extracted to know the exact location of the Chepang community inside Sahid Lakhan Rural Municipality. The figure illustrates the location of different wards situated inside the Sahid Lakhan Rural Municipality. The Chepang community resides in Taklung village which lies in ward number 5 and is situated in the central region of the Rural Municipality.

3.2 Access to the Respondents

The study area lies in Sahid Lakhan Rural Municipality of Gorkha District Nepal. The Chepang community is situated in Taklung village which is connected to the Prithivi Highway through a feeder road. There are several routes of feeder road in the village that connect the community to market areas and highway areas. The accessibility of the study area is satisfactory during the winter and dry seasons but during the monsoon season, the feeder roads often remain closed due to the occurrence of soil erosion in several areas of the road. During the field visit for this research also, we had to postpone the field survey plan for 15 days due to blockage of the feeder road due to slope failure.



Figure 5: Feeder-road available for transportation access to the Chepang community

3.3 Methodological Framework

Theoretical Framework

The core concept of the proposed research is based on the Theoretical framework. The theoretical framework has served as a guide for this research on which the concepts are built and supported in the entire study, and it has helped by providing structure to the research to define philosophical, methodological, and analytical approaches of the research. The theoretical framework has become the blueprint for this study without which the structure and vision for the study would become unclear. Eisenhart 1991, defined a theoretical framework as a “set of structures which guides research by relying on a formal theory constructed by using a set of established, coherent explanations of certain phenomena and relationships”. Therefore, the theoretical framework consists of a set of selected theories that undergird our thinking regarding how we plan to research our topic as well as concepts and definitions from the existing theories that are relevant to our topic. The framework of the proposed research is specified based on the factors that determine the ongoing changes in agriculture and the driving factors behind them in the proposed study area and livelihood strategies of the Chepang community based on relevant literature. The study specifically

tries to determine land use changes, occupation and income sources for the livelihood, the changing cropping pattern and agriculture system, and the overall livelihood basis of the Chepang community. This research is guided by framework questions that guide the entire research ideas, data collection, data analysis, and generalization of the findings. The framework questions include how the agricultural scenarios are changing in the project area. What are the present agricultural trends (Crop types, shifting cultivation) and livelihood trends (income sources and well-being) in the project area? Also, to identify how people think about the ongoing changes in agriculture and livelihood in the community and the probable reasons behind them. To identify the desired outcomes from the research, the study utilizes mixed methods of quantitative and qualitative research techniques and descriptive data analysis techniques. The research is conducted based on the questionnaire survey and Key informant Interviews for generating information from the Chepang community. The collected data are interpreted and analyzed based on descriptive techniques because it best suits the research process for analyzing what is the trend of agricultural behavior and why/how changes are occurring in the community. Also, the descriptive technique has helped a lot in understanding the characteristics of the phenomenon and what is happening in the community. The framework has guided in determining the probable reason behind changes in the agriculture system the declining shifting cultivation trend and introduction of a permanent agriculture system in the community, out-migration of the Chepang people to bigger city areas for better opportunities, and thus raised land use changes in the community. The crop yields from the farmland are not sufficient for obtaining food security year-round due to which Chepangs are diversifying their income sources these days, intensified cash crop cultivation is also a common method of income diversification for better livelihood in the community. In addition to this, the literacy ratio in the Chepang community is increasing which makes people more aware of the ongoing changes in other places of the country and involve themselves in diversified income-oriented works rather than agriculture.

Qualitative and Quantitative Methods

Aase (1997) stated that the researcher uses a methodology to explore the hidden meaning behind the scenes. Hence, a researcher needs to identify the appropriate methods and tools to identify and obtain the deeper meaning of the phenomenon before going into the field, which can help answer the research questions. Methodology is defined as a theory behind how research should proceed (Harding, 1986). There are two different approaches in methodology: qualitative and quantitative. These are the main pillars or foundations of social science research.

Qualitative research is the research process that uses a natural approach and helps to understand the phenomenon in a natural context (Golafshani, 2003). Qualitative analysis goals to explore the process and deeper meaning of the phenomenon, subject-specific experiences, feelings, social activities, and understanding of human behavior. However, this method lacks scientific rigor and includes personal expressions so is subjective, thus may be biased sometimes (Sandelowski, 1986). In contrast, the quantitative method tests hypothetical generalization and emphasizes the measurement and analysis of the relationship between variables (Denzin and Lincoln, 2008). The information is obtained in numeric form and can also be quantified to express in statistical terms (Charles, 1995). Quantitative analysis is objective and lacks expressions, feelings, and processes (Jayaratne and Stewart, 1991). Hence, considering the weakness of both methods, mixed methods are used to minimize error and find out the empirical fact (Creswell and Clark, 2017).

Quantitative methods have been used to find out the exact land use change in hectares, demographic phenomena, present cropping pattern and occupation, and the main source of income of the Chepang people. The qualitative method has been used to explore the knowledge, and perceptions of people towards agriculture, changes in cropping patterns if any, and livelihood basis of the people and reason behind the change of occupation or searching additional income sources. To fulfill the research question, it is very crucial to understand the current agricultural trend, the reasons behind hunting extra sources of income, and the basis of their livelihood. Hence, to minimize the error and find the empirical findings from the research mixed method has been used for this research but the analysis is done purely based on the qualitative method through descriptive analysis.

Researcher's Status: Insider/Outsider

The selected study area was unknown to me as I had never been there so in this respect, I was an outsider for the research. Gorkha borders my hometown district which made me select the study area even though I have never visited the site before, but the language spoken by the Chepang people, their culture, and nationality were known to me in this aspect, insider researcher position is also applicable for this case. The random Household survey was conducted in the Chepang households residing in Taklung village of Gorkha. A field survey was scheduled during the time of COVID-19 and the new variant spike. I, the researcher was in Bergen, Norway, and could not make it to my country for the field survey in the Chepang community of Taklung, Gorkha due to the probable risk of Covid exposure and risk associated with returning to Bergen, Norway in such

a harsh situation. Hence, the field survey was conducted with the help of a representator. I got help from a student studying at Tribhuvan University who has experience in conducting household surveys and collecting relevant data. He is from the Far-western region of the country. The representative helped me in all possible ways during the data collection phase by collaborating with the locals, conducting a housing survey, collecting further information through key informant interviews and resource persons in the community, and many more.

Chepang people and the representator's language were the same (Nepali language) and nationality was similar which made the representation an insider researcher, but as my representation was from a different district of the country they treated him as an outsider researcher who went there to gather their personal information for any organization or any official purpose. It was a tough challenge for my representation to convince them and make them feel safe to provide the necessary data. It was a challenging and tiresome job to make them understand that the purpose of the research was just for academic purposes and the representation was trying to help the researcher who couldn't make it to the household survey for data collection. As the Chepang people are introverted and do not often want to express their personal information openly and in addition to an outsider researcher's representative so convincing them was a very challenging task. The representatives went to their village and stayed with the Chepang people during the whole survey period. The representator in that way knew more about the Chepang culture and finally was able to win their trust after being familiar with their norms. This proves that as an outsider researcher, it is very difficult to gather information through household surveys in the Chepang community. The representative researcher was an outsider researcher for them as he was from a different place and culture. However, during the field survey, almost all the respondents participated happily and actively and provided all the necessary data and information believing the representative researcher as an insider researcher due to his friendly behavior and kind gestures which made the survey happen smoothly.

3.4 Research Methodology

The research was conducted in the Chepang community situated in Taklung village of Sahid Lakhan Rural Municipality in Gorkha District Nepal. The village lies in the northern central part of the country. The study primarily focused on determining the changes in agricultural patterns and crop cultivation and the driving forces behind them and determining their overall well-being. The study also highlights the livelihood status of the community and their dependency on

agriculture and forest resources for their livelihood. The detailed research process is enlisted in the headings listed below:



Figure 6: Photographic view of the study area

3.4.1 Primary methods

3.4.1.1 Preliminary inspection of the study area

The study area was selected after undergoing various research papers related to the Chepang community in Nepal. The selected area was of interest for the study as the study area is well known to me since my early childhood and Chepang communities living in those areas are facing the problem of changing environment and are changing the cultivation pattern to cope with all those problems and from changing situations. We as residents of the neighboring district to Gorkha are also facing the problem of changes in the environment and changing laws and policies due to unstable government bodies and hence the topic was of my interest for research. The preliminary field inspection included consultation with the ward chairman for information on the location of

the Chepang community and their willingness to participate in the household survey. The accessibility of the location of the study area was also determined during this phase.

3.4.1.2 Field Visit

The study area lies in the Sahid Laxman Rural Municipality of Gorkha District. The study area lies in the mid-hill region of the country and is prone to natural calamities including soil erosion. Field inspection was conducted from the 5th to the 15th of October 2022 to collect the household data. The field visit was conducted with the help of a university student studying at Tribhuvan University in Nepal and was guided by the main researcher. Participants for the survey were selected based on random sampling methods and altogether 44 households were selected for the survey. The field inspection was carried out just after the completion of the monsoon season in the country which is around (June-September). There were many mudslides and some landslides that blocked the road access to the study area, so we had to reschedule the field visit and survey plan. The local community people were notified through the ward office beforehand about the upcoming field visit and scheduled questionnaire survey so that people could be aware and provide us with the necessary data by their will.

3.4.1.3 Questionnaire Survey

Sampling procedures are one of the critical components of quantitative research. The primary aim of the sampling is to obtain a representative unit from a much larger group or population. The selected samples help in reducing the time and cost associated with conducting the research.

A simple random sampling method was utilized in selecting the respondents for a questionnaire survey in the proposed research area. According to (Thomas, 2020), a simple random sampling method ensures that each member of the population has an equal chance of being chosen as a respondent. This sampling technique was used in the research to find out the specific findings from the investigation. The main purpose behind choosing the simple random sampling method was to find the generalized result of the study whose results can be applied to represent the entire population. The study area i.e., the Chepang community of Gorkha, Taklung was not so big in structure and had fewer households which was around 88 households in total. The questionnaire survey was conducted in a total of 44 households which was around 50% of the total population. The results obtained are a very good sample of the entire population as it has included 50% of the households as respondents.



Figure 7: Photograph taken during a Questionnaire survey in the Chepang community

3.4.1.4 Key informant interview

Key informant interview (KII) was done with the key personnel of the Chepang community such as the Chairman of the ward office, the Principal of the Local school (Shree Pragati Primary School), community leader, and representatives of the social welfare parties. The key informant interview was conducted to gain generalized data representing the entire Chepang community about the prevalent social-ecological and agricultural aspects of the society. In addition to the household survey data, the results from key informant interviews added more informative knowledge which helped in the detailed analysis of the livelihood of the Chepang community and their knowledge and perspective on the changing climate.



Figure 8: Photograph taken during Key Informant Interview in the Local School

3.4.1.5 Demographic and Social Data Analysis

Demography is one of the essential factors to study in any kind of social survey-based research. Ecological aspects and social aspects of the community were studied through household surveys and key informant interviews. A list of ecological resources on which the Chepang community is still directly depending is listed and the social data was extracted from the data of the Central Bureau of Statistics (CBS, 2021).

3.4.1.6 Study of land conversion in the past two decades

Land use data has been analyzed to identify the detailed land use pattern of the study area and find the changes that occurred if any. For classifying the land use pattern of the Chepang community Remote sensing data of Gorkha District was utilized.

The dataset used for the satellite image for the year 2000 was Landsat-5, dated 04/04/2000, with sun elevation: 54.398 and Earth-sun distance: 1.0002. The image was downloaded on 19/10/2023 through QGIS and processed for the desired outcome. The image classification was done with the help of QGIS, and different land use patterns of the study area were categorized based on digitizing similar colored pixels in vector data of Gorkha district of Nepal.

Similarly, the dataset used for the 2020 satellite image was Landsat-8, dated 11/04/2020, with a sun elevation of 61.168 and an Earth-sun distance of 1.002. The image was downloaded on 19/10/2023 through USGS Earth Explorer and processed through QGIS for the desired outcome. The image classification was done with the help of QGIS, and the land use type of the study area was plotted based on the digitization of the similar colored pixels in the vector data of Gorkha district of Nepal.

Land use classification of Sahid Lakhan Rural Municipality was done using QGIS and the land use was classified based on the available data. Although satellite images of Taklung village were not available, the land use classification of the entire Sahid Lakhan Rural Municipality was done, of which the Chepang community is a part. The land use classification map of Sahid Lakhan Rural Municipality helped in generalizing the land use pattern of our study area i.e., Chepang community, Taklung. However, the image resolution of the classified land use pattern was not good due to which Google Earth Pro was utilized to generate the site-specific Google image to compare with the generated land use classification map for a more distinct classification.

3.4.2 Secondary methods

3.4.2.1 Literature review

Review of the existing literature and theories is the most important aspect for any kind of research whether it is qualitative research or quantitative research. The literature review provides us with knowledge on how our research topics have been previously investigated and how we can include innovative ideas in the previously existing knowledge. In many instances, past literature can provide us guidance on how we can limit the possible research gap and how we can make our research more precise minimizing the limiting factors. During this research, much literature of research related to the Chepang community, their livelihood, their agricultural practices, and their related indigenous knowledge were thoroughly reviewed. Literature related to land use patterns, and livelihood basics of the Chepang community were also studied in addition to the agricultural behavior of the Chepang community. The paper related to agricultural trends and behavior of

Chepang communities from different parts of Nepal was reviewed to know the present context of the scope and need of the research. For this research literature review was very helpful in guiding how to shape the research based on present-day context analyzing the past data and limiting factors.

3.4.2.2 Consultation with the expertise

Research is a process that collects all past experiences and knowledge and binds it together to reform innovative ideas according to the need and priority of the study area. During this process, consultation with the expertise of the research field is very essential. Consultation with the expertise not only provides us guidance on how we can shape our research but also, we can know past experiences on real which can help us limit the possible gaps during research and help us shape our research in the best possible ways. For this research consultation was done with the expertise working on similar projects in Nepal, with my seniors for proper guidance, and faculty members from the Department of Geography, University of Bergen.

3.4.2.3 Consultation with the Supervisor

Consultation with the supervisor is crucial for any kind of research. Advice and guidance from the supervisor are very important in any kind of research. My supervisor has assisted with this research from the beginning of the proposal to the end of report preparation. The valuable comments and suggestions from the supervisor have helped a lot in shaping the research into an innovative form, including all necessary credentials.

3.5 Methods of Data Processing and Data Analysis

Aase and Fossåskaret, (2014) once stated that data is not collected; but it is produced by the researchers. The researcher's task is to collect the empirical data and convert the raw data into required data or information. It is essential to understand the concepts of the research before analyzing the events. Hence, the people of the study area, their culture, and their natural setting have been categorized in the research. For the present research, both qualitative and quantitative methods were used for the data collection, and analysis was done based on the nature of the data.

For the quantitative analysis, all the questionnaire survey data were entered into the data sheet and organized according to the categories. The data sheet was generated through Microsoft Excel and the results were displayed in tabular, figures, and chart form. Charts, tables, and figures are powerful tools to display the details of information. Similarly, qualitative data obtained through different methods such as key informant interviews, Group discussion, and people's perceptions

were analyzed, and descriptive analysis was done in narrative form. The information recorded in the field notebook and voice recordings were also analyzed and described. Also, during descriptive analysis of the collected data, help was taken through relevant literature as a reference and was discussed in a way to generate desired outcomes based on the objectives of the research.

3.6 Reliability and Validity

The main requirement in the research is that the researcher should understand the concept of reliability and validity to make the research a perfect one. The main aim of any research is to generate a new understanding of a particular topic and deliver this information from researchers to the public. There are two different concepts: correspondence and coherence used to find the reality of the objective. The correspondence theory states that researchers can reach the reality of the objective by understanding the culture, so the theory and knowledge should correspond well with the reality. In the research by Aase and Fossåskaret (2014), it is stated that there is reality beyond the domain of humans and our knowledge must correspond with that domain of reality. In contrast to the correspondence theory, coherence theory states that we can never know the objective reality so one can reach the reality through logical analysis or interpretation of the data following the individual perspectives (ibid). Hence, to understand the people's intentions and actions the researcher should know the truth and should try to deliver new findings without modifying the existing ones.

There are several existing literatures explaining the concept of validity and reliability based on different assumptions of real and natural phenomena. Reliability simply designates the consistency of research methods while validity refers to the degree to which the findings of research match reality (Golafshani, 2003). The validity of the research is determined by how the researcher successfully represents the reality of the world based on the objective of their research through specific methodological approaches as stated by Silverman (2013) "*Validity is another word for the truth*". The concept of reliability and validity first emerged as a tool of quantitative research under the positivistic approach but later have been accepted in the naturalistic approach (Golafshani, 2003; Ritchie and Lewis, 2003) and now are widely used in both qualitative and quantitative research. Research should have a quality to ensure the findings can be trusted and believed. The reliability and validity of the research paper depend on the rigor, trustworthiness, quality of the data, and skills of the researcher (Golafshani, 2003). Hence, I have tried my level best to make my research trustworthy by various methods. Also, the consistency of the research

can be ensured through data triangulation which is the most widely used strategy for reliability and validity measurement of qualitative research. In my study, I also employed various data collection methods such as household surveys, key informant interviews, and discussions with resource persons to gather specific information and strengthen my study findings. To strengthen the validity of the research, the representation researcher stayed in the Chepang community during the field visit to observe the Chepang culture, behavior, and livelihood in detail and validate the study findings.

3.7 Ethical issues

Ethical issues are an integral part of any kind of research. The ethical issue is about ensuring the people's rights, and privacy and reducing any potential harm during the research work. The researchers should inform his/her participants about the purpose of the study before the collection of the information (Aagaard-Hansen and Johansen, 2008). Any kind of social research requires the interaction of both the informant and the researcher. Hence, the informant should agree to provide necessary information to the researcher without any kind of pressure and with no physical, social, or psychological impacts (Dowling, 2005; Ritchie and Lewis, 2003).

The field survey for the proposed research was scheduled for September immediately after the end of the monsoon season (June-August) because the monsoon rains every year block the feeder road connecting Chepang village to the Prithivi Highway, which is the only access road to the Chepang community. Unfortunately, I had to postpone the field survey as there was unexpected heavy rainfall in mid-September which caused soil erosion in many areas of the feeder road, and the road was blocked till the end of September. During that phase, my representor researcher tried contacting key persons of the Chepang community to know the exact location of the community, their traditions, and every detail that could be necessary for our field survey. Chepang community people were informed about the upcoming household survey through a key person (Chairman or Mukhiya in the local Language). Most of the Chepangs seemed very happy to share their knowledge and experience with the representation researcher. Meanwhile, some of the Chepang respondents had some doubts in their minds about the misuse of the collected data. A few Chepang respondents also thought that the representation researcher was working for an INGO (International Non-Governmental Organization) and was hesitating to provide information in the beginning. Some even asked the representator "Do you work for an INGO?"; in such cases, it was a difficult task to make them understand that we were collecting data only for academic purposes

and it had nothing to do with the INGO. Later, they were convinced and participated in the survey willingly. Also, some of the respondents thought that they would financially benefit if they participated in the survey and my representative researcher had to explain there was no specific funding for the project and the researcher was just a student who could not provide financial support for the survey participants. Some photographs were also taken during the field survey after getting permission from the respondents and some notes were taken during every discussion with their permission. Everyone looked happy and excited about the ongoing research and did their best to collect the necessary data for us. Our main goal during the whole research was not to offend or hurt any of the respondents and to make them feel secure and comfortable for knowledge sharing for which my presenter researcher was very conscious and tried his best to fulfill the goal.

It is the right of every respondent to know about the purpose of the study and should have a clear idea about how their information will be used in the research. As a researcher, my representation researcher explained the aim of the study to my respondents for the household survey. He also explained to them that the information which is being collected is solely for academic purposes and not for any other benefit and their details would be kept confidential. Consent of the respondents was obtained before each interview. During key informant interviews notes were taken for data collection.

Researchers should be sensitive to ethical issues throughout their projects and should think in practical ways. During the fieldwork, researchers must respect the informants and ensure that they are informed of the purpose of the research, and they should feel secure towards the collection of survey data. As a researcher, I am very thankful to all the Chepang household people who took out precious time and happily participated in the survey and provided me with valuable information despite me (the main researcher) not being able to attain the field survey.

CHAPTER 4: RESULTS AND DISCUSSIONS

To achieve the specific objectives of the study, it is very important to clearly understand the overall background situation of the population, including the socio-economic and demographic characteristics of the community. Hence, demographic information was collected to generate an idea regarding the population status of the Chepang community.

4.1 Demographic development of the study area

The study area lies in the northern central part of the country in a mountainous region. The research was conducted in the village named Taklung where the Chepang people are dwelling, and the village lies in the Gorkha district of Nepal. The demographic data was collected from the Central Bureau of Statistics of Nepal, and it reflects that the number of people dwelling in the Gorkha district and Taklung village has changed in the past few decades, which are listed in Table 2 and Table 4.

Table 2: Demographic data of Gorkha District from the year 2011 and 2021

Area/District	Total no. of Household	Population			Area(sq. km)	Household size	Sex ratio	Population density	Growth rate
		Total	Male	Female					
Gorkha (CBS, 2011)	66506	271061	121041	150020	3610	4.08	80.68	75	12.87
Gorkha (CBS, 2021)	68404	252201	119811	122390	3610	3.46	90.5	70	-2.85

Sources: Central Bureau of Statistics 2011 and 2021

The demographic data collected from the study district depicts that population growth was maximum i.e., 12.87% in the year 2011. There were altogether 66506 households with 271061 people dwelling in them. However, according to the recent survey conducted in 2021, it is recorded that the population growth rate has decreased a lot in comparison to the survey 2011 and marks a decline in growth rate of 2.85%. Although the household number has increased to 68404 which is greater than the survey 2011 (271061) the number of people dwelling in the household has decreased to 252201. The people from the study area claimed that in the study district and study area, people are migrating to the urban city areas for better opportunities.

Table 3: Demographic data of Sahid Lakhan Rural Municipality from the year 2011

Sahid Lakhan Rural Municipality (Former V.D.C.s) CBS, 2011	Households	Population		
		Total	Male	Female
Taklung	1121	5028	2232	2796
Bakrang	793	3019	1303	1716
Bungkot	1601	6260	2628	3632
Ghairung	966	3990	1687	2303
Namjung	809	3055	1339	1716
Manakamana	1392	6203	2876	3327
Total	6682	27555	12065	15490

Sources: Central Bureau of Statistics, 2011

Table 4: Demographic data of Sahid Lakhan Rural Municipality from the year 2021

V.D.C. / Rural Municipality	Households	Population		
		Total	Male	Female
Taklung (CBS, 2011)	1121	5028	2232	2796
Sahid Lakhan Rural Municipality (CBS, 2021)	6812	22429	10492	11937

Sources: Central Bureau of Statistics, 2021

Similarly, In the case of the research area i.e., Taklung Gorkha. According to the recent administrative merging of the former VDCs (Village Development Committee), the area lies in Sahid Lakhan Rural Municipality. Sahid Lakhan Rural Municipality at present is formed by merging six different former VDCs as listed in Table no.3. According to the household survey conducted in 2011, Sahid Lakhan Rural Municipality had a total household of 6682 with 27555 people dwelling inside. However, according to the survey conducted in 2021, the total household number has increased to 6812 but the total number of people dwelling inside has decreased to 22429. This also illustrates that there is an increment in the number of houses but a decrease in the number of people residing in the houses. The main reasons behind the decrease in population haven't been identified in detail but according to the household survey conducted for this research,

people claimed that Chepang people have been moving to the larger city areas leaving behind their houses and abandoning their farmland in the village which might be the probable reason behind decrease in population and increase in number of houses in the study area.

Changes in the demographic characteristics of the study area

The study area for this research i.e., Taklung, Gorkha lies in the middle hill region of the country. Maharjan et al., 2020 found a decrease in rural population due to rural outmigration and agricultural land use change due to increased farmland abandonment in the Gandaki basin. This result is like that in the Chepang community of Taklung Gorkha. Maharjan et al., (2020) mentioned that there is higher agricultural land abandonment in mountain areas than in the Terai region. Similarly, the study area for this research lies in middle hill areas which follows the trend of outmigration due to the topographical factors (fragile soil structure and difficult terrain), lack of road facilities, shortage of healthcare facilities, and other basic opportunities. The internal outmigration is noticed clearly from the CBS data 2011 and CBS data 2021 (Table 4). Also, Table 4 illustrates that the female population has decreased drastically from the year 2011 to 2021 which might be the reason behind depopulation and farmland abandonment (Figure 10) in the study area because the female population is more specifically engaged in agricultural activities intensively by the traditional Nepali culture. It is believed that internal outmigration of the women has a significant effect on agricultural land abandonment indicating their major role in agricultural activities (Maharjan et al., 2020) than when the men out-migrate.

The decrease in population in the study area is followed by a decrease in the working population in the Chepang community. The data obtained is like that mentioned by Shrestha and Shrestha (2014), that hilly regions of Nepal have been described as overburdened with older people because many of the young generations people migrate to the city areas or other countries in search of better jobs or better education facilities. Similarly, in the study area, people from the active working age category were found to be away from their family members during the time of the survey due to various economic reasons like government jobs, foreign country jobs, driving, and service works in bigger city areas. Active working-age people were in city areas for working purposes (jobs), and some were in foreign countries especially Gulf countries for earning purposes. The government of Nepal (2014) documented that depopulation and outmigration are widely common trends in the middle hills and mountain regions of Nepal and Taklung is no exception. Migration is one of the main drivers of demographic trends and outmigration affects the population dynamics in the

mountain areas like Taklung, Gorkha. People are migrating from the Rural Mountain areas like Taklung to the urban or city areas and foreign countries (See ICIMOD 2016).

4.2 Land use pattern from the study area in the past two decades

Land use is one of the major factors that is analyzed to trace the ongoing changes in the Chepang community. The results which are obtained from the remote sensing data are analyzed to identify the major changes. The major land use pattern observed constitutes built-up areas, cultivated land, water bodies, and forest areas. In the year 2000, Sahid Lakhan Rural Municipality had 8641 ha of land covered by forest comprising the maximum area of land cover and cropland formed the second largest land cover type comprising 5577 ha. Grassland comprised 356 ha of land, water resources comprised 100 ha, riverbed comprised 26.5 ha built-up area comprised 1.7 ha of land and 192 ha of land was other than the mentioned categories.

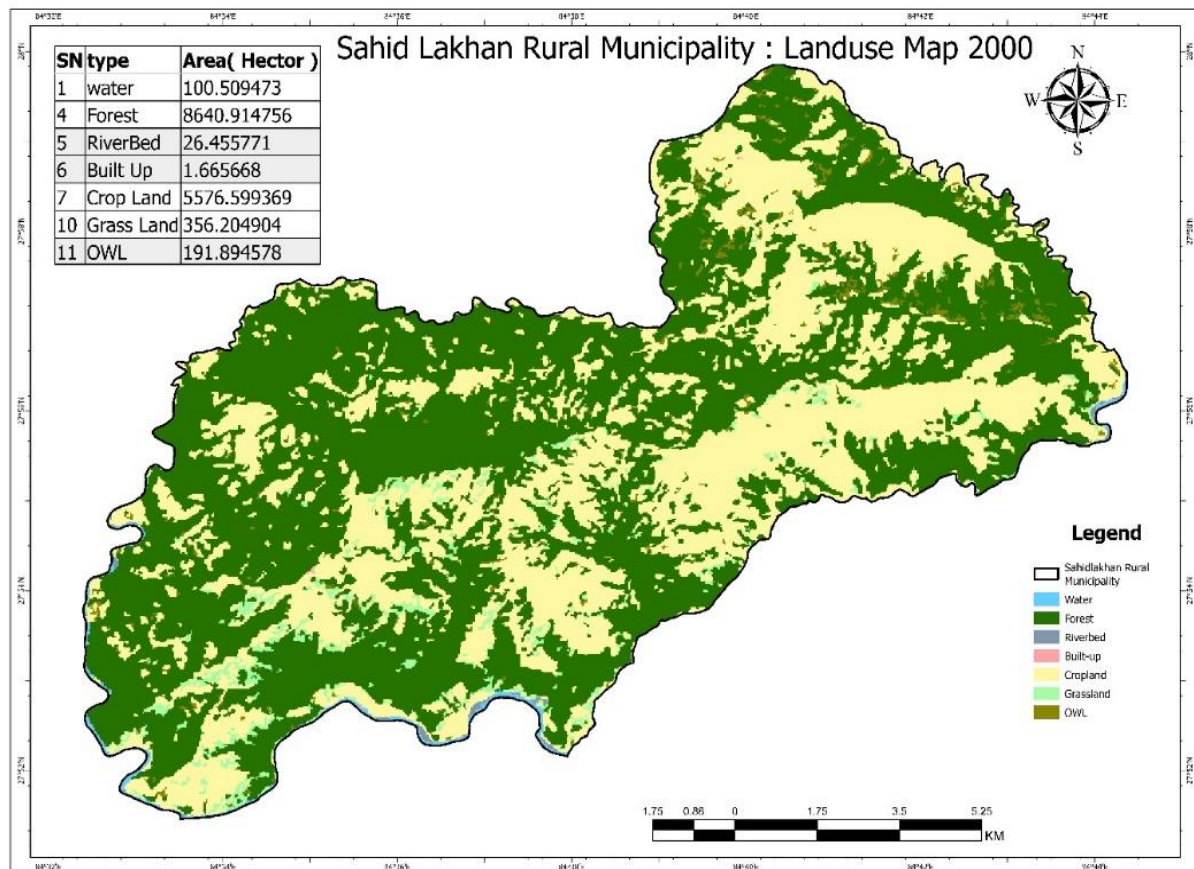


Figure 9: Land Use map of Sahid Lakhan Rural Municipality from the year 2000

In the year 2020, it is observed that Sahid Lakhon Rural Municipality had maximum land covered by forest i.e., 10477 ha which is more than that of the year 2000. Crop land covers 3900 ha comprising the second largest area of land cover. The cropland land cover had decreased substantially from that of year 2000. Similarly, grassland occupies 127.7 ha which is less than that of the year 2000, water bodies occupied 105.6 ha which is slightly higher than that of the year 2000, built-up area occupies 21.6 ha which has increased a lot as it was only 1.67 ha in the year 2000 and riverbed constitutes only 19.7 ha which has decreased than that of the year 2000 and remaining 244 ha of land is other than the mentioned categories.

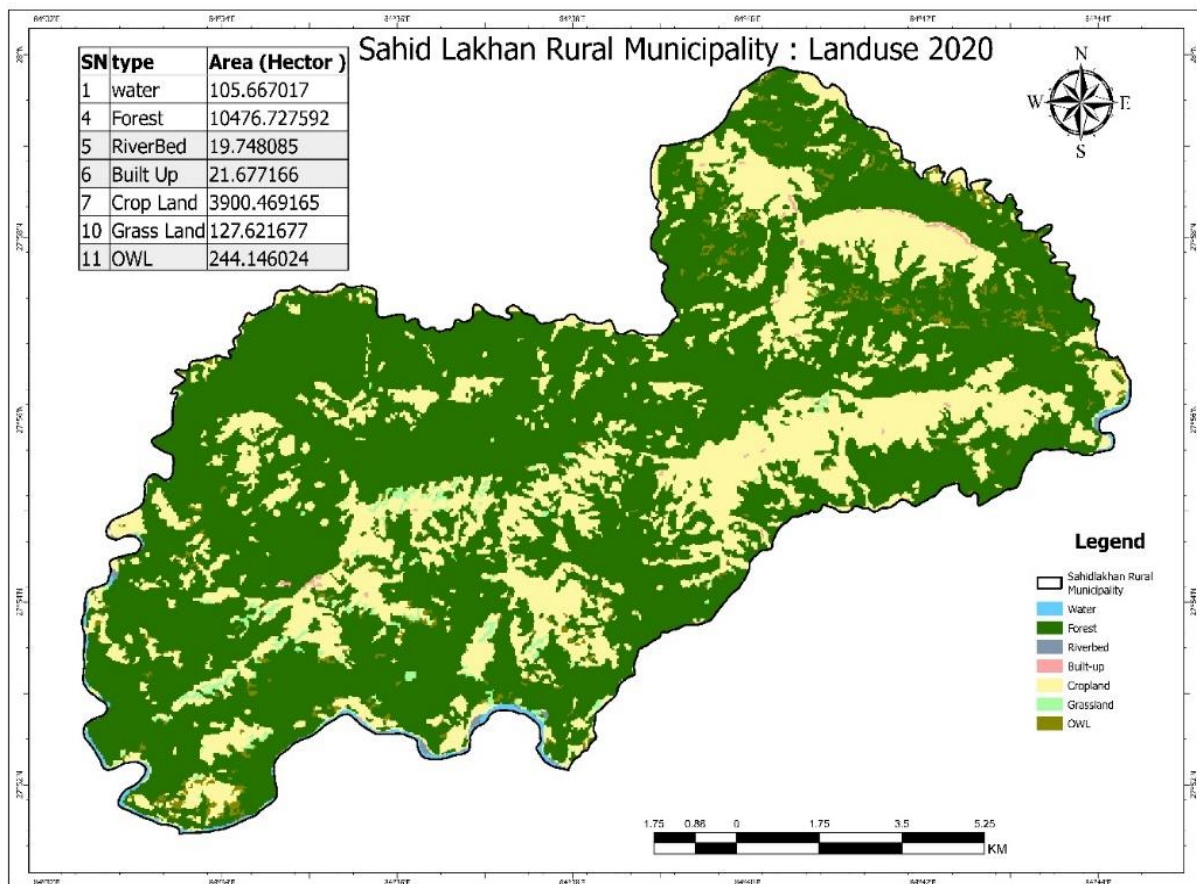


Figure 10: Land Use map of Sahid Lakhon Rural Municipality from the year 2020

Changes in the Land use or land cover in the study area:

Land use studies mainly concern the spatial and temporal patterns of land conversion at different geographical scales by human activities. Land use change is generally the outcome of changes in the human system of production which can be due to changes in shifting cultivation, subsistence agriculture or commercial production, patterns of consuming land change and all these factors

contribute to the changes in land and nature of land cover. In the study area, there are remarkable changes in the land use pattern in the 20 years of interval. There is a remarkable increment in the forest cover in the year 2020 in comparison to the year 2000. Land use in any area represents an insightful reflection of human interaction with its environmental and developmental interventions such as infrastructure development, introduction of new technologies, changes in the policies, and socio-economic development of the area (Gautam et al., 2002).

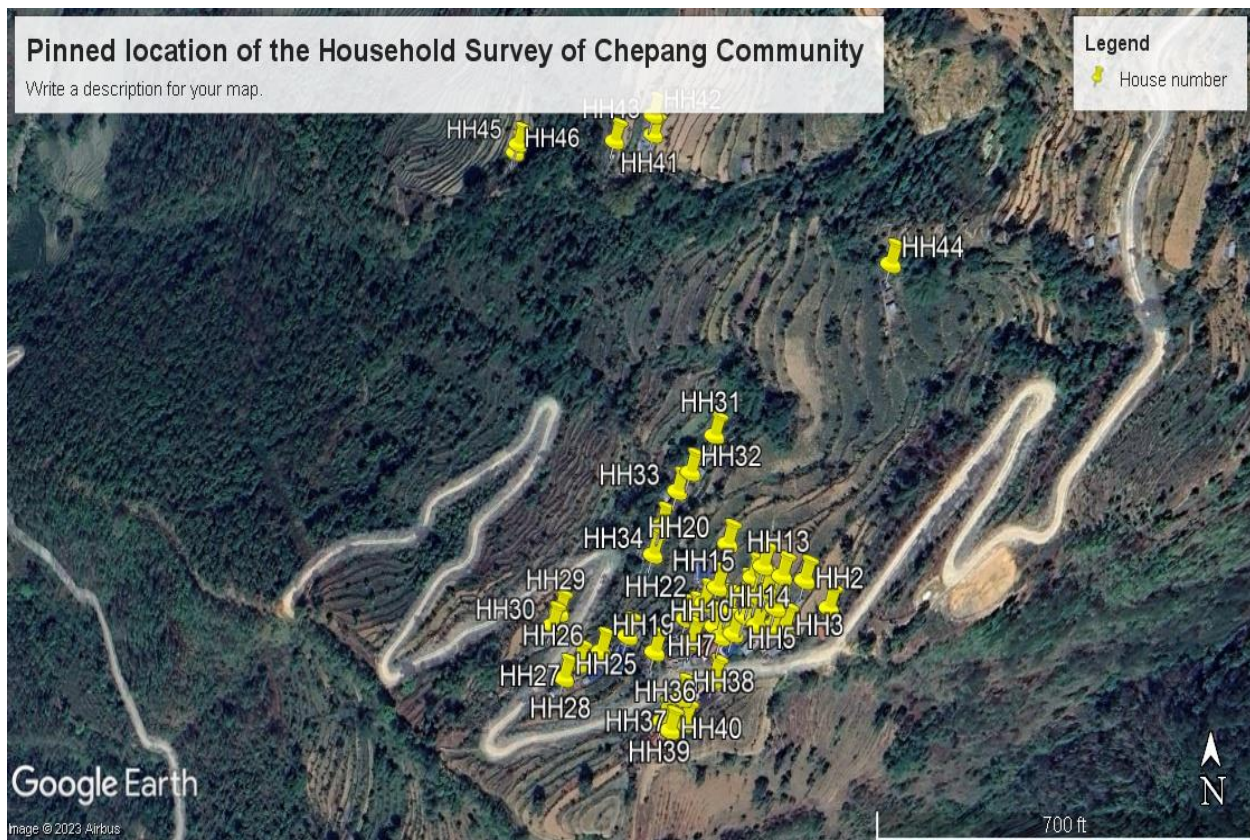


Figure 11: Google Earth image locating the Chepang community in Taklung village

There are noticeable changes in the agriculture pattern because people are changing the long-time practice shifting cultivation and have started to follow sedentary agriculture. This is made clear through the Google Earth image in Figure 11 that Chepang people nowadays perform agricultural activities on the terraces prepared on the slopes. People make terraces with great effort with the motive to continue agriculture in terraces for the long term permanently rather than just for a few cycles as in forest patches. There was the formulation of new government policies which included all the forest areas under government ownership and this act restricted the Chepang people from using the community forest freely as they used to do before the enactment of the policy. The land

use map of the study area shows a remarkable change in the land use pattern in the interval of 20 years and meanwhile, there are significant changes in society such as the provision of schools, changes in agricultural trends, transportation services, and market areas, all these factors are the major contributors for the landcover change in the study area.

During the household survey, Chepang people mentioned that they nowadays are migrating to the bigger city areas and towns for better facilities such as education, health facilities, better job opportunities, and a modern lifestyle. The new generation of people are no longer interested in agricultural activities and rather they want to find jobs in the city areas. Those people who earn a good income are now building houses in the city areas and migrating from the villages due to which village areas are depopulating which is also clear from the demographic data in Table 4. The land cover changes resulting from land abandonment are higher in the mountain and middle hill areas of Nepal rather than in Terai and flatland areas (Maharjan et al., 2020). The study area lies in a mountainous region and there has been noticed an outmigration from the CBS data (Table 4) and a decrease in farmland in the past 20 years (Figure 9 and Figure 10). Key informant interviews and household surveys revealed that people are leaving behind the cultivable land and migrating to the city areas due to which cultivable land has decreased in the present than the few decades before and forest land has increased (Figure 10) due to the proliferation of shrubs and bushes in the barren cultivable land. Land abandonment is increasing in the study area and is causing problems in the ecological and social aspects of the community. There are few research conducted in Gorkha which has mentioned the land use change like Sharma et al., (2014) who disclosed pastoral land abandonment and landscape changes in Gorkha Nepal and mentioned that grassland abandonment and decline in livestock population have been the major land-use change trends in the region over the past four decades due to out-migration of the local people from marginal areas. The land-use change of the proposed research area resembles similar data as illustrated by Sharma et al., (2014) because there is noticeable land abandonment, especially in the farmland resulting in a decrease in cultivation land and an increase in shrub proliferation resulting increase in forest area (Figure 10).

The concept of (Lowe et al., 1997) is useful for the agricultural practices of Taklung, Gorkha, Nepal. Farming practices seemed to pose no threat to rural interest and pursuits but on the contrary, it was felt that the condition of farming exacerbated other threats to the area such as urban encroachment and the decline of rural communities (Lowe et al., 1997). Thus, following the

concept of Lowe et al, (1997) secure and revitalized agriculture is required as an essential conserver of both rural life and the natural beauty of rural areas like Taklung, Gorkha. Agricultural practices in the study area should be more sustainable and at the same time should protect rural life and the natural beauty of the rural area. There are significant changes in the built-up area of the study area and Figure 10 shows a significant increase in built-up area in comparison to two decades ago. There are some noticeable changes in the construction field in the study area such as the construction of health institutions, the construction of roads, and some buildings. Chepangs mentioned during the survey that they are now replacing the old mud-built houses with semi-concrete ones. Some of the respondents mentioned that the massive earthquake (7.8 rectors) which occurred in 2015, damaged a lot of houses in the village, and in compensation to the victims of the earthquake were provided with relief funds by the Government of Nepal for the reconstruction of their houses a year later after the incident. The money which they obtained from the earthquake relief fund was utilized to construct semi-concrete houses on their available land which also increased the building infrastructure in the study area. Some of the respondents mentioned that they also got help from the remittance of their family members to support the construction of new houses after the damage caused by an earthquake in 2015. However, people are migrating out of their villages for better income opportunities. Hence, out-migration nowadays is an integral part of their new livelihood system which is mainly based on the physical labor in non-agricultural sectors (Janajati and Dalit Study Center, 2009) which also supports the fact that the decrease in farmland area in the year 2020 in comparison to the year 2000.

4.3 Results from the household survey

The household survey forms the primary source of knowledge for this entire research. The main goal of the research is to identify the changes in agricultural trends if any and livelihood aspects of the Chepang community to obtain these objectives the agriculture information is collected in detail from the study area and presented in the following sections:

4.3.1 Educational Status in the Community

Education is an important parameter that can help us analyze the changing trends (Agriculture, land use, and livelihood) of society. The household survey was taken as a key tool to identify the educational status of the Chepang people. During the household survey, every respondent mentioned the number of family members in their house from which the tentative number of populations in the community was identified which is 228 people from the surveyed households.

Table 5: Education status of the Chepang community

Education status in the community based on the HH survey	No. of people
Illiterate	99
School level	113
High School Level	12
University level	4

Source: Household survey, 2022

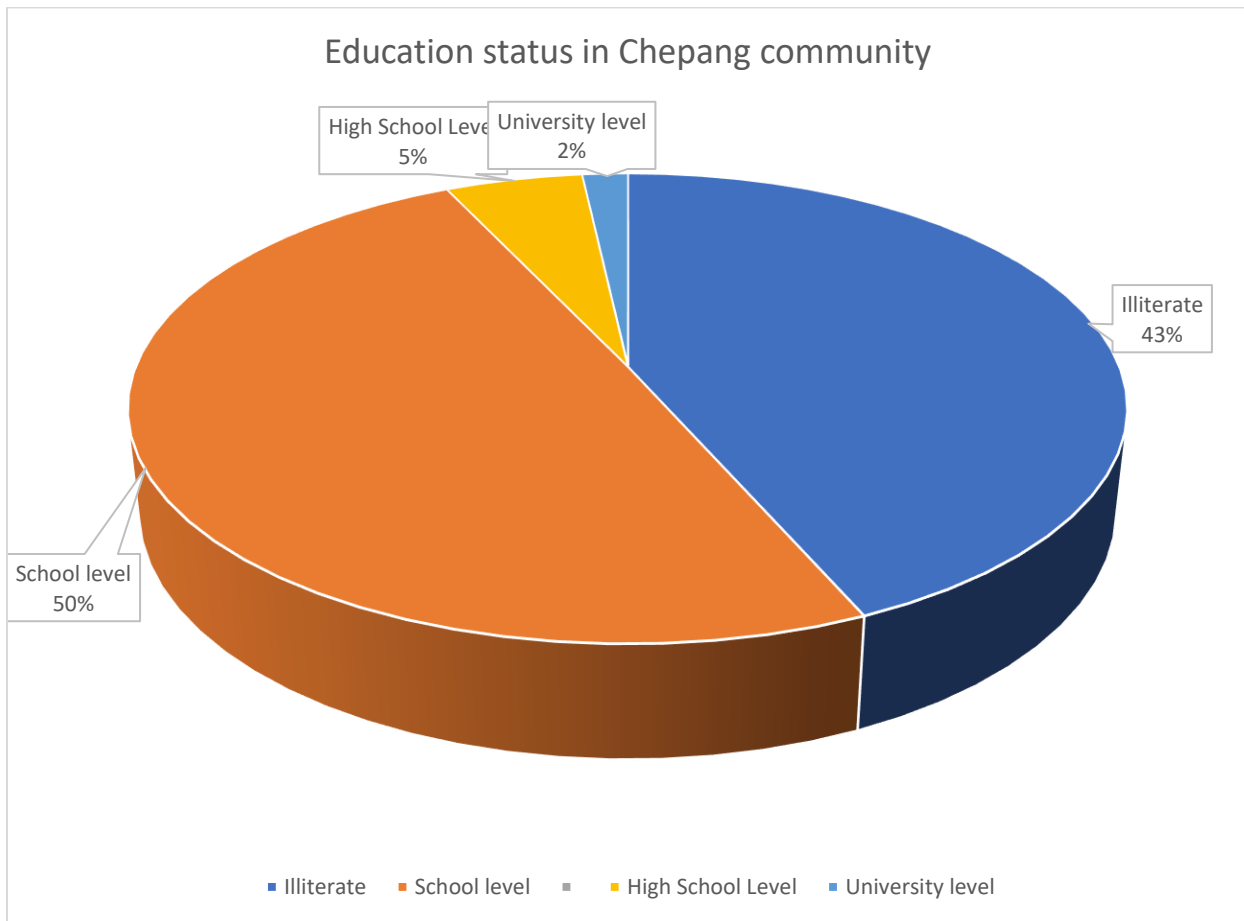


Figure 12: Education status in the Chepang community

Education is one of the major demographic factors that determines the living standard of the people living in the community. The educational status of the Chepang people has been utilized to analyze relation to their diversified income sources in this research. The survey depicts that in the present context around 50% of the people are literate. The illiteracy percentage generally constitutes kids

between 0-14 and elderly people above 65 years. The active population group, which is around 50% of the surveyed people in the study area have at least acquired a basic schooling, which makes them more aware of income diversification and better opportunities. There are very few people who have acquired higher education (high school and university education). Chepang people, being literate these days, are found interacting with the non-tribal people during the key informant survey. Hence, Chepang people these days are more aware of the ongoing changes in the outside world unlike before a few decades ago when they used to live isolated from all other groups of people and communities.

4.3.2 Agricultural trend in the past few decades

The household survey was conducted in the Chepang community with the motive of identifying the past and current agricultural practices and analyzing the trends and changes in agricultural trends if any. Chepang people in Taklung village mentioned that in recent years Chepang people are mostly cultivating in terraces formed in the slope areas of mountains. Chepangs mentioned that they used to clear the nearby forest area and cultivate the plots for a few crop cycles in the past. After a few crop cycles, they used to leave the land fallow and shift to another plot prepared by clearing the vegetation. But in the recent context, they are forming terraces in the sloping land and are cultivating permanently in terraces. In the past, Chepangs used to cultivate forest patches and rely totally on hunting and gathering wild species for their survival. Chepang people mentioned that the formulation of government policies gave the government ownership of all the forest and restricted the forest usage (hunting and gathering) for the local community members. Especially after the enactment of the Forest Act 1993, all hunting and poaching activities were banned, and the gathering of forest products was made strict and limited which further created hindrances in the day-to-day livelihood of the Chepang people due to which they had to change their shifting cultivation pattern into the permanent ones and diversify their livelihood strategies. Some of the Chepang people mentioned that the forest areas which they used to cultivate in the past could not be renamed into their ownership due to which they have even less acquired land for cultivation, thus reducing their annual food sufficiency.

4.3.3 Current cultivation pattern (Types of crops planted)

The current cultivation pattern in the study area was identified through a household survey. The annual cropping cycle in most of the Chepang households comprises maize and millet as the major staple crops cultivated for the household. Chepang people said that in the past, they used to do

Khoriya cultivation (Shifting cultivation), and the land in which they used to cultivate was very infertile characterized by stony, sloppy, and lack of irrigation facilities. However, Chepangs used to cultivate such infertile land for just a few years (for a few crop cycles) and used to leave the land fallow for the natural regrowth of the vegetation. After the enactment of laws only a few Chepang people who had official documents could make the shifting cultivation patches that they used to cultivate in the past into their ownership. In such shifting cultivation patches, Chepang people cultivate legumes like cowpea (Nepali name: Kattike Bodi; *Vigna unguiculata*), ricebeans (Nepali name: Masyang; *Vigna umbellata*) and horse gram (Nepali name: Chana; *Dolichos bitorus*) as per the Key informant interview conducted in the Chepang community of Taklung. Furthermore, Chepangs also cultivate cereals like sama foxtail millet, kaguno (*Setaria italica*), and Sorghum junelo (*Sorghum vulgare*) in Khoriya land (See Rai, 1985), but in the study area of this research, these cereals were not cultivated in shifting patches. The landholding data of the study area has been collected through the household survey (Table 6).

Table 6: Landholding status of the Chepang people

HHs	Land acquired (ropani)			
	No acquired land	Below 5 ropani	5-10 ropani	above 10 ropani
No. of HHs	2	18	17	7

Source: Household Survey, 2022

Chepang people in Taklung village generally have limited acquired land in which they cultivate the major staple crops, legumes, and vegetables for their daily food sufficiency. Only a limited number of Chepang households i.e. 7 HHs have enough cultivable land which makes them food sufficient for the year round as mentioned by Chepang respondents during the household survey. Those households who have acquired land in between 5 to 10 ropani are also engaged in the plantation of commercial legumes/beans or lentils and a few varieties of vegetables. Some of the Chepang households do not have any acquired land i.e. 2 HHs which makes them depend on other sources of income for their basic needs. The landholding among the Chepang community is divided into Khet (irrigated land) Bari (terraced upland, usually unirrigated), and Khoriya (sloping unirrigated upland without terraces) Maharjan et al. (2010). However, in this research, the focus is given only on the total ropani (common land measurement unit) of the land acquired and not on the type of landholdings. The Chepang people have very little acquired land and among that land, very little is fertile land most of the land is infertile and lacks irrigation facilities which does not

give the desired yield for annual food sufficiency. The Chepang community itself is situated in the slopy mountain area and the landholdings are also situated in the slopy characterized hills. As the source of water is situated very far from such landholdings and due to lack of irrigation facilities, the slopy and less fertile land is even characterized by drought conditions. The study area Chepang community of Taklung Gorkha has less irrigated stony soil texture as found during the field survey in 2022 (Figure 13). The soil in the study area is full of boulders and pebbles in it.



Figure 13: Stony soil texture seen during a field survey in the study area

The household survey (Figure 14) data illustrates that the maximum number of people almost 26% of the total surveyed households cultivate maize as the primary staple crop in less irrigated land (Bari). Millet forms the second most popular crop planted in the community which constitutes almost 16% of the total plantation. Maize and millet generally form the major annual crops cultivated in almost every household in the study area. This finding is like that of Maharjan et al., 2010 who found that Chepang people from the Chitwan and Makwanpur districts cultivate maize and millet in Shifting cultivation land and this forms the major staple crops for their food security.

In addition to that Chepangs from Chitwan and Makwanpur cultivate buckwheat (*Fagopyrum Esculentum*) and mustard (*Brassica campestris* var. Toria) in bari (Less irrigated land) (Maharjan et al., 2010) but in the study area Chepang people do not cultivate buckwheat and very few around 6% of the total respondents mentioned that they cultivate mustard in their field. Furthermore, a household survey depicts that paddy is among the major staple crops in Taklung, Gorkha and almost 12% of the total surveyed houses mentioned that they cultivate paddy as one of the major food crops. Besides this, Tomato cultivation constitutes 12% of the total crops and forms the third most popular type of cultivation.

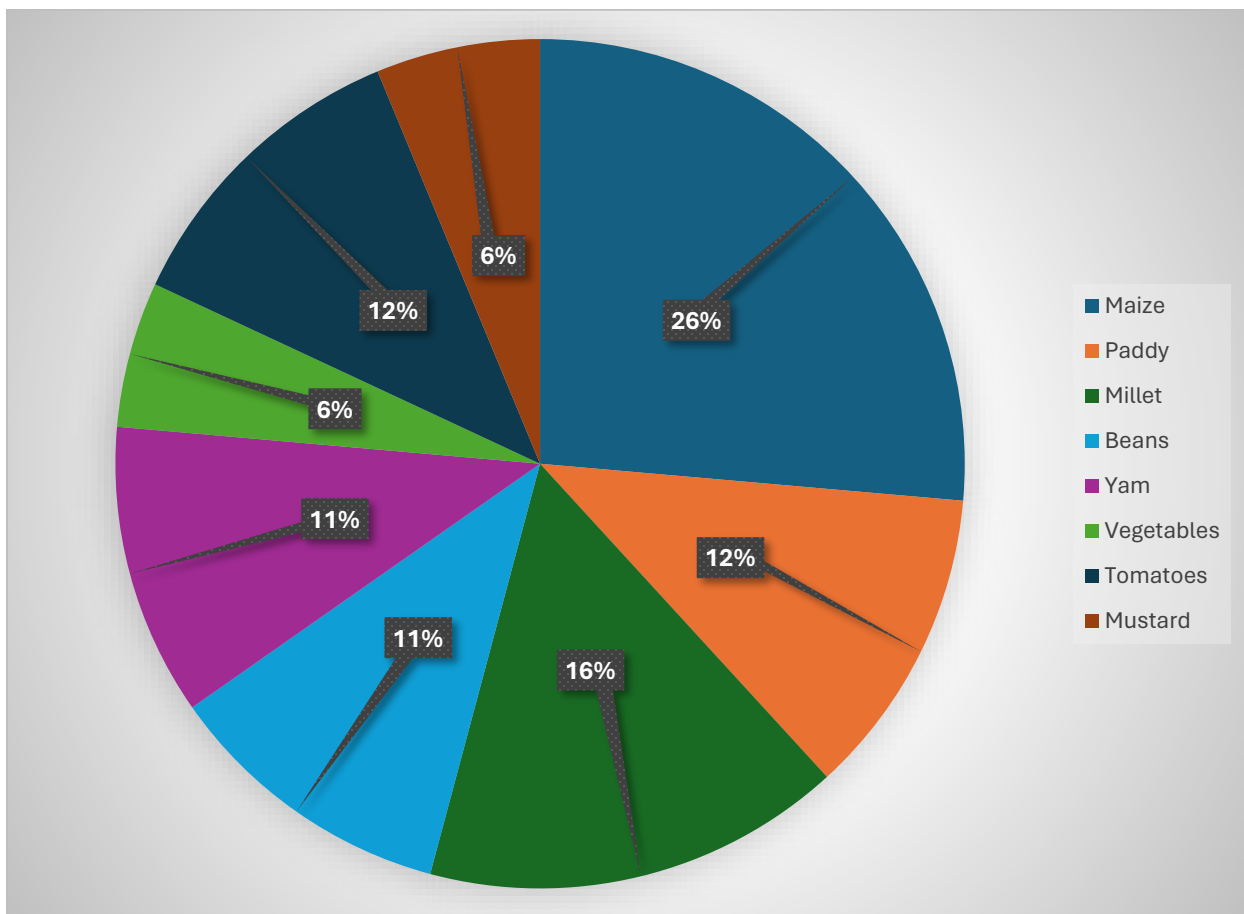


Figure 14: Current Cropping Pattern of the Chepang Community

Tomato cultivation in the study area is cultivated intensively with four cycles per year and mainly for commercial purposes. Also, the survey results show that people cultivate legume beans, yams, vegetables, and mustard as their preferred crops. Beans such as cowpeas and rice beans are generally cultivated along with the maize and millet in the bari (non-irrigated land) and are used for vegetables when they are young pods, and the remaining seeds are harvested along with the

maize and millet when they are mature seeds and are used as lentils. Soybeans and black gram are planted in the bunds of irrigated land during rice plantation and their mature seeds are harvested. Chepangs usually sell the surplus soybeans and gram (chickpea) in the road-head markets for cash income for their livelihood.

Chepang people mentioned during the household survey that they cultivate several types of legumes, but they couldn't mention the names of all the varieties that are cultivated in the area. Hence, the Key Informant Interview was held with the community members (socially renowned) personnel, and it highlighted that people cultivate various types of leguminous beans in the community. The resource person of the community through a key informant interview mentioned that they grow various types of beans in their villages as mentioned in Table 7. People utilize those legumes for their daily meals, and they also sell the surplus for a good price in the market areas.

Table 7: List of Beans cultivated in the Chepang Community

Name of Leguminous plants	Common Nepali Names	Scientific Names
Soybeans	Bhatmas	<i>Glycine max</i>
Dwarf beans	Ghiu Simi	<i>Phaseolus vulgaris</i>
Black-eyed pea	Sukeko lamo bodi	<i>Vigna unguiculata</i>
Yard long beans	Bodi	<i>Vigna unguiculata</i>
Winged bean	Climbing bean	<i>Phosphocarpus tetragonolobus</i>
Sword beans	Hiude simi	<i>Canavalia gladiator</i>
Rice beans	Masyang	<i>Vigna umbellate</i>
Kidney beans	Rato dried bodi	<i>Phaseolus vulgaris</i>
Broad beans	Bakkulla	<i>Vice Faba</i>
Green Pea	Matar kosha	<i>Possum sativum</i>
Gram	Chana	<i>Cicer arientinum</i>

Source: Key Informant Interview, 2022

During the field survey, we observed the fields where dwarf beans were cultivated (Figure 15). The dwarf beans were being cultivated for household consumption and our respondents mentioned that if the beans were surplus, they would either sell the young buds of dwarf beans for vegetables or just let the beans become mature and sell the bean's seed as lentils. Similarly, they cultivate all other kinds of beans mainly on a seasonal basis according to the availability of rainfall. One of our

key informants of the survey mentioned that rice beans and kidney beans have very high value for income when they are sold in the market, so they prefer planting them every year.



Figure 15: Dwarf beans cultivated by the Chepang community

The Chepang people cultivate very little vegetables, mainly green leafy vegetables, pumpkins, cauliflower, squash, and broccoli. They usually irrigate the land next to their house for vegetable farming and usually cultivate green leafy vegetables, pumpkins whose leaf is consumed as green vegetables during the early phase and later after they mature harvested, and even stored for food shortage period in the year. They consume green beans as vegetables and when they mature, they dry the excess beans to make lentils and even store them for a long time. Chepangs also dry green

leafy vegetables to make gundruk (fermented and dried greens) and store them for future consumption during lean periods.



Figure 16: Storage of crops and vegetables for future consumption

Agriculture in the Chepang community is generally rain fed. They have a fixed time in the year for plantation and harvesting of the crops (Table 8). As per the household survey, the major food crops of the Chepang people i.e., Maize and millet are planted one cycle per year during the spring season based on rainfall availability. And paddy is generally planted two cycles per year based on the availability of rainfall. Furthermore, cash crops like tomatoes and green vegetables are becoming more popular these days due to cash income and people are intensively cultivating these crops. Several types of beans that are being cultivated in the study area are mostly cultivated on a seasonal basis, but Chepang people cultivate tomatoes even in the off-season. In addition, Chepangs mentioned that they are cultivating a few vegetables like cauliflower, broccoli, and squash in off off-season with the application of manures and chemical fertilizers.

Table 8: Plantation and Harvesting Schedule of different crops and vegetables in Chepang community

Type of crops planted	Plantation time (Nepali calendar)	Plantation time (English calendar)	Harvesting time	Harvesting time (English calendar)
Maize	Chaitra	April	Bhadra	August
Millet	Asar	July	Mangsir	November
Paddy	Shrawan and Chaitra	August and April	Mangsir and Shrawan	November and August
Beans	Bhadra	August	Mangsir	November
Yam	Chaitra	April	Kartik	October
Vegetables	Seasonal, mainly during the monsoon season around (June-September) and few are cultivated off-season.			
Tomatoes	all year round (Seasonal)			

Source: Household Survey, 2022

Chepangs and their dependency on wild food resources

The relationship between Chepang and Wild Forest is many histories long as mentioned by one of the respondents during the Key Informant Interview. The Chepang people used to live a semi-nomadic life a few decades back and depended entirely upon wild vegetation and animals for food. Chepang people used to depend on the nearby forest areas to supply their needs. In the study area, The biological resources from forests were used in many ways like timber, fuelwood, food, wild vegetables, spices, wild fruits, and medicine. Among these medicinal herbs are the most important wild vegetation for their community. However, the economic valuation of such forest resources is still lacking and ignored (Khatri-Chhetri and Maharjan, 2006). Since ancient times, wild sources of food have been a great source of food for the Chepang people of Taklung when there is food scarcity or when the agricultural harvest is depleted. Chepang people, including those from the study area, often face food insecurity and during this lean period, they search for wild food which might be an important supplement for livelihood support (Aryal et al., 2007).

In the present context, although the dependency of Chepang people on wild food has reduced a lot (as mentioned by a respondent during a key informant interview) still they depend on several types of wild edible plant species (Table 9) for food. During the household survey respondents mentioned that the major types of tubers such as Githa (*Dioscorea bulbifera*), Bhyakur (*Dioscorea pentaphylla*), and Tarul (*Dioscorea alata*) still are a part of the staple diet for most the Chepang households. They also consume wild green vegetables such as edible fern (Niuro) and stinging nettle (Sisnoo) which are easily found in the forest bushes abundantly. Also, they collect wild mushrooms that sprout in the forest after the monsoon season. There are very few studies about the types of wild plant species consumed by Chepang people and the availability, status, and contribution of those wild species in the livelihood support (Regmi et al. 2006, Shrestha 2001). Chepangs in the study area gather Chiuri as a commercial crop. This finding is similar to Maharjan et al., 2010 who mentioned that Chiuri is one of the commercial wild plants used for generating income. Chiuri is used in butter extraction, soap preparation, candle preparation, and many more; hence, is a good source of income for the Chepangs. Wild mushrooms are collected abundantly during the monsoon season and are a very good source of vegetables in the study area. Maharjan et al., 2010 claimed that Chepang people have very good knowledge of distinguishing edible mushrooms from poisonous ones, Chepangs can remove poison from the tuber and poisonous legumes to render them into edible form. The indigenous knowledge in distinguishing the wild food and benefiting maximum from it is astonishing and is possessed only by the elderly Chepangs and hence, needs documentation for future knowledge transfer.

Table 9: Types of wild resources consumed by the Chepang community in the study area.

Common name of wild vegetation	Name	Purpose of use
Gurjo	<i>Tinaspora sinensis</i>	Medicine
Harro	<i>Terminalia Chebula</i>	Medicine
Barro	<i>Terminalia bellrica</i>	Medicine
Githa	Aerial Yam	Food
Ban Tarul	Wild edible yam	Vegetable
Vyakur	Deltoid yam	Food
Niuro	<i>Dryopteris cochleate</i>	Vegetable
Sisnoo	Stinging Nettle	Vegetable
Ban chyau	Wild mushroom	Vegetable

Kalo Niuro	Fiddlehead fern	Vegetable
Ban kurilo	Wild Asparagus	Vegetable
Wild honey	Honey	Food
Jungli Kera	Wild banana	Fruit
Khole saag/simsaag	Watercress	Vegetable
Chiuri	<i>Bassia butyracea</i>	Food
Kalo Karkalo	Indica purple taro	Vegetable

Source: Key Informant Interview, 2022

Chepangs and cash crop cultivation

The Chepangs are regarded as the most marginalized and resource-poor group in Nepal (See MDI, 2008). Chepangs used to depend entirely on the resources for their livelihood a few decades back and at present even though their forest dependency has decreased drastically still they depend on forest resources for many purposes. The forest is an important source of cash income among Chepangs (Piya et al., 2011). In the recent context, there are many visible changes in the traditional economic structure of the Chepangs in the study area due to interaction with non-tribal people. Chepang people are now selling their surplus products in the nearby market areas and are driving towards modernization. Researchers like Gurung (1990) have highlighted that there are certain gradual visible processes in the Chepang community including the construction of roads, the growth of market areas, the establishment of educational institutions, and the introduction of the Praja (Chepang) Development program which are driving the Chepang community more towards the modernization. Cash crops are popular these days not only in the Chepang community of this research area but all around the country. Household survey data reflects that a significant number of people are involved in tomato cultivation and people claim that it is for commercial purposes. Chepangs were found to cultivate tomatoes intensively in their farmland all year round (Figure 17).



Figure 17: Intensive tomato cultivation for commercial purposes

In addition to tomato cultivation, people also cultivate mustard, green leafy vegetables, and beans for commercial purposes. They sell surplus crops and vegetables such as tomatoes, green leafy vegetables, beans, and mustard in markets like Gorkha Bazar, the roadside of Prithivi Highway for income to support their livelihood. It is believed that the interaction with the non-tribal people is promoting them to sell their products in the market (Gurung, 1990). For more detailed information regarding all kinds of livelihood support from which Chepang people are benefitting we organized Key informant interviews with the key personnel of the community from which we learned that Chepangs sell forest products especially medicinal herbs like Harro, Barro, and Gurjo for cash income. Also, Chiuri which is a very good source of soap is sold by the Chepangs since a long time. Chepangs believe that cultivation of the cash crops and trading of the cash crops and wild crops are supporting a lot in their livelihood assessment and are a good source of cash income.

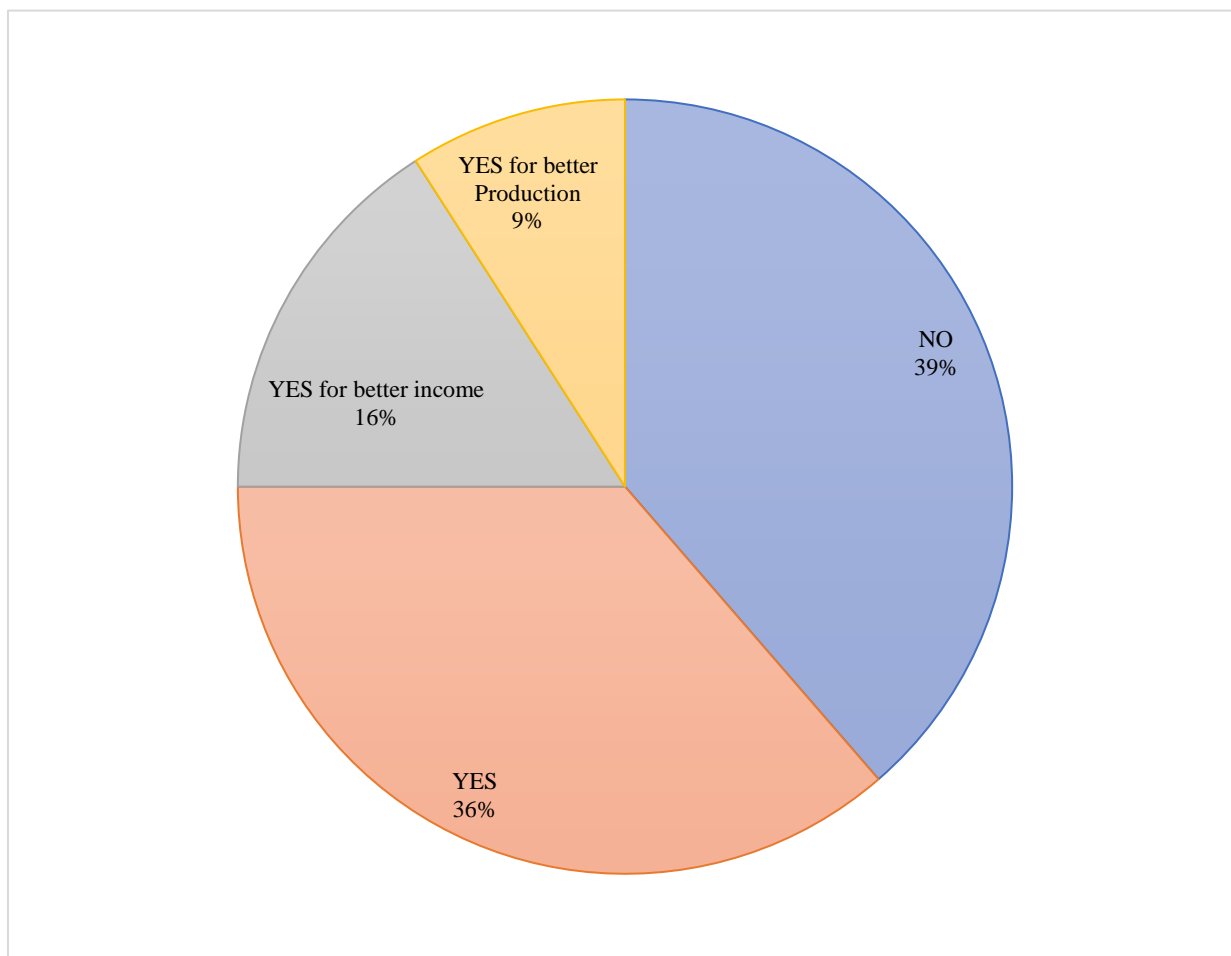


Figure 18: Chart for Changes in Cultivation Pattern in Chepang Community

The household survey gathered information regarding Chepangs people's cultivation pattern and changes in the cultivation pattern in the past 20 years if any. Respondents from the household survey mentioned that almost 36% of the total population had changed their cultivation patterns. Almost 39% of the people responded that they had not changed the cultivation pattern, and the remaining 25% did not mention changing the cropping pattern. Among the respondents who said they have changed the cropping pattern, almost 16 % of the people mentioned that they changed the cropping pattern for better income and the remaining 9% mentioned that they changed the cropping pattern for better production rather than commercial purposes. The respondents from the household survey mentioned that they prefer crop cultivation like beans which are easier to protect from wild animals like monkeys, Vegetables from which they can earn a good amount of income and easier to protect from wild animals, and mustard and tomato cultivation which can give good cash benefits. In general, in the present context, it is noticed that people in the study area are

attracted towards intensive commercial tomato farming because of good cash income in short duration.

Practices and Significance of shifting cultivation based on the perception of the Chepang community

According to the Focus group discussion conducted in the school (Shree Pragati Primary School) and Key informant interview it was clear that Chepang people no longer follow the traditional shifting cultivation practices. They have changed their agricultural practices over time due to various reasons. Although the main aim of the study, in the beginning, was to identify the shifting cultivation and adaptation practices in shifting due to climate change, the household survey ended up disclosing that people are not aware of the term climate change, and most of them don't even follow traditional swidden agricultural practices anymore. The household survey showed that the people had changed their agricultural practices in various ways, like changes in the types of crops planted and changes to the permanent agriculture trend governed by the formulation of more strict rules and policies related to forest conservation. The community used to focus extensively on cultivating food crops such as maize, millet, and paddy. Still, a significant percentage of people cultivate cash crops for commercial purposes. People mentioned several reasons behind changing the cultivation pattern in the study area, which include:

- i.** Changing crop types: They are changing the crop types for better production.
- ii.** Focus only on cash crops rather than food crops: People nowadays are cultivating more cash crops for better income.
- iii.** Ending agriculture and involvement in other income-oriented works: The Chepang community has many educated people. People nowadays are attracted to and influenced by the modern lifestyle and are trying to engage themselves in other jobs for better living standards and lifestyles.

4.4 Complementarity between Farming and Gathering

Farming is the primary source of Chepang's livelihood. The physiological condition of the Chepang community, such as having rugged topography, steep slopes, stony lands, and inadequate irrigation facilities, lowers the productive capacity of the area. The people are therefore concerned about alternative sources of income, and almost all households have alternative sources of income to support their livelihood when there is a shortage of food supply through farming and cultivation. Aryal et al., 2009 reported that the average food sufficiency of the Chepang households is five

months, and only one percentage of the Chepang households are food self-sufficient year-round. Also, Maharjan et al., 2010 highlight that the food sufficiency of the Chepang community is around seven months. The household survey data shows that the cultivated food crops are not self-sufficient for the Chepang household year-round. Still, in addition to that, Chepang communities depend on other extra income sources (Jobs, income-oriented cash crops, services, and many more) for their livelihood. The dry season leads to temporary drought in the region, due to which no farming is possible for an estimated three months. Despite these, Chepang communities still practice gathering wild food for subsistence. Although the formulation of new policies has constricted their access to forest resources, they still gather wild food from the forests. They gather wild food, especially vegetables, medicinal herbs, and wild fruits, and this helps in the livelihood of the Chepangs when there is an inadequate food supply from farming. Several types of food Chepangs consume also perform the dual roles of food and medicine. For instance, Chiuri butter is one of the medicinally valued wild plants consumed as food and has medicinal properties for treating rheumatism, wounds, and dry skin.

4.5 Changes in Livelihood aspects in the past two decades

Traditional norms and practices have always influenced rural livelihood. Rural populations like the Chepang people depended entirely upon agriculture and forest resources for their livelihood for a long time. Forests form an essential source of cash income because they trade various forest products for cash income. However, control over access to forest resources due to the formulation of unfavorable state policies has threatened the livelihood situation of the Chepang community. Hence, only those households who are food self-insufficient collect commercial forest products for cash income generation by selling the commercial wild crops, and the income thus generated is utilized to produce food from the market areas. Hence, in the recent context, commercial forest products have become an alternative to improve the food security situation of Chepangs (Maharjan et al., 2010). In the study area, during the household survey, respondents mentioned that the crop yield from cultivation is insufficient for annual food supply, and they are deprived of food for several months. For this reason, the Chepang people have started diversifying their livelihood strategy in the study area. Several strategies were recorded when studying the prevalent livelihood strategies of the Chepang people in detail in the recent context.

Based on the sustainable livelihood framework, the livelihood assets in the Chepang community which is contributing to achieving a sustainable livelihood are described as:

1. Human assets

The livelihood of the Chepang people from Taklung, Gorkha, is supported by human assets, including their knowledge, skills, and physical capabilities. Chepang people these days are more educated (Table 5) than the records. Their life and livelihoods are becoming more accessible and more efficient due to their increased awareness of the changing societal, economic, and environmental values around them. The household data shows that almost 50% of the people in the village are educated. That might be why Chepangs these days are interested in searching for government jobs or any private sector jobs according to their qualification. The educated member of the family supports the livelihood expense of their family through the acquired employment and income from it. Chepang people are also involved in service-oriented work, such as helping in restaurants, serving in houses, serving in schools, and serving in government offices. Through these works, they support their family economically when there is a lean period during the year. Out-migration is a vital livelihood strategy, as the Chepang key personnel mentioned during the group discussion. They mentioned that people are leaving behind their houses in the villages, abandoning the farmland, and moving to the larger city areas for either job opportunities, service works, or provision for better education and health services. There are no job opportunities in the village, and out-migration helps people get jobs in the city areas, supporting their livelihood.

2. Natural assets

The livelihood of the Chepang people from Taklung village depends upon natural assets such as land, water, and forest for their livelihood. Natural assets support their livelihood in several aspects, such as fulfilling their basic needs and medicinal and commercial values. Despite the strict rules on forest resource consumption, the Chepang people of Taklung village still collect some forest resources for consumption (wild fruits, tubers, wild vegetables) and are very limited for trade purposes. Chepang people mentioned during the household survey that they collect Harro and barro, which have medicinal value for trading purposes. Also, chili is another wild food that is sold for good value for money. The cash income from trading these forest resources is utilized for people's livelihood when there is a food shortage. Furthermore, land and water are essential for agriculture and still forms the primary basis for their livelihood in several community houses.

3. Financial assets

The livelihood of the Chepang people depends on financial assets like remittances, savings, and wages. Although agriculture still forms much of the occupation in the community, the yield from the cultivation is not enough for their annual food supply. Chepangs, thus, are involved in wage labor within the village and even in the neighboring villages in the daytime when they are free from farm activities. Chepangs mentioned that wage labor is like part-time work as they do not get it daily. When construction work occurs inside or in the neighboring village, they work as wage labor. Also, Chepang people mentioned that wage labor is done by the people involved in agriculture as their primary work for extra income to support their livelihood. Active age group members of the family from some of the households in the study area were out during the survey. When asked in detail, the respondents mentioned working abroad, mainly in the Gulf countries, to support their families financially. Remittance from employment to foreign countries is one of the essential livelihood strategies these days. Chepangs from the active age group (15-64) are going abroad (mainly to Gulf countries and a few to India) for income. They are supporting their family well through their income. Chepangs mentioned that they are building new houses after the 2015 earthquake with the help of remittances from their family members working abroad. Chepang people, in the lean period during the year when the agricultural harvest is out of stock, use the savings from wage labor and remittances to fulfill their needs.

4. Physical assets

Assets like production, transportation, and shelter are considered physical assets. Commercial crop cultivation is one of the livelihood strategies of the Chepang community of Taklung Gorkha. During the household survey, it was found that the food crops and legumes produced from their cultivation field were not enough for the year-round supply of food for their family. Hence, people still involved in agriculture seemed attracted to intensified cash crop cultivation, mainly tomatoes, in the study area. Besides tomatoes, surplus beans, and legumes, fruits, and vegetables are sold in the market areas (Gorkha bazaar and roadside of Prithivi Highway). The cash thus generated is utilized for the livelihood of Chepang households. Besides agriculture, Chepangs also raise very few domestic animals for trade and consumption purposes. They are raising goats, which have

excellent market value for goat meat. Especially during the main festivals of Nepalese, Dashain, and Tihar, goat meat has a perfect market. Also, Chepangs raise hens, buffalo, and cows in their shed. Buffalo and cows are raised to sell milk and milk products. Thus, livestock raising is also supporting their livelihood. The village has improved road access, even if it is a feeder road. Transportation access to nearby market areas for selling crops and raising livestock and products helps the Chepang people secure their livelihood.



Figure 19: Livestock raising in the Chepang community for their livelihood

5. Social assets

Chepang people have been known for their shy and introverted nature for ages. They used to like living alone with the tribal people in their community, which was very close to nature. They did not like to correspond with other tribal people in ancient times. However, these days, Chepang people in Taklung village interact with the non-tribal people from the neighboring villages. Chepangs interact with non-tribal people for trade, business, social networking, etc. Chepangs from Taklung work with non-tribal people in jobs, commercial markets, and almost all their workplaces. These social networks and relations have helped the Chepang people learn the new aspects of commercial business and more job markets and opportunities. Thus, these social assets help Chepangs from the study area support their livelihoods.

Unemployment, poverty, lack of non-land-based income opportunities, and a decade-long civil war in the study area have forced the rural people of Taklung village to find new ways to secure a livelihood. As a result, migration has emerged as a primary livelihood strategy for a large portion of the rural population like Chepangs. Most of Nepal’s population live in rural areas -almost 82.9%- but only 60% consider farming their primary livelihood strategy (GoN, 2014). The Nepalese economy has recently shifted from agriculture to remittances and migration. In 2016, Nepal’s gross domestic product with remittances counted almost 29.6% (World Bank, 2016). For analyzing the changes that have occurred in the Chepang community regarding livelihood aspects, their possible livelihood sources, and occupational status are analyzed.

Occupational status of the Chepang Community

Occupation is one proxy indicator for an individual's level of empowerment. Chepang people have been adopting shifting cultivation practices for ages, recently shifting towards subsistence farming practices in low-productive terrain like Taklung village. Agriculture still forms the major occupation type in the study area, with almost 80% of the people relying on it for their livelihood.

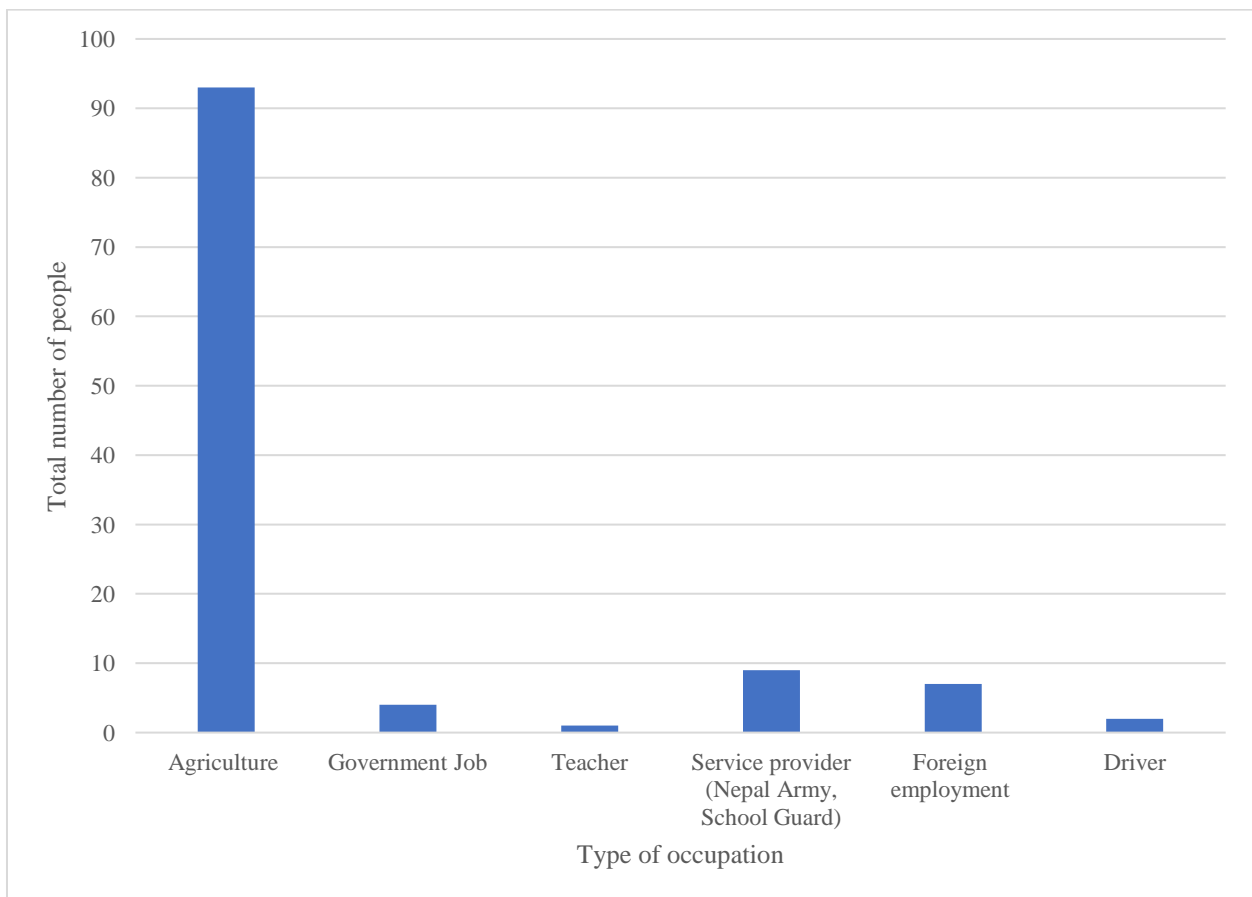


Figure 20: Chart for Type of occupation in Chepang Community

Table 10: Occupational details of the Chepang community

Types of occupation	Total no of people involved	Percentage (%)
Agriculture	93	80
Government Job	4	3
Teacher	1	0.9
Service Provider	9	7.8
Foreign employment	7	6
Drivers	2	1.7

Source: Household Survey, 2022

In the present context, the maximum number of people are still engaged in Agriculture as their primary source of income for their livelihood. Besides this, people also have alternative sources of income. From the collected data, Chepang people are now more educated (Table 5), especially the young generation, and are lured towards service jobs rather than relying only on Agriculture. In one household, if two members are engaged in Agriculture, at least one or two other persons are involved in other income-oriented activities like government jobs, service work, foreign jobs, teachers, and drivers (Figure 20).

Table 11: Dependency ratio of non-working members upon the working members in the Chepang families

Survey Households	No. of family members			Dependency ratio
	0-14 yrs.	15-64 yrs.	Above 65 yrs.	
HH1	0	4	0	0.0
HH2	3	4	2	1.3
HH3	2	2	1	1.5
HH4	0	3	1	0.3
HH5	2	3	1	1.0
HH6	0	0	2	0.0
HH7	3	5	0	0.6
HH8	2	4	0	0.5
HH9	1	1	1	2.0

HH10	2	2	0	1.0
HH11	2	2	1	1.5
HH12	0	4	1	0.3
HH13	0	4	0	0.0
HH14	5	4	0	1.3
HH15	0	2	0	0.0
HH16	2	2	1	1.5
HH17	2	4	1	0.8
HH18	1	3	0	0.3
HH19	1	4	0	0.3
HH20	0	4	0	0.0
HH21	2	3	2	1.3
HH22	0	2	0	0.0
HH23	3	3	0	1.0
HH24	3	3	1	1.3
HH25	1	5	0	0.2
HH26	3	3	1	1.3
HH27	2	4	0	0.5
HH28	2	4	1	0.8
HH29	2	5	0	0.4
HH30	2	3	1	1.0
HH31	3	2	0	1.5
HH32	3	2	1	2.0
HH33	0	2	1	0.5
HH34	0	1	0	0.0
HH35	1	3	0	0.3
HH36	2	3	1	1.0
HH37	3	3	0	1.0
HH38	1	3	0	0.3
HH39	2	2	0	1.0
HH40	3	2	0	1.5

HH41	3	2	0	1.5
HH42	1	2	1	1.0
HH43	3	4	0	0.8
Average dependency ratio of the Chepang household				0.75

Source: Household Survey, 2022

The working members are in good proportions as recorded during the household survey. The results from calculating the dependency ratio of the non-working family members to that of the working family members depict that the number of active members (Aged 15-64) in the Chepang households comprises a perfect percentage (Table 11). Hence, it explains why Chepang people from the community claimed they had no problems fulfilling their basic needs in almost all the houses during the household survey. The average dependency ratio of the non-working members upon the working family member is 0.75. Although the dependency ratio is high, the Chepang people claimed during the survey that they earn enough for their family members by diversifying their income sources. Furthermore, the number of active family members compared to the total number of dependent family members has helped generalize the food security status of the Chepang households.



Figure 21: Picture reflecting the daily life of a Chepang family

Respondents during the survey mentioned that only the food crops produced from their cultivated land are not enough food sources for their family all year round. People are now educated, even if it is just at the primary level, and they know the ongoing market ideas and profit and loss from agricultural products. Chepangs are now attracted towards the plantation of more income-oriented crops and vegetables like mustard, tomatoes, gram, and several kinds of beans. The trading of crops generates cash income for them, which ultimately helps secure their livelihood when crop production is not enough. Also, it is recorded that in most of the Chepang households surveyed, more than 50% of the members are economically active (Table 10) and involved in any income-generating activities, be it agriculture, cash crop plantation, or other kinds of jobs or services.

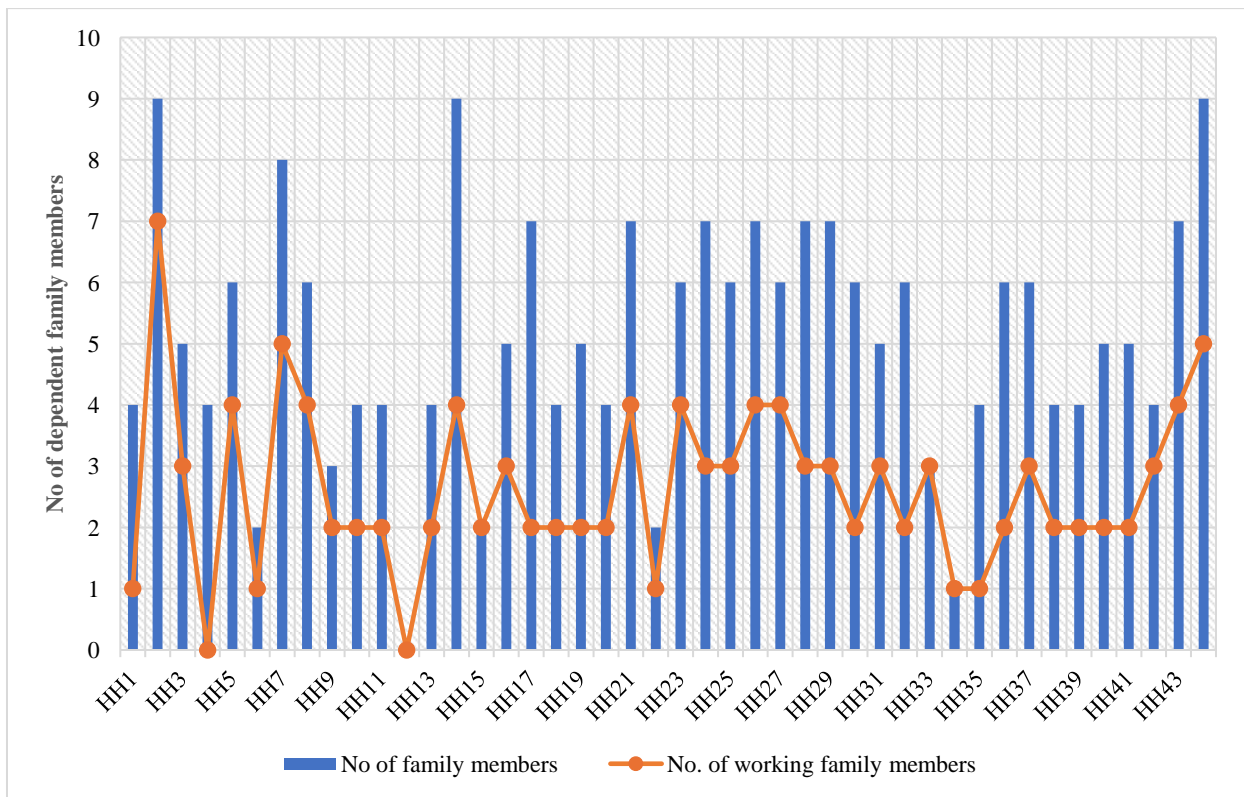


Figure 22: Chart reflecting dependent members Vs. working members in Chepang households

From the household survey, people seemed happy with their occupations, and nobody in the community complained about poverty-related problems. Every household has a good amount of active people involved in income-oriented activities. People mention that cultivating food crops only, as in the past, was not enough for the whole year. Still, almost all households have some

alternative sources of income or allowances from the government to support the need for their livelihood.

Occurrence of Natural Hazard to their livelihood

The Chepang people live in topographically fragile areas. They live in the areas most at risk of drought and landslides. The Chepangs rely on natural resources and suffer the most from problems such as drying up of the water resources, increased drought, landslides, and many more natural hazards. Even slight changes in the water resources or changes in the vegetation cover due to extreme events significantly impact their livelihood. In the study area, it is noticed that even slight changes in rainfall patterns can result in devastating consequences in crop yields, thus affecting the food security of the locality. Natural hazards are hindrances to any developmental activities. However, humans cannot stop the occurrence of natural calamities; they can control their anticipated consequences. In the study area, people are vulnerable to extreme weather events almost yearly (Household Survey, 2022).

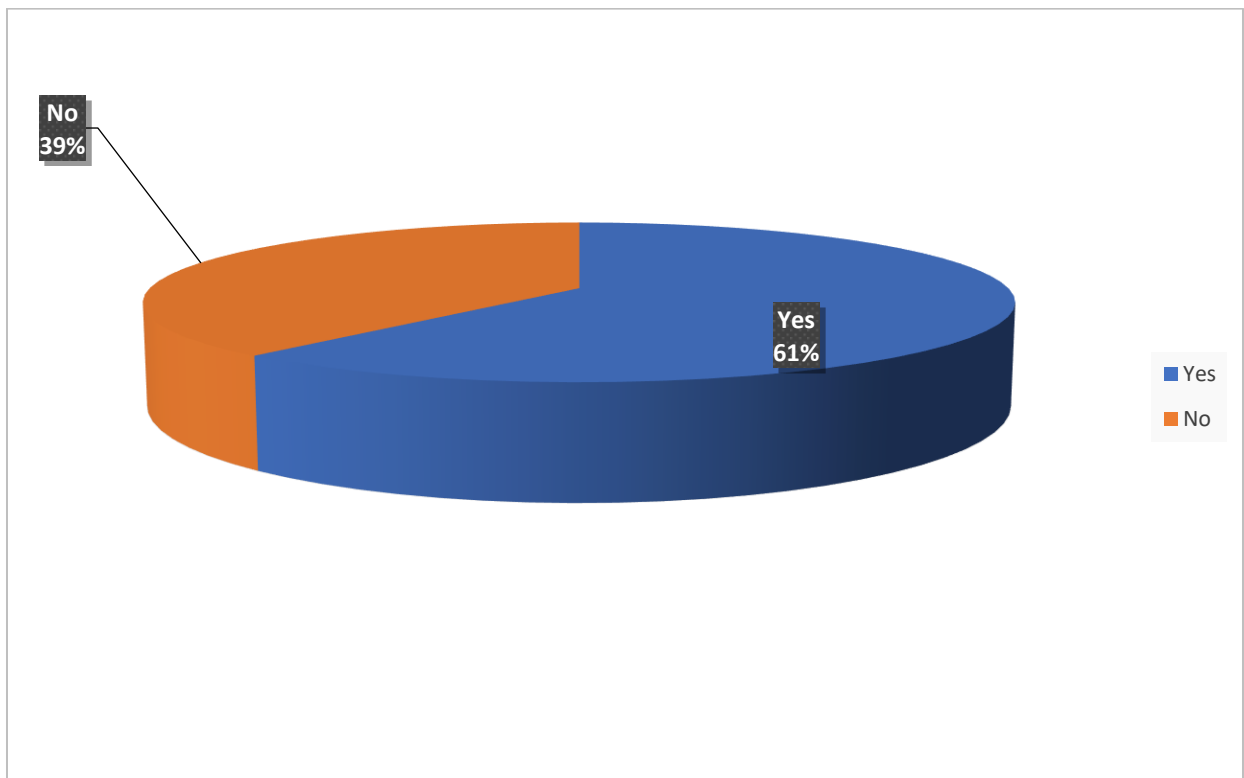


Figure 23: Chart for Natural Hazard Experience in Chepang Community

From the conducted household survey, it has been noticed that almost 61% of the respondents said they had experienced the occurrence of natural hazards, and the remaining 39% mentioned that they hadn't experienced any hazard till now. Respondents from the survey mentioned that they have experienced hazards such as drought season mainly (March-April) and landslides during the rainy season (June-September). The Chepang people mentioned that each year during the monsoon season, they face landslide hazards that block their access to market areas, hampering their daily livelihood. During that time, they lost connection with other communities, market areas, and even access to schools and hospitals, which made their life miserable. There was a massive landslide due to the earthquake in 2015 at the Gorkha epicenter, which posed maximum loss of life and property that year, even in the study area. Also, people mentioned landslides due to deforestation, road construction, and a lack of tree plantation/afforestation in the study area. In addition, Chepangs also mentioned that they face drought almost every year during March/April, which hampers crop yields and decreases their economic output.

People's perception of changing weather conditions about their agricultural trends and livelihood

The Chepang community lives close to nature and is greatly influenced by the changes in weather conditions in their locality. Their perception of changing weather conditions was analyzed to generate the impact of changes in weather conditions on their daily livelihood, if any. For this aim, household survey data helped gather information on people's perceptions of changes in weather conditions in the study area. The results show that most people were not aware of the term "CLIMATE CHANGE," but they responded to sudden changes in weather conditions repeatedly. The survey results show that almost 33% of the people reported they had experienced changes in weather conditions such as severe drought for three months a year, maximum hot weather, changes in rainfall patterns such as maximum rainfall or very minimal rainfall, Drying up of drinking water sources and so on. Almost 50% of the people mentioned that they have not experienced any significant changes in the climate in the past two decades, and about 14% of the people mentioned that they have no idea about the changes in weather conditions in their area.

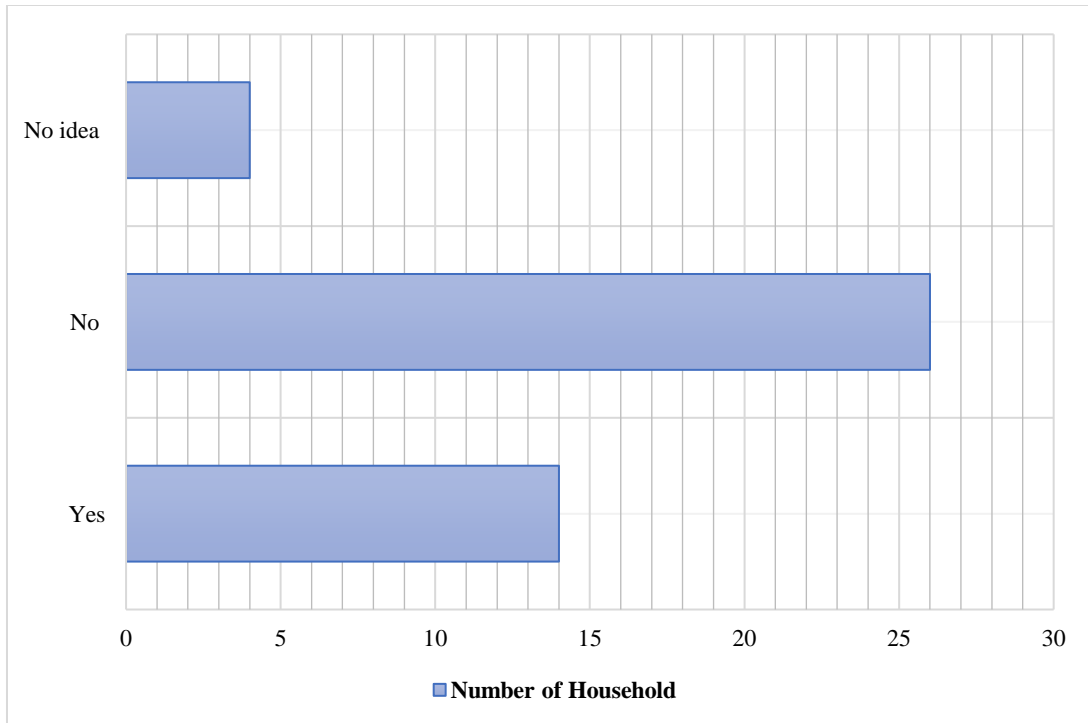


Figure 24: Chart for Changes in Weather Conditions in Chepang Community

Among the respondents who mentioned that they have experienced changes in weather conditions, they mentioned that there are changes in crop yields due to it. Some of them mentioned that some crops planted 20 years ago could no longer be cultivated, and those crops that could not be planted a few decades back are now producing high yields. In general, Chepang people mentioned that warmer weather has favored the plantation of more cash crops like tomatoes, cauliflower, broccoli, and some beans. However, the crops that require a high water supply, such as paddy, are decreased in production due to the drying up of the water resources in the locality. The Chepangs mentioned that they are also changing the crop types for plantations, such as plantations of crops that require less irrigation yet give high yield and cash benefits.

CHAPTER 5: CONCLUSION

The Chepangs are one of the fast-changing indigenous nationalities of Nepal. The Chepang people used to follow shifting cultivation practices before but are no longer practicing them in the surveyed area. The Chepangs mentioned that people are now practicing permanent agriculture. The main reason behind the transition from shifting cultivation to permanent agriculture was the formulation of the Forest Act, which restricted people's use of forest resources and a total ban on hunting and gathering activities. The Chepangs are currently cultivating major staple crops like maize, millet, and paddy. In addition, they cultivate beans, vegetables, tomatoes, and mustards in their farmland these days. The Chepangs are diversifying their income-oriented activities since food crops produced from the cultivation area are insufficient for their yearly supply. They are more engaged in intensifying cash crops like tomatoes and vegetable cultivation for better cash income. Furthermore, the formulation of the government's development initiatives, such as the construction of roads and infrastructures has led to changes in land use. The construction of roads has benefitted local Chepang households as they have access to the market areas for trading their surplus food crops and intensified agricultural products. In addition, the Chepang people's migration trend to nearby city areas for improved health facilities, better education, better job opportunities, and services has left behind the land and houses abandoned in the study area, thus changing the land use pattern in the community. The rapid proliferation of shrubs and bushes in the land that is left fallow and no longer cultivated has increased the forest area recently but decreased the farmland.

The lifestyle and livelihood strategies of the Chepang are changing day by day. There are several factors behind changes in their traditional lifestyle, such as the formulation of new government policies, the modern education system, the influence of non-tribal neighboring communities, and their culture and modernization, which have played an essential role in converting their traditional livelihood. Chepang people have changed their livelihood strategies, occupation, and economic sources due to changes in their basic traditional livelihood strategy, which used to be hunting and gathering. However, after the legal ban on hunting and gathering and restriction on the forest resources, Chepangs had no option but to change their livelihood strategies and agricultural trends to meet their basic requirements and for their survival.

CHAPTER 6: FUTURE SCOPE AND RECOMMENDATIONS

This research mainly focused on the changes in agriculture trends and the livelihood basis of the Chepang people of Taklung, Gorkha. The research did not detail all the possible factors behind these changes. This research focused on the types of crops planted in the present context, providing a glimpse of the land use pattern of the area and their contribution to obtaining food security in the Chepang people's livelihood. This study explained, in general, the income diversification by Chepangs for their livelihood. However, this study did not focus on quantification of the crops, be it food crops or the commercial cash crops, which could elaborate in detail regarding the crop production and their contribution to food security in Chepang households. Also, this study has mentioned the plantation and harvesting time of the crops and cycle of the crops per year. The details governing mainly the weather-related factors behind crop cycles and changes in plantation and harvesting time in the year can be studied. Hence, this study forms the basis for future researchers in the following ways:

1. The study recommends that future researchers focus on the livelihood analysis of the Chepang community of Taklung, Gorkha, based on the quantification of the crops (Staple and commercial) production in their acquired land.
2. The study forms the basis for studying the cropping decisions of the Chepang people based on factors governing changes in plantation and harvesting time of the crops.
3. The study forms the ground to study the correlation between acquired land by each Chepang household and their crop yield and derive the requirement for their income diversification.

REFERENCES

- Aagaard-Hansen, J. and Johansen, M.V., 2008. Research ethics across disciplines. *Anthropology Today*, 24(3), pp.15-19.
- Aase, T. H., 1997. Interpretation of Categories. In Fossåskaret et al. (eds). *Methodological Fieldwork (in Norwegian; Metodisk Feltarbeid)*, pp.23.
- Aase, T.H., Chaudhary, R.P. and Vetaas, O.R., 2010. Farming flexibility and food security under climatic uncertainty: Manang, Nepal Himalaya. *Area*, 42(2), pp.228-238.
- Aase, T.H. and Fossåskaret, E., 2014. Skapte virkeligheter: Om produksjon og tolkning av kvalitative data. *Universitetsforlaget*.
- Acharya, G.P., Tripathi, B.P., Gardner, R.M., Mawdesley, K.J. and McDonald, M.A., 2008. Sustainability of sloping land cultivation systems in the mid-hills of Nepal. *Land Degradation & Development*, 19(5), pp.530-541.
- Adato, M. and Meinzen-Dick, R.S., 2002. Assessing the impact of agricultural research on poverty using the sustainable livelihoods framework. *International Food Policy Research Institute (IFPRI)*.
- Adhikari, L., Hussain, A. and Rasul, G., 2017. Tapping the potential of neglected and underutilized food crops for sustainable nutrition security in the mountains of Pakistan and Nepal. *Sustainability*, 9(2), p.291.
- Adhikari, R., 2023. Life of the Chepang now and then: A Study of Chitwan District. *Nepal Journal of Multidisciplinary Research*, 6(1), pp.22-31.
- Ananda, J. and Herath, G., 2003. Soil erosion in developing countries: a socio-economic appraisal. *Journal of Environmental Management*, 68(4), pp.343-353.

Anderson, E.N., 2001. Tropical forest game conservation. *Conservation Biology*, 15(3), pp.791-792.

Aryal, K.P., 2007. Uncultivated Plants: an option for livelihood support of the people in the mid-hills of Nepal hills of Nepal hills of Nepal (Doctoral dissertation, Master Thesis, Uppsala University, Sweden).

Aryal, K.P., Regmi, B.R., Shrestha, P.K. and Tamang, B.B., 2007. How can research and development help upland farmers improve their farming systems? Experience in participatory technology development. In *Proceedings of the International Conference on Sustainable Sloping Lands and Watershed Management: linking research to strengthen upland policies and practices*. Vientiane, Laos.

Aryal, K., Berg, Å. and Ogle, B., 2009. Uncultivated plants and livelihood support—a case study from the Chepang people of Nepal. *Ethnobotany Research and Applications*, 7, pp.409-422.

Azétsop, J. and Joy, T.R., 2013. Access to nutritious food, socioeconomic individualism, and public health ethics in the USA: a common good approach. *Philosophy, Ethics, and Humanities in Medicine*, 8, pp.1-13.

Bessant, K. C., 2006. A farm household conception of proactivity in Canadian agriculture: motivation, diversification, and livelihood. *Canadian Review of Sociology/Revue canadienne de sociologie*, 43(1), pp.51-72.

Bhattarai, T.R., Dahal, P., Chepang, N.B., BK, K., Chepang, K., Chitrakar, J., Ghimire, G., Adhikari, D., Subba, B. and Chepang, B.B., 2003. Learning to manage and market Chiuri products in Central Nepal. *Way out of the woods: learning how to manage trees and forests*. CPL Press, Newbury, pp.13-52.

Bista, D.R., 1967. People of Nepal. *Ratna Pustak Bhandar, Kathmandu, Nepal*.pp.143.

Bista, D.R., Amgain, L.P. and Shrestha, S., 2013. Food security scenario, challenges, and agronomic research directions of Nepal. *Agronomy Journal of Nepal*, 3, pp. 42-52.

Brown, S. and Kennedy, G., 2005. A case study of cash cropping in Nepal: Poverty alleviation or inequity? *Agriculture and Human Values*, 22, pp.105-116.

Carney, D., 1998. Implementing the sustainable rural livelihoods approach. *Sustainable rural livelihoods: What contribution can we make*, pp.3-23.

CBS. 2011. National Population and Housing Census 2011. Kathmandu: *CBS and NPC*.

CBS. 2021. National Population and Housing Census 2021. Kathmandu. *CBS and NPC*.

Chambers, R. and Conway, G., 1992. Sustainable rural livelihoods: practical concepts for the 21st century (Vol. 296). *Brighton: Institute of Development Studies*.

Charles, C. M., 1995. Introduction to educational research principles and problems of participant observation. *Geografiska Annaler. Series B. Human Geography*, 65(1), pp.39-46.

Chaudhary, S., Wang, Y., Dixit, A.M., Khanal, N.R., Xu, P., Fu, B., Yan, K., Liu, Q., Lu, Y. and Li, M., 2020. A synopsis of farmland abandonment and its driving factors in Nepal. *Land*, 9(3), p.84.

Chepang, D.B., 2002. Appeal. *Chepang Aawaaj (Voice of Chepang)*, Kathmandu:1 (1), pp.1

Chidi, C.L., 2015. Depopulation and rural land abandonment in the hills of Nepal. *SSARSC Int J Geo Science Geo Info*, 3(1), pp.1-7.

Creswell, J.W. and Clark, V.L.P., 2017. Designing and conducting mixed methods research. *Sage publications*.

Dahal, B.M., Nyborg, I., Sitaula, B.K. and Bajracharya, R.M., 2009. Agricultural intensification: food insecurity to income security in a mid-hill watershed of Nepal. *International journal of agricultural sustainability*, 7(4), pp.249-260.

Denzin, N. K., and Lincoln, Y. S., 2008. Collecting and interpreting qualitative materials (Vol. 3): *Sage Publications*.

Dhakal, S., 2000. An anthropological perspective on shifting cultivation: a case study of Khoriya cultivation in the Arun valley of Eastern Nepal. *Occasional paper on Sociology and Anthropology*. 6. pp. 92-111.

- Dhungel, R.M., 1994. Chepang Samudaya Ra Sanskriti (Chepang Community and Culture). Kathmandu: *Sajha Prakashan*.
- Dowling, R., 2005. Power, subjectivity, and ethics in qualitative research. *Qualitative research methods in human geography*, Oxford University Press. pp. 19-29.
- Eisenhart, M., 1991. Conceptual frameworks for research circa 1991: Ideas from a cultural anthropologist; implications for mathematics education rese. *Psychology of Mathematics Education, North America Meeting, October 16-19*.
- Gautam, A.P., Webb, E.L. and Eiumnoh, A., 2002. GIS assessment of land use/land cover changes associated with community forestry implementation in the Middle Hills of Nepal. *Mountain Research and Development*, 22(1), pp.63-69.
- Golafshani, N., 2003. Understanding reliability and validity in qualitative research. *The qualitative report*, 8(4), pp.597-607.
- GoN., 2014. National Population and Housing Census 2011 (Population Projection 2011–2031). Kathmandu, Nepal: *Central Bureau of Statistics*.
- Gurung, G.M., 1995. Chepang culture and economy: at crossroad. *Chepang resources and development*, pp.26-35.
- Gurung, O.P., 1999. Local institutions, cultural practices, and resource management in a mountain village of west Nepal. *Anthropology and Sociology in Nepal: Cultures, Societies, Ecology and Development. Kathmandu, Nepal: SASON*.
- Gurung, G.M., 1990. Economic Modernization in a Chepang village in Nepal. In *Occasional Paper in Sociology and Anthropology*, Vol. 2. TU.
- Harding, S.G., 1986. The science question in feminism. *Cornell University Press*.
- Hobbs, R.J., Higgs, E. and Harris, J.A., 2009. Novel ecosystems: implications for conservation and restoration. *Trends in ecology & evolution*, 24(11), pp.599-605.

Hodgson, B.H., 1848. In the Chepang and Kusunda tribes of Nepal. *Journal of the Asiatic Society of Bengal*, 17(2), pp.650-658.

Hodgson, B.H., 1874. Essays on the languages, literature, and religion of Nepal and Tibet: together with further papers on the geography, ethnology, and commerce of those countries. *Trübner & Company*.

Hussain, A., Rasul, G., Mahapatra, B. and Tuladhar, S., 2016. Household food security in the face of climate change in the Hindu-Kush Himalayan region. *Food Security*, 8, pp.921-937.

Janjati and Dalit Study Center., 2009. The Chepangs: question for survival society, culture, and economy. *Kathmandu, Nepal*.

Jayarathne, T.E. and Stewart, A.J., 1991. *Quantitative and qualitative methods in the social sciences: Current feminist issues and practical strategies*. pp. 85-106.

Kafle, G., 2011. An overview of shifting cultivation concerning Nepal. *International Journal of Biodiversity and Conservation*, 3(5), pp.147-154.

Khatri-Chhetri, A. and Maharjan, K.L., 2006. Food insecurity and coping strategies in rural areas of Nepal. *Journal of International Development and Cooperation*, 12(2), pp.25-45.

Kunwar, R.M., Uprety, Y., Burlakoti, C., Chowdhary, C.L. and Bussmann, R.W., 2009. Indigenous use and ethnopharmacology of medicinal plants in far-west Nepal. *Ethnobotany Research & Applications*, 7. pp 5-28.

Lowe, P., Ward, N., Clark, J. and Seymour, S., 1997. Moralizing the Environment: Countryside Change, Farming and Pollution. *Routledge*.

Magar, D.B.T., 2008. Contribution of non-timber forest products to the livelihood of the Chepang community. *Social Inclusion Research Fund (SIRF), Kathmandu*.

Maharjan, K.L., Piya, L. and Joshi, N.P., 2010. Annual subsistence cycle of the Chepangs in mid-hills of Nepal: An integration of farming and gathering. *Himalayan Journal of Sociology and Anthropology*, 4, pp.105-133.

- Maharjan, A., Kochhar, I., Chitale, V.S., Hussain, A. and Gioli, G., 2020. Understanding rural out-migration and agricultural land use change in the Gandaki Basin, Nepal. *Applied Geography*, 124, pp.102-278.
- Maraseni, T.N., Shivakoti, G.P., Cockfield, G. and Apan, A., 2006. Nepalese non-timber forest products: an analysis of the equitability of profit distribution across a supply chain to India. *Small-scale Forest Economics, Management and Policy*, 5, pp.191-206.
- Mukul, S.A., 2011. Swidden Cultivation among two Chepang Communities in the Central Hill Districts of Nepal: Local Perceptions and factors influencing change. *Master's Thesis submitted at the University of Copenhagen*.
- Mukul, S.A. and Byg, A., 2020. What determines Indigenous Chepang farmers' swidden land-use decisions in the central hill districts of Nepal? *Sustainability*, 12(13), p.5326.
- Nepal, R. and Thapa, G.B., 2009. Determinants of agricultural commercialization and mechanization in the hinterland of a city in Nepal. *Applied Geography*, 29(3), pp.377-389.
- Norman, D.W., 2002. The farming systems approach: A historical perspective. In *Presentation held at the 17th Symposium of the International Farming Systems Association in Lake Buena Vista, Florida, USA*, pp. 17-20.
- Pain, A., Ojha, H.R. and Adhikari, J., 2014. Social inequality and food insecurity in Nepal: Risks and responses. In *New Challenges to Food Security*, Routledge. pp. 221-240.
- Pandit, B.H., 2001. Non-timber forest products on shifting cultivation plots (khoriya): a means of improving the livelihood of Chepang Rural Hill Tribe of Nepal. *Asia-Pacific Journal of Rural Development*, 11(1), pp.1-14.
- Pandit, B.H., 2008. Economics of non-timber forest production promotion and marketing: A case study from Malekhukhola Watershed of Dhading District, Nepal. *The Initiation*, 2(1), pp.145-156.

Paudel, K.P., Tamang, S. and Shrestha, K.K., 2014. Transforming land and livelihood: Analysis of agricultural land abandonment in the Mid Hills of Nepal. *Journal of Forest and Livelihood*, 12(1), pp.11-19.

Piya, L., Maharjan, K.L., Joshi, N.P. and Dangol, D.R., 2011. Collection and marketing of non-timber forest products by the Chepang community in the Chitwan district of Nepal. *The Journal of Agriculture and Environment*, 12, pp.10-21.

Piya, L., Maharjan, K. L. and Joshi, N. P., 2011a. Forest and Food Security of Indigenous People: A Case of Chepangs in Nepal. *Journal of International Development and Cooperation*, 17 (1), pp.113-135.

Piya, L., Maharjan, K. L. and Joshi, N. P. 2011b. Livelihood Strategies of Indigenous Nationalities in Nepal: A Case of Chepangs. *Journal of International Development and Cooperation*, 17 (2), pp.99-114

Pyakuryal, B., Roy, D. and Thapa, Y.B., 2010. Trade liberalization and food security in Nepal. *Food Policy*, 35(1), pp.20-31.

Rai, N.K., 1985. People of the stones, the Chepangs of Central Nepal. (*No Title*).

Rasul, G. and Thapa, G.B., 2006. Financial and economic suitability of agroforestry as an alternative to shifting cultivation: The case of the Chittagong Hill Tracts, Bangladesh. *Agricultural Systems*, 91(1-2), pp.29-50.

Regmi, B.R., Subedi, A., Aryal, K.P. and Tamang, B.B., 2005. Shifting cultivation systems and innovations in Nepal. *Unpublished report. LIBIRD, Pokhara*.

Regmi, B., Aryal, K., Tamang, B. and Shrestha, P., 2006. Home gardens: An opportunity to minimize pressure on the slash and burn system and option for improving the dietary diversity of Chepang households. In-Home Gardens in Nepal: *Proceeding of a workshop on "Enhancing the contribution of the home garden to on-farm management of plant genetic resources and to improve the livelihoods of Nepalese farmers: Lessons learned and policy implications"*, 6-7 August 2004, Pokhara, Nepal. *LI-BIRD, Biodiversity International, and SDC. Local Initiatives for Biodiversity*, 324, pp. 35.

Rijal, A., 2008. A Quantitative Assessment of the Indigenous Plant Use among Two Chepang Communities in the Central Mid-Hills of Nepal. *Ethnobotany research and applications*, 6, pp.395-404.

Rijal, A., 2011. Surviving on Knowledge: Ethnobotany of Chepang community from midhills of Nepal. *Ethnobotany Research and Application*, 9, pp. 181-215.

Ritchie, J. and Lewis, J., 2003. The applications of qualitative methods to social research. *London*, pp.24-46.

Sandelowski, M., 1986. The problem of rigor in qualitative research. *Advances in nursing science*, 8(3), pp.27-37.

School of Ecology, Agriculture and Community Works (SEACOW), 1997. Drawing Lessons from SEACOW's Five Years of Work with Chepangs in Kandrang Valley of Lahor VDC. Northern Chitwan. (*Study Report*). *Kathmandu: SEACOW*.

Scoones, I., 1998. Sustainable rural livelihoods: a framework for analysis. *Brighton: Institute of Development Studies*, 72, pp.1-22.

Sharma, D.P., 2012. Understanding the Chepangs and Shifting Cultivation: A Case Study from Rural Village of Central Nepal. *Dhaulagiri: Journal of Sociology & Anthropology*, 5.

Sharma, L.N., Vetaas, O.R., Chaudhary, R.P. and Måren, I.E., 2014. Pastoral abandonment, shrub proliferation, and landscape changes: a case study from Gorkha, Nepal. *Landscape Research*, 39(1), pp.53-69.

Shrestha, S.R., 2001. The state of uncultivated foods in Nepal biodiversity and uncultivated food plants. In *The proceedings of the regional workshop on uncultivated foods and biodiversity*, September, 24.

Shrestha, D.P., Zinck, J.A. and Van Ranst, E., 2004. Modeling land degradation in the Nepalese Himalaya. *Catena*, 57(2), pp.135-156.

Shrestha, S.L. and Shrestha, N., 2014. Dynamics of population aging in Nepal and the need for action. *Journal of Population Ageing*, 7, pp.81-95.

Silverman, D., 2013. What counts as qualitative research? Some cautionary comments. *Qualitative sociology review*, 9(2), pp.48-55.

Sunam, R.K. and McCarthy, J.F., 2016. Reconsidering the links between poverty, international labor migration, and agrarian change: critical insights from Nepal. *The Journal of Peasant Studies*, 43(1), pp.39-63.

Thapa, K.A., 2013. Do women work and men decide? Gender dimensions of cash cropping in the Middle Hills of Nepal. *Master's thesis, The University of Bergen*.

Thomas, L., 2020. An introduction to simple random sampling. Retrieved December, 4, p.2020

Turner, B. L., and Brush, S. B., 1987. Comparative farming systems: *Guilford Press*.

Tyagi, R., Agrawal, A., Varaprasad, K., 2017. Underutilized and neglected plant species for Food and Nutritional Security in Asia and the Pacific. pp. 68.

Upadhyay, B., 2004. Gender aspects of smallholder irrigation technology: Insights from Nepal. *Journal of Applied Irrigation Science*, 39(2), pp.315-327.

Upreti, B.R. and Adhikari, J., 2006. A case study on marginalized indigenous communities' access to natural resources in Nepal: National laws, policies, and practices. *The preliminary draft was presented at the national thematic dialogue held on 17*.

World Vision Advocacy Forum., 2009. Supporting marginalized ethnic Chepang community through enhanced district Chepang Rights Forum (DCRF) Nepal. Retrieved from <http://www.wvafnepal.org/pdf/tfd.pdf>. pp. 2.

World Bank., 2016. Personal remittances received (% of GDP). Retrieved on 27 March 2017.

Zhang, Y., Li, X. and Song, W., 2014. Determinants of cropland abandonment at the parcel, household, and village levels in mountain areas of China: A multi-level analysis. *Land use policy*, 41, pp.186-192.

Annexes

Questionnaire for the household survey

Checklist for Socio-Economic Household Questionnaire Survey:

Location: Taklung, Gorkha, Nepal

1. Personal Information

Name

Age

Gender.....

Ward no.

No. of family members

Type of family

2. Literacy

Have you ever been to school? Yes? No?

If yes what is your qualification?.....

What about your family members?

Member no.	Age	Qualification
1		
2		
3		
....		
....		
....		
....		

3. Occupation

What do you do for a living?.....

What do the other family members do for a living?

Member no.	Occupation	Place
1		
2		
3		
....		
....		
....		
....		

4. Do you have any other alternative source of income? Yes? No?

If yes. What are the alternative sources?.....

5. Are you engaged in Agriculture? Yes? No?

If yes. How long have you been engaged in the farming?.....

What type of crops do you plant in your field?

Type of the crops	Plantation time	Harvesting time
1		
2		
3		
....		
....		

Have you changed your cultivation pattern in the past 20 years? Yes..... No.....

If yes. What are the changes?

Cultivation Field?		Crop types?		Plantation/Harvesting months?	
Yes	No	Yes	No	Yes	No

a. If you have changed the cultivation Field in past 20 years. What might be the probable reasons behind it?

- 1.....
- 2.....
- 3.....

b. If you have changed the crop types in the past 20 years. What might be the probable reasons behind it?

- 1.....
- 2.....
- 3.....

c. If you have changed the cultivation and harvesting months for the same crops. What might be the probable reason behind it?

- 1.....
- 2.....
- 3.....
6. Do you have cultivation land on your own? Yes..... No.....
 If Yes. How many hecters?.....
 If No. Do you lease the land for cultivation? Yes..... No.....
 How many hecters land do you lease?.....
7. When do you receive the maximum rainfall in the year?.....
8. Have you ever experienced drought? Yes.....No.....
 If yes. Which year and months?.....
9. Have you ever experienced any other kinds of natural hazards?
 If yes. Will you list them?.....
 What might be the reasons behind the occurrence of those natural hazards?
 a.....
 b.....
10. Have you ever recognized any changes in the weather condition in the past 20 years? Yes..... No.....
 If yes. Will you list some of them?
 a.....
 b.....
 c.....
11. Have you ever experienced the crops planted 20 years ago cannot be planted now?
 Yes..... No.....
 If yes. Will you list them?
 a.....
 b.....
 c.....
12. Do you know the difference between food crops and cash crops?

Yes..... No.....

13. Which crops do you prefer for cultivation?
.....What are the reasons behind it?
a.....
b.....
14. How do you summarize your cultivation pattern in last 20 years? Has it changed?
Yes.....No.....
15. Do you know something about Climate change? Yes.....
No.....
Have you ever experienced it? Yes..... No.....

Thank You!

(Thank you for your time and valuable responses)