LAND HOLDING PATTERNS AND FOOD SECURITY IN BARBARDIYA MUNICIPALITY, BARDIYA

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In

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By

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LETTER OF RECOMMENDATION

We certify that this dissertation entitled “LAND HOLDING PATTERNS AND FOOD SECURITY IN BARBARDIYA MUNICIPALITY, BARDIYA" was prepared by Mr. Sunil Rawal under our guidance. We hereby recommend this dissertation for final examination undertaken by the Research Committee of the Faculty of Humanities and Social Sciences, Tribhuvan University, in fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY in SOCIOLOGY

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APPROVAL LETTER

This dissertation entitled "LAND HOLDING PATTERNS AND FOOD SECURITY IN BARBARDIYA MUNICIPALITY, BARDIYA" was submitted by Mr. Sunil Rawal of Humanities and Social Science, Tribhuvan University, in fulfillment the requirements for **Degree of Doctor of Philosophy in Sociology.** I hereby, certify the Research Committee of the Faculty has found the dissertation satisfactory in scope and quality. Therefore, it has been accepted for the degree.

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DECLARATION

I hereby declare that this Ph.D. Dissertation entitled “LAND HOLDING PATTERNS AND FOOD SECURITY IN BARBARDIYA MUNICIPALITY, BARDIYA" is submitted by me to the office of the Dean, Faculty of Humanities and Social Sciences, Tribhuvan University, Nepal is an entirely original work prepared under the supervision and guidance of supervisor Associate. Prof. Dr. Tikaram Gautam and co-supervisor Dr. Pramod Bhatta. I have made due acknowledgements to all ideas and information borrowed from different sources in the course of writing this dissertation. I am solely responsible if any evidence is found against my declaration.

Sunil Rawal

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ABSTRACT

This dissertation examines the association between the land holding patterns and food security in Barbardiya Municipality, Bardiya District. Agriculture constitutes the backbone of the local economy, yet the pattern of land distribution is marked by fragmentation and unequal. The study has three objectives and the first one is to examine landholding patterns of the Barbardiya Municipality, Bardiya; second objective is to describe the food security situation of the study area, and the last one is to analyses the relationship between land holding pattern and food security.

The research was methodologically based on Auguste Comte's positivistic approach. This approach emphasizing that social science can be objectively measured like a natural science to know social realities. A quantitative research design was employed to gather reliable and valid data. A sample size of 361 households were selected randomly from four wards through structured questionnaires. Descriptive statistics were applied to analyses land holding pattern and food security at study area. The livelihood ratio (G-tests) were conducted to determine the relationship between land size, ownership status, and household food security. This method guaranteed that the results were based on observable data and statistical evidence, rather than personal interpretation.

The findings indicate significant disparities in land ownership. Although almost all households possessed agricultural land, 52.6% managed less than 5 *Kattha*, while merely 1.7% owned over 60 *Kattha.* Land fragmentation was prevalent, characterized by limited participation in rental markets and a significant dependence on sharecropping arrangements. Despite 91.7% of land being irrigated, only 13.3% of households had access to year-round irrigation, highlighting infrastructural disparities.

Regarding food security, 82.8% of households indicated sufficiency throughout the year; however, many exhibited a lack of dietary diversity, and 18.6% experienced food security for less than three months. Financial limitations and unstable tenure were identified as significant factors contributing to insufficiency.

The results indicate a significant association between land holding size, access to irrigation, and household food security, with larger irrigated holdings consistently linked to higher levels of sufficiency in comparison to smallholders and landless families. This study enhances the theory of inequality by illustrating how unequal access to productive resources sustains structural inequality. The findings provide Marx's view of ownership as a basis for exploitation and Weber's focus on the interaction of class, status, and power, while also aligning with Maxwell and Wiebe's entitlement-based model of food security. The study supports Gautam’s (2013) statement that land distribution in Nepal is fundamentally connected to social inequalities, demonstrating how these disparities directly influence household-level food security outcomes.

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LIST OF ABBREVIATION

ADB	:	Asian Development Bank
ARD	:	Administrative Reforms Department
CBS	:	Central Bureau of Statistics
DoLRM	:	Department of Land Reform Management
ES	:	Economic Survey
FAO	:	Food and Agriculture Organization
GDP	:	Gross Domestic Product
HoD	:	Head of Department
ICIMOD	:	International Centre for Integrated Mountain Development
IFAD	:	International Find for Agricultural Development
INSEC	:	Informal Sector Service Centre
LLRs	:	Land and Land Resources
MoFSC	:	Ministry of Forest and Soil Conservation
MOF	:	Ministry of Finance
NESAC	:	North Eastern Space Application Centre
NESEC	:	Northeast States Emergency Consortium
NLSS	:	Nepal Living Standards Survey
NLUP	:	National Land Use Policies
NPC	:	National Planning Commission
UN	:	United Nation
WB	:	World Bank

CHAPTER I

INTRODUCTION

1.1 Land Holding and Land Holding Patterns

Landholding refers to the total amount of agricultural land that a household owns. This is not just a statistic it reflects a family's claim to land resources, their potential for sustaining livelihoods, and the economic opportunities they can access in rural settings (Chougule, Hajare & Talekar, 2018).

Landholding is understood as the control or ownership of land throughout academic arena either for agricultural, economic, or theoretical purposes regardless of ownership status. It shows not only the proportions or attribute of land but also the legal and economic scaffold under which the land is administered. Holdings are typically limited by physical factors that make them less useful for farming, especially on marginal lands (Jumaniyazov et al., 2023).

Landholding is connected to holding security, persuading how farmers use and secure land in the analysis of property right. In the situation of land banking, landholdings may be collected and hold into for long-term development rather than immediate use, Highlighting their role as financial assets (Chen et al., Sasu et al., 2022). Landholding model outline how land is owned, allocated, and utilized within a society. They are defined by historical, social, economic, cultural, and political aspects (Pal & Mondal, 1994). The major building block of landholding model are described below:

Landholdings range broadly in size, typically classified as small, medium, or large. This consolidation into larger holdings with a lot of regions experiencing

fragmentation where land is segmented into smaller, less efficient plots. (Sarker et al., 2021). The standard land per household or cultivator varies significantly relying on local farming practices and land availability. Land utilization also varies, enclosed subsistence and commercial farming, pastoral grazing, forestry, and also residential, industrial, or mixed-use function (Mohiuddin et al., 2020 & Keil et al., 2019). These model reflect diverse economic interests and resource decision-making strategies molded by social, environmental, and policy factors (Henderson, 2013; Lambin & Meyfroidt, 2011).

The inheritance and succession practices has significantly influence on the landholding patterns, often leading to fragmentation as land is divided among multiple heirs. Common systems include primogeniture or patrilineal inheritance, where land passes primarily to male heirs, while matrilineal inheritance systems exist but are less widespread (Beban & Martignoni, 2024). The legal and institutional framework governing land involves land laws and reforms aimed at regulating ownership and use, alongside systems for land registration and titling to establish formal ownership (Abubakari et al., 2019). These statutory systems frequently coexist and sometimes conflict with customary practices rooted in local traditions, creating a complex environment for land management and rights enforcement (Demetriou et al., 2013; Lesorogol, 2010).

Socioeconomic factors deeply shape land access and ownership, with class, caste, and ethnic backgrounds often influencing who controls land, while gender disparities typically favor male over female ownership (Levien, 2019). Migration trends contribute to absentee ownership, where landowners live away from their property, affecting land use and management (Davis & Lopez-Carr, 2014). Ownership structures

vary, ranging from individual and joint or communal ownership by clans or cooperatives, to state ownership and absentee landlordism (Wily, 2018).

The holding system encompasses a range of rights, including freehold (full ownership), leasehold or tenancy arrangements like renting or sharecropping, customary holding based on traditional community norms, and informal or undocumented holdings (Joireman, 2024). Land distribution patterns frequently reveal significant inequalities, with land concentrated among elites while many smallholders have minimal holdings, and a notable presence of landlessness persists in many regions (Berry, 2025).

An agricultural holding is defined as a single economic unit engaged in agricultural production, managed under one authority, and includes all land regardless of ownership or legal status as well as livestock and poultry. This definition emphasizes the functional scope of agricultural operations over formal ownership or land size. The person responsible for managing these activities is known as the agricultural holder, who may or may not be the same individual as the household head (National Statistics Office, 2024, p. 155).

National Statistical Office (2024) reports landholdings have become increasingly fragmented over the years in Nepal, shrinking from an average of 1.1 hectares in 1995/96 to just 0.4 hectares in 2022/23. At the same time, the share of very small farms (under 0.5m hectares) has risen from 40.1% to 57.1%, posing challenges for efficient farming and scaling up operations. While paddy remains a key crop, fewer farmers are growing it as they shift towards other crops, such as summer vegetables, whose cultivation patterns suggest changing market demands. Livestock farming has also declined sharply, with cattle-rearing households dropping from 73.5% in 1995/96

to just 37.8% in 2022/23, likely due to urbanization and evolving economic conditions of people.

Landowners and their rights are essential to land holding. It signifies to the pattern of legal estate that persists on a plot of land as freehold, leasehold, mortgage, or tenancy. It is outlined as a method of holding land property that is rooted on social structure and religious view. Land holding is significant for both an individual and community in the form of an investment and capital (Acharya, 2008).

Land holding systems, which include both statutory regulations and customary practices, influence community livelihood strategies (Smith et al., 2017). Statutory systems, established by legal frameworks, define property rights and ownership, whereas customary practices reflect long-standing traditions and social norms governing land use (Feder & Feeny, 1991). These systems interact to influence diverse aspects including land resource access, control, and utilization, shaping individual and community livelihood practices.

Livelihood strategies are inextricably linked to land holding arrangements, as access to land frequently determines opportunities for economic activity and resource utilization. In rural areas, where land is primarily held in customary holding, livelihoods may revolve around subsistence agriculture and communal resource management (Acharya, 2008). In contrast, in urban settings governed by statutory[1] land holding systems, livelihoods can be diverse, including wage labor, entrepreneurship, and property ownership (Dale & McLaughlin, 2000).

[1] Statutory land holding system is a legal system of land use, ownership, and rights governed through government laws, unlike customary systems (Food and Agriculture Organization [FAO], 2002; World Bank, 2003).

The relationship between livelihood practice and land holding underscores the imperative to understand and act on holding to increase socioeconomic development and resource sustainability (Barbier & Hochard, 2018a). However, Policymakers can help achieve livelihood diversification, poverty reduction, and natural resource management in more sustainable forms by enabling inclusive and equitable land holding systems. Land holding interventions must harmonize statutory and customary systems with the accommodation of local socio-cultural values and aspirations of communities to be successful (Bruce & Migot-Adholla, 1993).

The need of interventions highlights the importance of land holding not only for the land sales, land usage, and land rights, but also for the sustainability. The essential of land holding may be recognize not only for the land market, use of land, and right over land, but also as the major determinant of the land tax. As such, land holding systems-the institutions that determine ownership, rights, and use of land-remain a basic problem for human society (Bakrania, 2015).

Land holding is a subset of natural resource holding, which refers to the terms and conditions under which natural resources are held and utilized (Bruce, 1993; Moyo, 1995; Shivji, 1998). The discussion clarifies the idea of holding as a social development that specifies the ties among individual and groups Via which rights and obligations related to land management and usage are recognize. This definition clarifies that holding is a social construction which governs the relationships between people and groups, whereby rights and obligations are established for land use and management. Land holding is referred to as social connection and institutions regulating access to and control over land and natural resources. It is defined as a bundle of rights, special rights to undertake specific acts with land or property (Bruce, 1993).

Land holding is defined as the connection, whether legally or conventionally established, among people, as individuals or groups, with respect to land, according to the Food and Agriculture Organization. Other natural resources such as water, plants, minerals, and crude oil are included are also conceptualized as land. Land holding is an institution or a socially built mechanism that controls or directs people's behaviors. The socially established institutions determine property rights, land allocation rules, and access for use, control, and transfer, as well as responsibilities and limitations. Because it exists at the crossroads of sovereign nations and local governments, the parameters of this institution vary according on the circumstances. Therefore, land holding becomes a multi-dimensional and complicated feature of society (Smith et al., 2017).

Land holding relates to the association between people, as personal or groups, and land, whether legally or traditionally defined. In other words, the land is used here to integrate other Authentic resources such as water and trees. Land holding is an entity, or set of norms created by society to govern conduct. Holding rules define how property rights to land are to be divided among society. They precise how rights to use, control, and transfer land are granted. Land holding systems, define who have the access to what resources for how long and under what restrictions (Bruce & Migot-Adholla, 1993).

Holding research, particularly research relevant to food security divide land into three categories: a household's agricultural holdings (including individually managed plots); common land or common property resources (usually grazing and forest land); and state-reserved land (usually gazetted reserves for the preservation of forest or wildlife resources) (Feder & Feeny, 1991).

Land holding systems are the basis of human organization, in a crucial manner shaping three interconnected domains: social relations (governing who is entitled to or

excluded from land), political institutions (determining how power over assets is distributed), and economic development (facilitating or inhibiting productive land use). They operate through twin mechanisms of enforcement - formal legal systems (including title deeds and judicial processes) and customary settings (including communal consensus and customary means of governance) - which frequently co-exist in a relationship with each other, occasionally mutually strengthening but frequently being in competition with each other, particularly within societies transitioning from traditional to contemporary styles of governance. The viability of any holding system ultimately depends on whether it is able to be supported by cultural legitimacy combined with ensuring secure, enforceable rights that can be adjusted to evolving socioeconomic realities and development needs (Thiesenhusen, 1995).

According to Vinciuerra (2024), land holding is a web of crossing interests. There are some dominant interests: when an independent power (such as a nation or community) has the ability to assign or re-allocate land through expropriation[2], etc. When multiple parties are given separate rights to the identical area of land (e.g., one may have lease rights, similarly another may have a right of way, etc.) is called overlapping interests. Overlapping takes place when numerous parties have a vested interest in the same area of property (e.g., when members of a community share common rights to grazing land, etc.) it becomes complementary interest. When many parties compete for the same interests in the same piece (e.g., when two parties independently claim rights to exclusive use of a parcel of agricultural land); land conflicts emerge consequently occur because of conflicting claims (FAO, 2002) is called competing interests.

[2] A legal process where the government takes private property for public use, with compensation provided to the owner

In rural areas of Nepal, land plays a crucial role in power dynamics and social standing, going beyond its usual associations with agriculture. Its importance can be seen in matters like land use, productivity, credit availability, and conflict resolution. Particularly in degraded regions of low-income nations like Sub-Saharan Africa and South Asia, the rural poor rely heavily on the land. Rural poverty increased between 2000 and 2010 because of land degradation, influenced by economic, social, and environmental factors. Such complexities make it more difficult to alleviate poverty through economic reforms, necessitating all-encompassing investments in the affected areas and populations, including options for migration (Barbier & Hochard 2018). According to Dale and McLaughlin (2000, p. 133-134), land ownership type is frequently classified as follows:

1.1.1 Private

The transfer of rights to a private party, which can be an individual, a married couple, a group of individuals, or a corporate body such as a business corporation or a non-profit organization, is private. For instance, individual families can hold premium rights to residential parcels, agricultural parcels, and particular trees within a community. Other members of the neighborhood may be barred from utilizing these resources missing the permission of those owners who own them.

1.1.2 Communal

A right of commons may exist under a community if each member has the right to use the group's possessions independently. Representative of a community may enjoy the right to pasture cattle on a common pasture.

1.1.3 Open Access

Nobody has any unique rights and no one may be excluded. This normally includes maritime holding, where access to the high seas is largely open to anybody; it may also involve rangelands, woods, and other resources where everyone has free access to them. One significant distinction among open access and communal mechanisms nonmembers of the community are not permitted to use the common spaces.

1.1.4 State

Property rights are delegated to a public sector authority. For example, in certain nations, whether at a central or decentralized level of governance, forest areas may fall within the jurisdiction of the state. Land is necessary for both human existence and the economic well-being of a society. Land holding, ownership, and property laws are therefore essential in contemporary society. Orderly property use and transactions are made possible by procedures like land identification, measurement, and legal protection. Complex economies in industrialized countries are supported by these practices. Despite being separate, cadastral systems, boundary surveys, and land holding are all interconnected. Due to their close relationship, grasping one necessitates grasping the others (Cole & Wilson, 2016).

Land holding is defined informally as the imagined right to hold land rather than the sheer fact of having property (Dekker, 2006). The diverse topography of Nepal, which ranges from its highest peak to the Terai plains, makes it difficult to create a uniform system of land holding. Landlessness and a concentration of land ownership have both been caused by unclear tenant rights and unchecked rents. Factors like the

jamindari system[3], in which unofficial tax collectors tamper with land records, have fueled this trend. The problem of concentrated land ownership is made worse by the rural lending system, which is based on village moneylenders (Regmi, 1961).

Land together with labor and capital, is fundamental components of production, and it is an important input for housing and food production. Consequently, land holding is the cornerstone of agricultural sociology and it provides enormous social advantage. Changes in land holding contribute to economic and social progress. Emerging nations confront considerable population strain on land resources due to small landholdings and declining agricultural land quality (Lefroy et al., 2000). The highlands of Nepal are no exception, as degradation of the natural resource base and declining agricultural yields have created a severe obstacle to rural populations obtaining food security (Keatinge et al., 1999; Paudel, 2001).

Changes in land usage are not free. Transformation of agricultural land and forest to urban development minimize the magnitude of land accessible to food and timber output rate. Soil erosion, salinization, desertification, and other soil degradations produced by intensive agriculture and deforestation reduce the quality of land resources and future agricultural output (Lubowski et al., 2002).

Farmers living on the outskirts of cities face numerous of issues due to urbanization. Conflicts with machinery are a serious problem for farmers who live on the outskirts of towns (Lisansky, 1986). Local farmers frequently participate in production levels such as equipment sharing, land renting, traditional work, and irrigation process setup. If the adjacent farms are developed, these benefits will be gone.

[3] The zamindar system of landholding and revenue collection. The land owned or managed by a zamindar.

Farmers may no longer profit from information sharing as well as official and informal commercial collaboration among nearby farms. The "impermanence syndrome" (a lack of confidence in the stability and long–term profitability of farming) can also be produced by urbanization, which can lead to a reduction in investment in new technology or machinery, or farm idleness (Lopez et al., 1988).

Land use regulation manifests in various ways including zoning, density limits, and direct land use rules. While these strategies effectively regulate, they may also have negative effects on social welfare, such as higher housing costs, smaller homes, and inefficient land use (Cheshire & Sheppard, 2002; Walsh, 2007).

The various agricultural structures are feudal or semi-feudal, marked by absent landowners or corporations, and are subject to market and contemporary influences. Systems like tenancy and sharecropping, that reflect unequal resource allocation, are created because of unequal land distribution. The majority of the land is owned by dominant elites, which creates difficulties as peasants fight for rights to their means of subsistence and land reform to alter the balance of power is often persecuted (Rizal & Yokota, 2006).

Nepal’s total area is 147,181 km square with three major geographical regions: the southern plains (20%), the central foothills (56%), and the northern Himalayas (24%). The Chure Hills, which provide biodiversity and water resources, cover 13% of Nepal and spread across 33 districts. 2.9% of the country is made up of agricultural land, of which 1.5% is used for permanent farming. (World Bank, 2009; Food and Agriculture Organization, 1999; World Bank, 2004).

Poverty rates in the rural population are highest among landless and near-landless agricultural wage laborers (58 percent); small agricultural households (50

percent); the formerly untouchable castes (48 percent); indigenous nationalities (20–61 percent, depending on intra-group differentials); and Muslim community (43 percent) (Nepal & Bohara, 2009). The research aimed to offer insights into potential strategies for improving food security through more inclusive and equitable land holding practices by examining these connections.

Due to insufficient irrigation, inconsistent input access, and shoddy infrastructure, agricultural productivity in Nepal is challenged. Particularly in remote areas, rural farmers lack access to extension services and specialized technology. Poor market connections contribute to urban migration. 30% of farmland is covered with inefficient irrigation systems. Power access increased from 17–20% in 2001 to 82.1% in 2016; that implies a significant improvement (World Bank 2010; World Bank 2016; Sharma, 2001; Silpakar 2008).

According to Thapa (2000), the Nepali agricultural system is divided into privileged and unprivileged. The term "class" has referred to an economic state or the unity of common economic interests. It is the interaction between agricultural classes and social groupings that have particular places in society in terms of land possession and use. Agrarian connection often refers to a association between the parties involved in farming in general, and landlords and tenants in particular. The economic interest of a party is always in a specific piece of land. The pooling of rights and claims to soil products is at the heart of the partnership.

Nepal has a population of 29,164,578 people. Around 33.83% of the people lived in rural regions, with 38.94% earning a living via agriculture, forestry, or fishing. Nepal has 45.59 million cattle and 1.4 million hectares of cultivable land which is 10% of the country’s total land. The Terai region, where half of Nepal's population lives,

makes a significant contribution to agriculture. Cereal crops, particularly maize, wheat, and rice, predominate in agriculture, with maize and wheat being the main crops grown on rain-fed land. Vegetables, legumes, oilseeds, sugar cane, and fruits are all part of the agricultural spectrum, which results in a well-balanced production environment (NPHC, 2021, CBS 2021; NSCA, 2021/22).

1.2 Food Security

Food security has become an increasingly important issue all around the world. More than a billion people are malnourished due to inadequate caloric intake; with at least double that number suffers from micronutrient supply of food. The present research focuses on growing food insecurity monitoring. However, future incidence rates and patterns remain uncertain since measuring food security, remains difficult (Barrett, 2010).

Food security is achieved at individual, household, national, regional, and global levels when all individuals consistently have physical, social, and economic access to adequate, safe, and nutritious food that satisfies their dietary requirements and choices for an active and healthy lifestyle. The four components of food security are availability, access, utilization, and stability. The nutritional dimension is integral to the concept of food security (Grainger, 2009).

The availability, accessibility, and affordability of adequate, secure, and nutritious food for all people is referred to as food security. The Food and Agriculture Organization (FAO) is a global organization that seeks to promote food security and nutrition. One method it accomplishes is by the staging of periodic World Food Summits, when the heads of states and government of FAO member nations meet to

discuss food security challenges and revise the definition of food security. The most recent revision to the concept of food security was in the 2009 World Summit. These summits provide an essential venue for addressing global food security concerns and developing solutions to increase food availability, accessibility, and affordability for all people.

In the 20th century, food security was a significant policy concern. There were two points of view: one favored a more comprehensive view of food systems, while the other advocated increasing food production to combat hunger. The first was primarily agricultural, whereas the second was more all-encompassing. Since the reconstruction following World War II, the UN and governments have worked to fight hunger; the emergence of a complex social security idea posed a challenge to the production-oriented approach (Lang & Barling, 2012)

From its inception, the concept and definition of food security have remained mostly unchanged. The Summit, defines food security as the availability, access, usage, and distribution of food to all people in all seasons and across all communities (Rai, 2014). According to Pinstrup-Anderson (2011), food security is the ability of an individual, household, or nation to obtain sufficient food for nutrition and preference through legal, culturally acceptable means, and it incorporates the concept of risk, that a person who has enough food today but may not have enough tomorrow is not secure.

Food security is achieved at individual, household, national, regional, and global levels when all individuals consistently have physical, social, and economic access to adequate, safe, and nutritious food that satisfies their dietary requirements and choices for an active and healthy lifestyle. The four components of food security are

availability, access, utilization, and stability. People living over the poverty level may be food insecure as well, depending on availability of food (Pinstrup-Anderson, 2011).

Despite the broad concept of food security and insecurity, the circumstances of impoverished and low-income individuals, who predominantly experience insecurity and neglect, remain unaltered. The neoliberal belief that production and growth will ultimately eradicate poverty and hunger globally may not hold true in all instances. Numerous instances illustrate how global market penetration has exacerbated the disparity between the wealthy and the impoverished. Numerous disadvantaged individuals are experiencing more challenges in survival due to global capitalism compared to previous times. Food costs are increasing because of such penetration; the unexpected rise in food prices has become a significant concern in food security (Rai, 2014).

A key concept in determining a household's ability to access enough nourishing food is food security. The FAO's definition emphasizes regular access to a healthy lifestyle. This idea has developed and now includes a number of dimensions. Changing from measuring "inadequate access" to taking into account food availability and consumption, moving from objective to subjective measurements, and concentrating on immediate assessments rather than far-off indicators are some key trends (Weed et al., 2006).

Individuals or families must be regarded as more than mere biological entities or "consumers," and dietary consumption should be perceived as a social endeavour significantly influencing daily living, well-being, social cohesion, and societal participation. Qualitative investigations revealed new characteristics of food insecurity that are not currently recognized to be a component of food insecurity (Bourdieu, 1990).

Enhancing the concept with sociological depth broadens the definition of food insecurity to include not just financially constrained households but also those facing stress, time scarcity, or a psychological disinclination to adopt healthy eating patterns. The food insecurity questionnaire consists of enquiries focused on budget and family, obscuring disparities in food access and varying levels of restriction. Second, even if the food consumption unit is the family, disparities among household members (i.e., adults/children, women/men, active/unemployed) should be investigated (Warde, 2012).

According to Sen (1981), securing access to food rather than just raising food supply is the most important pillar of food security. This perception is supported by the data that show the need and access of food supplies even during periods of famine and starvation. It means those who need food do not have the financial capacity to obtain it (Sen, 1986).

Much of the research on food security focuses on identifying and evaluating household-level drivers of food poverty (Maxwell, 1996). Hence, this study looks at the elements that influence food security. Within the scope of the basic concept of food security, the factors of food security can be divided into three categories: food availability, food access, and food usage. Food supply, may be limited due to insufficient agricultural knowledge, technology, legislation, agricultural inputs, family size, and so on. Economic growth, a lack of work possibilities, a lack of finance, inadequate training, and a lack of understanding, may limit access to food and its use (Hoddinott, 1995).

Food security has multiple dimensions (FAO, 1996), including food availability where the availability of adequate amounts of high-quality food, whether produced

domestically or imported (including food aid); and food access where individuals' access to sufficient resources (entitlements) for obtaining suitable meals for a healthy diet. Entitlements are delineated as the comprehensive array of commodity bundles over which an individual can assert authority, taking into account the legal, economic, political, and social frameworks of their community, including traditional rights to common resources.

Utilization refers to attaining a state of nutritional well-being wherein all physiological needs are met, necessitating the consumption of an adequate diet, sanitation, access to water, and healthcare. It underscores the importance of non-food inputs in achieving food security and stability, whereby a population, household, or individual must consistently have access to adequate food to be deemed food secure. They should not face the threat of food loss owing to unforeseen events (such as economic or climatic disasters) or cyclical phenomena (e.g., seasonal food insecurity). The term "stability" pertains to both the availability and accessibility dimensions of food security.

In this study, the researcher is interested in food security, which can partially be done through home production and partially by increasing access to market-available food. The general concept of food security as deter by, the World Bank emphasizes the need of access: "access by all people at all times to adequate food for an active, healthy life." Although the World Bank's definition has a global scope, it can be utilized at various levels, including national, regional, household, and individual; nonetheless, it is predominantly applied to the household level. This standard is employed here because the home serves as the primary institution through which most individuals obtain access to both land and food, despite conceptual obstacles and diverse forms. A

closer analysis of the linkages between land holding and food security might lead to a better understanding of the family, based on uneven intra-household access to resources and food (World Bank, 1986).

Food security has increasingly been viewed as a component of "livelihood security," which recognizes the relevance of other fundamental requirements besides food (Chambers, 1988; Frankenberger & Coyle, 1993). A stable source of income is both a required and sufficient condition for food security (Maxwell, 1994).

Food access arises from the capacity to cultivate food directly or to trade other goods or services for food. Sen (1981) defines these opportunities in terms of entitlement, which are based on access to resources, manufacturing methods, environmental factors such as weather, and market variables including such as pricing. Access to nonmarket food transfers via traditional family networks or programmatic transfers via governments or non-governmental organizations, as well as access to food reserves acquired from prior food production, purchase, or transfers, are some examples of other sources (Chavas, 1995).

The World Bank's definition of food security is essential as it encompasses two characteristics that clarify food access. Firstly, it requires sufficient access for engagement and well-being. Sufficiency is frequently characterized by caloric consumption relative to physiological requirements during a specified duration. Factors include age, gender, and levels of physical activity, among environmental variables such as climate and the quality of accessible water and healthcare, affect requirements. A thorough comprehension of sufficiency can facilitate the analysis of factors such as cultural acceptability and the subjective criteria that compel impoverished individuals

and households to evaluate the trade-off between diminished consumption and the associated health risks and erosion of the household's non-labor resource base.

The World Bank defines food security as the continuous and sufficient access to food at all times. This provision can be interpreted in at least two manners. Initially, access must be adequate over the long term; in other words, it must be sustainable. A family cannot be considered food secure if it can only satisfy its current nutritional requirements by exhausting or liquidating its resource assets. The capacity of families and people to "produce access to sufficient food while retaining their endowments of resources over a prolonged period" is referred to as sustainability (Wiebe, 1994).

Sufficient access can be interpreted as at all times, indicating that access to food is adequate in all conceivable circumstances during any specified duration, so facilitating an understanding of vulnerability. Vulnerability is characterized by the risk of exposure to shocks, whether related to food access or livelihood and the capacity to manage such shocks. Vulnerability may be transient and foreseeable, chronic, or unpredictable. Variability does not denote uncertainty: households or people may recognize that their access to food will vary seasonally. Instability and lack of transparency in tenure arrangements may render access to resources uncertain (Chambers, 1988).

A comprehensive definition of food security must include all three characteristics of food access: sufficiency, sustainability, and vulnerability. A household is food secure throughout a certain period if there is a reasonable chance of continuous access to sufficient food during that time. While such a definition looks lengthy, it is mandatory to define each of the factors involved so far. Most discussions of food security now include (at least in passing) mention of each of these components.

Food insecurity, on the other hand, is still commonly described as a lack of access to sufficient food, ignoring the concepts of sustainability and vulnerability entirely. In other words, a family is food insecure if it does not have a reasonable expectation of having continuous access to sufficient food for a given time period (World Bank, 1986).

1.3 Relationship between Land and Agriculture

Land access policies necessarily establish economic development effects. The rules on who has access to land, under what conditions, and for how long are powerful policy tools with profound implications. Well-designed, these systems can: (1) raise farm productivity and support more overall income growth, (2) reduce poverty and inequality through guaranteeing fairness of distribution, (3) promote environmental sustainability through sound incentives for land management, and (4) enhance governance without causing resource conflict (Bardhan, 1984).

The material mechanisms of access to land ownership, leasing, or customary rights ultimately determine whether these potential benefits are achieved across society. Secure access to land and complementing inputs in an environment that allows for profitable usage can be potent tool for poverty alleviation. The family farm, with its labor cost advantage when there are transaction costs on labor markets and insufficient incentives to hired labor, can be especially beneficial in this regard (Bardhan, 1984).

The existence of an inverse relationship between farm size and total factor productivity, resulting from the family farm's labor cost advantage, has been cited as an empirical regularity to justify redistributive land reforms toward a family farm system. Even having access to a modest plot of land can provide stability in the face of food and labor market threats. Women's control of property can be a source of strength,

allowing them to consolidate their decision-making authority over household expenditures, from which children frequently benefit (Agrawal, 1994).

Land as a means of production; Land is a valuable resource that can be used to produce food and other commodities. The ownership and control of land can have a significant impact on social relations, as those who own land often have more power and privilege than those who do not. For instance, in many parts of the world, land ownership is concentrated in the hands of a small number of wealthy landowners. This can lead to inequality in access to resources, as well as social conflict over land use (Carolan, 2021).

Land as a symbol of identity; Land is considered as an icon of identity and belonging in numerous cultures. People feel a strong connection to the land where they were born or raised, and this connection can be a source of strength and resilience. Especially in many indigenous cultures, land is seen as sacred and is closely tied to people's sense of identity. This can make it difficult for indigenous people to be displaced from their land, even if it is for development or economic growth (Warde et al., 2007).

Land as a site of conflict the control of land can cause conflict, as different groups start compete access to land. That can lead to conflict over land use, resource extraction, and environmental degradation. In many parts of the world, there has been conflict over land use between agriculturalists and conservationists. Agriculturalists use land for farming, while conservationists may want to protect land from development. This can lead to conflict over how land is managed, as well as environmental degradation (Clover, 2010).

1.4 Land Holding versus Ownership

Binswanger et al. (1993) examine the reasons for the preference of sharecropping over alternatives including wage labor, fixed rent agreements, and property sales in the context of land ownership concentration. A fascinating topic related to this matter is the rationale behind landowners opting for landholding instead of direct production or property sale.

They have claim that sharecropping, despite its difficulties, can be an advantageous alternative to hiring employees or paying fixed rent, particularly in areas where access to credit is restricted and work supervision is a concern. Land sales are problematic as well. Small farmers struggle to purchase land because they lack the funds and find it difficult to obtain loans due to the risk of crop failure in the absence of insurance. Government assistance is limited to large landowners, making them less inclined to sell off undeveloped land. Due to an increase in value caused by this support, small farmers cannot afford to purchase land. Those without land can use it while saving money to purchase it later by renting (Ünal, 2012).

According to Birthal and Singh (1994), sharecrop agreements rather than fixed-rent tenancy are more common in less developed countries. According to Yokoyama (1995) within a region, poorer farmers with less access to the official sector prefer traditional crop sharing agreements. Sawant (1991) has concluded that there is a significant degree of covert tenancy in India based on anomalies in official data sources. Nepalese villages manage to produce enough food for their consumption. The majority of the respondents who were mostly from the Brahmin/Chhetri group worked in agriculture. Less people worked in agriculture as they became more educated.

Consequently, there were more people engaged in farming with little or no education. The study discovered that families that had to grow their own food did not have enough land and access to irrigation. With more land and better irrigation, the Brahmin/Chhetri community and the Tarai people were able to grow more crops. The Tarai region had extra food, which helped offset the hills and mountain region's food shortage (Joshi & Maharjan, 2007). The incidence of chronic food insecurity and the poverty gap were largest among female-headed households, residents of mountainous regions, occupational castes, daily wage laborers, and small landholders. Education was allocated the greatest priority in cash income expenditure, followed by food goods and agricultural promotion. The expenditure patterns indicate a favorable trend towards food self-sufficiency and, ultimately, food security, contingent upon improved off-farm employment possibilities and enhanced markets for both agricultural products and key inputs.

1.5 Sociological Perspective on Land Holding Patterns and Food Security

Land Holding refers to terms upon which people enter and take up land. The behavior of individuals as far as land is a source of income and property is central to its social subject. Conditions of holding must be assessed regarding the extent to which they respond to needs of people for some standards or ends which they want and anticipate the system of holding to assist them in achieving. Land holding issues cannot be discussed without invoking a system of social values, a system of beliefs concerning ethical standards people have and use to guide their conduct. A society's institutions as well as people's and groups' aims reflect these social ideals (Schickele, 1952).

Conflicts over land ownership have influenced the relationships between aristocrats, financiers, and businesspeople throughout capitalism's history. Complex

agreements between traditional farming and the global market have been the consequence of this long process. Both Marxists and economists have emphasized emphasis on sharing and using land, whereas communist movements have frequently opposed landowners. Capitalism is shaped by the history of land ownership, with capitalist class control playing a key role. The transformation of agriculture under capitalism turns land into capital and shapes the system (Marx, 2000).

The Marxists were unable to identify the true core of this petty-bourgeois ideology because they failed to recognize that their task was to introduce the historical element into the examination of the question and to replace the petty bourgeois point of view (abstract ideas of equalization, justice, etc.) with the proletariat's point of view on the true roots of the struggle against private land ownership in developing capitalist society. Disapproval of private landownership, according to the Narodnik, is a rejection of capitalism. That is incorrect. The rejection of private land ownership represents the desires for the purest form of capitalism. The minds of Marxists should be resurrected and Marx's lost works should be recalled, the criticism of private landownership in the context of the capitalist economy needs to be re-examined (Lelin, 1905). Lenin classified population in terms of rise of land and holding status.

While the imperative of the past for small-scale landholding is recognized, Marxist criticism must still critically evaluate its limits. Full freedom in landholding cannot be secured without full commodification - that is, unfettered right to buy and sell property. Such market dependence inevitably reproduces capitalist relations in a self-contradictory way negating the very notion of "free" smallholders. Private land ownership necessitates the expenditure of cash on land acquisition. "One of the distinctive problems of small-scale agriculture, if it is united with free landownership,

emerges from the cultivator's investing money in the acquisition of land," (Marx 342, III, 2) "Capital is expended on the price of land, and this capital is withdrawn from agriculture" (Lelin, 1905).

Thomas Malthus (1806) was the first to raise the issue of food shortage, arguing that the world's population will soon outstrip the planet's ability to feed it. "The population power is infinitely higher than the earth's capacity to supply man's livelihood." The varying rates at which people and food grow. The necessary impacts of these various increase ratios. Oscillation caused by them in the social conditions of the lowest classes. Reasons why this oscillation hasn't been noticed as much as one may think. The general argument of the Essay is based on three assertions. The many states in which mankind has been known to exist have been recommended to be investigated in light of these three claims.

According to Malthus (1986), the world population rose exponentially (1, 2, 4, 8, 32, 64...) while agricultural productivity grew arithmetically (1, 2, 3, 4, 5, 6, 7...), making it inevitable that the earth will be unable to feed its entire people at some point. Despite including variables such as wars and famines in his research, Malthus could not conceive of other important variables that emerged in later decades, such as birth control techniques and technological advances applied to agriculture and food production, proving his doomsday theory false over time (Walter, 2019).

Theories of dependency and world systems; As food security is a global phenomenon, international variables impacting hunger must be considered (McMichael, 1994). Dependency and world system theories explore the connections between individual nations and the global food order in this way. Food security as an international phenomenon has negative repercussions, according to dependency and

world system theorists. In this context, it is important to analyze a country's social change patterns and foe achieving the goal of development pertaining to food security.

1.5.1 Structural Functional Perspective

Structural functionalism understands society as an interconnected system, much like an organism, where institutions such as land holding provide a stabilizing role through regulating access to resources and maintaining social order. Land holding pattern function in this case to provide food through defining property rights, stimulating agricultural investment, and preventing land use conflicts hence maintaining equilibrium in society. This strategy, however, has been criticized for simplifying too much the processes of land disputes, skewed access, and environmental degradation, which are largely disrupting food production. Ritzer (1990) argue that structural functionalism neglects power contests e.g., land grabbing, small holder displacement, or policy failure that underpin food insecurity.

Parsons (2017) is a structural functionalism defender as a viable approach to analysis of societal systems, including land holding and food security. He argues that the theory's nuance allows examination of how institutions such as land ownership systems function to meet societal needs. Land holding institutions are, in this perspective, stabilizing forces that regulate resource access, maintain agricultural productivity, and theoretically ensure food security. Parsons draws attention to the utility of the theory to policy development, suggesting that by analyzing how land holding pattern contribute to (or destabilize) social equilibrium, policymakers can develop interventions that mitigate food insecurity. But critics contend that this threatens to underestimate power imbalances such as land dispossession or unequal

access that underlie hunger and that functionalist analysis must thus be supplemented by conflict-oriented approaches.

Durkheim highlights the mechanical and organic solidarity of society and emphasizes how the division of labor shapes societies. Simpler societies are characterized by mechanical solidarity, where people share similar tasks and values, which is characterized by specialization and diverse values. Numerous connections between this idea and current land holding practices exist. Social homogeneity or heterogeneity is influenced by the distribution of land ownership, and specialization is influenced by land use restrictions. We can create effective policies for a variety of societies by better understanding the relationship between land holding, social dynamics, and food security (Durkheim, 1947).

The areas of land holding pattern and food security can be connected to Parsons' support for the use of structural functionalism in comprehending and resolving societal issues. In the same way he emphasizes the theory's ability to account for complexities, such as conflict and change, He also shows how it can be used to examine the complex dynamics of land ownership, distribution, and its effects on food security. Furthermore, given Parsons' emphasis on utilizing the theory for efficient policy development could help create plans that guarantee equitable land distribution, encourage sustainable farming methods, and improve the results for diverse communities' food security (Parsons, 2017).

Merton talks about Durkheim's theory of the division of labor, emphasizing mechanical and organic solidarity. He claims that the practices of land holding and food security are related to this theory. Similar to organic solidarity, land holding practices that promote specialization and innovation tend to improve food security by increasing

agricultural productivity. Better food security is also a result of efficient land holding, land use, secure land holding, and equitable land distribution. Understanding these connections can inform policies and interventions to address the challenges of food security in various societies, even though the relationship is complex and context-dependent (Merton, 1934).

Land holding pattern and food security can be analyzed using the Davis-Moore thesis, it implies that unequal land distribution determined by resources and skills might improve agricultural productivity. Nevertheless, this notion demands close examination. Due to access issues, marginalized groups may experience food insecurity as a result of unequal land ownership. Besides, factors other than qualifications, like social and economic conditions, can affect the availability of resources. Even though the thesis makes a connection between productivity and land holding, it must be balanced by taking into account potential harm to marginalized communities and the intricate relationship between resources and qualifications (Davis & Moore, 1945).

1.5.2 Conflict Perspective through the Lens of Marxism

The history of human societies, according to Karl Marx, is the tale of how individuals interact in their quest to make a livelihood. "The earliest historical deed is the construction of material life," he stated. This is, without a doubt, a historical act, a basic prerequisite of all history (Bottomore, 1964).

Conflict sociology is a theoretical framework through which to analyze how power struggles, inequality, and competition between groups determine societies and drive social transformation. Contrary to stability or consensus practices, conflict sociology emphasizes the dynamic character habitually retarded by conflict in social relationships. Collins and Sanderson's book provides a comprehensive overview,

discussing the history of conflict sociology, key concepts such as power, conflict, social change, and inequality, as well as its applications to war, gender, race, and economics. This point of view contributes to a better understanding of societal change, power dynamics, and inequality by demonstrating how conflicts and struggles shape societies and drive transformation (Collins & Sanderson, 2015).

Karl Marx's Capital (1861-1879) explores the mode of production within capitalist society, focusing on productive forces and their ability to control nature. This analysis encompasses technological knowledge, tools, machinery, labor, and technology. Marx's framework addresses land holding pattern, food security, and production relations, highlighting land holding practices, landowner-agricultural worker dynamics, and worker-to-worker relationships as well. These interplays shape the trajectory and pace of productive forces' development (Marx, 1867).

Food is a paradox in modern capitalism, with discussions on food economics and sociology gaining prominence. Marx focuses on the Victorian working class's need for nutritious food and their health. He has been influenced by the research of John Simon, who pioneered important health studies in the United Kingdom. Despite abundant food, hunger has remained a major concern worldwide (Foster, 2016).

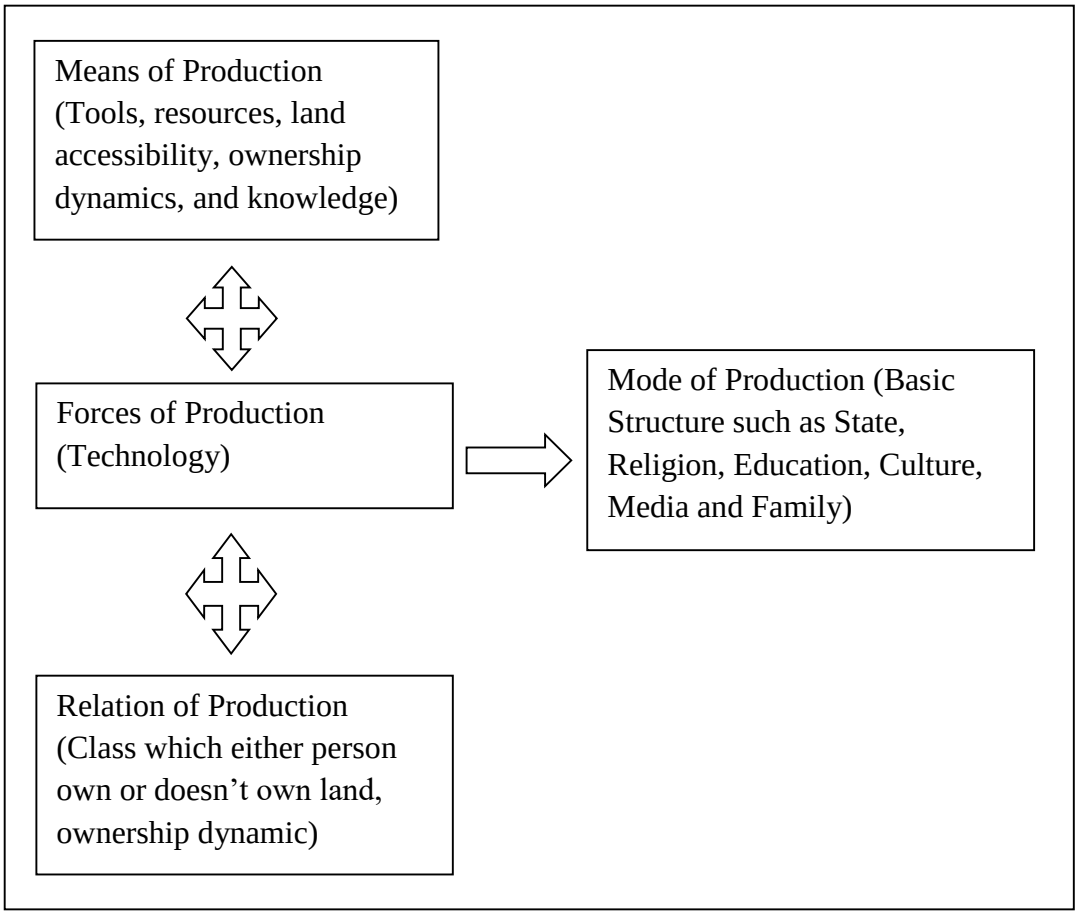
From the table 1.1 the mode of production is influenced by the means of production, production relations, and force, all of which are interconnected and have an impact on land holding practices and food security. Tools, resources, land accessibility, ownership dynamics, and knowledge are examples of production means. Production relations involve ownership dynamics, which affect land distribution and lead to food production inequalities. Food security outcomes are influenced by historical forces.

Land holding disparities caused by historical forces have a direct impact on the ability of both individuals' and communities' ability to ensure food security.

Weber realized societal conflict, focusing on the sources of class, status, and power. For him, conflict has the potential to bring about positive change by aligning with land holding practices and food security. Power dynamics lead to resource access conflicts because of unequal land ownership and status dynamics. Land holding disputes can spark reform movements, improving access and security. Weber's viewpoint emphasizes how power and status disparities can drive transformative shifts in land holding practices, thereby improving food security (Weber, 1987).

Figure 1.1

Formation of Mode of Production through Means, Force and Relation of Production



Source: Foster, 2016

The conflict perspective, which focuses on power struggles and social conflict in society, aligns with C. Wright Mills' perspective on power and inequality. Examining land holding practices and food security through this lens reveals how the concentration of power within a small elite class can influence land resource distribution and food access, perpetuating social inequalities and challenging democratic principles (Mills, 2018).

Sociologist Ralf Dahrendorf believes that conflict is not inherently negative, as it can serve as a catalyst for positive social change and the resolution of societal issues. He supports the conflict perspective in sociology, which holds that societal progress is frequently the result of tensions and struggles between different groups with varying interests and power dynamics. Conflict is linked to land holding practices and food security because it can result in positive outcomes and policy changes that promote land redistribution and food security. Conflict, when managed constructively, can be a positive change mechanism, raising awareness of inequalities and driving reforms aimed at creating more just and equitable societies (Dahrendorf, 2022).

Conflict theory has been expertly applied by feminist scholars to dissect the constructed nature of gender and its reinforcement of power imbalances between men and women. This agreement with the conflict viewpoint highlights the transformative potential of societal clashes. When applied to land holding, feminists employing conflict theory highlight how uneven land distribution disproportionately affects women because of patriarchal norms, advocating for equitable change through policy changes. Similarly, they emphasize how gendered roles and economic disparities marginalize women's contributions in food security, advocating for gender-sensitive policies. Finally, using conflict theory to drive reforms toward a more just and balanced

society for all genders, this approach uncovers and challenges systemic gender inequalities (Duerst-Lahti & Kelly, 1995).

1.5.3 Symbolic Interaction Theory

The core ideas of symbolic interactionism can shed light on the complex relationship between land holding practices and food security. Individuals attribute meaning to land ownership and use through symbolic interactions and shape their perceptions of property rights and resource access. These interactions have an impact on how communities form group identities around land, which affects their ability to secure food resources. Symbolic interactionism can help to understand the socio-cultural dynamics that affect food security outcomes by investigating how people interpret land ownership and holding, providing insights into how communities navigate challenges related to land use, resource distribution, and, ultimately, food availability (Reynolds, & Herman-Kinney, 2003).

Symbolic interactionism examines social meaning and interaction constructing land holding and food security (Kuhn, 1964). Land is economically valued but also perceived as shared heritage by indigenous peoples and a commodity by governments. Unequal access on the basis of gendered positions (men as "owners," women as "laborers") affects food security. Farmers resist policy through subtle actions when meanings clash. Terms like "productive land use" carry loaded meanings that impact policy efficacy. In revealing micro-level processes, this approach must be combined with structural analysis to address structural inequalities. Cultural meanings and power relations ultimately determine how land and food systems function.

According to Kuhn (1964), Land holding practices have symbolic and meaningful dimensions while linking it with that influence people's identities and roles

in communities. Social interactions significantly impact on how land ownership and access are perceived, which directly effect on resource availability and, food security. Through symbolic interaction, people construct and negotiate their positions in systems of land holding, influencing key food system attributes like production, distribution, and accessibility. Symbolic interactions help to investigate how individuals navigate their positions and connections within land holding systems, influencing factors such as food production, distribution, and accessibility. This viewpoint illuminates the interplay between social interactions, concepts of land, property rights, and resource distribution, deepening the understanding of how land holding pattern and food security outcomes are intertwined (Kuhn, 1964).

Mead's symbolic interactionism framework aids in the investigation of the relationship between land holding practices and food security. It emphasizes people's active role in shaping reality through interactions and assigning meaning to symbols. This approach looks into communities negotiate roles, establish identities, and interpret land-related symbols, that which affect food access and resource allocation (Mead, 1934).

1.5.4 Theory of Inequality

The Theory of Inequality investigates the causes, structures, and effects of differences in resources, opportunities, and advantages between social groups. Economic inequality, which is frequently rooted in unequal distribution of income and resources, remains a major concern. Karl Marx links these inequities to class strife and the bourgeoisie's exploitation of the working class, but Max Weber broadens the theory by include status and power components. According to Weber's thesis, social inequality is not just economic but also related to social reputation and political power, which impact people' access to resources and opportunities (Marx, 1867; Weber, 1922).

Social and cultural disparities shape land ownership and food security. Bourdieu's (1986) illustrates the role of education and social advantage in enabling elites to gain land rights, marginal groups having insecure access while focusing cultural capital. Feminist theory illustrates how patriarchal systems disenfranchise women from land ownership, restricting their farm performance and household food security. These interlinking disparities like economic, cultural and gendered recreate food insecurity by excluding vulnerable groups from accessing land resources. Sustainable solutions need to tackle formal land law as much as embedded social bias (Beauvoir, 1949).

Gramsci's (1971) unveil how presiding groups keep control over land holding systems by using political and ideological strength to shape laws, norms, and institutions in their favor for instance, elites plan land-titling systems that validate their ownership while relieve small farmers, while media and education order ideologically justify agro-industrial extension as "progress" to marginalize peasant land rightness. This disparity power relationship preserves land inequality, further worsen food insecurity among the disadvantage group, though counter-hegemonic strength like Via Campanian resist such influence through encouraging land reform and food sovereignty.

Furthermore, Bourdieu's idea of symbolic violence emphasizes the significance of cultural norms and ideologies in legitimizing and maintaining social inequality. Defining inequality as a natural or unchanging state helps dominant groups maintain their power and privilege. Amartya Sen's capacity approach takes a broader perspective, focusing on disparity in capabilities—what people can do or be—rather than just money

or material resources. This viewpoint focuses attention to people's genuine prospects for well-being and independence (Sen, 1999).

Inequality in Nepal is deeply rooted in the class structure and agrarian relations inherited from the feudal past, where land ownership has been a primary determinant of wealth and power. The commodification of land and capitalist modes of production exacerbate disparities, marginalizing smallholder farmers and landless laborers such as land creates a cycle of poverty, limiting opportunities for upward mobility and perpetuating food insecurity, as insecure holding arrangement (e.g., sharecropping) often leave tenants with limited control over agricultural decisions, reducing productivity and their ability to achieve food sufficiency. Addressing this inequality, he argues, requires land reforms and policies that empower marginalized communities and ensure equitable distribution (Mishra, 2006).

Pandey (2010) underlines the relevance of class analysis in understanding inequality and criticizes Nepal's development narrative for ignoring the economic factors that drive social exclusion. Nepal's land holding arrangements demonstrate class-based inequities, with upper-class ownership and control of land concentrated, leaving tenant farmers and landless people vulnerable. Insecure holding systems, such as sharecropping, foster exploitation and low agricultural output, compromising food security for underprivileged communities. Pandey contends that inclusive development must address structural disparities by linking land reform and secure holding to economic empowerment and increased food security. This viewpoint is consistent with inequality theory in that it emphasizes how unequal resource allocation reinforces class hierarchies and systematic exclusion, emphasizing the importance of land reform measures in ensuring equitable access and sustainable livelihoods.

In the study on inequality, Gautam (2013) examines the historical underpinnings of land-based inequities in Nepal, stressing land ownership as a fundamental factor of socioeconomic rank. He describes how feudal land arrangements traditionally privileged upper-caste groups like Brahmins and Chhetris while marginalizing Dalits and indigenous peoples, resulting in uneven land allocation and economic vulnerability. Using Amartya Sen's capacity perspective, Gautam contends that limiting land access limits possibilities and impedes underprivileged populations' engagement in education, healthcare, and politics. He favors structural reforms, such as equitable land redistribution, to promote inclusive growth and social justice.

1.5 Research Problem

The relationship between land holding pattern and food security is an important area of research, in the spectrum of global endeavors to combat food insecurity and promote sustainable development. Despite the widely acknowledged much importance of land holding dynamics in shaping food security outcomes, it is still mandatory for a thorough understanding of the complex interplay between socio-cultural factors, institutional arrangements, and their impact on food security (Moyo 1989; Shivji et al., 1988). The research has ignored the multifaceted nature of land holding pattern and fails to adequately investigate the mediating effects of variables such as land access, land distribution, and land management practices on the relationship between land holding practice and food security (Maxwell & Wiebe, 1998).

Land holding pattern play a vital role in determining food security, but insecure property rights and unequal access to land continue to exacerbate hunger and poverty, particularly in rural countries (Sen, 1981). Concentrating land ownership in the hands of a small number of people reduces the ability of smallholder farmers to produce food

in a sustainable manner (Borras Jr., 2010). In many developing countries, land grabs by corporate and foreign investors have disrupted local food systems, resulting in lower agricultural output and increased food insecurity (Edelman, 2013).

The shift from subsistence farming to commercial agriculture due to world food regimes has relegated rural populations to the margins further (McMichael, 2013a). Women and indigenous peoples are disproportionately denied rights to land ownership and hence their food sovereignty (Li, 2014). Land reforms have been implemented in some areas but their effectiveness in enhancing food security is controversial (Hall, 2011). The growth of export agriculture and biofuels has also de-agrarialized land for use in indigenous conventional food production, leading to greater dependency on volatile global markets (Patel, 2008).

While there has been a wide body of research on land holding and agrarian transformation, the understanding of how various models of land governance-communal, private, or state-led-affect long-term food security is still lacking (Bernstein, 2016). In addition, peasant movements' contributions to fighting land dispossession and promoting food sovereignty need to be studied from a sociological perspective (van der Ploeg, 2008). It is important to address these areas for formulating policies that promote fair land distribution and food-secure systems.

The relationship between land holding pattern and food security remains an urgent, though unresolved, argument in agrarian societies, with empirical evidence highlighting how inequitable land distribution and insecure property rights entrench hunger and malnourishment. Empirical evidence indicates that land holding insecurity discouraging long-term agricultural investment leads to low productivity and food

shortages, particularly among smallholder farmers in South Asia and sub-Saharan Africa (Deininger & Jin, 2006; Doss et al., 2015).

The land grabbing trend-in which foreign investors and companies have been acquiring large tracts of fertile land-has also resulted in destabilizing local food systems, displacing rural communities, and converting subsistence farms into export monocultures (Cotula et al., 2009; Borras & Franco, 2012). This trend aggravates food insecurity by reducing land use for domestic food production and increasing reliance on volatile global markets (McMichael, 2013b).

Inequalities in land holding between genders also compound the problem, with women-many of whom are small food producers-facing legal and cultural barriers to land access, undermining household nutrition and agricultural resilience (Agarwal, 2014; FAO, 2011). While land reform initiatives in countries like South Africa and Brazil have sought to remedy historic imbalances, their success remains patchy, with many beneficiaries struggling with bureaucratic hurdles and lack of state support (Hall & Kepe, 2017; Wolford, 2010). Further, the financialization of land has rendered agriculture a speculative commodity, prioritizing profit over food affordability and widening socioeconomic disparities (Fairbairn, 2014).

There are important gaps concerning understanding the long-term impacts of land holding reforms on intergenerational food security, the relative performance of communalized versus privatized land systems, and the gender dimensions of land access (Zoomers, 2010; Martínez-Torres & Rosset, 2017). Addressing these gaps is essential for designing equitable land governance policies that enhance food sovereignty and sustainable agriculture.

Despite carrying out extensive research on land holding pattern and food security, there are significant gaps in understanding the complex relationship between land governance, socio-economic conditions, and food systems. One such key deficiency is the urban dimension of food security and land holding, since the majority of studies focus on rural areas while neglecting the impact of informal settlements, land zoning laws, and urban agriculture on the urban poor's access to food (Hovorka et al., 2009; Zezza & Tasciotti, 2010). One of the less-researched areas is the intersection of land holding and climate change, such as the impact of customary and formal systems of holding on adaptive agriculture practice and climate-driven displacement resilience (Nyantakyi-Frimpong & Bezner Kerr, 2017). While rights to indigenous lands are becoming more widely recognized, there is very little comparative research into how legally recognized indigenous territories influence agro-ecological practice and food sovereignty compared to state-owned territories (Altieri & Toledo, 2011).

New themes such as digital land administration (e.g., block-chain titling) and their impact on smallholder farmers are not well-explored despite the potential to empower or exclude disadvantaged groups (Sjaastad & Cousins, 2023). Furthermore, intergenerational transitions also present a growing challenge with the specter of aging farmers and youth land access crises endangering future agricultural production, but there is limited research on how inheritance law and land fragmentation affect long-term food security (White, 2020). In conflict-affected regions, land restitution programs are a key factor in restoration of food systems, yet longitudinal studies on post-war land reform (as in Colombia or Rwanda) are scarce (Unruh & Williams, 2013).

Another debate is on whether land holding pattern should be corporate or collective and with what implications for nutrition. While privatization and communal

systems are typically framed as opposites, there is limited empirical evidence to contrast their impacts on food sovereignty and dietary diversity (Scoones et al., 2018). Finally, policy implementation shortfalls such as corruption and weak enforcement undermine land reforms, but few studies systematically explore why progressive legislation (e.g., Ethiopia's land certification) sometimes makes inequality worse (Holden & Ghebru, 2016). Closing these gaps is vital in developing equitable and sustainable land governance frameworks to enhance global food security.

The development and application of analytical models that capture the complex dynamics at work are critical component of bridging this research gap. The Holding Analytical Model of Food Security developed by Moyo (1989) and based on the research of Shivji et al. (1988), provides a framework for understanding how land holding practices influence sustainable development and food security outcomes. The analytical model by Maxwell and Wiebe (1998) establishes a causal relationship between key factors such as land, production, income, consumption, and nutritional status. Despite the insights provided by these models, empirical research is still required to validate and investigate the complex relationships between land holding pattern and food security.

This study has aimed to fill a gap by exploring the relationship between land holding pattern and food security, with an emphasis on how socio-cultural factors and institutional arrangements influence this relationship. This study has also aimed to provide a comprehensive understanding of how land holding pattern influence food security outcomes by examining the mediating effects of access to land, land distribution, and land management practices. This study has been generating valuable insights and inform policy interventions aimed at promoting equitable and sustainable

land holding practices to improve global food security via empirical inquiry guided by theoretical frameworks as proposed by Moyo (1989) and Maxwell and Wiebe (1998).

The research has formulated specific hypotheses and research questions that are empirically tested, based on this theoretical framework. The surveys shed light on the relationships between various food security indicators across various communities and various land holding arrangements. This approach has been used to give a quantitative understanding of the complex relationship between outcomes for food security and land holding practices. Food security is influenced by land holding patterns both directly and indirectly; individuals who enhance food security via personal food production require secure arable land holdings, while those who contribute through alternative economic activities typically necessitate secure land holdings for their operations, whether for themselves or for those overseeing the activities that underpin their livelihoods and food security.

1.6 Research Questions

Through the use of research questions that are linked to the description of the problem, the studies investigate the relationship between the patterns of land holding and the level of food sufficiency, which ultimately results in food security. Questions pertaining to research were posed in this study.

(I) What is the major practices of land holding pattern in the Barbardiya municipality of Bardiya district?

(II) How do household of the Barbardiya municipality practice food management strategies?

(III) How do land holding patterns associated with food security in Barbardiya municipality?

1.7 Objectives

The specific objectives of the study were assessing the effect of land holding patterns on food sufficiency that leads to food security.

(I) To examine the status of land holding patterns in Barbardiya municipality.

(II) To describe the food security situation in Barbardiya municipality.

(III) To explain the association between land holding patterns on food security in Barbardiya municipality.

Hypothesis Setting

Null Hypothesis (H_0): There is no significant association between land holding pattern and food security.

Alternative Hypothesis (H_1): There is a significant association between land holding pattern and food security.

1.8 Significance of the Study

The importance of this research on land holding pattern and food security stems from the fact that land holding and food security are inextricably intertwined and affect livelihoods of millions of people worldwide. This researcher helps to enhance land holding systems and policies to better support food security by better understanding the interconnectedness between land holding patterns and food security.

A land holding patterns and food security research demonstrate that some land holding patterns, such as land grabbing or forceful evictions, have a detrimental influence on food security by limiting access to land for small farmers and other rural communities. The data have been used to argue for policy reforms that ‘safeguard

disadvantaged groups' land rights and guarantee that land is used in ways that promote food security. Likewise, the research of this type emphasize the benefits of secure land holding patterns for food security, such as increased agricultural output and income, that are used to argue for land holding policies from which smallholder farmers and rural communities can benefit.

Overall, this study has given insights into how the effects of land holding patterns on food security varied across different geographies and population groups, which can be utilized to build targeted and effective food security policies. The importance of the study resides in its capacity to inform policies and practices that enhance food security for millions of people globally.

The sociological research indicates how food insecurity is impacted by social issues including poverty, inequality, and marginalization, and availability of food. This research is significant from a sociological standpoint since it sheds insight on the social components. Land holding and food security are profoundly embedded in social interactions, power dynamics, and cultural norms and values, the study show the social and cultural aspects that determine land holding patterns, such as the role of gender, race, class, and ethnicity in determining access to and control over land. This knowledge on the topic of the study is applicable in creating more inclusive and equitable land holding policies and practices. The study gives insights into how the social environment shapes the impacts of land holding practices on food security and how the food security outcomes of land holding patterns vary across different areas and population groups.

Access to land is essential for growing food and earning a living through farming. The majority of impoverished individuals who live in rural regions and rely

on farming for a job are sometimes unable to produce enough food for their families because they do not have legal rights. This is due in part to the fact that they do not have solid rights to the property on which they reside, and in part to the fact that they dwell in tough places with bad soil or a lack of transportation. According to studies, inhabitants in these remote places have legal property rights, but the land is not productive enough to grow adequate food. To address this issue, experts have been looking into ways to ensure that people have secure rights to land as well as measures to boost land production. This study contributes increasing knowledge on the topic to existing research by investigating the relationship between land holding and food security.

A range of land leasing arrangements includes labor tenancy, sharecropping, and long-term lease agreements. These arrangements lead to fluctuations in land output and productivity. The outcome of these agreements does not inherently align with the adequacy of food for the household. Nevertheless, the implications for food sufficiency cannot yet be comprehended with these diverse landholding configurations. This study has sought to examine the relationship between landholding and household food sufficiency, which typically varies at the neighborhood, village, or district level. It illustrates the correlation between land ownership and food security in the rural context of an agrarian economy. The significance of access to productive resources is well acknowledged; yet, a favorable outcome is achieved only when these resources are utilized effectively and efficiently. Resource allocation decisions are tailored to individual households due to variations in food security levels.

The derivation of food sufficiency from land tenure systems enhances the comprehension of the rural economy and addresses the hunger crisis in many regions

of rural Nepal. Furthermore, the study has contributed to resolving the contention regarding whether mere access to land via distribution systems can effectively address poverty in a sustainable manner.

1.8 Organization of the Study

The dissertation is divided into seven chapters to explore the complex relationship between land holding patterns and food security in Barbardiya Municipality. The first chapter introduces the research problem and outlines the fundamental perspectives on land holding practice, food security, and their interconnection. The chapter presents a thorough overview of the research problem, objectives, and significance of the study, and lays the groundwork for the following chapters.

The second chapter provides a thorough review of the literature traces the historical evolution of land holding patterns in Nepal, includes traditional systems such as the *Birta, Raikar*, *Kipat* and *Rajya* systems, and analyzes the land use regulations. Besides, the chapter establishes the conceptual and theoretical frameworks to systematize the study.

The third chapter explains the research methodology outlines the philosophical positions, methodological approach, data collection methods, and analytical techniques and presents the context of the study. The fourth chapter examines the municipality's land holding including land ownership, land types, and irrigation method. The fifth chapter focuses on food security, and evaluates indicators such as food consumption patterns, agricultural production, and household coping strategies.

The sixth chapter demonstrates the interconnectedness between land holding and food security, and examines the relationship between land holding sizes, ownership patterns, and food sufficiency. The final chapter summarizes the findings of the study, draws conclusions and presents theoretical reflections on the research outcomes. Overall, all of the chapters in the study contribute to dynamics that impact on land holding and food security in Barbardiya Municipality. Besides, the study enhances to academic scholarship and promotes policy discourse in the area of research.

CHAPTER II

REVIEW OF LITERATURE

2.1 The Historical Background of Nepalese Land Holding Pattern

Land holding pattern in Nepal have a long history in Nepal, dating back to the time of Lichchhabi dynasty ruler Mandev of the 5th century AD. Historically, the state controlled all of the land, and the kings of the period were the physical owners. They used to give or take land from individuals based on their wishes and needs of the state. Later on during the Malla reign (17th century), King Jayasthiti Malla established certain land surveying, measuring, and record-keeping procedures (Joshi et al., 2018).

The table 2.1 discusses the many kinds of land holding pattern in the Mall region throughout the 17th century. The systems are classified as registered or statutory or unregistered or non-statutory. The *Rajya*[4] system, legally recognized and socially acceptable but not registered with the state government, falls into the registered or statutory category. Private, Non-formal, State, Government, *Rajya*[5] (many varieties listed), and Encroachment are examples of unregistered or non-statutory systems that are socially acceptable but not legally recognized or registered with the government. The chart does not mention any public land holding pattern structure. Overall, the chart highlights numerous forms of land holding pattern systems in the Mall reign throughout the 17th century, as well as how these systems are recognized and approved by both society and the government.

[4] Land under the proprietorship of the state.

[5] Guthi is a type of institutional landownership characterized by religious and charitable aspects that have created unique problems and characteristics in the fields of land holding and taxation.

According to Regmi (1978), in the mid-eighteenth century, numerous autonomous and semi-independent kingdoms were merged to become the Kingdom of Nepal. Prithvi Narayan Shah Gorkha kingdom's monarch in 1743 began his conquests a year after taking the kingdom, and by 1768, he conquered the majority of small kingdoms in Nepal. The political history of Nepal can be divided into two periods: the first, from the mid-eighteenth century to 1846, when Nepal was ruled by Gorkha monarchs, and the second, from 1846 to 1951, when the Ranas attained effective political power. In a research paper, Regmi describes the first step. His research focuses on the Rana dynasty. This was the period in Nepal when feudalism was firmly entrenched and the people's pauperization began with a vengeance.

Table 2.1:

Land Holding Pattern Types and System during Mall reign (17th Century).

	Land Holding pattern System			
	Registered/Statutory		**Unregistered/Non-Statutory**	
Land Holding Pattern Types	Raikar	Private	Non-formal	Socially accepted Legally recognized Unregistered
	State	Government Public	In-formal	Socially accepted Legally recognized Unregistered
	Guthi	Several types	Encroachment	Socially accepted Legally recognized Unregistered

Source: Joshi, R. R., Panday, U. S., Chhatkuli, R. R., Antonio. D & Enemark, S. (2018).

To understand present land use practices, land ownership, or distribution patterns, it is important to look into the way lands were owned and managed in the past

needs to be elaborated. The land ownership structure is still a handover from the past feudal ruling system. Nepal had the diverse types of land holding pattern until the Rana period (1950). However, some changes took place subsequently as the consequence of increased domestic political pressures, and as external pressures based on information and experience garnered from other countries.

Prior to 1950, the government had been seen as a landlord. According to Regmi, there are two types of land holding pattern in Nepal: *Raikar*[6] and *Kipat*[7]. *Raikar* land used to be royal land (or state land, as the state was linked to the crown), but after 1950, *Raikar* land became an individual's private property in which he or she paid government taxes to the government and had complete rights to sell, use, inherit, transfer, split, and lease. *Kipat* was a type of community land ownership in which a group (s) controlled the property collectively and the state had no control over it. Although the land could not be s old or bought, the chief of that tribe allowed a member of that tribe to use it. Some indigenous peoples practiced this, and the Nepali government pledged to continue it during the country's unification process. "Individuals who cultivated land as members of a *Kipat*-owing ethnic group owed loyalty mainly to the community, not to the state," (Regmi, 1972, p. 27).

Different types of land holding pattern arose because of the state selling and gifting property. The state could either rent the property out directly to tenants or profit from taxes or production shares, In other words, it might contract out the land to people who would subsequently rent it out to tenants. Without working on the land, these middlemen made a lot of money. Because there was surplus land, that land holding

[6] Land which is under the proprietorship of the state.

[7] *Kipat* was a type of land holding that existed primarily in Nepal's eastern region. This was a communal land holding held by the Kirats of the former Majh and Pallo Kirat areas in western Nepal.

pattern was most likely created. However, there is a scarcity of available land. All other regions, other than exception of the *Kipat*, belonged to the state and were referred to as *Raikar*. *Raikar* was the origin of all other forms of holding land (Regmi, 1978).

Before 1950, *Raikar* land tenancy had been divided into two categories: genuine tenant cultivators and tenant owners. Tenants in the second category paid rent to the state but had the ability to sell or bequeath their Raikar land, whereas tenants of the first category (tenant cultivators) possessed no rights to sell, sublet, or otherwise transfer the land allocated to them. Tenant owners were, in a sense, tenants of the state, cultivating the state's property while paying rent. The tenant-cultivators were the tenant's tenants, without having any rights. Tenant owners were similar to manors in medieval Britain. The government granted concessions of its land (i.e., *Raikar* land) in various forms to people. *Birta Jagir, Guthi, Rakam, Rajya,* and Sera received these donations (Adhikari, 2011).

2.1.1 The *Raikar* System

Under this structure, the property was controlled by the state, but private usage for agricultural production was authorized if taxes were paid. The state also sold property to individuals, resulting in the development of the private land ownership system. Individuals may own *Raikar* property privately as state land. They have the ability to sell or transfer the title to others as owners. The right to property, including land, was guaranteed in the Nepalese Constitution (1990). The present Interim Constitution retains the option for "scientific land reform" (2007). This provision makes future land reform initiatives simpler to implement. When the Rana dynasty collapsed in 2007 BS (1950), *Raikar* land accounted for about half of all agricultural land. Except

for *Raikar* property, this expanded when other sorts of land ownership were prohibited by 2023 BS (1966).

2.1.2 The *Birta* System

The role of land as a form of property and a source of revenue has impacted the shape and substance of the land holding system in impoverished nations where agriculture is the primary source of subsistence. Socio-religious institutions, which embody the hierarchical stratification of the society, have significantly conditioned the form of land ownership and holding of rights on the land. Within such civilizations, there are groups unable to participate in regular economic activities due to religious tradition or social and political functions and must be sustained at the expense of the agricultural classes (Regmi, 1964).

In these circumstances, land is seen not just as the most reliable source of income but also a symbol of tremendous social and economic significance. Such circumstances occur in Nepal, where the state's divestment of land ownership, largely through the *Birta* system, in favor of priests, religious instructors, warriors, and members of the aristocracy and royal family served as the pivot upon which the state's social and political structure was built (Regmi, 1964, p. 1).

Under this plan, the government pays individuals with tax-free land. The Rana kings and, to a lesser extent, the *Panchayat*[8] system awarded huge areas of land to people who had been to and loyal to the governing class. As a result, society's elites who served and benefitted the ruling class were entitled to such benefits. The state

[8] Panchayat was a non-party political system established by King Mahendra to replace the Nepali Congress government of B. P. Koirala on December 15, 1960 AD (1st Poush 2017 BS). On January 5, 1961 AD, he established the partyless Panchayat system (22nd Poush 2017 BS).

might rescind the award. This land accounted for 36 percent of total land until 2016 BS (1959), when it was abolished.

2.1.3 *Guthi* System

The land given to religious or benevolent organizations by the state or people refers to *Guthi*. *Guthi* lands are free from taxation and cannot be reclaimed by the donors. People want *Guthi* because of this assurance. This holding pattern still applies to around two percent of cultivated land. The popularity of the *Guthi* land holding pattern can be explained sociologically in terms of the social and economic stability that it gives to the people. The guarantee that the land would not be reclaimed and the exemption from taxes can give the individuals a sense of stability and security. The charitable aspects of the organizations that own the property have cultural and spiritual value for the people in the area.

The *Guthi* land holding system also reflects the region's social and cultural values, which highlight the role of religious and charitable groups. It also highlights the importance of societal institutions in society and their function in distribution of both land and resources. However, this holding structure may have unintended consequences. It can lead to the consolidation of land ownership in the hands of a few religious or charitable groups that cause in social and economic inequities. Besides, the absence of government control and regulation of the property might lead to possible misappropriation or exploitation of the land by these groups.

2.1.4 Jagir, *Rajya* and Rakam Systems

Prior to 1951, the state allocated land to individuals in recognition of their governmental work as a substitute for their remuneration. Taxes were remitted, and the

state possessed the authority to revoke the grant. This concession was referred to as *Jagir* land. The *Jagir* lands from which employees received cash payments were termed *Khuwa*, whereas the estates from which government servants obtained payments were referred to as *Khangi*. In 2009 (1952), the *khuwa* and *khangi* were transformed into *Rajya*, and the cultivators got land in lieu of their pay entitlements. Employees began receiving pay in cash from the government. Former kings or chieftains of microstates and localities served as middlemen between the government and the populace in certain regions. This was referred to as the *Rajya* system, wherein former kings or chieftains possessed certain rights over land in specific regions (Adhakari, 2011).

They were tasked with collecting land revenue and remitting it to the government. Diverse procedures existed for the deposit of income generated from land tax. The collectors could appropriate all the land revenue for personal use or retain the majority for themselves while remitting a portion to the government. Primarily, they would get a specified percentage of the land revenue remitted to the government. All of this was annulled in 2018 BS (1961). The territories designated for cultivation by the populace, contingent upon their provision of unpaid labour (corvée) and additional offerings to the government (i.e., rulers), were referred to as *Rakam* land. This was likewise annulled in 2020 BS. (1963). The *Jagir, Rajya*, and *Rakam* systems constituted approximately 7.7 percent of the land at the time of its abolition (Adhikari, 2011).

2.1.5 *Kipat* System

It is territory possessed by a community, accessible exclusively to its members in accordance with its traditional regulations. Land ownership under the *Kipat* system was restricted to specific communities of Mongoloid descent, including the Limbu, Rai, Danuwar, Sunuwar, and Tamang, primarily located in the eastern and western

highlands of Nepal. This was abolished in 2023 BS and, then about 4% land was under this system (Kaplan, 2013).

2.1.6 *Jimidari* System

Jamindars, or landlords, functioned as local government officials tasked with tax collection, encompassing land revenue. In the Terai, they were designated as *Talukdars*[9]. They would receive a designated percentage of the revenue generated from land for the government. In some situations, the government assigned land to them, which they cultivated using the corvée work of persons within their jurisdiction. The territory obtained by the *Jimidars* in return for their participation in land revenue collection was designated as sir or *Jirayat*. The procedure of allocating such land was referred to as *Jamidari*. This system was later discontinued in 2021 BS (1964).

The historical tenure structure of resources in Nepal was designed to optimise the revenue of the state, synonymous with "rulers" until the 1950s. Consequently, revenue allocation directly influenced the tenure systems. Regmi (1988, p. 29) argued that three ancient mechanisms existed via which the state might buy products and utilise human resources without employing money as a medium of exchange. These three revenue-generating mechanisms were also associated with the tenurial systems. These included:

Mineral resources are the property of the state. The state's ownership rights in these resources, unlike those in agricultural lands and forests, were never conferred to individuals. Regardless of the tenure regimes governing individual land, the state retained the authority to exploit the mineral riches situated therein. The state could

[9] Revenue collection functionary in the hill region.

utilize individuals to exploit resources, but fifty percent of the earnings must be allocated to the state. The government utilized the land and forest as compensation for its employees, referred to as *Jagir*. The government, or the state, might utilize the populace without compensation for public labor or other official purposes. This was referred to as *jhara*. Individuals were granted the privilege to utilize resources such as land, forest, water, or pasture in exchange for rendering certain services to the ruling elite referred to as *Rakam*.

The pre-1950 Nepali state employed both contemporary and traditional institutions to produce revenue and manage land and natural resources. The primary focus was on the state's authority over all revenue streams within its territory. In contrast, it employed conventional institutions and practices that assigned revenue and ownership rights to the authority of individuals, institutions, and communities. Which were designated as infra-state agencies capable of *Rajya, Birta, Guthi*, and *Kipat*. *Rajya* referred to a vassal state assigned to a family for the purpose of collecting revenue from resources and remitting a specified share to the central government.

The Ranas and their relatives acquired a substantial portion of it. Another factor contributing to the Rana family's extensive land ownership is the territory acquired from the British Empire. The four districts in western Terai (Banke, Bardia, Kailali, and Kanchanpur) were ceded to India following the pact for a peaceful truce in 1816. The Nepali army, led by Janga Bahadur, assisted in suppressing the Sepoy Uprising against the British in 1857–1858. Consequently, this province was restored to Nepal, and King Surendra at that time allocated half of the territory to Rana Prime Minister Janga Bahadur and the remaining half to his six brothers (Ghimire, 1992).

Ranas additionally allocated estates in this region, referred to as *naya-muluk*[10] (new nation), to various elites in Kathmandu. Notwithstanding the grants, these elites refrained from attending due to malaria. It was only after the eradication of malaria that the elites and other hill migrants entered Terai. The government founded the Nepal Resettlement Company in 1963 to allocate land to landless individuals. A significant influx of Indian settlers arrived in Nepal to reclaim and cultivate land on a rental basis. The Indians were actively encouraged to do this action. Nevertheless, the local indigenous inhabitants, such as the Tharus, who are believed to have inhabited the region for about 600 years, were gradually marginalized and disenfranchised. As a result, a class of feudal landlords formed (Karki, 2002).

This feudal landlord class consisted of not only *Shahs, Ranas and Thakuris* (ruling class and primary beneficiaries of the land grants), but also the *Brahmins, Chhetris* and *Newars* as they also obtained the land grants. The ethnic minorities marginalized populations and *Dalits* did not obtained any grants. As a result, they remained marginalized landless (Seddon, 1984).

Karki (2002) has categorized these landless people into four sections: victims of natural disasters, internal migrants displaced by socioeconomic causes; migrants from India, and discriminated ethnic minorities in Terai (*Tharus, Mushahars, Satars*). These people were also attached with the landlords in various bonded and semi bonded

[10] Naya Muluk is a geographical area situated in the western-southwestern region of Nepal. Post-1860, the Terai region situated between the Kali and Rapti rivers was referred to as "Naya Muluk."

relationships. They worked as *Kamaiya, Haruwa*[11] and *Charuwa* for the landlords in this bonded or semi bonded Status.

Almost one-third of agricultural and forestland of the nation was granted to private individuals by 1950 and the remaining belonged to *Rana*. Local functionaries all favorites of *Rana* implemented the land grant policy in the village and were able to assure most benefit for themselves. They obtained a great deal of land from the state through *Jagir* and *Rajya* grants and rented those lands to peasant farmers under tenancy arrangements. In this way local functionaries turned into landlords. Peasant farmers had to pay half of their crop yield as rent to the local landlords (Regmi, 1978).

To ensure their rent, landlords introduced the *kut* (contract) system where only those tenants who were able to pay high rents could become the part of a contract. Irrespective of the performance of their crops, even if the crops failed, farmers had to pay rent as *Kut*. Eventually these peasant farmers effectively turned into slave laborers of the *Jagir* and *Rajya* holders (Regmi, 1978).

The over exploitation of the peasants, the real cultivators of land and high indebtedness among them lead to confiscation of their properties, corvee labor system or compulsory, unpaid labor in which they did not get paid, and extra services to be provided to the landlords Revenue functionaries of the area caused a Black gram exodus of these people to India, Sikkim and Darjeeling. They were involved in land reclamation, tea estates and infrastructure building. Initially they were encouraged to

[11] The *haruwa-charuwa* system is a debt-based forced labor system prevalent in Nepal's agricultural sector of the eastern Terai region. *Haruwa* means "forced tiller" and usually refers to adult males, whereas *charuwa* refers to women and children.

settle there to expand the local agriculture and bring more land under cultivation. Later on, they faced numerous problems there as well (Upreti, 2004).

The predominant form of land holding is *Raikar*, followed by the *Guthi.Birta, Jagir* and other forms of land holding have been abolished and have been converted to *Rajya* in different periods as mentioned earlier. Until the 1950s, about one-third of the agricultural and forest lands were granted to individuals and the remaining belonged to the *Rana* themselves (Regmi, 1978).

After the downfall of ranas, some endeavors were made to modernize the land administration in Nepal. This meant redistributing the land obtained from the elites and guaranteeing tenants' land holding. The Draft Land Reform Act (1955), emphasized giving land ownership to the tillers. This Draft Act was converted into the Land Act (1964), which abolished intermediary relations in the land such as the *Zamindari* system, the *Rajya Rajauta* system and *Birta*, *Jagir* and *Rakam* systems. The *Kipat* system was abolished and the *Guthi* system reformed (Adhikari, 2011).

In Nepal, endeavors were made to implement social reforms including as land reform during the *Panchayat* Period (1960 to 1990) to win over the populace to the *Panchayat* system. The Land Act of 1964 provided tenants with legal protection and registration to combat absentee landlordism and intermediary relationships. Although the Terai region's land reclamation was emphasized, political issues rather than the distribution of land to farmers were the main focus. Hill people were encouraged to settle in the plains than. Due to liberalization, privatization, and donor influences, land reform progress remained constrained after democracy was restored in 1990. In spite of all these, land continues to be essential for security and food production, by causing land-related disputes that account for a sizable portion of legal cases in Nepal. These

disputes, reduce productivity, fragmentation of land, and cause social conflicts. Subsequently the overthrow of the Rana regime took place in 1950, and the significance of land reform became clear (Wily et al., 2008).

Ghimire (1992) focuses on the political economy of landlessness and land reform in Nepal in detail. He argues that the good intention of land reforms initiated by democratic government formed through election in 1960 was thwarted as the government was removed by an alliance made by landlords, army and the monarch. Land reform was carried out after the enactment of the Land Reform Act 1964 that could only appropriate about 1.5 % of the surplus land. This land was again distributed to poorer families. However, the registration was done only for the men. The changes in this Land Reform Act did not bring any perceptible changes in land reform. One of the reasons for less effectiveness of Land Reform Act 2064 was that it kept the high ceilings of land ownership with the privilege to the landowning people.

Land-based movements and struggles from civil society have increased the pressure on governments and the international community has been dealing with land ownership issues for several years. After 1950, there have been movements for proper land reform in Nepal. However, most of the movements have not been successful.

2.2 Contemporary Land Holding Practice and Food Security in Nepal

The unstable and dispersed land holding system as one of Nepal's land management challenges. Due to the lack of resources and credit, this causes problems like land disputes, inefficient land use, and poverty. The study presents some recommendations: overhauling the system of land holding; developing open-book land use plans helps in transparent, participatory planning approach where all land-related

data is publicly accessible and stakeholder can collaboratively review, discuss, and update land-use policies in real-time; and enhancing government capacity to carry out these plans. The research acknowledges Nepal's historical feudal legacy has influenced the current system, that results in creating problems like land disputes, inefficient land use, and poverty. The uncertainty in land rights has caused such problems (Chanda, 2019).

Agrawal and Ostrom (2001) examine these issues. They contend that safe property rights and decentralized decision-making within local communities are key to effective's collective action. They elaborate government-run irrigation systems in India failed because of centralized decision-making, while community forestry in Nepal achieved success. Clear property rights encourage people to protect shared resources, and local communities are given the power to effectively manage resource usage through decentralization, which means that land holding practices can either support or obstruct collective action.

The current land issues in the Federal Democratic Republic of Nepal, underscore the difficulties posed by a disjointed and unstable system of land holding. Significant issues such as landlessness, which affects particularly vulnerable populations who are vulnerable of eviction and poverty, exacerbate gender inequality by denying women access to land and property. Their study highlights both inefficient land use that resulted from a lack of investment opportunities as well as the prevalence of land disputes caused by ambiguous holding rights, that creates expensive and time-consuming conflicts. The study seeks the government to take the necessary steps to address these problems, including reforming land holding for greater security and

equity, granting women's access to land, enhancing conflict-resolution skills, and creating open land use plans (Pradhan, 2018).

Gautam "Ethnicity and Land Ownership in Nepal" (2017) investigates the relationship between ethnicity and property distribution in Nepal, revealing historical and structural disparities that marginalize specific ethnic groups. It underlines unequal access to land exacerbates economic and social inequality, limiting chances for underprivileged people. Gautam contends that land ownership differences exacerbate social inequality and obstruct equitable development. The paper calls for fair land reform as a critical step toward reducing inequities and promoting social justice.

In Nepal's rugged, stories of food security unfold at the crossroads of evolving farming practices, humanitarian interventions, and structural struggles. Efforts to develop rural areas frequently disregard the traditional knowledge held by the locals that causes confusion and discontinuities. Participants draw attention to worries about biodiversity, the disassociation between concepts like climate change and their own lived experiences, the negative effects of market-based monoculture agriculture, and the depletion of social capital brought on by externally-driven social and cultural change (Rimal, 2018). The study's sociological significance emphasizes on the value of recognizing and respecting local knowledge in development interventions. Its recommendations support the use of heirloom seeds and environmentally sound methods to address issues with biodiversity, livelihoods, and cultural preservation while drawing on the diverse experiences of the communities.

Households that receive remittances are more likely to have access to food than those who do not that implies that migration impacts on Nepal's food security outcomes hugely. In a nation with serious food security concerns, addressing migration-related

issues and maximizing the benefits of remittances should be at the forefront of policy and development strategies (Regmi, 2014). Remittances improve household food access but deepen land holding challenges. Migrant families often abandon farmland, leading to underutilization or informal leasing, while elites consolidate control. This weakness on agricultural productivity, despite short-term food gain from remittance cash. Policy must link migration to land reform-securing holding investment in sustainable farming.

In Nepal, achieving food security was extremely difficult, especially in rural areas. The use of conventional farming techniques, land fragmentation, vulnerability to climate change, gender disparities in agriculture, rural-to-urban migration, a lack of adequate infrastructure, and ongoing malnutrition problems were some of these difficulties. The availability, accessibility, and use of food resources were all affected by these factors. The solution to these problems required a multifaceted strategy that included gender equality, rural development, agricultural innovation, and improved transportation infrastructure. Nevertheless, the food security landscape can change over time because of various socioeconomic and environmental factors, that necessitating continued efforts and adaptations in policies and interventions (Tamang, 2019).

Nepal's food security issues are the result of a complex interplay between social, economic, and environmental factors. The gender gap in agriculture, rural-to-urban migration, and the effects of climate change bring to light the importance of sociological ideas including gender roles, social mobility, and vulnerability in determining the outcomes of food security (FAO, 2021; World Bank, 2023 & Regmi, 2014). This structural inequality requires gender-inclusive land policies, migration-

sensitive agriculture, and equitable climate adaptation programs to insure sustainable food security.

Food security depends on land holding security in direct (via stable farm production) and indirect (via non-farm livelihoods) ways, that contributing to food security through their own food production need which are arable land holding security and those that contribute to food security through other economic activity usually need secure holding of the land on which that activity takes place-either for themselves or for those controlling the activity on which their livelihoods and food security depend. Thus, holding security is foundational to hunger reduction (FAO, 2020).

2.3 Nepal Land Use Regulations (2015)

Due to a rapidly expanding population, internal migration, and unregulated and rapid urbanization, among other things, encroachment of arable lands, forests, government and public places, and varied natural resources is prevailing in Nepal these days, and safeguarding them has become a difficulty. Due to geographic and geological circumstances, and as biological changes, disaster hazard dangers such as soil erosion, floods, and landslides are growing. Naturally, this has posed a threat to food security, human settlement security, ecological balance, and long-term growth. The government of Nepal (GoN), Council of Ministers, adopted a National Land Use Policy (NLUP) in 2013 to address such hazards and difficulties (Chand, 2019).

The National Land Use Policy of 2013 emphasized the conservation of arable areas as a means of ensuring food security. The strong earthquake on April 25, 2015 and its aftershocks exposed the Nepalese to non-vulnerable, safe human living in the land. Consequently, people are now aware that in designated natural disaster areas, only

guided activities are authorized. When building physical infrastructures, it is widely acknowledged that the possibility of newly created threats among natural disasters, such as earthquakes. 2013 must be accounted for following a review of the Land Use Policy The 2015 Land Use Policy was developed to handle all of these contemporary challenges in a long-term manner (Chand, 2019).

Chand further presents the following are the definitions of Land Use Zones according to Schedule-1 (Related to 1) from page 56 to 60:

2.3.1 Agriculture Zone

Agriculture Zone refers to the area where agricultural production (corn crops, cash crops, etc.) takes place. Horticulture (among other things), animal husbandry, fisheries, agricultural forest products, and plants grown on private property all exist or may have existed. This phrase also refers to any specific zone that the Government of Nepal (GoN) has designated as an agricultural zone, among other things.

2.3.2 Residential Zone

The term residential zone refers to the region where humans live. This phrase also refers to a shed, *bhakari* (a huge bamboo container used to store crops), garage, stable, well, water tap, fruits garden, vegetable garden, yard, or any other property used for similar reasons, whether or not it is adjacent to a house. This phrase also refers to a colony house, an apartment built by a corporate enterprise or institution in a residential zone, and any specific zone designated as a residential zone by the GoN.

2.3.3 Commercial Zone

The land covered by a house, shop, hotel, exhibition hall, petrol pump, go down, health, communication, or goods transacting spot, or any literary, scientific, or technical service, association providing information and consultancy, *haat* (local market places where transaction is done on a regular basis), disco operated for business purposes, club, swimming pool, theater hall including entertainment site, or any other business purpose, is referred to as a business zone. A commercial facility established by a business company or association in a business zone, as well as the area covered by such a building, is referred to as a business zone. Besides, any geographic region proclaimed by the GoN to be urbanized for market expansion and business purposes, among other things, is referred as commercial zone.

2.3.4 Industrial Zone

Industrial zone refers to the territory covered by a home or hut built for the purpose of establishing or operating an enterprise that produces goods, including property that has been divided for that reason. This phrase also refers to any specific geographic zone designated by the Government of Nigeria, such as an industrial corridor, an industrial village, an industrial cluster, a special export zone, or a special economic zone for industry development, among other things.

2.3.5 Mines and Minerals Zone

The territory where mines and minerals are dug, produced, or processed, or any specific geographic region recognized as mines and minerals by the GoN, is referred to as the Mines and Minerals Zone. This phrase also refers to any zone in which a mine

or mining business is located, as well as houses and huts used for the same purpose, and land used for the same reason.

2.3.6 Cultural, Archaeological and River, Lake-Reservoir Zone

Cultural and Archaeological Zone refers to historical palaces, buildings, cloisters, temples, shrines, mosques, and monasteries, as well as mane (the prayer wheel) and other religious sites, temples, shrines, and historical sites. This phrase also refers to any geographic region designated by the GoN as a historical, cultural, religious, or archaeological site. River, brooklet, territorial stream, canal, pond, lake-reservoir, and wetland are all examples of "River and Lake-Reservoir Zone."

2.3.7 Forest Zone

Forest Zone refers to government, community, and leasehold forest that is fully or partially covered by tree and vegetation, including wildlife conservation, preserved areas, bushes, and nursery plants, as well as lands with all types of forests declared as forest areas by the government despite the absence of trees. This phrase means specific geographic region designated by the government as a forest area for expanding the forest area or green space.

2.3.8 Public Use and Open Space Zone

Public Use and Open Space Zone refers to academic institutions such as schools, colleges, vocational education centers, and universities, as well as security bodies, health institutions such as health centers, health posts, private and community hospitals, government offices responsible for telecommunications, drinking water, electricity, and other energy supplies, community buildings, libraries, elders homes and houses, huts, and *patis* (resting inns/houses) built for public use, and land covered by the zone. These

phrases also refer to grazing land that is not included in the policy's other classifications, such as a hill, mountain, slope land, or snow-covered terrain. The term refers to a playground, park, stadium, *chautaro* (tree-shaded platform), ground, picnic spot, open space not in use for a specific purpose, highway, district road, village road, bus park, airport, cargo area, dry port, railway, ropeway, waterway, cable car, electrical transmission line, port, and any other zone designated as a public use zone by existing law and the GoN, among other things.

2.3.9 Construction Materials (Stone, Sands, Concrete) Excavation Zone

Construction Materials (stone, concrete, sand mines) Excavation Zone refers to a specific geographic area designated by the GoN for the excavation, production, or processing of stone, concrete, or sand mines in accordance with the standard, or any other special geographic area designated by the GoN as a Construction Method (stone, concrete, sand mines) Excavation Zone.

2.3.10 Other Zones Specified as per Necessity

Other Zones Specified as Needed refers to a zone that does not exist in any of the land use zones but appears to be essential to specify a certain sort of land use zone. This phrase refers to terrain of mixed character. In this case, Intermingled Zone refers to zones that exist in various towns, town-oriented, residential, and business zones located in highway regions at the time of writing, and which are inextricably mixed with one another and cannot be separated. Only the prior settlement and market zone are regulated by this zone.

2.4 Research Gap

A research gap is an unaddressed topic or unresolved problem in an area that implies a lack of existing research in that space. The research gap can occur when there is a substantial amount of previous research but the findings of the studies go in multiple directions, making it difficult to make strong conclusions (Jansen, 2022).

This research covers the current status of Land Holding Practice and Food Security in Barbardiya Municipality. After reviewing the existing literature on the explored topic of the study, that encouraged me to study the relationship between food security and household size. This has not been deeply investigated in previous study. Which open up a new direction to investigate into the area of the researches in this field.

In this research a contextual gap arose because there was a substantial corpus of previous research on a single issue but a lack of study in specific situations. There was a scarcity of study on a certain demographic, geographic location, or historical period. Finally, this research explored the methodological gap and concluded that the existing methodology was fallible or lacked a clear perspective.

The current investigations have found as many literature reviews, systematic reviews, and meta-analyses on the topic of the study. The researcher has read the most recent journal publications to get a sense of the current state of knowledge. It was advisable to review current dissertations and theses (especially doctoral-dissertations). ProQuest, EBSCO, and Open Access dissertation databases were considerable sources for this study. The research have been looking into current materials which have been studied.

The research explored a study gap on the relationship between land holding systems and food security. While there is evidence that secure land holding contributes to food security by providing smallholder farmers with the resources and incentives they need to invest in their land and increase productivity has been my exploration. The association between land holding practice and food security has experience significant attention from researcher, but an understanding of contextual, demographic, and methodological factors influence this link remains unexplored. The current body of literature specify that having secure land holding notably boosts food security because it allows smallholder farmers to pervade in productivity improvement and more sustainable agricultural practices or farm infrastructure.

The unique legal and institutional frameworks controlling land holding, the economic and social realities of the communities concerned, and the larger policy and political context in which land holding practices are situated have been largely significant. Land holding is the way in which people acquire access to, use, and control a precise piece of land property. It is initiated and figure-out by a set of guidelines which are legal, social, economic, and political. The socio-cultural and legal systems governing land ownership differ as a result of history, culture and country. Such structure may accept the pattern of legal regulation. Social customs, or a mixture of both, which generates blending rules that oppose each other. Similarly, the economical and societal position of the community where the land is located plays a notable part on how land will be applied and controlled socially.

Questions such as employment, family roles concerning to gender, social hierarchy, and ethnicity shape who is granted to arable land access and under what terms. In addition, policy and politics like national policy plans, external capital

environmental policy, and relative power significantly shape the land holding systems. Guidelines configured without concerning to the demarcated dimensions tend to promote social tensions and conflicts, unbalanced distribution of land and resources, and biased and inefficient policy frameworks. It becomes transparent that one needs to look at all aspect to create suitable, equitable, and enduring systems of land management.

More study is also needed on the possible effects of land holding policies on food security, such as relocation of smallholder farmers and the possibility of land grabs by bigger players. Understanding these consequences is critical for developing treatments and policies that promote both stable land holding and food security. More study is needed to better understand the complicated link between land holding and food security, as well as to develop effective interventions and policies to improve both.

There is a vast area of research pertaining to land holding and food security. Cotula et al (2006) suggests that it is only the economic and environmental sides of land holdings that have previously been studied, leaving aside the social and cultural around which land right are negotiated. Moreover, the relationship of land holding and food security with urbanization and climate change alone with gender studies is deeply interwoven within the developing countries and requires sorely lacking context-sensitive examination. With more holistic and deeper research the relationship of food security and land holding can be better unveiled.

Recognizing the importance of land holding in food security: Land holding systems, such as property rights and access to land, have been investigated to see how they affect food security. This involves investigating how various holding systems, such as community land holding or private ownership, impact households' capacity to

produce and acquire food. Investigating the effects of changing land use and land cover on food security: Researchers have investigated changes in land use and land cover, such as land conversion from agricultural to urban development, might affect food security. This involves investigating climate change affects agriculture and food production.

While evaluating the efficacy of land holding intervention the researchers have assessed the success of numerous interventions aimed at improving land holding and food security, such as land registration programs, land holding regularization projects, and land use planning regulations. Examining the relationship between land holding and gender: Researchers have looked at how land holding systems and practices affect men and women differently, and how this affects food security. Much more study is needed in this sector, as well as numerous obstacles and possibilities for enhancing land holding and food security.

2.5 Conceptualization and Theoretical Framework

The theoretical and conceptual framework explains the path of a research and grounds it firmly in theoretical constructs. The overall aim of the two frameworks is to make research findings more meaningful, acceptable to the theoretical constructs in the research field and ensure generalizability. In this research the major conceptual and theoretical framework has been used on Land Use Practice related with Farming and Livestock.

Conceptual and theoretical framework for comprehending land holding patterns and food security can be founded on a variety of sociological ideas and notions. Some of these sociological concepts include: Patterns of social inequality, such as the

distribution of money, power, and resources that, can impact on land holding practices. Land holding practices may favor certain groups (for example, affluent landowners) at the detriment of others (e.g. small farmers or indigenous communities). Power dynamics can change land holding patterns, such as the manner in which various groups can exercise influence over land use choices through obligation, pressure, or more delicate means.

Land holding patterns can be impacted by cultural variables such as distinct communities' values, beliefs, and customs. Some civilizations may focus on land ownership as a source of social status or identity, whilst others may highly emphasize collective usage of land for the benefit of the community. Land holding patterns are often regulated by formal institution. These institutions can determine how land is allocated and utilized, and they can be influenced by a range of circumstances, including political, economic, and social concerns.

Land holding patterns can be impacted by cultural variables such as a society's values, beliefs, and customs. For instant, some civilizations may place a significant focus on land ownership as a source of social status or identity, whilst others place a larger emphasis on the common use of land for the benefit of the community.

Global pressures, such as the increased integration of national economies into the global economy, can impact on land holding policies. This can result in the consolidation of land ownership in the hands of a few major multinational businesses, with severe consequences for food security and local populations.

Overall, a sociological conceptual and theoretical framework for understanding land holding patterns and food security must take into account the intricate interaction

of these and other factors, as well as how they affect land and resource distribution in various communities.

2.5.1 Conceptualization

The conceptual framework of this study has been based on the fact that access to land is governed by the holding system associated with the land. Land can be accessed for farming in primarily two ways. One is if the household has its own land and another is through renting it. Regardless of how access is obtained, there are various factors that affect production and determine how much is produced from the accessed land. Production would be different in own land and rented-in land. After these factors affect the production level, then the level of food sufficiency can be obtained and implications can be generated as how the land holding implies to food sufficiency of the household.

Relying on this theory, the researcher claims that the production of the household is affected by four major factors, namely, land ownership, land size, type of land and type of holding which is then correlated with food sufficiency months of the household which is the primary focus of this study. The researcher has included numerous sociological aspects in a conceptual framework for understanding land holding patterns and food security in the study area.

Ownership and access to land: Land ownership is directly linked to social position, power, and money. Land ownership patterns in Barbardiya municipality are mostly determined by historical, cultural, and economic considerations. The knowledge on who has access to land and how that access is obtained and maintained can reflect the dynamics of food security in the study area.

Land use and resource management: How land is utilized and managed largely impact on food security. If land is over utilized or mismanaged, it becomes less productive that causes, food scarcity. On the other side, if land is maintained responsibly, it supports a variety of crops and cattle, and helps the society to have a reliable food supply.

Social and economic inequality: Inequality in access to resources, especially land, can lead to food insecurity on a social and economic level. Pertaining to the distribution of income and power in Bardiya municipality and this characteristic impacts on the access to land and other resources, can explain the core causes of food insecurity in the region.

Cultural and historical context: The cultural and historical setting of the study area is likely to impact on land holding patterns and food security. Traditional land-use patterns and resource management systems, may affect modern practices, as the legacy of colonialism or other historical events still sustains.

Political and policy context: It is equally crucial to consider the political and policy environment in which land holding practices and food security occur. Laws and rules governing land ownership and resource management, many influence access to land and other resources, as well as the capacity to grow and sell crops. The description of these laws and regulations can elaborate the larger context of land holding patterns and food security.

2.5.2 Theoretical Framework

The theoretical framework to explore the relationship between land holding practice and food security, in the context of global efforts to combat food insecurity and

promote sustainable development. The present study focus on understand the complex interplay between socio-cultural factors, institutional arrangements, and their impact on food security. It also investigated the mediating effects of access to land, land distribution, and land management practices on the relationship between land holding practice and food security.

The Holding Analytical Model of Food Security was created by Moyo (1989) has been as a major component of this study, it is based on the research of Shivji et al, (1988). This model incorporates the five main land management analytical constructs-land distribution, land use, land holding security, land administration, and land adjudication which focus on how land holding affects the outcomes of sustainable development and food security.

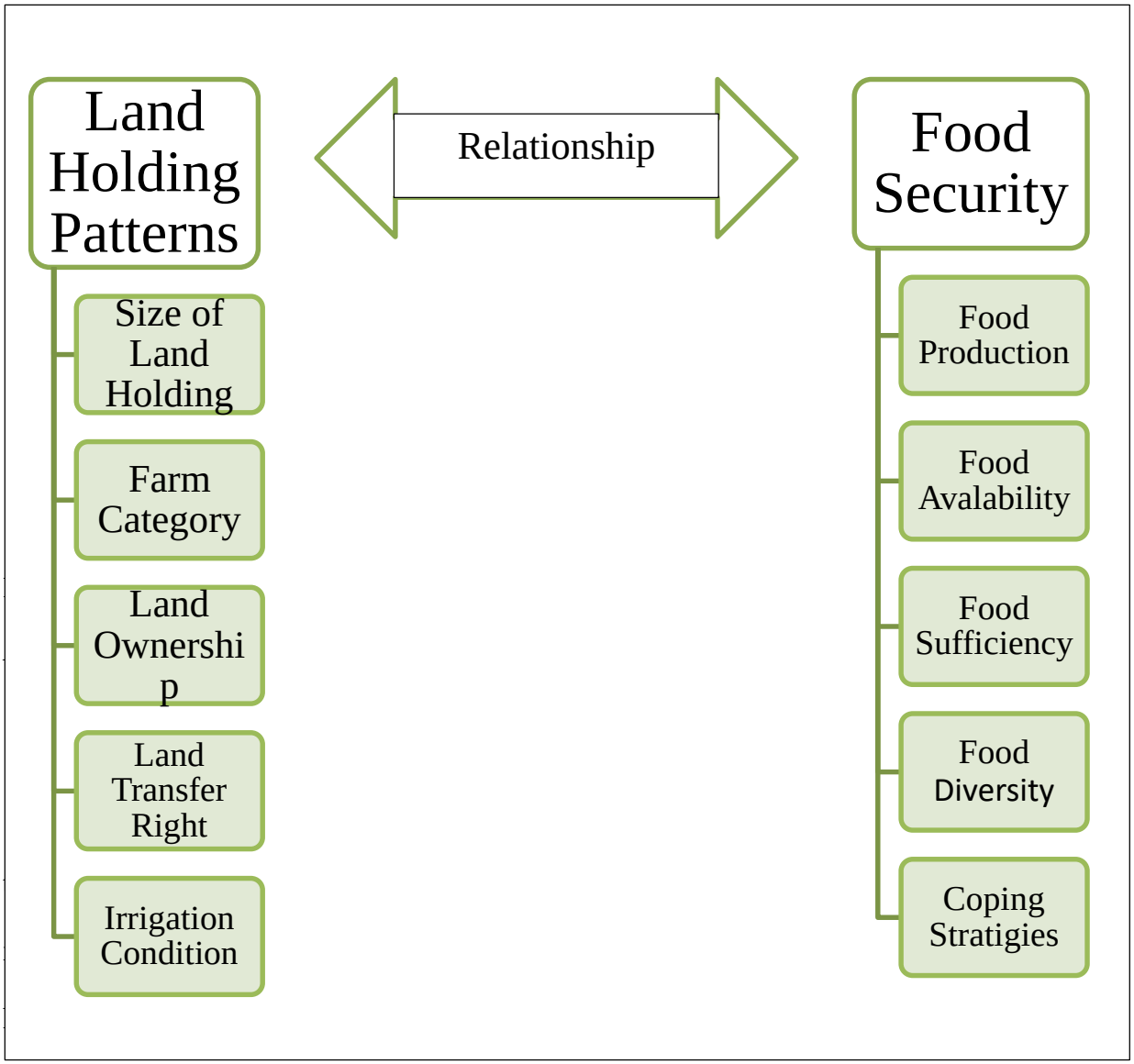
The analytical model proposed by Maxwell and Wiebe (1998) delineates a causal relationship among key factors including land, production, income, consumption, and nutritional status. This model addresses fundamental questions regarding individuals' and households' access to resources like land, and the implications of various forms of access or changes in land holding and property rights on income generation and food accessibility. The framework outlines that decisions concerning consumption and investment play a crucial role in shaping the household's resource endowment in subsequent cycles and highlight the complexity inherent in these relationships (Maxwell & Wiebe, 1998).

Investment in land or capital assets significantly improves income-generating capabilities for the subsequent period. Besides, consumption serves as a form of investment by contributing to the household's labor endowment and overall health. This concept underscores the importance of sufficiency and sustainability within the system.

A household with secure access to an adequate food supply can afford to consume enough to sustain activity and health without depleting its wealth reserves unsustainably. Consequently, it can preserve its labor and non-labor resources in the long term (Maxwell & Wiebe, 1998).

Figure 2.1

Relation between Land Holding Pattern and Food Security



Source: Developed by Researcher connecting with Maxwell and Weibe (1998, p.11)

Holding institutions play a crucial role in shaping food access at the household level in predominantly agrarian societies by regulating resource access. Moreover, they

have indirect implications for food security at both local and national levels by influencing overall food availability and subsequent prices (Maxwell & Wiebe, 1998). However, the relationship between land holding and food security extends beyond direct production influences. Maxwell and Wiebe (1998) argue that access to resources fundamentally determines access to food, with food security being contingent upon food availability, access, and utilization. They further assert that access to food encompasses key dimensions such as sufficiency, sustainability, and vulnerability. In light of these arguments, the research suggests a dynamic linkage between land holding and food security, wherein decisions regarding production, marketing, consumption, and investment interact within a changing landscape of resource distribution within and among households.

Land holding practices yield significant influence over local food security dynamics in rural communities. Secure and fair land ownership correlates strongly with increased agricultural productivity and improved food sufficiency. Conversely, areas characterized by unstable land holding often grapple with insufficient crop yields, leading to food shortages and heightened vulnerability to food insecurity. Moreover, disputes arising from contested land ownership or usage rights can escalate community tensions and exacerbate the challenges in ensuring food access and availability. The pivotal role of land holding in shaping food security outcomes at the grassroots level cannot be overstated by underscoring the urgent need for equitable and sustainable land holding practices.

The analysis of the relationship between land holding practice and food security is based on the causal relationships between land holding arrangements, It increase investment in agriculture production when land is more valuable. Therefore, land and

the holding arrangements associated with it have become permanent. For this cross tabulation is done following different statistical tools for hypothesis testing according to the nature of the variable.

Inefficient holding systems on one hand limit the access to productive resources. On the other, it prevents the people from diversifying their income. Agricultural households that are dependent on rainwater for irrigation consume their maximum produce the crops have been harvested. This overconsumption has affected the future consumption in the whole year because of low productivity during dry periods. Diverse factor has caused food insecurity, namely, ratio of male members within the family, ratio of able-bodied members, households working outside as laborers, landless, near-landless, education, irrigation, tenancy, livestock, improved water, latrine, caste, etc.

Almost all of these factors are directly or indirectly linked to the land holding system of any household. As such, this study focuses study on the issues of land holding emphasizing on problems and prospects related to land holding and impacting on the food security of the household. This table summarizes the major elements of land holding and shows how they relate to different aspects of food security.

The figure 2.1 focuses on how land ownership, holding size, and transfer rights affect production levels, economic access to food, and nutrition consequences. The distribution and security of land holding are inextricably linked to agricultural production and food availability and emphasizes the importance of land holding in maintaining food security and better nutritional status for families.

It offers a framework for examining how various components of land holding affect food security. Each dimension focuses on a crucial component that serves as a focal point for understanding the relationship between land holding and food security

as well as an explanation of how they are linked. First, land ownership is important because it determines how land is allocated among people, families, and communities. Secure land ownership frequently results in improved food security outcomes because it stimulates long-term agricultural investments.

On the contrary, unstable ownership breeds uncertainty, the results in reduced production and food insecurity. Landholding size as a bigger holding gives more chances for agricultural output, diversity, and access to resources like loans and markets. On the other hand, smaller landholdings reduce output and risk of food insecurity.

2.5.3 Dimension of Land Holding Pattern with Food Security

The table 2.2 presents a thorough examination of how many dimensions of land holding are linked to food security. The table, divided into three Columns-Dimension, Key Variable, and Linkage-shows a clear grasp of how each aspect of land holding affects food supply and accessibility, which is critical for maintaining livelihoods.

The first component, Land Ownership, focuses on how land is divided among different groups in society, and how this affects their food security. Land ownership determines who owns land resources, and it impact directly on the ability of both an individual or community to generate food. In diverse circumstances, unequal land distribution creates considerable gaps in food security, including marginalized populations frequently having restricted access to agriculture-producing land, making them more vulnerable to food insecurity.

The next section, Land Holding, discusses the extent of landholdings and their relationship to agricultural output. Larger landholdings often allow for more broad and

diverse agricultural operations, perhaps resulting in better production levels and improved food security. On the other the same direction, smaller landholdings may limit the ability to produce enough food, leaving households with restricted land more vulnerable to food insecurity.

Table 2.2

Dimensions of Land Holding and Food Security

Dimension	Key Variable	Linkage
Land Ownership	Land Ownership	How land is distributed among different groups and its impact on their food security status.
Land Holding	Land Holding Size	Size of landholdings and their relation to agricultural productivity and food security.
Land Transfer	Land Transfer Rights	Legal and customary rights to land transfer and their effect on land holding security.
Food Availability	Production Levels	Influence of land holding on agricultural production and overall food availability.
Food Access	Economic and Physical Access to Food	Impact of land holding on household income and access to markets and food resources.

Source: Developed by the Researcher

Land Transfer is another essential factor that focuses on the statutory and customary rights associated with land transfers. Secure transfer of land rights allows people and communities to purchase, sell, or inherited land without worry about losing it. This stability stimulates investment in land upgrades and the adoption of environmentally friendly agricultural methods, eventually enhancing food security by guaranteeing that land stays productive and in the hands of those who are capable of using it efficiently.

The capacity to transfer land is important, as land transfer rights-whether controlled by legal or customary systems-influence land holding security. Secure land transfer rights improve food security by allowing families to access and use land effectively and productively. Land transfer restrictions or poor holding rights, on the other hand, might cause uncertainty, limiting access to land and jeopardizing food security. The issue of food availability is strongly related to agricultural productivity, since stable holding frequently results in better production levels due to a stronger willingness to invest in farming methods and technology. Insecure holding, on the other hand, can reduce output and food supply at both the family and community levels.

Finally, land holding affects economic and physical access to food. Secure holding raises household income by encouraging agricultural produce that can be sold for profit and allows the household to buy food from markets. Besides, solid holding can increase access to financing and other resources that improve food security. However, unstable holding can limit income-generating options and access to markets and resources, worsening food poverty. Overall, land holding stability is an important factor of food security, which impact on productivity, income, and access to food on a variety of levels.

2.5.4 Linkage with Maxwell and Wiebi

Maxwell and Wiebe (1998) have established a causal relationship between key variables such as land, production, income, consumption, and nutritional status. The table combines these dimensions and key variables with Maxwell and Wiebe's framework. The table "Linkages of Dimensions of Land Holding and Food Security with Maxwell and Wiebe (1998, p. 11)" provides a thorough framework for connecting essential aspects of land holding to food security. The table shows how various land holding factors such as the ownership of land, holding size, transferable rights, and food access affect food

production, revenue generation, and consumption. Each of these elements contributes significantly to family and community food security.

The first connection, Resources (Land), discusses land ownership. This dimension emphasizes how land is allocated among families and how this directly affects their ability to grow food. The concept Maxwell and Wiebe's underscores land ownership as a critical resource to food production.

Table 2.3

Linkages with Maxwell and Wiebe

Maxwell and Wiebe Framework	Dimensions of Land Holding	Keys Variables	Linkages
Resources (Land)	Land Ownership	Land Ownership	The distribution of land among households and its impact on their ability to produce food.
Production	Land Holding	Land Holding Size	The size of landholdings and their impact on production levels and food availability.
Income	Access to Land, Land Transfer	Land Transfer Rights	Rights to transfer land, that impact land holding security and household income generation.
Consumption	Food Access	Economic and Physical Access to Food	Access to markets and economic ability to purchase food, affected by land holding security.

Source: Developed by the Researcher by linking it with Maxwell and Wiebe Model (*1998, p. 11).*

Households having secure and equal access to land have more control over local agricultural techniques and results in a steady food supply. However, unbalanced land

distribution and insecure land ownership reduces the ability households to enough food leaving them particularly susceptible to food insecurity. The size of the landholding is an essential variable in the subsequent dimension of production. The extent of landholdings is critical in affecting productivity levels and food supply. Larger landholdings frequently enable households to take part in broader and more diversified agricultural operations, resulting in enhanced production and food supply.

Smaller landholding households, on the other hand, struggle to produce enough food to fulfill their requirements, making them more vulnerable to food shortages. In the model Maxwell and production is inextricably related to food security, including secure and appropriately sized landholdings improving agricultural output and total food supply.

The third factor is income that is concerned with access to property and land transfer rights. This link highlights the significance of secure land transfer rights, which allow people to sell, lease, or inherit land. These rights protect land holding stability and enable families to make money from their land. In the theory of Maxwell and Wiebe stable land holding directly adds to a household's economic stability since it allows for continuous revenue creation. Households with secure land holding are better positioned to purchase food, whether through agricultural output or land transactions to boost overall food security.

The fourth factor, Consumption, focuses on how secure land holding affects both financial and physical access for food. Households with solid land holding are usually more economically stable, allowing them to shop and buy food. Besides, accessibility to markets impact on physical availability to food. In this context, the "consumption" part of Maxwell and Wiebe's model refers to the actual food intake, which is determined by both the household's purchasing capacity and market access.

Secure land holding maintains household income, that increases food consumption and lowers the risk of food insecurity.

This table 2.3 highlights the complex link between land holding and food security. The use of Maxwell and Wiebi's paradigm clarifies that stable land holding is indispensable for assuring the availability of resources, agricultural productivity, revenue creation, and food consumption. Equitable land distribution, secure transfer rights, and suitably sized landholdings are critical components in ensuring long-term food security. In agricultural cultures where livelihoods strongly rely on land, resolving land holding concerns is critical for increasing food availability, access, and consumption that eventually contributes to long-term food security.

Gautam (2013) sees land ownership as a crucial component in Nepal's socioeconomic inequality, stating that the feudal land holding system traditionally concentrated land among upper-caste groups such as Brahmins and Chhetris, while marginalizing Dalits and indigenous peoples. This lopsided distribution exacerbates economic inequities and restricts access to resources. Upper-caste groups often possess bigger, more productive landholdings, but Dalits and indigenous communities frequently experience landlessness or own unproductive plots, limiting their economic mobility and involvement. He also emphasizes gendered inequality, noting that women suffer extra impediments to property ownership, compounding disparities. He pushes for equitable land transfer, acknowledgment of informal holding, and affirmative action to alleviate inequality and foster inclusive development in Nepal.

Maxwell and Wiebe's (1998) paradigm for food security highlights the role of land ownership, holding size, land transfer rights, and food access in maintaining food security. These factors are consistent with Gautam's (2013) research of land holding systems in

Nepal, which investigates how unequal land distribution, insecure land holding, and fragmented land holdings contribute to inequality and impede food security. Both frameworks emphasize the importance of stable land holding in increasing agricultural productivity, revenue creation, and food security. He contextualizes these worldwide concepts within Nepal's socioeconomic environment, demonstrating how land holding arrangements have a direct impact on household food security.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Philosophical Foundations

A research philosophy is a viewpoint on the methods used to collect, analyze, and interpret data about a phenomenon. In contrast to doxology refers to what is believed to be true the term "epistemology" refers to what is known to be true. This research is based on both ontology and epistemology.

3.1.1 Ontological Position of Land Holding Practice and Food Security

Pertaining to philosophical foundations ontology refers to the area of metaphysics that studies issues pertaining to the nature of existence, being, and reality. It has helped comprehend the fundamental concepts and frameworks that form the basis of existence. Ontology is the study of what entities or concepts are, how they are, and how they relate to one another. Ontology in sociology refers to the study of the nature of reality and the fundamental categories of existence. In the context of land holding practice and food security, the ontological position deals with how the essence of land ownership, control, and access, and its impact on the fundamental human need for food are understood (Ritzer, 2013).

The study takes a realism-based ontological stance. Realists believe that holds that there is an objective reality that exists apart from human perceptions and beliefs. This viewpoint assumes that the phenomena being studied-land exist in the real world and can be objectively measured and observed. The realist ontological stance significantly influences on research design and methodology in the following ways:

Because the research assumes an objective reality, it emphasizes empirical evidence and observable data consistent with the use of quantitative methods including surveys and statistical analysis, to collect and analyze data on land holding practices and food security outcomes among households in Barbardiya Municipality. The research produces objective and quantifiable findings. The positivist approach, consistent with realism has reduced researcher bias and subjectivity by employing standardized data collection and analysis techniques. Assuming an objective reality helps to achieve the goal of generalizing findings beyond specific context of the study. By validating theoretical models proposed by Moyo (1989) and Maxwell and Wiebe (1998), the study has gained broad insights into the relationship between land holding and food security.

A structured and systematic approach to research is based on the realist stance that includes developing specific research questions, employing rigorous data collection methods, and utilizing statistical tools to test hypotheses and establish causal relationships. Overall, the realist ontological stance impacts on research by emphasizing empirical evidence, objectivity, and a systematic examination of the association between land holding practices and food security. This approach ensures that the study is strong, reliable, and useful in advising sustainable development policies.

3.1.2 Epistemological Position of Land Holding Practice and Food Security

Epistemology is the branch of philosophy that studies the theory of knowledge. It investigates the nature, origins, and boundaries of human knowledge, posing questions about what knowledge is, how it is acquired, and how we can be certain of what we know (Audi, 1998). This field investigates into the relationship between belief,

truth, and justification, and it is critical for understanding how we perceive and interpret the world.

The epistemological stance used in this study of land holding and food security is positivism. Positivism holds that knowledge is founded on empirical evidence and can be obtained through systematic observation and experimentation. It focuses on objectivity, quantifiability, and the application of scientific methods to discover universal laws governing social phenomena. The positivist epistemological stance impacts on the research method selection and data interpretation in the following ways:

Quantitative Methods: Positivism prefers quantitative research methods such as surveys, experiments, and statistical analysis, which enable the collection and examination of numerical data. This study employs surveys and statistical analysis to quantify land holding practices, food security indicators, and their relationships.

Objectivity and Generalization: Positivism emphasizes objectivity and explores findings that are valid and applicable beyond the study's specific context. The research uses standardized data collection instruments and statistical techniques to reduce bias and establish universal patterns or relationships between land holding and food security.

Causal Relationships: Positivism discovers causal relationships between variables by testing hypotheses based on theoretical frameworks. The study uses statistical analysis to investigate how variations in land holding practices impact on food security outcomes, identifying key factors that contribute to food sufficiency and security.

Data interpretation is based on the positivist epistemological stance, which prioritizes empirical evidence and statistical significance. The findings are interpreted

using quantitative analysis prioritizing identifying patterns, correlations, and causal mechanisms that can be objectively verified.

Overall, the positivist epistemological stance directs the research by emphasizing empirical evidence, objectivity, and the use of quantitative methods to identify causal relationships between land holding practices and food security outcomes. This approach ensures that the study's findings are rigorous, reliable, and generalizable, there by adding valuable insights for the sustainable development.

3.1.3 Axiology Position of Land Holding Practice and Food Security

Axiology is a branch of philosophy concerned with ethics and aesthetics. It looks at the nature of value judgments, the criteria for determining what is valuable, and the principles that underpin moral and aesthetic evaluations. Axiology addresses the issues of what is good, what ought to be, and what is worthwhile (Rescher, 1969).

The researcher's axiological position in the study on land holding and food security emphasizes social justice, equity, and sustainability. The researcher is concerned with community well-being and promotes positive social change through empirical research and evidence-based policymaking.

Land is considered as a basic part of human experience and identity from a philosophical standpoint. It is more than just a physical resource; it signifies and connects to the natural world. Land represents feelings of location, belonging, and history, as well as a source of income, housing, and security. The researcher's values influence diverse aspects of the research process:

Choice of Research Topic: This research commitment to social justice and equity influences the research topic. Land holding and food security have been chosen

as focal points because they have significant implications for rural communities' livelihoods, particularly for those who are vulnerable to food insecurity and lack of land holding.

Methodological Approach: This research applied a quantitative methodological technique grounded with positivism, Conforming the principle formulated by August Comte. This approach prioritizes objectivity, empirical insight, and use of structure method to calculate social phenomenon. A household survey was carried out using a structured questionnaire to gather numerical data on land holding practices and their association to food security. This research focuses on distinguishing patterns and relationships through statistical interpretation, aiming to generate relevant findings based on observable and measurable evidence.

Findings Interpretation: The researcher's values impact on how research findings are interpreted, emphasizing the importance of contextual understanding and attention to local realities. The findings are examined through the lens of social justice and equity by highlighting disparities in land access, distribution, and food security outcomes when advocating for policy interventions that promote equitable land holding practices and food security.

Ethical Considerations: The researcher's commitment to social justice informs all aspects of the research process, including informed consent, confidentiality, and respect for participants' rights and dignity. Ethical principles are followed to ensure that the research process reflects the researcher's values such as integrity and respect for human dignity.

Overall, the researcher's axiological position shapes research decisions by emphasizing social justice, equity, and sustainability. These values influence the

selection of research topics, methods, results interpretation, and ethical considerations, ensuring that the research process is guided with a commitment to positive social impact and meaningful community engagement.

Land, on the other hand, is a source of conflict and inequality since it has frequently been exploited to assert authority, status, and money. Land has been a source of dispute throughout history, as numerous groups have attempted to claim and control it for various objectives. This has resulted in a complicated and tumultuous history of land holding patterns, with various types of ownership, tenancy, and usage.

In this context, the study on land holding systems has been significant since it reflects on how land is utilized, managed, and shared among various groups. Researchers can acquire a better knowledge of how land is allocated and exploited, as well as the social and economic repercussions of these practices, by investigating into aspects such as the area of agricultural land, the kind of land, and the form of contractual arrangements and land transactions. Finally, the study can help build more fair and sustainable land use systems.

The first question regarding land holding practice has been if the size of land matters? Larger plots of land are thought to be more productive and lucrative because they allow for a greater variety of crops to be cultivated and possibly more efficient use of resources such as labor and machinery. However, the size of the land is not the only determinant of its production. Other elements such as soil quality, irrigation, and agricultural techniques impact in land's productivity and profitability as well.

Besides, the location of the land is critical. Even though it is smaller land located in locations with adequate infrastructure and market access more valuable and lucrative.

A larger plot of land in a remote place with limited access to resources and markets, on the other hand, may be less productive and valuable.

Finally, the size of the property is only one aspect considered when assessing its productivity and profitability potential. It is vital to examine the quality of soil, availability to irrigation and other resources, and the position of land to marketplace and infrastructure.

Food security can be defined as when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security exists at the individual, familial, national, regional and global levels. Food security as a social structure changes as it is independent and somehow dependent in terms of time and space when interacting with land holding practice. This study analyzes food security from a socio-cultural vantage point of view. The understanding of the food security is likely to change in accordance with time and place. Hence, the diet chart produced/prepared by a dietician or nutritionist is unlikely to be included in the food culture of the study area.

The knowledge and understanding on land holding and land titles featured prominently in early agricultural economies, land holding security and agricultural productivity can be investigated into separately. The association between land holding security and agricultural productivity is a relatively new subject. Although there have been publications on the subject, the relation between land holding and production continues to be conceptually described rather than operationally quantified.

The relation is debatable. Initially, individual and secure land holding rights are prominent components of a productive agricultural sector that helps alleviate poverty.

Although the links between holding security and agricultural productivity are indispensable, the reverse link holds significance important. Holding security is endogenous a positive correlation between investment and land holding security could occur, because people invest more in holding secure. Nonetheless, the proposition still lacks substantial grounding.

The philosophical proposition of the setting can create tension or can be dialectic with conceptual, theoretical and empirical perspective. To explore the relationship between land holding and production has become the core aspect of the study. Therefore, the research like to show my proposition/standing more clearly at finding level for satisfying myself and reader.

3.2 Methodological Alignment with Research Goal and Objectives

To effectively address the research questions, this study has taken a positivist approach, as conceptualized by Auguste Comte. The positivist approach emphasizes empirical, observable, and measurable evidence, which is consistent with the study's goal of producing objective and quantifiable findings.

Quantitative methods, including surveys and statistical analysis, have been used to collect and analyze data on land holding practices, land use, and food security among the residents of Barbardiya Municipality. The methodological choice ensures that the findings are based on empirical evidence that allows for the generalization and validation of the theoretical models proposed by Moyo (1989) and Maxwell and Wiebe (1998).

This study has used household surveys to collect data. A thorough review of various research approaches was presented in the chapter preceding which supported

the researcher's choice of the research methodology Besides a thorough examination of the research methodology employed to gather and analyze the data. The study design, data type, sampling, sample size, data collection tools, data analysis techniques, and research procedures were all explained in this chapter with the justification for the choices made in the study.

3.3 Research Design

3.3.1 Research Paradigm

The research paradigm to this study is positivism, which is based on a realist ontology, positivist epistemology, and social justice and equity. Realism holds that an objective reality prevails independent of human perceptions and can be measured and observed. Positivism focuses on empirical evidence, objectivity, and the application of scientific methods to uncover universal laws. The researcher's commitment to social justice and equity motivates has motivated the researcher to look into land holding practices and food security in order to help bring about positive change.

3.3.2 Research Approach

The research has employed a quantitative approach which is consistent with the positivist paradigm's emphasis on achieving objective, quantifiable, and generalizable outcomes. The quantitative methods allow the study to systematically assess and evaluate the relationships between land holding practices and food security outcomes by ensuring that the findings are based empirical evidence.

3.3.3 Research Strategy

A survey method has been employed. Surveys are useful for gathering large amounts of data from a broad universe and allow the researcher to gain comprehensive information on land holding practices, land use, and food security among households in Barbardiya Municipalitity. Surveys have enabled the researcher to collect standardized data that facilitate statistical analysis for testing hypotheses and identifying patterns or correlations.

3.3.4 Introduction to Barabardiya Municipality

According to Municipality Profle, Barbardiya Municipality, situated in Bardiya district of Lumbini Province in Nepal, was constituted on the 27 Falgun, 2073 by the Government of Nepal proclamation. This municipality was founded by merging four village development committees: *Savik* Baniabhar, Padnaha, Magragadi, and Dhadwar. It consists of 11 wards. It is located in the heart of the Bardia district ranging the temperature from 28 degrees 26 minutes and 28 degrees 36 minutes' north latitude and 81 degrees 30 minutes and 81 degrees 50 minutes' north longitude (Municipality Profile of Barabardiya, 2022).

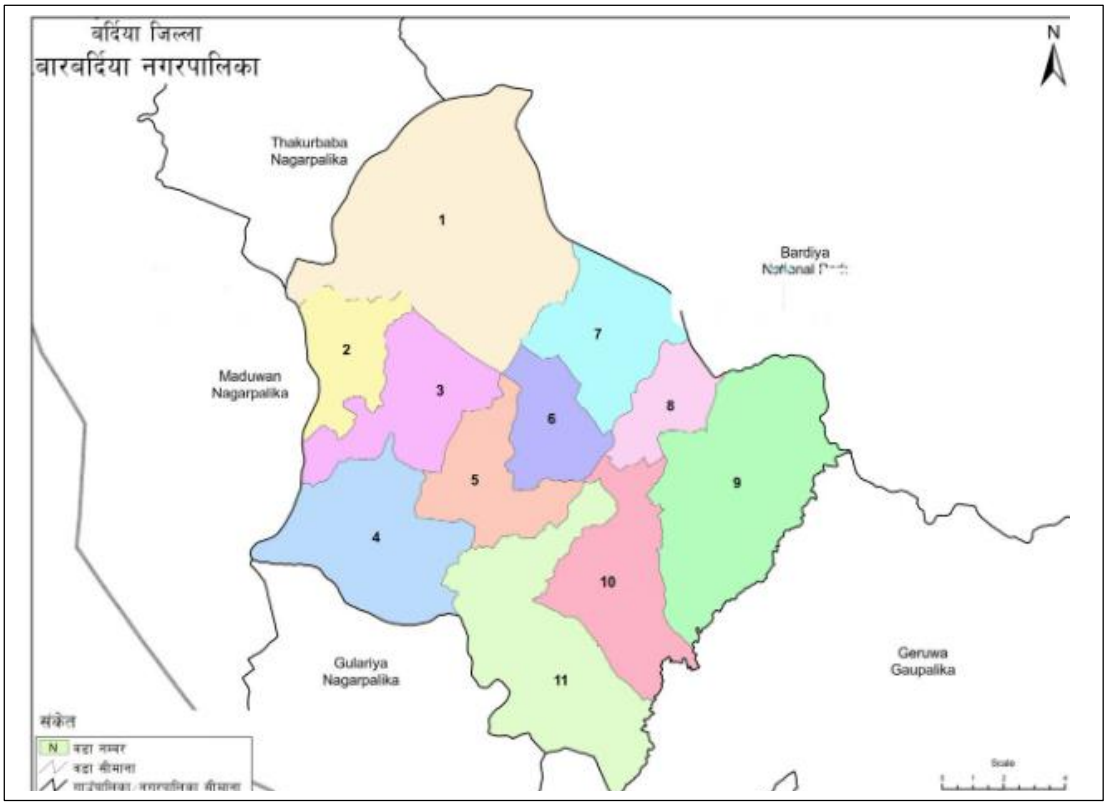
The borders are Bansgarhi municipality in the east, Madhuwan municipality in the west, and Bardia National Park in the north and Thakurbaba Municipality and Guleria Municipality in the north. This municipality has a total population of 68012 people, with 32673 men and 35339 women. This municipality has an area of 226.09 square kilometers and stands around 175 meters above sea level. Other specifics about this municipality, which includes some *Chure* territory in the north and Terai territory in the south (Municipality Profile of Barabardiya, 2022).

3.3.5 Rational for Selecting Barbardiya Municipality

The current study has selected Barbardiya Municipality as the location of the study. First landscape is plain region where farming activity is part of livelihood most which will help to investigate land holding practice and food security as a crucial in western Nepal; directly aligned with the research objective. The municipality has proclaimed to ensure a variety of food security conditions and land holding systems. Secondly, diversity of land holding practices in Western Nepal from traditional community-based system to more modern approaches, has allowed me to make a comprehensive examination of how these practices affects food security outcomes.

Figure 3.1

Map of Barbardia Municipality



*Source:*https://www.nepalarchives.com/map-of-barbardiya-municipality-bardiya-nepal/. *(Date: 08/07/2018 - 15:16)*

In addition, the variation in food security levels across the region, shaped by differences in geographical, agricultural, economic, and resource-related factors, has presented insightful data. The unique local characteristics of the municipality, influence by culture, history, and economy conditions, helps deepen the understanding of how specific regional factors interact with broader, general trends. This decision has been influenced by practical considerations as well as including data accessibility and logistical viability and the possibility of building on prior research or filling in knowledge gaps. stakeholders.

Barbardiya Municipality due to its distinct geographical and demographic condition had tremendous potentials for research which focuses on the dynamic interaction between land holding practices and food security. Because of its strategic location within a significant agricultural region; it's rich ethnic diversity, its relative isolation from contemporary urban influences, and the presence of relevant government programs. This setting had provided a solid platform for multifaceted investigations.

3.4 Population, Sampling Method and Sample Size

The demographic statistics and sample frame for the research region present a complete picture of the households being investigated. According to the 2075 Municipality Profile, there were a total of 5,694 households divided across four wards: Ward 8 had 1,331 homes, Ward 9 had 1,522, Ward 10 had 1,697, and Ward 11 had 1,144 families. This data has been used to analyze the demographic Structures.

When the poll was conducted, the research has used the Municipality Profile of 2075 BS as a sample frame, that revealing a modest rise in homes, totaling 5,981 over the same wards. Ward 8 had 1,425 homes; Ward 9 had 1,634; Ward 10 had 1,800; and

Ward 11 had 1,122. The revised profile reflected adjustments. This revised profile included changes in population and housing over a three-year period, offering a more current picture of the region. The disparity between census data and the sample frame demonstrates the population's changing character, and the sampling frame selected so far assured that the survey was based on the latest data. This enabled a more exact portrayal of the current household distribution, as well as precise sample selection and improved survey reliability.

In social research, sampling issues emerge in the creation of observation and measuring procedures, as well as in the analysis and interpretation of data. Fundamentally, they arise from constraints on the amount, accuracy, and breadth of observations and their solution determines the most efficient approach to do research within these constraints. There is no generally "optimal" sampling approach; each methodology is tailored to the specific characteristics of the scenario. The original specifications, design, costs and resources, accuracy, operation, and usage of sampling are all discussed (Stephan, 1950, p. 371-375).

To calculate the sample size for a population (N) is 5,981, confidence level 95% means Z-value = 1.96, confidence interval (margin of error): 5% means e = 0.05 and population proportion (p) is 0.5 (assumed maximum variability) which exist in households in Barbardiya Municipality ward number 8. 9, 10 and 11 and we need to use the sample size formula used is the Cochran's formula:

Sample Size Formula (for proportions**): $n_0 = (Z^2\ p\ (1 - p))\ /\ e^2$,** Where:

n = sample size (before adjusting for finite population)

Z = Z-value (based on confidence level)

p = estimated proportion of the population (commonly 0.5 if unknown,

for maximum variability)

e = margin of error (confidence interval. As a decimal)

Now, we need to use value,

$$n_0 = (1.96)^2 \cdot 0.5 \cdot \{(1 - 0.5)/(0.05)^2\}$$

$$= 3.8416 \cdot 0.25/0.0025$$

$$= 0.9604/0.0025$$

$$= 384.16$$

Since the population of the study area is not infinite, we need to apply the finite population correction (FPC), where N = 5981 and n_0 = 384.16.

$$\textbf{FPC} = n = n_0/\ 1 + (n_0 - 1/N)$$

$$= 384.16/\ 1 + \{(384.16 - 1)/5981\}$$

$$= 384.16/\ 1 + (383.16/5981)$$

$$= 384.16/\ 1 + 0.06406$$

$$= 361 \text{ HHs}$$

Table 3.1
Calculating Sample Size at Barbardiya Municipality

Factors	**Factors description**	**Number**
Household Size (no.)	The total population that sample will present	5981
Confidence level (%)	The probability that the sample accurately represent the characteristic of the population	95%
Confidence-interval (%)	The range that the population responses may deviated from the sample	5%
	Sample Size Calculated	361

There were 5,981 households in Ward number 8, 9, 10 and 11 of Barbardiya Municipality. This group includes a range of household types and land holding systems. Besides, it helps to justify a thorough study.

A degree of confidence of 95% and a 5% interval of confidence (margin of error) has been used to calculate the sample size, which equals 361 households. Standard statistical procedures that strike a compromise between accuracy and resource limitations have been used to compute this sample size. The main criteria used to determine the sample size for the research in Barbardiya Municipality are explained in this table 3.2.

Table 3.2

Determine Size of Sampling

Ward Number (Purposive Sampling)	Household Size (N)	Proportion (%) of Population	Random Sample Size (n)
Ward 8	1425	17	86
Ward 9	1634	17	99
Ward 10	1800	17	108
Ward 11	1122	17	68
Total	5981	17	361

Source: Household Survey (RM Profile) 2075

In simple terms, sampling is the process of gathering data from a larger population or group. Dealing with a sizable, diverse population dispersed over a vast area can be difficult for a social researcher, especially when there are time and financial constraints. It is not always possible to gather data from the entire population of such a size. When conducting research, a representative sample of the population is frequently used, and this sample can shed light on the population. Sampling streamlines the research process by enabling researchers to draw accurate conclusions without having to examine every single subject (Thompson, 2012).

The sampling method used for the study in Barbardiya Municipality; combines purposive sampling and random sampling within the selected wards. The dual approach ensures that the sample is both representative and relevant to research objectives. Ward 8, 9, 10 and 11 were specifically selected. With purposive sampling, particular units have been objectives of the study. Selected in accordance with pre-determined standards pertinent to the objectives of the study. These wards were selected because of certain traits pertaining to food security and land holding. The wards were selected because of their importance to the research. Certain land holding systems, differences in food security, or other pertinent elements are present in certain wards that make

Random sampling methods were used to choose households within each of the wards that was purposefully selected. Selection bias has been eliminated by random sampling, which guarantees that every house in a ward has an equal chance of being included in the research. Every household in each ward selected was listed, and then each house was selected at random using a random number generator or a comparable technique.

3.5 Methodological Approach

According to Neuman (2004) research techniques can be classed as quantitative, qualitative, or mixed methodology or triangulation. Triangulation makes use of both qualitative and quantitative data (Cited in Rawal, 2017). Quantitative research procedures differ in numerous aspects, including the research output. As a result, it is critical to evaluate these distinctions between research approaches in order to select the most appropriate one for the phenomena under investigation. Gautam (2013) defines what before delving into the methodology used in the study, it is necessary to clarify

two key things concerning the nature of the study and the sources of data used. First and foremost, the study is mostly quantitative in character.

According to Dawson (2002), qualitative research investigates attitudes, actions, and experiences using methods such as in-depth interviews or focus groups. The qualitative technique elicits an in-depth view of the respondents by emphasizing behavior and experiences. Because qualitative research places a premium on respondents' behavior and experiences fewer people participate in it. However, engagement with respondents lasts far longer than in quantitative research.

Using a logical process of information acquisition, quantitative methodology describes, tests, and analyses cause and effect relationships (Burns & Grove, 1987). Unlike quantitative techniques, which evaluate theories deductively from existing data by creating predicted correlations and suggested study outcomes, qualitative researchers are directed by specific ideas, viewpoints, about the issue to be examined (Cormack, 1985). The 'paradigm' of social constructionism, description, and interpretation affects qualitative research. Besides, quantitative research mostly generates data through large-scale survey research, which employs procedures such as questionnaires or organized interviews (Dawson, 2002).

Dawson (2002) states that quantitative research relates to many more individuals than qualitative research, However the, interaction with those people is considerably faster in quantitative research. The devices or tools used for data gathering are referred to as research techniques in the next section.

The distinction between research methodology and research techniques is that research methodology is an overall approach to researching a topic, whereas research methods are the instruments that the researcher has used to acquire data. The next

chapter digs into the data gathering tool that has been employed. In the study, I have linked Land holding with Land owned, share cropping, rented, Mortgaged-In and Increase or decrease in Land holding within the household level.

3.6 Method of Data Collection

A questionnaire survey was used to gather data from the selected wards. This method was created to gather comprehensive data on topics, including family food security, land usage, and holding patterns. The survey included a number of important topics. First, demographic data were collected, including information on the age, gender, and work status of the residents. Second, by looking at land ownership patterns, land holding security, and land transactions, it looked at land holding practices.

The land use section of the questionnaire examined crop kinds, agricultural practices, and irrigation techniques used by the families. Finally, the survey evaluated food usage, availability, and access as well as diversity and patterns of food intake to measure food security. The goal of these extensive data gathering initiatives has been to offer a thorough picture of the municipality's agricultural and socio-economic processes.

To ensure systematic and reliable data collecting, the process needed numerous processes in the data collection process. To improve the questionnaire, a small group of households participated in a pilot research. It took me twenty-five days to gather the data, during which researcher went door-to-door throughout the selected ward of the municipality and explained the research objective to receive the consent, and filled out the questionnaire. The procedure followed a well-organized schedule and

comprehensive guidelines, with regular plans and frequent evaluations to ensure quality and quickly resolve problems.

3.6.1 Operationalization, Measuring Variables and Indicator

The study has converted abstract concepts into measurable observations to make them operationalized. It helped to define how to measure, observe, or manipulate a concept in the research. The research has used operationalization to collect and evaluate phenomena that could be observed directly. In the table below the researcher have operationalized a concept related to land holding practice and food security by segregating it under various indicators and what kind of test I was going to measure for the study.

The table 3.3 presents a framework for comprehending the connection between land holding and food security. There are three components in the table: idea, variables, and indication. It carves an organized method to understanding how inequality theory relates to land holding and food security. This approach deconstructs several characteristics of land holding, such as ownership, usage patterns, and transfer rights, and connects them to food security results. This demonstrates how discrepancies in land access and management lead to differences in food availability and security among families.

The notion of land holding was studied using various critical factors, beginning with land ownership. Ownership is an important component in determining a household's ability to engage in agricultural operations. Indicators such as the state of agricultural land ownership, land categorization based on local circumstances, and whether families sold or transferred property have given information about how secure or unstable land ownership affects food supply. Families with ownership were better

positioned to develop crops, but those forced to sell or transfer land experienced food insecurity. The status of land transactions, including selling and purchasing, represents additional economic constraints on people, impacted on their food security.

The table 3.3 focuses on land use patterns, namely the size of landholdings. Households with greater landholdings often have more resources to produce food, but smaller or fragmented landholdings have limited agricultural productivity. Various types of land access including rented land, mortgaged land, and sharecropping agreements, have been key indications of how families cultivate land other than their own.

These metrics highlight the impact of informal or semi-formal land arrangements on food security, particularly for households without large land assets. Access to public land serves as a valuable complement for people with limited private holdings, changing the capacity of households to satisfy their food demands. Land transfer rights, refer to the capacity to sell, lease, or inherit land. Secure transfer rights enable people to successfully manage their land holdings, either for agricultural output or income creation. Insecure rights, can cause economic instability by limiting a household's capacity to produce or acquire food. The duration of sharecropping and the status of land transfer all impact on the predictability and stability of land use that eventually affects food supply and security.

The chart discusses the different types of terrain and how they affect food production. Land categorization based on laws and local conditions impacts how land is utilized and whether it can be productively farmed for agricultural purposes. The availability of irrigation is significant since it increases agricultural production and

reliability. Irrigated land produces more constant food than rain-fed land, which is more susceptible to seasonal changes and droughts.

Table 3.3

Conceptualization of Theory with Concept, Variable and Indicator on Landholding Pattern and Food Security

Theoretical Framework	Concept	Key Variable	Indicator
Theory of Inequality	Land Holding Pattern	Land Ownership and Land Use Practice	Farm Categories of the Family based on Size
			Land Holding Size of Rented-In Land
			Land Holding Size of Mortgage-In Land
			Land Holding Size of Sharecropping-In Land
			Land Holding Size of Sharecropping-Out Land
			Household Holding Public Land Size
		Land Transfer Rights	Rights to transfer land
			Sharecropping-In Period (In Year)
			Status of Land Transaction
		Type of Land	Type of Land
			Type of Land according to Policies
			Condition of Irrigation in the Field
			Mode of Irrigation of the Field
		Status of Agriculture Land	Status of Agriculture Land being Irrigated or Rainfed

Source: Developed by the Researcher

Finally, this conceptual framework demonstrates the complex linkages between land holding and food security. By assessing indices of land ownership, landholding size, transfer rights, and irrigation status, the framework emphasizes the necessity of stable land holding ownerships in achieving food security. Households with consistent access to land and the ability to efficiently manage and use that property are better positioned to produce food, lowering their susceptibility to food insecurity. This research emphasizes the need of policies that address land holding imbalances and

encourage sustainable land use practices in order to increase food security, particularly for rural and agricultural populations.

The table 3.4 conceptualize theory with concept, variable, and indicator on Food Security. It sees theory of inequality with food security by concentrating on factors such as production availability, sufficiency, and insufficiency. It employs a variety of measures to investigate how household differences, particularly in terms of resource availability, impact food security outcomes. The theoretical approach focuses on how social and economic disparities affect food production and consumption patterns, as well as a household's capacity to satisfy its food demands.

The idea of food security is examined using the variables of production availability, sufficiency, and insufficiency. This variable demonstrates how a household's capacity to reliably get food is critical to food security. The first indication, household food consumption patterns, displays the types and quantities of food consumed by households, indicating if they are meeting their nutritional requirements. These patterns are important for understanding the quantity and nutritional quality of food accessible to households, as they provide a direct measure of food security. Households with diversified foods are more likely to be food secure, but those with repetitive diets can suffer from nutritional inadequacies, even if they eat enough.

The indication is the cause of insufficient food, which reveals structural or economic barriers that hinder households from having enough food. Income restrictions, a shortage of agricultural inputs, and environmental shocks can all reduce food production or purchasing power that result in food insecurity. The practice of reducing or missing foods owing to a shortage of food is next sign of food insecurity that emphasizes the gravity of the situation for certain households. Skipped foods

frequently indicate food shortages and demonstrate the direct impact of inequality on access to nutrition.

Table 3.4

Conceptualization of Theory with Concept, Variable and Indicator on Food Security

Theoretical Framework	Concept	Key Variable	Indicator
Theory of Inequality	Food Security	Production Availability, Sufficiency and Insufficiency	Household food consumption patterns Reasons for insufficient food Cutting or skipping meals due to lack of food Use of improved crop varieties Types and status of crop production Livestock/poultry raising status Household food diversity

Source: Developed by the Researcher

The table looks at the influence of agricultural techniques in food security, including the usage of enhanced crop types. Households that employ more resilient and productive crop types have better food security outcomes because these crops produce greater yields and are more resistant to pests and climatic unpredictability. This indicator contributes to the wider subject of inequality by demonstrating that families with more access to agricultural technology and resources are more likely to attain food security, whereas disadvantaged households lack the ability to invest in such improvements.

Crop type and condition are the indicators of a household's food production potential. Households that grow a variety of crops are more likely to be food secure because they are less susceptible to crop failure or market shocks. Besides, livestock/poultry rearing status has a complementary function in food security. Households that raise livestock or poultry can enrich their diet with animal protein while also earning money via the sale of animal goods. The capacity to keep livestock reflects larger inequities because households with greater land or more financial resources are better equipped to support animal husbandry.

Finally, household food diversity is a reliable measure of food security. Food diversity is necessary not just to fulfill caloric requirements, but also to provide a balanced intake of important elements. Households that consume a range of foods, such as grains, vegetables, fruits, and proteins, are more likely to have greater levels of food security than those that eat staple crops.

This table 3.4 demonstrates how food security is closely linked to social and economic disparities, particularly those related to production capability and resource availability. Production availability, sufficiency, and insufficiency are key characteristics that determine whether families attain or struggle with food security. Households having access to enhanced agricultural inputs, diverse food production, and animals are more likely to be food secure, whereas those with limited resources, forced to curtail meals, or a lack of crop diversification are more vulnerable. The concept highlights that differences in land access, income, and agricultural resources lead to discrepancies in food security results. Addressing these discrepancies through specific policies, such as better agricultural technology or safety nets for disadvantaged households, is indispensable to attaining universal food security.

3.6.2 Tools, Procedures and Materials Used to Gather Data

For data gathering and analysis, a variety of approaches can be used. The majority of them are built around a set of fundamental tools. Interviews, focus group discussions, observation, photography, video, surveys, questionnaires, and case studies have been used as research methods. Direct measurement, secondary data assessment, and informal project / program management techniques can all provide data (Koch et al., 2022). In this research the tool, procedures and materials used to gather data are as follows:

Household Survey has been used as a method to collect data for the study. I collected data of the study area with a sample size of 361 households. A household survey was undertaken to collect detailed information on current land holding systems, identify the motivations for becoming a land renter and/or choosing for migration, define agricultural production from land holding, and document the respondent family's degree of food sufficiency. For this, a semi-structured questionnaire with both open-ended and closed-ended questions was created. Household Survey using questionnaire was done through SMAP Server a mobile platform for research survey.

Smap Consulting (Smap) offers a variety of solutions for a variety of applications, including evaluation, monitoring, guidance, and case management. The use of digital technology for data gathering has been demonstrated to cut expenses, improve data quality, and shorten the time between data collection and implementation of data-driven learning. However, it is this last benefit, that it takes a shorter time to apply what one has learned, that has the most potential to improve program outcomes.

3.6.3 Selection of the Study Area

The study covered Barbardiya Municipality, Wards 8, 9, 10 and 11 located in Bardiya district of Lumbini Province. Barbardiya is a municipality in the Bardiya district with district regional identity in Nepal. It is politically located in Nepal's Terai belt, with significant geographic variations. The land quality in the district is pretty excellent, and it is well suited to agricultural development.

3.7 Methods of Analysis

"Data analysis" is defined by De Vos (2002) as "the act of providing order, structure, and meaning to the Black gram of acquired data." Data acquired using the qualitative technique is typically huge in volume and, unless organized in a certain way, can be difficult to comprehend for both the researcher and others who can benefit from this study. Data analysis is the process of arranging data in a logical and simpler manner. Following the fieldwork, the data was processed and presented in a clear way (p. 339).

To analyze the data, the results were first captured during the interview on the Household (HHs) Survey using the SMAP program. The acquired data was prepared prior to analysis. Missing data and outliers were verified in the dataset. The "outlier labeling rule" was employed for this. Outliers were defined as any value that fell outside of the computed range (Hoaglin & Iglewicz, 1987). After that, the data was examined using the statistical program SPSS. I used a multifaceted strategy for data analysis in the quantitative research.

In the beginning, the researcher used descriptive statistics to identify the key features of the dataset. Then used histograms, bar charts as visual tools to identify data

trends in addition to statistical measures like mean, median, mode, and standard deviation. The research ventured into inferential statistics, moving beyond description, which allowed me to extrapolate population-based insights from the sample data. This included testing hypotheses using tools like G-test to unravel complex relationships. Then carefully coded and cleaned the dataset, transforming categorical variables into numerical formats and assiduously fixing errors to ensure data suitability. Cross-tabulations was done, which made them an especially useful tool for analyzing survey data. Specialized statistical software was added to the analytical toolbox to enable accurate execution of various tests and calculations.

Besides, the research investigated techniques for reducing data complexity, such as factor analysis and principal component analysis, which revealed latent patterns in the dataset. The analysis' thoroughness enabled me to derive significant insights and dependable findings, which were in line with research goals and ensured the validity of the quantitative study.

3.8 Reliability and Validity

This study evaluated the reliability of the research instrument by Cronbach's Alpha, a statistical metric for internal consistency. The analysis was performed using SPSS (Statistical Package for the Social Sciences), whereby the acquired data were input and examined via the reliability analysis feature. This approach produced an alpha coefficient (α) that reflects the degree to which the items in the questionnaire reliably assess the same underlying construct. According to established norms, a Cronbach's Alpha value of 0.80 is considered indicative of good internal consistency. The application of SPSS facilitated an efficient and precise computation of the reliability

coefficient, so validating that the questionnaire items were consistently aligned with the study objectives and appropriate for subsequent analysis.

The research was meticulously planned to precisely document the family features and landholding structures pertinent to the region. The questionnaire was created considering the pertinent local context, with major topics such as land ownership and household size well delineated to prevent ambiguities. My direct engagement with respondents facilitated clarification when necessary, so ensuring that the replies accurately represented their circumstances. The survey findings are both precise and representative of the target population in Barbardiya Municipality.

3.9 Field Experiences

The researcher had decided to have it on the Barbardiya Municipality in Bardiya. The research was meticulously investigated and studied the area by using households as the main unit of analysis. The research process included randomly visiting each household as part of the selected sample. The researcher had discussed the knowledge and insights I gained from the fieldwork in Barbardiya in this dissertation. The study goal was to connect the dots between land holding practice and food security by fusing my personal and professional responses to this work.

The field experience was carried out in a real-world social setting by limiting the number of variables as much as possible. The researcher was immersed in unfamiliar environments throughout the fieldwork and experienced those social contexts. The researcher was interacted with people while gathering primary data using techniques like social surveys (often via questionnaires), interviews, and observations.

CHAPTER IV

LAND HOLDING PATTERNS IN BARBARDIYA MUNICIPALITY

Land is one of the most valuable possessions as it signifies people's cultural and social identities. It is a useful tool for boosting economic growth. Individuals and groups' relationships with land and land-based resources are referred to as land holding. Land holding systems establish who has the right to own and use resources, for how long, and under what circumstances. When a society has both official and informal institutions, holding rules can overlap, that creates confusion and instability. Gender, race, class, and political affiliation impact on affect land holding. Different land holding systems have their own set of benefits and drawbacks. Individual land ownership make land more economically effective, but exclude disadvantaged people, such as the poor, and limit state land management alternatives as well. Land systems can be reviewed comprehensively in both official and informal settings for inclusive and sustainable land governance. Individuals and communities' attitudes about land and associated resources show the significance of land. Land holding rules describe how property rights to land are granted, transferred, utilized, and administered in a society.

Land holding pattern in Nepal refers to rights and duties of both individuals and communities pertaining to land and other natural resources. Land holding in the Bardiya District is managed by a blend of traditional practices and national regulations. Land in the Bardiya District has traditionally been held for agriculture, forestry, and other reasons by communities. Land holding in the study area is frequently dependent on customary customs with few variations based on community differences. Land in Nepal is owned by the state and administered by the Department of Land Reform and Management (DoLRM), according to national regulations The DoLRM holds the

authority to put land reform ideas into action and grant land holding certificates to individuals and communities.

4.1 Setting of the Study Area

Barbardiya Municipality, located in Bardiya District of Nepal, presents a unique geographical and demographic profile indispensable for understanding the region's socio-economic dynamics. Barbardiya is situated in the plain, characterized by its proximity to the Bardiya National Park is a significant ecological and tourist attraction. The municipality is strategically located near the Babai River, which enhances its agricultural potential but also poses risks including floods and landslides during the monsoon. The climate is typically subtropical, with warm summers and mild winters, which supports diverse agricultural activities, predominantly rice, wheat, and maize cultivation.

Barbardiya has a diverse ethnic population, with the Tharu people standing out the most. This indigenous population has distinct cultural traditions and dialects that profoundly impact on the municipality's social fabric. The municipality has also seen significant migratory patterns, among people interested in overseas, mainly in Gulf countries that has ramifications for local employment dynamics including family structures.

Barbardiya's socio-economic conditions combine traditional customs blended with modern influences. Numerous households continue to rely on subsistence agriculture, although there is an increasing trend of diversification of livelihoods, involving tourism and small-scale businesses, particularly in regions near the national park. Besides, gender-based violence including food security are major challenges that

require focused interventions to improve inhabitants' overall quality of life (Barbardiya Municipality Profile, 2075).

4.1.1 Ward Wise Distribution of Population Size of Household

Using information from the Municipality Profile of 2075 (2018 AD) and the Census of 2072 (2015 AD), the table 4.1 provides a useful comparison of home size and population across four wards (8, 9, 10, and 11) in Barbardiya Municipality. At 8,533 households, or 28.56% of the total population in the four wards, Ward 10 was the most densely inhabited in 2072 B.S. Ward 8 had 7,169 people (24.00%), Ward 11 had 6,267 people (20.95%), and Ward 9 had 7,911 people (26.49%). All of the wards had a very balanced gender distribution, with 50.49% of the male population and 49.51% of the female population.

Table 4.1

Status of Family and Population at Barbardiya Municipality (Study Area)

Ward	Census (2072)				Municipality Profile (2075)
	Household Size	Population			Household Size (Sample Frame)
		Female	Male	Total	
8	1331	3548	3621	7169	1425
9	1522	3982	3929	7911	1634
10	1697	4205	4328	8533	1800
11	1144	3059	3208	6267	1122
Total	5694	14794	15086	29880	5981

Source: CBS, 2072 B.S., Municipality Profile, 2075 B.S.; collected from the office of municipality.

The size of households increased in all wards except ward 11 between 2072 B.S. and 2075 B.S. The highest increase in household size was seen in ward 10, where there

was a 6.07% increase from 1,697 to 1,800 households. This increase is a sign of a population rise in family sizes brought on by improved local infrastructure or employment prospects. In a similar vein, the number of households in ward 9 increased significantly to 1,634 households. However, ward 11 saw a 1.92% decrease in household size, from 1,144 to 1,122 households, which indicates fewer families or out-migration because of various socio-economic conditions.

The general pattern in wards 8, 9, and 10 indicates a trend of rising settlement in these regions the steady rise in both household size and population. This increase implies that Barbardiya Municipality has been urbanized, with more residents relocating to these wards because of better living circumstances, more favorable economic situations, or other alluring elements. On the other hand, the decrease in households in ward 11 can be the result of other local factors, including industry shifts or migration to other areas.

The information concludes by highlighting the differences in family and population dynamics among the four wards of Barbardiya Municipality. The increases in household size and population, especially in wards 9 and 10, highlight the necessity for the local planning agencies to carefully manage infrastructure, services, and resources to support these regions' expanding populations and evolving family structures.

4.1.2 Number of Settlement by Ward

When I visited the Barbardiya Municipality to conduct a field study as shown in the table 4.2, which provides an overview of the settlement areas within the 8, 9, 10 and 11 wards of Barbardiya Municipality. Each ward has a unique collection of settlements that represent the varied topography and cultural milieu of the municipality.

There are 19 different villages in ward 8, including Chauki Tol, Bhagatpur, and Beech Tol, among others. The presence of numerous villages implies demographic diversity. The coexistence of more recent developments like Sukumbasi Tol and historic villages like Shivnagar implies a mix of older communities and newly constructed settlements, potentially indicating continuous migration and urbanization processes.

Table 4.2

Name of the Settlement According Ward in Barbardiya (Study Area)

Ward	Name of Settlement
8	Chauki Tol, Bhagatpur, Beech Tol, Shivnagar, Simalghari, Ram Nagar, Mahatan Tol, Jakartol, Sukumbasi Tol, Raj Kulo Tol, Vakhalbhar, Dudha, Thanphena, Sanjhana Tol, Nakkifanta, Bargadi, School Tol, Dakshin Tol, and Pathariya Tol).
9	Katarnia, Saushawa, Prasahwa, Vanagai, Khaeri, and Dhakela.
10	Dhadhwar, Hausalpura, Damra), Vaidi, Vaidi Danda, Gumasta), Vaida, Simrahwa, (Meraiya), Dafaiya, Uttarlamki, and Shobhanagar)
11	Jabdi, Khuntipur, Akalgharwa, Phachkhwa, Belbhar, Lamkiphanta, and Vijay Nagar.

Source: Field Survey, 2022

In contrast, Katarnia, Saushawa, and Prasahwa are among the six villages that make up ward 9. Given the rural character of the village names, the fewer settlements in this ward would point to a more concentrated or homogenous population that probably concentrates on agricultural pursuits. This could indicate that, in contrast to ward 8, the village structure is less diversified.

There are twelve villages in ward 10, including Hausalpura, Vaidi Danda, and Dhadhwar. Similar to ward 8, this ward has a blend of more contemporary and historic

villages, that indicating a dynamic environment with various community structures. The diversity in ward 10 may encourages a variety of economic endeavors, such as small-scale business and farming that suggests a potentially thriving local economy. Ward 11 has seven villages, including Vijay Nagar, Khuntipur, and Jabdi. The terrain is more subdued but still diversified. Due to shifting socioeconomic dynamics, the ward is developing from a predominately rural to a more mixed-use region, as seen by the coexistence of both agricultural villages and more urbanized neighborhoods like Vijay Nagar

Generally, traditional villages and developing settlements are mixed together in these four wards of Barbardiya Municipality's settlement patterns. While wards 9, 10, and 11, each has distinctive settlement characteristics that add to the municipality's overall variety, Ward 8 stands out for having a greater number of settlements, implying a more populated and diversified ward. The numerous settlement kinds and densities seen in each ward demonstrate how intricate and dynamic community life is in Barbardiya Municipality.

4.1.3 Ward Wise Caste/Ethnicity Distribution of Household

The distribution of households by caste and ethnicity across four wards in Barbardiya Municipality has been divided down in depth in the table 4.3. The relative sizes and distribution of various communities within each ward are highlighted in this research, which provides insightful information on the municipality's demographic makeup.

The Tharu community, which makes up 65.73% of all families, is the largest ethnic group. They prevail in ward 10, where there are 1,471 Tharu households accounting for 37.41% of the municipality's Tharu population. With 1,011 families, or

25.71% of the total Tharu population, ward 11 also has a sizable Tharu community as well. The Tharu community's domination throughout the municipality emphasizes their dominant place in Barbardiya's social and cultural fabric.

At 19.33% of all families, the Brahman/Chhetry/Thakuri group is the second biggest community. Ward 9 has the highest concentration of this community (38.05% of all households in the municipality). With 378, or 32.70% of the total, Brahman/Chhetry/Thakuri households, ward 8 likewise contains a sizable proportion of these households. This group is well-represented in the denser and more developed economically wards based on their distribution.

Table 4.3

Number of Households according to Caste/Ethnicity and Ward Wise

Caste/Ethnicity	Household Number				Total
	Ward 8	Ward 9	Ward 10	Ward 11	
Brahman/Chhetry/Thakuri	378	440	192	46	1156
Dalit	151	182	72	61	466
Muslim			8		8
Janajati	307	50	57	4	418
Tharu	489	961	1471	1011	3932
Others		1			1
Total	1425	1634	1800	1122	5981

Source: Municipality Profile, 2075 B.S.

Despite its decreased size, the Dalit community still accounts for 7.79% of all households. They are mostly in wards 8 (32.40%) and 9 (39.06% of the total Dalit population). The concentration of Dalit households in certain wards is sign of opportunities or resources that are not available in other parts of the municipality. 7.3.44% of the Janajati group's total households are situated in ward 8, which is home

to 6.99% of the group's total households. This implies that the community in ward 8 drawn to or maintained by a unique cultural and economic context. Wards 9, 10, and 11 have fewer Janajati households than other areas which suggest that this group has a more scattered settlement pattern. The minority ethnic group shown in the table is the Muslim community, which consists of just 8 households and is concentrated in ward 10. This little but noticeable presence, especially in wards where one ethnic community predominates, emphasizes the municipality's diversified and cosmopolitan character.

Overall, a complex and multiethnic environment is shown by the household distribution in Barbardiya Municipality, with the Tharu population a significant impact in each of the four wards. While the Janajati community is mostly centered in ward 8, the Brahman/Chhetry/Thakuri and Dalit communities are also well-represented, especially in wards 8 and 9. The municipality is more diverse because of the significant and modest Muslim community. The acknowledge on Barbardiya's social dynamics and directing local planning and resource allocation to suit the demands of the diverse people depends on these demographic insights.

4.1.4 Distribution of Household by Religions Status in Wards

The table 4.4 shows how households are distributed throughout the four wards within Barbardiya Municipality based on their religion, including information on the size and structure of these household within each ward.

Hindus make up the vast majority of Barbardiya Municipality households-5,451 households, or 95.75% of the total 5,693 households spread among the four wards. With 1,664 Hindu households (30.07% of all Hindu families), ward 10 has the highest proportion of Hindu households, closely followed by ward 9 with 1,398 households (25.65%). There are a sizable number of Hindu families in wards 8 and 11, with 1,294

(23.66%) and 1,095 (19.68%), respectively. With 28,686 people living in Hindu households over the four wards, the households are comparatively big, that indicates the majoritarian status of Hindus in the municipality.

Table 4.4

Status of Caste ethnicity according to Ward Wise Household Number

Religion		**Household Number**				**Total**
		Ward 8	**Ward 9**	**Ward 10**	**Ward 11**	
Hindu	HHn	1294	1398	1664	1095	5451
	HHs	6984	7293	8377	6032	28686
Buddhist	HHn	5	28	3	4	40
	HHs	26	166	19	17	228
Muslim	HHn	1	0	8	0	9
	HHs	4	0	43	0	47
Christain	HHn	30	96	22	45	193
	HHs	148	452	94	218	912
Total	HHn	1330	1522	1697	1144	5693
	HHs	7162	7911	8533	6267	29873

Source: Municipality Profile, 2075

The 40 households of the Buddhist group represent 0.70% of all the households. With 28 Buddhist families (or 70% of all Buddhist households), ward 9 has the highest number of Buddhist households, that indicates a more concentrated Buddhist community in the study area. However, the Buddhist populations in the remaining wards including 8, 9, 10 and 11 have five, three and four households respectively. Overall, the Buddhist population of 228 is smaller than household that of other communities.

There are just 9 Muslim in the municipality consisting of 0.16% of all households that makes a small population. These households are located in wards 8 (1 household) and 10 (8 households) that indicates there is a very slight yet noticeable Muslim population. Altogether there are forty-seven Muslims in the selected wards.

Despite its minority status, Christian community accounts of 193 households that is 3.39% of all the households. At 96 (or 49.74% of all Christian households), ward 9 has the highest percentage of Christian households (96). Wards 11–45, 8–30, and 10–22 all have a high percentage of Christian households. There are 912 Christians in all, which suggests to a considerable number that is fairly distributed throughout the municipality.

In conclusion, the vast majority of households in Barbardiya Municipality practice Hinduism the most leading religion in the study area. The Christians, Muslims, and Buddhists add to the overall variety, with distinct distribution patterns of each faith observed in each of the four wards. Wards are north worthy as it is the households with faith in Buddhism, Hinduism, Islam and Christianity. To promote community cohesion and guarantee that the requirements of all religious groups are met within the municipality, it is imperative to comprehend this religious fabric.

4.1.5 Linguistic Status of Population

The table 4.5 shows the population in terms of languages and gives a general overviews of the linguistic variety in the four wards of Barbardiya Municipality wards (8, 9, 10, and 11). This research highlights the municipality's linguistic aspects and how it reflects the cultures and ethnicities of the target group. There are 29,787 people in the four wards with 7,168 residents, ward 8 makes up 24.06% of the total population. With 7,811 residents, ward 9 accounts for 26.22% of the total population, whereas ward 10,

the most populated area with 8,533 residents, or 28.65%. With 6,275 residents, ward 11 accounts for 21.07% of the population.

4.5 Table

Ward wise Population according to Language

Linguistic	Ward Number Population				Total
	8	9	10	11	
Nepali	4409	3857	4801	573	13640
Tharu	2677	3824	3663	5666	15830
Awad	5	0	12	4	21
Dotel	9	0	17	21	47
Magar/Kham	35	17	21	0	73
Maithali	6	12	7	0	25
Gurung/Tamu	0	11	0	0	11
Others	27	90	12	11	140
Total	7168	7811	8533	6275	29787

Source: Municipality Profile, 2075

With 15,830 users, or 53.15% of the total population, Tharu is the most spoken language among the remaining languages. The Tharu population is well-represented, as seen by the 5,666 residents (35.79% of all Tharu speakers) in ward 11, On the other hand, ward 8 has 2,677 individuals (16.91%) less Tharu speakers than other communities. 13,640 people speak Nepali, The second most spoken language in the country and accounts for 45.80% of the total population. With 4,801 individuals (35.20% of the total population) speaking Nepali, ward 10 has the largest proportion of Nepali speakers. Ward 8 is next closest with 4,409 people (32.32%) of Nepali users. Ward 11 contains the fewest people who speak Nepali-just 573 individuals, or 4.20% of the total population.

The Barbardiya Municipality's cultural variety is demonstrated by the existence of minority languages. Twenty-one individuals (0.07% of the total population) speak Awadhi, which is distributed among wards 8, 10, and 11 It implies it is a neglected language in the study area. Of the 47 speakers of Doteli (0.16%), the majority (21 individuals, or 44.68% of Doteli speakers) reside in ward 11. There are 73 speakers of Magar/Kham (0.25%) who mostly reside in wards 8, 9, and 10. There are 25 speakers of Maithili (0.08%), primarily in wards 8, 9, and 10, and just 11 speakers of Gurung/Tamu (0.04%), in ward 9. There are 140 persons (0.47%) in the "Others" category who are distributed over the four wards. The wide distribution suggests/ implies the existence of other language groups.

The prevalence of the Tharu language, especially in ward 11, is indicative of the Tharu community's significant demographic presence in Barbardiya Municipality. Meanwhile linguistic expansion of Nepali in ward 8 and 9 points to both a varied demographic mix and a deeper integration with national linguistic trends. The presence of many minority languages, notwithstanding their limited usage, highlights the cultural diversity of the study area. Nonetheless, the small number of speakers of these languages raises the possibility that these communities do not have much social impact. The linguistic diversity of Barbardiya Municipality emphasizes the necessity of inclusive policies that cater to the linguistic needs of all populations.

4.1.6 Barbardiya Municipality during Field Visit

When researcher visited the Barbardiya Municipality there was a strong agricultural system aided by considerable irrigation coverage, which is indispensable for local food security and livelihoods. However, land fragmentation remains a significant obstacle to agricultural efficiency and output. Addressing land

fragmentation and continuing to invest in irrigation and other agricultural infrastructure could boost regional production, increase food security, and improve the economic well-being of farming households. While the majority of households own and cultivate their land, the land holding system in Barbardiya Municipality is dominated by informal land usage arrangements.

Stable food crops line has dominated the agricultural landscape. Despite this, the area demonstrates a significant degree of crop diversification, including pulses, vegetables, oilseeds, and root crops. Vegetables and oilseeds are particularly notable for their dual role in household consumption and the local market economy Oilseeds serve as important cash crops. Although pulses and root crops are cultivated on a smaller scale, they contribute to nutritional diversity and food security. Overall, the municipality's agricultural system reflects a balanced approach, including staple food production with diverse crops to enhance food security, nutrition, and economic stability. The municipality maintains a balance of permanent and diversified crops to boost agricultural output and economic stability.

Farmers primarily cultivate rice there. They employ locally sourced seeds, enhanced varietals, and hybrid seeds. Households use pesticides to kill pests, and a few use both local/organic and mineral/chemical fertilizers. The majority of the families use fertilizers in their farming methods. The data show a large dependency on improved and hybrid seeds for rice production The use of fertilizers and pesticides, indicates their attempt to improve agricultural output and manage crop health effectively.

Agricultural households cultivate maize. Few households use local, improved, or hybrid seeds. This demonstrates a diversified approach to maize agriculture, with significant usage of enhanced and hybrid seeds. I found people's dependency on local

wheat seeds and an extensive usage of both chemical and organically produced fertilizers to improve crop productivity and soil health. Few farming households employ only male permanent laborers, whereas the majority of the farmers rely on temporary laborers. This temporary labor force has a huge gender discrepancy as there have been far more male workers than female workers. The widespread usage of temporary labor emphasizes its relevance in supporting agricultural activities, as it contributes a significant number of wage laborers to farming operations.

4.1.7 Land Fragmentation and Irrigation Practices in Barbardiya Municipality: Insights from the 2021/22 Agricultural Census

In accordance with the National Sample Census in Agriculture (2021/22), the table 4.6 summarizes the number of land holdings, total holding area, number of parcels, and irrigation extension in Barbardiya Municipality. This information provides insight into the organization of land use and agricultural activities.

The total number of holdings is 13,403, which represents individual farming land maintained by farmers in Barbardiya Municipality. This indicates that a sizable proportion of the population relies on agricultural activities that focus on the importance of farming to the local economy and livelihoods. Besides, the total area of holdings is 6,964.1 hectares that represent the municipality's agricultural land usage. This large agricultural area implies that farming is an important element of land use in Barbardiya, although the efficiency and production of these lands vary depending on how they are managed and distributed.

The total number of parcels is 30,626 that indicates that land holdings are usually fragmented into smaller pieces. With an average of 2.3 parcels per holding, this pattern of land fragmentation represents a barrier to agricultural production.

Fragmented landholdings are frequently more difficult to manage successfully due to limited adoption of modern farming practices as resulted in limited productivity. Smaller, scattered parcels take more resources to cultivate and therefore, they are less economically feasible than large and more consolidated plots.

Table 4.6

Number, Area of Holding, Number of Parcel and Area Irrigated at Barbardiya

Land Holding	**Number**
Total number of holdings	13403
Total area of holdings (ha.)	6964.1
Total number of parcels	30626
Average number of parcels	2.3
Irrigated area (ha.)	6383.9

Source: National Sample Census of Agriculture, 2021/22

Despite the obstacles faced due to land fragmentation, the data reveal that 6,383.9 hectares, or around 91.7% of total agricultural land, are irrigated. This high percentage of irrigated land indicates that the majority of farming activities in the study area do not fully rely on rainfall. The widespread use of irrigation enables more dependable and intense agricultural operations, which can result in better crop yields and the cultivation of a wider range of crops throughout the season.

Sociologically, the predominance of fragmented landholdings are related to historical patterns of inheritance, land division, and holding systems in many agricultural communities. While the region's considerable irrigation system is a key source of agricultural output, it solves the issue of land fragmentation it boosts productivity even more. Policies targeted at land consolidation, together with attempts

to expand access to modern agricultural technology, are projected to result in more efficient land use and greater support for Barbardiya's farming population.

4.1.8 Land Holdings and Holding Patterns in Barbardiya Municipality: Distribution and Area Analysis

The table 4.7 shows the breakdown of land holdings by holding forms in the study area as mentioned in the National Sample Census of Agriculture (2021/22). The data exhibit the various land holding systems in use and provide insights into how land is distributed under these systems. The findings reflect the municipality's complicated land ownership and holding situation, which significantly consequents in agricultural production and socioeconomic growth.

The majority of land holdings in Barbardiya Municipality (9,622) are classed as owned, totaling 3,511.4 hectares. This pattern of individual land ownership indicates that private ownership is the most common holding form. The frequency of owned land indicates a highly stable land holding system in which landowners retain control over their property. Nevertheless, this stability is critical for long-term agricultural investment because landowners are more inclined to invest in sustainable farming techniques, increase land productivity, and provide better lives.

Table 4.7

Number and Area of Holdings at Barbardiya Municipality

One Holding forms	No. of Holdings	Area of Holding (ha.)
Owned	9622	3511.4
Rented from Other	20	35.6
Other holding form	140	69.8
More than one holding forms	3621	3347.4

Source: National Sample Census of Agriculture, 2021/22

A relatively considerable number of assets (20) are indicated as "Rented from Other," totaling 35.6 hectares. This shows that renting land from others is not frequent in the area. The minimal dependence on rented land represents strong cultural preferences for ownership over leasing, which further indicates a scarcity of land for rent. It also implies that land leasing markets in this area are underdeveloped with limited options for individuals who do not own land to engage in farming operations.

The other forms of holding have 140 in number with totaling area of 69.8 hectares. This group to encompasses a variety of different land arrangements, such as communal ownership, state ownership, and customary holding systems. Although this category accounts for a minor fraction of overall land holdings, it demonstrates the presence of various holding types associated with certain social or legal circumstances in the study area. These holding arrangements represent various historical or cultural land use patterns that still exist.

According to the statistics, private ownership is the most common form of holding in Barbardiya Municipality, which likely helps to maintain land stability and agricultural investment. However, the presence of landholders with several holding forms shows that land management methods are flexible and adaptable, potentially in reaction to economic constraints to develop agricultural land through diversified holding arrangements.

The comparatively small proportion of rented land and "other" holding patterns indicate constraints in land rental markets. Nonetheless, the diversity of holding forms highlights the municipality's complicated land use patterns. Addressing these multiple holding arrangements in agricultural policies help increase land access and production for various sections of the population.

4.1.9 Land Use Distribution and Agricultural Practices in Barbardiya

The table 4.8 presents a complete description of land use trends in Barbardiya Municipality It emphasizes land holding distribution and usage for arable, temporary, and permanent crops, as well as non-arable purposes. The data from the National Sample Census of Agriculture (2021/22), demonstrates the degree to which land is used for agricultural production and other uses that eventually provides important insights on the municipality's land management methods.

The Barbardiya Municipality has 13,263 households totaling 6,466.1 hectares of arable land. Land actively utilized for farming and other agricultural activities falls under this category. The large area of fertile land indicates the municipality's primarily agricultural character since farming is probably the principal source of income for a sizable section of the population. The amount of arable land indicates that the region has a high potential for agricultural output.

The majority of the arable land (6,461.0 hectares) is planted with transitory a crop that implies seasonal or yearly crops constitute the municipality's main source of agricultural output. Cereals, vegetables, and other transient crops that are harvested in less than a year fall under this category. The ephemeral crops grown on all 13,263 land holdings indicate that farmers make the most of their property for quick agricultural production, in order to fulfill market or subsistence demands. Out of all the arable land, just 5.1 hectares, or 100 holdings, are classified as "Other Arable Land." Land that is not farmed right now but may be in the future falls into this group. The small size of this category suggests that there is not much unutilized land because the municipality is using practically all of the arable land that is available for productive uses. This

indicates a concentration on optimizing agricultural production from finite land resources or a symptom of intense land pressure.

Just 22.5 hectares of land, spread among 360 holdings, are used for permanent crops in contrast to the predominant usage of land for transient crops. Plantations, fruit trees, and vineyards are examples of permanent crops that are long-term agricultural investments. Farmers in Barbardiya Municipality emphasize more on short-term, seasonal farming than on the long-term cultivation of perennial crops, as seen by the comparatively modest area devoted to permanent crops. Which is due to market demand, economic factors, or the appropriateness of the land for various crop kinds.

Table 4.8

Number, Area and Land Use by Municipalities

	No. of Holdings	**Area of Holding (ha.)**
Total arable land	13263	6466.1
Land under temporary crops	13263	6461.0
Other arable land	100	5.1
Land under permanent crops	360	22.5
Other land	13403	475.5

Source: National Sample Census of Agriculture, 2021/22

A significant section of landholders (3,621) engage in multiple holding arrangements, covering 3,347.4 hectares. This suggests that majority of the households rely on a combination of ownership, renting, or other holding systems to access agricultural land. The complexity in landholding patterns could be driven by factors such as land fragmentation, inheritance practices, or efforts to secure access to additional agricultural land. This flexibility in holding arrangements provides

opportunities for households to diversify their land use, but it also complicates land management and agricultural planning.

Lastly, the other land category has 13,403 holdings totaling 475.5 hectares. Land utilized for non-agricultural uses, such residential neighborhoods, infrastructure, or fallow land, is included in this category. The considerable amount of land in this category highlights the municipality's various land use demands by showing that not all land holdings are entirely concentrated to agricultural production. It reflects the increasing urbanization or the existence of mixed-use estates, which combine agricultural and residential uses.

The agricultural environment is dominated by transitory crop farming, as evidenced by the statistics from Barbardiya Municipality. The large percentage of arable land under cultivation indicates that the land resources are exploited extensively. The comparatively limited area planted to permanent crops, however, can point to a lost chance for long-term agricultural investments that improve the region's farming sustainability and economic resilience.

4.1.10 Livestock and Poultry Distribution in Barbardiya Municipality

The table 4.9 gives specific information from the National Sample Census of Agriculture (2021/22) on the number of holdings reporting livestock and poultry, as well as the total number of each kind of animal in Barbardiya Municipality. This information provides insightful information about the municipality's livestock management and agricultural methods. 3,180 households have 7,080 cattle. This shows that cow domestication is widely practiced in the municipality and emphasizes its importance to regional agriculture. There are a number of uses for cattle, such as producing milk, providing draught power, and producing meat beyond the practice in

Nepal. The fact that there are comparatively more holdings than cattle overall indicates that cattle farming is common but not as extensive on individual farms.

Table 4.9

Number of Heads, Number of Holdings Reporting Livestock and Poultry at Barbardiya Municipality

Livestock	No. of holdings	No. of head
Cattle	3180	7080
Buffalo	4121	8881
Goat/Chyangra	8062	33746
Sheep	620	2843
Pig/Boar	3761	8323
Other Livestock	60	140
Poultry(Chicken)	7062	96246
Other birds	1259	5559

Source: National Sample Census of Agriculture, 2021/22

There are 8,881 buffaloes according to 4,121 households that declare buffalo farming. The milk produced by buffaloes is highly prioritized in many dairy economies. The considerable numbers of household have buffaloes. Buffalo farming is a significant contributor to the local agricultural economy. Among all animal categories, goat farming is the most common consisting of 8,062 farms with 33,746 goats in total. Goats are important in Barbardiya Municipality, where they are grown for meat, milk, and other items. This large quantity shows that goat farming is more intense than that of other livestock as seen by the large number of goats compared to the number of holdings.

Sheep husbandry is recorded by 620 households with 2,843 sheep. Despite having fewer holdings than other livestock, sheep farming adds to the municipality's

livestock variety. Sheep are commonly farmed for wool, meat, and milk, but their low numbers indicate that they are less important to local agriculture than goats and buffaloes. Pig farming includes 3,761 households with 8,323 pigs. Pigs are domesticated for meat an important element of the diet in many areas. The number of pig holdings indicates a significant presence of pig farming that is less widespread than goat or poultry farming.

The data shows a variety of livestock and poultry husbandry techniques used in Barbardiya Municipality. Goat and poultry farms largely contribute to local agricultural economy. The abundance of goats and hens suggests that these animals play an important role in local food production and lives.

The category of other birds includes 1,259 households with a total of 5,559 birds. This group consists of various types of poultry and ornamental birds. Although less significant than chickens, the presence of other birds reflects the diversity in poultry farming practices within the municipality. The data reveals a diverse range of livestock and poultry husbandry approaches in Barbardiya Municipality. Goat and poultry farms are especially common that reflect their importance to the local agricultural economy.

The existence of buffaloes and pigs, though less common than goats and hens, demonstrates their importance. Sheep and other livestock contribute to a wide range of agricultural operations. However, they are less important to the municipality's livestock industry.

4.2 Land Holding Patterns

Land holding patterns is the distribution and size of the land occupied by household in the study area. It gives information about ownership structure, inequality

in access to land, and the basis of agricultural production. In this sub section the research explains about the land holding pattern at Barbardiya municipality. It shows the land holding size, type of holding, status of ownership, type of land according to policies, mode of irrigation, contractual arrangement, land transmission etc.

4.2.1 Status of Family Having Agriculture Land

Family farming has been well-established practice in Nepal. This practice combines crops, cattle, and forests. It is run and managed by a family, and relies on family labor. It is connected to various other aspects of rural development since it encompasses all family-based agricultural operations. According to the most recent census, about 70% of families (3,831,093) are directly or indirectly involved in family farming the most common method of food production in the country. Farming in the family provides four purposes. It is linked to family ideals such as solidarity, continuity, and commitment from a sociological standpoint. It benefits the environment by improving soil quality, carbon sequestration, water purification, insect control, pollination, and biodiversity (Kaini, 2016).

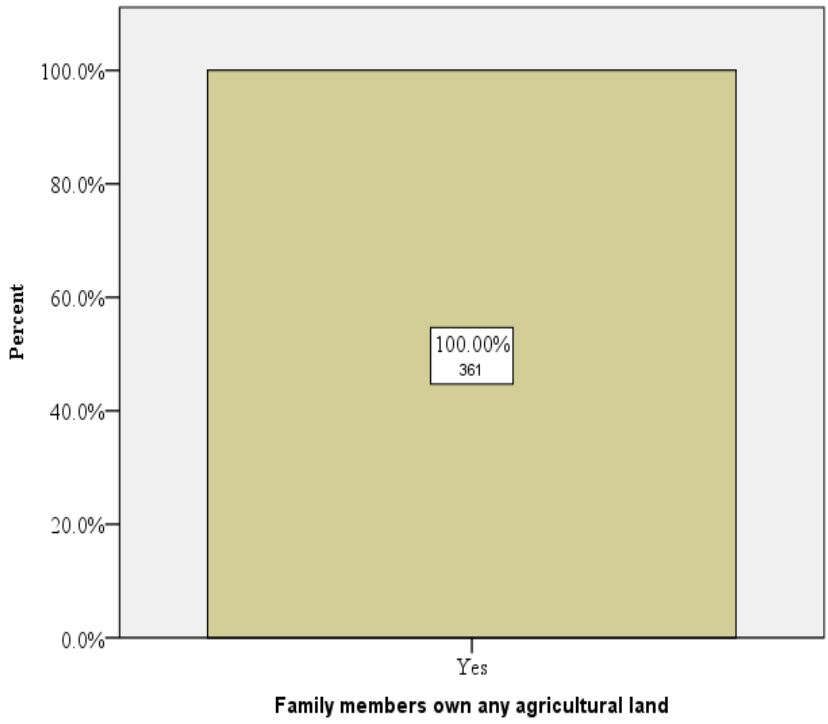
Majority of the households in Bardiya District have acquired land holding certificates from the DoLRM, with the right to use and manage the property for agricultural, forestry, and other uses. However, there are still some issues in the district in terms of land holding security, since some communities have not acquired official land holding certificates and are at risk of losing their property.

The bar chart 4.1 provides information about the percentages of family members that own any agriculture land in Barbardiya municipality during field survey of 2022. Among 361 households the bar diagram shows all the households own agriculture land.

The study shows somehow all the people posses' agriculture land. However, all of the farmers do not have *lalpurja* (registration certificate).

Figure 4.1

Status of Family Having Agricultural Land



Source: Field Survey, 2022

The study area is rural where agriculture is the primary source of income for the majority of people. The study group has a long history of agricultural production and land ownership as the study area has a small population which has made easy for all households to acquire agricultural property.

4.2.2 Land Holding Size of the Household

In accordance with a field survey conducted in 2022, the table 4.10 shows landholding size among households as assessed in *Kattha*. The distribution of the data is skewed, with most households (52.6%) owning less than 5 *Kattha* of land. A

considerable proportion of households (30.7%) possess five to fifteen *Kattha* lands, whilst a negligible percentage (1.7%) possesses sixty or more *Kattha*. There is a substantial clustering around smaller landholding sizes in this distribution, with very few households in charge of big plots. The population's preponderance of smallholders is shown by the skewness toward smaller holdings.

Additional understanding of this distribution can be gained from the central tendency measurements. The existence of households with greater landholdings causes a little tilt in the mean landholding size of 11.16 *Kattha*. The prevalence of smallholders is also supported by the fact that the median landholding size is 5 *Kattha*, meaning that half of the households possess less than this amount. The mean, which likewise occurs to be 5 *Kattha,* highlights the concentration of the populace around smaller land parcels and verifies that smaller landholdings are the most prevalent.

The table 4.10 indicates the frequency and percentage distribution of household by area of land in *Kattha* in Barbardiya Municipality, Ward number 8, 9, 10 and 11. The huge variance of 248.015 and standard deviation of 15.745 in terms of dispersion indicate that there is a significant amount of variation in the sizess of landholdings among households. The wide variation in land ownership is shown in the 149 *Kattha* range, which extends from the smallest tract (1 *Kattha*) to the largest (150 *Kattha*). This implies a vast range in the extent of landholdings, with most households controlling relatively modest parcels of land while some control much larger ones.

The distribution is strongly right-skewed as indicated by the positive skewness of 4.265, which means that a small percentage of households possess disproportionately large amounts of land. Besides, a distribution with a high peak and heavy tails is suggested by the kurtosis value of 24.570, which implies the existence of extreme

outliers. The high level of land distribution disparity highlighted by these statistical indicators has been due to a small number of households possessing much more land than the rest.

Table 4.10

Land Holding Size of the Household

Land Holding Size (*Kattha*)	**N**	**Percentage (%)**
Less than 5	190	52.6
5-15	111	30.7
16-25	31	8.6
26-40	13	3.6
41-60	10	2.8
More than 60	6	1.7
Total	361	100

Source: Field Survey, 2022

Note. The land holding size is shown in '*Kattha*' where n=sampled number 361 and %=total percent from sample.

1. Mean = 11.16, Median = 5.00, Mode = 5, Std. Deviation = 15.745

The results show a notable disparity in the distribution of land, with most households concentrated at the lower end of the landholding spectrum and a tiny number of households that significantly control larger holdings. This concentration of smallholders is a sign of an agrarian economy focused on subsistence, where smaller plots are typical and can impact on food security and production. Larger landholders benefit disproportionately from agricultural income and power, whereas households with lesser landholdings have more difficulty maintaining their standard of living and guaranteeing food security.

There are more significant social and economic implications to these differences in landholding sizes. Inequalities in land distribution have the potential to exacerbate economic inequality and social stratification by restricting smaller landholders' access to resources like technology, credit, and irrigation. Policies that support smallholders or encourage land reform are crucial in addressing these problems to improve social justice and the economic stability of the study area. Such actions promote more sustainable livelihoods for smallholders and improve the general well-being of the population by reducing the disparity in land distribution.

4.2.3 Type of Land

Agronomic characteristics, the community in which it is located, as well as environmental and regulatory elements, all influence land production. The value that consumers or producers are ready to pay for these features is reflected in land prices. Two sections of land look similar, but their qualities and environmental variables (e.g., soil quality, biodiversity) differ that affect the price a potential buyer is ready to pay (Mockshell &Villarino, 2018).

The distribution of various landholding types across households is shown in the table 4.11 as a function of replies with percentages that denotes the prevalence of each land type. The figures show that 99.72% of households own cultivated farmland, or *Kheta*, which is immensely dominating. With 79.78% of households, *Bari* (kitchen garden or homestead land) is the next most prevalent type. In contrast, only 0.28% of households own *pakha*, or uncultivated sloping terrain which makes it almost nonexistent. Only 3.32 percent of the area is classified as Jungle (forest or nursery land).

According to theory of inequality, this distribution shows that all households have equal access to agricultural land (*Kheta*) that most families own some sort of land

that has been farmed. Nevertheless, the inequity becomes apparent when who has access to different kinds of land outside of *Kheta* is looked at. For instance, while the majority of households also own *Bari* land, a sizeable minority (20.22%) do not have access to this kind of land, which may restrict their ability to cultivate vegetables or other supplemental crops that are often essential for the food security of their households.

Table 4.11

Type of Land Holding (n-361)

Type of Land Holding	N	PC (%)
Kheta	360	99.72
Bari	288	79.78
Pakha	1	0.28
Jungle (Nursary)	12	3.32

Source: Field Survey, 2022

Note. The land holding size is shown in n= number and PC=Percent of Cases. Dichotomy group tabulated at value 1.

The scarcity of *Pakha* land and the restricted amount of jungle land suggest more stratification. Though scarce, households with access to forest or nursery land profit from extra resources not available to others, such as wood or forest products. The fact that only a small section of households own land in the jungle illustrates how land ownership patterns support social and economic inequalities by allowing some households to benefit from more varied and potentially lucrative land uses while keeping others restricted to simple agricultural plots. This pattern highlights the ways in which social stratification is further entrenched by disparity in land ownership, which goes beyond simple land size to include the types of land that are accessible. The

community's inequality worsens if specific land types are concentrated in the hands of a small number of households, giving them advantages in economic activity and resource control.

The table 4.12 shows descriptive data for four categories of landholdings: uncultivated sloping land (*Pakha*), homestead or kitchen garden land (*Bari*), cultivated farmland (*Kheta*) and Jungle (forest/nursery land). The data highlights inequality by showing differences in the distribution of land. Statistics reveals significant heterogeneity for *Kheta* land. With a median of 4.00 *Kattha* and a mode of 1 *Kattha*, the mean holding is 8.40 *Kattha*.

Table 4.12

Descriptive Statistics on Type of Land Holding (In Kattha)

Descriptive Statistics		**Kheta**	**Bari**	**Pakha**	**Jungle (Nursary)**
N	Valid	360	288	1	12
	Missing	1	73	360	349
Mean		8.40	1.59	1.00	1.00
Median		4.00	1.00	1.00	1.00
Mode		1	1	1	1
Std. Deviation		14.629	2.196		0.000
Variance		213.995	4.820		0.000
Skewness		4.600	6.751		
Std. Error of Skewness		.129	.144		.637
Kurtosis		27.860	60.305		
Std. Error of Kurtosis		.256	.286		1.232
Minimum		1	1	1	1
Maximum		140	26	1	1

Source: Field Survey, 2022

This shows that although 8.40 *Kattha* is the average landholding, half of the households own less than 4 *Kattha*, with 1 *Kattha* being the most common holding size. A wide range of land holdings is shown by the significant variation (213.995) and standard deviation (14.629), with some households with to 140 *Kattha*.

The distribution is strongly right-skewed and peaked, with a small number of households owning significantly bigger plots, which inflates the mean and emphasizes the disparity in the distribution of land according to the skewness value of 4.600 and kurtosis value of 27.86. The median holding for *Bari* land (Kitchen garden) is 1.00 *Kattha*, the mode is 1 *Kattha*, and the mean holding is 1.59 *Kattha*.

Even with a maximum holding of 26 *Kattha*, there is less variability than in *Kheta* land, as evidenced by the comparatively low standard deviation (2.196) and variance (4.820). The distribution looks even more skewed and peaked than *Kheta* land, based on the skewness (6.751) and kurtosis (60.305) values. Although the majority of households have extremely small *Bari* plots, a small number own substantially larger plots, which also contributes to inequality in this form of property.

The data for *Pakha* and *Jungle* land, exhibit little variability because the mean, median, and mode values for each category of land are 1.00 *Kattha*. With standard deviations and variances of 0 for both *Pakha* and *Jungle* land, there is no variation that implies that the few households that own these kinds of land have the same amounts. This lack of variability supports the idea that only a small number of households have access to a variety of land types, which indicates various types of land extremely scarce and not broadly distributed across households.

The examination of the table highlights the unequal distribution of land, with significant differences in the extent of landholdings in *Kheta* and *Bari* and restricted

ownership and distribution of land in *Pakha* and the *Jungle*. This disparity in the amount and kind of land reflects larger patterns of social stratification, in which various households have differing access to land, which affects their ability to control resources and pursue economic possibilities.

4.2.4 Farm Categories of the Family Based on Size

Farmers are Nepal's *annadata* (Bread winners). They labor tirelessly to feed the globe. According to their landholdings, the farmers are classified based on size. Farming is classed into different landholding sizes based on geographical factors, produce need, labor, and technological level. The data on farm types by land size in Barbardiya Municipality provides a clear picture of land distribution among families.

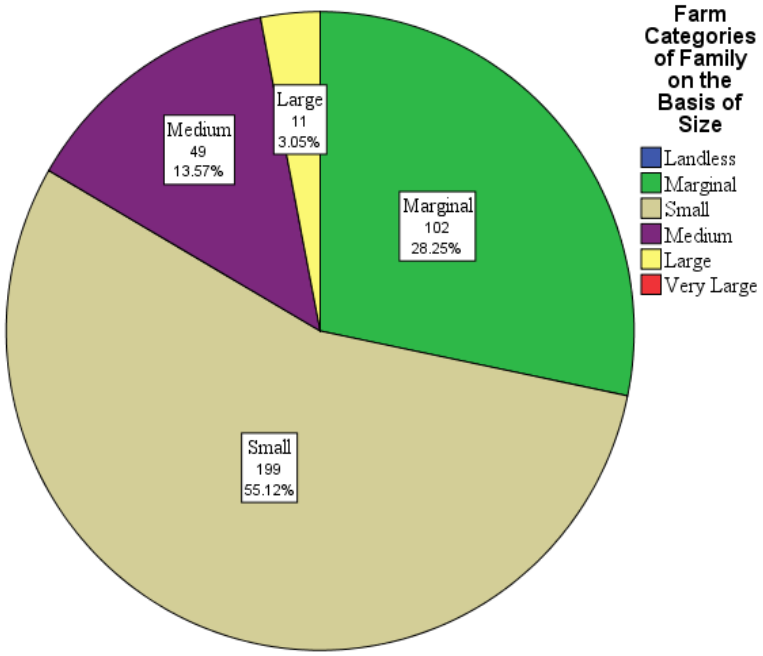
The chi-square test ($\chi^2 = 221.017$, d.f. = 3, $p < 0.001$) reveals substantial differences in land allocation, indicating that land ownership is not fairly dispersed across the population. This trend illustrates the area's profound social and economic inequality. Wealthier and more powerful families own bigger and more productive landholdings, whereas smaller, less affluent households are limited to marginal plots.

Unequal land allocation reflects larger structural disparities. Larger landowners have more access to resources including technology, human resource, and cash that allow them to ensure better food security and create more income. This economic advantage strengthens their social position and sustains a circle of privilege as they are more resilient in the face of environmental and market crises. The uneven land distribution, from the perspective of inequality theory, reveals larger structural disparities.

Smaller landowners, on the other hand, are frequently limited to their resources and struggle to satisfy even their most basic demands. These households are more likely to experience food insecurity, lower income, and limited opportunities for advancement. The imbalance between the two groups adds to socio-economic tensions, since unequal land allocation exacerbates class divides and widens the gap between the rich and the poor.

Figure 4.2

Farm Categories of the Household



Source: Field Survey, 2022

Note. The land farm categories of household are shown in percent (%). Chi-Square = 221.017, d.f. = 3 and level of significance = 0.000 a. 0 cell (0.0%) have expected frequency less than 5. The minimum expected cell frequency is 90.3.

This research emphasizes the need of policies targeted at more equitable land distribution, better access to resources for smaller landholders, and addresses structural

disparities that fuel social tensions and conflicts. Understanding these processes allows politicians and social activists to work toward reducing gaps and promoting a more equitable agricultural system that benefits all households, regardless of landholding size.

4.2.5 Ownership of Land

Land is a common resource since it is always a part of a certain natural and cultural "territory." Besides, it is a support for varied natural resources. Absolute private land ownership is thus a harmful fiction, and it should be replaced with a model based on a collection of rights and various types of community resource management. In general, land ownership refers to the legal right to acquire, utilize, and govern real estate.

Table 4.13

Status of Ownership of Land

Ownership of Land	**N**	**Percentage (%)**
Leased-In	1	0.28
No Ownership	5	1.39
Own by Self	355	98.34
Total	361	100.00

Source: Field Survey, 2022

The table 4.13 shows the information about Status of Ownership of the land of household. The table explains the ownership into three categories. Among the total 361 households 0.28 percent household has leased-In the land, 1.39 percent households have no ownership on the land and 98.34 percent household has own by self. The study shows that less than full of the household has owned by self which means the households have ownership on land. It is crucial to remember that land ownership rules

can vary greatly depending on the location of the land and the exact conditions of the ownership.

According to the data, the overwhelming majority of households (98.34%) possess independent land, indicating a situation in which those with the financial resources or social standing to purchase property retain substantial control over available resources.

Theory of inequality, which highlights how uneven access to resources like land sustains, social stratification and upholds preexisting power relations, is consistent with this distribution. The low percentages of families that lease land (0.28%) or do not own any property (1.39%) highlight differences in access to land ownership, which is a sign of restricted possibilities or economic disadvantages for some groups of people. It is imperative to address these gaps through equitable land policy in order to promote social cohesiveness and stability within the community as well as justice.

4.2.6 Type of Land According to Policies

According to Land Use Zone (LUZs) related to Schedule-1, land has divided into different Zone like Agriculture Zone, Residential Zone, Commercial Zone, Industrial Zone, Mines and Mineral Zones, Cultural and Archaeological Zone, River and Lake-Reservoir Zone, Forest Zone and Others Zones Specified as per need.

The table 4.14 gives information about types of land according to policies of household. It explains the land type according to policies into four categories. Among the total 361 households 84.49 percent of households has agriculture zone, 52.91 percentage of households has residential zone, 1.66 percentage of household has forest

zone, 2.49 percentage of household has public or government zone. The research shows that more than half and quarter of household has agriculture Zone.

Table 4.14

Type of Land according to Policies

Land Types according to Policies	Responses		PC (%)
	N	Percentage (%)	
Agriculture Zone	305	59.69	84.49
Residential Zone	191	37.38	52.91
Forest Zone	6	1.17	1.66
Public or government Zone	9	1.76	2.49
Total	511	100.00	141.55

Source: Field Survey, 2022

Note. The land type according to policies is shown in Response N=Multiple response 511 and PC=Percent of Cases and Dichotomy group tabulated at value 1.

According to theory of inequality, the distributions worsen or maintain social injustices. As an illustration, compared to families in residential or forest zones, those in agricultural zones experience higher agricultural production and more economic prospects. The unequal distribution of productive land exacerbates socio-economic inequality by giving agricultural landowners more access to income and power, which solidify their place in the social hierarchy. In order to mitigate possible causes of social conflict resulting from unequal land distribution, policies that promote equitable land allocation and guarantee that all families have fair access to productive resources are needed to address these imbalances.

4.2.7 Classification of Land based on Local Context

This section classifies the land into different categories like crop land, pond, woodland or forest based on local context. Crop land denotes the land where farmers

cultivate different variety of crops for their livelihood, Pond is the body of land covered by water where fishery is done and woodland or forest is the type of land where the household has planted tree for 10 to 25 years for generating income.

The table 4.15 demonstrates the classification of land based on local context. It explains the land type into three categories. Among the total 361 households 100 percent of households have crop land, 3.30 percentages of households have pond and 3.90 percentages of households have woodland or forest. The study shows that all the families have crop land.

Table 4.15

Sample Household by Land Use Pattern

Land Use Pattern	Responses		PC
	N	Percentage (%)	
Crop land	361	93.30	100.00
Pond	12	3.10	3.30
Woodland or forest (Nursery)	14	3.60	3.90
Total	387	100.00	107.20

Source: Field Survey, 2022

Note. The land type based on local context is shown in Response N=Multiple response 387 and PC=Percent of Cases and Dichotomy group tabulated at value 1.

These findings highlight the importance of crop lands for agricultural productivity that emphasize food availability in relation to land holding and food security. Crop lands have a direct impact on the municipality's food security results by maintaining food availability and production.

Ponds and woodland areas are indicators of a variety of land uses that enhance the ecological balance overall and augment food supplies through fishing or non-timber

forest products Understanding how various land uses affect food production and security is made easier by analyzing data within the framework, which emphasize the significance of sustainable land management techniques for ensuring long-term food security in the study area.

4.2.8 Ownership of the Land

Land is owned by a landlord who is often a person or corporation who rents out the property for a charge to others. The landlord has the authority to manage and govern the use of the land, and he or she may set limits or conditions on its use. Land held by an individual or corporation is referred to as own land. This sort of land is utilized for a number of reasons, such as residential, commercial, or agricultural. The landowner has the power to govern and regulate its usage, and may sell or transfer ownership as desired.

Land that is held by the government or is not legally registered with a government body is referred to as public/unregistered land. The public may utilize this form of land for a parks, recreational spaces, or public infrastructure. Land held by a relative, such as a parent, brother, or cousin, is referred to as relative's land. Depending on the agreement between the relative and the person utilizing the property, this sort of land can be utilized for a number of reasons.

The table 4.16 presents the information about ownership of land according. It explains the ownership into four categories. Among the total 361 households 87.53 percent of household has own land, 11.63 percentage of households has public/unregistered land, 0.55 percent households own landlord’s land and 0.28 percent households own relatives land. The research shows less than full (87.53%) and more than half and quarter of households have own land. These types of land in Barbardiya

are utilized for agricultural, residential and commercial development. The exact use of the property can be determined by Barbardiya's land use rules and regulations, as well as the preferences and intentions of the land's owner or user.

Table 4.16

Ownership of Land

Ownership Status	**N**	**Percentage (%)**
Landlord's land	2	0.55
Own land	316	87.53
Public/Unregistered land	42	11.63
Relative's land	1	0.28
Total	361	100

Source: Field Survey, 2022

Note. The land ownership is shown in Response n = sampled number 361 and % = Percent.

This distribution of land ownership status reflects a complex landscape of holding arrangements where public and informal land usage play important roles alongside individual ownership. Theoretically, secure land ownership (individual ownership) is essential for boosting agricultural productivity and food security because it offers incentives for investment and sustainable land management techniques. This is especially true when viewed through the prism of Land Holding and Food Security frameworks. On the other hand, depending on unregistered or public land provides issues with unstable land holding and restricted access to resources required for sustainable food production and security. Therefore, improving the results of food security in the municipality requires resolving concerns pertaining to land holding and ownership rights.

4.3 Land Use Practice

Land use practice refer to the way people utilize and manage land for different purposes such as agriculture, settlement, forestry, grazing, or other activity. It reflects human interaction with land resources, shaped by social, economic, cultural and environmental factors (FAO, 1995). Agriculture is Nepal's principal economic sector that employs around 80% of the population. Nepal's poverty reduction plan emphasizes the importance of agricultural expansion in achieving broad-based growth and improving the livelihoods of the majority of the Nepalese (International Water Management Institute, 2007).

4.3.1 Status of Agriculture Land Being Irrigated or Rainfed

Agriculture is Nepal's principal economic sector that employs around 80% of the population. Nepal's poverty reduction plan emphasizes the importance of agricultural expansion in achieving broad-based growth and improving the livelihoods of the majority of the Nepalese. Agriculture in Nepal relies on monsoon rains, which come from June to September and account for 75% of yearly rainfall. Irrigation that is regulated and controlled consequently enhances agricultural output, notably during the lengthy dry season. However, during dry spells or the rainy season can affect crop yields (International Water Management Institute, 2007).

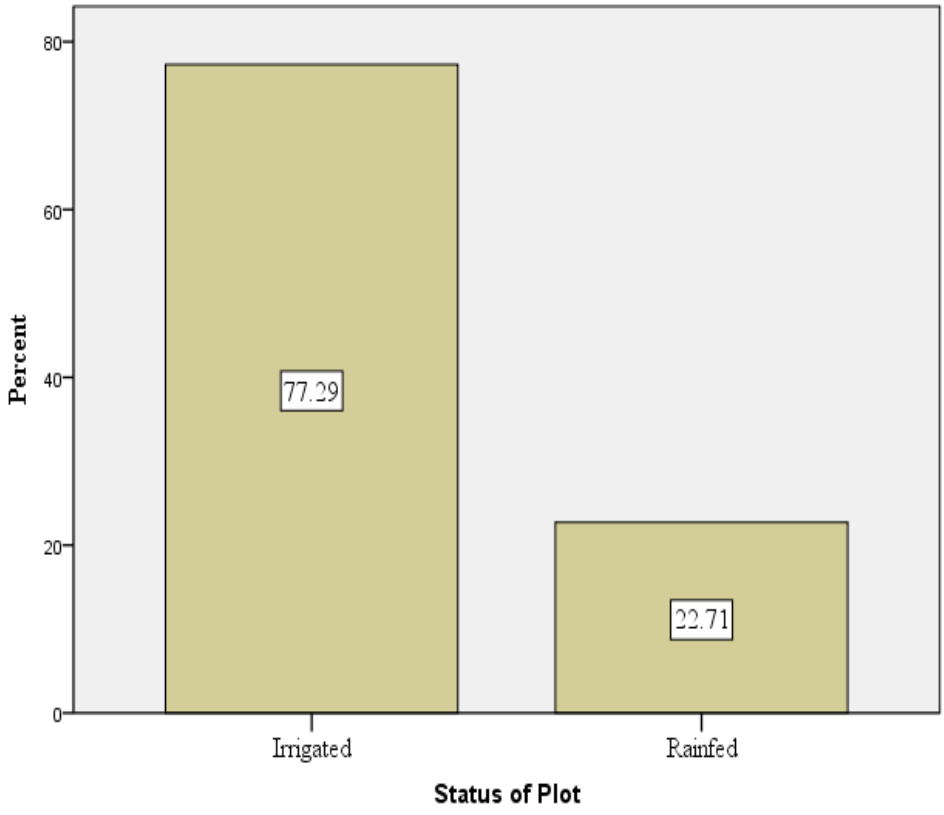
Agricultural land is defined as either irrigated or rainfed based on the source of water utilized to grow crops. Irrigated land is artificially supplied with water by a network of pipelines, canals, or other water delivery technologies. This type of terrain is generally found in places with minimal natural rainfall or with variable rainfall

distributions throughout the year. Irrigated land is typically seen to be more productive and reliable for agriculture since water supply can be regulated and managed.

Rainfed land, on the other hand, is irrigated by natural rainfall. This type of terrain is commonly found in locations with more continuous and predictable rainfall patterns, and it is frequently used to grow crops well-suited to the local climate and soil conditions. Rainfed agriculture is less dependable than irrigation-based agriculture since it is vulnerable to weather and climatic fluctuations.

Figure 4.3

Irrigation Status of Farm Land among Sample Household



Source: Field Survey, 2022

Note. The Status of Farm Land is shown in % =Percent and the total sampled n = 361 Household.

The bar diagrams 4.3 presents the status of farm land. It explains the farm land categories into irrigated and rainfed farm land. Among the total 361 households 77.29 percent of households has irrigated farm land and 22.71 percent of households depends on monsoon rain.

The proportion of agricultural land that is irrigated vs rainfed varies greatly across the world due to climate, water availability, and crop type. In certain countries, the vast majority of agricultural land is irrigated, but in others, the vast majority of farmland is rainfed.

4.3.2 Condition of Irrigation in the Field

Irrigation systems can vary greatly based on a number of criteria, including crop type, availability of water supplies, and local climate. Irrigation systems that are often used include flood irrigation, sprinkler irrigation, drip irrigation, and pivot irrigation. The sort of irrigation system employed in Bardiya District is likely to be determined by the area's distinct demands and resources.

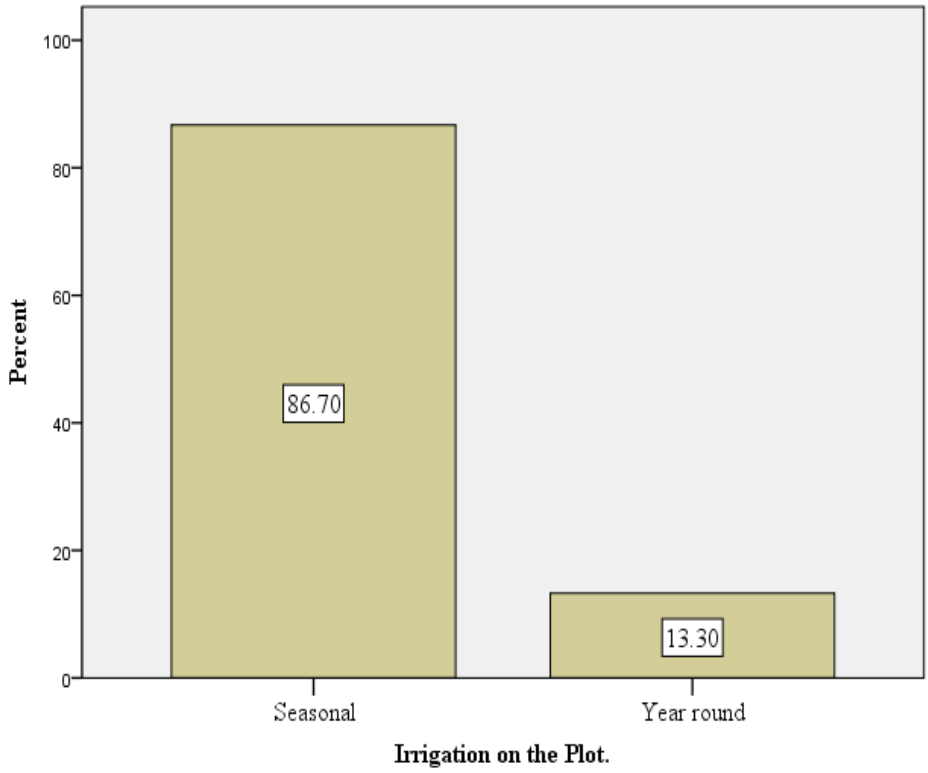
Seasonal irrigation is the technique of delivering water to crops at specified times of the year when it is most needed, such as during the dry season and during high evapo-transpiration periods. Seasonal irrigation can be employed in locations with regular weather patterns, where the timing and amount of water required can be forecast with accuracy.

Year-round irrigation, on the other hand, refers to the technique of supplying crops with a steady flow of water throughout the year. This sort of irrigation is often utilized in locations with a regular water supply and climate, as well as in greenhouses or other controlled environments where conditions can be carefully monitored. Year-

round irrigation is frequently required for crops with high water requirements or for livestock.

Figure 4.4

Condition of Irrigation



Source: Field Survey, 2022

Note. The Irrigation Status is shown in % =Percent and the total sampled n = 361 Households.

The bar diagram 4.4 presents the condition of irrigation on the plot. It explains the condition of irrigation of plot into two categories seasonal and year round. Among the total 361 households 86.70 percent of households are depending on seasonal irrigated farming and 13.30 percent of households have access of irrigation year round.

The sort of irrigation system used for a certain location is determined by the type of crops farmed, the availability of water resources, and the local climate. It is

critical to carefully analyze these elements and select an irrigation system suited for the crops' individual demands as well as the environment in which they are cultivated.

4.3.3 Mode of Irrigation of the Field

FMIS (Farmer Managed Irrigation Systems) have a unique place in the national economic and food security system. Almost 70% of Nepal's irrigated land is subject to FMIS. FMIS is confronted with issues caused by population development, rising demand for food, environmental deterioration, and a lack of local construction materials (Pradhan, 2000).

The table 4.17 presents the distribution of irrigation techniques across 318 respondents in the research region. *Nahar* (Canal) is the most popular technique of irrigation, accounting for 63.2% of answers and 72.6% of all instances. This reveals public reliance on canal irrigation, most likely due to the established infrastructure that delivers a consistent and potentially cost-effective water supply to agricultural areas. The prevalence of canal networks also implies regional government.

Electric motor is the second most frequent irrigation technology, employed by 25.8% of respondents and accounting for 29.6% of all instances. The widespread usage of electric motors indicates a trend toward increasingly mechanical irrigation systems, which are praised for their efficiency and capacity to water bigger areas. The reliance on electric motors suggests that the region has enough electricity to sustain agricultural activities. However, it also demonstrates a reliance on energy infrastructure, which impacts on farming operations during power outages or excessive energy expenditures.

A Boring (Irrigation Bore Pump) accounts for 6.6% of responses and 7.6% of cases. Bore pumps, while less frequent than canal or electric motor irrigation, indicate

the use of groundwater resources. These are most typically employed in places with limited access to surface water or in regions with intermittent canal water supplies. Bore pumps suggest a level of independence for farmers who have direct access to groundwater, yet this technology incurs greater initial expenses and raise sustainability problems owing to potential groundwater over-extraction.

Table 4.17

Mode of Irrigation

Mode of Irrigation	**Responses**		**PC**
	N	**Percentage (%)**	
Tube well	3	.9%	1.1
Boring (Irrigation Bore pump)	21	6.6%	7.6
Nahar (Canal)	201	63.2%	72.6
Pond/Tank	5	1.6%	1.8
Electric Motor	82	25.8%	29.6
Other natural resource	4	1.3%	1.4
Mixed	2	.6%	.7
Total	318	100.0%	114.8

Source: Field Survey, 2022

Note. The mode of irrigation is shown in Response n=sampled number 361 and PC=Percent of Cases and Dichotomy group tabulated at value 1.

Other less prevalent irrigation methods include pond/tank irrigation (1.6% of responses and 1.8% of instances) and other natural resources (1.3% of responses and 1.4% of cases), such as rivers or rainfall collected. These methods are most likely secondary or additional water sources that demonstrate reliance on local terrain and seasonal rainfall patterns. Mixed irrigation, which was employed by just 0.6% of respondents, demonstrates the low prevalence of mixing diverse water sources, presumably indicating a preference for a single, dominating mode of irrigation.

Overall, data shows that irrigation in the region is predominantly supported by large-scale infrastructure (canals) and mechanical systems (electric motors), with natural and mixed techniques that play very modest roles. This distribution indicates various degrees of development throughout the region, which has consequences for agricultural resilience. Farmers rely heavily on canal systems, making them sensitive to changes in water policy or infrastructure interruptions, whilst those who use electric motors are affected by fluctuations in energy supply or cost. Farmers who use bore pumps, on the other hand, may encounter sustainability issues with groundwater.

This research emphasizes the importance of access to water infrastructure and technology in defining agricultural outputs that impact food security, and determine the economic sustainability of farming families.

4.3.4 Ownership Status of Land Cultivated by Sample Household

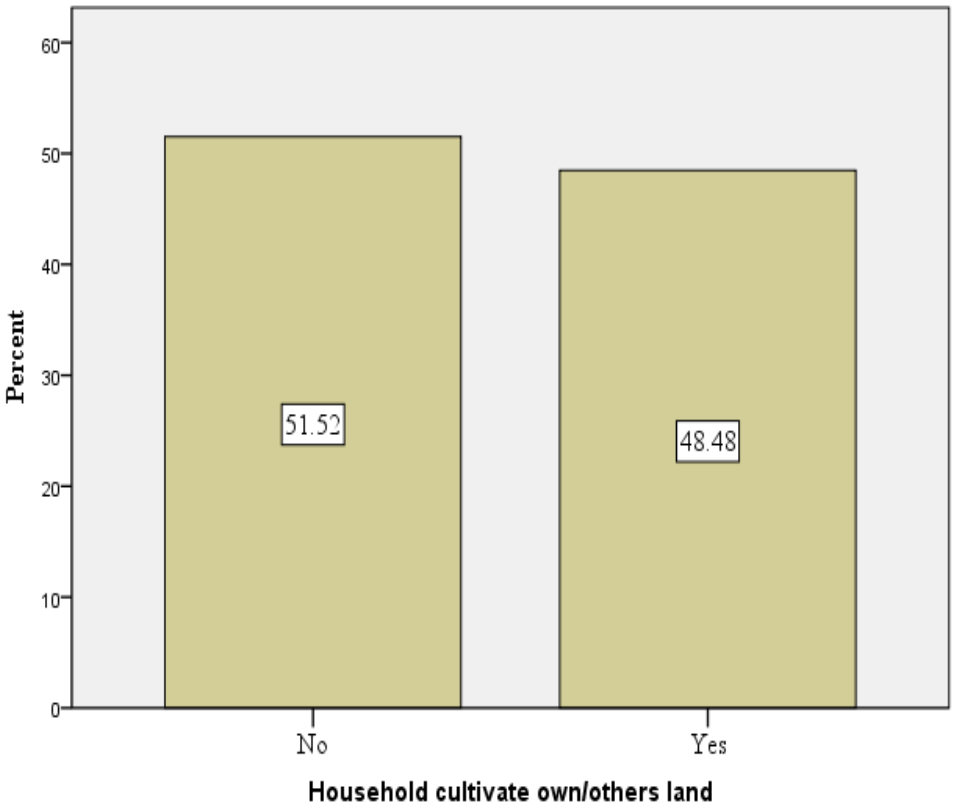
The agriculture industry employs around 66% of Nepal's entire population. It accounts for one-third of the country’s GDP and makes a substantial contribution to the national economy. It generates a wide range of occupations and employment opportunities, from farming to small-scale businesses.

Nepal is subject to food insecurity as well as repeated natural catastrophes such as floods, droughts, landslides, earthquakes, disease outbreaks, and insect outbreaks. Subsistence farming continues to dominate the country's agriculture sector, results in poor productivity and agricultural commodity output. Bardiya is the primary place where grain crops are cultivated widely. Because of the region's tropical environment, the principal agricultural products are tropical and subtropical food crops, vegetables, and fruits.

The data presented in figure 4.5 exhibit home land cultivation methods in Barbardiya Municipality. Out of the 361 households polled, a slightly majority (51.52%) cultivate land owned by others, while 48.48% cultivate their own. The nearly equal division between self-owned and externally held land cultivation reflects the region's complicated land holding patterns.

Figure 4.5

Ownership of Cultivating Land by Self/Someone



Source: Field Survey, 2022

Note: The Cultivating Land Own by Self/Someone is shown in % =Percent and the total sampled n = 361 Household.

This high number of households farming other people's land reveals their reliance on land leasing or sharecropping arrangements. Such arrangements are typical in locations where a few number of people hold most of the land, but the rest

of the population does not have enough land for agriculture. Households without land must rely on leasing or sharecropping arrangements, which can create insecurity in their livelihoods. These households confront issues such as changing rents, limited control over land usage, and insecure holding, all of which can impact on agricultural output and long-term stability.

Households that cultivate their own land (48.48%), on the other hand, are likely to have higher decision-making power in terms of land usage, crop selection, and agricultural upgrade investment. However, the virtually equal distribution of self-owned and rented property underlines the region's unstable land ownership situation, it implies that land ownership is not uniformly accessible to all farming families.

This study reflects wider socioeconomic trends regarding land access and inequality. Households that cultivate others' property have additional financial obligations or rely on landowners, heightening their economic fragility. In contrast, persons who cultivate their own land have greater stability and the possibility for long-term wealth growth. These dynamics highlight the need for land reform or policies that increase access to land ownership, particularly for disadvantaged households, to boost economic stability and reduce inequality in the study area.

4.3.5 Contractual Arrangement of Land

The contractual arrangement of land in Nepal's Terai area varies based on the precise terms and circumstances agreed upon by the parties concerned. Farmers in Nepal's Terai area frequently engage into tenancy agreements with landowners, in which the farmer pays the landowner rent in exchange for the right to use and occupy the land for agricultural purposes.

The table 4.18 shows the various contractual arrangements for land among households in the study area, with sharecropping-in accounting for 81.9% of responses and 89.2% of cases. This shows that sharecropping is the principal mechanism by which the majority of families in Barbardiya Municipality gain access to agricultural land. In sharecropping agreements, farmers cultivate the land in exchange for a portion of the harvest, which is normally divided with the landowner. This structure reflects the region's socioeconomic situation, since numerous households lack the resources to own property. Instead they engage into agreements with landowners.

Table 4.18

Contractual Arrangement of Land

Contractual Arrangement of Land	Responses		PC
	N	Percentage (%)	
Rented-In	5	2.9%	3.2
Mortgage-In	21	12.3%	13 .4
Sharecropping-In	140	81.9%	89.2
Sharecropping-Out	5	2.9%	3.2
Total	171	100.0%	108.9

Source: Field Survey, 2022

Note. The Contractual Arrangement of Land is shown in Response n=sampled number 361 and PC=Percent of Cases and Dichotomy group tabulated at value 1.

Mortgage-in arrangements represent 12.3% of responses and 13.4% of cases. This shows that a small but considerable proportion of families obtain property through mortgaging, in which they temporarily receive the right to cultivate land in return for making a debt to the landlord. Such arrangements are more popular among households with somewhat higher incomes that allow them to obtain land use rights for a set period of time.

Rented-in and Sharecropping-out options account for just 2.9% and 3.2% of responses, respectively. The low percentages of rented-in arrangements indicate that direct leasing of land is less frequent than sharecropping or mortgaging, probably due to economic hurdles that make renting unaffordable for numerous people. Sharecropping-out, in which households lease their property to others in exchange for a portion of the harvest, is also uncommon, that the majority of landowners prefer to cultivate their land themselves or make alternative arrangements.

The findings show a dependence on informal and customary land use arrangements, with sharecropping being the most accessible way for households without land ownership to participate in agricultural operations. This pattern highlights the region's continued issues with land ownership and access, as land inequality continually impacts the economic prospects accessible to rural households. The predominance of sharecropping suggests that numerous households rely on landowners for a living, which can prolong cycles of poverty and impede economic mobility.

This research emphasizes on the need of resolving land holding concerns and looking at measures that promote fair land distribution. Enhancing land ownership options or offering more secure and equitable contractual arrangements can boost agricultural household stability and production, thereby lowering regional socioeconomic inequities.

4.3.6 Land Holding Size of Rented-In Land

Land that has been rented in refers to property that has been leased or rented for a certain period from another owner or company. The overall area of the land being rented is referred to as the size of the land holding. Depending on the measuring system

in use in the area where the property is located, the size of the land holding can be stated in acres, hectares, or square feet.

The table 4.19 presents the contractual arrangement of land. Among the total 361 households surveyed in municipality, 81.9 percent of households have contracts on sharecropping-in, 2.9 percent households have contracts on sharecropping-out, 12.3 percent households have contracts on mortgage-in and 2.9 percent households have contracts on rented-in. The data show more than half and quarter of households involved in sharecropping-in which most of the families depend on landlords' land.

Table 4.19

Size of Rented-In Land

Rented-In (*Kattha*)	**N**	**Percentage (%)**	**Valid Percent**
6-15	3	0.8	60
16-25	2	0.6	40
Total	5	1.4	100

Source: Field Survey, 2022

Note. The Size of Rented-In Land is shown in Response f = frequency, total percent from sample, valid percent from rented-in household and Dichotomy group tabulated at value 1.

The majority of sharecropping agreements show uneven power relations and financial gaps between tenants and landlords. The prevalence of sharecropping indicates that a sizable fraction of families relies on land owned by landlords for agricultural output, frequently under conditions that could be advantageous to the landowners. Due to the unequal distribution of property access and control, renters

have less economic mobility and autonomy than landowners, which can perpetuate socioeconomic inequities.

The uneven character of land holding relations in the area is the lack of responses that suggests rented-out or mortgage-out arrangements, which affected by historical or cultural reasons that uphold landlord dominance. According to Conflict Theory, social tensions and disputes over land ownership, usage rights, and economic benefits can result from such unequal power relations. This emphasizes the need for equitable land reform policies in Barbardiya Municipality to address these disparities and advance socio-economic justice.

4.3.7 Land Holding Size of Mortgage-In Land

A mortgage is the transfer of a property interest as security for a debt or other obligation. It is the most popular way to finance real estate transactions. The party conveying the interest in land is known as the mortgagor. The mortgagee, who is often a financial institution, provides the loan or other interest in return for the security interest. A mortgage is typically paid in installments that include both interest and a payment on the principal amount borrowed (Dhakal, 2015).

Table 4.20

Mortgage-In Land Size

Mortgage-In Land (*Kattha*)	**N**	**Percentage (%)**	**Valid Percent**
Less than 5	13	3.6	61.9
6-15	4	1.1	19
26-40	4	1.1	19
Total	21	5.8	100

Source: Field Survey, 2022

Note. The Size of Mortgage-In Land is shown in Response f = frequency, total percent from sample, valid percent from rented-in household and Dichotomy group tabulated at value 1.

Land that is pledged as security for a mortgage loan is referred to as mortgage-in land. In this instance, the entire area of the land being used as mortgage collateral is referred to as the size of the land holding. Similar to rented-in land, the size of the land holding can be specified in terms of acres, hectares, or square feet, depending on the regional measuring system in use. The value of the property, the conditions of the mortgage contract, and the borrower's general financial situation can impact on how much land is owned.

The tables 4.20 explain the information about contractual arrangement of mortgage-in land. Among the total 21 mortgage-in household surveyed in municipality 61.9 percent have less than 5 *Kattha*, 19 percent have 6-15 *Kattha* and 26-40 *Kattha*. In the study area less than quarter of the households have mortgage-in land.

4.3.8 Land Holding Size of Sharecropping-In Land

Sharecropping is a method of farming in which households rent small plots of land from a landowner in exchange for a percentage of their produce, which is paid to the landowner at the end of each year. Sharecropping evolved as a system that benefitted both partners. Landowners could have access to the Black gramive work force required to cultivate crops (Sherman, 2010).

The table 4.21 shows the distribution of land sizes under sharecropping-in arrangements, as measured in *Kattha*, which provides useful information on land availability among sharecroppers. The majority of households that participate in sharecropping inhabit smaller plots of land, reflecting the difficulties of obtaining

greater holdings in this farming system. The most prevalent land size group, 6-15 *Kattha*, accounts for 34.3% of families that implies that the average sharecropper works on a moderate-sized allotment. While this is sufficient for subsistence farming, it restricts the household's potential to develop excess output or revenue.

Followed closely, 29.3% of households practice sharecropping on slightly bigger plots of 16-25 *Kattha*. This range still accounts for a considerable amount of sharecropped land, giving these households additional crop production flexibility and the possibility of small-scale commercial activities. However, smaller plots of less than 5 *Kattha* account for 11.4% of families that implies that numerous sharecroppers labor on relatively tiny amounts of land. These households are more vulnerable to food insecurity and economic instability since their land size does not sustain adequate agricultural output to fulfill their basic requirements.

Table 4.21

Sharecropping-In Size of Land

Sharecropping-In (*Kattha*)	**N**	**Percentage (%)**	**Valid Percent**
Less than 5	16	4.4	11.4
6-15	48	13.3	34.3
16-25	41	11.4	29.3
26-40	22	6.1	15.7
41-60	11	3	7.9
More than 60	2	0.6	1.4
Total	140	38.8	100

Source: Field Survey, 2022

Medium-sized plots, classified as 26-40 *Kattha* account for 15.7% of sharecropping families. These families are expected to have more chances for diverse farming and enhanced food security than those with smaller holdings. However, the

statistics show that bigger plots are uncommon within the sharecropping system. Only 7.9% of households sharecrop on land ranging from 41 to 60 *Kattha*, and only 1.4% have access to plots greater than that. The scarcity of larger plots can be attributed to landowners' reluctance to lease out large areas or the limited availability of such land allocations.

The distribution of land sizes with sharecropping-in agreements demonstrates the difficulties most sharecroppers have in obtaining significant landholdings. The majority of households live on small to moderate-sized plots, reflecting the area's overall patterns of land disparity. Households operating on smaller plots are more likely to encounter economic insecurity, but those with somewhat bigger plots enjoy more stability, albeit productivity and market involvement remain key restraints. This distribution underscores the notion that, while sharecropping provides access to land, it frequently limits opportunities for economic progress.

4.3.9 Land Holding Size of Sharecropping-Out Land

Most of agricultural land is rented under short-term sharecropping contracts known as *adhiya. Adhiya* requires tenants to offer work while landowners provide a percentage of inputs. In theory, the tenant and landowner receive equal parts of the produce, but the tenant is seldom given a half-share, either because he or she owes the landlord money or because the landowner supplied all of the inputs.

The table 4.22 shows the distribution of land sizes under sharecropping-out agreements as assessed in *Kattha*. Sharecropping-out is the practice of leasing land to others in exchange for a portion of the agricultural production. The findings show that this practice is rather uncommon in the study area, with just five households that

participated in sharecropping-out agreements accounting for only 1.4% of the entire sample.

The most prevalent land size categories among individuals who engage in sharecropping-out are 6-15 *Kattha* and 41-60 *Kattha*, each accounting for 40% of sharecropping-out families. This suggests that landowners who lease out property typically deal with smaller or medium-sized holdings. The outlook of two separate groups indicates that sharecropping is not limited to tiny landholders, but can also include people with medium-sized plots who prefer to lease out their land rather than farm it themselves.

Only 20% of landowners lease out more than 60 *Kattha* of land, which shows that greater sharecropping arrangements are unusual. It represents a lack of large landowners in the region or a propensity among larger landowners to maintain control over their agricultural activities.

Table 4.22

Sharecropping-Out Size of the Land

Sharecropping-Out (*Kattha*)	**N**	**Percentage (%)**	**Valid Percent**
6-15	2	0.6	40
41-60	2	0.6	40
More than 60	1	0.3	20
Total	5	1.4	100

Source: Field Survey, 2022

Note. The Sharecropping-Out Size of Land is shown in f = frequency, total percent from sample, valid percent from Sharecropping-Out size of land and Dichotomy group tabulated at value 1.

The data reveals that sharecropping is not a common practice, due to a combination of land scarcity and landowners' inclination to farm their land or participate in other types of land use agreements. For individuals who lease out their land, their plot sizes are often modest and medium-sized. A small number of examples including greater landholdings imply that wealthy landowners have other ways to capitalize on their land, such as direct cultivation or alternative investment tactics.

The distribution of land size under sharecropping-out agreements emphasizes the area's land access and ownership difficulties. While sharecropping-out allows landowners to gain from their land without directly participating in farming, its rarity shows that the practice is not a substantial contributor to the local agriculture sector. The dependence on small and moderate-sized plots in sharecropping-out indicates continuous land fragmentation, which can lead to inefficiencies in agricultural output and limit the possibilities for large-scale farming operations.

4.3.10 Families Holding Public Land

Land policy changes in Nepal have been reported since the 1951 governmental shift yet, land reform measures have fallen short of full accomplishment. Despite the existence of a land management system based on cadaster and land registers, 25% of arable land with an estimated 10 million spatial units on the ground is inhabited informally and off-register.

There has been a political movement/voice to ensure that all people have access to land. *Sukumbasi* is a landless person/family who lacks land across the country and without the financial means to acquire land on their own. Informal settlers are individuals or families who use some land(s) without having a formal land holding ship,

but who own land(s) somewhere in the country that is(are) legally registered in their (or their family's) name.

The table 4.23 presents the distribution of public landholding sizes among families as assessed in *Kattha*. The table shows the extent to which households in the study area own public land, which is an important measure of land access and use in the region. Out of the entire sample, 111 families (30.7%) own public land that provides an overview of its distribution.

The majority of families with public land, 78.4%, own plots of less than 5 *Kattha*. This implies that public landholding is mostly limited to extremely tiny parcels, which represents the scarcity of bigger public lands or municipal land regulations that give smaller pieces to people. These tiny plots are more likely to be used for subsistence farming or additional activities than for large-scale agricultural development.

Table 4.23

Status of Holding Public Land Size

Status of Holding Public Land (*Kattha*)	**N**	**Percent (%)**	**Valid Percent**
Less than 5	87	24.1	78.4
6-15	19	5.3	17.1
16-25	3	0.8	2.7
41-60	1	0.3	0.9
More than 60	1	0.3	0.9
Total	111	30.7	100

Source: Field Survey, 2022

A lower proportion of families (17.1%) own public land ranging from 6 to 15 *Kattha*. These bigger plots give households more land use freedom that allows them to

engage in a broader range of agricultural activities or cultivate more diversely. However, these households have tiny landholdings, which limit their capacity to engage within commercial farming.

The results show that only few households own bigger amounts of public property. 2.7% of households own land in the 16-25 *Kattha* range, with 0.9% holding land in the 41-60 *Kattha* and more than 60 *Kattha* categories. These bigger landholdings are uncommon which implies that access to considerable areas of public land is limited. Households with larger plots are better suited to more extensive agricultural operations or land-based economic activities, but they are the exception rather than the rule.

The overall distribution of publicly owned landholding sizes reflects regional trends of scarcity and fragmentation. The vast majority of households owning public land have extremely tiny plots that limit their capacity to engage in large-scale agricultural production and result in continued food security and economic fragility. The preponderance of tiny landholdings suggests that public land policy promotes extensive but restricted access, to ensure that as numerous families have access to land, even in small quantities.

This variety of land sizes highlights the difficulty that people confront in optimizing the production of their property as well. The scarcity of bigger public landholdings implies that few households have the chance to considerably increase their agricultural activity through access to public land, and exacerbate patterns of land inequality. Addressing these inequities necessitates governmental measures to either improve the availability of bigger public land plots or to assist families in making better use of their smaller land holdings.

4.3.11 Status of Sharecropping –In Period (In Year)

Sharecropping is not a common agricultural production method in the study area. New agricultural production methods such as lease agreements or owner-operated farms, displaces sharecropping. It is also likely that the respondents who engaged in sharecropping had only recently begun doing so, either because they were new to farming or because they had just signed a sharecropping agreement.

The table 4.24 presents the varied lengths of sharecropping-in arrangements across families that emphasize the complexity and diversity of land holding systems in the research area. The data reveals a wide split, with 61.22% of families falling into the "Not Valid" group, which indicates that they do not engage in sharecropping. This further implies that a sizable proportion of families either rely on alternate kinds of land access, such as land ownership or renting, or do not engage in agricultural land usage under sharecropping agreements.

Table 4.24

Status of Sharecropping-In Period (Year)

Status of Sharecropping-In Period	N	Percentage (%)
Not Valid	221	61.22
1 – 2 Year	15	4.16
11 – 20 Year	15	4.16
21 – 30 Year	13	3.60
3 – 5 Year	20	5.54
6 – 10 Year	34	9.42
Above 30 Year	35	9.70
Less than 1 Year	8	2.22
Total	361	100.00

Source: Field Survey, 2022

There is a noticeable tendency of long-term arrangements among households that engage in sharecropping. 9.70% of households have been sharecropping for more than 30 years, with 9.42% participating for 6-10 years. These long-term partnerships indicate a robust and durable connection between landowners and sharecroppers. Such stability has been due to established trust or a lack of other land access possibilities, which forces some households to rely on sharecropping as their principal agricultural land usage. However, the lack of ownership rights in these long-term agreements limits the economic mobility of these households.

In contrast, only a minority of households engage in short-term sharecropping. 5.54% households have participated for 3-5 years, while 4.16% households have been involved for about a couple of years. These short-term arrangements are likely to depict households that are new to sharecropping or in transitional stages of land holding, due to changing connections with landowners or fluctuating access to land resources. Furthermore, 2.22% of households have been sharecropping for less than a year indicates that they are either new to the system or are testing its practicality.

Moderate-term sharecropping, which accounts for 4.16% of households participating for 11-20 years and 3.60% for 21-30 years, represents a balance of stability and unpredictability. Although these households have relatively consistent land access, they are nonetheless subject to changes in their land holding arrangements, which impact on their agricultural output and income stability.

The total distribution of sharecropping throughout eras reflects the complex dynamics of land holding in the region. While long-term sharecropping offers security for certain families, a lack of ownership and control over the property can stymie economic progress. Meanwhile, short-term sharecroppers experience volatility and

uncertainty in their land access that hampers their efforts to attain agricultural sustainability. To address these issues, policies aimed at improving the security and equity of land holding arrangements, such as increasing access to ownership or offering more favorable sharecropping terms significantly improve the economic resilience and livelihood stability of sharecropper households.

4.3.12 Land Ownership Condition

Nepal recognizes two forms of land holding: ownership and leasehold. Landowners have the exclusive right to use their land; they have the freedom to freely transfer their land and pass it on through inheritance. The Land Reform Act of 1964 sets plot size limits based on geo-ecological variations, soil types, average precipitation, other climatic circumstances, and land use categories such as irrigated land, rain-fed land, grazing land, and average family size. The fifth modification to the Land Reform Act 2001 decreased the previous ceiling to 3.75 hectares in the highlands, 1.5 hectares in the Kathmandu Valley, and 7.43 hectares in the Terai and Inner Terai since the Draft Land Policy is intended to adjust these limitations based on certain land-use zones (DFID, 2008).

The figure 4.6 presents an overview of the land ownership situation of Households in the research area based on respondents' perspectives. The bar diagram shows the diverse perspectives of land ownership across the 361 households and highlights a wide range of experiences with land governance and ownership. According to the survey, a majority of households (53.03%) are confident in their land ownership. 46.26% respondents rate their land ownership as "good" and 6.77% describe "very good" ownership conditions. Majority of households have a strong feeling of ownership and control over their property, which helps them maintain stability and productivity in

agriculture. This perspective is ascribed to clear legal titles, long-standing holding, or minor disputes over land rights.

Figure 4.6

Land Ownership Condition of Household according to Respondent Views

Source: Field Survey, 2022

However, a sizable 30.19% of households indicate "poor" land ownership. This means about a third of the population has issues with land holding or rights. Unresolved land conflicts, ambiguous or informal land holding arrangements, and challenges preserving legal title of their land may all contribute to this image. These households have been found susceptible to land loss or lack the power to make decisions about their property, and to limit their economic options and security. In addition, 17.17% of the surveyed rate their land ownership as "fair." These households most likely have a reasonable sense of control over their land; nevertheless, they have constraints that prevent them from obtaining complete ownership satisfaction. This intermediate

category has some statutory land rights but limited by the quantity, quality, and legal standing of their holdings. Their experiences suggest a level of uncertainty, which limits their capacity to invest in or fully use their property.

Mixed perceptions of land ownership reflect underlying concerns with land holding and property rights in the study area. The high share of families with poor or merely fair ownership suggests possible issues, such as unstable holding, legal difficulties, or resource restrictions. Addressing these concerns via measures targeted at enhancing land security and settling conflicts improves the economic prospects and sense of stability for numerous households in the region. Overall, while more than half of families have positive land ownership circumstances, a significant percentage continue to experience problems that prevent them from exercising full control over their property and affecting their overall lives.

4.2.13 Status of Household Selling Land

The purchasing and selling of property occurs worldwide for diverse reasons, such as the benefits of owning land, which include cash returns on sale, leasing income, extra assets, and enhanced financing capacity. In the case of Barbardiya Municipality, residents sell land for economic purposes, such as buying land near their house or meeting domestic needs and resolving family problems.

The table 4.25 demonstrates the status of land transactions among households in the study area. The data show that the vast majority of households, 97.8% (353 homes) have not sold any land. This considerable size of the population/households implies that land ownership is the dominating tendency in the area that suggests most families prefer to retain their land as much as they can afford. This behavior is influenced by a number of variables, including the cultural and economic value of land

as a source of subsistence, security, and legacy. For numerous families, land ownership provides not just agricultural prospects, but also a dependable asset that can be passed down to future generations.

Table 4.25

Status of Selling Land

Status of Selling	N	Percentage (%)
No	353	97.8
Yes	8	2.2
Total	361	100.0

Source: Field Survey, 2022

The unwillingness to sell land shows a desire to ensure long-term economic security and family property. In contrast, the modest percentage of households that have sold land (2.2%) suggests that these people were forced to sell their property due to unfavorable circumstances. Financial pressures, debt, or the necessity to liquidate assets for immediate needs such as health care, education, or relocation are some of the reasons for selling. It further indicates a shift in livelihood strategy, with households shifting away from agriculture or no longer viewing land as an important asset.

Overall, the results show a significant inclination among households to retain land, and reflect the importance of land in the social and economic fabric of the society. The limited fraction of land sales demonstrates that selling land is an outlier rather than the rule mostly driven by special economic demands or conditions.

4.3.14 Situation of Selling and Buying of Land

The process of obtaining or disposing of real estate's such as land, residences, or commercial structures is referred to as buying and selling land. A range of reasons,

including personal, financial, and market concerns, contribute to this process. Land is often seen as a desirable asset owing to its potential for capital gain through time, and people purchase land as an investment or to diversify their portfolio. Land can also be purchased and sold for development reasons, such as the construction of residences, commercial structures, or industrial facilities.

Land can be purchased for personal reasons such as building a house or beginning a farm. Land is inherited from a family member and subsequently sold by the recipient in specific instances. Furthermore, land is sold if the owner's circumstances change, such as if they need to relocate for employment or can no longer afford to maintain the property. Market dynamics such as supply and demand, economic conditions, and changes in property prices all can impact on the purchase and sale of land.

The table 4.26 has presented the status of land selling or buying within a year. Among the total 361 households, data on land purchases made by families in the study area reveal that the typical household purchased 3.56 units of land, with a median of 3 and a mean of 1. The standard deviation of 3.127 shows that the data points are spread apart, while the variance of 9.778 indicates that the data is variable. The range of 10, minimum of 1, and maximum of 10 indicate that the data a broad range of values. The sum of 32 implies that families in the study region have sold a total of 32 *Kattha* of land.

The data indicates the amount of money obtained from the sale of land the study are. The mean value is 668333.33, which is the average of all the values. The median value is 400000, which is the midway value when all of the values are ranked from lowest to highest. The mode, or most usually occurring value, is zero. The standard

deviation is 661740.13, which is a measure of the spread or dispersion of data around the mean. The variance is 4.379, which is a measure of the spread or dispersion of data around the mean. The range is defined as the difference between the highest and lowest numbers. The lowest and maximum values are 0 and 1900000, respectively. The total of all values is 6015000.

Table 4.26

Status of Land Selling or Buying

Descriptive Statistic		**LSH (*Kattha*)**	**CRSL (In Rupees)**	**LBH (In *Kattha*)**	**HPCL (In Rupees)**
N	Valid	8	9	16	16
	Missing	352	352	345	345
Mean		3.56	668333.33	6.25	1927500
Median		3	400000	4	675000
Mode		1	0[a]	1	600000[a]
Std. Deviation		3.127	661740.13	9.525	2275707.948
Variance		9.778	4.379	90.73	5.179
Range		10	1900000	39	6470000
Minimum		1	0	1	30000
Maximum		10	1900000	40	6500000
Sum		32	6015000	100	30840000

Source: Field Survey, 2022

Note. The Status of Household Selling Land is shown in Descriptive Statistic, LSH = Land Sell by Household, CRSL = Cash Received by Selling Land, LBH = Land Bought by Household, HPCL = Household Pay Cash for Land and Multiple modes exist. The smallest value is shown

A household's most typical purchase of land is one. The data's standard deviation and variance indicate that the number of parcels of land purchased by

households is well dispersed. The data demonstrate that the number of pieces of land purchased by households varies substantially, with some purchasing as little as one piece and others purchasing as many as forty pieces. The aggregate of the data suggests that all of the households have purchased a total of 100 *Kattha* of land. These statistics show the distribution and dispersion of the number of parcels of land purchased by households.

The data demonstrate the amount of money spent for land by families in a certain research region. The mean value is 1927500, which is the average of all the values. The median value is 675000, which is the midway value when all of the values are ranked from lowest to highest. The mode, or most commonly occurring value, is 600000. The standard deviation is 2275707.948, which is a measure of the spread or dispersion of data around the mean. The variance is 5.179, which is a measure of the spread or dispersion of data around the mean. The range is 6470000, which is the difference between the highest and lowest numbers. The lowest and maximum values are 30000 and 6500000, respectively. The total of all values is 30840000. These numbers offer a general picture of the data's distribution and dispersion.

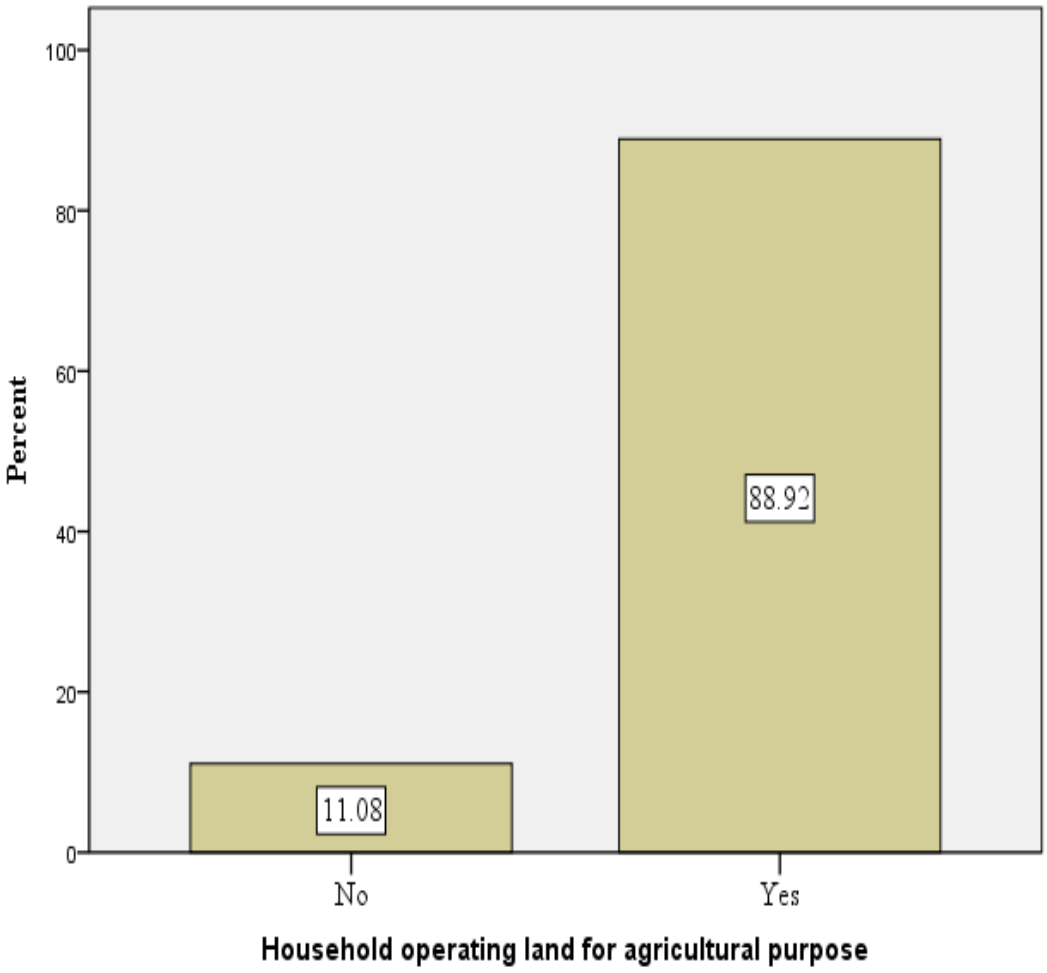
4.3.15 Household Operating Land for Agriculture Purpose

Agriculture accounts for 28 percent of Nepal's total land area (21 percent cultivated, 7 percent uncultivated); forest accounts for 40 percent, and pasture accounts for 12 percent. However, cultivated land accounts for 21.88 percent of the total land. This reflects Nepal's recent increase in agriculture area. Similarly, the forest covered area has expanded from 40% to 44.4 percent. Other land accounts for 28.68 percent of total area after the forest. In contrast, settlement and wetland cover 1.15 percent and 1.22 percent of the total area, respectively (Timilsina et al., 2019).

Households in Nepal cultivate land for a variety of reason. Agriculture is a major source of income for majority of the Nepalese, and operating land for agriculture gives a way of producing food for home consumption as well as creating cash via crop sales. Agriculture is an important sector in Nepal's economy, and farming land helps the country's overall economic growth.

Figure 4.7

Household Operating Land for Agriculture Purpose



Source: Field Survey, 2022

Numerous Nepalese people rely on agriculture as their major source of income, and operating land for agriculture as it is a lifeline for these families. Furthermore, agriculture is a historic and cultural activity in Nepal, and farming families continue to

farm land for cultural and social reasons even if it is not their major source of income. Overall, operating land for agricultural purposes is a widespread and vital activity for majority of Nepalese population.

The figure 4.7 explains the household operating land for agriculture. Among total sampled households 11.08 percent of households do not operate land for agriculture and 88.92 percent of households operate land for agriculture. Among the households that do not own land for agricultural purposes, wage labor is noted. This implies that a sizable number of the selected families rely on agriculture as a source of income, whereas a smaller proportion of the population rely on other sources of income such as wage labor and service.

4.3.16 Status of Land Transfer/Transaction

Land holding refers to the legal rights and duties that people or families have in terms of land ownership and usage in Nepal. There are two types of land holding: ownership and leasehold. Landowners have the only right to use their land and the ability to transfer and pass it on through inheritance. This implies that landowners have the freedom to use their property for a variety of reasons, including agricultural, housing, and commercial operations. They have the right to sell or transfer their land to others, as well as to pass it on through inheritance to their successors as well.

Land sales in Bardiya take place in a variety of ways. One method is through parent land inheritance, which means that when a parent dies, their land is handed on to their offspring or other relatives. This is a frequent method of transferring land in Nepal, as land is often seen as a precious possession that is passed down through generations. Another option to obtain land is to use one's own money to purchase it. This means that a person or family can acquire land with their own money.

Land trades can also take place through the dowry, or *dijo*, system, which entails trading land as part of a marriage contract. Land sales are simplified in some situations by government initiatives like *Sukumbashi Aayog* or *Kamaiya*[12] Aayog, which grant land to individuals or households. Finally, land purchases take place through private firms or with government assistance, such as Basobas Compani. Overall, depending on the unique legal and social setting, land transfers occurs in a variety of ways in the context of Bardiya.

Table 4.27

Status of Land Transfer/Transaction

Land Transaction	Responses		Percent of Cases
	N	Percentage (%)	
Inheritance of Parent land	205	49.5%	57.3
Own Income	62	15.0%	17.3
Sukumbashi Aayog/ Kamaiya Aayog	137	33.1%	38.3
Basobas Compani/ Government Support	2	.5%	.6
Daijo	8	1.9%	2.2
Total	414	100.0%	115.6

Source: Field Survey, 2022

Note. The Status of Land Transaction is shown in N = frequency, % = total percent and PC = Percentage of Cases. Dichotomy group is tabulated at value 1.

A lower proportion of households (17.3%) have earned their land from their own earnings. This indicates that they have spent their own money, such as salary or savings, to buy the land or pay for the rights to use it. A sizable percentage of families (38.3%) have received their land through *Sukumbasiaayog* or *Kamaiya aayog*. These

[12] The word "*Kamaiya*" comes from the Tharu language. Its *Tharu* word meaning is "people who work hard and a lot," and it is called *Kamaiya*. However, the modern definition of *Kamaiya* is bounded labor.

are most likely organizations that supply free or low-cost land to families. The material supplied does not explain how these initiatives work or what criteria are used to decide which families are qualified to acquire land.

A relatively tiny proportion of families (0.6%) have had their land through a firm named *Basobas* or through government assistance. The study shows *Sukumbasi aayog* and *Kamaiya aayog* are different from each other. Finally, a tiny minority of households (2.2%) have received their land through a method known as *Daijo*. However, it is not clear what this procedure entails or what qualifications or circumstances must be satisfied in order to get land through *Daijo*.

Overall, the statistics imply that a high proportion of the families in the study received their property through inheritance or through land-grant schemes. A lesser proportion has received their land by their own resources or through other means such as government assistance or a business known as *Basobas*. However, more data are needed for understanding the context and significance of these findings. Overall, a tiny minority of households have (2.2%) received their land through a method known as *Daijo*.

4.4 Discussion

This finding discusses with extensive research on agrarian inequality in Nepal, highlighting unequal landholding as a primary factor contributing to poverty and vulnerability. Marx's claim that ownership of productive resources sustains class exploitation is evident in Barbardiya, where tenants and smallholders remain reliant while larger landholders solidify their advantages (Marx, 1976). Adhikari (2014) and Upreti (2017) reach analogous conclusions, illustrating that unequal land distribution

routinely marginalizes disadvantaged groups from agricultural advantages. Weber's paradigm enhances this viewpoint, demonstrating that land ownership transcends economic benefits to bestow social prestige and political power (Weber, 1978). Gautam (2013) similarly discovered that land ownership in Nepal is intricately linked to prestige and power, hence perpetuating social stratification this finding align with this dissertation’s results of irrigated households possessing greater resilience and sufficiency.

Sen's entitlement approach elucidates food security as an issue of access and capabilities, rather than solely production. Secure tenure, irrigation, and resource control enhance households' genuine liberties to maintain varied diets, consistent consumption, and enduring investments (Sen, 1981). This supports Maxwell and Wiebe’s (1999) assertion that land and food security are interdependent: sufficiency facilitates reinvestment and asset accumulation, whereas insecurity depletes resources and sustains vulnerability. Pokharel (2019) similarly demonstrates that food insecurity in rural Nepal embodies both material deprivation and exclusion from entitlements. This research situates Barbardiya’s case within broader theoretical and empirical frameworks, demonstrating that structural discrepancies in land and irrigation access perpetuate inequality across economic, social, and political dimensions, thereby reinforcing household-level food insecurity.

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CHAPTER V

FOOD SECURITY STATUS OF HOUSEHOLD AT BARBARDIYA MUNICIPALITY

Food availability, accessibility, and consumption are important factors in ensuring food security. These aspects must be steady, necessitating the use of a stabilizer. Food stability refers to the availability of food across time. Rice and other food products are produced only during the monsoon, what happens when the food is not available after and before the production season is a serious question. It is the responsibility of all parties involved to ensure that meals are available throughout the year (Rozaki; 2021).

Three aspects of food security (availability, access, and utilization) are critical, but it is also significant. However, it is critical to ensure that food security requirements are satisfied on a constant basis. As a result, the fourth and final factor of food security is stability. For food security, a population, household, or person must have access to sufficient food and should not be at danger of losing it due to unexpected economic, climatic, or political shocks. The stability dimension seeks to assess the food security situation's resilience to cyclical, predictable fluctuations in yearly weather patterns (Moltedo et al. 2014).

5.1 Sufficiency Status of Households for 12 Months Period

The phrase "food consumed in home in the 12 months holding" can be used to measure food security at the household level by gathering information about the types and amounts of food consumed by households in the previous year. A home can be considered secure in terms of food if it has regularly had enough food to consume.

Nevertheless, a household that has frequently suffered food shortages or has been unable to get the sorts of food they want are deemed food insecure. It is feasible to discover any contingent concerns or obstacles associated to acquiring sufficient and healthy food by examining data and taking action to combat food insecurity.

Table 5.1

Status of the Food Consumed in Household in 12 Months Period

Status of Food Consumed in Household	N	Percentage (%)
Enough of the kinds of food we want to consume	30	8.3
Enough but not always the verities of food we want	299	82.8
Sometimes not enough to consume	30	8.3
Often not enough to consume	2	0.6
Total	361	100

Source: Field Survey, 2022

Note. The Status of Food Consumed in Household in 12 Months Holding is shown in f = frequency, % = total percent.

The table 5.1 describes the statement of the food consumed in household in the 12 months' period. According to the data in the table, 82.8% of the sampled families have enough food to consume; however, it is not necessarily the sorts of food they choose. This indicates that these households have access to enough food, but they are not able to pick exactly what they want to consume. 8.3% of the studied families have enough of the food they wish to consume but not always enough to rely on. This shows that these households do not have constant access to the foods they want. Nevertheless, they are able to receive adequate food. Finally, 0.6% of the families frequently lack adequate food.

The study shows that a tiny number of households in the study area routinely encounter food shortages and have to struggle to get appropriate quantities of food on a regular basis. Nutritious food is scarce for the health and well-being of people and families. The finding that 0.6% of the families frequently lack sufficient food to consume emphasizes the need for measures and support to reduce food insecurity in the study area.

Furthermore, 8.3% of the examined households had both enough of the type of food they wished to consume and sometimes not enough to survive on shows that food insecurity has been a fluctuating issue for certain Bardiya District households. This is due to seasonal shifts in food supply, economic instability, or other barriers to food access.

Overall, the data underscore the need of addressing food insecurity in the Bardiya District, particularly for those households who frequently do not have enough food to consume. Implementing initiatives such as food assistance programs, boosting access to healthy food, or addressing the root causes of food insecurity in the study area has been crucial.

5.2 Cause of Not Having Sufficient Desired Food

A person's capacity to acquire and afford the food they wish to consume is influenced by a variety of circumstances. Financial restrictions, such as a lack of cash or access to resources, can make purchasing and preparing preferred foods difficult. Geographical constraints, such as living in a rural or isolated place, affect the availability of specific foods. Besides, dietary limitations or allergies, as well as personal or cultural preferences, limit the sorts of food a person can consume.

The table 5.2 describes the reason why people do not always have enough or the kind of food they want to consume in the 12 months' period. Among the total

sampled households, the reason why people do not always have enough or the kind of food they want to consume. It shows that the majority of respondents (89.9%) either does not know or do not feel that a lack of access to particular types of food or inadequate cash for food has been a problem for them in the previous year because they had constant access to the sorts of food they wanted and/or had the financial means to buy the meals they wanted.

Table 5.2

Cause of Not Having Sufficient Desired Food

Cause of Not Having Sufficient Food	N	Percentage (%)
Don't know or not applicable	324	89.8
Kinds of food I want are not available	9	2.5
Not enough money for food	25	6.9
Not enough time for shopping or cooking	3	0.8
Total	361	100.0

Source: Field Survey, 2022

However, a small number of respondents (2.5%) identified a lack of particular types of food as a cause for not always having what they wanted to eat because of geographic location, seasonality, and supply chain interruptions. Similarly, a somewhat higher proportion (6.9%) cited a lack of food funds as a cause for not being able to obtain the meals they desired. Which has been because of financial issues, such as a poor salary, unanticipated costs, or a lack of financial resources?

Finally, a minor proportion (0.8%) indicated a lack of time for shopping or cooking as a cause for not having access to the food they desired. This is because of hectic work or a lack of transportation or other resources that would allow for food

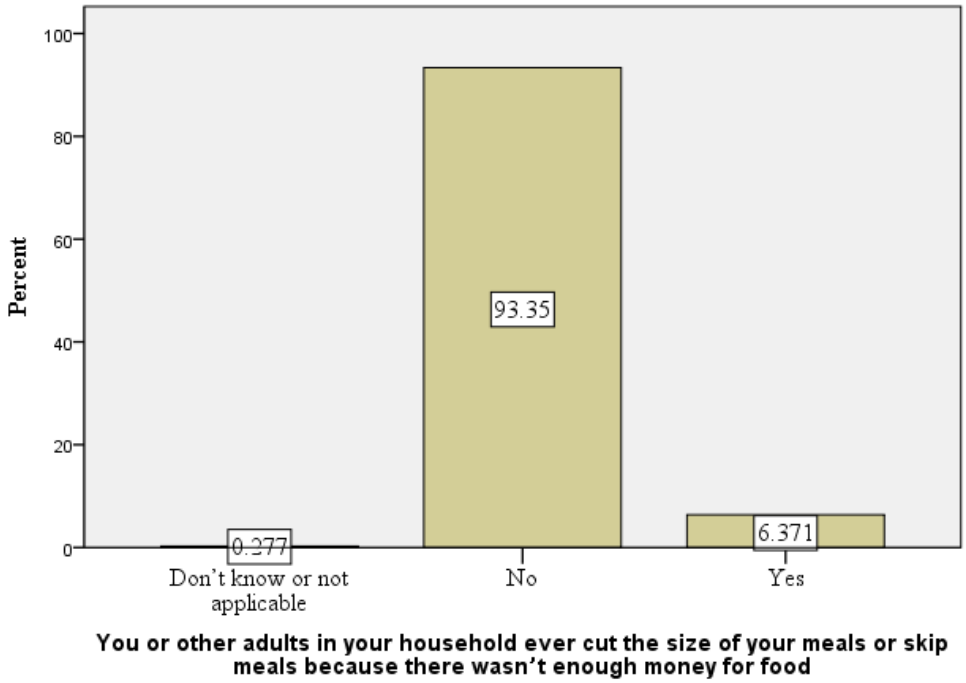
shopping and meal preparation. These findings indicate that, while availability to food was not a general issue in the households, it was a serious concern for some individuals.

5.3 Reduction of Food Size because of Insufficient Funds by Adults

There have been several theoretical theories for why certain households, even in countries with relatively high levels of economic development, experience food insecurity. One cause is that some households have low levels of income or wealth, making it difficult for them to buy a sufficient amount of food. Besides, other necessary expenses, such as housing or healthcare, can consume a large portion of a household's income, leaving little money for food. Addressing food insecurity necessitates a multifaceted approach that includes expanding access to healthy and affordable food, increasing household income and wealth, and lowering housing and healthcare costs.

Figure 5.1

You or Reduction of Food Size because of Insufficient Funds by Adults (n-361)



Source: Field Survey, 2022

The figure 5.1 explains why respondent or other adults in their household ever cut the size of meals or skip meals due to not having enough money for food. Among the total sampled households, a small fraction (0.27%) of respondents either did not know or did not perceive the question to be relevant to their position. A higher proportion of respondents (93.35%) stated that adults in their families have meals due to the lack of funds. However, a small number of respondents (6.37%) said that adults in their families had to reduce the quantity of their meals due to a shortage of money.

Besides, economic uncertainty, such as job loss or unanticipated costs, can lead to food insecurity in some households. Food insecurity is a complicated issue that can be impacted by a range of factors, including economic, social, and cultural issues. Consequently, resolving food insecurity necessitates a diversified strategy that considers the individual needs and circumstances of impacted households.

5.4 Status of Family Cutting or Skipping of Meal

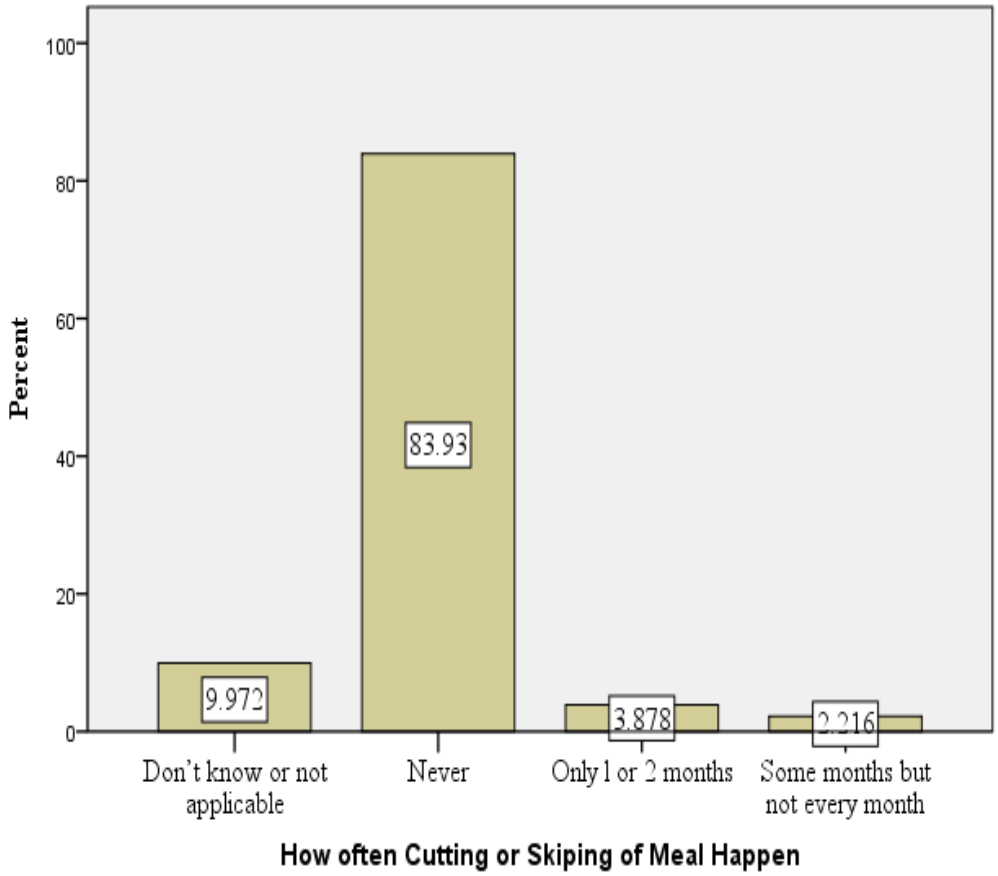
There have been numerous reasons why a family reduced or eliminated meals. A family with low income was not able to purchase enough food to satisfy its needs, unexpected costs or financial setbacks, such as a medical emergency or job loss, caused meal reduction or skipping as a means of stretching resources.

The figure 5.2 describes status of family cutting or skipping meal. Among the total sampled household status of family cutting or skipping in the past 12 months, 9.97 percent of respondents did not know the reason or not applicable, 83.93 percent of respondents acknowledged that their families did not have to cut or skip meal, 3.87 percent of family/households had to cut or skip foods for only 1 or 2 months, 2.21 percent of the families had to cut or skip meal for some months. If a high proportion of

a community's households had access to adequate food and were able to satisfy their nutritional demands, this indicated food security in that population. However, food security is a complicated issue which is impacted by a number of factors, including economic, social, and environmental considerations

Figure 5.2

Routine of Reducing or Skipping of Meal (n-361)



Source: Field Survey, 2022

Lack of food availability can be an issue, whether because of living in a food desert with limited access to nutritional foods or because of living in a disaster-prone location where food is scarce. Other personal or societal factors that influence an individual's or household's access to food are such as time constraints due to work care-

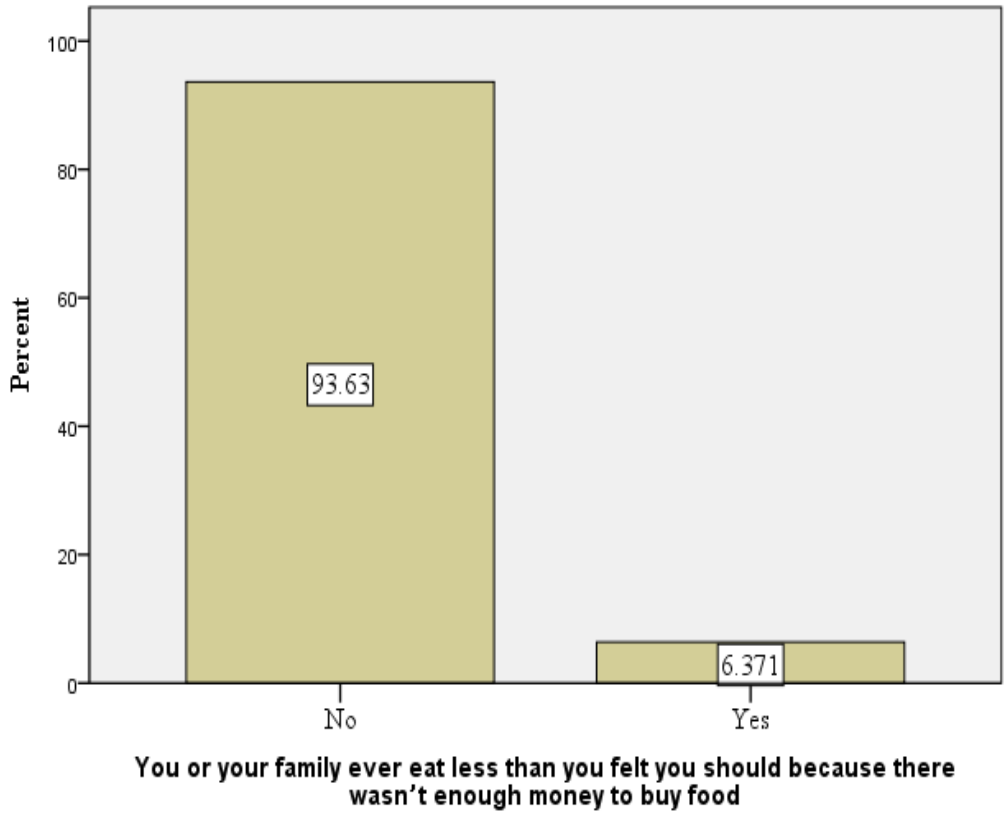
giving responsibilities, and social and cultural norms that impact an individual's or household's access to food.

5.5 Status of Families Consuming Less than Expectation

The figure 5.3 describes the reason families ever consume less than expected due to shortage of money/resources. Among the total sampled household's respondent's insufficient resources to buy food throughout the year. 93.63 percent of respondents lacked food due to not having enough money to buy food and 6.37 percent of respondents stated that families had little to consume due to not having sufficient resources.

Figure 5.3

Frequency of Eating Less than Desired Due to Financial Constraints (n-361)



Source: Field Survey, 2022

Connecting evidence with social conflict theory, its results highlight the impact of economic disparity on food security. According to social conflict theory, power imbalances lead to unequal distribution of society resources, including food. In this scenario, the minority of households that were forced to compromise with less owing to budgetary constraints are most likely from socioeconomically disadvantaged groups with restricted access to resources. This disparity exacerbates and sustains social tensions and conflicts, because individuals who lack access to basic resources like food feel excluded and oppressed. Addressing these discrepancies necessitates policies that promote more fair allocation of resources and opportunities, lowering the probability of social conflict while improving overall community well-being.

5.6 Status of Families Failing to Afford Required Foods despite Hunger

The bar diagram 5.4 describes the reason respondents ever remained hungry because they could not afford food. Among the total sampled population 94.18 percent of respondents and family had to stay hungry due to inability to afford sufficient food and 5.82 percent of respondents and families had to stay hungry.

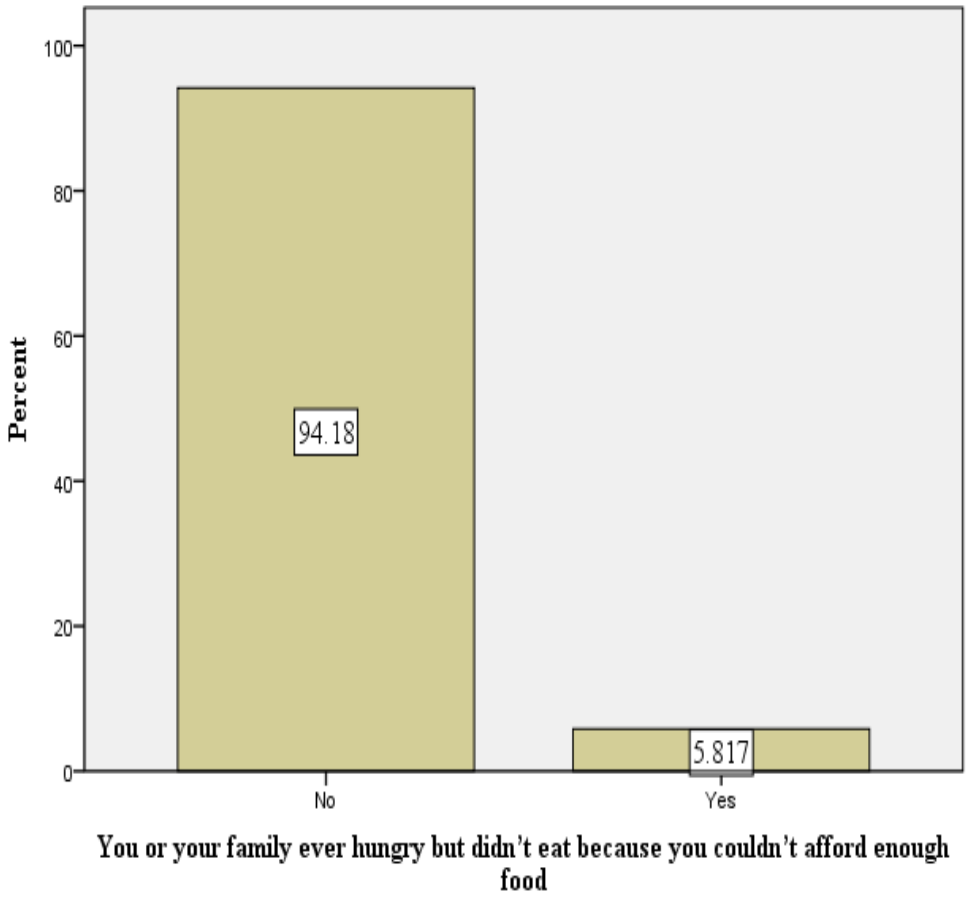
Due to low income, high food prices, restricted access to food, or a lack of availability to healthy food, families are unable to purchase adequate food. These elements can contribute to hunger and malnutrition. To recognize and address a family's need for food assistance, it is critical to evaluate their individual circumstances and problems.

The findings linked to social conflict theory indicate the underlying economic imbalances that contribute to food insecurity. According to social conflict theory, power imbalances and socioeconomic disparities result in uneven distribution of society

resources. The minority of households that experienced hunger owing to financial constraints belong to the economically deprived portion of the population. These households encounter hurdles such as low income, high food prices, limited access to food markets, and a lack of nutritious food alternatives.

Figure 5.4

Cause of Hungry Due to Inability to Afford Food (n-361)



Source: Field Survey, 2022

These variables lead to hunger and malnutrition, aggravating socioeconomic disparities and tensions. Addressing these gaps necessitates specific actions and policies aimed at increasing economic possibilities, managing food costs, expanding access to food markets, and assuring the availability of healthy food for all members of

society. This technique can help to lessen social conflict while also promoting social cohesiveness and well-being.

5.7 Status of Household ever not Eat for a Whole Day

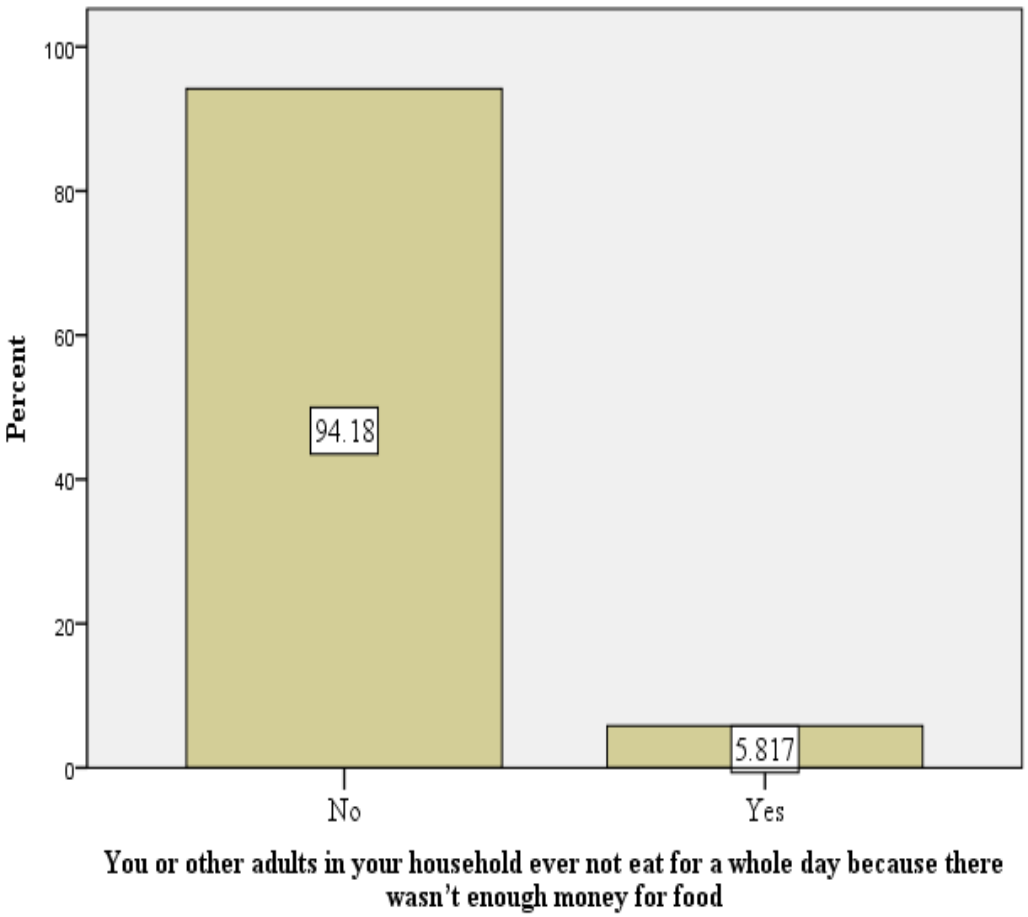
A household has experiences food insecurity when one eats for the entire day due to a lack of funds. Lack of access to adequate food to live a healthy and active life is referred to as food insecurity. Numerous things including poverty, unemployment, and poor income, contribute to it. Families experiencing food insecurity find it difficult to satisfy the needs of all members, which may force them to skip meals or go without food. People's health and wellbeing, especially those of children and the elderly can terribly be affected from food insecurity.

The figure 5.5 describes the respondents or whose families do not eat for a whole day due to lack of food. Among the total sampled household respondents or in the past 12 months 94.18 percent of respondents did not have to be hungry ever due to not having enough money to buy food and 5.82 percent of respondents had to eat less for a whole day due to not having enough money to buy food. This implies that only a tiny percentage of respondents were found hungry because of a lack of money in a span of a year.

According to conflict theory, society resources are allocated unevenly owing to power imbalances and systemic inequalities, putting economically vulnerable households at risk of poverty, unemployment, and low income, resulting in severe food insecurity. Food insecurity reflects deeper socioeconomic inequities, which badly impact on the health and well-being of vulnerable populations such as children and the elderly.

Figure 5.5

Reports of Adults in the Home Skipping Meals for the Entire Day Owing to Insufficient Funds for Food Source (n-361)



Source: Field Survey, 2022

Addressing food insecurity seeks to address economic inequality via policies that increase income prospects, employment stability, and access to low-cost food. Addressing these structural concerns allows society to alleviate food insecurity, increase social fairness, and improve well-being, so lessening social strife and promoting a more cohesive and equitable society.

5.8 Duration of Not Eating Food for a Whole Day

A small percentage of respondents had to temporarily lower their food consumption owing to financial hardships, although the majority of respondents did not have to reduce the amount of food consumption.

Table 5.3

Duration of Adults Not Eating for a Whole Day Due to Lack of Money for Food

Duration for not eating	N	Percentage (%)
Don't Know	12	3.3
Never	327	90.6
Only l or 2 months	12	3.3
Some months but not every month	10	2.8
Total	361	100.0

Source: Field Survey, 2022

The table 5.3 represents how often respondents ever ate less than they felt due to lack of money to buy food. Among the total sampled households' respondents ate less than they felt due to less money to buy food in the past 12 months, 3.3 percent of respondents did not have to eat less due to not having enough money to buy food, 90.6 percent of respondents never had to eat less due to not having enough money to buy food, 3.3 percent of households to eat less for only 1 or 2 month because there was not enough money to buy food.

5.9 Used Improved Varieties of Crops

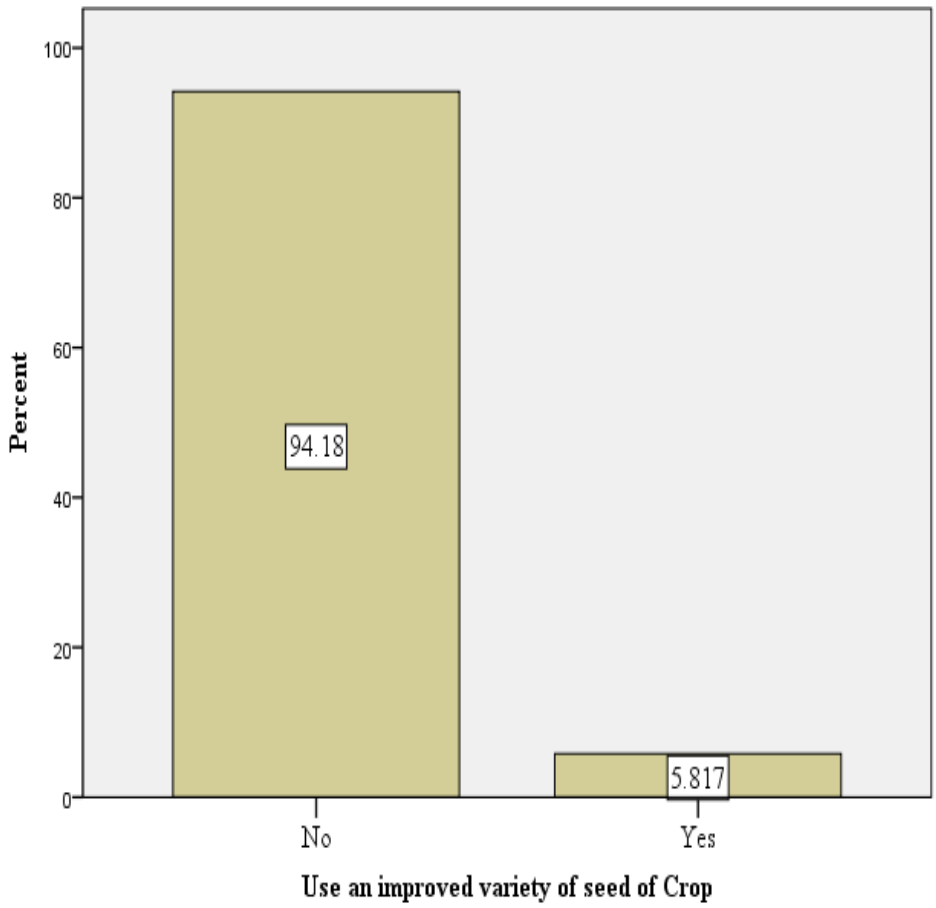
Crops with improved variety can increase yields, use less pesticides, adapt to changing climatic circumstances, and have higher nutritional value. These elements

support enhancing agricultural sustainability, fulfilling the rising demand for food, and enhancing human health.

The bar diagram 5.6 explains the use of improved variety of crops seeds by the farmers. Among the total sampled households 94.18 percent of households do not use improved variety of crop seeds and 5.82 percent only use improved variety of crop seeds.

Figure 5.6

Use of an improved variety of Crops Seeds (n-361)



Source: Field Survey, 2022

The bar diagram indicates that merely 5.82 percent of households utilize upgraded crop seeds, whereas 94.18 percent do not, highlighting a pronounced disparity

in access to agricultural advancements. From the perspective of inequality theory, this suggests that the advantages of modern agriculture are monopolized by a small few, while the majority are marginalized due to systemic obstacles such as insufficient awareness, access to credit, and extension services. This disparity in access not only restricts productivity for the majority of farmers but also exacerbates socio-economic disparities, since the limited adopters accrue cumulative benefits in income and food security relative to non-adopters.

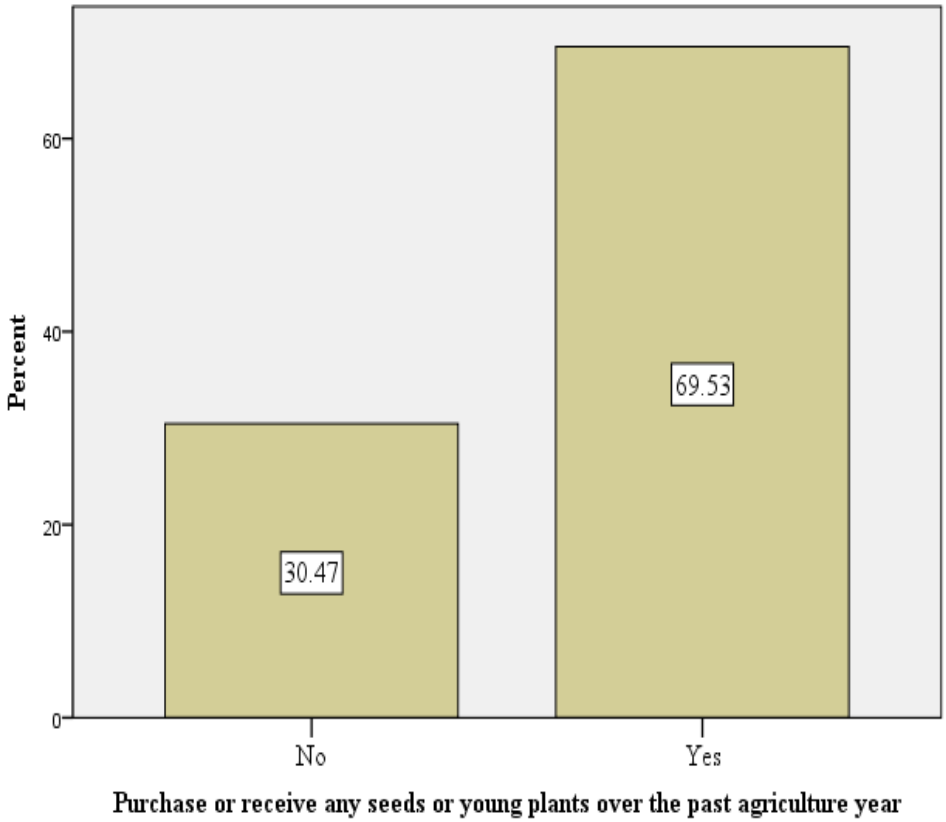
5.10 Purchasing of Seeds or Young Plants for Agriculture in the Previous Season

Farmers have chosen to acquire seeds or young plants for numerous reasons. To grow a new crop on their property is the first reason. To replace crops that have been lost due to pests, illnesses, or other circumstances has been the second cause. Farmers have brought fresh seeds or baby plants to experiment with novel cultivars that have higher yields, disease resistance, or other desired qualities. Farmers occasionally get seeds or young plants as part of government or nonprofit projects that support the adoption of better crop types or promote sustainable agricultural methods.

The bar diagram 5.7 explains the purchase of any seeds or young plants in the previous season. Among the total sampled households 30.47 percent of households do not purchase any seeds or young plants and 69.53 percent of households purchase seeds or young plants over the past agriculture year. Understanding the extent to which farmers in the sample population employ enhanced seeds and young plants in their agricultural activities can be possible with the use of this information. It could be beneficial to pinpoint any obstacles or difficulties that farmers have while trying to utilize these resources.

Figure 5.7

Purchasing of Seeds or Young Plants for Agriculture in the Previous Season.



Source: Field Survey, 2022

5.11 Types of Crops Cultivated by Families

Terai soils have a 20 to 30 cm thick, friable, often dark brown top soil on top of light yellow or brown loamy subsoil. The soils are typically acidic, well-drained clay loams or silty loams. Crops and cattle are interdependent in agriculture, which is defined by a mixed agricultural system. Farmers plant diverse crops and rear different animals that are complimentary to each other, depending on the agro-ecology and their family requirements and priorities (Louwaars & Marrewijk, 1996).

The table 5.4 shows the types of crops cultivated by households in the study area that displays the findings of a survey of 361 households. The table displays the

proportion of households that grow each type of crop in addition to the number of households that grow each type of crop. Paddy, wheat, maize, peas, Black gram, Red lentil, Pigeon pea, Bangal gram, vegetables, oilseeds, mango, lychee, banana, guava, and citrus fruits are among the crops included in the table.

Table 5.4

Types of Crops Cultivated by Families (n-361)

Types of Crop Cultivated	Responses	Percent of Cases (%)
Paddy	330	95.9
Wheat	247	71.8
Maize	188	54.7
Peas	97	28.2
Black gram	43	12.5
Red lentil	85	24.7
Pigeon pea	35	10.2
Bangal gram	35	10.2
Vegetables Crops	181	52.6
Oilseeds	156	45.3
Mango	246	71.5
Lychee	54	15.7
Banana	136	39.5
Guava	192	55.8
Citrus fruits	220	64.0

Source: Field Survey, 2022

a. Dichotomy group tabulated at value 1.

According to the table 5.4 the two crops that are most frequently grown are wheat (grown by 71.8% of households) and paddy (grown by 95.9% of households). Maize, peas, and vegetables are other frequently grown crops, with 54.7% of households cultivating maize, 28.2% of households cultivating peas, and 52.6% of

households cultivating vegetables. The table also reveals that a sizable portion of families grow fruit trees, such as mangoes (71.5% of households grow them), guavas (55.8% of households grow them), and citrus fruits (64.0% of households grow them).

The cropping pattern illustrated majority of households plant staple cereals such as paddy and wheat, while a few engage in the cultivation of diversified crops like peas, oilseeds, or specific fruits, can be elucidated through the theory of inequality. Inequality emerges due to the unequal availability of households to resources such as land, irrigation, capital, and knowledge that facilitate crop diversification. Households with superior resources are more inclined to cultivate fruits and vegetables, which necessitate substantial investment but offer bigger returns, whereas resource-deprived households predominantly rely on staple cereals for sustenance. This inequitable access to productive resources and opportunities exacerbates socio-economic inequities, with affluent households reaping the advantages of increased income and superior nutrition, while marginalized households encounter restricted options and heightened susceptibility to food insecurity.

5.12 Status of Cereal Production

The table 5.5 shows descriptive information for the output of three important cereal crops-paddy, maize, and wheat-among 361 families in kilograms. This data provides useful insights into the production levels, distribution, and variability of these staple crops in the study area, as well as information about agricultural methods and productivity discrepancies.

The cultivation of paddy emerges as the most dominant cereal crop, with the greatest recorded production of 16,000 kg that indicates a major outlier or an

exceptionally prolific family. On the opposite end of the scale, some households grow as little as 8 kg of paddy that demonstrates the diversity of agricultural production. The average (mean) output per home is 1,580 kg that shows a moderate amount of production overall. However, the standard deviation of 1,755 kg indicates significant heterogeneity among families, with output levels ranging substantially. The median production is 1,000 kg lower than the mean, indicating that more than half of households generate less than this amount.

Table 5.5

Status of Cereal Production (n-361)

Descriptive Statistic	Paddy cultivation (In Kg)	Maize cultivated (In Kg)	Wheat cultivated (In Kg)
Count	361	361	361
Maximum	16000	6500	4000
Minimum	8	1	5
Mean	1580	135	499
Median	1000	48	400
Mode	1500	25	200
Sum	521397	25399	123130
Range	15992	6499	3995
Standard Deviation	1755	486	565
Variance	3081212	236391	319049

Source: Field Survey, 2022

The average of 1,500 kg implies that this is the most often reported amount of paddy yield. The overall paddy production across the study area is 521,397 kg that demonstrates the importance of paddy in the region's agriculture. Despite the high average output, the huge range of 15,992 kg and the substantial variance of 3,081,212

highlight major discrepancies, with some families contributing significantly more to rice production than others.

In comparison, maize farming is less prevalent in the area. The highest recorded maize production is 6.5 ton, which is much less than the top paddy producer which indicates fewer large-scale maize producers. At the low end, some households grow as little as 1 kilogram of maize that highlights its importance as a supplementary crop for sustenance. The average maize production is just 135 kg, in sharp contrast to rice production levels which highlights maize's relative relevance in overall agricultural output.

The median maize output is 48 kg, but the mode is 25 kg which indicates that many families produce tiny amounts of maize, most likely for personal use rather than commercial usage. The overall output of maize across all households is 25,399 kg, which is much lower than paddy production which implies that maize plays a more supplementary function in the regional food system. Maize production, like paddy, is variable with a range of 6,499 kg and a variance of 236,391 which indicates large variances in maize cultivation scale across households.

Wheat agriculture ranks between paddy and maize in terms of importance and output. The highest reported wheat output is 4,000 kg which indicates a low scale of production when compared to rice and maize. The minimum wheat production is 5 kg which demonstrates that some households engage in only limited farming. Wheat output averages 499 kg, greater than maize but lower than rice which indicates wheat's importance as a secondary staple crop. The median wheat production is 400 kg, but the mean is 200 kg, indicating that numerous families grow little amounts of wheat. Wheat production across all households is 123,130 kg that places it between rice and maize in

terms of overall output. Wheat cultivation has a range of 3,995 kg and a variance of 319,049 which shows a significant variety in output levels, but not as dramatic as paddy production.

Overall, the table 5.5 shows that cereal output varies significantly between families in the study area. While rice is the most extensively produced crop and has the largest yield, maize and wheat are grown on a smaller scale. The inequalities in output levels across all three crops indicate that agricultural productivity is unevenly distributed most likely due to variances in access to resources, land, and farm capacity. These discrepancies impact on food security, income levels, and general socio-economic circumstances in the area.

5.13 Status of Food Sufficiency from Agricultural Production

While food security in Nepal has improved considerably, according to the 2016 Nepal Demographic and Health Survey, 4.6 million people remain food insecure, with 20% of households mildly food insecure, 22% moderately food insecure, and 10% severely food insecure (DHS). According to the survey, residents in rural areas of Nepal are more likely to be food insecure than those in urban areas (Food Assistance Fact Sheet-Nepal, 2021).

The table 5.6 shows the state of food sufficiency based on family agricultural production. It demonstrates how long families can support themselves with food grown on their own land and the different levels of food security experienced by the studied households. Food Sufficient for Less than Three Months: A Sizable Minority of Households (18.6%) says that their agricultural production lasts less than three months. This means that roughly one-fifth of the families in the study are experiencing serious

food insecurity, depending on their own output for just a short span of time. These households have to rely on alternate food sources or external aid for the rest of the year that render them vulnerable to food shortages.

A lower proportion of households can support themselves for 3 to 5 months (7.2%) and 6 to 8 months (14.4%). These households have intermediate food sufficiency. Nevertheless, they experience considerable food insecurity for a part of the year. This implies, while these households rely on their own production for some months of the year. They face scarcity and need to augment their food supply with market purchases.

Table 5.6

Status of Food Sufficiency from Agricultural Production

Food Sufficiency Status	N	Percentage (%)
< 3 months	67	18.6
3 - 5 months	26	7.2
6- 8 months	52	14.4
9 - 11 months	62	17.2
12 month	88	24.4
Surplus	66	18.3
Total	361	100.0

Source: Field Survey, 2022

Approximately 17.2% of households claim that their agricultural produce provides food security for 9 to 11 months of the year. These households are reasonably food secure for the most of the year which indicates increased agricultural productivity or more efficient land use. However, they still face a shortage in the remaining months

that indicates that they are not completely self-sufficient and need to purchase food to make up the difference.

The majority of households (24.4%) attain complete food sufficiency through their own agricultural output, which means their harvests can support them year-round. These households are self-sufficient in terms of food supply, indicating good agricultural performance or adequate land and resources. This degree of food security promotes stability and may lessen the need for market dependency.

Furthermore, 18.3% of household's report excess production, which means that their agricultural output exceeds their consumption requirements. These households not only feed themselves, but they also likely sell or trade their excess product, which provides them with additional money and economic stability. This surplus can also be used as a buffer during low crop years or periods of economic instability.

The table 5.6 shows a broad range of food sufficiency levels among the questioned households, from severe food insecurity to complete self-sufficiency and excess. A sizable proportion of households (40.2%) are either unable to fulfill their food demands for the whole year or only attain sufficiency for a brief period (less than 8 months). This shows that a sizable section of the population is vulnerable to food shortages and can require external assistance or alternative sources of income to meet their food requirements.

On the other side, approximately one-quarter of households are completely food sufficient, with an additional 18.3% producing extra food. These households are more likely to experience economic security and resilience in the face of agricultural fluctuations. The variation in food sufficiency among households demonstrates the uneven distribution of agricultural success and food security within the study area,

pointing to larger concerns of inequality in access to land, resources, and agricultural production. Addressing these gaps enhances food security results for the most underprivileged households.

5.14 Status of Food Deficiency

The table 5.7 presents a detailed breakdown of food deficiency among Barbardiya Municipality households by categorizing the data as severe deficiency, moderate deficiency, and no deficiency. This categorization helps in determine the level of food insecurity in the area.

A significant proportion of households (40.20%) suffer from severe food deficit, which is defined as having food for less than 9 months of the year. This high deficit implies that a sizable proportion of households struggle to address their food demands year-round from their agricultural production. These households are likely to encounter significant difficulty in obtaining adequate food throughout the year. Finally, they have to rely on outside sources of food.

Table 5.7

Status of Food Deficiency in Barbardiya Municipality

Status of Food Deficiency	N	Percentage (%)
Less than 9 months (Severe Deficiency)	145	40.20
9 - 11 months (Moderate Deficiency)	62	17.20
No Deficiency (12 months or Surplus)	154	42.60
Total	361	100.00

Source: Field Survey, 2022

In the study area the moderate food insufficiency affects 17.20% of households, with food lasting for 9 to 11 months. While these households are better than those in acute deficit, they experience food insecurity. This community is closer to reaching year-round food sufficiency, but it is still vulnerable during the months when its own output is insufficient.

On the other side, 42.60% of households do not face food scarcity, since they are either food adequate for the whole year (12 months) or have a surplus. This category includes people who have secured adequate food from their agricultural produce or have additional resources. This fraction demonstrates a positive element of food security in the municipality while also emphasizing the gap between families with and without enough food supplies as well.

The statistics highlight a severe difficulty in Barbardiya Municipality, with more than half of households facing some form of food insecurity. The high number of people suffering from extreme food insecurity highlights the urgent need for initiatives to increase food security. Support includes increasing agricultural production, providing access to more resources, or introducing food assistance programs.

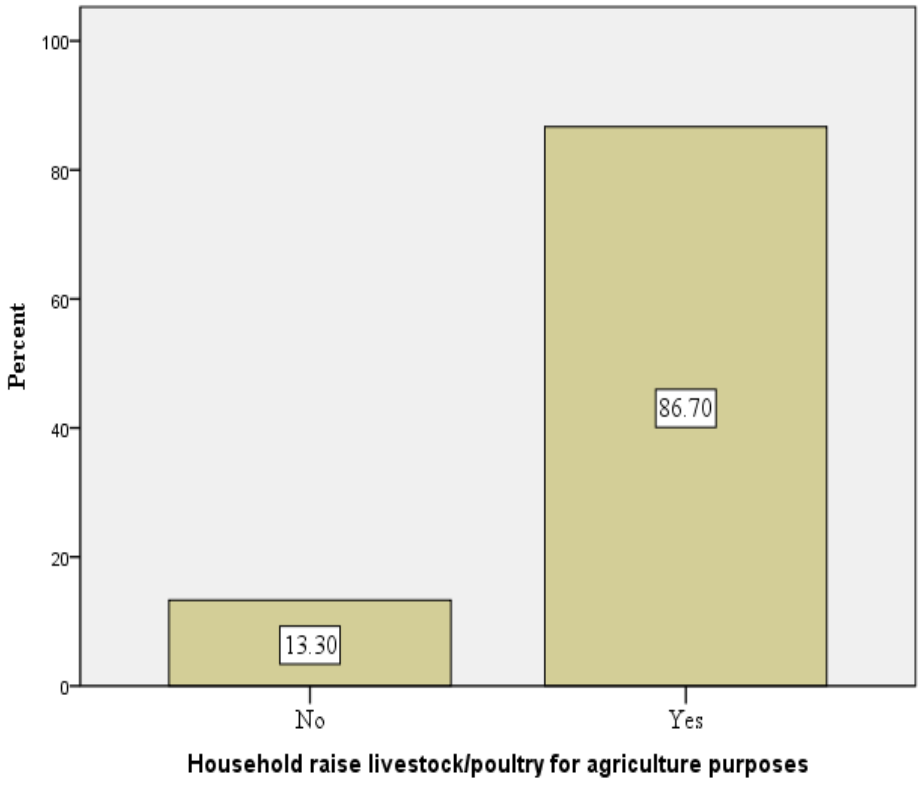
The presence of households with moderate deficit implies that, while some progress has been made, more work is needed to close the gap and provide full food sufficiency for all. Addressing these concerns is critical to enhancing overall food security and ensuring that all households in the municipality can achieve their nutritional needs throughout the year.

5.15 Status of Household Raising Livestock/Poultry for Agriculture Purposes

Food supply, family nourishment, family income, asset savings, soil productivity, livelihoods, transportation, agricultural traction, agricultural diversity and sustainable agricultural output, family and community employment, ritual reasons, and social status are all aided by livestock (Moyo & Swanepoel, 2010). The bar graph 5.8 depicts the findings of a survey on the status of households raising livestock/poultry for agricultural reasons. The study inquired if households raised animals or poultry for agricultural purposes. The replies are divided into two groups: those who grow livestock or poultry for commercial purposes and those who do not. The percentage of households in each group is shown in the bar graph.

Figure 5.8

Status of Household Raising Livestock/Poultry for Agriculture Purposes (n-361)



Source: Field Survey, 2022.

The study shows that the majority of households (86.70%) grow livestock or poultry for commercial reasons, while a lesser minority (13.30%) do not. These findings indicate that keeping livestock or poultry for agricultural reasons is a prevalent household activity in this area. It would be beneficial to further examine the data to better understand why households keep livestock or poultry for agricultural purposes, as well as the impact of this activity on the household and the community. The prevalence of livestock and poultry farming among households demonstrates its significance for agricultural production and, presumably, local economies. It demonstrates how deeply this technique is ingrained in the community's agricultural traditions and lives.

The reasons households raise livestock or poultry for commercial purposes and the potential repercussions of this activity on the household and the community. It is essential to take these aspects into account and aim for sustainable and equitable ways to livestock or poultry production. Using sustainable farming practices, ensuring proper animal care and welfare, providing education and training to farmers, promoting fair trade and sustainability, and implementing policies and regulations that promote sustainable and equitable production are some strategies that can help to minimize negative impacts and maximize positive impacts.

5.16 Status of Livestock Grazing

The table 5.7 shows a thorough breakdown of cattle grazing methods across the 361 households. The data illustrates the sorts of animals raised and their prevalence that emphasizes the importance of livestock in agricultural operations in the area. Goats are the most popular livestock, with 65.8% of households confirming their presence. This high proportion indicates that goats are a popular choice due to their versatility and

minimal care needs. They are likely to be used for a variety of functions, including meat and milk production, as well as generating cashes.

Chickens are commonly raised with 55.6% of households owning them. Chickens are valued for their eggs and meat, and their widespread distribution indicates their importance in family agriculture. They are generally simple to manage and can provide a constant source of food and even cash. Pigs are raised by 43.1% of families indicating an important importance in local agriculture. Pigs provide a significant amount of meat while also contributing to household income. Their larger percentage than other animals with the exception of goats and hens, emphasizes their importance.

Table 5.8

Status of Livestock Grazing (n-361)

Status of Livestock Grazing	**Responses**	**Percent of Cases**
	N	
Cow/Ox	83	27.3
Buffalo	112	36.8
Sheep	24	7.9
Goat	200	65.8
Pig/pork	131	43.1
Chicken	169	55.6
Duck	49	16.1
Rabbit	2	.7

Source: Field Survey, 2022.

1. Dichotomy group tabulated at value 1**.**

A total of 36.8% of households raise buffaloes. In addition to producing milk, buffaloes are valued for their strength and usefulness in agriculture. In comparison to chickens and goats, they are less common but still rather noticeable. Of households,

27.3% keep cows or oxen. Despite being less common than goats and chickens-possibly because they require more care and food-they are nonetheless vital for draft work and milk production. 16.1% of households keep ducks, which is a more specialized yet noteworthy practice. Ducks are valued for their meat and eggs, and their existence indicates that livestock husbandry takes a varied approach. A mere 7.9% of households own sheep. Sheep, though less numerous than other animals, fulfill certain agricultural and economic demands by producing wool, meat, and occasionally milk. As far as livestock goes, rabbits are the least frequent stated by only 0.7% of households. Their low predominance is a result of their poor use and lower size in relation to other animals.

The information in table 5.7 demonstrates the wide variety of livestock operations that exist in the study area. The most common animals in home agriculture are goats and hens that reflect their importance in producing food and generating cash. While lambs, ducks, and rabbits play more specialized functions, pigs and buffaloes are also significant animals. The diverse livestock methods highlight the versatility of households in managing their resources and agricultural outputs by reflecting a blend of local conditions, preferences, and agricultural demands.

5.17. Food Diversity of a Household

The condition or reality of being distinct or diversified is defined as diversity. Food diversity indicates a few different things. For one thing, it represents all cuisines and cultures. The varieties of nutrients are required for a well-balanced diet. Alternatively, the diversity of crops are planted on a farm (Food Assistance Fact Sheet-Nepal, 2021).

This table 5.8 displays the findings of a survey regarding the food diversity of Barbardiya households. Over a 30-day period, the study was conducted on households about the sorts of food they ate. Cereals, vegetables, green leaves, pulses and legumes, root and tubers, fruits, meat and poultry, and dairy products are the eight categories of responses. The table displays how many households (N) and how many instances (%) consume each type of food.

Table 5.9

Food Diversity of Family for 30 Days

Food Diversity	Responses	Percent of Cases
Cereals	361	100.0
Vegetables	361	100.0
Green leaves	333	92.2
Pulses Legumes	359	99.4
Root/tubers	341	94.5
Fruits	216	59.8
Meat/Poultry	320	88.6
Dairy product	153	42.4

Source: Field Survey,

1. Dichotomy group tabulated at value 1.

As the table presents, the vast majority of households (100%) consume cereals and vegetables, while a sizable proportion (92.2% and 99.4%, respectively) eat green leaves, pulses, and legumes. Fruits are consumed by a lesser number of households (59.8%), but meat and poultry are consumed by a considerable number of households (88.6%). Dairy products are consumed by a very modest number of families (42.4%).

These findings indicate that the types of food consumed by households in the study area vary significantly. A detailed analysis of the data helps to understand the

causes for this diversity and to decide what steps can make to increase food diversity and nutrition in the area.

5.18 Perception towards Current Agricultural Program in Area

Nepal is an agricultural country, with 66 percent of the population involved in farming. Farming is a subsistence activity, and crops are generally linked with cattle. Nepal is abundant in agro-biodiversity. The principal staple food crops are rice, maize and wheat.

Table 5.10

Perception towards Current Agricultural Program in Village

Perspective on Current Agricultural Plan	N	Percentage (%)
Don't know	184	51.0
Excellent	3	.8
Fair	41	11.4
Good	48	13.3
Not good	85	23.5
Total	361	100.0

Source: Field Survey, 2022.

1. Dichotomy group tabulated at value 1.

The majority of respondents (51%) were unaware of the village's present agricultural projects. A tiny proportion of respondents (0.8%) thought the programs were great, while a significantly higher proportion (13.3%) said they were good. A sizable proportion of respondents (11.4%) evaluated the programs as fair, while a sizable proportion (23.5%) ranked them as poor. These findings show that there has been a lack of knowledge or comprehension of the village's present agricultural activities, as well as some complaints or challenges with the programs. A detailed

analysis of the data helps to understand the causes for these impressions and to discover ways for improvement.

An agriculture program is a collection of efforts meant to aid in the growth and enhancement of a region's agriculture industry. An agricultural program's objectives include raising crop yields, improving farming methods, promoting sustainable agriculture, boosting competitiveness, and improving food security. These programs, which are usually undertaken by government agencies, non-governmental organizations (NGOs), or other groups, can focus on activities such as research and development, extension services, training, policy creation, and infrastructure development. Agriculture initiatives must be well-designed, evidence-based, and sensitive to the needs and goals of the agriculture sector for effectiveness.

5.19 Knowledge about Agricultural Perspective Plan of Government of Nepal

The Agricultural Perspective Plan (APP) is a twenty-year national policy with a cross-sectoral approach (1995-2015). Its objective is to increase agricultural growth by two percentage points, to increase per capita agricultural growth from 0.5 percent to 3 percent per year (Cameron, 2009).

Table 5.11

Knowledge about Agricultural Perspective Plan of Government of Nepal

Knowledge on Agricultural Perspective Plan of Government of Nepal	N	Percentage (%)
No	343	95.0
Yes	18	5.0
Total	361	100.0

Source: Field Survey, 2022.

Dichotomy group tabulated at value 1.

The table 5.11 displays the findings of a study of respondents' understanding about the Nepalese government's agricultural outlook plan. The respondents were asked if they were aware of the strategy. The percentages of respondents who replied "yes" and "no" are tabulated. The vast majority of respondents (95%) have been found unaware of the government’s agricultural perspective plan, while tiny minorities (5%) have been aware. These findings show that respondents lack knowledge on the agricultural policies and plans.

5.20 Coping Strategies of Family

Coping mechanisms are social reactions employed in times of adversity to offset risks to a household's food and economic resources. The various sorts of coping mechanisms are indicators of the severity of situations, which are sometimes classified into different phases of food insecurity (Junaidi et al., 2022).

Coping strategies are the acts that people use to deal with tough or unpleasant conditions, such as food shortages or economic hardship. These mechanisms can be divided into several groups or phases based on the intensity of the event and the coping techniques employed. Buying food at the market, selling assets or animals, borrowing food or money, limiting meal size, or relying on help from family and friends are all the examples of coping techniques.

Coping strategies are used to assess the severity of a situation and to get useful insights into the demands and problems that families and communities confront. Understanding coping strategies can assist policymakers and practitioners in developing and implementing effective interventions and support programs to address food insecurity and other issues.

Table 5.12

Status of Coping Strategies of Family

Coping Strategies of Family	N	Percent of Cases
Buying from market	361	100.0
Sales of Livestock	200	55.4
Exchange of labor for food	245	67.9
Borrowing food	259	71.7
Receiving from relatives and friends	271	75.1
Reducing meal size	21	5.8

Source: Field Survey, 2022.

1. Dichotomy group tabulated at value 1.

This table 5.12 demonstrates the findings of a survey on the coping methods employed by families in the face of food insecurity. The respondents were asked about their strategies for dealing with food insecurity, and their responses are organized into six categories: purchasing food at the market, selling livestock, exchanging labor for food, borrowing food, receiving food from relatives and friends, and reducing meal size. The table indicates how many households (N) and how many instances (%) employ each coping approach.

The table 5.12 presents that, all of the households (100%) used market food as a coping method. A substantial number of households (67.9% and 71.7%, respectively) were found trading labor for food and borrowing food. A sizable proportion (75.1%) of households received meals from relatives and friends. A modest minority of households (5.8%) reduced the amount of their meals. These findings imply that families in this area employ a range of coping techniques in the face of food insecurity or scarcity.

5.21 Discussion

In Barbardiya Municipality the household food security varies significantly, while 82.8% of households indicated year-round sufficiency, nearly one-fifth had shortages lasting under three months, with financial limitations and restricted dietary diversity compelling economically disadvantaged households to adopt coping measures such as meal reduction or omission. These results correspond with Sen's (1981) entitlement theory, which highlights that food insecurity arises not merely from inadequate production but also from constrained access to resources (land holding pattern) and entitlements.

The results indicate that irrigated households continually attained higher levels of sufficiency and surpluses, but rainfed households continued to be susceptible to seasonal shortages. Notwithstanding the diversity of crops and livestock, production disparities between small and large estates highlight enduring inequality. This corroborates Maxwell and Wiebe's (1999) theory, which underscores the cyclical connection between land access and food security, wherein stable tenure and irrigation enhance resilience, while instability exacerbates vulnerability.

CHAPTER VI

RELATIONSHIP BETWEEN LAND HOLDING AND FOOD SECURITY IN BARBARDIYA MUNICIPALITY

Land Holding and Food Security is a multidisciplinary issue that is seen through social lenses. Food security concerns the management of food resources to protect people from food deficits, shortages, famine, and infections, whereas land holding refers to the arrangement or right under which the holder owns or utilizes the land. One of the political-economic themes is food security and land holding, which focuses on livelihood, spatial exclusion, production of food, distribution, and accessibility (Rawal, 2021). To address these difficulties, a multidisciplinary strategy is needed that including land reform, registration, and planning, as well as initiatives to enhance land and food systems.

6.1 Relationship between Size of Land Holding and Characteristics of Food Consumed in Households over a Year.

The 6.1 table depicts the relationship between landholding size and the statements that best describe the food consumed in households over the previous year. The cross tabulation reveals an important relationship between the size of land holdings and food security status in a household. More specifically, households with less than 5 *Kattha* of land are the most food insecure according to all measures. Namely, 42.9% of these households' experience enough to eat but not always the foods that they want (EAKFW), and merely a small proportion of 1.4% has sufficient access to the types of food they like better than others do (EKFE). This pattern of greater food insecurity among smaller land holdings is also more generally true, the OEE occurrence rate

increased to 7.8% for households that never get enough to consume and at most often have a shortage of sought foods (SEE), accounted by as low as 0.6%.

Table 6.1

Relationship between Size of land holding and Characteristics of food Consumed in households in Over a Year

Size of Land Holding (*Kattha*)		Status of foods eaten in Households in Over a Year				Total
		EAKFW	EKFE	OEE	SEE	
Less than 5	N	155	5	28	2	190
	%	42.9	1.4	7.8	.6	52.6
5-15	N	101	8	2	0	111
	%	28.0	2.2	.6	0.0	30.7
16-25	N	28	3	0	0	31
	%	7.8	.8	0.0	0.0	8.6
26-40	N	7	6	0	0	13
	%	1.9	1.7	0.0	0.0	3.6
41-60	N	5	5	0	0	10
	%	1.4	1.4	0.0	0.0	2.8
More than 60	N	3	3	0	0	6
	%	.8	.8	0.0	0.0	1.7
Total	N	299	30	30	2	361
	%	82.8	8.3	8.3	.6	100.0

Source: Field Survey, 2022

Note. SLH = EAKFW = Enough but not always the kinds of food we want, EKFE = Enough of the kinds of food we want to eat, OEE = Often not enough to eat, SEE = Sometimes not enough to eat, n=Count of the number and %=Percent

1. Likelihood Ratio (G-test) = 69.996, degree of freedom (d.f.) = 15 and Asymp. Sig. (2-sided) (p-value) = 0.074

The size of land holdings increases; nevertheless, fewer households are considered food insecure. There are clear trends that larger land holdings go with better food security, and those in the more than 60 *Kattha* of land availability have by far lowest rates for every category. Households with more land are also significantly more like to have sufficient quantities and varieties of food as suggested by majority of respondents.

The observations and statistical analysis corroborate these findings. A Likelihood Ratio (G-test) value of 69.996 at 15 degree of freedom with a p-value 0.074 is below the standard alpha value 0.05, so we reject null hypothesis rejected and accept research hypothesis. which indicates that there is a strong association between land holding size and food security status. The bold statistical significance reaffirms the cause and effect relationship of land holding size in food security.

The study shows that, land ownership and access to resources are important factors that affect household food security from a sociological perspective. Households with larger land are likely to have more resources and better access to markets and other food sources, which contribute to improved food security. Households with smaller land holdings, on the other hand, face more barriers to food access, particularly during times of economic or environmental hardship. The findings emphasize the significance of policies and interventions addressing food insecurity among vulnerable populations, particularly those with limited access to resources.

6.2 Relationship between Farm Categories and Characteristics of Food Consumed in Households over a Year

The table 6.2 shows the link between farm types and households' food security status, to provide important social insights into inequality. The findings demonstrate that, households with small farms, which account for the majority of the sample (55.1%), are more likely to report food security difficulties. Specifically, 46.5% of small farm households have enough food but not always the types they choose (EAKFW), whereas 5.3% do not have enough to eat (OEE). Large farm homes, while being a smaller group (3.0% of the sample), have the lowest rate of food insecurity, as no households in this category have been found with food insecurity.

Table 6.2

Relationship between Farm Categories and the Food Eaten in Household Over a Year

Farm Categories		Food eaten in respondent household in the past 12 months				Total
		EAKFW	EKFE	OEE	SEE	
Large	N	6	5	0	0	11
	%	1.70	1.40	0.00	0.00	3.00
Marginal	N	88	2	11	1	102
	%	24.40	0.60	3.00	0.30	28.30
Medium	N	37	12	0	0	49
	%	10.20	3.30	0.00	0.00	13.60
Small	N	168	11	19	1	199
	%	46.50	3.00	5.30	0.30	55.10
Total	N	299	30	30	2	361
	%	82.80	8.30	8.30	0.60	100.00

Source: Field Survey, 2022

Note. EAKFW = Enough but not always the kinds of food we want, EKFE = Enough of the kinds of food we want to eat, OEE = Often not enough to eat, SEE = Sometimes not

enough to eat, n=Count of the number and %=Percent.

1. Likelihood Ratio (G-test) = 41.880, degree of freedom (d.f.) = 9 and Exact. Sig. (2-sided) (p-value) = 0.037.

a. 8 cells (50.0%) have expected count less than 5. The minimum expected count is .06

These data sociologically suggest a dramatic disparity in levels of food security by farm size. Larger farm types that have more available resources to produce provide the best ability for guarantee of sufficient and diverse food. In contrast, the marginalized and small agricultural households are in a situation where they have very high exposure to food insecurity. Smaller farm types, which are most prevalent in food poverty, can be especially vulnerable due to the unequal allocation of resources (land and assistance) within agricultural systems.

A Likelihood Ratio (G-test) value of 41.880 at 9 degree of freedom with a p-value 0.037 is below the standard alpha value 0.05, so the null hypothesis is rejected and research hypothesis is accepted. which indicates that there is a strong association between farm size and food security status. The bold statistical significance reaffirms the cause and effect relationship of land holding size in food security.

Customized policy interventions have to be put in place to reach out the gaps and strengthen support for smaller, marginal farms enabling an increase in production productively and resourcefully which will go a long way in reducing food poverty thereby establishing equitable agricultural sector.

6.3 Relationship between Size of Land Holding and Status of Food Sufficiency by Own Agricultural Production.

The table 6.3 shows an examination of the link between landholding size, as measured by *Kattha*, and the level of food sufficiency obtained by a household's own farming operations. The data are divided into degrees of food sufficiency, which range from "surplus" via "less than 3 months". Among the different landholding classifications, households with a maximum of five *Kattha* are the largest group, with 190 families. A sizable proportion of these families, 65 out of 190, have food sufficiency for fewer than three months that demonstrate a high incidence of food scarcity despite owning property. In contrast, just ten households in this group record surplus food production.

The group with 5-15 *Kattha*, which includes 111 families, has a more even distribution of food sufficiency categories, with the majority (39 households) obtaining 12 months of food sufficiency. However, a few households in this category continue to experience extreme food insecurity having fewer than three months of sufficiency.

In the 16-25 *Kattha* group, 15 of 31 households have stated that surplus food output, while relatively few confront food scarcity, only one reporting less than three months' sufficiency. Food insufficiency is uncommon in households with 26-40 *Kattha*, with none highlighting food insufficiency less than 6 months. Similarly, in the 41-60 *Kattha* groups, the majority of the households have accepted a food surplus that indicates a robust link between bigger landholdings and improved food security. Most families with more than 60 *Kattha* have acknowledged excessive production of food, and none experience food insecurity for less than 6 months.

Table 6.3

Relationship between Size of Land and Status of Food Sufficiency by Own Agricultural Production.

Size of Land Holding (*Kattha*)	Status of Food Sufficiency by Own Agricultural Production						Total
	Surplus	12 month	9 - 11 months	6- 8 months	3 - 5 months	< 3 months	
Less than 5	10	39	23	37	16	65	190
5-15	19	39	30	13	9	1	111
16-25	15	5	7	2	1	1	31
26-40	9	4	0	0	0	0	13
41-60	8	1	1	0	0	0	10
More than 60	5	0	1	0	0	0	6
Total	66	88	62	52	26	67	361

Source: Field Survey, 2022

Note. Likelihood Ratio (G-test) = 168.144, degree of freedom (d.f.) = 25 and Asymp. Sig. (2-sided) (p-value) = 0.043

a. 20 cells (55.6%) have expected count less than 5.

The study implies that bigger landholdings are related with better levels of food security. Households having smaller landholdings, in particular those with fewer than five *Kattha*, are more inclined to experience food insecurity, as they produce enough food for less than three months. As landholding size grows, so does the possibility of food increase, with the majority of households owning over twenty-five *Kattha* having both surplus and food security for a year. This link emphasizes the significance of land ownership and access to sufficient land as significant factors of food availability in agricultural households. which indicates that there is a strong association between size of land holding and food security status. The bold statistical significance reaffirms the cause and effect relationship of land holding size in food security.

Overall, the findings show that landholding size is important in determining the degree of food sufficient for rural families, with higher landholdings typically leading to greater food security. The Likelihood Ratio Tests provides statistical data that supports this link.

6.4 Relationship between Farm Categories and Status of Food Sufficiency through Agricultural Production

The table 6.4 presents farm categories that can ensure availability of own agriculture-produced food. The farm sizes of those who can afford to eat reveal much about the shameful social and economic divides in a country. The proportion of food sufficiency is relatively high among households with large farms (even though this sample was small): only 2.2% stated a surplus, no one suffered from less than 3 months of food supply. Unlike medium-sized farms, which are catered for within this sub-sample type but at a lower percentage to all other sizes combined (20 %), more than one third of marginal and small holdings exhibit different food sufficiency status.

The share of farms with less than 3 months' food sufficiency was the highest (11.4%) at marginal farms. Even on small farms, food sufficiency is broadly distributed with 15.2% able to produce enough staple foods for all year round consumption. Nevertheless, the figure shows that still as much a 6.9 % of the farmers face less than three months provisioned period. Those larger, more productive farms disproportionately benefit from economies of scale and ability to access resources better than the smaller land holders who are under-poverty highlights a broader socio-economic inequality that provides food security.

Table 6.4

Relationship between Farm Size and Status of Food Sufficiency through Agricultural Production

Farm Size		Status of Food Sufficiency through Agricultural Production						Total
		Surplus	12 month	9 - 11 months	6- 8 months	3 - 5 months	< 3 months	
Large	N	8	1	2	0	0	0	11
	%	2.2	0.3	0.6	0	0	0	3
Marginal	N	6	23	9	19	4	41	102
	%	1.7	6.4	2.5	5.3	1.1	11.4	28.3
Medium	N	29	9	7	2	1	1	49
	%	8	2.5	1.9	0.6	0.3	0.3	13.6
Small	N	23	55	44	31	21	25	199
	%	6.4	15.2	12.2	8.6	5.8	6.9	55.1
Total	N	66	88	62	52	26	67	361
	%	18.3	24.4	17.2	14.4	7.2	18.6	100

Source: Field Survey, 2022

Note. Likelihood Ratio (G-test) = 124.256, degree of freedom (d.f.) = 15 and Asymp. Sig. (2-sided) (p-value) = 0.016

The G-test with significant value and $p<0.05$ showing strong associations between farm category and food sufficiency. This indicates that there is a strong association between institutional support and food security gaps besides structural inequalities concerning how agricultural resources are disseminated. This means larger farms regularly fulfill better food security (surpluses, year-round supply), while small/marginal farms face prolonged shortages—disclosing deep structural disparity in land ownership, source access, and institutional support. The outcomes imply that present agricultural systems unequally favor larger farms, leaving smallholders vulnerable. To minimize food insecurity, focused policies (land reform, credit access,

and technology for small farms) are instantly needed to correct these unbalances. The data underline that food security lapses are systemic, not accidental, challenging structural interventions.

6.5 Relationship between Ownership of Cultivating Land and Status of Food Sufficiency through Agricultural Production.

The table 6.5 presents the link between land ownership and food sufficiency, which provides vital insights into agricultural production dynamics and food security. Households that own the land they farm account for the great majority of the sample, with 98.3% that claims varying levels of food sufficiency. While some of these households (18.0%) highlight a surplus and 24.1% are able to maintain food sufficiency for a year a considerable fraction (18.3%) continues to struggle with fewer than three months of food sufficiency. This heterogeneity between land-owning households indicates that ownership is important in establishing food security. However, it is insufficient. Other structural variables, such as access to resources, land quality, and farming techniques, play crucial roles in determining food outcomes.

The results highlight a significant disadvantage for the tiny fraction of households that they do not own land, with these households unable to reach even minimum levels of food sufficiency, frequently managing only 3-5 months' worth of food. The small proportion of households who rely on tenancy also highlights the difficulties faced by those who are without their agricultural resources.

The statistical research demonstrates that the association between ownership of land and the availability of food is not significantly different. It further highlights the

complexities of the availability of food, which is impacted by a wide range of factors other than land ownership.

Table 6.5

Relationship between Ownership of Cultivated Land and Status of Food Sufficiency from Own Agriculture Land

Ownership of Cultivated Land		Status of Food Sufficiency by Own Agricultural Production						Total
		Surplus	12 month	9 - 11 months	6- 8 months	3 - 5 months	< 3 months	
Leased	N	0	0	0	1	0	0	1
	%	0.0	0.0	0.0	.3	0.0	0.0	.3
No Ownership	N	1	1	1	1	0	1	5
	%	.3	.3	.3	.3	0.0	.3	1.4
Own by Self	N	65	87	61	50	26	66	355
	%	18.0	24.1	16.9	13.9	7.2	18.3	98.3
Total	N	66	88	62	52	26	67	361
	%	18.3	24.4	17.2	14.4	7.2	18.6	100.0

Source: Field Survey, 2022

Note. a. 10 cells (66.7%) have expected count less than 5. The minimum expected count is .07.

*Likelihood Ratio (G-test) = 4.805, degree of freedom (d.f.)=15 and Exact.Sig. (2-sided) (p-value) = 0.024

The findings underscore greater concerns of inequality in land allocation and access. Land ownership is unquestionably an important component of the security of food. However, the study shows that merely owning land cannot guarantee enough food production. Addressing food security necessitates a more holistic strategy that not only increases access to land but also improves farming circumstances, such as greater support for agricultural methods, availability of resources, and economic prospects for

landless people. This emphasizes the necessity for policies which focus on both agricultural distribution and the larger socio-economic conditions that lead to food insecurity.

6.6 Relationship between Ownership of Cultivated Land and Characteristics of Consumable Foods in Households over a Year

The table 6.6 demonstrates the link between land ownership and food sufficiency to provide vital insights into agricultural production dynamics and food security. Households that own the land account for the majority of the sample, with 98.3% claiming varying levels of food sufficiency. While some of these households (18.0%) have obtained a surplus and 24.1% have been able to maintain food sufficiency for a year, considerable fractions (18.3%) continue to struggle with fewer than three months of food sufficiency. This heterogeneity between land-owning households indicates that, ownership is important in establishing food security. Other structural variables including access to resources, land quality, and farming techniques play crucial roles in determining food outcomes.

The results highlight a significant disadvantage for the tiny fraction of households that do not own land households has been unable to reach even minimum levels of food sufficiency, frequently managing only 3-5 months' worth of food. The small proportion of households that rely on rented property also highlights the difficulties experienced by people who do not own their agricultural resources. The statistical study shows the association between land ownership and food sufficiency is not statistically significant, highlighting the complexities of food security, which is impacted by a wide range of factors other than land ownership.

Table 6.6

Relationship between Ownership of Cultivated Land and Characteristics of Food Consumed in Households Over a Year

Ownership of Cultivated Land		Characteristics of Food Consumed in Households over a Year				Total
		EAKFW	EKFE	OEE	SEE	
Leased	N	1	0	0	0	1
	%	100.0	0.0	0.0	0.0	100.0
No Ownership	N	5	0	0	0	5
	%	100.0	0.0	0.0	0.0	100.0
Own by Self	N	293	30	2	30	355
	%	82.5	8.5	.6	8.5	100.0
Total	N	299	30	2	30	361
	%	82.8	8.3	0.6	8.3	100.0

Source: Field Survey, 2022

Note. EAKFW = Enough but not always the kinds of food we want, EKFE = Enough of the kinds of food we want to eat, OEE = Often not enough to eat, SEE = Sometimes not enough to eat, C=Count and %=Percent

*Likelihood Ratio (G-test) = 2.282, degree of freedom (d.f.) = 6 and Exact. Sig. (2-sided) (p-value) = 0.042.

The findings underscore greater concerns of inequality in land allocation and access. Land ownership is unquestionably an important component of food security, but studies show that merely owning land does not ensure enough food production. Addressing food security necessitates a more holistic strategy that not only increases access to land but also improves farming circumstances, such as greater support for agricultural methods, resource availability, and economic prospects for landless people. This emphasizes the necessity for policies that address both land distribution and the larger socioeconomic conditions that lead to food insecurity.

6.7 Relationship between Ownership of Residential Land and Characteristics of Food Consumed in Households over a Year

The table 6.7 presents the relationship between land holding and family food security. It categorizes responses from 361 families depending on the type of land they occupy (landlord's land, their own property, public/unregistered land, or relative's land) and their food intake over a year. Food Security in Households can be categories: EAKFW (enough but not always the sorts of food we want), EKFE (enough of the kinds of food we want to eat), OEE (often not enough to eat), and SEE.

Households residing on the landlord's farm stated 100% EAKFW that indicates that they always received enough food even if it was not their favorite. Although such households did not experience acute food shortages, their nutrition was limited. No respondents indicated severe food insecurity, such as OEE or SEE which implies implying that food access was not a priority for them.

Among households which owned their land, 82% choose EAKFW, while 9.5% went with EKFE indicating that they had enough food of their preference. However, 7.9% suffered SEE that suggests periodic food shortages, whereas 0.6% accepted OEE, which indicates a more chronic lack of food. The data demonstrate that while land ownership is typically associated with higher food security. Certain families remain susceptible that implies that land ownership does not provide complete protection against food insecurity, particularly for more vulnerable populations.

Family members living on public and unregistered land exhibited greater risk. While 88.1% had EAKFW, 11.9% had SEE, that indicates that such households were more likely to experience food shortages. The study underscores the vulnerable status of

individuals who do not have formal or secure land ownership because a lack of holding security can impair their capacity to produce or get adequate food on a regular basis.

Table 6.7

Relationship between Ownership of Residential Land and Characteristics of Food Consumed in Household over a Year

Ownership of House Build Land		Characteristics of Food Consumed in Household over a Year				Total
		EAKFW	EKFE	OEE	SEE	
Landlord's land	N	2	0	0	0	2
	%	100.0	0.0	0.0	0.0	100.0
Own land	N	259	30	2	25	316
	%	82.0	9.5	.6	7.9	100.0
Public/Unregistered land	N	37	0	0	5	42
	%	88.1	0.0	0.0	11.9	100.0
Relative's land	N	1	0	0	0	1
	%	100.0	0.0	0.0	0.0	100.0
Total	N	299	30	2	30	361
	%	82.8	8.3	0.6	8.3	100.0

Source: Field Survey, 2022

Note. EAKFW = Enough but not always the kinds of food we want, EKFE = Enough of the kinds of food we want to eat, OEE = Often not enough to eat, SEE = Sometimes not enough to eat, C=Count and % = Percent

*Likelihood Ratio (G-test) = 9.92, degree of freedom (d.f.) = 9 and Exact. Sig. (2-sided) (p-value) = 0.035.

Only one respondent depending on a relative's farm chose EAKFW that implies the enough food was available. However, the tiny sample size restricts any larger inferences. Overall, 82.8 percent of households across all land holding groups chose EAKFW which implies that they had adequate food. However, their dietary options were

limited. Only 8.3% of households stated that they experienced EKFE, which indicates improved food security and contentment with food variety. Meanwhile, 8.3% experienced SEE, with just 0.6% accepting OEE, that indicated food insecurity.

The likelihood ratio (G-test) obtained a p-value of 0.035, showing significant relationship between house-building ownership of land and household food security status. This shows that income, market access, and the structure of households affect the status of food security.

Finally, the data show that owning property is typically associated with better food security outcomes, although landowners experience periodic food shortages. Households living on public or unregistered land are more vulnerable and experience greater risks of food insecurity. While land ownership enhances food security, it is not a panacea that underlines the importance of comprehensive policies that address larger socio-economic problems besides land holding to alleviate food scarcity.

6.8 Relationship between Ownership of Residential Land and Status of Food Sufficiency from Agricultural Production

The data demonstrates that the minority of households living on property owned by a landlord or relative often have stated to have ample food. The table 6.8 presents the association between residential land ownership and status of household food sufficiency measured by their agricultural production. The data show patterns in how land ownership and holding type affect a household's capacity to produce enough food.

The majority of households (87.5%) own the land upon which their houses are built. Food sufficiency outcomes vary greatly among these households: 18.0% have had a food surplus; 21.6% sustains food sufficiency for a year, and 14.4% have fewer than

three months of food security. These shows, while owning residential property offers a securer base for agricultural output that does not provide comprehensive food security.

Table 6.8

Relationship between Ownership of Residential Land and Status of Food Sufficiency from Agricultural Production

Ownership of House Build Land		Status of Food Sufficiency from Agricultural Production						Total
		Surplus	12 month	9 - 11 months	6- 8 months	3 - 5 months	< 3 months	
Landlord's land	N	0	0	1	1	0	0	2
	%	0.0	0.0	.3	.3	0.0	0.0	.6
Own land	N	65	78	56	43	22	52	316
	%	18.0	21.6	15.5	11.9	6.1	14.4	87.5
Public/Unregistered land	N	1	10	5	8	4	14	42
	%	.3	2.8	1.4	2.2	1.1	3.9	11.6
Relative's land	N	0	0	0	0	0	1	1
	%	0.0	0.0	0.0	0.0	0.0	.3	.3
Total	N	66	88	62	52	26	67	361
	%	18.3	24.4	17.2	14.4	7.2	18.6	100.0

Source: Field Survey, 2022

Note. a. 13 cells (54.2%) have expected count less than 5. The minimum expected count is .07.

*Likelihood Ratio (G-test) = 24.770, degree of freedom (d.f.) = 15 and Exact. Sig. (2-sided) (p-value) = 0.043.

Households that live on public or unregistered land, which account for 11.6% of the sample, tend to have more varied and typically less positive results. Only 2.8% of these households maintain food sufficiency for a year, while a 3.9% of the households' experience extreme food insecurity, with fewer than three months of

sufficiency. This implies that a lack of legal land ownership contributes to instability and vulnerability because of insecure holding and restricted access to resources.

A relatively tiny percentage of households (0.6%) reside on land held by landlords or relatives. These households have variable results with some obtaining 9-11 months of food sufficiency. However, they have low food production capacity. The findings suggest that owning land is associated with higher levels of food sufficiency because it provides greater control and access to resources. Renting public or unregistered land, on the other hand, limits access to resources and control over production that results in lower levels of food sufficiency.

These findings have significant sociological implications, particularly when it comes to understanding the role of land ownership in food security. Access to land and resource control are critical determinants of food production and, ultimately, food security. Land ownership has long been argued to be an important factor in the distribution of power and resources within society. Hence, the table provides empirical data to support the claims. The findings emphasize the significance of addressing land ownership disparities to promote food security and to reduce inequality.

6.9 Relationship between Type of Land based on Irrigation and Food Sufficiency through Agriculture Production

The table 6.9 demonstrates a substantial association between the kind of land used for agricultural production (categorized by irrigation) and household food sufficiency. The findings, based on a 2022 field survey of 361 families, suggest that the majority (77.3%) of the respondents rely on irrigated land, while a lesser number

(22.7%) depend on rainfall. This indicates that irrigated land is more common in the area of the study.

Table 6.9

Relationship between type of land based on Irrigation and Food Sufficiency through Agriculture Production

Type of Land based on Irrigation		Food Sufficiency through Agriculture Production						Total
		Surplus	12 month	9 - 11 months	6- 8 months	3 - 5 months	< 3 months	
Irrigated	N	62	70	54	39	15	39	279
	%	17.2	19.4	15.0	10.8	4.2	10.8	77.3
Rainfed	N	4	18	8	13	11	28	82
	%	1.1	5.0	2.2	3.6	3.0	7.8	22.7
Total	N	66	88	62	52	26	67	361
	%	18.3	24.4	17.2	14.4	7.2	18.6	100.0

Source: Field Survey: 2022

Note. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.91.

*Likelihood Ratio (G-test) = 34.844, degree of freedom (d.f.) = 10 and Exact. Sig. (2-sided) (p-value) = 0.016

The table 6.9 illustrates a notable disparity in food sufficiency between households with irrigated land and those with rainfed land. A greater percentage of irrigated households reported food excess (17.2%) and year-round adequacy (19.4%), whereas a minor fraction (4.2%) experienced shortages for less three months. Conversely, rainfed households had a minimal surplus of 1.1% and year-round sufficiency of 5.0%, with a significant portion (7.8%) encountering food shortages lasting under three months. In all, 18.3 percent of households reported a surplus, and

24.4 percent experienced food sufficiency for 12 months; nonetheless, a significant 18.6 percent faced food insufficiency for fewer than three months.

This mismatch distinctly illustrates the impact of irrigation on agricultural output and household food security, consistent with the theory of inequality, which elucidates how unequal access to productive resources like irrigation generates socio-economic disparities. Households with irrigated land are more capable of ensuring food security and livelihoods, whilst those reliant on rainfed agriculture remain susceptible and disadvantaged.

The Likelihood Ratio (G-test) result ($G = 34.844$, $d.f. = 10$, $p = 0.016$) indicates a statistically significant association between land type based on irrigation and food sufficiency via agricultural production, as the p-value is below the alpha level of 0.05. This suggests that households having access to irrigated land are more likely to attain food sufficiency than those dependent on rain-fed or less fertile land. This relates to the theory of inequality, emphasizing that unequal access to productive resources, particularly irrigation infrastructure, generates discrepancies in agricultural results. Farmers having access to irrigated land have increased yields and enhanced food security, whereas those lacking irrigation are susceptible to seasonal rainfall and crop failures, thus exacerbating socio-economic disparities within rural communities.

These findings have significant sociological implications, especially in terms of understanding the role of infrastructure and technology in promoting food security. Irrigation technology access is a critical determinant of food production and, ultimately, food security. Sociologists have argued that investments in agricultural infrastructure can lead to increased food production that reduces food insecurity and improves rural

livelihoods. The findings also emphasize the importance of addressing disparities in irrigation technology access to promote food security and to reduce inequality.

6.10 Relationship between Type of Land based on Irrigation and Characteristics of the Food Eaten in Households over a Year

The table 6.9 demonstrates the association between the kind of land used for agriculture-irrigated or rainfed and how households characterize their food consumption over the year. The responses are presented into four categories: (1) having enough food but not always the sorts they desire (EAKFW), (2) having enough of the kinds of food they want (EKFE), (3) frequently not having enough to eat (OEE), and (4) occasionally not having enough to eat (SEE). The data are from a 2022 Survey of 361 households.

The distribution of responses by land type reveals that households with irrigated land (81.7%) stated that they had adequate food. However, it was not necessarily the kind they wanted (EAKFW). A lower number of households 10.8%, had enough foods they desired (EKFE) that indicates better availability to a variety of dietary options. Only 6.8% of irrigated households had occasional food shortages (SEE), while only 0.7% stated frequently not having enough to eat (OEE).

In comparison, those that rely on rainfed land had somewhat better levels of nutrition adequacy, with 86.6% stating adequate food but not always the required variety (EAKFW). However, none among those households received enough of the food they desired (EKFE) that indicates a major constraint in dietary diversity. Besides, a bigger number (13.4%) experienced periodic food shortages.

Table 6.10

Relationship between type of Land based on Irrigation and Characteristics over a Year of the food Consumed in Households

Type of Land based on Irrigation		Characteristics of Food Consumed in Households over a Year				Total
		EAKFW	EKFE	OEE	SEE	
Irrigated	N	228	30	2	19	279
	%	81.7	10.8	0.7	6.8	100.0
Rainfed	N	71	0	0	11	82
	%	86.6	0.0	0.0	13.4	100.0
Total	N	299	30	2	30	361
	%	82.8	8.3	0.6	8.3	100.0

Source: Field Survey, 2022

Note. EAKFW = Enough but not always the kinds of food we want, EKFE = Enough of the kinds of food we want to eat, OEE = Often not enough to eat, SEE = Sometimes not enough to eat, C=Count and %=Percent

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is o.45.

*Likelihood Ratio (G-test) = 19.639, degree of freedom (d.f.) = 6 and Exact. Sig. (2-sided) (p-value) = 0.046

When comparing the two types of land, the statistics show that rainfed households receive more food on a regular basis. However, their food options are limited that make them more prone to food insecurity. Households on irrigated land had higher food sufficiency and better availability to chosen food types with 10.8% stating enough of what they want (EKFE). However, the absence of households in this group among those who rely on rainfed land indicates a significant lack of food diversity. Furthermore, rainfed households are more likely to experience occasional food

shortages (SEE) that indicates a larger likelihood of food insecurity in areas without irrigation.

The statistical study, with Likelihood Ratio (G-test) value is 19.639, accompanied with 6 degrees of freedom and a p-value of 0.046. The p-value (0.046) is less than the alpha level of 0.05, indicating statistical significance. This is a substantial correlation between the type of irrigation land and the dietary features of households over the course of a year.

Overall, the findings highlight irrigation's vital role in increasing food security and nutritional diversification for agricultural households. Households having access to irrigated land have more stable food supply and a wider variety of food alternatives, making them less vulnerable to food shortages. Rainfed households, on the other hand, have fewer options for food and are more likely to experience food insecurity on rare occasions. These findings indicate that developing irrigation infrastructure is an important option for improving food security, particularly in areas where rainfed agriculture predominates. Efforts to boost rainfed agriculture, such as improved farming practices or increased access to different crops help alleviate these risks and reduce food insecurity.

6.11 Discussion

The study's findings showed a strong relationship between household food security, irrigation, and landholding patterns. Likelihood Ratio tests demonstrated significant relationships between land type and both sufficiency ($G = 34.844$, $p = 0.016$) and dietary diversity ($G = 19.639$, $p = 0.046$). Households on irrigated land consistently reported sufficiency or surplus, whereas those reliant on rainfed agriculture encountered

persistent deficits. The data confirm that food poverty originates from structural inequities rather than production deficiencies, a conclusion consistent with Sen's (1981) entitlement model, which emphasizes access and capability above mere availability. The research corroborates Maxwell and Wiebe's (1999) assertion that land and food security constitute a cyclical relationship, wherein adequacy facilitates reinvestment, while insecurity sustains vulnerability.

When analyzed through the theory of inequality, the results align closely with Marx's (1976) claim that the ownership of productive assets perpetuates class differences, as bigger irrigated holdings provide lasting advantages while tenants and smallholders remain reliant. Weber's (1978) multidimensional perspective elucidates how landholding influences not only economic class but also social status and political power, corroborating Gautam's (2013) assertion that land distribution in Nepal underlies both livelihood results and stratification. Consequently, the findings of this chapter empirically validate that discrepancies in irrigation access serve as a fundamental mechanism for the perpetuation of structural inequality in rural Nepal.

CHAPTER VII

SUMMARY, FINDINGS, CONCLUSIONS, CONTRIBUTION TO KNOWLEDGE AND RECOMMENDATION FOR FUTURE RESEARCH

This study focused on Status of Land Holding Pattern and Food Security at Barbardiya Municipality ward number 8, 9, 10 and 11. From the sociological perspective, the research has land holding and shown the relationship between food security. The general research objective of the study was to assess the effect of land use practice on food sufficiency leading to food security. The specific research objective of the study was to explore the current land holding practice in the study area. The next objective was to examine the current food sufficiency. Likewise, the study also aimed to demonstrate the relationship between lands holding practice and food security.

7.1 Summary

The study examines landholding patterns and food security in Barbardiya Municipality, Bardiya District, using primary and secondary data. Barbardiya has 6,964.1 hectares of land and 13,403 holdings, however land fragmentation is still a problem with 2.3 parcels per holding. Although 91.7% of land is irrigated, just 13.3% of households enjoy year-round irrigation, highlighting huge infrastructure gaps. Private ownership dominates landholding (98.3%), yet renting and sharecropping show precarious tenure for many smallholders. Socioeconomic inequality remains, with 52.6% of families owning fewer than 5 *Kattha* and 1.7% owning more than 60 *Kattha*.

The analysis shows considerable family food security variance. 18.6% of families faced severe seasonal shortages, with food security lasting fewer than three months. 82.8% reported year-round adequacy. Financial constraints and low food

diversity hinder household resilience, notwithstanding rare acute hunger. Irrigated families were consistently more food secure than rainfed households, demonstrating the importance of irrigation access. Barbardiya grows paddy, wheat, maize, vegetables, fruits, animals, and poultry. However, smallholders had poorer productivity, demonstrating how land size, fragmentation, and insecure tenure affect food production.

The dissertation shows a robust link between landholding characteristics and family food security. Large farms, especially those above 25 *Kattha* with consistent irrigation, maintained sufficiency or excess, whereas smaller farms under 5 *Kattha* generally had deficits. Unregistered or public land and sharecropping households were more vulnerable to insecurity, underscoring the importance of land size, ownership security, and irrigation in food sufficiency. These findings highlight the need for equitable land allocation, irrigation infrastructure expansion, and tenure system changes. Structural determinants must be addressed to reduce inequality, boost agricultural production, and provide sustainable livelihoods and food security in rural Nepal.

7.2 Findings

The dissertation shows that Barbardiya Municipality has 6,964.1 hectares of land throughout 13,403 holdings for agriculture. With an average of 2.3 parcels per holding, land fragmentation persists. Over half of families (52.6%) possess less than 5 *Kattha*, while just 1.7% own more than 60 *Kattha*. Private ownership accounts for 98.3% of land, while renting and sharecropping provide precarious tenure for many smallholders. With 91.7% of land irrigated, just 13.3% of households have year-round irrigation, irrigation is crucial to productivity and food security.

The analysis shows large household food security gaps. 18.6% of families had food security for fewer than three months, indicating systemic weaknesses. 82.8% reported year-round sufficiency. Financial restrictions hindered dietary diversification and nutritional sufficiency in many homes. homes with reliable irrigation were more self-sufficient and excess than rainfed homes, which were more seasonal. The municipality has crop and livestock variety, but production outputs differ by land size and ownership security, highlighting livelihood inequities.

Statistics show a substantial correlation between landholding size, ownership security, and food sufficiency. Large farms with solid tenure and year-round irrigation, above 25 *Kattha*, achieved sustained sufficiency or excess. Less than 5 *Kattha* families, those using public or unregistered land, and sharecroppers were more vulnerable to food insecurity. These results show that uneven land distribution, unstable tenure arrangements, and poor irrigation infrastructure affect agricultural output and food security. The dissertation emphasises the need for fair land transfer, irrigation expansion, solid tenure rights, and targeted support for smallholder farmers to promote sustainable livelihoods and alleviate food insecurity in rural Nepal.

7.3 Conclusions

The dissertation indicates that landholding patterns significantly impact household food security in Barbardiya Municipality. The municipality has a strong agricultural foundation; however, ongoing fragmentation, unequal distribution, and insecure tenure arrangements hinder the productivity and resilience of farming households. Evidence indicates that private ownership predominates; however, smallholders, who represent the majority, face disadvantages due to restricted access to

land and irrigation. Structural inequalities reinforce socio-economic disparities and perpetuate vulnerability among marginalized households.

Food security outcomes are significantly associated with landholding size, ownership security, and access to irrigation. Larger, well-irrigated farms consistently exhibit year-round sufficiency or surplus, whereas smaller, rainfed farms experience frequent shortages. Although crop and livestock diversity exists, dietary insufficiency and financial limitations impede nutritional adequacy among households. The analysis emphasizes that, in addition to food availability, equitable access to productive resources is crucial for achieving sustainable food sufficiency. The findings indicate that landholding structures serve as both an economic issue and a sociological factor influencing inequality, livelihood stability, and social well-being.

The study indicates that unequal land distribution and insecure tenure significantly contribute to food insecurity, necessitating immediate policy intervention. Enhancing irrigation infrastructure, facilitating transparent land registration and titling, and fostering equitable access to property based on gender and caste are crucial for addressing systemic disparities. Incorporating climate resilience into agricultural strategies will enhance household coping mechanisms against environmental variability. This dissertation situates landholding within broader discussions of inequality, entitlement, and sustainable development, contributing to theoretical understanding and policy formulation. It emphasizes that equitable land governance is essential for enhancing food security and rural livelihoods in Nepal.

7.4 Contribution to Knowledge

This dissertation clearly the theory of inequality by demonstrating the direct relationship between unequal landholding patterns and food insecurity in Barbardiya Municipality. Consistent with Marx's (1857), perspective on land as a tool for exploitation and Weber's (1978), focus on class, status, and power, the study indicates that smallholders and landless households are structurally disadvantaged, whereas larger irrigated farms achieve sufficiency and surplus. The findings support Gautam's (2013) assertion that land distribution in Nepal is a key factor in inequality by empirically connecting ownership, tenure security, and irrigation access to food sufficiency outcomes.

The study employs Maxwell and Wiebe's (1999), entitlement-based framework to illustrate that food insecurity arises not only from production factors but also from access, which is influenced by land size, tenure, and resource control. This dissertation enhances both theoretical and empirical insights into agrarian inequality in Nepal, demonstrating that equitable land distribution and secure tenure are essential for mitigating food insecurity and promoting sustainable livelihoods.

7.5 Recommendation for Future Research

This study provides significant insights into the association between landholding patterns and food security in Barbardiya Municipality; yet, other areas need to be exploration. Future study should systematically examine gendered land ownership and food security. It must focus on the gendered aspects of land ownership and their effects on food security. Women's access to and control over land are limited by inheritance laws, patriarchal norms, and institutional barriers, which restrict their

capacity to improve household nutrition and agricultural productivity. An examination of gender-equitable property rights is crucial, as well as comparative analyses of caste- and ethnicity-based inequalities that persistently marginalise Dalits, indigenous populations, and landless laborers from access to agrarian resources. These investigations would enhance the comprehension of structural inequality and its implications for livelihoods and nutrition.

Future studies should utilize longitudinal and comparative designs to effectively capture the evolving relationship among landholding, food security, and climate vulnerability. Rainfed households are significantly vulnerable to unpredictable rainfall, drought, and seasonal shortages, highlighting the need to examine the impacts of tenure security, irrigation, and tenancy on resilience. The application of factor analysis alongside cross-regional comparisons between the Terai and hill regions will facilitate the identification of structural drivers and contextual variations. This approach aims to enhance theoretical discussions on agrarian inequality and entitlement, while offering evidence-based recommendations for equitable land governance, gender-sensitive policies, and climate-resilient agricultural strategies.

APPENDIXES

Appendix I: Household Survey Questionnaire on – "Land Holding Patterns and Food Security in Barbardiya Municipality, Barditya"

This questionnaire will be distributed to chosen case homes in order to document their assets for subsistence. All information will be kept confidential and used solely for research purposes.

A. General Introduction of Municipality at Sampled Household Level

1. Name of the respondent:
2. Gender:
3. Age:
4. Caste/Ethnicity:
5. Religion belief:
6. Marital Status:
7. Mother Tongue:
8. Educational Status:
9. Household Size:
10. Ward No:
11. Village/Tole Name:
12. Occupation of the Family:

B. Status of Land Holding Practice in the Municipality

13. Do you/family own a land? a. Yes b. No

14. How much land does you/your family member has (*Bigha/Kattha/Dhur*)?

15. Land Holding Size of Family in *Kattha*.

a) < 5

b) 5 – 15

c) 16 – 25

d) 26 – 40

e) 41 – 60

f) More than 60

16. What type of land is the [PLOT] on the basis of quality of production?

a) *Kheta*

b) *Bari*

c) Pakha

d) Jungle (Nursary)

17. Under which Farm Categories do you want to keep your family?

a) Landless

b) Marginal

c) Small

d) Medium

e) Large

f) Very Large

18. Ownership of Cultivated Land

a) Own by Self

b) Leased

c) Own by relative

d) No Ownership

19. Land use Pattern according to policies

a) Agricultural Land

b) Industrial area

c) Resident area

d) Forest area

e) Public or government area

20. Classification of land according to local context

a) Crop land

b) Ponds

c) Woodland or forest (Nursery)

f) Others

21. Ownership of House build Land

a) Own Land

b) Public/Unregistered land

c) Landlord's land

d) Relative's land

e) Guthi

22. Is the plot irrigated or rainfed?

a) Irrigated

b) Rainfed

23. Is the irrigation on the [PLOT]?

a) Seasonal

b) Year round

24. What is the mode of irrigation on the [PLOT]?

a) Tube well

b) Boaring

c) Nahar (Channel)

d) Pound/Tank

e) Electric Motor

f) Other natural resources

g) Mixed

25. Over the past AGRICULTURE YEAR did your household cultivate land owned by someone else (or that was mortgaged in)?

a) Yes

b) No

26. What is the contractual arrangement on this (plot)?

    a) Rented - In

    b) Rented - Out

    c) Mortgage - In

    d) Mortgage - Out

    e) Sharecropping - In

    f) Sharecropping - Out

    g) Others

27. Renting of Agricultural Land

    Renting-In

    a) < 5

    b) 5 – 15

    c) 16 – 25

    d) 26 – 40

    e) 41 – 60

    f) More than 60

    Renting-Out

    a) < 5

    b) 5 – 15

    c) 16 – 25

    d) 26 – 40

e) 41 – 60

f) More than 60

28. Mortgage of Agriculture Land

Mortgage – In

a) < 5

b) 5 – 15

c) 16 – 25

d) 26 – 40

e) 41 – 60

f) More than 60

Mortgage - Out

a) < 5

b) 5 – 15

c) 16 – 25

d) 26 – 40

e) 41 – 60

f) More than 60

29. Sharecropping of Agriculture Land

Sharecropping-In

a) < 5

b) 5 – 15

c) 16 – 25

d) 26 – 40

e) 41 – 60

f) More than 60

Sharecropping-Out

a) < 5

b) 5 – 15

c) 16 – 25

d) 26 – 40

e) 41 – 60

f) More than 60

30. Household holding public land Size

a) < 5

b) 5 – 15

c) 16 – 25

d) 26 – 40

e) 41 – 60

f) More than 60

31. Registered Tenant: Dartawala Mohi

a) Less than 10 Year

b) 11 – 20 Year

c) 21 – 30 Year

d) Above 30 Year

32. Adhiya/Battaiya: Sharecropping Period

    a) Less than 1 Year

    b) 1 – 2 Year

    c) 3 – 5 Year

    d) 6 – 10 Year

    e) 11 – 20 Year

    f) 21 – 30 Year

    g) Above 30 Year

33. Cultivated Land in Contact (1 bigha = 20 *Kattha*; 1 *Kattha* = 20 dhur)

34. If yes, how is your landownership condition?

    a) Very good

    b) Good

    c) Fair

    d) Bad

35. Did your household sell/transfer any land over the past 12 months?

    a) Yes

    b) No

36. How much land did your household sell/transfer? (1 bigha = 20 *Kattha*; 1 *Kattha* = 20 dhur)

37. How much did your household receive from the sales? (In Rupees)

38. How much land did your household buy/get? (1 bigha = 20 *Kattha*; 1 *Kattha* = 20 dhur)

39. How much did your household pay for this land? (In Rupees)

40. Does your household operate any land for agricultural purposes?

    a) Yes

    b) No

41. If yes, the total area of the land (1 bigha = 20 *Kattha*; 1 *Kattha* = 20 dhur)

42. Land Transactions

    a) Inheritance of Parent land

    b) Own Income

    c) Sukumbashi Aayog/ Kamaiya Aayog

    d) Basobas Compani/ Government Support

    e) Daijo

    f) Others

C. Status of Food Security in the Municipality

43. Which of these statements best describes the food eaten in your household in the past 12 months?

    a) Enough of the kinds of food we want to eat

    b) Enough but not always the kinds of food we want

    c) Sometimes not enough to eat.

    d) Often not enough to eat

    e) Don't Know

44. Here are some reasons why people don't always have enough or the kinds of the foods they want to eat. Please indicate if any of the following is a reason

why YOU or FAMILY don't always have enough or the kinds of food you want.

a) Not enough money for food

b) Kinds of food I want are not available

c) Not enough time for shopping or cooking

d) Too hard to get to the store

e) On a diet

f) No working stove available

g) Not able to cook or eat because of health problems

h) Don't know or not applicable

45. In the past 12 months, did you or other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?

a) Yes

b) No

c) Don't know

46. [IF YES ABOVE, PLEASE ANSWER] How often did this happen-almost every month, some months but not every month, or only 1 or 2 months?

a) almost every month

b) Some months but not every month

c) Only l or 2 months

d) Never

e) Don't know or not applicable

47. In the past 12 months, did you or family ever eat less than you felt you should because there wasn't enough money to buy food?

    a) Yes

    b) No

    c) Don't Know

48. In the past 12 months, were you or your family ever hungry but didn't eat because you couldn't afford enough food?

    a) Yes

    b) No

    c) Don't know

49. In the past 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?

    a) Yes

    b) No

    c) Don't Know

50. [IF YES ABOVE, PLEASE ANSWER] How often did this happen-almost every month, some months but not every month, or only 1 or 2 months?

    a) Almost every month

    b) Some months but not every month

    c) Only l or 2 months

    d) Never

    e) Don't know

51. In the past AGRICULTURE YEAR, what crops did you grow? LIST ALL CROPS GROWN BY HOUSEHOLD

52. Did you use an improved variety of seed of [CROP]?

    a) Yes

    b) No

53. Did you purchase or receive any seeds or young plants over the past AGRICULTURE YEAR?

    a) Yes

    b) No

54. Does your household raise livestock/poultry for agriculture purposes?

    a) Yes

    b) No

55. If Yes, list the types of livestock/poultry at your home/Farm

56. If yes, the total number of livestock/poultry for agriculture purposes

    a) Cow/Ox

    b) Buffalo/Yak

    c) Sheep

    d) Goat

    e) Pig/pork

    f) Chicken

    g) Duck

    h) Other

57. How many months does your own agriculture production support for food security?

    a) Surplus

    b) 9-12 months

    c) 6-8 months

    d) 3-5 months

    e) < 3 months

58. Do you know about the Agricultural Perspective Plan of Government of Nepal? (If no, don't ask the question)

    a) Yes

    b) No

59. What is your perception towards current agricultural program in your village?

    a) Excellent

    c) Good

    d) Fair

    e) Not Good

    f) Don't know

60. Coping Strategies of the Family

    b) Bye from market

    c) Sales of livestock

    d) Exchange labor for food

Thank you so much for cooperation!

Appendix II: Crop Calendar in the Barbardiya Municipality

Table 1

Crop Calendar of Barabardiya Municipality

Crops	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
A. Cereal Crop												
Paddy			TP	TP		H	H					
Wheat	H						P	P				H
Maize		P	P									
B. Legumes Crop												
Black gram			P	P			H	H				
Red lentil							P	P				H
Pigeon pea	H	P										
Chickpea						P	P					H
Bengal Gram						P	P					H
C. Oil Seed							P			P		
D. Vegetable Crop	H	H				P	P	H	H	H	P	P
E. Potato Farming						P	P			H		
F. Fruits Farming												
Mango		H	H									
Leechi		H	H									
Guva		H	H									

Notes: i). P = Planting; TP = Trans-Planting; H = Harvesting

ii). 1=Baisakh; 2=Jesth; 3=Ashad; 4=Shrawan; 5=Bhadau; 6=Ashwin; 7=Kartik; 8= Mangsir; 9=Poush; 10=Magh; 11=Falgun and 12=Chaitra.

Appendix III: Conversion Table on Land

1 Bigha	=	270 Sq.Feet
	=	1.6737 Acre
	=	13.63125 Ropani
	=	20 *Kattha*
	=	20 x 20 Dhur
	=	400 Dhur
1 Ropani	=	74 x 74 Sq.feet
	=	0.12571 Acre
	=	0.05087 Hectare
	=	4 Mato Muri
	=	16 Ana
	=	16 x 4 paisa
	=	64 Paisa

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