

**LIVELIHOOD DIVERSIFICATION IN NAGALAND: A CASE
STUDY OF KOHIMA AND PHEK DISTRICTS**

Submitted by

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Submitted

**In Partial Fulfillment of the Requirements for the Degree of Doctor
of Philosophy in Economics of Nagaland University**

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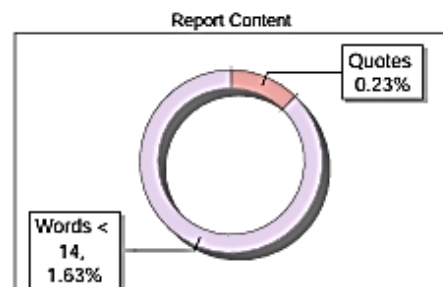
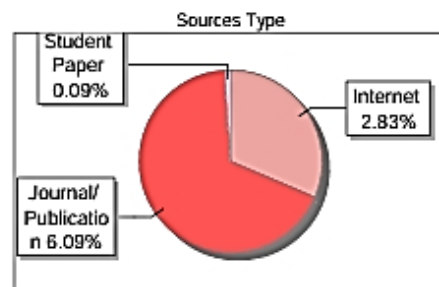
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Dedication

To my beloved mother,
whose love, strength, and sacrifices shaped the person I am today. You are missed
every day.

To my dearest dad and siblings,
for your constant prayer, love, encouragement, and unwavering support.

This achievement is as much yours as it is mine.

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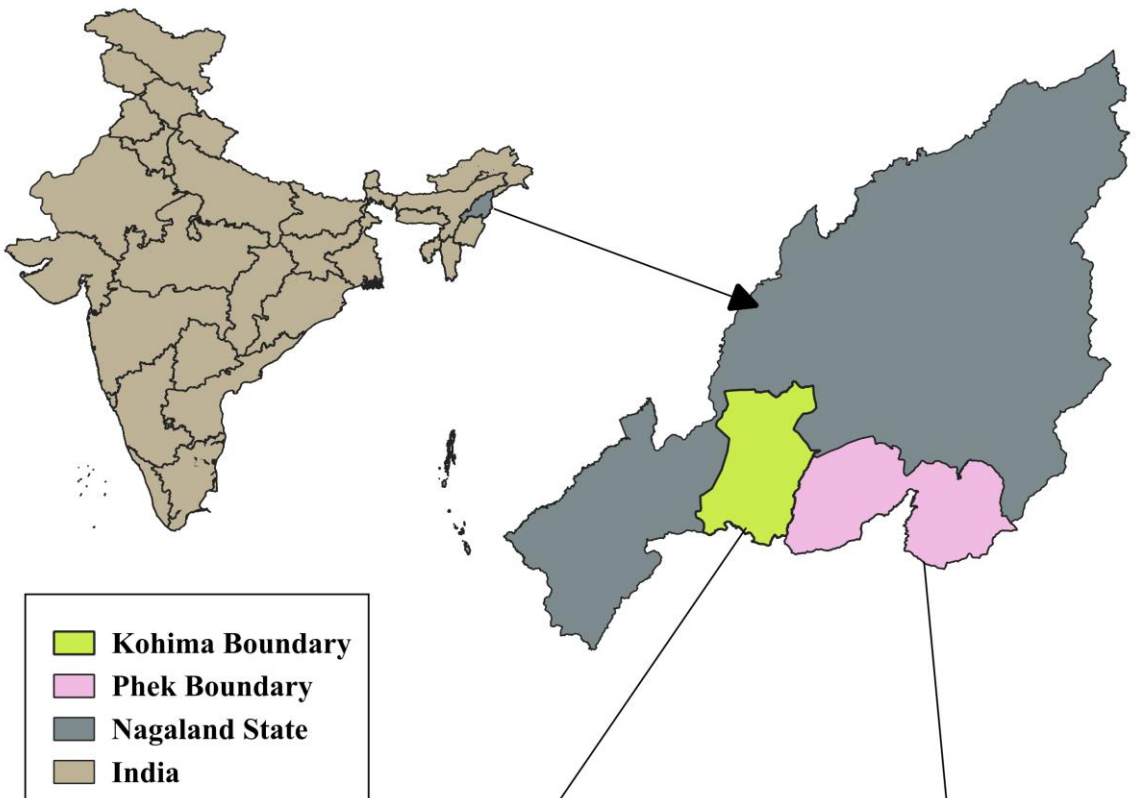
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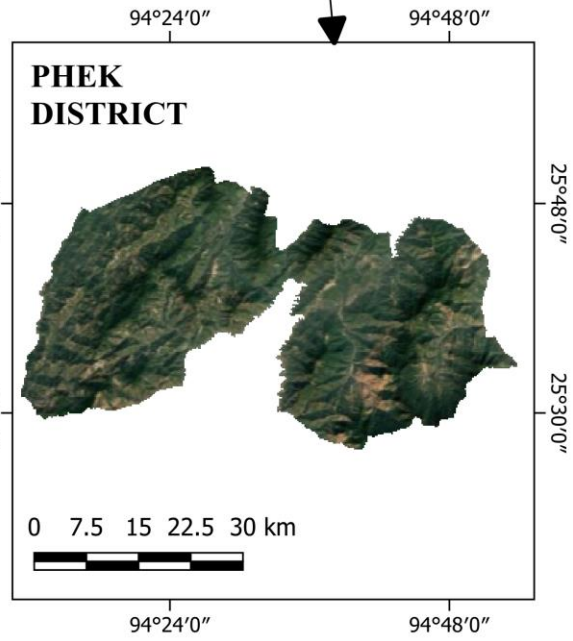
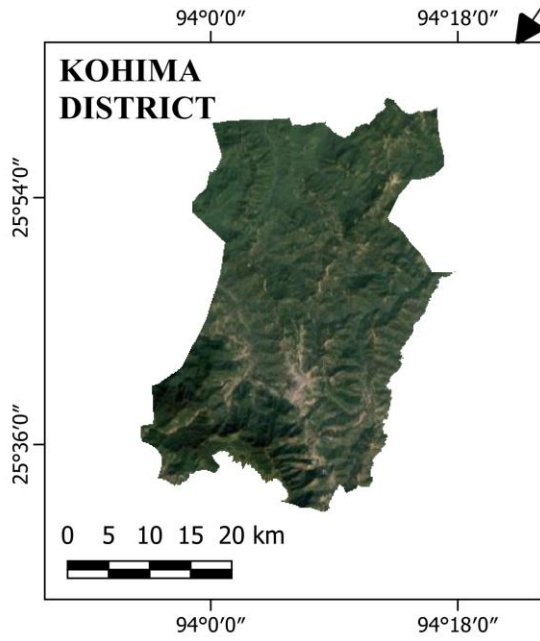
ACRONYMS

PLFS	Periodic Labour Force Survey
NSSO	National Sample Survey Organisation
NER	North Eastern Region
SDI	Simpson Diversity Index
HDI	Human Development Index
RD	Rural Development
LFPR	Labor Force Participation Rate
WPR	Working Participation Rate
CWS	Current Weekly Status
GSDP	Gross State Domestic Product
NES	Nagaland Economic Survey
HH	Head of Household
MHH	Male Headed Household
FHH	Female Headed Household
VIF	Variance Inflation Factor
RPI	Responses Priority Index

LOCATION MAP



- Kohima Boundary
- Phek Boundary
- Nagaland State
- India



CHAPTER 1

INTRODUCTION

1. Introduction

For a very long time, the livelihood of the people of India has depended on agriculture. Livelihood can be defined as the stock and flow of food cash with an individual or family to meet its essential needs (Acharya, 2006). The fundamental components of the livelihood concept are the link between assets, activities, and income, as well as the role of institutional structure in how assets are used and returned (Winters et al., 2002). Every economy follows a unique trajectory in its economic transaction and the development and liberalization of the Indian economy have witnessed a transformation where the share of the agricultural sector, both in the workforce and national income, has declined while that of the industry and service sector increased. However, the agricultural sector still bagged almost half of the total labour force in India, with 43.21% of the total workforce in 2019. With the increase in population and dwarf productivity growth of agriculture with low returns, the livelihoods of the people not only encompass agriculture but also non-farm and off-farm activities mainly to overcome poverty and risk and improve livelihood security. Livelihood diversification activities are thus beginning to emerge as increasingly important for livelihood. It is defined as “the process by which rural families construct a diverse portfolio of activities and social support capabilities to survive and to improve their standard of living” (Ellis, 1998, pp.4).

The process by which individual or households expand their sources of income and engage in other economic activities outside of their primary occupation is known as livelihood diversification. This strategy is often used to reduce vulnerability to economic shocks, market fluctuations, or environmental changes. Engaging in a range of activities—for instance, combining farming with small-scale business ventures or supplementing wages with freelance work—can significantly enhance their financial stability and resilience. Livelihood diversification contradicts the principle of growth driven by specialization. In rural areas, where traditional livelihoods may be limited or unstable, diversifying can be particularly crucial for improving the overall quality

of life and achieving sustainable development. Diversification has various advantages, especially in mitigating risks relating to economic downfall, fluctuation of markets, or crop failure. For example, a farmer might also engage in seasonal labour, invest in livestock, or start a small business. Similarly, a person engaged in a non-farm activity might engage in a part-time job or take on freelance projects in addition to their main employment activity. The main aim is to reduce reliance on one source of income, which can be vulnerable to various changes or other unforeseen challenges.

Worldwide evidence has shown that a vast array of rural households is increasingly engaging in diverse sets of livelihood activities to generate income. The diversification strategy is gaining heightening importance in the present day. It is realized that only a small proportion of individuals obtain their entire income from a single source, meaning not limited to one activity. There is a coexistence of activities where people diversify by adopting a series of activities and combining them to increase their income. These income sources comprise all farm income, off-farm income, and non-farm income. Farm income includes income generated from crop cultivation by family members. Off-farm incomes are the income earned outside the farm and as agricultural laborers on someone else's farm. And non-farm income is earned from non-agricultural activities (Bhakar et al., 2007; Katera, 2016). The inability of the farmers to generate sufficient income from agriculture alone has led them to undertake other additional farm activities such as dairy farming, horticulture, poultry farming, etc. According to Menon (2007), household resources and assets enable them to create unique livelihoods, while their vulnerabilities force them to look for and implement coping mechanisms. The process of livelihood diversification is often been categorized into two main outcomes: diversification for survival and diversification for accumulation. The former is a reactive strategy pursued by the less advantaged households as a reaction to shocks or stresses whereas, the latter is a proactive strategy followed by the richer households in anticipation of new opportunities (Idrobo & Davidson-hunt, 2012).

This chapter is categorized into two parts. Part I provides a brief introduction to livelihood diversification in India as well as in North-East states and Nagaland. It also discusses the framework and the concepts of the study. Part II reviews the

available literature, both national and international. Part III highlights the identification of research gap, the significance of the study, the statement of the problem, objectives, hypothesis, and methodology of the study. It also gives the limitation and the organisation of the study.

PART-I

1.1 Livelihood Diversification in India

In India, population pressure is a challenge, with its total population at 1.39 billion in 2020 compared to 1.25 billion in 2011. It is expected that the country has entered the demographic dividend where the working-age population has accelerated compared to its dependent population. The Indian median age population in 2020 was found to be 29 years, while for other developed countries like the US and Japan, it was above 40 years (Jain & Goli, 2022). The inadequacy to absorb the surplus labour has given rise to the unemployment rate and, thus, has led to high competition in search of job opportunities, and with 80 percent of the farming community owned by small and marginal farmers, they are faced with demographic pressure on land and minimal prospect for expanding their cultivating areas (Ashok, 2015). This has led to the low marginal efficiency of labour and low-income rates in the country, which has prompted individual to diversify activities and explore new opportunities to find alternative ways to earn their livelihood and augment their income. Over the years, India has adopted a number of equitable growth and poverty eradication policies; however, their impact has been limited. Therefore, the literature has confirmed livelihood diversification as the best policy prescription for the present scenario. Recently, reports show that the economic activity of the country is slowly recovering where an increase in employment in both the farm sector and non-farm sector was seen in 2019-20 and a decrease in the unemployment rate from 6.07 percent in 2017-18 to 4.84 percent in 2019-20 (PLFS data series; given in Chand & Singh, 2022).

India is an agriculture-driven economy where the majority of the rural population depends on the agricultural sector both for employment and livelihood. Diversification is taking place across and within crops and non-crop sectors, i.e., livestock, fishery, forestry, and animal husbandry (N. P. Singh et al., 2006). An estimation of the National

Sample Survey Organisation (NSSO) reports that for the people below the poverty line, the per capita consumption of cereals declined by 10 percent between the period of 1983 to 1999-2000. In the same period, their consumption of vegetables and milk increased by 50 percent and 30 percent, and meat, eggs, and fish increased by 100 percent, with a 163 percent increase in the consumption of fruits. According to Joshi et al., (2000), this speaks of a silent revolution symbolizing a diversification of agriculture in favour of non-cereals and high-value commodities. Studies also revealed that the share of rural non-farm employment has been rising across the country. Rural non-farm employment contributed 65 percent to India's rural Net Domestic Product in 2010 (Reddy et al., 2014). In Punjab, rural non-farm income is the major source of income for 51 percent of the household, constituting 30.5 percent of the total income, which is caused by the decreasing profits in agriculture and almost exhausted capacity to absorb the labour force in the farm sector (Vatta & Garg, 2008). According to a study in Assam, there is diversification from the farm to the non-farm sector, with 45.5 percent of workers engaged in the non-farm sector. Farming, being the traditional activity, showed a negative employment growth rate, with farming as the major source of income to only 31.7 percent of households, contributing 21.72 percent of income, against non-farm income being the major source to 63.6 percent of households, contributing 69.42 percent to total income (Saikia, 2016).

1.1.1 Livelihood diversification in NER and Nagaland

From 1993-94 to 2009-10, the North Eastern region of India was seen to have an increase in the share of employment in the non-farm sector with a decrease in the farm sector, indicating a structural transformation in the occupation sector (Panda, 2017). In rural Sikkim, while farming remains the primary activity for many households, the largest share of total household income comes from non-farm sources. This indicates that despite agriculture being the key activity, people in this region are significantly boosting their overall income with income from other sectors (S. Sharma et al., 2017). Studies in different regions of Assam have found that while majority of the rural population relies on agriculture, they do not depend on one activity alone. They choose to diversify their livelihood activities largely because they are unable to make ends meet as agriculture remains stable only for a few months (Bora, 2020; Swargiary &

Mahanta, 2020). In the hill district of Manipur, livelihood activities are mainly focused on subsistence, which is aimed at meeting basic needs and ensuring survival. Employment in this region exhibits a moderate level of diversification with an SDI of 0.42 (Guite et al., 2022). A study in Meghalaya has found fifty percent of the respondent to have a very high diversity level, with mixed cropping remaining as their main occupation. The study has also found diversification of livelihood activities to be a necessity for rural households to enhance their income and their survival (Dympep et al., 2018). In Nagaland, Ezung (2018), in a small survey, found the majority (31.11 percent) of the households to be engaged in one activity for their livelihood, and 52.11 percent of the households belonged to the low-income diversity group.

1.2 Framework

The framework for this study is based on the Sustainable Livelihood Framework (DFID, 2001) as depicted in Figure 1.1.1. This framework examines the various factors that influence people's livelihood choices and links them with different outcomes. This framework is applicable to different ranges – from the individual to the household and, to the nation at large (Scoones, 1998). The study does not aim to explore and discuss every aspect of the Sustainable Livelihood Framework. It focuses specifically on the aspects related to livelihood strategies, determinant factors, and the livelihood outcome (income) resulting from these choices. Nonetheless, this framework is valuable to provide key elements for the study and helps to identify the linkages between these elements.

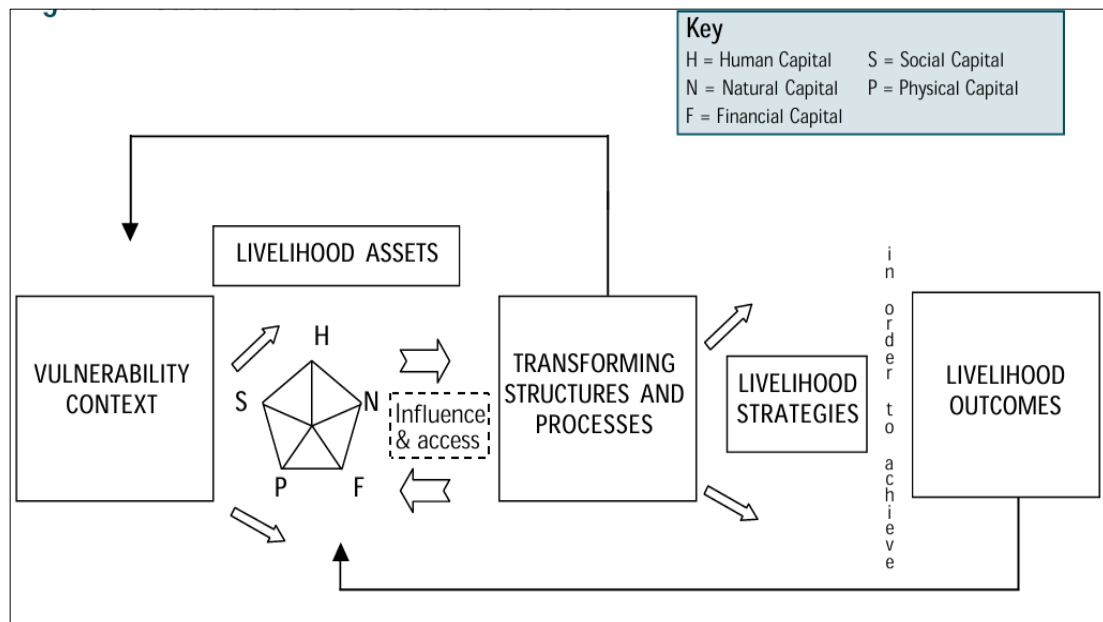


Figure 1.1.1: Sustainable Livelihood Framework
 Source: DFID (2001)

1.2.1 Conceptual framework

Figure 1.1.2 gives a graphical summary of the study and illustrates how livelihood diversification is linked to a household's decision to diversify and the various attainable outcomes from it. The framework is not limited to a specific group or individual but can be applied to any. The population is involved in various income-generating activities, which can be categorized into three distinct sectors: the non-farm sector, the off-farm sector, and the farm sector. Within these three sectors, individuals participate in multiple activities, reflecting different strategies influenced and determined by various factors related to the nature of the households/individuals. Despite facing constraints and limitations, these activities aim to achieve a desired outcome that will benefit the well-being of everyone involved. The key concepts used in this work are discussed below.

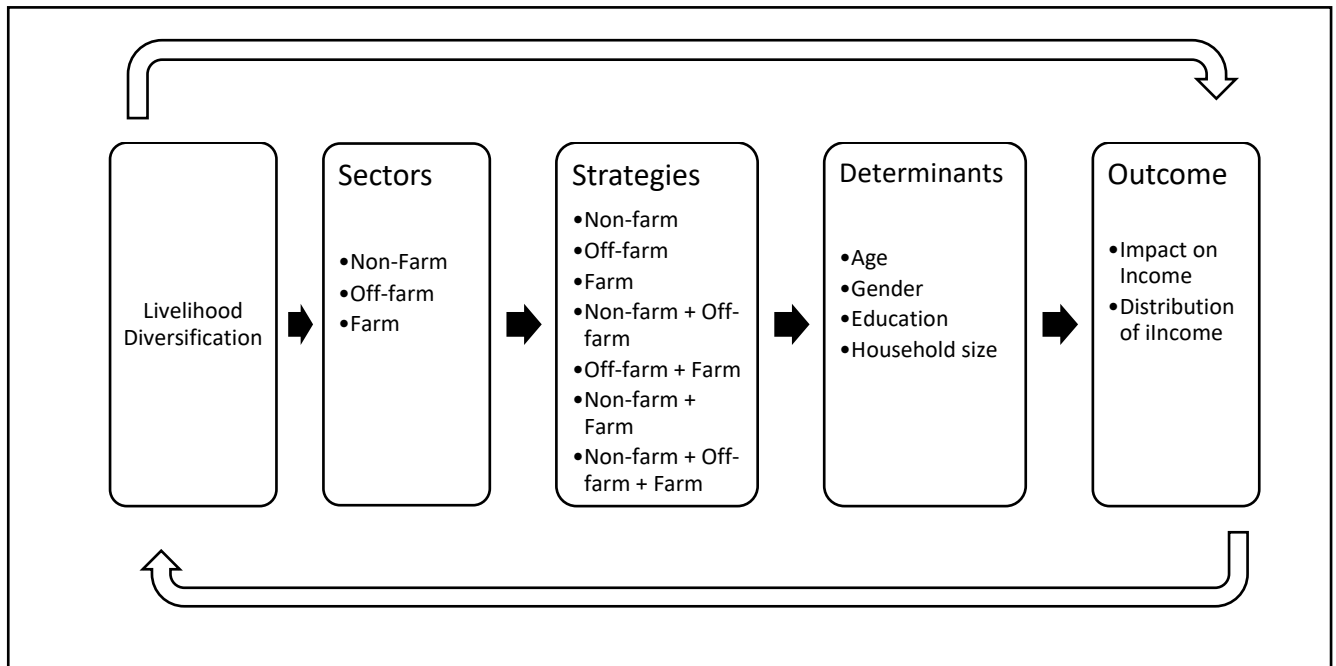


Figure 1.1.2: A conceptual framework and the graphical summary of the study

1.2.1.a Household

According to the NSSO definition, a household is a collection of one or more people sharing a common kitchen and typically living together. The members of this household may or may not be related to one another by blood, marriage, or adoption.

1.2.1.b Livelihood

Ellis (1998) defined livelihood as the activities, assets, and access that jointly determine the living expenses of an individual or household. According to Chambers & Conway (1991), “A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living.” Livelihood can be defined as a set of economic activities that involve different types of employment based on one’s capabilities to generate income for meeting self as well as household needs. It is a continuous process and a way of life that goes far beyond generating income. Livelihood can thus be described as the capability for an individual to obtain the needs of life, which includes obtaining food, water, shelter, clothing, and other essentials that are the bare essentials for human survival at the individual or household level. In other words, it is the accessibility of social and public services, including income of both cash and in kind.

1.2.1.c Diversification

Diversification is a livelihood strategy adopted by individuals and households by engaging in different productive activities to utilize the available resources efficiently or to abstain from risk and shocks efficiently (Neog & Buragohain, 2020). According to Iiyama et al., (2008), it is considered a rational response because of inadequate opportunities for specialization.

1.2.1.d Livelihood diversification

The definition of livelihood diversification is multidimensional. It is used to denote four different but similar concepts (Minot et al., 2006).

The first one can be described as increasing income-generating activities. It is the re-allocation, re-combination, and incorporation of all economic activities from any sector. In this definition, two income sources are considered more diversified than one with only one income source (Ersado, 2003; Joshi et al., 2000).

The second refers to producing food for subsistence to producing commercial agriculture. This implies a person produces different crops or vegetables for self-consumption or specializes in cash crops. This definition does not require a change in the number of income sources (Minot et al., 2006)

The third one is concerned with the shifting from farm to non-farm activities. It simply means the expansion of the non-farm sector. This definition also does not necessarily take into consideration the number of income sources or the balance among them. It mostly deals with the structural change and development of a country (Reardon et al., 1992).

The fourth deals with the shifting from low-value crops to higher-value crops. These crops include fruits, dairy, processed food, etc., which are labor intensive and generate quick returns (Birthal et al., 2007).

This study deals with the first definition as compared with the other definitions, the study of diversification with regard to the number of activities and their balance is relatively rare. Thus, livelihood diversification refers to creating diverse multiple

activities that can yield a source of income. In brief, it is a movement from all directions of occupations.

Households alter their income sources by increasing and broadening their economic activities by participating in different sectors, either temporarily or permanently.

1.2.1.e Livelihood strategies

According to Ellis (2000), livelihood strategies indicate all the activities that bring about the means of household survival. Livelihood strategies are the technique of a combination of different income-generating activities to meet the needs of the people. It encompasses the range and combination of occupations and choices that are undertaken by the people/households to achieve their livelihood goals. Livelihood strategies directly depend on the assets and institutions (DFID, 2000). With the use of these assets available, different forms of livelihood strategies are constructed. Thus, households adopt different strategies depending on the characteristics and nature of the households.

1.2.1.f Classification of sources of income

Livelihood activities can be categorized into three, namely, nonfarm, off-farm, and farm. According to Saha & Bahal (2014a), Bhakar et al., (2007), Yizengaw et al., (2015), Kassegn & Abdinasir (2023), Admasu et al., (2022), Wondim (2019), etc., the three categories are distinguished as shown in Table 1.1.1 and described below.

- (a) Non-Farm: Non-farm activities refer to all activity that takes place outside the agriculture sector, which includes trading, handicraft and artisanship, formal employment, service provision, and rental activities.
 - i) Trade: Trade activities in Nagaland are significantly flourishing. Diverse trading and business activities take place in the state, which includes retail stores, professional services, and larger-scale trading operations. Business activities take place in colony streets, community counters, or in the main town. All these activities play unique roles in

the state's economy, providing a range of goods and services to cater to the different needs and preferences of the people.

- ii) **Handicrafts and Artisanry:** The state is known for its rich identity and heritage, including handlooms, knitting, and handicrafts. The making and selling of these items are uncommon, and due to their unique detailing, the labor costs are very high.
 - iii) **Formally employed:** Formal employment mainly refers to white-collar jobs that play the role of professional, administrative, and managerial, involving office work, which requires a higher level of education and specialized skills. These activities include government, private, education, healthcare, etc. In the study area, children are often pressured by their parents to engage in formal activities against their will, as employment in this category is mainly considered superior to other categories or sectors.
 - iv) **Service Provision:** With the rise in unemployment among youths, there has been a noticeable rise in service-oriented activities in the study area as a means to earn income. This trend reflects the growing exploration of diverse opportunities to sustain livelihood by embracing roles such as taxi drivers, shopkeepers, salesmen, musicians, etc.
 - v) **Rental Income:** There is a diverse rental business in the study area, influenced by urbanization, tourism, migration, and economic development. These activities display a range of opportunities across residential, commercial, equipment, vehicles, flowers, etc., which have recently ventured out in the state.
- (b) **Off-Farm:** Off-farm activities include activities that are taken off one's farm which include wage casual labour activities (both farm and non-farm) and self-employment activities in natural resources such as forest products and fishing-related activities which includes guarding fishing ponds, and farmhouses which are paid in salary.

- i) Wage Labour: In the absence of formal education or specialized skills, many households in the study area end up as daily wage laborers/earners in order to sustain their livelihood.
 - ii) Forest Products: The state is blessed with rich natural forest products. With 33% of its geographical area under forest cover, the forest has been a source of livelihood for many years, and its role cannot be neglected. It plays a significant role in providing food, medicinal plants, firewood, fuel, rubber, timber, bamboo, etc. to the people.
 - iii) Fishing-related activities: Being a hilly region, fisheries are not commonly practiced in the state. People practicing fisheries are mostly for self-consumption, where only small quantities are sold at a price. There is also certain activities like guarding people's ponds or farms etc. which are paid in the form of salary. Such activities are also considered in this category.
- (c) Farm: Farm activities focused on crop products, animal husbandry activities, livestock by-products, horticulture, and floriculture.
- i) Crops: The state also has favorable agro-climatic conditions, which provides a high potential for cultivators to go for organic farming. Today, organic products are preferred compared to other crops that are easily available and in bulk. The state also has a remarkable share in the production of spices such as turmeric, etc.
 - ii) Livestock & Livestock by-products: The climatic condition of the state is pleasant for the rearing of livestock, piggery, etc., which generates both employment and income for its people. This activity is purely sustainable and does not harm the environment, and what is produced is automatically sold. Livestock farmers rear and sell livestock as well as livestock by-products such as meat and milk, which improves the household's food and income security.

Table 1.1.1: Categorized activities in different sectors for the study

Sectors	ACTIVITIES				
	Trade	Handicrafts & Artisanship	Service provision	Formally employed	Rental Income
Non-Farm	Grocery, Stock Business, Middleman, Contractor, Livestock, Cattle feed, Garments, Electrical, Food grain, Drugs, Lumber, Foods, Kerosene, Fruit, Vegetables, Meat, Fish, Home-brewed beer, Seasonal business, Stationery shop, XE-ROX shop.	Pottery, Blacksmith, Tannery carpentry, Basket making, Roof thatching, Mat making, Carpet making, Bamboo work, Weaving, Goldsmith, Baking, Jeweler,	Cobbler, Barber, Butcher, Mechanic, Transport, Musician, Grain mills, Traditional medicine, Tailor, Money lender, Fortune teller, Guide, Salesman, Driver	Teacher, Health worker, Veterinary, Surgeon, NGO worker, Local agent of the party, Council member, Maid, Guard, Defense service, Church ministry, Peon, Banking services, Sweeper, Government servant, Office assistant, Pensioner,	Animals, Tools, Tractors, Land, House, Tents, Decorative items, Chairs and Tables, Sound System,
Off-farm	Wage labour	Forest products	Fishing related activities		
	Food for work, Agricultural labour, Porter, Sand collection, State Farm laborer, Carpentry,	Charcoal, Wood, Grass, Lumber, Bamboo,	Fish catching, repairing nets and equipment, transporting fish, Guarding fishing ponds/ farmhouses		
Farm	Crops	Livestock & Livestock by-products	Poultry	Floriculture	
	Maize, Wheat, Rice, Vegetables, Fruits, Oil, Seeds, Tea, Coffee, Rubber, Spices	Cattle, Goats, Milk, Yogurt, Meat, Pig,	Chicken, Turkey, Duck, Geese, Egg,	Nursery, Fresh flowers, cut flowers,	

Source: Adopted from Saha & Bahal (2014)

- iii) Poultry: Rearing and selling of poultry, which is nutritious and sustainable, provides daily cash income to the poultry farmers.
- iv) Floriculture: The commercialization of floriculture goods is starting to boom in the state, which is helping many individuals, such as farmers, wholesalers, and retailers, to earn an income. It also creates employment opportunities for unemployed youths and homemakers. The increased demand for floricultural products has encouraged more entrance into this business.

PART-II

1.2 REVIEW OF LITERATURE

The approaches and impacts of livelihood diversification vary based on the motive and study area. Thus, Part II of this chapter gives an overview of earlier studies of the various works on livelihood, its extent, strategies, determinants, outcomes and challenges both within India and beyond.

1.2.1 Livelihood Diversification

Ellis & Allison (2004) in their work “Livelihood diversification and natural resource access,” they take the view that livelihood diversification is a tool for rural poverty reduction as it widens people's options and also enhances human capital to develop new skills and experiences.

Ersado (2003) uses the Income Consumption and Expenditure Surveys of 1990/91 and 1995/96 to examine income and activity diversification in urban and rural Zimbabwe. Rural households have a more diversified income portfolio and the degree of diversification decreases with the level of urbanization. The findings suggest that depending on wealth within the rural and urban areas, the level of diversification differs: In rural areas, the relatively better-off households pursue multiple income sources, whereas, in urban areas, it is the poor who have a more diversified income base that are temporary, seasonal, and informal jobs. The study concludes that households with a more diversified income base are better able to withstand the unfavourable impacts of policies and shocks.

Acharya (2006) in his study on rural livelihoods, classified four principal ways of acquiring livelihoods by rural households. The first one is the production-based livelihood. This section includes the small and marginal farmers who gain livelihood through production on small pieces of land. The improved methods of production and the access or availability of inputs affect the livelihood of these households. The second set of livelihoods is the labour-based livelihood, which includes small landholders and landless rural households who derive their livelihoods by selling their labour. Demand for labour, wage rates, and prices of food are critical for their livelihood. The third way of acquiring livelihood is the exchange or market-based livelihood. This section comprises the rural households who produce surplus food and non-food agricultural products or non-farm goods and earn their livelihood by selling these surpluses in the market. Some critical factors for their livelihoods are the market system and the relative prices of what they sell and buy. The fourth is the transfer-based entitlement households, which consist of households without any income-earning asset or able-bodied person to work and depend solely on the transfers from the government or other social organizations.

The evidence from the study showed that rural livelihood is multi-locational. People migrate to towns, cities, and industrial centres where jobs are found in dynamic and expanding informal sectors. These jobs are mostly underpaid, dangerous, and insecure, however, since these jobs are not seasonal and the chances of climbing up the social and economic ladder are high, the rural households find it attractive. Over the years, this motivation for migration has shifted from just ‘coping’ to ‘accumulation’ and the ‘pushes’ from agriculture are replaced by ‘pulls’ by the growing urban wages and expanding job opportunities. In rural areas, the development of infrastructure, improvement in the existing rural marketing system, complementary investment by the state, and deregulation of the domestic markets will encourage investment and widen the opportunities for employment in the non-farm sector.

With the data collected from 118 respondents of rural households of Chhattisgarh in the year 2002-2003, Bhakar et al., (2007) study reveals that farm and non-farm activities are the main sources of income and employment in the study area. Total income from farm households was higher than non-farm households, but with

not much difference on a per-capita basis. Contribution from off-farm activities was found to be negligible. The main source of income under non-farm households was services and non-agricultural labour. The study also found that increasing population pressure, small and fragmented agricultural holding, and iniquitous distribution of land are some reasons for unemployment in the states. Therefore, they recommend urban facilities in rural areas, diversification of agriculture, and financial assistance to provide better livelihood to rural households.

P. S. S.Kumar (2007) studied the livelihood diversification in rural Tamil Nadu. With the use of the Inverse Simpson Index, he found that the mean diversity index in the study area was only 1.9 as against the maximum possible value of 8, which can be considered very small. In the study area, the diversity was high among the higher-income households and low among the low-income households. The richer households derive a higher proportion of their income from non-farm sources than the poorer households, and a major portion of the income of the rich households has been derived from cultivation, and that of the poorer from agricultural labour. Diversity does not increase with the increase in the landholding status, however, the diversity was less in the landless households than in the landed households. In the total income, the share of non-agricultural income among the landless was 58.21 percent whereas for the highest landholding group, it was only 26.5 percent. Therefore, the share of non-agricultural income decreases along with the increase in the landholding status.

Agyeman et al.,(2014) studied the determinants of income diversification of farm households in the Western Region of Ghana. The degree of income diversification of farm household was 0.338 in the Simpson Index of Diversity (i.e. 33.8%) which is quite low. This indicates that farm households generate their income from a few livelihood activities. The study found the share of farm income to be 70.95% and non-farm income to be 29.05%. From the farm sector, 94.4% of households were engaged in food crops production, which generates only 20.16% of income. Natural resource collection, livestock and farm wages were practiced by 4.7%, 51.7% and 10.7% households generating 1.10%, 1.70% and 2.89% of total household income. Non-farm sector includes non-farm wage activity (13.2%), self-employment (4.7%), remittances income (11.5%) and other income sources such as pensions, transfers, etc. (9.0%)

which generates 5.84%, 19.07%, 1.96% and 2.18% of total household income respectively. With the use of Tobit regression, female headed households, household income per capita, extension visits had, number of years of education, value of productive assets owned and nature of road (tarred roads) were found to have a positive relationship with diversification while the age of head of household showed a negative relation.

Baby & Helen (2015) analysed the livelihood diversification among small and marginal farmers in Kerala. The study showed that the majority of the households depend on multiple livelihood sources and the sole dependence on farming for livelihood was seen to be declining. They diversified their farming pattern by engaging in cash crops, and mixed farming (crop, livestock, poultry, etc.). The study also revealed non-farm activities in addition to their base livelihood activity, i.e., farming, as the dominant livelihood pattern of the farmers. Migration was also seen as one of their livelihood diversification option in the study area.

With the use of the Simpson Diversity Index, Ahmed et al., (2018) studied the livelihood diversification in 500 rural households in Bangladesh and found that a total of 94 percent of the sampled households diversified their livelihoods into multiple income sources with only 6 percent having a zero Simpson Index. The diversified households diversify at medium and high levels.

Maja & Oluwatayo (2019) examined the nexus between livelihood diversification and poverty among rural households in Capricorn districts, Limpopo, South Africa. To enhance their poverty status, a number of rural households in South Africa combine two or more jobs to generate more income. The study revealed that households that diversify their livelihood sources are non-poor households, whereas the poor households rely only on a single income, and that females are poorer than males. The study concludes that livelihood diversification is a strategy to alleviate poverty in rural areas.

In their study on semantic review of the rural livelihood diversification among tribal communities of the North-Eastern Region of India, Bora & Mahanta (2022) conclude that in the region, the livelihood of the people has become diversified which

is associated with an increase in income which can further increase the standard of living of the people. However, due to its crawling pace of urbanization, the creation of alternative livelihoods and opportunities often fails. Therefore, they urge the government and private investors to intervene in the region's infrastructure and industrial development.

1.2.2 Employment Diversification

Singh (2003) study on farm and non-farm employment in rural Punjab revealed that there was a decline in rural population during the period of 1991-2001, indicating a shift of population from rural to urban areas. The study revealed that the highest proportions of self-employed earners were grocery shopkeepers/fruit and vegetable sellers, followed by artisans and electrical work persons, respectively. Income from the farm sector was higher than the non-farm, however, the analysis showed that the per-household income and the per capita income were relatively better distributed among non-farm households than the farm households. The study further revealed that males have a higher literacy rate and earn more than females. The majority of the working population was formed by adults (88.30 percent) followed by children, the aged people, and the overall dependency on the farm sector was 57.7 percent. People employed in the government sector were found to have the highest education level and the lowest in agricultural labour. The results of the functional analysis revealed that the number of persons in farm employment, education of the person engaged in non-farm employment, age of the head of the household, farm size, and herd size were the significant determinants of non-farm employment in rural Punjab.

A. Kumar (2009), with the use of data from the NSSO report on the study of rural employment diversification in Eastern India, it has been revealed that the non-farm sector is one of the potential pathways for generating employment opportunities. Education and skill development are found helpful for removing entry barriers to this employment opportunity.

In his study on rural employment diversification in North East India, Panda (2017) found that the leading sector of employment in the NER was the construction sector (approximately 30% of RNFE) whereas the share of manufacturing employment

declined during the period of 1993-94 to 2009-10. The share of NER in the public service sector was 27.1 percent as against the all India shares of 14.9 percent. The process analysis shows that the participation of the households in non-farm activity was influenced by both development and distress factors, where the development factor includes income from agriculture, access to credit, and distance from the nearest urban center, and the distress factor includes poverty of households. Further, it revealed a distress push and helplessness of the women workforce in the region. The study recommends an urgent need to strengthen the production linkage aspect of agricultural growth through inter-sectoral production linkages for a more efficient and productive process of diversification of employment.

Based on various rounds of NSSO data, Chand et al., (2018) examines non-farm employment and its implications on the agriculture sector in Rural India. The study shows that two-thirds of India's population still resides in rural India, however, the rural economy is transforming its occupational structure to the non-farm sector. The study revealed a gradual decline in agricultural workers from 83.4 percent in the 1970s to 58.9 percent in 2015-16, whereas an increase in the share of workers in the construction sector from 1.3 percent in the 1970s to 9.4 percent in 2009-10. The percentage of male workers in agriculture and allied sectors declined from 80.6 percent in 1977-78 to almost 60 percent in 2015-16, where still 71.6 percent of females are engaged in this sector. Level of education was argued to be a determining factor for choosing farm or non-farm employment, showing a positive relation between the level of education and the rate of the workforce in the non-farm sector. The study revealed that the main barrier for rural workers from entering the non-farm sector was the lack of skills and technical knowledge.

1.2.3 Income Diversification

V. Kumar (2001) studied the impact of diversification in farming on income and employment in Punjab, which is considered one of the most agriculturally developed states of India. He found that most of the heads of the households of diversified farms are young between the age group 21-58 years and are more literate as compared to non-diversified farmers. The study also showed that medium farmers

are more diversified and earn the highest return per unit of land compared with small and large farmers. Business income is found to be an important part of the total income of diversified farmers and the income of diversified households is higher in upper-income segments than lower-income segments.

Schwarze & Zeller (2005) in their study on the income diversification of rural households in Central Sulawesi, Indonesia, it was observed and confirmed by the economic analysis that the less-poor households derive 40% of their income from activities outside agriculture while for the poorest households, it accounts for only 10% of the income. They suggested that better-off households diversify more out of the agricultural sector than the poorer households. Households that have received formal loans have diversified their income more out of the agricultural sector. Measuring the degree of income diversity by using the Shannon Equitability Index shows that poor households have more sources of income and more evenly distributed income between these sources.

In a study on rural employment and income in Punjab, Vatta et al., (2008) found that the multiplicity of income sources is distress-driven, that is, households having three or more sources of income belong to the non-cultivating, marginal, and small cultivator categories. On searching further whether a particular source played a more significant role, it was found that the major source of income for cultivating households is self-employment in agriculture, and for the non-cultivating households, it is the non-farm sector followed by rental income and livestock. Female workers from cultivating households were found to be less diversified than the non-cultivating households. The study revealed a negative relationship between employment diversification (dependence on non-farm as a major source of income) and the size of land holdings.

With the use of multiple regressions, Sultana et al., (2015) studied income diversification and household well-being in rural areas of Bangladesh and revealed that income diversification in the study area has a significant impact on household well-being. However, they found that the extent of income diversification is comparatively low in the study area. Most household depends solely on agriculture,

which is subjected to different types of risk (natural disasters), and new sources of income emerging in the rural households are mostly by the rich farmers. They also found that households with higher income diversification have more expenditure compared with lower diversification households. To increase the extent of income diversification, they recommended small-scale businesses in rural areas, expansion and development of existing credit markets, reduction in interest rates by credit-providing institutions, and development of better transport, communication, and electricity.

Wan et al., (2016) studied income diversification: A strategy for rural region risk management in Northern China and found that rural households have more diversified income. According to the result of their study, the number of income sources is positively related to the educational level of the household head, and also households with a small proportion of children and elderly people tend to diversify income sources because a greater proportion of children of household members means that fewer family members are able to engage in agricultural production. The study shows that income diversification is an effective and valuable strategy for rural households to cope with weather shocks as it provides a stable income and new ideas for disaster management and relief. It also revealed that crop diversification improves farm income.

Vatta et al., (2018) while examining the sources of income and determinants of the agricultural households in rural India from the data set of “Situation Assessment Survey of Agricultural Households” by the National Sample Survey Office (NSSO) 2012-13, they found that majority of the agricultural household’s main source of income is from agriculture while for the richer households, greater percentage of their income are from wages and salaries. On dividing the region into four categories, they found that low-income, low-diversification regions diversify less, households in low-income, high-diversification region diversifies to low-return activities, households in high-income, high-diversification regions depend mostly on non-farm income activities, and households with high income, low diversification specialize in few activities for income enhancement. In short, they conclude that income diversification is linked with distressed factors.

From his study of income diversification strategies among pastoralists in Central Asia, Kyrgyzstan, Sabyrbekov (2019) found that household herders with the highest livestock diversification have the lowest income diversification probably because of a lack of opportunities as investment is required for setting up new livelihood activities and also because the households are located far from the main markets which has a high unemployment rate. He also found that households engaged in non-livestock activities, i.e., tourism, boast the highest level of income. However, this source of income activity is available only for two months a year, resulting in only a supplementary livelihood activity while livestock-based income is available throughout the year. It revealed that income diversification differs depending on the number of heads of livestock a household owns, regional differences, and whether a household manages livestock belonging to others.

1.2.4 Non-Farm Sector

The reliance of households on non-farm livelihood diversification is widespread across the globe. De Janvry et al., (2005) found that 72 percent of the rural households in China engage in non-farm activities, accounting for 36 percent of the total household income. According to them, non-farm activities are a solution for absorbing rural surplus labour, which not only increases income but also improves the standard of living and narrows the income gap. The non-farm sector includes all non-agricultural activities and is characterized by its heterogeneity, including self-employment, micro-, small- and medium enterprises (MSMEs), and trade activities (Davis, 2006). Households engaged in non-farm activities have higher and more stable incomes and food security than those households that do not engage in such activities (Chang & Mishra, 2008; Seng, 2015). Mat et al., (2012) considered non-farm income as the successor of agriculture income, which serves as an engine of growth for rural areas. A study by Saikia & Goswami (2015) on 332 rural households in Assam has shown that 63 percent of households derive their major sources of income from non-farm activities. Farming contributes only 31.72 percent of income, although most (86 percent) of its households pursue farming as a source of income. Based on a few rounds of the National sample survey, Chand et al., (2018) found that non-farm employment

has been increasing at a tremendous rate even in advanced agricultural states like Punjab, Himachal Pradesh, and Madhya Pradesh in the period from 1993 to 2015.

Kuiper et al., (2006) in their study on the interplay between farm activities, non-farm activities and the resource base on rural livelihoods in some regions in Africa and Asia found out that educated males are most probably to engage in non-farm employment and that non-farm employment is necessary for rural poverty reduction. Besides education and gender, geographical location plays a major part in the participation of individuals in non-farm. Non-farm activities also affect agricultural production decisions, however, income from non-farm activities was not invested in agriculture. Preliminary analyses of the sustainability of agricultural production have shown a reduction in fertilizer use.

Misra (2014) studied the growth and structure of rural non-farm employment in Maharashtra from 1993-94 to 2009-25 based on the 66th National Sample Survey (NSS) data on employment and unemployment. The study showed no significant increase in rural employment in the non-farm sector during this period. The less urbanized regions are more engaged in RNFS as compared to the urbanized regions, which proved to be contrary to certain studies which have linked the rural non-farm sector with the level of urbanization. The result shows that male employment in non-farm is more than that of females as females are more engaged in agriculture and allied activities. Household size and landownership showed a negative impact on employment in RNFS. Older people are more vulnerable to taking up non-farm activities. Higher education levels and better skills are considered to be the key roles that can lead to better employment opportunities in the rural non-farm sector. Therefore, he suggested that proper education and training programs should be implemented to benefit and provide a better possibility of getting employment in the non-farm sector.

Reddy et al., (2014) review the studies about rural non-farm employment and rural transformation in India and they found that RNFE contributing 65 percent to the rural Net Domestic Product in 2010 is emerging as one of the key drivers of rural development and transformation. The share of agriculture has experienced a net

decline in production from 64% in 1980-81 to 35% in 2009-10, while that of the non-farm sector experienced a sharp increase from 36 percent in 1980-81 to 65 percent in 2009-10 in the Net Domestic Product. With the growing share of rural non-farm employment (31 percent in 2009-10), agriculture still stands as the major employer of the rural workforce (68 percent in 2009-10). Within the non-farm sector, the foremost change has been the share in construction which increased from about 4 percent in 1980-81 to 15 percent in 2009-10. Evidence of rural-urban migration and shift of labour from farm to non-farm has resulted in a scarcity of labour for farm work. Therefore, the study recommends piece rate or contracting agricultural works to increase the bargaining power of labour, improve productivity in both farm and non-farm, improve rural infrastructure, and government interventions were also recommended to ensure security, safety, and social protection to migrant labour as rural-urban migration was considered to be an increasingly opportunity driven.

Nagler & Naudé (2017) study on non-farm entrepreneurship in rural Sub-Saharan Africa shows affirmation that households operate enterprises for two reasons. Firstly, households are pushed into entrepreneurship to survive risks and uncertainties as they lack insurance schemes and social protection. Secondly, households are pulled into the non-farm economy to seize the opportunity for higher income and wealth. The result also showed that the former, i.e., operated by necessity, is less productive than the latter, i.e., making use of the opportunity.

1.2.5 Off-Farm Sector

Off-farm employment has been defined in various ways in the literature. Barrett et al., (2001) describe off-farm activities as any work performed away from one's property, irrespective of the sector or function, it refers to any activity that is either wage employment or self-employment. According to Sisay (2010), off-farm work includes wage labour such as teaching, mechanics, unskilled jobs, and community service, as well as self-employment activities like handicrafts, weaving, trading, and collecting firewood or local food and beverages. It also encompasses low-cost activities with minimal returns, such as gathering wild fruits and firewood (Manjur et al., 2014). Anang et al., (2020) define it as any farming-

related activity that farmers engage in outside their primary farming work to generate auxiliary income.

It is evident from various studies that off-farm activities perform a significant role in earning more income than the farmer's income in developing countries. A lot of studies have shown that off-farm income plays a crucial role in the agricultural development by enabling households to alleviate cash constraints for farm investment. From their study in the East Gojjam zone, Yizengaw et al., (2015) found that farm households are forced into labour works which are low paying, small trading, selling of firewood and handicraft activities due to a lack of land resources to accommodate the labour force and unpredictable rainfall patterns leading to agricultural risk. According to Sani (2017), off-farm employment can enhance rural households' income and well-being while helping minimize income uncertainty. It also balances the household income and lowers the vulnerability and unpredictability related to farm activities (Anang et al., 2020).

Chikwama (2004) examines the extent to which rural off-farm activities particularly wage employment, assist households in farm investment and contribute to agriculture development in Zimbabwe. With the assumption that the rural capital market is entirely absent, he found that there is no effect of rural wage earnings on the household farm investment as the income from rural wage employment is mostly used to finance consumption expenditure and the saving rate on the rural wage income is zero. The effect of rural wage employment income on the household's farm investment is mutually dependent on the ability of rural wage employment activities to generate surpluses and the extent of unemployed labour in the household. When all the households' labours are fully employed, the increase in the rural wage employment will lead to 'de-agrarianisation'. In developing countries, diversity in rural wage employment and institutional mechanisms to save the income earned by rural households should be encouraged.

In a study on livelihood diversification in Kerio Valley, Kenya, Iiyama et al., (2008) found that more than half of the surveyed households (57%) are dependent on off-farm activities. And though households depend on off-farm activities, an organized

off-farm labour market does not exist. The lowest income groups were also seen to be the least diversified, which was the result of a lack of skill, knowledge, and barriers to entry for high return opportunities.

Babatunde & Qaim (2009) analysed the role of off-farm income diversification in Nigeria where they found that almost all farm household in the study area derive their income from farming, which accounts for only half of their total income, and sixty-five percent of the sample households participate in off-farm activities where agriculture wage employment and self-employment are the highest. In this paper, self-employed non-agricultural activities include handicrafts, food processing, shop-keeping, trade in agriculture, and non-agriculture goods, which constitute almost a quarter of the household income. Non-agricultural wage employment consists of both formal and informal jobs in education, health, commerce, administration, construction, manufacturing, and other services, constituting forty percent of the households, which accounts for only 6% of the average income.

In the study, there exists a positive correlation between farm size and per-capita income, both in farm and off-farm income, showing that both the income sources are complementary rather than substitutes. Farming is the most important source of income for the poorest household, whilst the largest income share for the richest household is from off-farm activities. In the Kwara state of Nigeria, an element of demand-pull diversification is seen among the better-off.

With the use of the Probit model, they found that participation in agricultural and non-agricultural wage employment is positively related to household size, and male-headed households are most likely to participate in wage employment. The econometric analysis showed that household size has a positive effect on farm income while older household heads benefit more from non-agricultural employment but less from agriculture. Education is crucial for income from non-agriculture employment and self-employed activities.

Their study revealed that income sources from non-agriculture and agricultural wage incomes are the most unequally distributed income with a Gini coefficient of 0.84 and

0.74 respectively. The study therefore confirmed that ‘farm income is inequality-decreasing, whereas off-farm income is inequality-increasing’ in rural Nigeria.

From the above results, they recommend removing entry barriers for poorer households to participate in higher-paying off-farm activities, promoting crop and livestock activities, accessible credit schemes, encouraging education, and increasing physical infrastructure in overall employment opportunities.

Babatunde (2013) examines the effects of off-farm income diversification on agricultural production in rural Nigeria. With the data collected from 40 villages in Kwara state of Nigeria, it was found that almost 90 percent of the households have at least some off-farm income, accounting for 50 percent of total household income. This income contributes to higher farm production and more expenses on purchased inputs but decreases the use of family labour. The author suggests the presence of elements of complementarities and positive spill-over effects between the farm and off-farm sectors. Off-farm activities meet the gap by directly increasing households’ income and providing liquidity that is needed to invest in farm inputs to increase agricultural production. He therefore recommends the removal of credit market imperfections and the creation of accessible credit schemes that can increase off-farm business and which in turn can promote agricultural development simultaneously.

From their study on the contribution of off-farm activities to household income in Hawul local Government area, Borno state, Nigeria, Bila et al., (2015) found that off-farm activities (mainly crop and livestock production) increase households’ income, contribute to self-employment and increase their standards of living. However, inadequate credit facilities, poor knowledge of improved technology, high cost of raw materials, and discrimination are some of the setbacks for households to participate in off-farm activities

To study diversification among households in Northern Kenya, Watete et al., (2016) divided the households into three categories; pastoral (50% or more revenue from livestock-related activities), agro-pastoral (more than 50% revenue from farming crops and the remaining from livestock-related activities), and off-farm (overall contribution made by livestock and crop production was less than 50% and there are

other alternative sources of income). At least 30% of the off-farm households were involved in seven different income activities, 30% of pastoral households earned from 5 different sources, and agro-pastoral were the least diversified. Heads of households pursuing off-farm categories were younger compared to their counterparts pursuing pastoral and agro-pastoral. They also have higher literacy levels. Male-headed households were found to be more diversified compared with female-headed households.

Therefore, this study refers to off-farm activity as the activities that are taken off one's farm, which includes wage casual labour activities (both farm and non-farm) and self-employment activities in natural resources and salaried employment activities such as guarding fishing ponds, and farmhouses.

1.2.6 Farm Sector

With the use of secondary data, Pal & Biswas (2011) studied the diversification of farm and non-farm sectors and the structural transformation of the rural economy with India's rural economy in particular. The study showed that the rural non-farm sector was highly diversified over the years from 1970 to 2000, but a low structural transformation in the rural economy. Whereas, the diversification index showed high diversification and a high degree of transformation in the farm sector. The study also revealed a complementary role played by the two sectors in India's rural economy, that is, the dependence of the farm sector on the non-farm sector and the non-farm sector on the farm sector.

Black et al., (2002) opined that farm diversification involves various forms where two types are usually perceived: agricultural and non-agricultural. Agricultural diversification incorporates a more extensive scope of yield choices inside the traditional farming endeavour. Non-agricultural diversification incorporates ventures, for example, farm-based accommodation, on-farm processing, and immediate marketing of food as well as land/building rented for non-agricultural purposes. According to them, farm diversification includes monetary expenses, improvement of skills, access to new resources, and in particular a capacity to make or react to new market openings.

Ogloblin & Brock (2006) studied household income sources in Russia, showed that income from farming is crucial as a means of subsistence for poor families and as a source of income for wealthier households. For the average rural household, it constitutes more than 32 percent of the total income, and 20 percent for the wealthier urban households. Without farm income, more than 40 percent of rural households are unable to afford even basic food. The study revealed that household plots narrow the gap between urban and rural households at all income levels. The study also showed that the lowest income group incurs the majority of their income from farming, whereas the medium-income household depends on pensions, and the largest source of income for the high-income group is from the labour market.

Mishra et al., (2010) study on the determinants of farm household income diversification in the United States by farm-level data, where they learned that the maximum part of the farm household income comes from off-farm sources. To increase their income level and to reduce the fluctuation in their income, farm households go for off-farm employment.

Makate et al., (2016) study on crop diversification and its impact on smallholder farmers in Zimbabwe, and found that crop diversification has the potential to enhance the productivity of the main crop. It also enhances the soil fertility and is effective in controlling diseases and pests. Crop diversification was also found to increase income and lower production risk. Furthermore, it was also found to have a positive significant impact on food security and nutrition.

According to Rahman & Akter (2012), from their study on the determinants of the livelihood security in poor settlements in Bangladesh proposed that areas with the availability of land should support farm activities such as livestock, fisheries, etc. Furthermore, they suggested that programs should be designed based on access to different capital endowments.

To study the feminization of agriculture in China, Brauw et al., (2013) have defined agricultural feminization in two ways: feminization of agricultural labour and feminization of farm management. The former occurs when the proportion of farm work done by women increases on a farm, meanwhile, the latter occurs when women

begin to make decisions about farm production or when the household is headed by a female. The study has seen that agricultural feminization is indeed occurring in China and further showed that women have equal access to input, resources, efficiency, and asset holdings with that of men when they manage farms.

Ashok (2015) in his work on an economic study on crop diversification and its impact on farmers' income in the Indore district of Madhya Pradesh, it was found that the additional benefit-cost ratio was 0.08 after the diversification of the farm. It is interesting to know that this ratio decreases with the increase in the size of the holding. The average net farm income from overall crop production increased by 38.03 percent after crop diversification.

Poláková et al., (2016) consider farm diversification as the reallocation and recombination of farm resources away from its original farming activities to generate another form of income. Whereas, it is a survival strategy for small and marginal farm holdings.

1.2.7 Determinants of Livelihood Diversification

According to Hussein & Nelson (1998), people diversified their livelihood with multiple motivations which include both push factors (e.g., environmental risk, falling incomes) and pull factors (e.g., changing terms of trade, perceptions of improved opportunities). In their study, they found out that livelihood diversification is normal for the majority of the people in rural areas of developing countries in Africa and Asia. It has also found that the poorest rural groups have the fewest opportunities to diversify, which can lead to accumulation for investment purposes.

Deb et al., (2002) studied the diversification and livelihood options in two villages of Andhra Pradesh. It was found that with the continuous decline in income from agriculture, cropping patterns have changed towards commercial crops, an increase in migration, and non-farm livelihood, which signifies diversification both from within and outside agriculture. However, various activities that can be explored in Andhra Pradesh are limited by caste, social networks, and kin relations.

Lanjouw & Shariff (2002) in their research on 'Rural Non-Farm Employment in India: Access, Income, and Poverty Impact', it was evidently found that education improves gateways of finding non-farm employment and with higher levels of education, employment in well-paid regular non-farm occupations rises. The result also shows that there are few opportunities for women in rural India in the non-farm sector and therefore, they are more engaged in agricultural labour. Low education levels, wealth, and social status restrict the access of the poor to a more attractive non-farm occupation, those which are most likely to be able to lift them out of poverty.

Carswell (2002) studied the significant contribution of adults in carrying out non-farm and off-farm activities in Wolayta, Southern Ethiopia. In her study, it has shown that 14 percent of all adults are engaged in trading, which is seen to be the single most important activity. In contrast to Ellis (1998), who says that diversification activities are generally thought to be more available to men than to women, Carswell's study found that involvement in diversification activities is higher in women than in men (mainly in trading). The majority of diversifiers have full control over the income they earn from their activities and more than half of the diversifiers do their activity on a regular basis throughout the year. The survey showed that the contribution of non-farm and off-farm activities to household income is larger for poorer wealth groups.

With the use of secondary data to study rural non-farm employment (NFE) in Karnataka, Gopalappa (2004) through this paper revealed that male employment in agriculture keeps on decreasing but increases in non-farm employment. Non-farm employment for women was seen to be declining. It also proved that literacy rate, willingness to work, and availability of infrastructure facilities are the major determining factors of non-farm employment.

Croppenstedt (2006) examines the determinants and structures of household income in rural Egypt and finds that agricultural income from crop production increases income inequality and this inequality can be reduced by wage employment and livestock production. 63.3 percent of the income of the poor household is derived from casual employment, livestock, and transfer incomes, whereas better-off households engage mainly in public sector jobs which are better paid. Male-headed

households perform much better than female-headed households. The study also revealed that education is the key factor in determining wage employment and returns.

As livelihood diversification varies between countries and regions, Alabi et al., (2008) reviews the case of developing countries with empirical evidence from Edo state, Nigeria. It shows that rural households search for diverse opportunities to increase and stabilize their income. In this study, regression analysis shows that in the Endo state of Nigeria, income sources, education, and location are positive and significant determinants of income, while gender has a non-significant relationship with income. The study recommends approaches towards specialization and commercial agricultural development, improved rural infrastructure, and strengthening the linkages between farm activity and non-farm activity to optimize the contribution of non-farm activity to pro-poor rural economic development.

Olale & Nazli (2010) studied the influence of market barriers and farm income risk on the diversification of income. With the use of the Tobit regression model, this paper confirms that market barriers and farm income risk are two aspects to consider when analyzing income diversification behaviour. Where market barriers reduce the strength of non-farm income diversification, farm income risk increases the strength of non-farm income diversification.

With the data extracted from the Ghana Living Standards Survey (GLSS) 1991/1992 and 2005/2006, Asmah (2011) examines the importance and the influencing factors of livelihood diversification and household welfare in Ghana. The study shows that the increase in the age of the head of household increases the farm household's welfare but decreases the likelihood of engaging in non-farm diversification. Male-headed households and the level of education of the head of household have a positive effect on non-farm diversification, which ultimately improved welfare. Having access to television and listening to the radio are found to be some effective tools to influence household livelihood diversification and welfare.

Machado & Nayar (2011) identified that livelihood diversification can be achieved through activities based on natural resources (agricultural activities, tourism,

etc) and activities based on non-natural resources (service, manufacturing, formal jobs, etc.).

Their study on off-farm and non-farm activities development in rural South-Eastern Bosnia, Berjan et al., (2013) found that almost half of the surveyed households are mixed households (on-farm and off-farm) with diversified income-generating activities. These households have higher education levels compared with farm and non-farm households. In the study area, 51.9% of households have agricultural production as their main or additional income whereas 15.9% do not have any farm income. The existence of a healthy diversified rural economy is needed for a household to diversify its livelihood. Almost 27.9% of the surveyed households never applied for a loan. Hence, lack of financial resources, time, and weak business skills are some setbacks for households to diversify.

According to O Abimbola & A Oluwakemi (2013), almost three-quarters of the respondents of rural households in Ondo State, Nigeria adopt a combination of farm and non-farm livelihood strategies. The main reason found in the study area for diversifying into other activities was a combination of limited agricultural income and large family size. Econometric analysis showed household size, total household income, and primary education of the head of household as influencing factors for choosing livelihood options.

VanWey & Vithayathil (2013) in their study on off-farm work among rural households in the Brazilian Amazon, individuals with more schooling work in higher paying off-farm jobs, but the level of education does not vary significantly between on-farm and off-farm workers in low-paying works. Men were found to participate in off-farm work at a much higher rate than women. Among the women working off-farm, more are engaged in higher-pay work, whereas for men, it is the opposite as women were seen to work off-farm only if the wages were higher.

Idowu et al., (2013) in studying the female-headed household's participation and wage in non-farm employment, they reported that 62 percent of the rural female-headed farm household income was contributed by the non-farm activities and the participation in these non-farm activities was determined by the education level,

dependency ratio, and the distance to urban centre. The wage received from non-farm employment was determined based on the hour of labour supplied, distance from urban centres, and the level of education.

Yizengaw et al., (2015) studied the determinants of livelihood diversification among the smallholder rural farm households in Debre Elias Woreda, East Gojjam Zone, Ethiopia. The study grouped the livelihood activities into three categories, on-farm, non-farm, and off-farm activities, where 61 percent of the sampled households participate in non-farm and off-farm activities, indicating that farm activities alone cannot provide enough income to the smallholders. The econometric analysis showed that households having a good relationship with urban people, access to media, and female non-farm role recognition were likely to have a diversified livelihood. The study recommends awareness of listening to the radio by proper road and electrical facilities and rural-urban linkages.

Gebreyesus (2016) in a case study on the determinants of livelihood diversification in Kembata Tambaro Zone, Southern Ethiopia, found that almost all households in the study area derive income from farming, accounting for 47% of the total household income. However, due to the problem of population density, it has resulted in a scarcity of land, leading to low agricultural income. Therefore, farm households rely on alternative sources to increase their income. The study found that 97 % of the respondents in the study area diversified into non-farm activities. It concluded that higher educational level, increase in non-farm activities, better access to credit facilities, market distance and small farm size have strong influence on rural livelihood diversification. The study recommends micro-credit facilities, rural urban infrastructure, and rural development policy focusing both on agricultural intensification and livelihood diversification strategies for smallholder.

Katera (2016) found that in Tanzania, more women depend on agriculture for livelihood, and women in off-farm activities are also seen to be increasing, but earnings remain higher among men compared to women in off-farm activities. On examining the driving forces of off-farm income generating activities in rural Tanzania, he found that households in the study area participate in off-farm activities as a result of push

factors. 73 percent of farm households have at least one member engaged in off-farm activities, and young and female-headed households show more movement to off-farm activities. Households with limited access to land and low income have higher chances to diversify to bridge the consumption gap. However, with low finance and low educational level, poorer households remain in low-paying, easy entry activities while the better-off households dominate the profitable off-farm activities. The study recommends better credit schemes, entrepreneurial skill development centres, and development of infrastructure such as roads, hospitals, and schools.

Asfaw et al., (2017) examined the determinants of non-farm livelihood diversification in rain-fed dependent smallholder farmers in north central Ethiopia. Through binary logistic regression, it was revealed that better-off households, households led by literate, younger heads, and having access to micro-finance, having frequent contact with development agents, have a better chance to be engaged in non-farm economic activities. Farmers with large farm size are less likely to diversify their livelihood into non-farm income sources. The study found mixed farming including crop production and animal husbandry as the main source of livelihood in the study area and that livelihood diversification favoured the better-off groups.

Kassie et al., (2017) on determining the factors of livelihood diversification in Amhara National Regional State of Ethiopia with the use of logit model, the study indicated that age and education of the household head have a negative effect on farm household's decision to participate in non-agricultural livelihood diversification activities. That is, 1% increase in the farm household's age results in a decline of the probability of livelihood diversification by 0.37% units and a decline of 41.8% units on farmers with a higher educational level. The study shows the location of a household as a determining factor of livelihood diversification where farm households closer to the highway have more opportunity to engage in non-farm income generation activities through trading and migrating to other rural areas and towns. Also, membership in cooperatives and having land rights increases the probability of participating in livelihood diversification activities by 32.5% and 44% units. To study the farm income diversification, the Seemingly Unrelated Regression (SUR) model was used and it revealed that male household heads earn more than female heads.

Household's membership in cooperative increases the off-farm income level of the household by 0.96% on average, while access to credit service decreases the off-farm income by 0.43% units at 5% level of significance. Farm land size has a positive impact on on-farm income level with 1% increase in farm size leading to an increase in non-farm income by 0.30% at 5% level of significance. Livestock rearing positively affects non-farm income with a 1% increase in value of livestock, non-farm income increases by 0.56 units.

Khatiwada et al., (2017) in a study on the livelihood strategy of households in rural Nepal, they found that the non-farm sector has dominated over the farm sector. About 65 percent of the households adopt a non-farm-related livelihood strategy, with only 23 percent having a farm-based strategy. Being an agriculture-dependent country, this result shows a significant risk to future food security and agricultural progress. The study also found education, training, land holding, access to credit, market distance, and agroecological location to be the key determinant factors in adopting higher-return strategies. Therefore, they suggest targeted programs, development projects, and investments in the rural poor that can encourage the diversification of livelihood activities to more profitable strategies.

Dinku (2018) analysed the determinants of livelihood diversification strategies in Borena pastoralist communities of Oromia regional state, Ethiopia, it is found that the age of the head of the household negatively affects the choice of the farmers' livelihood activities to non-farm and off-farm activities by the probability of 0.9 units. Market access and credit access were found to be motivating factors for expanding livelihood diversification. The study also showed that off-farm activities are engaged mainly by the individuals belonging to the lower income groups who have limited options to construct sustainable livelihood diversification. Furthermore, it revealed that those people with more choice and flexibility in their livelihood options have greater ability to withstand the external shocks and stresses.

Quimba & Estudillo (2018) study on the sources of income in rural Philippines shows that population pressure (scarcity of farmland) induces households to engage more in non-farm activities and to migrate overseas. It also shows a positive and a

significant relationship between non-farm wage and urbanization with a 1 percent increase in the percentage of households living in an urban area associated with a \$5.562 increase in income from non-farm wages. Young members of households (between 15-25 years) and an increase in female members in a household also show an increase in non-farm activities. Infrastructure development shows a positive impact on non-farm income but a negative impact on agricultural income as the presence of infrastructures drives labour away from agriculture to non-agriculture activities. Therefore, they recommended infrastructure development policies which consider focusing on infrastructure that creates jobs employing unskilled labour.

Samuel & Sylvia (2019) on analyzing the rural livelihood diversification strategies in South Africa, they found that more than half of the respondents diversified their livelihood into off-farm and non-farm income generating livelihood strategies, where 46.8 percent of the respondents engaged only in the farm activities. Education, age, household size, and farming experience were identified to be influencing factors in their choice of livelihood diversification. Therefore, the authors recommend promotion of quality education and training to improve livelihood in the study area.

With the use of the Double-Hurdle Model on studying the factors influencing off-farm work and the income earned on it, Anang & Yeboah (2019) found that educated farmers are more attracted to off-farm works and earn a high income. Also, less experienced farmers hardly participate in off-farm works, but once they participate, they earn much more than experienced farmers

1.2.8 Outcome of Livelihood Diversification

Galab et al., (2006) in their paper “livelihood diversification in rural Andhra Pradesh: Household asset portfolios and implications for poverty reduction” it reports that greater opportunities to engage in non-farm activities are needed in order to help households move out of poverty which includes forestry, mining and quarrying, processing, manufacturing, construction, utilities, trade, warehousing, transport, rural tourism and basic services (health, education, business and financial services). They suggested NGO assistance and social capital facilitates livelihood diversification among the poor.

Hadijah et al., (2012) studied the effect of non-farm income in poverty and income inequality in agricultural households in rural Kedah. The study indicated that one-third of the total agriculture household income is from the non-farm sector. According to the poverty headcount measure, addition of non-farm income to the agricultural household total income reduces the level of poverty by 42.94 percent. With the use of Gini coefficient analysis, this study shows that income from the non-farm sector increases income inequality. Assuming other sources of income remain unchanged, a 1 percent increase in farm agricultural income reduces the overall inequality by 0.3 percent, while a 1 percent increase in non-farm sources of income resulted in an increase in the overall inequality by 3.9 percent. The study encouraged non-farm income activities in rural households with a main focus on the value-added activities to raise income, hence, reduce poverty and also suggested a balanced development approach within rural areas.

Ajani & Igbokwe (2013) reviewed literature about the occupational diversification among rural women in Sub-Saharan Africa. The study found that occupational diversification varies from a positive effect to a negative effect. Negatively, it withdraws critical labour from the family farm and positively, it alleviates credit constraints and reduces the risk of innovation. The study revealed that rural women in Sub-Saharan Africa diversified their occupation to cope with crisis and seasonal stress in farm and non-farm activities. They get involved in non-farm activities to earn additional income to meet family requirements. But despite the fact that rural women are involved in non-farm activities, farming still stands as the dominant occupation of the rural women.

Shehu & Sidique (2014) used the propensity score matching approach to assess the impact of non-farm activities on household well-being by comparing the well-being of non-farm households with households that depend only on subsistence agriculture. The result shows a positive and significant impact of non-farm activities on household wellbeing.

Israr et al., (2014) aimed to study the diversification of income, its contribution and the effect of income of the household in Shangla district of Khyber Pakhtunkhwa,

Pakistan. In their study, it has been observed that the majority of households diversify their livelihood by shifting to other occupations or intensifying their activities within the same source of livelihood. Rural households diversified their income from both farm and non-farm sources, where the contribution to total income from farm sources was 31 percent, which has decreased by 10.03 percent after diversification, and 69 percent from non-farm sources, showing that non-farm income increased after diversification. The findings showed that after the diversification of income, the average income of the households increased both from farm as well as from non-farm sources. But the contribution of non-farm sources was greater than the farm sources of income to the total household income. The p-value of the student t-test in this study has shown a 57.65 percent change in the income of the households as a result of diversification. The study recommends further improvement in both the farm and non-farm sources of income for sustainable livelihood by investing more in the productive capitals of the rural households for inclusive rural development.

With the use of the Vietnam Household Living Standards Survey 2010 covering 6571 rural households, Khai & Danh (2014) found that human capital plays a substantial role in influencing a household to diversify its income sources. Households with higher education and better financial and social capital also help in enhancing income diversity. The study also proved that diversification of income sources increases the income of the households.

Bila et al., (2015) analysed the contribution of off-farm activities to household income in Hawul local Government area, Borno state, Nigeria, they have found that off-farm activities (mainly crop and livestock production) increases households' income, contributes in self-employment and increases their standards of living. However, inadequate credit facilities, poor knowledge on improved technology, high cost of raw materials and discrimination are some of the setbacks for households to participate in off-farm activities.

Saikia (2016) studied the diversification of income portfolio and its impact on poverty and inequality in less developed areas of Assam, revealed a gap between the wage participation ratio of male and female, mainly because the work done by female

is not recognized as economic activity. It also shows a transformation in Assam with employment diversification from farm to non-farm sector with 45.5 percent workers engaged in non-farm sector. Farming being the traditional activity showed a negative employment growth rate with farming as the major source of income to only 31.7 percent of households contributing 21.72 percent of income against non-farm income being the major source to 63.6 percent of households contributing 69.42 percent to total income. Age of head of households, access to electricity was found to be positively related to income diversity.

Gautam & Andersen (2016) examine the rural livelihood diversification and household well-being in Humla, Nepal. The analysis showed that diversification does not contribute to well-being, but rather household's well-being is enhanced by the household's ability to pull high return sector into its livelihood portfolio. This ability is dependent on the level of resources and assets. The study also found that resources are unequally distributed and off-farm diversification increases income inequality as the rich people diversify into high return sectors and improve their well-being whereas poor households lack resources to diversify.

Sharma (2018) studied about the rural livelihood diversity and its impact on livelihood outcome in Jammu and Kashmir. The study confirms the hypothesis that livelihood diversification has a positive and significant impact on the income of the households, that is, more diversified households have more income compared with less diversified households. Regression analysis shows that diversity increases household earning despite the location. A U-shaped relationship between age of household and earning was also evidently found. Households facing more risk and higher education have a positive effect on household earnings, while female-headed and less active working member households have a negative effect on earnings.

Salvioni et al., (2020) study showed a significant and positive impact of on-farm non-agricultural diversification on the financial performance of family farms in Italy. Farm size growth was found to have the largest impact on enhancing financial performance. Efficiency and specialized education in agriculture also indicated a positive impact.

Nguyen Tuan Kiet et al., (2023) on using the data from the Vietnamese Household Living Standard Survey (VHLSS) covering the years 2004, 2006, 2008, 2010, 2012, 2014, 2016, and 2018, accumulating a total of 74,304 households, they found income diversification to be the key to decrease vulnerability and managing risk for the agricultural households. With the use of a quantile regression model, they have evaluated the varying impact of diversification on Vietnamese household welfare where they found that before 2010, diversification increased household welfare (income), particularly for low-income households. In contrast, the medium-high income households experienced a negative impact on income. However, after 2010, income diversification was found to have had a negative impact on all households, assuming that this could be due to the rapid economic growth of the Vietnamese economy. They propose the promotion of skill development by offering training programs for low-income households.

Das & Nijara (2024) analyzed the relationship between rural non-farm employment and the well-being of the people in the North-Eastern Region of India, taking MPCE as a proxy of income, the second stage of IV regression (2SLS) showed the result that employment in the non-farm sector increased household consumption expenditure by 35 percent. Also, a person with a higher education was seen to earn more.

1.2.9 Constraints to Livelihood Diversification

Saha & Bahal (2012) have identified the constraints faced by the farmers of West Bengal to diversify their livelihood. Despite the vast potentiality to diversify their livelihood, the top constraints found are: lack of marketing facilities for products the people produced, lack of technical guidance, inadequate or no experience on new occupations, too much competition in local experience, and primary activities not leaving enough time to pursue.

Dutta (2016) studied the problems and prospects of livelihood diversification among the Missing and Sonowal Kachari rural tribes in Dibrugarh district of Assam. Basing on both primary and secondary data, he found that an individual's occupation choice is influenced by factors such as level of education, land ownership, assets of

the household, closeness to a town, household size, agricultural wage and infrastructure development in the village. 65.5 percent of the total household farm income comes from both on-farm and non-farm income generating activities. The traditional livelihood in the study area is agriculture, but they are engaged in other activities like livestock rearing, horticulture, weaving, fishing, tea cultivation, etc, as they still practice traditional methods of farming, a constant threat of wild animals, and the whole area being a flood-prone area. He also found that one main problem in diversification of livelihood was the poor infrastructure facilities, including transport, power supply, other social amenities, large family size, and lack of awareness about different government schemes. Therefore, he suggested that new opportunities and a successful, proper training and skill formation program be conducted by the government, credits to be facilitated simultaneously with a training program. For overall success, he said that the prerequisite requirement is infrastructural development and strong local organization.

Sathyapriya et al., (2022) identified the consequences faced by the respondents in livelihood diversification where they rank the constraints by using the Garrett ranking technique. The first rank was 'lack of previous experience' where they faced difficulties in adapting to the management of new occupations. It is followed by poor family support, the involvement of risk components, fear of failure, and lack of confidence. Along with the top five constraints, and a few others, the authors have suggested the need for specific training and encouragement, also subsidy programs to assist in their livelihood choices.

Tenaw (2016) studied the livelihoods of the pastoral and agro-pastoral regions in Western Hararghe of Eastern Ethiopia, with a major focus on the constraints they faced to livelihood diversification. The study found that the study area engages in a number of activities which provide them with additional capital for accumulation. And the constraints of livelihood diversification faced by the households as well as individuals in the study area include poor asset base, limited financial facilities, awareness, trainings, infrastructure, and opportunities. Therefore, the study suggests the creation of better opportunities, development of social infrastructure, awareness, and credit facilities.

On identifying the problems affecting livelihood diversification in Eastern Rural India, Lalchhandama & Sengupta (2023) found that transportation problem, poor rural-urban linkage, lack of credit facilities, financial startup, market access, awareness, training, and landholding are some of the setbacks to performing diversification in the study area.

PART-III

1.3 Identification of Research Gap

From the above existing literature, it is evident that livelihood diversification exhibits distinct characteristics and outcomes that vary across region to region, community to community, household to households, and individual to individuals. In short, livelihood diversification is found to be heterogeneous in nature. While substantial research has been undertaken globally and in India as well, studies focusing on Northeast India remain minimal. And to the researcher's knowledge, limited comprehensive research has been done on this topic in Nagaland. Livelihood in Nagaland often differs from other parts of India, perhaps due to its uniqueness in terrain, lifestyle, culture, and history, which necessitates the need for a more intensive study. Therefore, with this end in view, this study attempts to fill this research gap and seek to provide valuable insights on the livelihood diversification of households.

1.4 Significance of the Study

The study looked into the different types of livelihood activities adopted by the people in the study area and analyzed the extent of employment and income diversification taking place in the state. The study also examines the various factors determining diversification, the impact of diversification on people's income, and the distribution of income from each source. It also looked into the constraints faced by the people to diversify their livelihood activities. The study further presents suggestions and policy measures for policymakers to implement and formulate the best strategies and identify the opportunities for the people to have the finest livelihood and achieve a self-sufficient income.

1.5 Statement of the Problem

The economy of Nagaland is primarily forest-based and agricultural, and 71.14 percent of its population is in rural areas. In the primitive society of Nagaland, for decades, 99% of the rural population was engaged in agriculture and allied sectors. Agriculture was considered as the main source of livelihood, and the society produced everything that was consumed by its people. The interrelationship between the forest and the people has been the basis of livelihood for generations. However, changes in their social, administrative, and economic landscape due to development and transformation have introduced changes impacting their livelihood strategies (Zingkhai, 2015). The tribal people of Nagaland are moving toward different livelihood strategies, such as floriculture, sericulture, beekeeping, handloom and handicraft, fishing, trade and commerce, and small-scale industries, by adopting modern technologies and other public and private services (Rulu, 2022). The return from farm activities was very low and was not sufficient for the well-being of the household to support family needs. Therefore, farmers attempt to commercialize their farm products also in desperation to follow the trends of wealthier farmers, government schemes, and the influence of market forces (Jamir et al., 2014). The state's economy has extended beyond agriculture, it is now comprised of a complex range of activities. Agriculture, which was considered subsistence before, tried to produce more with new methods and advanced techniques of farming and production, which yielded them more returns. People have started to participate in diverse activities within different sectors, such as non-farm and off-farm sectors simultaneously, which has provided them not only with more income but a higher standard of living as well. Though the demeanour of livelihood diversification is evident, the direction of this expansion remains ambiguous and has received limited attention in the empirical literature. The question of the degree and extent of diversification remains unanswered, which has necessitated a quantitative study on livelihood diversification in Nagaland. Therefore, this study will fill this research gap in knowledge by analyzing livelihood diversification through the income and employment of the households.

1.6 Objectives of the study

To study the potential of diversifying livelihood activities in the study area by focusing on the household and individual level, the following objectives are specified:

1. To study employment diversity and income diversity.
2. To study livelihood diversification by gender, age, education, and household size.
3. To assess the impact of livelihood diversification on the income of households.

1.7 Hypothesis

1. Higher income groups have higher livelihood diversification.
2. Livelihood diversification is higher in Kohima than in Phek.

1.8 Methodology

1.8.1 Area and period of the study

For the study of livelihood diversification in Nagaland, Kohima district and Phek district are chosen as the representative districts of Nagaland as the study area. Kohima district, being the capital of the state, experiences rapid development and is often considered more urban than the other districts, whereas Phek district is less developed and more rural than Kohima district. Moreover, in terms of the Human Development Index, Kohima district ranked third out of 11 districts with an HDI of 0.66 in the 2011 census, while Phek district is ranked eighth with an HDI of 0.59. However, these two districts also have a similar culture and environment, making it interesting to study in such a rural-urban setting. The data were collected from the selected households during the period of 2020-2021.

1.8.1.a Nagaland at a Glance

Nagaland, the sixteenth state of India, was established on December 1, 1963, by the State of Nagaland Act 1962. It is a hilly state located between 25°53'N-26°01N latitude and 93°91'E-94°32'E longitude, in the North-Eastern region of India, which is

inhabited by a number of tribal communities with an extensive history. According to the 2011 census, the population of Nagaland was 19,80,602, out of which 10,25,707 are males and 9,54,895 are females, respectively. The state is bounded by Arunachal Pradesh and part of Assam in the North, Myanmar (Burma) in the East, Manipur in the South, and Assam in the West. Nagaland has a sub-tropical climatic condition and is widely acknowledged as a region of mega-biodiversity due to its mountainous topography, mostly covered by forest, which is among the richest on the Indian subcontinent. The forest, which is quite rich with flora and fauna, is known to play a significant role in the social and economic life of the people of the state as it provides them a source of livelihood and necessities like medicine, firewood, raw materials, fodders for their cattle and shelter as well. Agriculture is considered to be the primary activity of the state, and it employs more than 70% of the state's population. Almost all tribes and villages practice jhum cultivation, with a few tribes, such as Angami, Chakhesang, and Zeliang, practicing terrace cultivation alongside jhum cultivation. In addition, the people of the state also rear livestock, especially cattle and poultry. Planting horticultural crops in the kitchen backyard and wild fruits and vegetables from the forest also plays a significant role in the revenue generation and survival strategy of the people of the state. However, this produce is mainly for self-consumption, and a very little portion of the produce is used for commercial purposes. Nagaland's economy is a developing economy that struggles to advance its social and economic conditions, mainly due to its remoteness and inaccessibility. The continuous and enormous growth of the labour force on the one hand and the absence of big industries and small fragmentation of land on the other have failed to provide employment opportunities in the formal sector, which calls for the need for and the requirement for employment opportunities in the informal sector. Although the dependency of the state on agricultural activities has declined from as much as 96.5 % in the 1950s to about 68% in 2000, agriculture still remains the primary source of livelihood. Therefore, in order to adapt to this pattern of change, people adopt multiple activities and try to engage in activities that can provide them a source of return and an income certainty for precautionary motives. At present, people of the state also adopt modern technologies and practice floriculture, horticulture, handloom, handicrafts, and other cottage industries to earn their livelihood.

The Government of Nagaland is also seen to be taking the initiative by launching various livelihood missions such as Nagaland State Rural Livelihood Mission (NSRLM), Nagaland Bamboo Development Agency (NBDA), Prime Minister's Employment Generation Programme (PMEGP), Nagaland Industrial Development Corporation (NIDC) etc. to improve the livelihood of the people by providing training, resources, boosting agricultural practices, increasing the possibility of self-employment and to have financial stability, however with limited evidence of substantial impact.

1.8.1.b Kohima

Kohima district is the oldest district in Nagaland, with its administrative headquarters located in Kohima town. It was the first area to adopt modern administration as the headquarters of the former Naga Hills district under British rule and became the capital of Nagaland when the state was established in 1963. The district covers a total area of 1,463 sq. km and is situated at a latitude of 25°40' N and a longitude of 94°07' E. It is bordered by Wokha district in the North, Manipur state to the South, Zunheboto and Phek districts to the East, and Assam by the West. The climate of Kohima district is a milder form of a humid subtropical climate. Kohima, the capital city of Nagaland, is one of the fastest-growing economies of the state, constituting a mixture of different tribes of Nagaland and those from mainland India. As per the 2011 census, Kohima district is controlled by eight administrative circles with 4 Rural Development (RD) blocks, covering 106 inhabited villages. The district has pleasant weather and climatic conditions, which are favourable for vegetation and minerals. Terrace cultivation (wet farming) is the state's main cultivation activity, with rice as the staple food for the people. Kohima district's economy is primarily based on agriculture. However, a significant portion of the urban population is employed in government jobs and small businesses. Local farmers practice jhum cultivation, and the key crops grown are paddy, maize, millet, and barley. Additionally, the district produces cash crops, including potatoes, soybeans, and various local beans. Natives of the district supplement their income through poultry and cattle farming. Small-scale industries and home-based production are the primary sources of manufacturing in the state

1.8.1.c Phek

Phek was granted a full-fledged district on 19th December 1973. It is located in the southeast of Nagaland, sharing a boundary with Zunheboto and Kiphire Districts in the North, Myanmar in the South East, Manipur in the South, and Kohima District in the West. The district is a mountainous region with 70% of its land covered with thick evergreen forests rich in flora and fauna. According to the 2011 census, Phek district has 14 administrative circles with 5 Rural Development Block covering 117 inhabited villages. The district has a varied geo-climatic condition, which is favourable for vegetation, spices, horticulture, floriculture, and other crops. It is also known for limestone deposits, decorative stones, and other minerals. However, due to inadequate infrastructure and transportation, these riches largely remained unutilized and unexplored. By tradition, the main activity of the district is agriculture, which is still labour-intensive, with 80 percent of its people engaged in it. Some of the main crops in the region are rice, maize, millet, cabbage, yam, pulses, ginger, etc, with fruits such as passion fruit, peach, plum, kiwi, and cardamom boosting the area.

Agricultural products are mostly sold in marketing sheds by the highways and taken to nearby town areas as street vendors. Animal husbandry is also an important activity in the district. Livestock such as pigs, poultry, cattle, goats, buffalo, etc, are reared domestically with traditional rearing practices where the livestock are kept loose for grazing (open grazing system). However, there is no organized market system, for instance, inadequate infrastructure and lack of proper transportation for marketing livestock and poultry. Forest resources, which have once been an important revenue generation in the district, are becoming less active due to an increase in population and developmental activities.

1.8.2 Sources of Data

(a) Primary data

The study follows a multi-stage random sampling method from state to district, from district to administrative, from administrative circle to villages, and from villages to households (see Figure 1.1.3). In the first stage, two districts, Kohima and Phek districts, were chosen randomly. The second stage follows cluster sampling, where the

districts are divided into various administrative circles. From each of the districts, four circles are randomly selected. In the third stage, one village from all the selected circles has been randomly chosen as the sampled villages. Finally, as per the 2011 population census, a sample of 10 percent of the total households from each village were randomly selected as sampled households (Table 1.1.2). The aim of the study is to examine the variations in livelihoods in association with income and employment. Therefore, to avoid bias, the households were selected randomly, irrespective of the occupation or income sources of household members.

Table 1.1.2: Survey area (villages) and selected sample size

Sl. No	District	Name of the Village	Total household (as per 2011 census)	10% of the total households
1	Kohima	Kohima village	3375	338
2		Nerhema	310	31
3		Sechu village	735	74
4		Zisunyu	499	50
5	Phek	Pfutseromi	618	62
6		Porba	626	63
7		Enhulumi	230	23
8		Lasumi	216	22
		Total		663

Source: Field survey. (2020-2021)

(b) Secondary data

The secondary data used in this study were mainly from Census data of India 2011, different rounds of the National Sample Survey Organization (NSSO), administrative reports, government documents, statistical handbooks, books, articles, journals, theses, and other sources available in published and unpublished form.

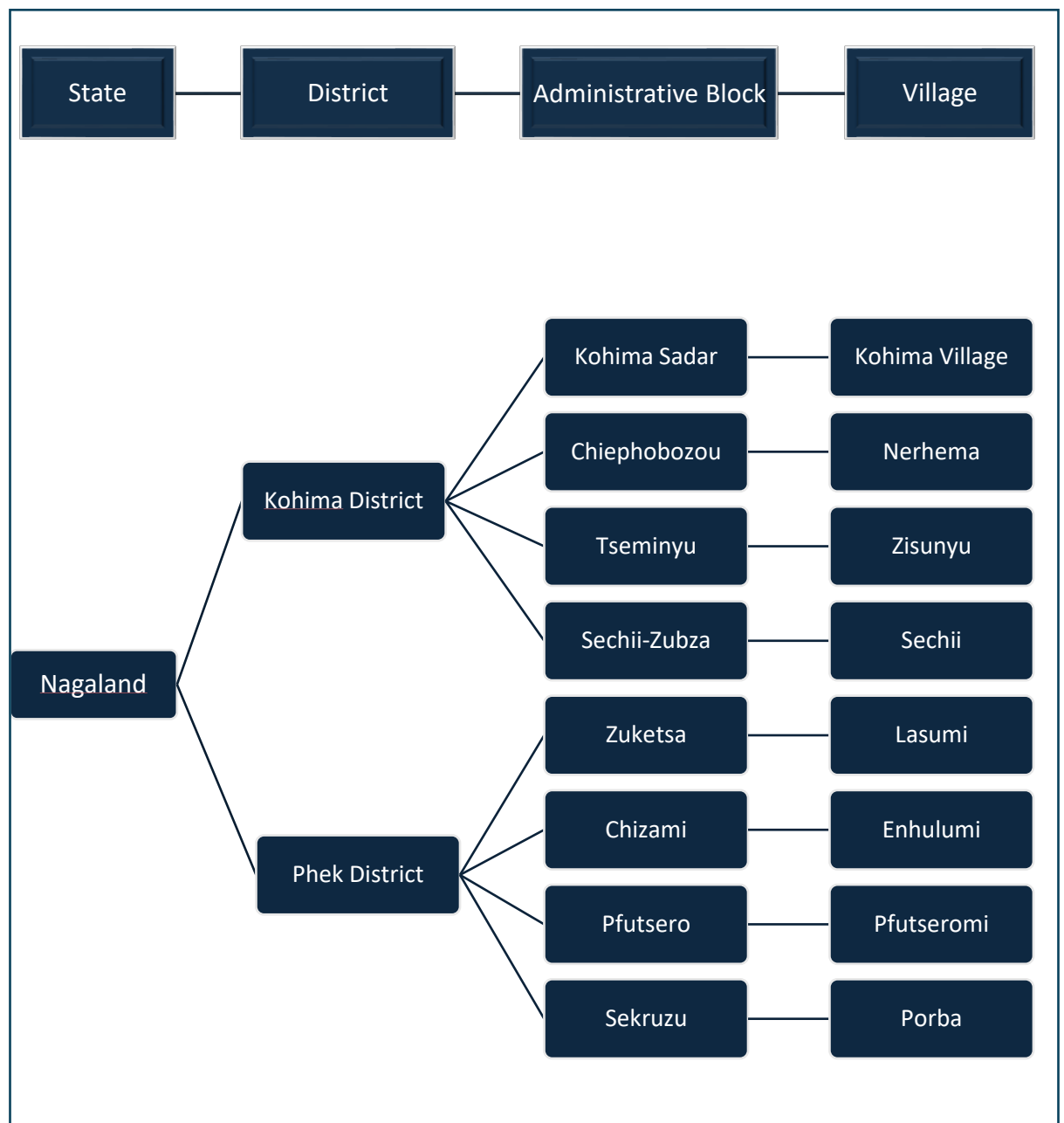


Figure:1.1.3: Flowchart of the sampling design

1.8.3 Analytical framework

The data were analysed by using suitable analytical tools as required by the objectives with the help of software packages such as, Excel, SPSS v16.0 and STATA 12.0.

i) Simpson Diversification Index

The formula for the Simpson Diversity Index is as follows:

$$SDI = 1 - \sum_{i=1}^n p_i^2$$

Here, $i = 1, 2, \dots, n$

n = number of activities of an individual

p_i = proportion of activity from i^{th} source to the total number of activities.

The value of SDI ranges from 0 to 1, 0 implying no diversification and 1 indicating a very high degree of diversification and more uniformly distributed sources of employment.

ii) Censored Tobit Regression Model

The censored Tobit regression model is used to analyze the determinants of livelihood diversification. The model is as specified below;

$$SDI = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u$$

$$SDI = \begin{cases} 0 & \text{if } SDI \leq 0 \\ 1 & \text{if } SDI \geq 1 \end{cases}$$

Where SDI is the dependent variable, X 's are the explanatory variables, β 's are the intercepts, and u is the error term.

iii) Simple Linear Regression

Simple Linear Regression was used to check the relationship between the different income groups and the level of diversification:

$$Y = \beta + \beta_1 X + e$$

Where Y is the dependent variable, β 's are the coefficients to be measured, X is the explanatory variable and e is the error term.

iv) Two-Staged Least Square Method

To determine the impact of livelihood diversification on income, a two-stage methodology was used. In the first stage, a few variables are regressed on livelihood diversification, where the number of farm employment is used as an instrumental variable to prevent the problem of endogeneity.

$$S = \beta_0 + \beta_1 X_1 + \beta_2 I_1 + \varepsilon \quad \text{-----}(1)$$

In the second stage, the total household income is regressed against the predicted value of SDI and the other independent variables. The dependent variable in equation (1), which is the livelihood diversification index, is used as an independent variable in equation (2).

$$\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 \hat{S} + \varepsilon \quad \text{-----}(2)$$

v) Decompose Gini Coefficient

The Gini coefficient decomposition analysis method was used to identify the inequality in the distribution of income, and the correlation of each source with the total income.

The Decompose Gini coefficient for total household income G_0 can be represented as:

$$G = \sum_{k=1}^K S_k G_k R_k \dots (1)$$

Where,

$$G = \sum_{k=1}^K [m_k/m] \times [2Cov(y_k, F_k)/m_k] \times [Cov(y_k, F(y_0))/Cov(y_k, F(y_k))] \dots (2)$$

vi) Responses Priority Index

The Responses Priority Index (PRI) was used to identify the constraints faced by households in terms of livelihood diversification. The equation will be shown below:

$$(RPI)_i = \frac{\sum_{j=1}^k f_{ij} \cdot X_{[(k+1)-j]}}{\sum_{i=1}^1 \sum_{j=1}^k f_{ij}} \quad 0 \leq RPI \leq 5$$

Where,

RPI_i = Response Priority Index for i^{th} constraint

f_{ij} = Number of responses for the j^{th} priority of the i^{th} constraint

$\sum_{j=1}^k f_{ij}$ = Total number of responses for the i^{th} constraint

k = Number of priorities i.e. 5

$X_{[(k+1)-j]}$ = Scores for the j^{th} priority (I, II, III, IV, V)

$\sum_{i=1}^1 \sum_{j=1}^k f_{ij}$ = Total number of responses to all the constraints

$\sum_{i=1}^1 RPI_i$ = Summation of RPI for all constraints

Here, the larger the value of RPI, the higher the value of the particular constraint hindering livelihood diversification

1.9 Limitations of the study

Comprehensive efforts have been undertaken to obtain the most accurate and pertinent information about livelihood diversification in the study area. However, it is challenging to eliminate errors and inaccuracies completely. Most households do not maintain a proper record of their income earned from different sources, as most earn from various regular and temporary activities. Hence, the data (apart from fixed salary and wage income) are collected based on their memory and approximate calculations, placing certain drawbacks on the study. One main limitation is the unwillingness and indecisive response from the respondents to reveal their precise income and the alternative activities they engage in. The study utilized the 2011 census to estimate the

sampling margin and other related data since no other accurate data was available. Various adversities were faced during the data collection process due to the COVID-19 pandemic lockdown phase. The state is known as a region with various cultures, tribes, etc., belonging to different agroclimatic areas. Therefore, the findings cannot be generalized to the state as a whole. However, despite the discussed drawbacks, feasible efforts have been taken to minimize errors and maintain the accuracy of the data.

1.10 Organization of the Study

Chapter 1: Introduction

This chapter provides an introduction to livelihood diversification in India as well as in North-East states and Nagaland and highlights the literature review related to this study. It also discusses the framework, concepts, objectives, hypothesis, and limitations of the study, the statement of the problem, and the significance and methodology of the study.

Chapter 2: Employment and Income Diversity

This chapter is divided into three parts. Part I describes the tool used to measure livelihood diversification. Part II deals with employment diversification, and Part III deals with income diversification in the study area. This chapter provides the pattern, strategies, and extent of the livelihood diversity in the study area. The subsequent sections provide and elaborate the economic activities and income at the district, village, household, and individual levels.

Chapter 3: Livelihood Diversification by gender, age, education and household size

This chapter emphasizes and analyzes the relationship between livelihood diversification and the gender, age, level of education of the head of household, and the size of the household.

Chapter 4: Impact of Livelihood Diversification on Household Income

This chapter focused on the impacts of livelihood diversification on household income. It also deals with the share of income and income inequality in the

study area, highlights the main motive for the people to diversify their livelihood activities and also discusses some of the major constraints faced by the people.

Chapter 5: Conclusion

This chapter brings out the key findings from this research. In the end, it highlights some policy suggestions based on the present research, emphasized the concluding statement and gives a brief overview of the scope for future research.

CONCLUSION

This chapter gives an introduction, elucidates the concepts, and discusses the various available related literatures, which are the foundation of this study. It also explores the methodology, the profile of the study area, and the other information pertaining to the study area.

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CHAPTER 2

EMPLOYMENT AND INCOME DIVERSITY

2. INTRODUCTION

The growing interest in research in rural economies on off-farm and non-farm income sources is progressively indicating that rural people derive their livelihood from multiple/diverse sources of activities rather than depending on one sector alone (Gordon & Craig, 2001).

Employment diversification has been considered the adoption of multiple activities where one can acquire a livelihood. Diversification offers additional choices to people to enhance their income-earning opportunities. Studies have shown that most households are less likely to depend on one source of income alone however, they seek to participate in other activities to add to their primary source of income. According to Barrett *et al.*, (2001), the majority of people attempt to diversify their income sources, while limited people acquire income from one source or utilize their assets in only one activity. Employment diversification is measured by the number of activities that the people are engaged in, a household that has three employment activities will be considered more diversified than a household that has only two employment activities. Also, households with three employment activities from different categories would be more diversified than those with three employment activities from the same category (Ersado, 2006; P.K. Josh, 2003).

The degree and extent of livelihood diversification vary depending on the region, which is confirmed by the extensive literature that is found globally. A study in the Edo state, Nigeria, found that 46 percent of its people have a diversified portfolio specifying five sources of income to be the optimum number of employment in the study area (Alabi, 2008). In rural Afghanistan, the people earn their livelihood from different sources, and only a small part of the rural household relies solely on farm production for their livelihood where both the farm household and non-farm households are involved in wage jobs as well as non-farm self-employment activities for instance, raising livestock, growing crops for consumption and commercialization, handicraft and other business activities (Maletta, 2006). In comparing the number of

sources of household livelihood in Aurepalle and Dokur villages of Andhra Pradesh by Deb et al., (2002) between the years 1975 and 2001, the result showed that there was an increase in the number of livelihood sources the household depends on. In 1975, the maximum sources of livelihood in Auepalle village were three sources, where 55 percent of households had two sources and 37 percent had only one source of livelihood. By 2001, Aurepelle village had 59 percent of its households engaged in two to four sources, with 16 percent having up to five sources of livelihood. In Dokur village, only 6 percent of households have three sources of livelihood, while the majority of the households had only one or two sources in 1975. However, by 2001, the number of households depending on only one source had decreased to less than seven percent of the total households. Sherf-Ul-Alam et al. (2017), in their study in Sunamganj district of Bangladesh, found that about 79 percent of the households diversify their livelihood sources by engaging in non-farm activities with some farm activities. A study of livelihood diversification in West Bengal by Saha & Bahal, (2014) found the maximum percentage of households depend on three sources of income, with only 11.25 percent having a single livelihood source. With the use of the Simpson Index, the study found that 21.74 percent of diversified households had a high diversification index, as opposed to 60 percent of diversified households with an average diversification.

This chapter is divided into three parts. Part I describes the tool used to measure livelihood diversification. Part II gives an overview of the employment and income structure in India as well as Nagaland. Part III and Part IV deals with employment diversification and income diversification in the study area. On viewing and describing the diversity taking place in the livelihood of rural households, this chapter provides the pattern, strategies, and extent of the livelihood diversity in the study area. The study focuses on the activities in which the households as well as the individual engaged to earn their livelihood. The subsequent sections provide and elaborate the economic activities and income at the district, village, household, and individual.

PART I

2.1 METHODOLOGY

2.1.1 Simpson Diversity Index

To measure the diversity of livelihood through employment and income, that is, the number and distribution of livelihood activities among the population, the Simpson Diversification Index was used. This index was used because of its computational simplicity and broader applicability (Agyeman et al., 2014; Sultana et al., 2015). The formula for the Simpson Diversity Index is as follows:

$$SDI = 1 - \sum_{i=1}^n p_i^2$$

Here, $i = 1, 2, \dots, n$

n = number of activities of an individual

p_i = proportion of activity from i^{th} source to the total number of activities.

The value of this index ranges from 0 to 1, where 0 signifies total concentration on one activity and 1 high diversification. The maximum possible value of the index, that is, 1 is achieved when there are multiple income and employment activities and are distributed equally between each source as well, signifying a high level of diversity. The minimum value of 0 indicates that there is only one source of income/activity, meaning complete specialization.

Based on the SDI values, the level of diversification is ranged as follows:

Table 2.1.1: Range of extent of diversification

Extent of Diversification	SDI values
No Diversification	<0.01 or close to Zero
Low	0.01-0.25
Medium	0.26-0.50
High	0.50-0.75
Very High	>0.75

Source: Adopted from Ahmed et al., (2018)

2.1.2 HYPOTHESIS

Livelihood diversification is higher in Kohima than Phek district.

PART II

2.2 AN OVERVIEW OF THE TRENDS AND PATTERN OF EMPLOYMENT IN INDIA AND NAGALAND

As population grows, the labour force in the economy also expands. In Nagaland, from 2017-2019, the labour force participation rate was relatively low (lower than the country level) however, from 2019, it surged to 47.2 percent reaching 47.7 percent in 2021 (see Table 2.2.1). From this point onwards, the labour ratio declined by 4.1 percent between 2021 and 2022. In overall India, the labour force growth remained fairly stable, which fluctuated at a moderate level, with its highest rate in the year 2020-2021, and a decrease in growth thereafter. Since 2019, the labour force participation in Nagaland consistently exceeded the rate at the national level. As the labour force grows, the workforce participation rate increases in Nagaland and India as well, though the rate of increase in Nagaland was seen to be higher than the rate at the national level. To explore workforce shifts effectively, it is crucial to examine the share of employment across different sectors.

Table 2.2.1: Distribution of persons according to Labour Force Participation Rate (LFPR)¹ and Working Participation Rate (WPR)² as per Current Weekly Status (CWS)³

Year	Nagaland		India	
	LFPR	WPR	LFPR	WPR
2017-18	33.0	25.9	36.9	34.7
2018-19	34.4	28.5	36.2	33.0
2019-20	47.2	35.0	38.3	35.0
2020-21	47.7	38.6	39.2	36.3
2021-22	43.6	39.0	38.7	36.1

Source: PLFS Annual Reports (NSSO, 2019, 2020, 2021, 2022, 2023).

¹ LFPR is the percentage of persons in the labour force either working or is available for work in the population.

² WPR is the percentage of employed persons in the population.

³ A person engaged in any economic activity during a reference period of 7 days preceding the date of the survey.

Table 2.2.2 illustrates the composition of employment across various activities/sectors in Nagaland and its comparison with the national data. Notably, in Nagaland, the share of employment increases in the agriculture and secondary sectors, while it has declined in the tertiary sector over time. From 2017 to 2019, the tertiary sector dominated the workforce which was surpassed by the agriculture sector thereafter. The implication of such growth in agriculture and the secondary sector relative to the tertiary sector may be the result of diversification in the two sectors, potentially reflecting the creation of new job opportunities. In contrast, the share of the workforce distribution in India across various sectors remains almost stable, with a slight decline in the tertiary sector. These findings indicate the importance of looking into the occupation status of the workforce.

Table 2.2.2: Estimate the percentage of the workforce in different categories of industry

Sector	Nagaland					India				
	2017-18	2018-19	2019-20	2020-21	2021-22	2017-18	2018-19	2019-20	2020-21	2021-22
Agriculture	36.79	36.47	48.54	43.26	45.00	44.14	42.49	45.56	46.46	45.46
Mining and Quarrying	0.06	0	0.02	0	0.35	0.41	0.42	0.28	0.32	0.33
Manufacturing	5.68	8.11	4.48	4.47	4.55	12.13	12.07	11.15	10.91	11.57
Electricity & Water supply	2.3	1.91	1.62	1.22	1.25	0.59	0.56	0.61	0.58	0.55
Construction	0.27	2.63	3.29	5.02	7.12	11.67	12.1	11.63	12.08	12.43
Total Secondary Sector	8.31	12.65	9.41	10.71	13.27	24.8	25.15	23.67	23.89	24.88
Trade	10.72	10.86	10.67	10.39	10.45	10.09	10.76	11.51	10.55	10.35
Transport	5.43	6.02	3.71	4.76	4.89	4.93	4.94	4.66	4.4	4.34
Accommodation & Food	0.62	0.49	1.05	0.8	0.39	1.87	1.86	1.71	1.68	1.75
Other services	38.11	33.52	26.64	30.07	26.01	14.15	14.82	13.09	13.01	13.22
Total Tertiary Sector	54.88	50.89	42.07	46.02	41.74	31.04	32.38	30.97	29.64	29.66

Source: PLFS Annual Reports.

The distribution of the workforce based on the occupation status is illustrated in Table 2.2.3. From 2017 to 2022, Nagaland had a higher proportion of self-employed

and regular workers compared to the country's average. However, the proportion of casual workers occupies a larger share of the workforce in overall India than in Nagaland. The table also reveals that the percentage change in the workforce distribution across different occupation statuses does not show any significant transformation at the country level. In contrast, Nagaland witnessed a notable increase in self-employment and casual workers over the years, accompanied by a significant decrease in the regular workers. This shift points to growth in the off-farm sector in the state. The rise in casual workers could also suggest a diminishing rate in the quality of employment in the state. As mentioned earlier, the growth in agricultural employment in Nagaland is likely due to the rise in self-employment and casual workers, while the decrease in the tertiary sector reflects the decrease in the regular workers. This indicates a high entry barrier and intense competition in the non-farm sector in the state.

Table 2.2.3: Distribution of occupation status of person (in percent) as per Current Weekly Status (CWS)

Year	Nagaland			India		
	Self-employed	Regular	Casual	Self-employed	Regular	Casual
2017-18	54.5	44.3	1.2	51.9	24.1	24.0
2018-19	57.9	39.2	2.9	51.6	25.2	23.1
2019-20	64.6	32.8	2.6	54.4	24.1	21.5
2020-21	61.2	35.4	3.4	55.6	22.4	22.0
2021-22	62.1	30.4	7.5	55.3	23.2	21.5

Source: PLFS Annual Reports.

Therefore, the above data indicate a transformation or shift in employment trends in Nagaland. Both the LFPR and WPR showed significant growth over the years. Additionally, a notable change in the workforce share across the sectors was also seen, with an increase in both the agricultural and secondary sectors and a significant decline in the tertiary sector. Compared to the national trends, Nagaland saw a substantial rise in self-employment and regular workers from 2017 to 2022, along with a decrease in casual workers. This result points to a structural transformation in the

state's employment activities since 2017, emphasizing the need for further study on this change.

2.2.1 TRENDS OF INCOME PATTERN OF THE WORKFORCE

Every form of labour is compensated, either through cash or goods. With the heterogeneity in employment across different sectors of the economy, the income level varies and fluctuates based on the purchasing power and consumption expenditure of the people. The average monthly earnings (or daily wages for casual labour) are illustrated in the figure 2.2.1.

The income data from 2017 to 2022 has been estimated using the PLFS data for the years 2017-18 through 2021-22 (as shown in Figure 2.2.1) the first two income sources - salary and self-employment income- are based on monthly earnings, while casual income accounts for the day-to-day daily wage income. Compared to India, self-employment income was quite low and showed significant fluctuations. In general, the income from this source in India was higher than in Nagaland, except for a few months. Additionally, the state had higher regular wage/salaried income rates compared to the rate in India. Casual daily wages are seen to be increasing over time. Regular wage/salaried remain the highest source of income, with the lowest monthly income in India being Rs. 15598 in the year 2018 and the highest at an average of Rs. 18585.03 in 2022. In Nagaland, the lowest was an average of Rs.17041.72 in the year 2018 and the highest was Rs. 29576.59 in 2022. For self-employment, the highest average monthly income in India was Rs. 12,186.28 in 2022, and in Nagaland Rs. 11,718.26 in 2021. The lowest monthly income in India was Rs. 9540.7 in 2020 and Rs. 6269.86 in Nagaland in 2019. For casual daily wages, the highest in India was Rs. 382.88 in 2022, with the lowest at Rs. 243.11 in 2017. In Nagaland, the highest daily wage for casual labour was Rs. 481.3 in 2021, while the lowest was Rs. 260.49 in 2017.

Based on this estimated income, income from all sources has shown an upward trend during this period. Further details on the contribution of various sectors to the Gross State Domestic Product (GSDP) in Nagaland is discussed next in Table 2.2.4.

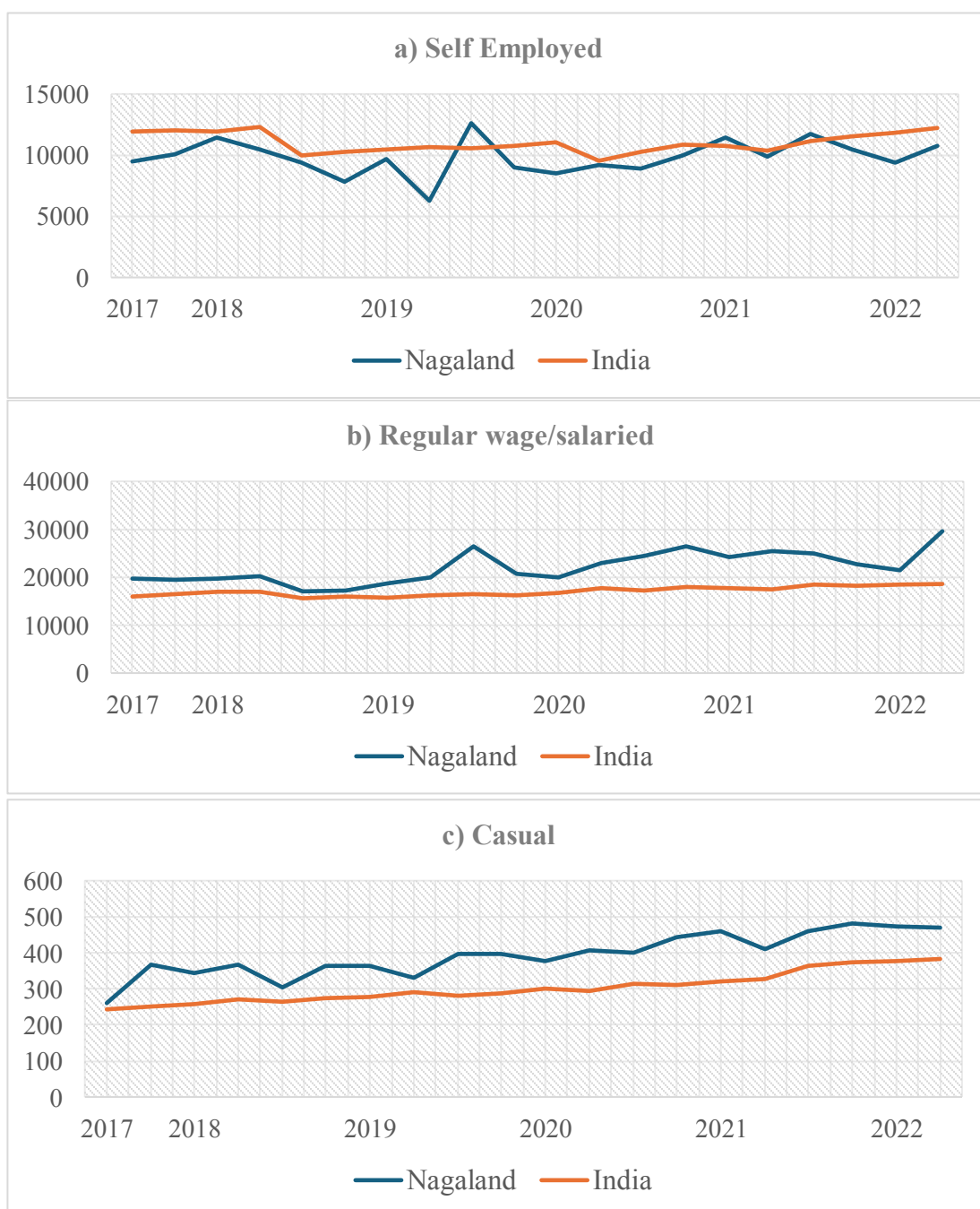


Figure 2.2.1: Average gross earnings of the workforce in Nagaland and India. (Monthly income for self-employed and regular waged/salaried and per day income for casual labour).

Source: PLFS Annual Reports.

Table 2.2.4: Contribution of the sectors to GSDP (in Percentage)

Year	Primary	Secondary	Tertiary
2017-18	28.05	12.9	59.06
2018-19	25.78	12.05	62.17
2019-20	27.57	10.95	61.47
2020-21	29.37	9.79	60.84
2021-22	21.58	9.71	68.72

Source: Nagaland Economic Survey Annual Report (GOI, 2023)

According to the various rounds of the National Economic Survey (NES), the contribution of the different sectors to the Gross State Domestic Product (GSDP) is outlined in Table 2.2.4. The data reveals that the contribution of the primary sector fluctuates over the years, with its share rising and falling. The highest rate was in 2020-21 at 29.37 percent and decreased the next year by 7.79 percent in 2021-22. The secondary sector, the least contributor to the GSDP, showed a declining rate, from 12.9 in 2017-18 to just 9.71 percent in 2021-22. In contrast, the tertiary sector has consistently been the largest contributor to the GSDP, accounting for over 60 percent in most years. In 2021-22, it made up nearly 69 percent of the GDSP, indicating that the sector has been performing increasingly well over the years. These findings have initiated the interest in exploring the performance of the non-farm sector in the study area, which led to more enthusiasm for the study.

PART III

2.3 THE PATTERN OF EMPLOYMENT IN THE STUDY AREA

Out of the 1746 total employment in the study area, it is seen in Table 2.3.1 that 69.19 percent of the employment is from the non-farm sector while 22.45 percent is from the farm sector, and only 8.36 percent of the total employment is from the off-farm sector. The farm sector mainly constitutes street vendors, contributing significantly to rural livelihoods. They sell blends of their hard-laboured agricultural produce, livestock, and other indigenous organic forest products on the street pavements of nearby towns, markets, and even on highways. In Kohima district, 73.41 percent of its total employment is in the non-farm sector, and almost 20 percent (19.45

percent) have their activities in the farm sector with only 7.15 percent of its total employment in the off-farm sector. Phek district has 56.85 percent of its total employment in the non-farm sector, 31.24 percent in the farm sector, and 11.91 percent in the off-farm sector. The result shows that the majority of the workforce in the study area is engaged in non-farm activities.

Table 2.3.1: Distribution of employment in the sectors of the sampled area

Districts Sectors	Kohima	Phek	Total
Non-farm	955 (73.41)	253 (56.85)	1208 (69.19)
Off-farm	93 (7.15)	53 (11.91)	146 (8.36)
Farm	253 (19.45)	139 (31.24)	392 (22.45)
Total	1301 (100.00)	445 (100.00)	1746 (100.00)

Source: Field survey result (2020-2021).

2.3.a Pattern of employment in different sectors among the districts

The sample data in Table 2.3.2 showed that the non-farm sector employs the highest percentage of employment in all the sampled villages, followed by the farm sector and last by the off-farm sector. The highest share of employment in the non-farm sector is found in Kohima village, with 80.96 percent of its total employment in the non-farm sector, while the least is Enhulumi village, with only 46.48 percent in the non-farm sector. In the off-farm sector, Sechu village has its highest share of employment (20.33 percent) compared to all the villages, with Lasumi village having the most negligible share of employment, which is only 2.94 percent. The table shows that there is a uniform share of employment in the farm sector among all eight villages, with Enhulumi village ranking just a little higher and Kohima village a little lower than the other villages.

Table 2.3.2: Distribution of total employment in different sectors in the sampled villages

District	Kohima				Phek				Total
Village	Kohima	Nerhema	Zisunyu	Sechu	Enluhumi	Lasumi	Pfutseromi	Porba	
Non-farm sector	727 (80.96)	47 (49.47)	91 (72.22)	90 (49.45)	33 (46.48)	41 (60.29)	91 (61.49)	88 (55.70)	1208 (69.19)
Off-farm sector	32 (3.56)	16 (16.84)	8 (6.35)	37 (20.33)	11 (15.49)	2 (2.94)	20 (13.51)	20 (12.66)	146 (8.36)
Farm sector	139 (15.48)	32 (33.68)	27 (21.43)	55 (30.22)	27 (38.03)	25 (36.76)	37 (25.00)	50 (31.65)	392 (22.45)
Total	898 (100.0)	95 (100.0)	126 (100.0)	182 (100.0)	71 (100.0)	68 (100.0)	148 (100.0)	158 (100.0)	1746 (100.0)

Source: Field survey result (2020-2021).

2.3. b. Pattern of employment within the sectors

On the whole, from all the sectors taken together, it is seen from Table 2.3.3 that formal employment is the principal occupation for the maximum number of employees as it constitutes the highest number of employment (40.19 percent). It is followed by trade (11.89 percent), cropping (9.35 percent), service provision (7.97 percent), wage labourer (7.91 percent), and so on, with the least being fishing related activities.

Out of 1301 total employment in Kohima district, 562 numbers of employment, and in Phek district, out of 445 total employment, 139 number of employments are from formal employment activity. It is followed by the trade and service provision activities in Kohima district, which are all from the non-farm sector. Whereas in the Phek district, which is more rural than the Kohima district, formal employment is followed by cropping activities from the farming sector and wage labour from the off-farm sector. In both districts, forest products and fishing related activities are taken up by the least number of people. Rental activity in Phek district is found to be much less compared to that of Kohima district.

Table 2.3.3: Distribution of employment by activities within the sectors

Sectors	Activity	Districts		Total
		Kohima	Phek	
Non-farm	Trade	169 (12.99)	38 (8.54)	207 (11.86)
	Handicraft and Artisanship	72 (5.53)	44 (9.89)	116 (6.64)
	Service Provision	110 (.46)	29 (6.52)	139 (7.96)
	Formal Employment	562 (43.20)	139 (31.24)	701 (40.15)
	Rental	42 (3.23)	3 (0.67)	45 (2.58)
Off-farm	Wage Labourer	89 (6.84)	49 (11.01)	138 (7.90)
	Forest Products	3 (0.23)	2 (0.45)	5 (0.29)
	Fishing related activities	1 (0.08)	2 (0.45)	3 (0.17)
Farm	Crop	90 (6.92)	73 (16.40)	163 (9.34)
	Livestock and by-products	63 (4.84)	34 (7.64)	97 (5.56)
	Poultry	77 (5.92)	18 (4.04)	95 (5.44)
	Floriculture	23 (1.77)	12 (3.15)	35 (2.12)
Total		1301 (100.0)	445 (100.0)	1746 (100.0)

Source: Field survey (2020-2021).

2.3.c. Number of employment of households

Households are found not only engaging in one employment activity, but they also engage in another or multiple activities. As shown in Table 2.3.4, firstly, about 20.69 percent in Kohima and 14.12 percent of households in Phek district have only one employment activity, mainly found in the non-farm sector. Secondly, the highest percentage of diversified households (38.13 percent and 39.41 percent) has two sources of employment. These two employment activities are mainly those households where both the parents are engaged in one activity each. Thirdly, around 18 percent and 28 percent of households are also found to have three sources of employment in both districts. After this, the percentage of households decreases as the number of activities increases.

As also shown in Figure 2.3.1, in Kohima districts, households that have up to 10 employment activities (2 households) have the highest number of activities per

household in the district. The highest number of employments in a household in Phek district is found to be seven numbers of activities.

Table 2.3.4: Total number of employment activities households pursues

Employment	Kohima	Phek	Total
1	102 (20.69)	24 (14.12)	126 (19.00)
2	188 (38.13)	67 (39.41)	255 (38.46)
3	91(18.46)	48 (28.24)	139 (20.97)
4	52 (10.55)	17 (10.00)	69 (10.41)
5	41 (8.32)	10 (5.88)	51 (7.69)
6	8 (1.62)	3 (1.76)	11 (1.66)
7	5 (1.01)	1 (0.59)	6 (0.90)
8	3 (0.61)	0	3 (0.45)
9	1 (0.20)	0	1 (0.15)
10	2 (0.41)	0	2 (0.30)
TOTAL	493 (100.0)	170 (100.0)	663 (100.0)

Source: Field survey (2020-2021).

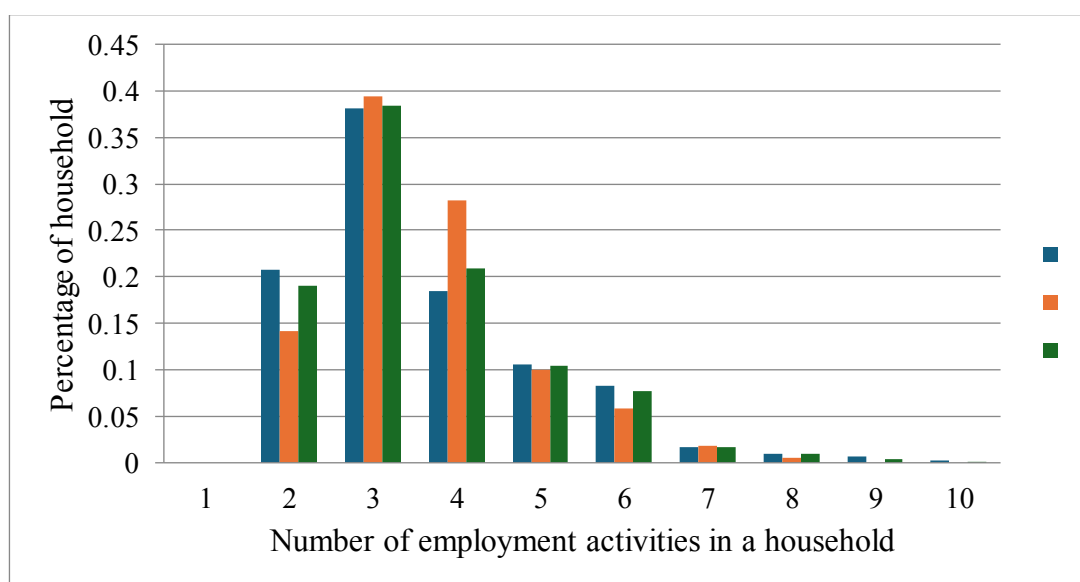


Figure 2.3.1: Total number of employment activities households pursue

Source: From Table 2.3.4.

2.3.1 HOUSEHOLD LIVELIHOOD STRATEGIES

Depending on the different activities that individuals are employed in a household, the households are divided into different strategies, namely, Non-farm, Off-farm, Farm, Non-farm+ Off-farm, Non-farm +Farm, Off-farm + Farm, and Mixed diversification (non-farm+ off-farm+ farm). From the surveyed data, as shown in Table 2.3.5, households are more concentrated in non-farm activities alone (53.09 percent). It is then followed by the strategy of non-farm activities along with some farm activities (27.45 percent). The lowest percentage of households was found in the strategy of single-farm households (1.76 percent).

Table 2.3.5: Household livelihood strategies

Sector	Kohima	Phek	Total
Non-farm	291 (59.03)	61 (35.88)	352 (53.09)
Off-farm	15 (3.04)	6 (3.53)	21 (3.17)
Farm	4 (0.81)	9 (5.29)	13 (1.96)
Non-farm + Off-farm	22 (4.46)	13 (7.65)	35 (5.28)
Non-farm + Farm	126 (25.56)	56 (32.94)	182 (27.45)
Off-farm + Farm	14 (2.84)	12 (7.06)	26 (3.92)
Mixed Diversification	21 (4.26)	13 (7.65)	34 (5.13)
Total	493 (100.0)	170 (100.0)	663 (100.0)

Source: Field survey (2020-2021).

Non-farm

More than half of the households (59.03 percent) in Kohima district and 35.88 percent in Phek district are non-farm households. This result is supported by the findings of Bhakar et al., (2007), where most employment was found to be formally employed and trading activities. In the study area, formal employment is preferred as these jobs are regular salaried jobs with income stability and security. As in trading, few being owing big businesses, most of them are found to be into petty trading with small grocery stores opened outside their house mostly taken care of by females where they can manage their stores and carry on the invisible household works of females.

Off-farm

Most landless and uneducated individuals engage in off-farm work, mainly in day-to-day wage labour. 3.04 percent of households in the Kohima district and 3.5

percent of households from Phek district were found to earn their living only from the off-farm sector. Whether skilled or unskilled, they get paid for their labour by their employers. This result found similarities with the finding of Babatunde & Qaim (2009), where employment in the off-farm was found to be more of a distress push as households face the risk of low farm income, population growth, and market failures.

Farm

Only 1.96 percent of households in the entire total sampled households, that are, 0.81 percent in Kohima district and 5.29 percent of households in Phek district earn solely from farm activities, mainly poultry and livestock sellers. There are significantly fewer farm households that depend on farm activity as their primary activity; instead, farm activities are adopted mainly by richer households as a secondary activity to earn extra income for the family. This result corroborates with the findings of Ogloblin & Brock (2006), where for poor households, it is a means of subsistence, while for richer households, it is a source of extra income or pleasure.

Non-farm + Off-farm

A total of 4.46 percent in Kohima district and 7.6 percent in Phek district of non-farm households were involved in off-farm activities. These households constitute skilled handicraft, self-employed in small business, and wood-work expertise entrepreneurs who also go for daily wage labour during their business breaks or to earn extra income.

Non-farm+ Farm

While non-farm is their main activity, around 25.56 percent in Kohima district and as high as 32.4 percent in Phek district of the sampled household are engaged mainly in farm activities to earn more income or for their pleasure. These two sectors often work hand in hand simultaneously. Some non-farm households earn from farm activities by selling their excess production of crops from homestead gardens and livestock from backyard poultry. With the advancement of modern technology, the farm sector also depends on the non-farm sector for packaging and selling of their produce. This result corroborates the findings of Pal & Biswas (2011), who, on

analyzing whether these two sectors are substitutable or complementary, found an increase in the dependence of both sectors on each other. This finding indicates a complementary role played by both sectors.

Off-farm + Farm

Off-farm and farm works are seasonal and uncertain; therefore, they diversify among themselves and work interchangeably (2.8 percent in Kohima district and 7.1 percent in Phek district). Most off-farm wage laborers rear livestock for selling, and also individuals in farm activities go for wage labour during the daytime, both to earn extra income. This result is supported by the finding of Bila et al., (2015), who found that with the imperfect rural market, farm households engage in off-farm activities to improve their livelihood.

2.3.2 THE EXTENT OF EMPLOYMENT DIVERSIFICATION

As mentioned in the methodology, the level of diversification and its value criteria are analyzed using the Simpson Diversity Index. The greater the extent of diversification, the greater the value of the index. As seen in Table 2.3.6, the employment diversity in the study is found to be 0.46, which is on a medium level of diversification. The employment diversity is also constructed for both the selected districts for this study. The employment diversity in Kohima district is also at a medium level (0.42), lower than the overall study area. The diversification of employment in Phek district is found to be on a high level with 0.57 SDI, which is higher than Kohima district and also the overall study area. The finding shows that employment in Phek district is more equally distributed and perfectly scattered in all the different activities compared to Kohima district.

Table 2.3.6: Employment diversification level in the study area

District	SDI
Kohima	0.42
Phek	0.57
Overall	0.46

Source: Field survey (2020-2021).

For further analysis of the extent of diversification, activities are arranged sector-wise as non-farm, off-farm, and farm sectors. In Figure 2.3.2 below, it is seen that in the total study area, though the non-farm sector constitutes the highest number of employment (69.2 percent), the farm sector is the most diversified sector (0.698), which signifies that households in the non-farm sector are over-concentrated in only one type of activity. Employment in the farm sector is seen to be equally spread in all different kinds of farm activities, with its diversity as high as 0.698 SDI. The off-farm sector, with a very small number of employment mainly concentrated only in wage labor, has a significantly lower diversity level (0.106).

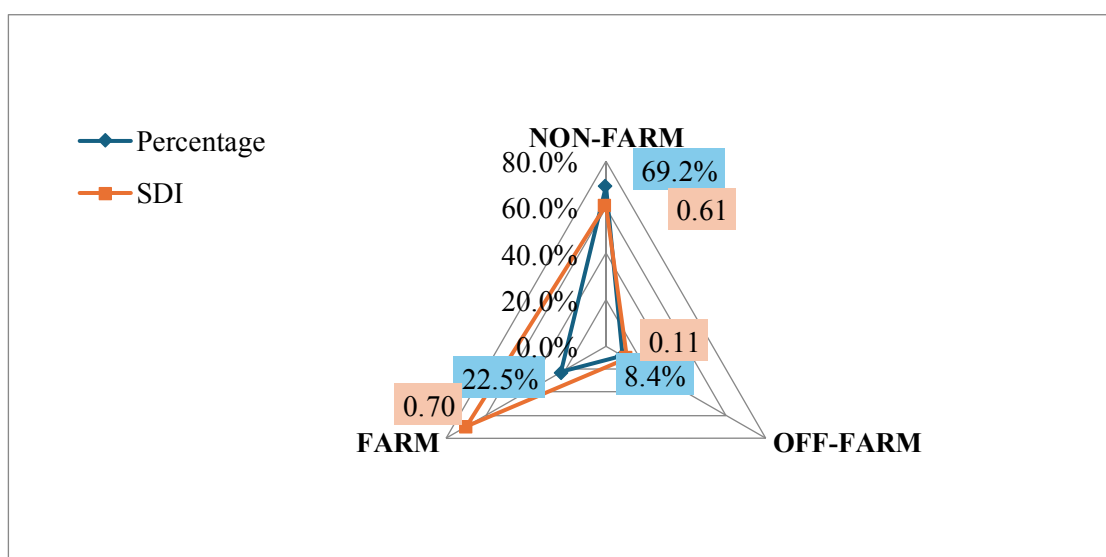


Figure 2.3.2: Employment diversification across the three sectors in the study area
Source: Field survey (2020-2021).

In Kohima district, we can see from Figure 2.3.3 that the non-farm sector constitutes the highest percentage of employment (73.4 percent) with a diversity index of 0.60 SD which is a high level of diversity. It is followed by the farm sector with 19.4 percent of employment having a diversity of 0.71 SDI which is at the peak of high level, almost a very high level of diversity. Employment in the off-farm sector has the lowest percentage, with only 7.1 percent of employment and a very low diversity level of 0.08 SDI.

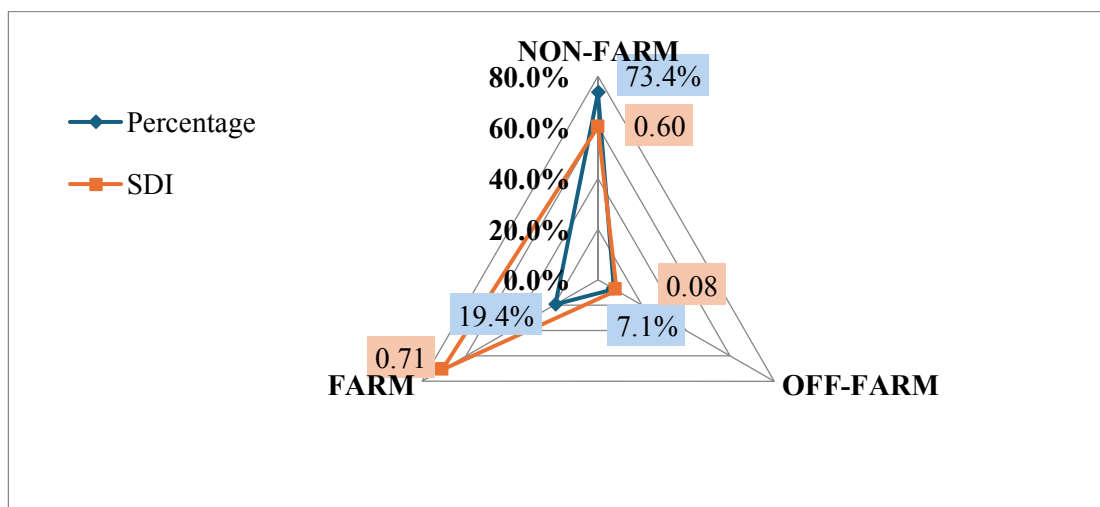


Figure 2.3.3: Extent of employment diversification across the three sectors in Kohima district

Source: Field survey (2020-2021).

Figure 2.3.4 shows that in Phek district, the non-farm sector has the highest percentage of employment (57.1 percent), followed by the farm sector (30.9 percent) and then the off-farm sector (12.0 percent). It is also seen that in Phek district, the non-farm sector and farm sector have the same diversity level of 0.63 SDI, which is in the high-level range with a low diversity level in the off-farm sector (0.14 SDI).

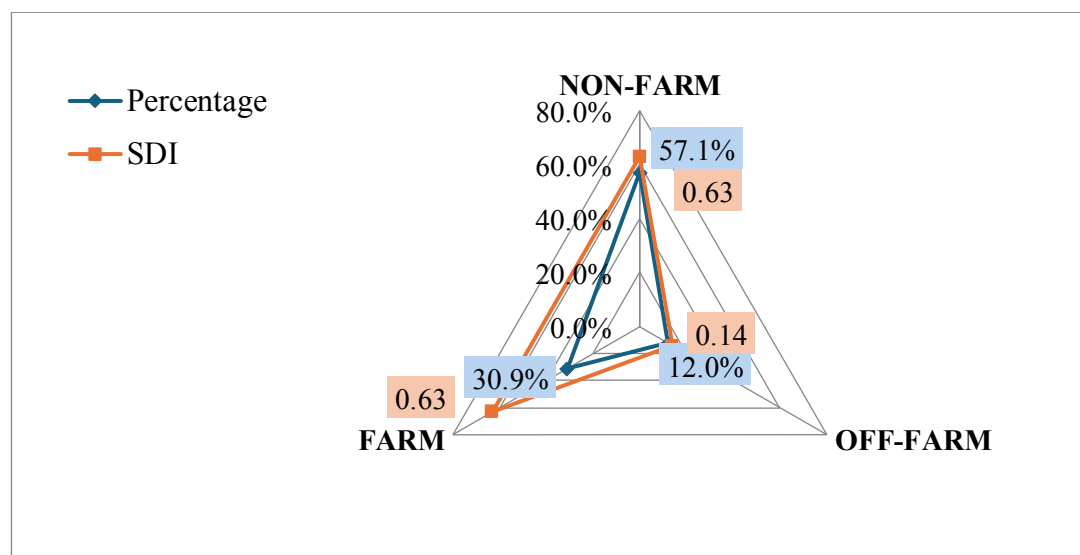


Figure 2.3.4: Extent of employment diversification across the three sectors in Phek district

Source: Field survey (2020-2021).

2.3.2.a Extent of employment diversity within the sampled villages

In Table 2.3.7, the employment diversification is further constructed across the three sectors for the sampled villages. It is found that, unexpectedly with high employment, Kohima village is seen to have a very low total diversity index (0.320) compared with the other villages. Zisunyu village is found to have the least diversity among the sampled villages (0.432). All the other villages are seen to have almost equal diversity levels, for instance, Nerhema village, Sechu village, and Enhulumi village have 0.620, 0.626, and 0.624 SDI also; Lasumi, Pfutseromi, and Porba have 0.508, 0.545, and 0.577 SDI.

Table 2.3.7: Extent of employment diversification across the three sectors in the sampled villages

Sectors	Non-farm		Off-farm		Farm		Total	
Villages	Frequency	SDI	Frequency	SDI	Frequency	SDI	Frequency	SDI
Kohima village	727	0.63	32	0.12	139	0.72	898	0.32
Nerhema	47	0.68	16	0	32	0.46	95	0.62
Zisunyu	91	0.36	8	0.46	27	0.73	126	0.43
Sechu village	90	0.49	37	0	55	0.79	182	0.63
Enhulumi	33	0.62	11	0	25	0.63	69	0.62
Lasumi	41	0.72	2	0	25	0.29	68	0.51
Pfutseromi	91	0.62	20	0	37	0.73	148	0.54
Porba	88	0.56	20	0.35	50	0.62	158	0.58

Source: Field survey (2020-2021).

It is also clearly seen that the farm sector is the most diversified sector (0.722 SDI) in Kohima village, followed by the non-farm sector (0.628 SDI) and then the off-farm sector (0.12 SDI). Nerhema village has a total diversity level of 0.619 SDI, with 0.68 SDI in its non-farm sector and 0.46 SDI in the farm sector. The off-farm sector has zero diversity level though there are around 16 employments indicating that all the employment is of the same type of activity. Zisunyu village has a total diversity level of 0.431 SDI and the least diversity among all the sampled villages in the non-farm

sector with 0.363 SDI. However, this village also has the highest diversity in the off-farm sector among all the sampled villages, with 0.464 SDI. Sechu village, with the highest total diversity level of 0.63 SDI, also has the highest diversity level in the farm sector (0.788 SDI) among all the sampled villages. The village has 0.486 SDI in the non-farm sector and 37 employments in the off-farm sector with zero diversity. Enhulumi village has an overall diversity level of 0.623 SDI, with a high diversity level both in the non-farm (0.619 SDI) and the farm (0.630 SDI) and with zero diversity in the off-farm sector, which shows that employment in the off-farm sector is all concentrated only in one type of activity. Lasumi village has an overall diversity level of 0.507 SDI, with the highest diversity in the non-farm sector among the study area of 0.723 SDI. The village has a medium diversity level in the farm sector (0.290 SDI) and zero in the off-farm sector. Porba village has a high diversity level both in the non-farm (0.564 SDI) and farm (0.621 SDI) sectors and a medium level in the off-farm sector (0.36) with an overall diversity level of 0.58 SDI.

In comparison, Sechu village is the most diversified village among all the sampled villages, followed by Nerhema and Enhulumi each with an SDI above 0.60. Porba, Pfurseromi, and Lasumi have SDI of 0.58, 0.54, and 0.51 respectively, which also indicate high levels of diversity. Zisunyu has a medium diversity level with an SDI of 0.43. Despite being the largest sample village, Kohima village has the lowest diversity as a result of over concentration of employment in the non-farm sector, with an SDI of just 0.32.

In the non-farm sector, Lasumi exhibits the highest diversity level (0.72) followed by Nerhema, Kohima village, Enhulumi, Pfurseromi, and Porba each within the range of high level of diversification. Sechu village and Zisunyu are in the medium range, with Zisunyu being the least diversified (0.36) in the non-farm sector.

Though Zisunyu has the least diversity in the non-farm sector, it leads in the off-farm sector with the highest index (0.46). Porba has an SDI of 0.35 in the off-farm sector and Kohima Village with 0.12 SDI. Apart from these three villages, the other five sampled villages show zero diversification in the off-farm sector.

In the farm sector, Sechu Village has the highest diversity index (0.79) perhaps due to its warm favourable climate for farm-related activities. Zisunyu and Pfurseromi follow closely, with 0.73 SDI each, while Kohima village has an SDI of 0.72, and Lasumi has the lowest diversity index among all the sampled villages in the farm sector.

2.3.2.b Extent of employment diversification within the sectors

The participation and distribution of employment and its level of diversification in all the activities are constructed and shown below in Table 2.3.8.

Table 2.3.8: Distribution of employment and their diversification range within different activities

Sectors	Percentage	SDI	Level of diversification
NON-FARM ACTIVITIES			
Trade	17.14	0.79	Very high level
Handicraft & Artisanry	9.60	0.80	Very high level
Service provision	11.51	0.66	High level
Formally employed	58.03	0.79	Very high level
Rental Income	3.73	0.35	Medium level
Total	100.00		
OFF-FARM ACTIVITIES			
Wage labourer	94.52	0.69	High level
Forest products	2.74	0	No diversification
Fishing related activities	2.74	0	No diversification
Total	100.00		
FARM ACTIVITIES			
Crops	41.79	0.62	High level
Livestock & Livestock by-products	24.87	0.54	High level
Poultry	24.36	0.10	Low level
Floriculture	8.97	0.14	Low level
Total	100.00		

Source: Field survey (2020-2021).

Table 2.3.8 shows that within the non-farm sector, handicraft and artisanship have the highest diversity level in which tannery carpentry, weaving, and baking have the highest share of employment. It is followed by formally employed with 0.79 SDI which constitutes more than half of the employment (58.03 percent) mostly found in government workers, teachers, and health workers. Trade also has 0.79 SDI constituting the second most employment (17.14 percent), mainly in grocery stores, retail, and petty businesses. Service provision is practiced by 11.51 percent of individuals, mainly drivers, and salesmen, with a high diversity of 0.66 SDI (medium level). Rental activity constitutes the least number of employees in the non-farm sector, with only 3.73 percent. Rental activity mainly consists of house rents, decorative items, and tents showing a medium diversification level (0.35 SDI).

Off-farm employment is a type of employment where one works on another person's farm and is paid by their employer, which is the day-to-day wage activity and agricultural laborers. The single most important off-farm sector is wage labour, with 94.52 percent involved in daily wage labour. Wage labour includes weeding others' farms, carpentry work in others' houses, manual work for others, etc., with a high diversity level (0.69 SDI). Forest products, including firewood collection, charcoal, and lumber, cover 2.74 percent, and fishing-related activities 2.74 percent of the off-farm sector. Both these activities have zero diversity level, which means there is no diversification.

In the farm sector, cropping has the highest percentage of employment (41.79 percent) and diversity level (0.62 SDI), which includes selling vegetables, fruits, rice, maize, spices, and other agricultural products. The next important farm activity is livestock and livestock by-products, with a share of 24.87 percent of employment, mainly selling pigs, goats, and meat, with a diversity level of 0.54 (Medium level). With modernization, floriculture is becoming more popular, practiced by 8.97 percent of individuals in the study area, including selling flowers, greenery, nurseries, cut flowers, etc., with 0.14 SDI. Poultry (24.36 percent) constitutes the raising and selling of chicken, ducks, turkeys, and eggs. However, most of these households depend on chicken alone; therefore, the diversity level is relatively low (0.10 SDI).

2.3.2.c Classification of households based on the extent of diversification

The diversity level of households is analyzed and classified according to how diversified or specialized their employment activities are. Households are classified into no diversification, low diversification, medium diversification, high diversification, and very high diversification, where the minimum possible value of diversification is zero and the maximum potential value is 1.

Table 2.3.9: Classification of households as per degree of employment diversification

SDI Range	Diversification status	Kohima	Phek	Total
Below 0.01	No diversification	310 (62.88)	76 (44.71)	386 (58.22)
0.01-0.25	Low diversification	7 (1.42)	0 (0.00)	7 (1.06)
0.26-0.50	Medium diversification	136 (27.59)	7 (4.12)	143 (21.57)
0.51-0.75	High diversification	22 (4.46)	48 (28.24)	70 (10.56)
Above 0.75	Very high diversification	18 (3.65)	39 (22.94)	57 (8.60)
Total		493 (100.0)	170 (100.0)	663 (100.0)

Source: Field survey (2020-2021).

Table 2.3.9 depicts that most of the total sampled households (58.22 percent) do not diversify their livelihood activity, meaning that these households have a Simpson Diversity Index equal to zero. These households either do not diversify their employment sources or participate only in one type of activity. Around 21 percent of the households have a medium diversity range, 10.56 percent have a high diversity range, and 8.60 percent have a very high diversity range. The lowest percentage of households (1.06 percent) is in the low diversity range.

The table also shows that out of 493 households in the Kohima district, 310 do not have employment diversity. About 27 percent of total households have a medium range of diversity, followed by a high (4.45 percent) and very high (3.65 percent) range

of diversity. Whereas only 1.42 percent of households, that is, 7 out of 493 number out households, have a low diversity range. In Phek district, 44.7 percent of the sample households have a diversity level below 0.01, which signifies that they solely depend on their base livelihood activity. There is no household with low diversification, and only 4.12 percent have a medium level of diversification. The table also shows that 28 percent of households have a high level of diversification, and almost 23 percent have a very high level.

PART IV

2.4 THE PATTERN OF INCOME SOURCES IN THE STUDY AREA

Households earn income by participating in the various activities discussed below. The level of income varies depending on the type of activities they pursue. Based on the data collected on household's and individual's monthly income during the year 2020-2021, the table below shows the sharing of income from the different sectors in the study area.

Table 2.4.1: Share of income of the three sectors in the study area

Sectors	Income (Rs. In '000)	Percentage
Non-farm	31148	87.60
Off-farm	1298	3.65
Farm	3112	8.75
Total	35558	100.00

Source: Field survey (2020-2021).

Table 2.4.1 and Figure 2.4.1 shows that the maximum percent of income is from the non-farm sector (87.60 percent), 8.75 percent is from the farm sector, and only 3.65 percent is derived from the off-farm sector. This shows a big gap in the share of income in all three sectors which can mean that people deriving income from the non-farm sector will be much richer than the income earner in the other two sectors.

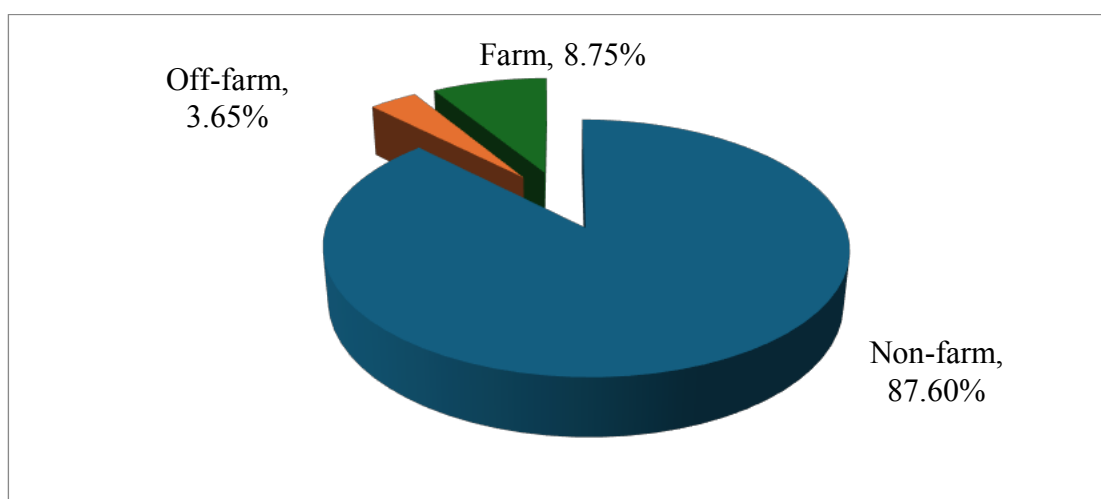


Figure 2.4.1: Percentage share of income of the three sectors in the study area
Source: Field survey (2020-2021).

2.4.a Pattern of income sources within the sectors

It is also important to see the share of income within the three different sectors. Figure 2.4.2 (a) shows that among the non-farm sector, the highest is formal employment, with 72.4 percent of income, followed by trade activities contributing 13.5 percent. The other three activity contributions are below 10 percent each, with service provision at 6.6 percent, handicraft and artisanship at 4.6 percent, and rental activities with the lowest share of 3 percent. There is a massive income gap in the non-farm sector activities.

However, a bigger gap can be seen in the off-farm sector [see Figure 2.4.2 (b)], with wage labour contributing 94.8 percent of the total income. Forest products and fishing-related activities contribute only 3.7 percent and 1.5 percent of income.

In the farm sector [see Figure 2.4.2 (c)], cropping activities contribute the highest, with 39.3 percent of income. It is followed by livestock activities at 29.3 percent, poultry at 19.4 percent, and floriculture with the least percent at 11.3 percent.

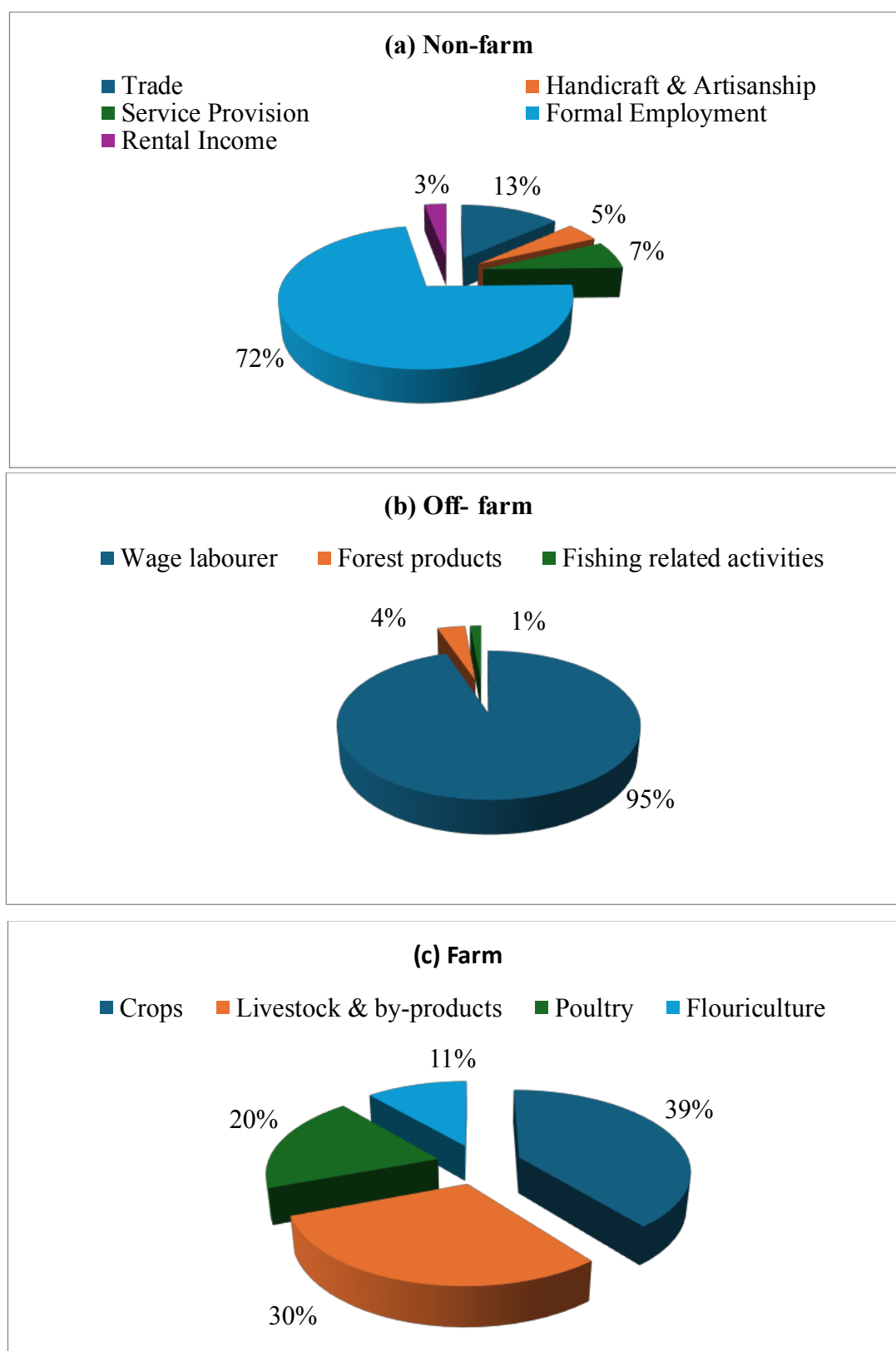


Figure 2.4.2: Percentage share of income in non-farm, off-farm, and farm sectors in the study area

Source: Field survey (2020-2021).

2.4.b Share of income from different activities

All the activities from the three sectors are taken together to see the contribution of each activity to the livelihood of the people. As shown in Table 2.4.2, formal employment contributes the highest percentage of income, which is more than half of the percentage of all the activities taken together (63.39 percent). This is followed by trade activities, which account for 11.79 percent; service provision activities, 5.78 percent; and arts and handicraft activities, which account for 4 percent of the total share of income. Wage labour and cropping activities almost have an equal contribution of income with 3.46 percent and 3.44 percent, and rental activities and livestock activities with 3.63 percent and 2.62 percent share of income. Poultry contributes 1.70 percent of income, and floriculture contributes almost 1 percent of income. Forest products and fishing-related activities contribute the most negligible income percentage, below 1 percent each (0.13 percent and 0.05 percent).

Table 2.4.2: Composition of income of households as per income sources

Sector	Activity	Percentage
Non-farm	Trade	11.79
	Handicraft and artisanship	4.00
	Service Provision	5.78
	Formal Employment	63.39
	Rental Income	2.63
Off-farm	Wage labourer	3.46
	Forest products	0.13
	Fishing related activities	0.05
Farm	Crops	3.44
	Livestock and by-products	2.62
	Poultry	1.70
	Floriculture	0.99
Total		100.00

Source: Field survey (2020-2021).

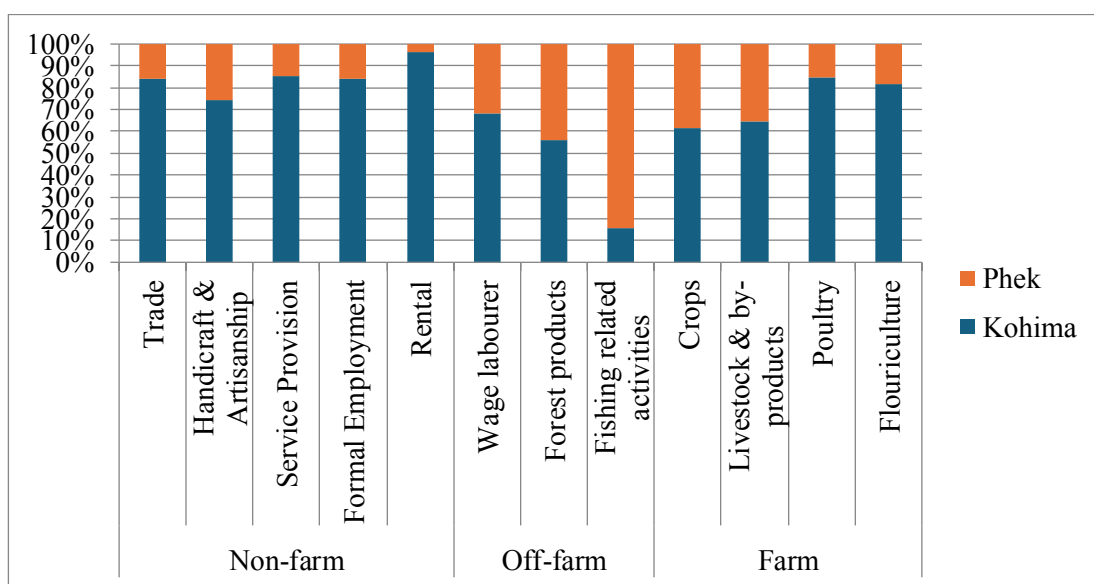


Figure 2.4.3: Share of income within the two districts

Source: Field survey (2020-2021).

Figure 2.4.3 shows the percentage share of income among the two districts. From the figure, it is seen that income in Kohima district is higher compared to Phek district in all the activities except fishing, where income is higher in Phek district. It is also seen that earnings from the non-farm sector are better suited in Kohima district, and income from off-farm and farm sectors are better in Phek districts.

2.4.c Descriptive statistics of income shares

On viewing the income profiles based on the sources and level of income, the minimum income a person earns in a month is highest for wage labour and forest products activities (Table 2.4.3). Trade, formal employment, fishing-related activities, and livestock and by-products all have the same minimum amount (3000), and then it is followed by floriculture and service provision. The least minimum monthly income is from handicraft and artisanship, crop, and rental activities. The maximum income a person earns monthly is from formal employment, followed by trade. This result shows that a person's maximum income in the off-farm sector is low though the minimum income is high. The highest incomes are earned from the non-farm sector. It also shows that formal employment has the highest average income (32155.99), followed by rental activities, trade, service provision, handicraft and artisanship, floriculture, livestock and by-products, forest products, wage labours, crop, poultry, and fishing-related

activities. Detailed descriptive statistics of income of the two sampled districts are shown in Table 2.4.4.

Table 2.4.3: Descriptive statistics of income according to income sources in the study area

Sectors	Activities	Minimum	Maximum	Mean
Non-farm	Trade	3000	200000	20248.79
	Handicraft & Artisanship	1000	65000	12262.93
	Service Provision	1500	60000	14794.96
	Formal Employment	3000	360000	32155.49
	Rental	1000	80000	20811.11
Off-farm	Wage Labourer	4000	25000	8920.29
	Forest Product	4000	15000	9600
	Fishing related activities	3000	12000	6333.333
Farm	Crop	1000	25000	7418.182
	Livestock and by-products	3000	40000	9608.247
	Poultry	2000	20000	6357.895
	Floriculture	2000	38000	10057.14

Source: Field survey (2020-2021).

In Kohima district, it can be seen that the minimum income an individual earns in a month is highest in wage labourers, forest products, and livestock and by-products. It is followed by trade, formal employment, fishing related activities, and service provision. Handicraft and artisanship, crop, and rental activities have the lowest minimum income. The highest maximum income is from formal employment and trade. It is followed by rental activities, handicrafts, artisanship, service provision, floriculture, livestock and by-products, wage labourer, poultry, and forest products. The least maximum income is from fishing activities. It is also seen that the highest mean income is formal employment (33654.8), which is followed by rental activities (21511.258), trade (20896.45), service provision (15986.36), handicraft and artisanship (14687.5), floriculture, livestock and by-product, wage labour, forest products, crop, and fishing.

In Phek district, the highest minimum income is from forest products, followed by rental activities. Service provision, formal employment, wage labour, and fishing-related activities have the same minimum income level. Also, trade, livestock and by-products, and floriculture have the same minimum income level. Crop, poultry, handicraft, and artisanship have the lowest minimum incomes. The highest maximum income is from formal employment, followed by trade, handicraft and artisanship, livestock and by-products, crop, service provision, rental, wage labour, forest products, fishing, and poultry.

Therefore, it can be said that though the minimum income from off-farm sectors is high, it cannot be as high as the other two sectors at their maximum level. In other words, income earned from off-farm will not be as high as that earned in the other two sectors.

2.4.d Frequency distribution of household's monthly income

Table 2.4.5 presents the distribution of income in different income groups. It shows that about 60 percent of households have earnings below 50,000, and only 39 percent have more than 50,000 incomes. The highest percentage of households (11.46 percent) have an income of more than 100000. It is then followed by households (10.26 percent) with income ranging from 15000 to 20000. The lowest percentage of households is from below 5000 income range.

Table 2.4.4: Descriptive statistics of income according to income sources in Kohima and Phek districts.

Sectors	Activities	Kohima			Phek		
		Minimum	Maximum	Mean	Minimum	Maximum	Mean
Non-farm	Trade	3000	200000	20896.45	3000	65000	17368.42
	Handicraft & artisanship	1000	65000	14687.5	1000	53000	8295.455
	Service Provision	1500	60000	15986.36	4000	20000	10275.86
	Formal Employment	3000	360000	33654.8	4000	90000	26093.53
	Rental	1000	80000	21511.9	5000	20000	11000
Off-farm	Wage Labourer	4000	25000	9393.258	4000	20000	8061.224
	Forest Product	4000	15000	9000	10000	11000	10500
	Fishing related activities	3000	3000	3000	4000	12000	8000
Farm	Crop	1000	25000	8333.333	2000	25000	6320
	Livestock and by-product	4000	30000	9571.429	3000	40000	9676.471
	Poultry	2000	20000	6636.364	2000	7000	5166.667
	Floriculture	2000	38000	12478.26	3000	12000	5416.667

Source: Field survey (2020-2021).

Table 2.4.5: Frequency distribution of household's monthly income of the sampled households

Income	Kohima	Phek	Total Household	Percentage
0-5000	3	0	3	0.45
5000-10000	16	7	23	3.47
10000-15000	17	22	39	5.88
15000-20000	44	24	68	10.26
20000-25000	38	24	62	9.35
25000-30000	38	15	53	7.99
30000-35000	22	9	31	4.68
35000-40000	29	11	40	6.03
40000-45000	33	10	43	6.49
45000-50000	27	13	40	6.03
50000-55000	21	7	28	4.22
55000-60000	21	2	23	3.47
60000-65000	21	3	24	3.62
65000-70000	18	2	20	3.02
70000-75000	15	2	17	2.56
75000-80000	17	2	19	2.87
80000-85000	16	1	17	2.56
85000-90000	9	1	10	1.51
90000-95000	11	2	13	1.96
95000-100000	11	3	14	2.11
Above 100000	66	10	76	11.46
Total	493	170	663	100.00

Source: Field survey (2020-2021).

2.4.1 THE EXTENT OF INCOME DIVERSIFICATION

The Simpson Diversity Index is used to measure income diversity. Table 2.4.6 shows that the overall income diversity in the study area is low, with only 0.22 SDI. It

can also be seen that the income diversity in Phek is 0.36, which is on a medium level, while in Kohima, it is low with 0.19 SDI. This signifies that the income diversity in Phek district is higher than Kohima district.

Table 2.4.6: Income diversification level in the study area

Districts	SDI
Kohima	0.19
Phek	0.36
Overall	0.22

Source: Field survey (2020-2021).

On measuring the diversity between the sectors, it is found from Table 2.4.7 that the overall income diversity is highest in the farm sector (0.70), which stands in the high level of diversity range. It is followed by the non-farm sector with 0.45 SDI, which falls in the medium-level range. The off-farm sector is found to be the least diversified as there is less employment in this sector resulting from less income. In Kohima district, the farm sector was found to have a high diversity level with 0.72 SDI, followed by the non-farm sector (0.45), which stands at the medium level. The off-farm sector is the least diversified sector, with only 0.06 SDI. In the Phek district, the farm sector is the most diversified sector, with 0.62 SDI, which is in the high-level range. The non-farm sector is in the medium range with 0.44 SDI, and the off-farm sector, with only 0.160 SDI, is the least diversified.

Table 2.4.7: Income diversification level of the three sectors in the study area

Sector	Kohima	Phek	Overall
Non-farm	0.45	0.44	0.45
Off-farm	0.06	0.16	0.09
Farm	0.72	0.62	0.70

Source: Field survey (2020-2021)

On further analyzing the range of income diversity at the village level, it can be seen from Table 2.4.8 that income diversity in all the villages is low. No village is found to have a high-income diversity level in the study area. Enhulumi is found to be the most income diversified village among all the eight villages, with only 0.47 SDI,

which is at a medium level. It is followed by Sechu village and Porba with 0.41 SDI each, Lasumi with 0.39 SDI, Nerhema with 0.38 SDI, and Pfutseromi with 0.26 SDI, which are all in a medium level of diversity. Zisunyu and Kohima village were the least income diversified villages, with only 0.17 SDI and 0.15 SDI in a low diversity level. This signifies that the maximum income is concentrated in one sector with negligence income from other sectors. Overall, the diversity in the study area was found to be low, with only 0.22 SDI.

Table 2.4.8 Extent of Income diversification across the three sectors in the sampled villages

Village	Non-farm income (Rs. In '00)	Off-farm income (Rs. In '00)	Farm income (Rs. In '00)	Total (Rs. In '00)	SDI
Kohima village	209595	3540	14500	227635	0.15
Nerhema	9080	1200	1490	11770	0.38
Zisunyu	22135	450	1830	24415	0.17
Sechu village	20840	3470	3690	28000	0.41
Enhulumi	4840	790	1350	6980	0.47
Lasumi	5650	170	1750	7570	0.39
Pfutseromi	21330	1700	1980	25010	0.26
Porba	18010	1660	4530	24200	0.41
TOTAL	311480	12980	31120	355580	0.22

Source: Field survey (2020-2021).

2.4.1.a Extent of employment diversification within the sectors

Every sector contributes different levels of income, which varies between the villages. Hence, the diversity levels in the different sectors from the sample villages are also computed. From Table 2.4.9, it is seen that in Kohima district, both Kohima village and Nerhema village have a small level of diversification (0.48) in the non-farm sector, which is in the medium level. It is followed by Sechu village with 0.31 SDI, which is also in the medium level of diversity. Zisunyu village is found to have only 0.18 SDI, which is a low level of diversity and the least diversified in the non-farm sector. In the off-farm sector, Zisunyu village is the highest diversified village

with 0.27 SDI from the medium range. Kohima village has a diversity of 0.21 SDI, which is the low level of diversity. Both Nerhema village and Sechu village do not have any diversity in the off-farm sector, meaning that there is very little or a very limited income source. All the villages have the highest diversity levels in the farm sector. The highest diversity range was found in Kohima village, with 0.73 SDI, followed by Zisunyu village, with 0.702 SDI both in high diversity range. The income diversity of Sechu village (0.69) and Nerhema village (0.55) both range in the medium level of diversity.

Table 2.4.9: Income diversification level of the three sectors in the four villages of Kohima district

Village	Non-farm	Off-farm	Farm
Kohima village	0.484	0.121	0.731
Nerhema	0.485	0	0.557
Zisunyu	0.182	0.274	0.702
Sechu village	0.313	0	0.696

Source: Field survey (2020-2021).

Table 2.4.10: Income diversification level of the three sectors in the four villages of Phek district

Village	Non-farm	Off-farm	Farm
Enhulumi	0.513	0	0.643
Lasumi	0.569	0	0.405
Pfutseromi	0.476	0	0.717
Porba	0.296	0.371	0.564

Source: Field survey (2020-2021).

Among the villages in Phek district, as shown in Table 2.4.10, Lasumi village is the most diversified village (0.56) in the non-farm sector, followed by Enhulumi village (0.51), both in the high diversity range. Pfutseromi village, with 0.47 SDI, and Porba village, with 0.29 SDI, stand in the medium range of diversification, with Porba village as the least diversified village in the non-farm sector. All three villages except Porba village have zero diversity, which signifies low-income levels and sources in the

off-farm sector. Porba village has an SDI of 0.37, which is at the medium level. In the farm sector, Pfutseromi village has the highest diversity index with 0.71 SDI, Enhulumi village with 0.64 SDI, and Porba village with 0.56 SDI, which are in the high diversity range. Lasumi village, the most diversified village in the non-farm sector, is the least diversified village in the farm sector with 0.40, medium range.

2.4.1.b Classification of households based on the extent of diversification of income

Based on the value of the diversification range criteria mentioned previously, all households' diversity index is analyzed and distributed among the different ranges of diversification levels. Likewise, the classification of households based on their income diversity level is shown in Table 2.4.11.

Table 2.4.11: Classification of households on the level of income diversification

SDI Range	Diversification status	Kohima	Phek	Total
Below 0.01	No diversification	310 (62.88)	76 (44.71)	386 (58.22)
0.01-0.25	Low diversification	37 (7.51)	20 (11.76)	57(8.60)
0.26-0.50	Medium diversification	131 (26.57)	64 (37.65)	195 (29.41)
0.51-0.75	High diversification	15 (3.04)	10 (5.88)	25 (3.77)
Above 0.75	Very high diversification	0	0	0
Total		493 (100.0)	170 (100.0)	663 (100.0)

Source: Field survey (2020-2021).

It is seen that 386 households, that is., 58.22 percent of the total households in the study area, have no income diversification. It means that maximum income of these households is derived only from one source or from the same type of activities. Almost 30 percent of the households have medium diversification, 8.60 percent have low diversification, and 3.77 percent have high diversification. No household in the study area has a very high-income diversification. In Kohima district, more than half of the households (62.88) have no diversification, 26.57 percent have a medium diversity

level, 7.51 have low diversification, and 3.04 percent have high diversification. In Phek district, 44.71 percent have no diversity in income, which is less than Kohima district and the entire study area. At the same time, 37.65 percent, which is higher than Kohima district and the study area, has a medium diversity level. 11.76 percent of households have low diversification, and 5.88 percent have high diversification.

Hypothesis:

Table 2.4.12: Diversification in the two districts

Districts	Employment	Income
Kohima	0.42	0.19
Phek	0.57	0.36

Source: Field survey (2020-2021).

Since both employment and income diversification are higher in Phek district, the result of this chapter failed to accept the hypothesis that Kohima district is more diversified than Phek district.

CONCLUSION

This chapter discusses the employment and income diversification in the two districts. The study found employment diversification in the study area to be moderate, that is, at a medium level. The employment diversity in Phek district was higher than in Kohima district. In both the districts, the highest number of employment was found to be in the non-farm sector while the farm sector was found to be the most diversified sector. The highest percentage of income in the study area is from the non-farm sector, and the highest percentage of households earns Rs. 15000-20000. The overall income diversity in the study area was found to be quite low, with Phek having a higher income diversity compared to Kohima district. The farm sector was found to have the highest income diversity. In the study area, the maximum number of households have very low or no diversification status. Thus, the result of this chapter failed to accept the hypothesis that Kohima district is more diversified than Phek district. Therefore, the second hypothesis could not be sustained.

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Appendix

Table A 2.1: Average gross earnings of the workforce in Nagaland and India. (Monthly income for self-employed and regular waged/salaried and per day income for casual labour).

Year	Month	Salary		Self employed		Casual	
		Nagaland	India	Nagaland	India	Nagaland	India
2017	July-September	19616.05	15844.77	9480.89	11884.6	260.49	243.11
	October-December	19493.7	16566.44	10057.44	12016.9	366.59	251.02
2018	January-March	19808.39	16850.14	11472.81	11908.41	343.99	258.43
	April-June	20249.03	16847.65	10474.16	12304.25	368.27	270.78
	July-September	17041.72	15598	9393.88	9944.98	304.87	264.38
	October-December	17313.68	15917.63	7820.88	10261.58	363.07	275.59
2019	January-March	18803.43	15827.17	9706.79	10438.46	363.7	278.56
	April-June	19849.96	16196.24	6269.86	10648.3	330.98	290.7
	July-September	26484.19	16418.18	12610.87	10538.15	397.92	281.9
	October-December	20589.5	16135.75	9020.51	10725.5	398.06	287.43
2020	January-March	19839.29	16759.07	8485.5	11010.94	375.4	300.78
	April-June	22996.02	17600.17	9228.61	9540.7	407.02	292.51
	July-September	24553.35	17234.08	8894.59	10291.44	400.95	313.91
	October-December	26511.63	17949.69	9958.27	10839.65	443.91	311.15
2021	January-March	24288.07	17594.16	11475.92	10756.81	461.43	322.21
	April-June	25519.35	17509.35	9860.27	10363.28	409.51	326.72
	July-September	25008.32	18468.07	11718.26	11104.59	461.35	364.37
	October-December	22704.01	18138.74	10449.15	11553.62	481.3	372.98
2022	January-March	21472.64	18372.05	9436.8	11867.02	474.56	376.48
	April-June	29576.59	18585.03	10779.30	12186.28	469.06	382.88

Source: Author's calculation based on various PLFS Annual Reports.

CHAPTER 3

LIVELIHOOD DIVERSIFICATION BY GENDER, AGE, EDUCATION AND HOUSEHOLD SIZE

3. INTRODUCTION

According to Daniel (2014), livelihood diversification refers to the efforts by households/individuals that they put up to uncover new ways to increase their income and reduce their chances of being vulnerable to various livelihood shocks. Hussein and Nelson (1998) view livelihood diversification as the process by which households or individuals find ways to enhance their income from different sources, such as non-farm and off-farm activities, through the production of goods and services (agricultural or non-agricultural), self-employment activities or wage labour works, which may vary depending on the freedom of choice. Likewise, household carries out their livelihood activities by utilizing the capital they own and the ability they possess to arrive at a standard of living (Habib et al., 2023). However, various degrees of investment are required to diversify livelihood activities, which affects the adoption decision. For the rich, their livelihood activities are more capital intensive, which has high entry barriers accompanied by high returns, whereas, for the poor, their activities are almost labor intensive, which have low entry barriers and low returns accompanied by fewer opportunities to discover new activities.

Several factors affect the decision of the household to adopt livelihood diversification. Households tend to respond heterogeneously to the same stochastic shocks depending on the accessibility of the qualities and quantities of physical endowments or acquired skills. Some studies found that the head of households' education, age, land access, farm size, farming experiences, etc., are considered to be the essential determinants of livelihood diversification (Alobo, 2012; Corral & Radchenko, 2017; Tesfaye et al., 2011). A few studies also found that the key determinants of livelihood diversification are market access and the differences in the incentives and the constraints (Barrett et al., 2001), credit facilities, and market distance (Gebreyesus 2016). While for some, it is the poverty status, farm income, gender, etc. (Ayantoye et al., 2017). As a result of its heterogeneity and the number of

factors that contribute to building the livelihood diversification activities of the households, it is vital to examine and explore the major factors that are liable to determine it. However, regardless of the significance of this study, a proper understanding of the factors influencing the household's livelihood choices in Nagaland remains obscure on the grounds of lack of literature. Therefore, this chapter attempts to bridge the literature gap and execute the need for a thorough household-level study on their decision to diversify their livelihood activities.

This chapter is divided into six parts. Part I deals with the methodology used in this chapter and Part II highlights the description of the variables used. Part III emphasizes the relationship between livelihood diversification and gender of the head of household, Part IV on livelihood diversification and age of the head of household, Part V on livelihood diversification and the level of education of the head of household, Part VI on the relationship between the size of the household and livelihood diversification. Part VII analyses the determinants of livelihood diversification in the study area.

PART 1

3.1 METHODOLOGY

3.1.1 Tobit Regression Analysis

The censored Tobit regression model is used to analyze the determinants of livelihood diversification. As the value of SDI ranges from 0 to 1 and the presence of zeros in the dependent variable, this censored model is applied (Agyeman et al., 2014; Balense & Debebe, 2020; Vatta et al., 2018). The model is as specified below;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u$$

$$SDI = \begin{cases} 0 & \text{if } SDI \leq 0 \\ 1 & \text{if } SDI \geq 1 \end{cases}$$

Where Y= The value of SDI

X_1 = The gender of the head of households

X_2 = The age of the head of households

X_3 = The highest education level of the head of households

X_4 = The total size of the households

U = Error term which includes the unknown factors influencing the livelihood diversification

β_0 = Coefficient

PART II

3.2 DESCRIPTION OF THE VARIABLES USED

As identified by Alemu (2012), the variables that have the potential to impact a households choice to adopt different livelihood strategies are the gender, education level and age of the household head, and also households accessibility to social infrastructure and size of household. In view of this, there are four explanatory variables in this study, which are gender, age, education, household size, and livelihood diversification, as the dependent variable to examine the household's decision to adopt diverse livelihood activities. The selected variables, along with their descriptions and expected relationship with livelihood diversification, are summarized in Table 3.2.1.

Gender: Males and females have major differences in asset holdings, access to resources, physical strength, risk-bearing, capabilities, and responsibilities. Households headed by females are more likely to be less diversified than households headed by males as females have additional roles to play in the household, such as child caring, cooking, household chores, etc., which are time-consuming and unavoidable.

Age: The age of the head of the household was used as most decisions are made by the head of the household. It is rather ambiguous how the age of the household head will affect the household's decision to adopt multiple livelihood activities. It is possible that older heads may be more experienced and knowledgeable. However, a high

number of studies found a negative relationship between the age of the household head and the diversification of the household.

Table 3.2.1: Background of the variables and their expected relationships.

Name	Description of variables	Expected relationship with livelihood diversification
SDI	Livelihood Diversification Index	The diversity level is calculated with the use of Simpson Diversity Index which ranges from 0 to 1.
Gender of HH head	Gender as in male or female	Households headed by males are expected to adopt multiple livelihood activities: and expects to engage more in the non-farm sector.
Age of HH head	Age of HH head in years	Households with younger heads of household are expected to be more diversified and expected to engage more in the non-farm sector.
Education of HH head	Highest education level of the HH head	Households with higher educated heads of households are expected to be less diversified: and expected to engage more in the non-farm sector.
Household size	Total HH size	Households with bigger sizes of households are expected to adopt multiple livelihood activities: expected to engage more in the farm sector.

*HH: Household

Education: The higher the education level of the head of household, the more the ability and skill to acquire new skills as education provides knowledge to develop and grab opportunities. It is frequently seen from most of the available research works that

the relationship between the education attainment of the household head and the livelihood diversification of the household is positive, which signifies that higher education attainment opens more opportunities in the labor supply.

Household size: A large household implies more labor for income-generating activities. One reason is that larger households tend to incur higher expenditures and, hence, higher income requirements. Secondly, a larger household means a broader range of skills and expertise.

3.2.1 Descriptive statistics of the variables used

Table 3.2.2 presents the descriptive statistics of the selected independent variables derived from the sampled households. The percentage of male-headed households from the sample households is 82.05 percent, with a standard deviation of 0.38. The average age of the head of household is 50 years and the youngest age of the head of household is 24 years and the oldest with 98 years of age. There is an average of 4.16 members in the selected households. The mean percentage of different levels of education is 2.11.

Table 3.2.2: Descriptive statistics of the variables

Variables	Mean	Standard Deviation	Minimum	Maximum
Livelihood diversification (SDI)	0.21	0.3	0	1
Male-headed households (%)	82.05	0.38	0	1
Age of Head (Years)	50.49	13.81	24	98
Family size	4.16	1.94	1	11
Education of Head	2.11	1.43	0 (Illiterate)	5 (PG & above)

Source: Field survey (2020-2021).

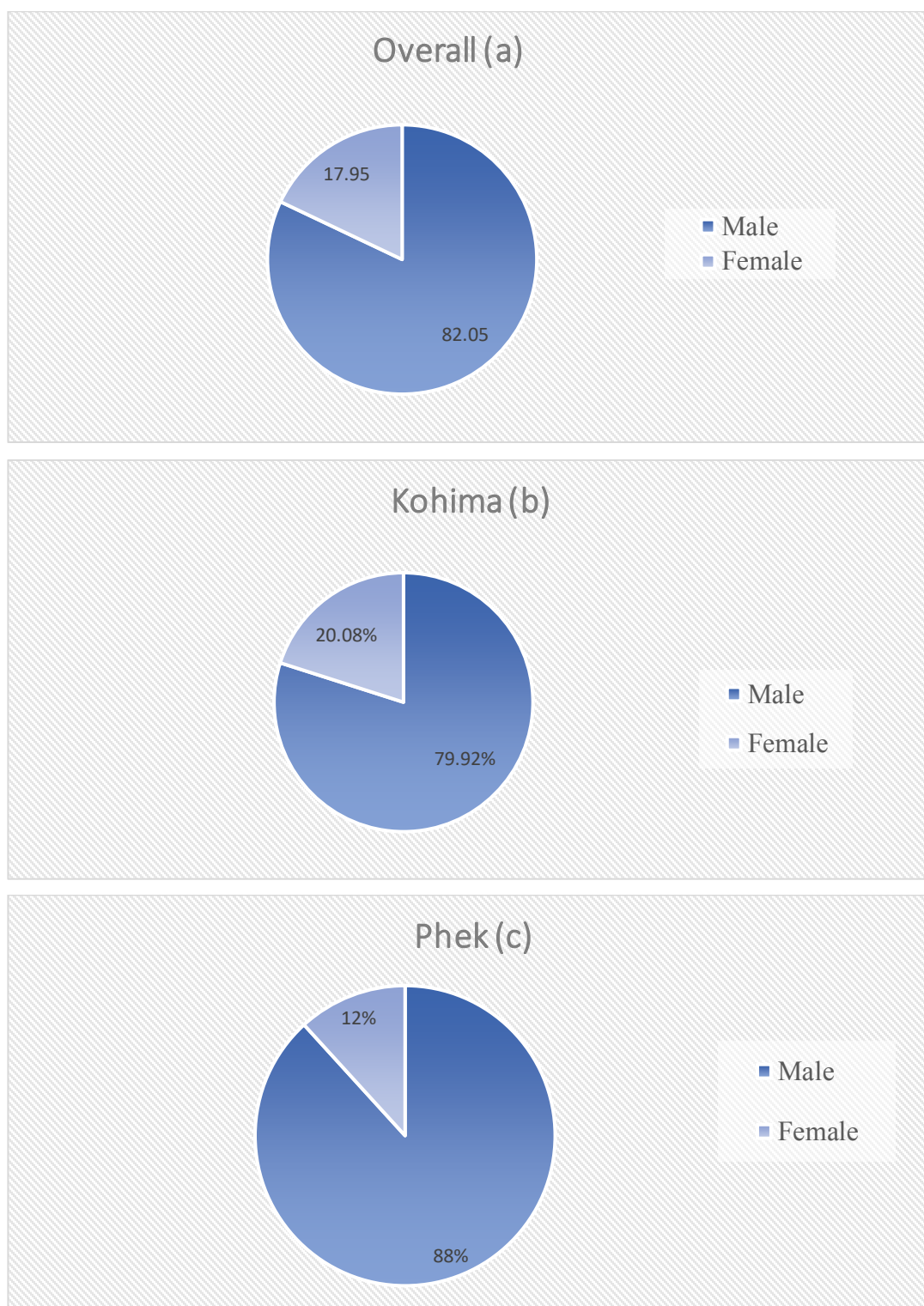
PART III**3.3 GENDER AND LIVELIHOOD DIVERSIFICATION**

Figure:3.3.1: Percentage of genders of heads of households in the study area

It can be seen from Figure 3.3.1(a) that in the sampled area, out of 663 households, 544 (82.05 percent) are male-headed and 119 (17.95 percent) are female-headed households. In Kohima district (b), 80 percent of the households are male-headed households, and only 20 percent of households are female-headed households. Also, in the Phek district (c), we can see that out of 170 sampled households, 150 (88.42 percent) households are headed by males, while 20 (11.76 percent) are headed by females. Male-headed households are found to be comparatively more than their counterparts, as a female is considered as the head of the household only if she is divorced or a widow (Rahman & Akter, 2014).

3.3.1 Employment of head of households

From Figure 3.3.2 (a), it can be clearly seen that in the study area, among the male-headed households, the maximum percent are employed (95.40) while only a negligible percent (4.60 percent) are unemployed. As for female-headed households, 85.71 percent are employed, and 14.29 percent are unemployed.

In Kohima district (b), 94.67 percent of the household heads are employed among the male-headed households (MHH), while 5.32 percent are unemployed. As for female-headed households (FHH), 84 percent are employed, and 15.15 percent are unemployed.

Figure 3.2 also shows that in the Phek district (c), a total of 97.33 percent of male-headed households are employed, while 2.67 percent are unemployed. As for female-headed households, 90 percent are employed, and only 10.00 percent are unemployed. From this finding, it can be seen that male-headed households are more employed compared with female-headed households.



Figure 3.3.2: Percentage of gender employment role in the study area

3.3.2 Measurement of Diversification

Table 3.3.1 Level of diversification and genders in the study area

Gender	Kohima	Phek	Overall
Male	0.42	0.56	0.47
Female	0.42	0.63	0.45

Source: Field survey (2020-2021).

It is seen from Table 3.3.1 that in the study area, male-headed households are slightly more diversified (0.47 SDI) than female-headed households (0.45 SDI). This indicates that more male-headed households can be found engaged in different activities than female-headed households. This result is similar to the finding of Abera et al.,(2021), which found that female-headed households are less likely to diversify their livelihood activities as females are mainly occupied with household domestic work such as cooking, childcare, house chores, etc.

Also seen from Table 3.3.1, both MHH and FHH have equal total diversity in Kohima district with 0.42 SDI each. This result signifies that the gender of the household head has no impact on the diversity of livelihood activities of household members in the district.

In the Phek district, female-headed households with 0.63 SDI are found to be more diversified than male-headed households, which have only 0.56 SDI. This result signifies that households with female heads take more active parts by engaging in multiple activities compared to the households headed by males. This reason might be that male heads mostly earn more, in other words, have higher income compared to female heads, which compels female-headed households to have multiple income sources so as to meet their needs. For a better understanding of the role of gender, diversity within the three sectors is calculated in Table 3.3.2.

3.3.2.a Gender and diversification within the sectors

Table 3.3.2: Level of diversification and genders of the head of households within the sectors in the study area

	Kohima		Phek		Overall	
	Male	Female	Male	Female	Male	Female
Non-farm	0.64	0.55	0.64	0.57	0.63	0.69
Off-farm	0.12	0.00	0.00	0.00	0.17	0.00
Farm	0.64	0.71	0.63	0.71	0.48	0.68

Source: Field survey (2020-2021).

On looking further into the sector-wise among the genders in the study area, it is found that male-headed households are more diversified in the non-farm sector with 0.64 SDI, while female-headed households are more diversified in the farm sector with 0.71 SDI (Table 3.3.2). The probable reason may be that most FHH practice animal husbandry or maintain fruit and vegetable gardens and earn by selling their produce. They also earn a livelihood by selling their produce from small homestead gardens and backyard poultry. In Figure 3.3.3 (a), both gender curves touch the x-axis in the off-farm sector, which shows that there is no diversification in this sector.

In Kohima district, female-headed households are found to be more diversified in the farm sector, with 0.71 SDI. This result corresponds with the result found by Bahadur et al., (2017), where they found that FHH are more confined to the farm sector. Table 3.3.2 also shows that male-headed households are more diversified in the non-farm (0.64 SDI) and off-farm sectors (0.12 SDI). This result is similar to the finding of Demissie & Legesse (2013), who found that compared to their counterparts, MHH engages and also earns more in the non-farm and off-farm sectors. The probable reason may be that MHHs are more confident and resource accessible in both the non-farm and off-farm sectors, which also requires time, physical strength, and risk-taking ability.

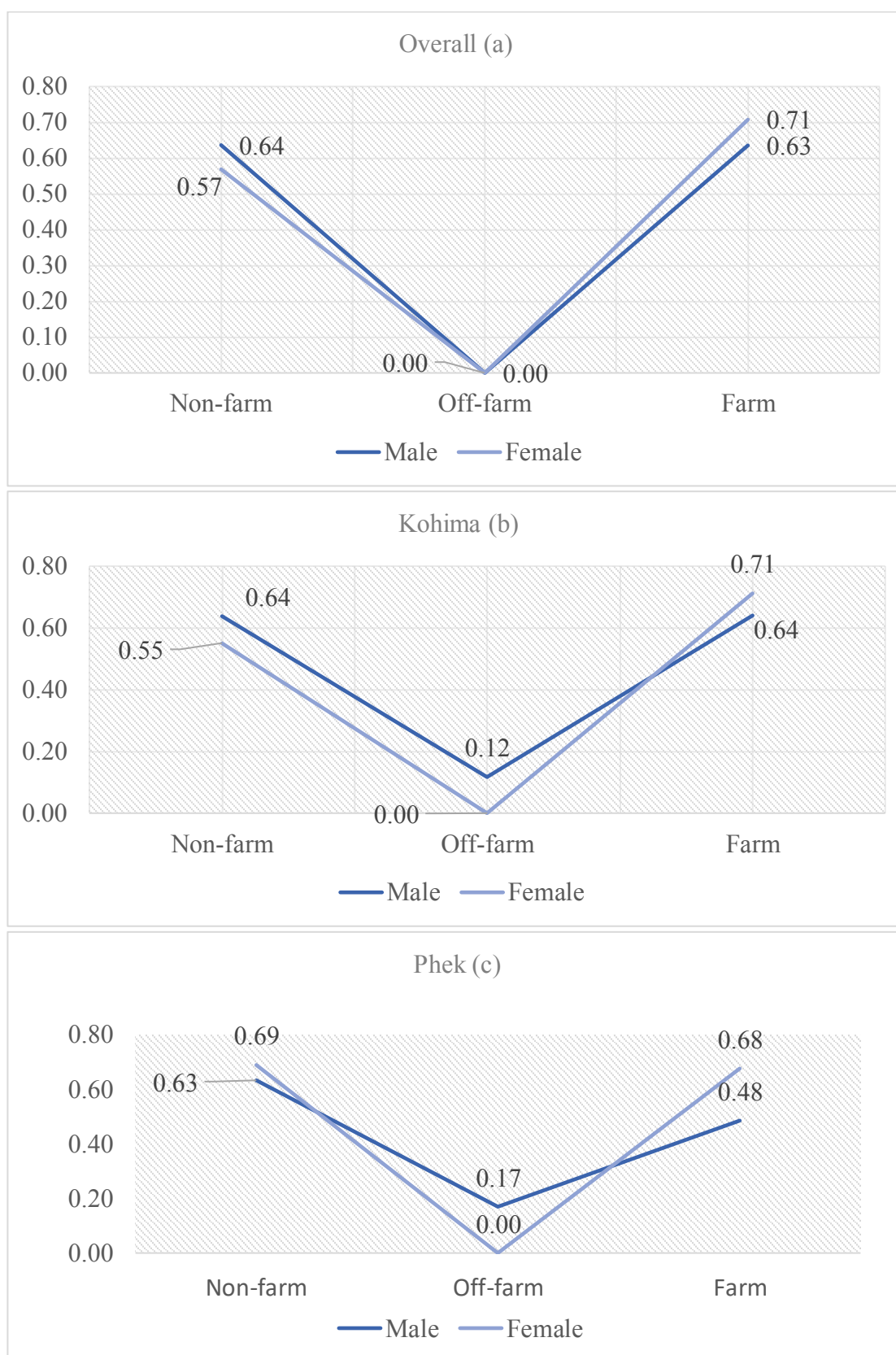


Figure 3.3.3 Diversification of households in the three sectors based on the gender of the head of household

From Table 3.3.2 it is seen that in Phek district, female-headed households are more diversified in both non-farm and farm sectors, with 0.69 SDI and 0.68 SDI; however, they have zero diversity in the off-farm sector. As for male-headed households, they diversify but less than female-headed households in both non-farm (0.63 SDI) and off-farm sectors (0.68 SDI), except in the off-farm sector with 0.17 SDI.

From Figure 3.3.3 (b) and (c), we can see that in both districts, the female curve touches the x-axis in the off-farm sector, which illustrates that there is zero or no diversity. This reason might be because females in off-farm are only engaged in one type of activity, particularly wage agricultural activities, which are weeding, paddy works, etc., where they do not participate in any other off-farm activities.

PART IV

3.4 AGE AND LIVELIHOOD DIVERSIFICATION

Table 3.4.1: Distribution of households based on age group of head of household in the study area

Age group	Kohima	Phek	Overall
25-35	60 (12.17)	22 (12.94)	82 (10.75)
35-45	119 (24.14)	28 (16.47)	147 (22.43)
45-55	127 (25.76)	50 (29.41)	177 (26.57)
55-65	121 (24.54)	38 (22.35)	159 (24.06)
65-75	42 (8.52)	14 (8.24)	56 (8.46)
75-85	18 (8.52)	15 (8.82)	33 (4.80)
Above 85	6 (3.65)	3 (1.76)	9 (1.34)
Total	493 (100.00)	170 (100.00)	663 (100.00)

Source: Field survey (2020-2021).

From Table 3.4.1, it is seen that the maximum of heads of households in the study area is between the ages of 45 to 55 (26.57 percent), which is followed by 55 to 65 (24.06 percent) and 35 to 45 (22.43 percent). The lowest number of heads of households is above 85 years of age which is only 1.34 percent. In Kohima district,

the highest percentage of the head of household is between 45 and 55 years of age (25.76 percent), with the lowest in the above 85 years of age group (3.65 percent). Likewise, in Phek district, the age group 45 to 55 years has the highest percentage (29.41 percent), with the lowest percentage in the age group above 85 (1.76 percent).

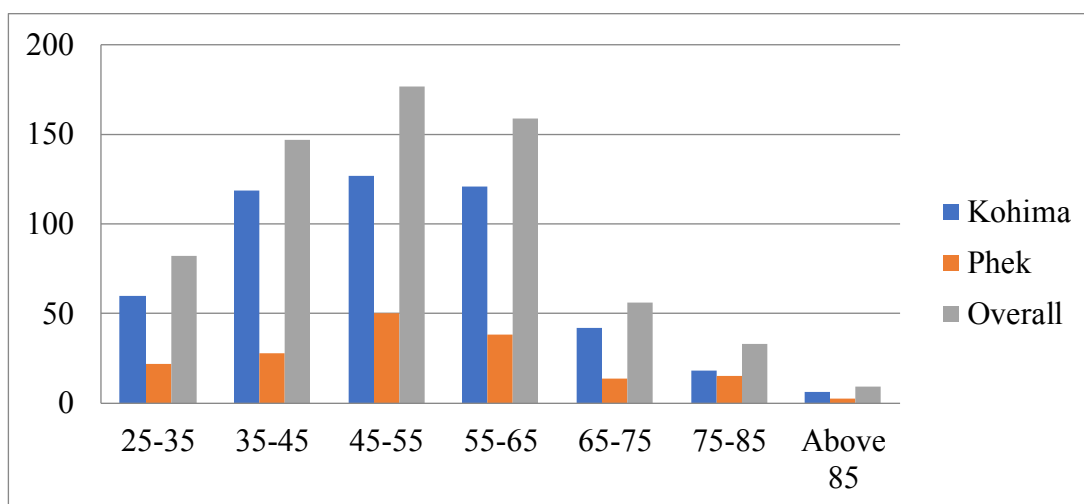


Figure 3.4.1: Distribution of households based on age group of head of household in the study area

3.4.1 Measurement of Diversification

Table 3.4.2: Diversification of households based on the age group of the head of household in the study area

Age group	Kohima	Phek	Overall
25-35	0.46	0.60	0.51
35-45	0.44	0.56	0.47
45-55	0.43	0.57	0.50
55-65	0.36	0.57	0.42
65-75	0.44	0.56	0.47
75-85	0.46	0.53	0.41
Above 85	0.18	0.48	0.29

Source: Field survey (2020-2021)

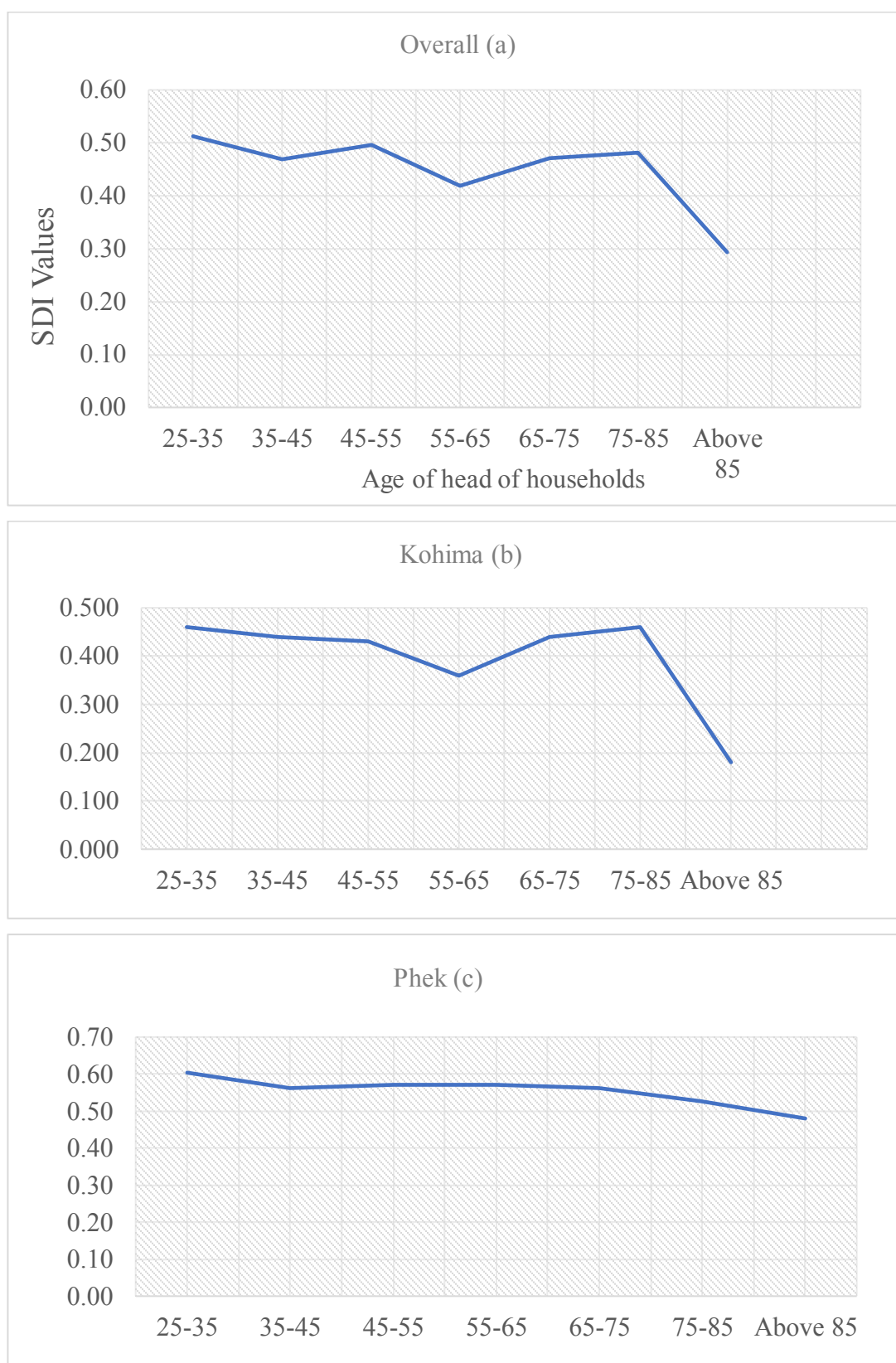


Figure 3.4.2: Diversification of households based on the age group of head of household in the study area

From Table 3.4.2, it is seen that in the study area, as expected, the youngest age group has the highest diversified households with 0.512 SDI which is at the medium level. Dinku (2018) and Gebru et al., (2018) also found similar results where they also found that the age of the household head has a negative influence on livelihood diversification of households. Young-headed households diversify more mainly because these households are more energetic, updated, and can take risks. The households with old heads are found to be the least diversified households, with only 0.293 at the low level of diversity. From Figure 3.4.2 (a), it is also clear that the younger the age group of the head of household, the more diversified the household is, and the higher the age of the head of household, the lower the diversity level.

As expected, the youngest age group heads of households are the most diversified households in Kohima district with 0.46 SDI. However, unexpectedly, older age heads of households (75-85) are also found to be highly diversified in the district (0.46 SDI). Young-headed households are more diversified as these households mostly remain more active and have better knowledge about modern lifestyles and technology. Households with older heads are also found to have a high diversity level in this sampled district, which is probably due to the fact that households with older heads generally have household members who are mature enough to venture into various activities to earn their livelihood. From Figure 3.4.2 (b), it is seen that households with the oldest heads have a downstroke in the diversity curve, which went down to 0.18 SDI, as most members of these households usually get married and move out to start their own families.

Also, as expected, households with the youngest head are found to be the most diversified, with 0.60 SDI in Phek district. It is also found that in Phek district, all the households diversify moderately, almost at the same degrees of diversification, regardless of the age of the head of households. However, amongst all the households, households with a head of household above 85 years of age were found to be the least diversified, where they moderately diversified with only 0.48 SDI. Further views on the three sectors are discussed in the tables below.

3.4.1 a Diversification within the three sectors in the study area

Table 3.4.3: Diversification of households in the three sectors based on the age group of the head of household in the study area

Age group	Non-farm	Off-farm	Farm
25-35	0.70	0.00	0.63
35-45	0.63	0.08	0.70
45-55	0.62	0.10	0.71
55-65	0.56	0.06	0.71
65-75	0.64	0.11	0.70
75-85	0.71	0.47	0.62
Above 85	0.71	0.00	0.68

Source: Field survey (2020-2021)

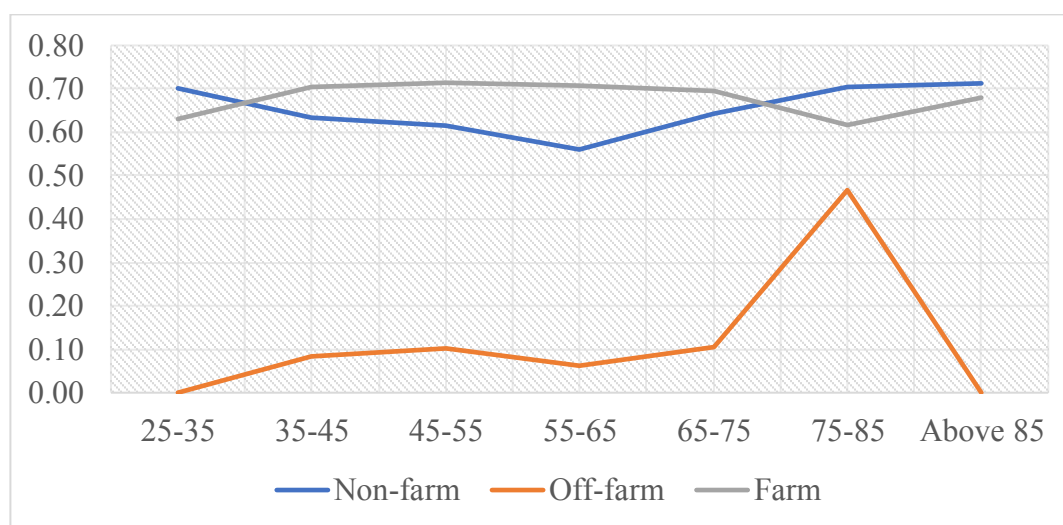


Figure 3.4.3: Diversification of households in the three sectors based on the age group of the head of household in the study area

In the non-farm sector (Table 3.4.3), the households with old heads of households have the highest diversity level (0.71), which may be the reason for high capital accumulation through savings and investments. The youngest age group also has a high diversity in the non-farm sector (0.70 SDI), as younger generations are more confined and exposed to non-farm activities compared to their counterparts. There is a very low diversity in the off-farm sector. However, the older-headed households are

seen to be more diversified than the younger ones, probably because older households have more knowledge about off-farm activities like forest products, wage woodwork, fishing, etc. This finding contradicts the finding of Katera (2016), who found that compared to older-headed households, younger-headed household depends more on off-farm activities. The middle-aged-headed households are seen to be more diversified in the farm sector, being the generation that witnessed and experienced both traditional and modern farming methods.

3.4.1 b Diversification within the three sectors Kohima District

Table 3.4.4: Diversification of households in the three sectors based on the age group of the head of household in Kohima district

Age Group	Non-farm	Off-farm	Farm
25-35	0.67	0.00	0.67
35-45	0.64	0.00	0.72
45-55	0.62	0.08	0.71
55-65	0.54	0.08	0.74
65-75	0.66	0.00	0.69
75-85	0.73	0.53	0.66
Above 85	0.69	0.00	0.53

Source: Field survey (2020-2021)

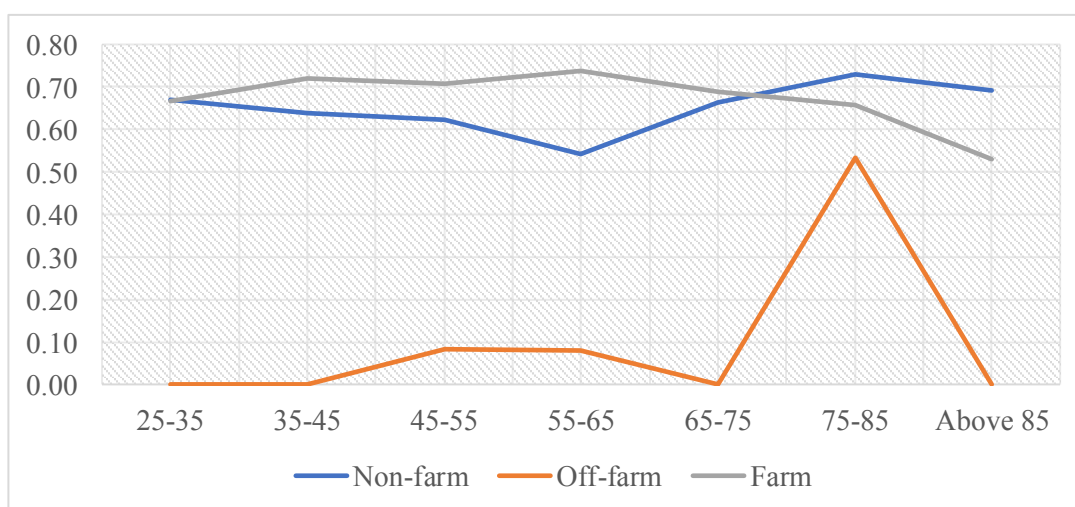


Figure 3.4.4: Diversification of households in the three sectors based on the age group of the head of household in Kohima district

Table 3.4.4 shows that in Kohima district, in both the non-farm sector and off-farm sector, households with older heads (75-85 age) are found to be most diversified, with 0.73 SDI and 0.53 SDI, respectively. This probably might be because of the fact that these households have better knowledge about the non-farm livelihood market which makes them invest more in it. A similar finding was made by Loison (2019), where older-headed households diversify more in the non-farm sector probably because they have the wealth and experience to invest in this sector. In the off-farm sector, the high diversity may be the result of the existence of a workforce available for different labor jobs, wage earnings, charcoal making, etc. The former can be assumed to be the richer households, while the latter are the poorer households. The youngest age group is also found to have a high diversity in the non-farm sector with 0.67 SDI, as these households concentrate mostly on non-farm formal activities and are less likely to adopt farm activities. As mentioned earlier, middle age groups being exposed to both the modern and traditional methods of farm activities are likewise seen to have high diversity in the farm sector.

Table 3.4.5: Diversification of households based on the age group of the head of household in the sampled villages of Kohima district

Villages	Age group	25-35	35-45	45-55	55-65	65-75	75-85	Above 85	Total
Kohima village	%	9.47	23.96	27.51	26.63	7.99	3.85	0.59	100.0
	SDI	0.32	0.30	0.33	0.30	0.33	0.48	0.39	0.32
Nerhema	%	16.13	29.03	32.26	6.45	12.90	3.23	0.00	100.0
	SDI	0.46	0.60	0.66	0.73	0.63	0.67	0.00	0.62
Zisunyu	%	14	18	16	32	12	4	4	100.0
	SDI	0.51	0.44	0.50	0.40	0.64	0.00	0.00	0.43
Sechu village	%	21.62	27.03	21.62	17.57	6.76	2.70	2.70	100.0
	SDI	0.66	0.67	0.65	0.57	0.47	0.60	0.00	0.63

Source: Field survey (2020-2021)

On further viewing the diversity of households by age village-wise (Table 3.4.5), Sechu village has the highest diversity level with 0.63 SDI, where each age group has high diversity levels except the above 85 age group, which has zero

diversity. It is followed by Nerhema village and Zisunyu village with 0.62 SDI and 0.43 SDI. Kohima village is found to have the lowest diversity level (0.32 SDI), probably due to the high number of employment in the non-farm sector alone.

3.4.1 c Diversification within the three sectors Phek district

Table 3.4.6: Diversification of households in the three sectors based on the age group of the head of household in Phek district

Age Group	Non-farm	Off-farm	Farm
25-35	0.77	0.00	0.59
35-45	0.61	0.29	0.66
45-55	0.59	0.14	0.71
55-65	0.63	0.00	0.58
65-75	0.56	0.18	0.71
75-85	0.65	0.50	0.36
Above 85	0.44	0.00	0

Source: Field survey (2020-2021)

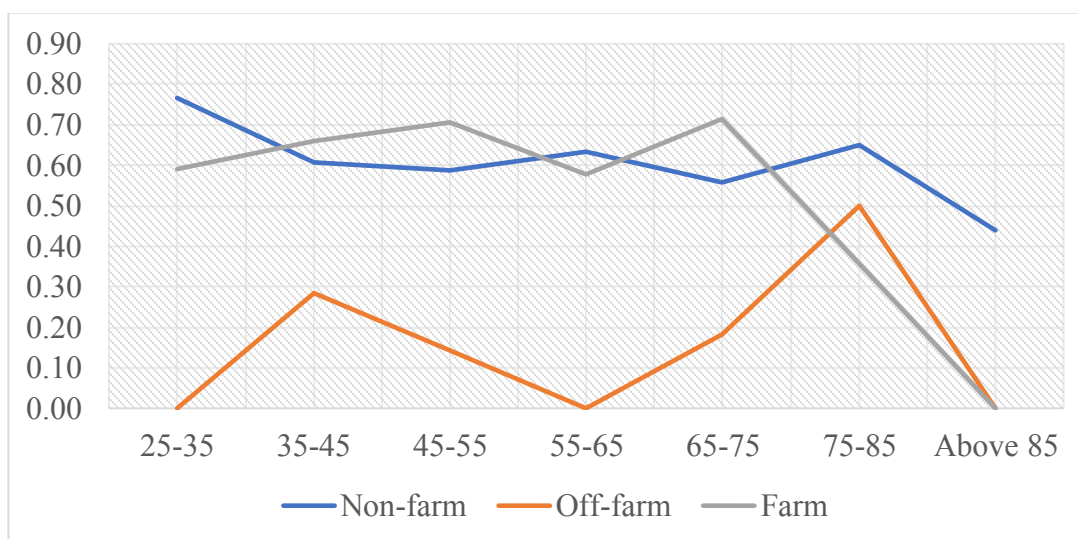


Figure 3.4.5: Diversification of households in the three sectors based on the age group of the head of household in Phek district

The different age groups of households respond to livelihood choices in many different ways in the Phek district. As found in Table 3.4.6, in the non-farm sector, the

youngest age group households have the highest diversity with 0.77 SDI, and the oldest age group households have the least diversity with 0.44 SDI. This result found similarity with the finding of Shehu & Abubakar (2015), where households led by younger heads are more diversified in the non-farm sector than households led by older heads. It is also found that younger-headed households are more diversified in the non-farm sector than in the off-farm and farm sectors. In support of this finding, Rahut et al., (2017) pointed out that young-headed households are likely to abandon farm activities and engage in self-employment non-farm activities. As illustrated in Figure 3.4.5, households with the oldest heads are found to have zero diversity both in the off-farm and farm sectors as both this point touches the x-axis, indicating that there is too little employment or that they are only engaged in one type of activity.

Table 3.4.7: Diversification of households based on the age group of the head of household in the sampled villages of Phek district

Villages	Age group	25-35	35-45	45-55	55-65	65-75	75-85	Above 85	Total
Enlumi	%	30.43	8.70	21.74	26.09	8.70	4.35	0.00	100.0
	SDI	0.58	0.5	0.61	0.62	0.75	0	0	0.62
Lasumi	%	9.09	13.64	18.18	27.27	22.73	9.09	0.00	100.0
	SDI	0.8	0.54	0.55	0.42	0.59	0.67	0	0.51
Pfutseromi	%	8.06	20.97	37.10	16.13	6.45	9.68	1.61	100.0
	SDI	0.6	0.56	0.60	0.53	0.47	0.51	0	0.54
Porba	%	12.70	15.87	28.57	25.40	4.76	9.52	3.17	100.0
	SDI	0.57	0.53	0.55	0.62	0.29	0.56	0.67	0.58

Source: Field survey (2020-2021)

On studying the diversity village-wise (Table 3.4.7), Enhulumi village is found to be the most diversified village among the sampled villages in Phek district with 0.62 SDI. It is followed by Porba village with 0.58 SDI, Pfutseromi village with 0.54 SDI, and then Lasumi village with 0.51 SDI.

PART V

3.5 EDUCATION AND LIVELIHOOD DIVERSIFICATION

Table 3.5.1: Distribution of households based on education level of head of household in the study area

Education level	Kohima	Phek	Overall
Illiterate	46 (9.33)	16 (9.41)	62 (9.35)
Below Class 10	167 (33.87)	79 (46.47)	246 (37.10)
Highschool Passed (Class 10)	73(14.81)	17 (10.00)	90 (13.57)
Higher Secondary Passed (Class 12)	88 (17.85)	33 (19.41)	121 (18.25)
Graduate	87 (17.65)	21 (12.35)	108 (16.29)
PG & above	32 (6.49)	4 (2.35)	36 (5.43)
Total	493 (100.0)	170 (100.0)	663 (100.0)

Source: Field survey (2020-2021)

In the study area, it is found from Table 3.5.1 that the maximum percentage of the heads of households (37.10 percent) have an education level below class 10, that is, high school level. The minimum percentage is found above the PG level at 5.43 percent only. This result shows that the majority of the heads of households are not well-educated in the study area.

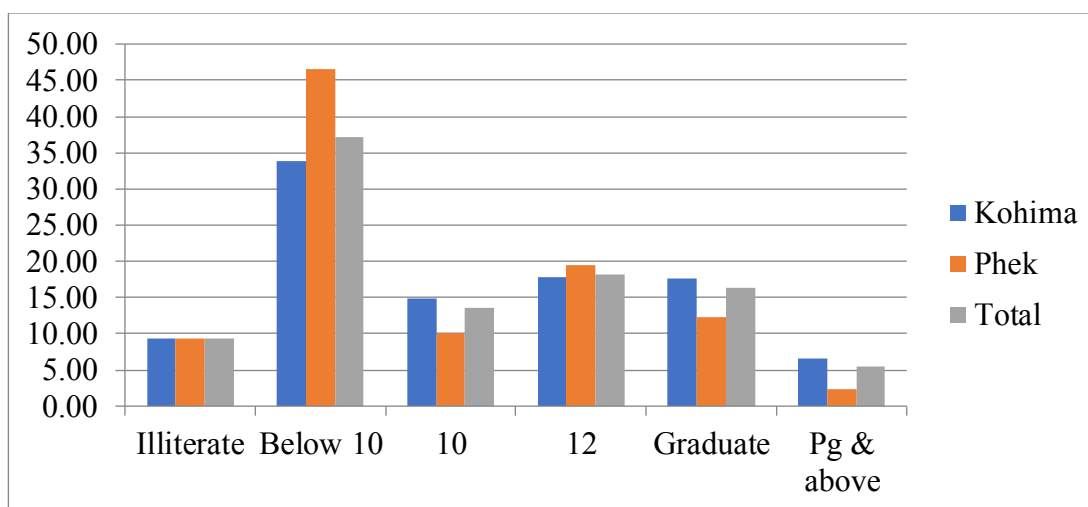


Figure 3.5.1: Distribution of households based on the education level of the head of household in the study area

In Kohima district, we can see from Figure 3.5.1 that 33.87 percent, that is, the maximum percentage of the head of household, have education below class 10, with only 6.49 percent having PG and above the level of education. In Phek district, as much as 46.47 percent, which is nearly half of the total head of households, have education below class 10, and only 2.35 percent have PG and above the level of education. Comparing the two districts, both districts has almost equal percentages of illiterate heads of households (9.33 and 9.41 percent). However, heads of households in Kohima district are found to be more educated than those in the Phek district.

3.5.1 Measurement of Diversification

Table 3.5.2: Diversification of households based on the education level of the head of household in the study area

Education level	Kohima	Phek	Overall
Illiterate	0.52	0.63	0.55
Below Class 10	0.50	0.51	0.52
Highschool Passed (Class 10)	0.44	0.55	0.46
Higher Secondary Passed (Class 12)	0.38	0.58	0.45
Graduate	0.22	0.48	0.29
PG & above	0.22	0.47	0.25

Source: Field survey (2020-2021)

On the basis of the education level of the head of households, the highest diversity level is found in the households with illiterate household heads (0.55 SDI), which is in a medium range of diversity (Table 3.5.2). Meanwhile, households with the highest educated head of households, that is, PG and above, are found to be the least diversified households with only 0.25 SDI. This shows that the education level of the head of the household negatively affects the household's decision to diversify their livelihood activities. The probable reason is that well-educated households are mostly confined to white-collar jobs with high returns, which remains sufficient for the living conditions of their households. In contrast, the illiterates are more vulnerable to low-paying blue-collar jobs with low returns, which compels them to adopt multiple activities for their livelihood expenses.

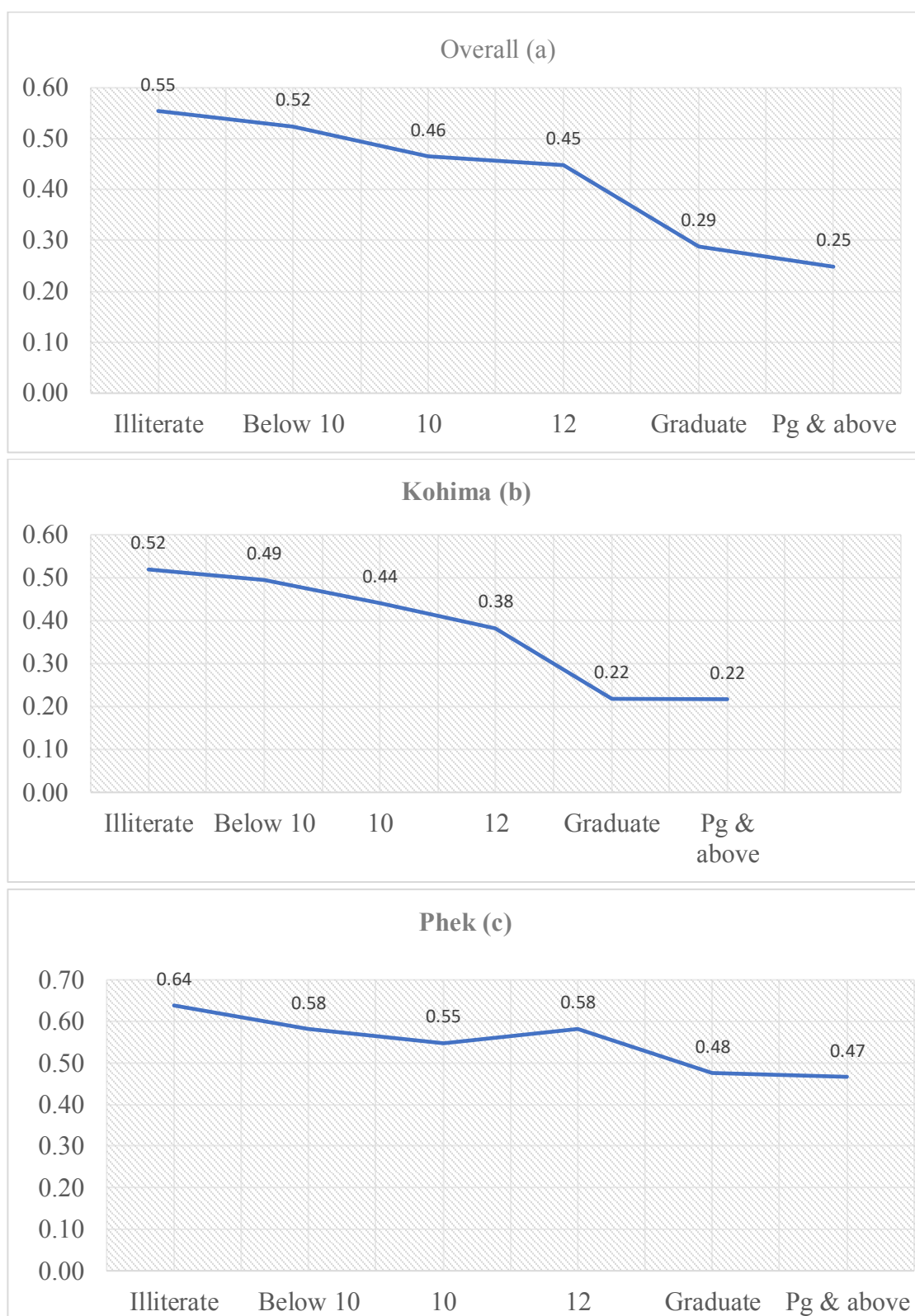


Figure 3.5.2: Diversification of households based on the education level of the head of household in the study area

This result is in line with the findings of Guite et al., (2022), who have found that higher educational attainment leads to specialization in few works for livelihood.

In Kohima district, households with illiterate heads of households are found to be more diversified (0.52 SDI) than their counterparts. The table above shows that the lower the education, the more their livelihood diversity, and the higher the education level, the lesser the diversity in their livelihood. The probable reason for this negative relation is that educated individual gets more opportunities to participate in higher-paying jobs. In contrast, uneducated individuals usually end up with low-paying jobs where they are required to find alternative sources of income. As expected, Figure 3.5.2 (b) shows that the relationship between the level of education and livelihood diversity is a downward-sloping curve.

Table 3.5.2 also shows that, in Phek district, households with the youngest head are found to be the most diversified with 0.63 SDI. Regardless of the education qualification of the head of households, it is also found that all the households diversify moderately. However, amongst all the households, households with head of household with education level PG & above was found to be the least diversified with only 0.47. As found above, there is also almost a downward sloping curve in Phek district showing an inverse relationship between education level and the households' decision to diversify; that is, illiterates are more diversified than educated households.

3.5.1.a Diversification within the three sectors in the study area

Table 3.5.3: Diversification of households in the three sectors based on the education level of the head of household in the study area

Education Level	Non-farm	Off-farm	Farm
Illiterate	0.69	0	0.66
Below Class 10	0.68	0.14	0.66
Highschool Passed (Class 10)	0.69	0.17	0.75
Higher Secondary Passed (Class 12)	0.51	0	0.67
Graduate	0.43	0	0.77
PG & above	0.44	0	0.75

Source: Field survey (2020-2021)

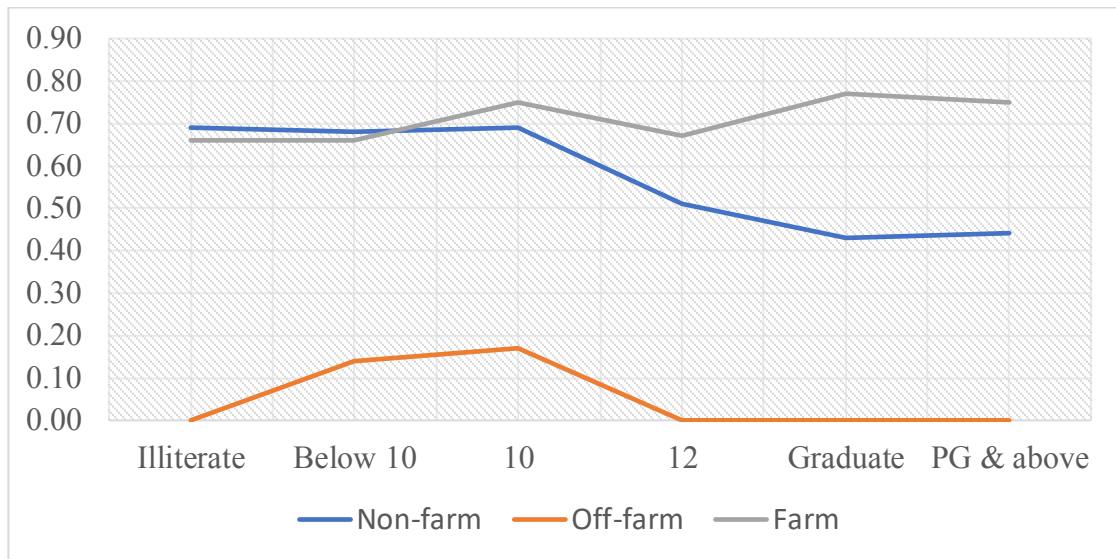


Figure 3.5.3: Diversification of households in the three sectors based on the education level of the head of household in the study area

From Table 3.5.3, it is seen that in the non-farm sector, households led by illiterate head are the most diversified with 0.69 SDI while households with the oldest head of household are the least diversified households with 0.44 SDI. This reason might be because of the fact that educated individuals mostly go for formal employment which are stable and have higher pays and therefore, they do not seek for any alternative jobs. However, the lesser educated individuals tend to seek for employment in different activities to earn for their livelihood, with also some engaging in multiple activities to enjoy their passion. Such as salesman, petty small businesses, selling of homemade crafts, tutors etc. From Figure 3.5.3, it is seen that the off-farm curve touches the x-axis throughout almost all educational group with few rises in below high school and high school passed group having 0.14 and 0.17 SDI. This shows that there is very little diversity in the off-farm sector which might be because they engage in only one type of activity. In the farm sector, households with high educated head are found to be the most diversified with 0.75 and the lower educated to be the least diversified (0.66 SDI). Educated ones have more knowledge about the potentiality and sustainability of the farm/agricultural resources, therefore, they make use of these resources and tries to extract the most out of it by adopting multiple farm activities.

3.5.1.b Diversification within the three sectors in Kohima district

Table 3.5.4: Diversification of households in the three sectors based on the education level of the head of household in Kohima district

Education Level	Non-farm	Off-farm	Farm
Illiterate	0.66	0.00	0.71
Below Class 10	0.69	0.07	0.69
Highschool Passed (Class 10)	0.68	0.25	0.72
Higher Secondary Passed (Class 12)	0.50	0.00	0.69
Graduate	0.41	0.00	0.76
PG & above	0.44	0.00	0.82

Source: Field survey (2020-2021)

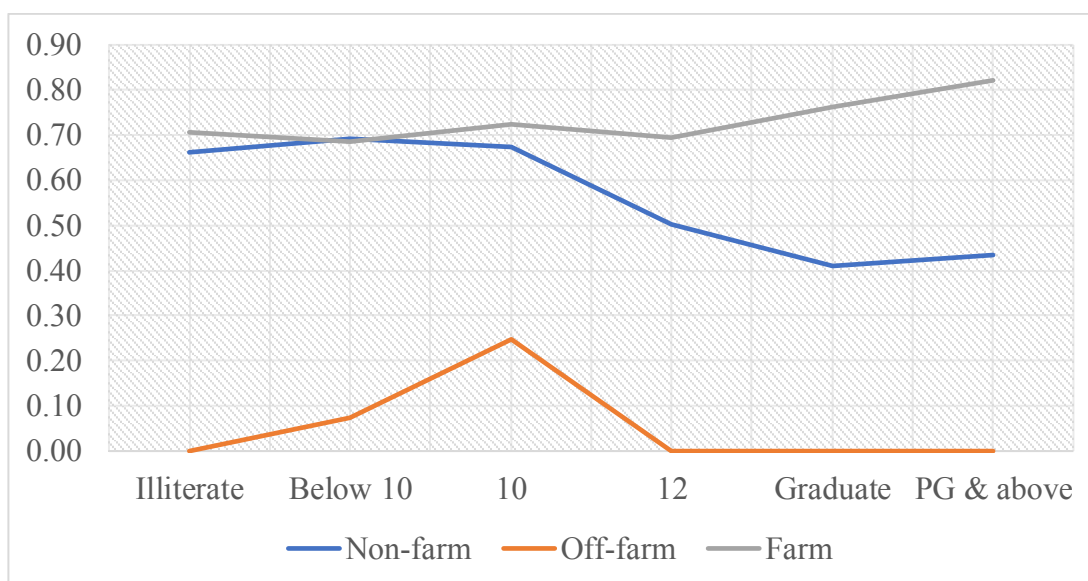


Figure 3.5.4: Diversification of households in the three sectors based on the education level of the head of household in Kohima district

From Table 3.5.4, it is seen that in Kohima, in the non-farm sector, households with lower educated heads of household are more diversified compared to the households with higher educated households. This may be because lower-educated households largely engage in multiple low-paying activities, which require less educational qualification. As seen in the table, there is very little or no diversity in the off-farm sector, which is also portrayed in Figure 3.5.4, where the off-farm curve

touches the x-axis almost throughout the curve. There is a rise and fall in the diversity level in the farm sector, showing that households with the highest educated heads have the highest diversity with 0.82 SDI. Higher educated households multiply their livelihood sources by adopting different farming activities such as organic farming, floricultural activities, and modern livestock rearing activities, which generate high revenue and require better knowledge.

Table 3.5.5: Diversification of households based on the education level of the head of household in the sampled villages of Kohima district

		Illiterate	Below 10	10	12	Graduate	PG & above	Total
Kohima village	%	9.47	32.84	15.68	17.46	17.75	6.80	100.0
	SDI	0.41	0.38	0.36	0.28	0.15	0.19	0.32
Nerhema	%	16.13	22.58	22.58	19.35	16.13	3.23	100.0
	SDI	0.67	0.70	0.60	0.66	0.49	0.00	0.62
Zisunyu	%	6.00	16.00	18.00	26.00	26.00	8.00	100.0
	SDI	0.67	0.66	0.64	0.47	0.39	0.48	0.63
Sechu village	%	8.11	55.41	5.41	13.51	12.16	5.41	100.0
	SDI	0.67	0.51	0.56	0.44	0.24	0.25	0.43

Source: Field survey (2020-2021)

From within the village level (Table 3.5.5), it is seen that Kohima village has the lowest diversity level with only 0.32 SDI in which they diversify moderately. It is followed by Secuma village with 0.43 SDI on the medium level, Nerhema with 0.62 SDI on the high level, and Zisunyu village as the highest diversified village with 0.63 on a high level of diversification.

It is seen from Table 3.5.6 that in the non-farm sector, households with illiterate heads are the most diversified households with 0.74 SDI and the least diversified with higher educated heads of households with 0.48 SDI. It is seen from Figure 3.5.5 that the off-farm curve touches the x-axis in all education level households with a short spike in below class 10 level with 0.26 SDI. This shows that there is zero diversity, which might mean that all the activities are just one type. Contrary to the non-farm

sector, in the farm sector, households with illiterate heads of households are the least diversified households with only 0.43 SDI. The probable reason may be that in such a household, with the lack of knowledge and guidance, members are mostly engaged in the same activity.

3.5.1.c Diversification within the three sectors in Phek district

Table 3.5.6: Diversification of households in the three sectors based on the education level of the head of household in Phek district

Education Level	Non-farm	Off-farm	Farm
Illiterate	0.74	0.00	0.43
Below Class 10	0.65	0.26	0.60
Highschool Passed (Class 10)	0.73	0.00	0.71
Higher Secondary Passed (Class 12)	0.53	0.00	0.59
Graduate	0.54	0.00	0.77
PG & above	0.48	0.00	0.67

Source: Field survey (2020-2021)

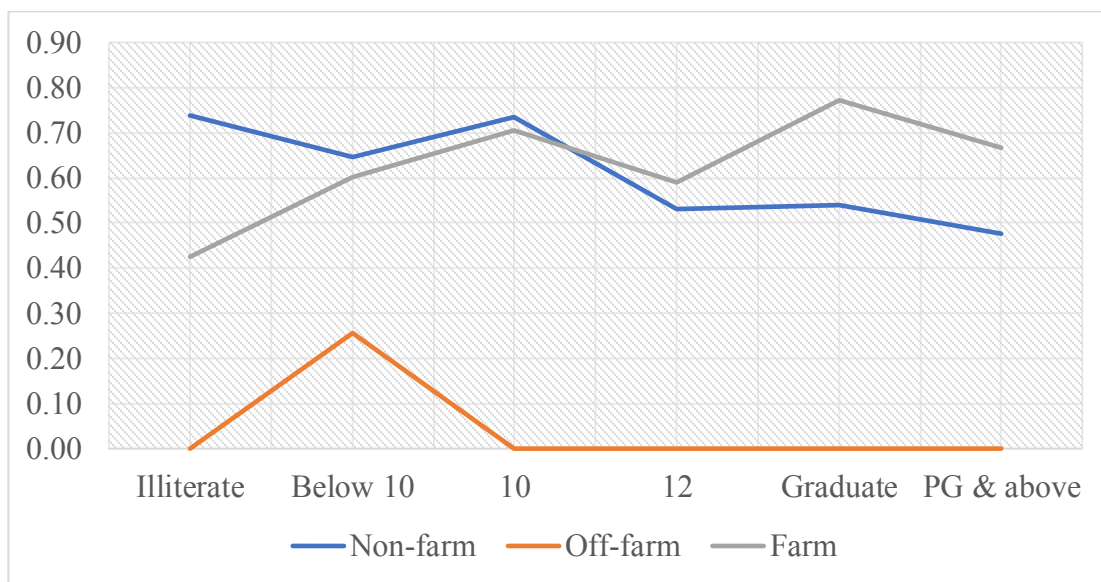


Figure 3.5.5: Diversification of households in the three sectors based on the education level of the head of household in Phek district

Table 3.5.7: Diversification of households based on the education level of the head of household in the sampled villages of Phek district

		Illiterate	Below 10	10	12	Graduate	PG & above	Total
Enhulumi	%	13.04	43.48	17.39	21.74	4.35	0.00	100.0
	SDI	0.67	0.64	0.66	0.59	0.67	0.00	0.62
Lasumi	%	22.73	54.55	9.09	13.64	0.00	0.00	100.0
	SDI	0.54	0.41	0.29	0.68	0.00	0.00	0.51
Pfutseromi	%	0.00	46.77	11.29	17.74	20.97	3.23	100.0
	SDI	0.00	0.51	0.42	0.67	0.53	0.53	0.54
Porba	%	12.70	44.44	6.35	22.22	11.11	3.17	100.0
	SDI	0.63	0.64	0.67	0.47	0.28	0.50	0.58

Source: Field survey (2020-2021)

From Table 3.5.7 it is seen that Enhulumi village is the most diversified village with 0.62 SDI, which is followed by Porba village with 0.58 SDI, Pfutseromi village with 0.54 SDI, and lastly, Lasumi village with 0.51 SDI. However, all the villages are found to have high diversity levels.

PART VI

3.6 HOUSEHOLD SIZE AND LIVELIHOOD DIVERSIFICATION

Table 3.6.1: Distribution of households based on household size in the study area

HH size	Kohima	Phek	Overall
<3	81 (16.43)	26 (15.29)	107 (16.14)
3-6	267 (54.16)	95 (55.88)	362 (54.60)
6-9	131 (26.57)	44 (25.88)	175 (26.40)
9 & above	14 (2.84)	5 (2.94)	19 (2.87)
Total	493 (100.0)	170 (100.0)	663 (100.0)

Source: Field survey 2020-2021)

From Table 3.6.1, it can be seen that more than half of the sampled households in the study area have up to 5 members of household (70.74 percent), and only around 29 percent of the sampled households have members above five members. The finding

shows that in the study area, the maximum percentage of the households are medium household size households.

3.6.1 Measurement of Diversification

Table 3.6.2: Diversification of households based on household size in the study area

HH size	Kohima	Phek	Overall
<3	0.54	0.45	0.52
3-6	0.38	0.60	0.46
6-9	0.41	0.53	0.44
9 & above	0.48	0.68	0.53

Source: Field survey (2020-2021)

Human resource is an important factor that determines livelihood diversification. It is expected that large family members will have the tendency to diversify more than the smaller household members by engaging in different livelihood activities. As expected, from Table 3.6.2, we can see that the highest household members are the highest diversified households in the study area with 0.53 SDI, which is a high level of diversity. It is also clear from Figure 3.6.1(a) that the relationship between household size and SDI is a U-shaped curve, which signifies that the household with the least and the highest household members engages in more diverse livelihood activities compared to the mid-member households.

Contrary to the expectation in Kohima district, it was found that households with the least household members are the most diversified with 0.54 SDI (Table 3.6.2), which means the chances of finding fewer member households in all three sectors of activities are high. Gebru et al., (2018) found a similar result, where they were of the opinion that all the members of a large family might not belong to the productive labor force. It can also be seen from Figure 3.6.1(b) that large member households diversify but less than expected, which is depicted in the U-shape curve, showing the relationship between household size and their decision to diversify.

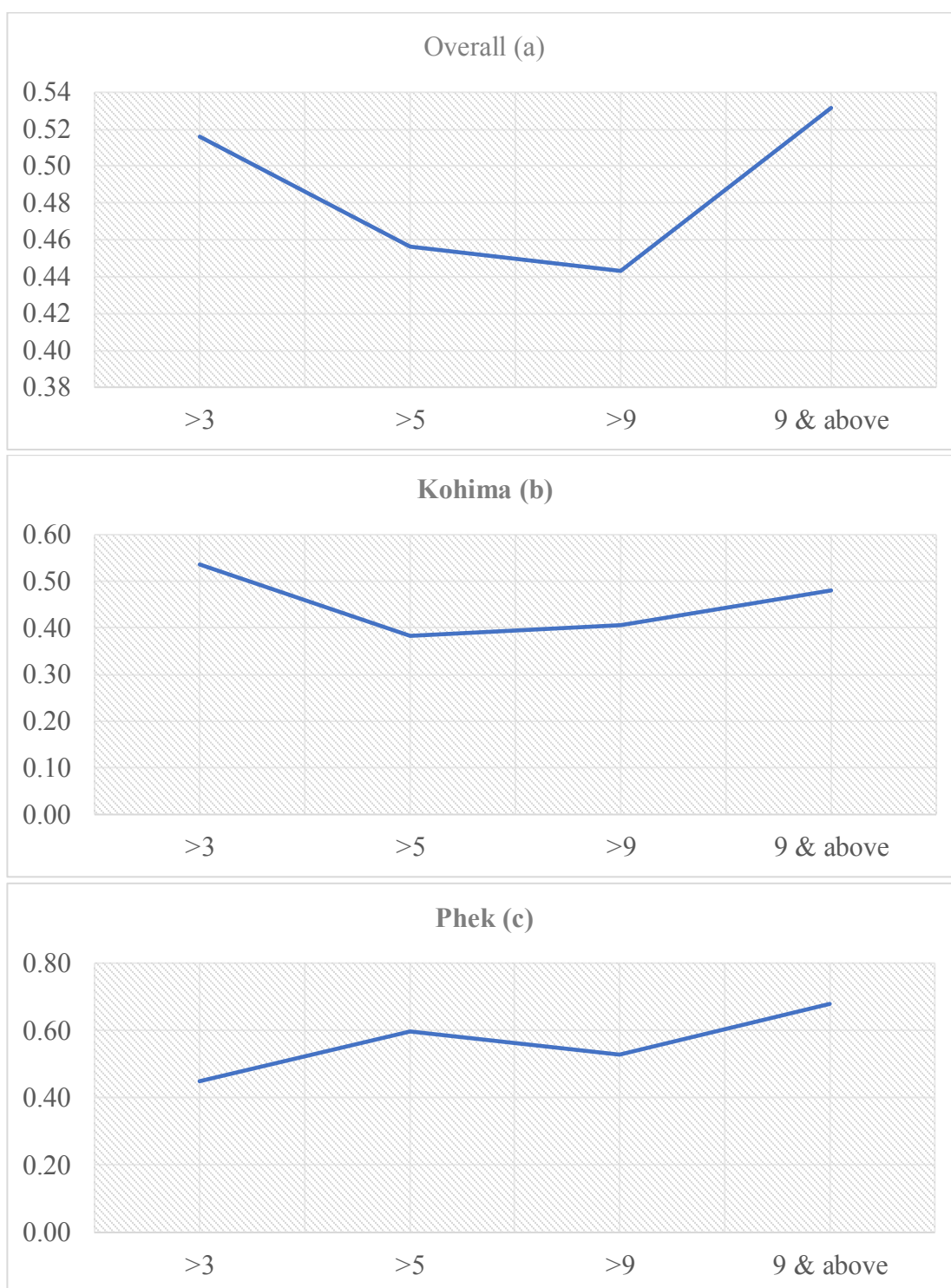


Figure 3.6.1: Diversification of households based on household size in the study area

In Phek district, households with the highest number of household members are the most diversified, with 0.68 SDI, whereas the least member households are the least diversified, with only 0.45 SDI. This result is in line with the findings of Bora

(2020), who found large member households to engage in multiple livelihood sources. The up-and-down fluctuating curve in Figure 3.6.1(c) shows that households with around five members are also highly diversified (0.60 SDI) but lower than the highest-membered households, which have 0.68 SDI. Households with around nine members have a diversity level of 0.53 SDI, which is higher than the least household members who have 0.45 SDI but lower than the other two household sizes.

3.6.1.a Diversification within the three sectors in the study area

Table 3.6.3: Diversification of households in the three sectors based on household size in the study area

HH size	Non-farm	Off-farm	Farm
<3	0.64	0.00	0.69
3-6	0.61	0.08	0.69
6-9	0.62	0.20	0.71
9 above	0.59	0.35	0.75

Source: Field survey (2020-2021)

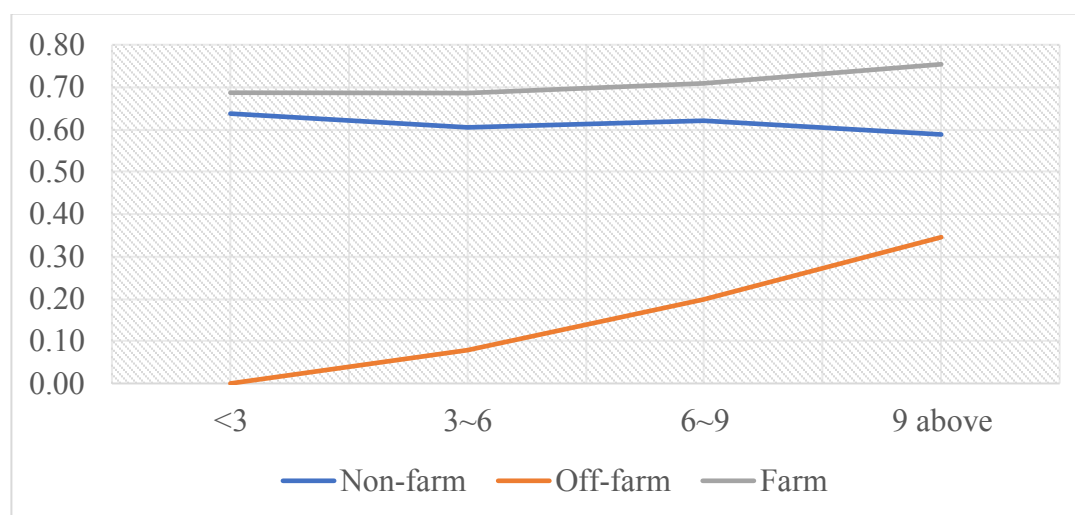


Figure 3.6.2: Diversification of households in the three sectors based on household size in the study area

In the non-farm sector (Table 3.6.2), the households in the study area with the least household members with 0.64 SDI are more diverse than their counterparts. However, these households were found to be the least diversified in the farm sector

(0.69 SDI), with no diversification in the off-farm sector. Households with the highest number of household members, on the other hand, were found to be the least diversified in the non-farm sector with 0.59 SDI, while the most diversified in both the off-farm (0.35 SDI) and farm sectors (0.75 SDI). Therefore, it can be seen from Figure 3.6.2 that the non-farm curve is a downward-sloping curve showing an inverse relation between the household member and their livelihood activities, whereas both the off-farm and farm sectors are upward-sloping curves from left to right, indicating a direct relationship.

3.6.1.b Diversification within the three sectors in Kohima district

Table 3.6.4: Diversification of households in the three sectors based on household size in Kohima district

HH size	Non-farm	Off-farm	Farm
<3	0.63	0	0.68
3-6	0.60	0.09	0.71
6-9	0.62	0.16	0.73
9 above	0.57	0	0.77

Source: Field survey (2020-2021)

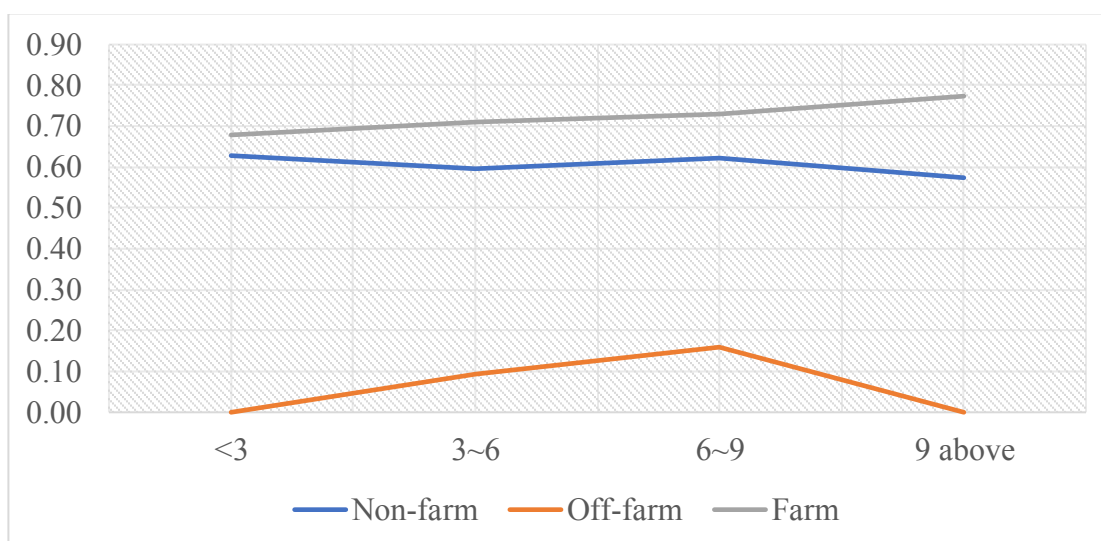


Figure 3.6.3: Diversification of households in the three sectors based on household size in Kohima district

From Table 3.6.4, it is seen that household size was found to affect each sector differently. The size of households in Kohima was found to have a negative relation with its diversification in the non-farm sector, which corresponds with the finding of Habib et al., (2023). The probable reason is that members are influenced to follow the family trend of employment as household size increases by engaging in the same line of activity. On the other hand, small member households earn their livelihood by engaging in different types of activities. In the off-farm sector, households with the least and the highest members have zero diversification, which can be clearly seen in Figure 3.6.3, where the inverted U-shaped curve touches the x-axis at its extreme ends. This may mean that these households engage in only the same type of activity or that they do not engage in any off-farm activity. There is a positive relationship between family size and their participation in farm activities. The result collaborates with the findings of Loison (2019), who found that households with more household members concentrate more on diversifying within the farm sector.

Table 3.6.5: Diversification of households based on the household size in the sampled villages of Kohima district

Villages	HH Size	<3	3~6	6~9	9 above	Total
Kohima village	%	14.20	55.33	27.81	2.66	100.0
	SDI	0.30	0.27	0.33	0.22	0.32
Nerhema	%	9.68	74.19	16.13	0.00	100.0
	SDI	0.76	0.62	0.67	0	0.61
Zisunyu	%	20.00	56.00	22.00	2.00	100.0
	SDI	0.44	0.40	0.47	0	0.40
Sechu village	%	27.03	39.19	28.38	5.41	100.0
	SDI	0.67	0.60	0.58	0.68	0.63

Source: Field survey (2020-2021)

On a deeper view of diversification on household size within the villages (Table 3.6.5), it is found that Sechu village has the highest diversification index (0.63), followed by Nerhema with 0.61, Zisunyu village (0.40) and Kohima village with only 0.32 SDI.

In Phek district, it can be seen from Table 3.6.6 that households with the least household members are the highest diversified both in the non-farm and farm sectors, with 0.66 and 0.78 SDI. Households with the highest members are found to be the most diversified households in the off-farm sector, with 0.7 SDI. The off-farm curve from Figure 3.6.4 shows an upward-sloping curve from left to right, which portrays a direct relation between household size and livelihood diversification activities.

3.6.1.c Diversification within the three sectors in Phek district

Table 3.6.6: Diversification of households in the three sectors based on household size in Phek district

HH size	Non-farm	Off-farm	Farm
<3	0.66	0	0.78
3-6	0.64	0.06	0.60
6-9	0.61	0.27	0.65
9 above	0.64	0.7	0.73

Source: Field survey (2020-2021)

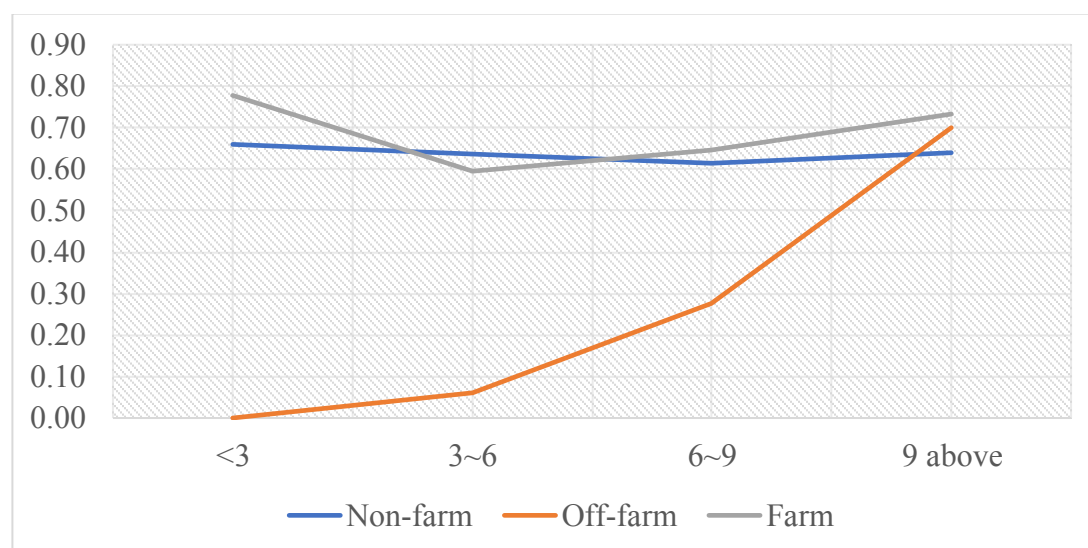


Figure 3.6.4: Diversification of households in the three sectors based on household size in Phek district

On studying the diversity village-wise (Table 3.6.7), the result shows that in the Phek district, Enhulumi village has the highest diversity level (0.62). It is followed by Porba village with 0.58 SDI, Pfutseromi (0.54), and Lasumi (0.51).

Table 3.6.7: Diversification of households based on the household size in the sampled villages of Phek district

Villages	HH Size	<3	3~6	6~9	9 above	Total
Enhulumi	%	4.35	56.52	30.43	8.70	100.0
	SDI	0	0.64	0.63	0.67	0.62
Lasumi	%	18.18	50.00	27.27	4.55	100.00
	SDI	0.43	0.57	0.30	0.67	0.51
Pfutseromi	%	19.35	61.29	19.35	0.00	100.0
	SDI	0.45	0.60	0.48	0	0.54
Porba	%	14.29	52.38	30.16	3.17	100.0
	SDI	0.54	0.59	0.56	0.75	0.58

Source: Field survey (2020-2021)

PART VII

3.7 REGRESSION ANALYSIS RESULT

A more robust approach, the Tobit regression model was used to confirm the validity of these results. The advantage of this model is that it censors the extreme ends which can create the problem of biasness. The regression result for determining the factors influencing livelihood diversification is presented in Table 3.7.1.

Using 663 observations from the overall study area, similar to the above findings, the regression showed that the gender of the household head and the education of the head of the household have a significant relationship with households' decisions for livelihood diversification. In the study area, the regression model was left censored on 276 observations, which were zero values of the dependent variables. The regression result indicates that female-headed households have a negative and

significant relationship with livelihood diversification. This means that, male-headed households have a higher chance of diversifying into multiple activities. The education of the head of the household also plays a huge role in households' decisions to diversify their livelihoods. Higher education paves the way for entry into higher-paying jobs, which shows a higher standard of living. However, people employed in these occupations are not likely to diversify their activities as they have sufficient income for consumption as well as for savings. Likewise, in the study area, households with household heads who are high school passed or have passed higher secondary or graduated are negatively significant with livelihood diversification. As the education level of the head of household increases, the diversity level of the household decreases. Household size and education level (primary and PG & above) carried expected signs, although not significant. It is expected that the larger the household size, the greater the diversification, as there will be more labor available to take up new activities. Though not significant, age is found to have a positive relation with diversification.

Household size is an important factor that contributes to the determination of livelihood diversification in rural areas. In Kohima district, 183 observations are left censored, which have zero value. Here, household size plays a positive significant role in determining livelihood diversification. With an increase in the number of members of a household, the diversity will increase by 2 percent. Education is seen to have a negative significant impact on diversification. With an increase in the level of education, the diversity level of the households decreases to 15 percent for the high school level, 41 percent for the higher secondary level, and 32 percent for the graduate level of education of the head of household. This signifies that households with better-educated heads do not prefer to engage in secondary or supplementary activities other than the primary activity. Although insignificant, as expected, the age and gender of the head of households were found to be negatively related to livelihood diversification. Households with younger heads and households headed by males will have a higher diversification index.

By applying left censoring on 83 observations, which have zero value of the dependent variables, households with the head of household education level high school passed and graduated were found to be negatively significant. Based on its

coefficient value, it is seen that the education level of the head of the household has a negative impact on the household's livelihood diversification. This signifies that households with literate heads of household or heads of households with years of schooling are found to be less diversified than those households with an illiterate head of household.

Table 3.7.1: Tobit regression result of determinants of livelihood diversification

Variables	Kohima	Phek	Overall
Age	-0.0003142	-0.0019987	0.0011525
Household size	0.028227**	0.0134293	0.0020003
Gender	-0.0737271	-0.0483436	-0.2078156***
Primary	-0.1248289	-0.1626208	-0.1383937
Highschool	-0.1507964**	-0.2248793*	-0.2948832***
Higher secondary	-0.4126038***	-0.1938712	-0.406678***
Graduate	-0.3244307***	-0.3009831**	-0.3157839**
PG and above	-2.477744	-0.209623	-0.3655915
Constant	0.0250292	0.8011352***	0.1655604
Pseudo R2	0.0831	0.034	0.0306
Observations	493	170	663
Log likelihood	-256.88549	-77.566358	-467.80946
Left-censored observation	sdi<=0.00 182	sdi<=0.00 3 87	sdi<=0.00 276

*Significant at 10% level, **Significant at 5% level, ***Significant at 1% level.

The plausible reason is that households that have an educated head of household are more likely to engage in specialized only a few high-paying jobs,

whereas households with less educated heads have the tendency to diversify their income sources, which are low-paying. This collaborates with the findings of Kassie et al., (2017), which also shows that rather than diversifying, educated households tend to specialize in different particular activities. Other regressors, such as gender and age of the head of household and household size, though insignificant but, carried expected signs. For example, both age and female-headed households have a negative impact on livelihood diversification, implying that with the increase in the age and households headed by females, the diversity of the household decreases. Household size, also though not significant, carries the expected sign, which may plausibly mean that the greater the number of household members, the greater the diversification.

CONCLUSION

The determinants of livelihood diversification have been analyzed in this chapter. With 95.40 percent of employed male-headed households in the study area, gender was found to play a moderate role in the study area in determining livelihood diversification, and female-headed households are found to be less diversified than male-headed households. However, sector-wise, female-headed households are found to be more diversified in the farm sector than male-headed households.

The age of the head of the household plays different roles in determining livelihood diversification at different age groups. In the overall study area, households with the youngest age group and mid-age group were the most diversified. Sector-wise, households with the oldest age groups are the most diversified in the non-farm and off-farm sectors. Meanwhile, in the farm sector, households with mid-age heads are found to be the most diversified.

Levels of education have varying impacts on livelihood diversification. Accordingly, in the study area, the level of education negatively impacts the household decision to diversify. That is, the higher the education qualification, the lower the diversity level. Likewise, in the non-farm sector, education has a negative relationship with households. On the contrary, in the farm sector, education is found to have a positive relationship with the household decision to diversify.

The workforce is an important element for diversification. In the study area, the size of the household has a U-shaped relationship with livelihood diversification. Sector-wise, non-farm and farm sectors have an almost straight-line relationship with livelihood diversification, with an upward-sloping curve between off-farm and livelihood diversification.

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Appendix

Table A 3.1: Employment of head of households in the study area

	Overall		Kohima		Phek	
Gender	Male	Female	Male	Female	Male	Female
Employed	519 (95.40)	102 (85.71)	373 (94.67)	84 (84.85)	146 (97.33)	18 (90.0)
Unemployed	25 (4.60)	17 (14.29)	21 (5.323)	15 (15.15)	4 (2.67)	2 (10.0)
TOTAL	544 (100.0)	119 (100.0)	394 (100.0)	99 (100.0)	150 (100.0)	20 (100.0)

Source: Field survey (2020-2021)

CHAPTER 4

IMPACT OF LIVELIHOOD DIVERSIFICATION ON HOUSEHOLD INCOME

4. INTRODUCTION

From the viewpoint of various empirical experiences, policymakers, and available theories, livelihood diversification is deemed to be an action of escaping from financial difficulty and poverty. Rural households, especially, are envisaged to diversify their livelihood activities under certain internal resources and external conditions. Generally, diversifying livelihood activities takes place as a consequence of impermanence, uncertainty, and instability in income and risk terrify. Furthermore, it is also an approach to cope with the problem of diminishing marginal returns to labor in areas where there is seasonal unemployment (Tran & Nguyen, 2014). Therefore, poorer households are presumed to have a more diverse source of income compared to richer households.

Diversification of livelihood is a channel through which people attempt to earn better income through various income-generating activities. It is the core strategy for households if their primary source of income fails. It lowers the risk of income failure and enables a household to save for precautionary or speculative motives. The outcome of livelihood diversification is not homogeneous for all the diversifiers, as the outcome also depends on the motive of the decision to diversify. Literature showed that the heterogeneity of the outcome of livelihood diversification also triggers income inequality in some cases. Despite all these facts, it remains ambiguous whether livelihood diversification is an ideal solution to enhance household income. Therefore, this chapter will discuss how livelihood diversification impacts the income of the households in the study area, the extent of livelihood diversification in different income groups, the distribution of income, and the motive behind their household diversification.

This chapter is divided into four parts. Part I discusses the methodology and the variables used in this chapter. Part II emphasizes the impacts of livelihood diversification on various variables. Part III deals with the share of income and income

inequality in the study area. Part IV highlights the main motive for the people to diversify their livelihood activities and Part V examines the constraints by the respondent to diversify their livelihood.

PART 1

4.1 METHODOLOGY

4.1.1 Two staged Least Square Regression Model

To determine the impact of livelihood diversification on income, a two-stage methodology was adopted. As specified by Gujarati (2003), estimating equation models with explanatory variables that is/are endogenous may result in simultaneous equation bias as these endogenous explanatory variables become stochastic and correlated with the disturbance term. Therefore, in this situation, the correct approach is to construct a simultaneous equation and estimate it by a two-stage least square method. The livelihood diversification index and total income are simultaneously dependent on similar household socio-economic variables, and therefore, this justifies the use of the two-stage least square regression technique. The model is specified as follows:

$$Y_i = \beta_0 + \beta_1 LDI + \beta_2 x_2 + \dots + \beta_k x_k + \epsilon_i \quad \dots (1)$$

Where y is logged total income; β_0 is the constant term; β_1 , β_2 , and β are parameters to be estimated; LDI is the Livelihood Diversification Index; x 's are the independent variables, and ϵ is the error term. In the equation, β_1 is the main parameter as it estimates the impact of livelihood diversification on income. A significant and positive value of the β_1 would indicate that livelihood diversification has a high impact on income and vice versa.

The variables on the right-hand side are closely exogenous. However, in actual fact, there is the potentiality of endogeneity issues in livelihood diversification as diversification may cause an increase in income, and higher incomes will have the capability to diversify their livelihood activities. The consequence of this is that when the OLS regression is directly used in equation (1), the presence of this endogenous variable may produce biased and inconsistent results. Therefore, to cope with this

potential endogeneity bias issue of LDI, the Two Stage Least Square (2SLS) model with instrumental variable is used to estimate the impact of livelihood diversification on income. The advantage of using the 2SLS is that it estimates all the parameters of the equations in the model simultaneously. The instrumental variable should, therefore, satisfy two conditions: (i) the Instrumental variable be positively or negatively related to the endogenous variable, and (ii) the Instrumental variable is uncorrelated with the disturbance/ error term. Therefore, in this study, the number of employment in the farm sector is used as the instrumental variable.

Therefore, the first stage of estimation, as shown in equation (2), demonstrates the impact of a number of activities in non-farm, off-farm, and farm sectors, as well as some other variables on livelihood diversification. The number of farm employment is used as an instrumental variable to prevent the problem of endogeneity. The first stage model is as follows:

$$S = \beta_0 + \beta_1 X_1 + \beta_2 I_1 + \varepsilon \quad \text{..... (2)}$$

Where LDI is the Livelihood diversification Index as the dependent variable, β_0 is the constant term, X_1 is the set of independent variables, I_1 is the Instrumental variable, and ε is the error term.

In the Second stage, equation (3) was estimated where the total household income is regressed against the predicted value of SDI and the other independent variables. The dependent variable in equation (2), which is the livelihood diversification index, is used as an independent variable in equation (3).

$$\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 \hat{S} + \varepsilon \quad \text{..... (3)}$$

Where $\hat{Y}$ is the total log of respective income of the households; β_0 is the constant term, X_1 is the set of independent variables, $\hat{S}$ is the predicted value of SDI, and ε is the error term.

The existence of a severe multicollinearity problem between the variables was checked using the variance inflation factor (VIF). The VIF result revealed that each coefficient of the parameter is less than 10 indicating that the data have no serious problem of multicollinearity.

4.1.2 Linear regression

Simple Linear Regression was used to check the relationship between the different income groups and the level of diversification:

$$Y = \beta + \beta_1 X + e$$

Where,

Y= level of diversification

X= the income level groups (quartiles)

β = the coefficients of the variables

e= the error term

4.1.3 Decompose Gini Coefficient

The Gini coefficient decomposition analysis method was used to identify the inequality in the distribution of income and the correlation of each source with the total income. This analysis is one of the most commonly used methods for examining how a specific source of income impacts overall income inequality. For example, if the income from non-farm contributes the largest share to the total income and is unequally distributed (i.e., concentrated to the higher income group), this is likely to increase income inequality. However, if another source of income has a negative correlation with the total income (concentrated in the lower income group), then there is the possibility that this share might help to equalize total income.

The decomposed Gini coefficient proposed by Lerman & Yitzhaki (1985) is used which analyses the share of the income sources in total income and its correlation with the total income. The decomposed Gini coefficient is as follows,

Assuming that y_k is income (y) from source k (for example, farm income), the total income of the household y_o can be written as:

$$y_o = \sum_{k=1}^K y_k, \quad k = 1 \dots K$$

The Decompose Gini coefficient for total household income G_o as proposed by Adams & Mnsed (1999); Pyatt et al., (1980) can be represented as:

$$G = \sum_{k=1}^K S_k G_k R_k \dots (1)$$

$$G = \sum_{k=1}^K [m_k/m] \times [2Cov(y_k, F_k)/m_k] \times [Cov(y_k, F(y_o))/Cov(y_k, F(y_k))] \dots (2)$$

Where,

G is the Gini coefficient of income inequality and $F(y_o)$ and $F(y_k)$ denotes the distribution of the total income and the income from source k , respectively.

$S_k : [m_k/m]$. This is the share of income from source k (y_k) in the total income (y_o). The value of S_k is always positive and less than 1.

$G_k : [2Cov(y_k, F_k)/m_k]$. This is the Gini coefficient indicating the inequality in total income from source k . The value of G_k exhibits the case of income from source k , whether it increases or decreases the total income inequality. This value always remains positive and can be greater than 1 when there is negative in any of the income sources.

$R_k : [Cov(y_k, F(y_o))/Cov(y_k, F(y_k))]$. This is the correlation between income source k and the total income. It gives the degree and strength of the relationship between the income source and the total income. The value of R_k ranges from -1 and +1.

According to Strak et al., (1986), this decomposition provides an intuitive interpretation:

- a) The importance of the share of an income source with respect to the total income (S_k).
- b) The distribution of income source, whether it is equally or unequally distributed (G_k).

- c) The correlation between the income source and the distribution of total income (R_k).

4.1.4 Responses Priority Index

The Responses Priority Index (RPI) was used to identify the constraints faced by households in terms of livelihood diversification. There was an issue in quantifying the constraints expressed by the households, particularly regarding whether importance should be assigned to the highest frequency of responses to a constraint in the first priority or the number of responses to a particular constraint. As both lead to different conclusions, to resolve this problem, a product of the Proportion of Responses (PR) and Priority Estimate (PE) was used to construct the Responses Priority Index (RPI) (Alidas et al., 2020; Mehta et al., 2022; Rao, 2011). Where PR for the i^{th} constraint gives the ratio of the number of responses for a particular constraint to the total responses. The equation will be shown below:

$$(RPI)_i = \frac{\sum_{j=1}^k f_{ij} \cdot X_{[(k+1)-j]}}{\sum_{i=1}^1 \sum_{j=1}^k f_{ij}} \quad 0 \leq RPI \leq 5$$

Where,

RPI_i = Response Priority Index for i^{th} constraint

f_{ij} = Number of responses for the j^{th} priority of the i^{th} constraint

$\sum_{j=1}^k f_{ij}$ = Total number of responses for the i^{th} constraint

k = Number of priorities i.e. 5

$X_{[(k+1)-j]}$ = Scores for the j^{th} priority (I, II, III, IV, V)

$\sum_{i=1}^1 \sum_{j=1}^k f_{ij}$ = Total number of responses to all the constraints

$\sum_{i=1}^1 RPI_i$ = Summation of RPI for all constraints

Here, the larger the value of RPI, higher the value of the particular constraint hindering livelihood diversification.

4.1.5 Hypothesis

Higher-income groups have higher livelihood diversification.

4.1.6 Descriptive characteristics of the diversified and undiversified households

The socio-economic characteristics of the diversified and undiversified households, such as the age, gender, marital status, and education of the head of household and the family type, total income of the household per month, and the household size, are described in Table 4.1.1. A higher percentage of the heads of households were found to be middle-aged, and the chi-squared result reveals a significant difference between the age of the heads of the diversified and undiversified households ($\chi^2 = 11.571$; $p=0.072$). As for the gender, the gender of household heads of the diversified and the undiversified was found to be statistically the same.

Table 4.1.1: Descriptive statistics of the diversified and the undiversified households

Characteristics	Diversified (%)	Undiversified (%)	Chi-square
Age			
25-35	14.51	9.75	11.571*
35-45	23.83	19.49	
45-55	23.83	30.69	
55-65	25.13	22.38	
65-75	6.74	10.83	
75-85	4.15	6.14	
Above 85	1.81	0.72	
Gender			
Male	78.71	82.07	0.811
Female	21.29	17.93	
Marital Status			
Married	71.17	80.94	6.611*
Unmarried	7.27	2.16	
Divorced	3.64	1.08	
Widow	17.92	15.83	

Educational Qualification			
Illiterate	6.79	12.59	23.71***
Primary passed	35.25	39.21	
Highschool passed	11.75	16.91	
Higher secondary passed	18.54	17.63	
Graduate	21.15	10.07	
PG & above	6.53	3.60	
Family type			
Nuclear	94.04	96.04	2.023
Joint	5.96	3.96	
Income			
0-20000	23.32	15.52	23.474***
20000-40000	23.32	35.02	
40000-60000	16.84	24.55	
60000-80000	14.51	8.66	
80000 & above	22.02	16.25	
House size			
<3	24.87	25.47	18.815***
<6	55.96	43.07	
<9	17.62	27.72	
9 & above	1.55	3.75	

Source: Field Survey (2020-2021)

The chi-squared result also revealed that there is a significant difference in the marital status of the diversified and the undiversified households ($\chi^2=6.611$; $p0.085$). Regarding the education of the heads of households, a greater percentage of the diversified heads of households were found to have higher education. The Chi-square test shows a significant difference in the education of the head of household between the diversified and the undiversified households ($\chi^2=23.71$; $p0.000$). The majority of the households are nuclear families, and no significant difference was found between the diversified and the undiversified households based on family type. In terms of the monthly income of the households, the result of the chi-square test also revealed a

significant difference in the income between the two groups ($\chi^2=23.474$; $p<0.000$). The test also showed a significant difference between the diversified and the undiversified households in terms of household size ($\chi^2=18.815$; $p<0.001$). The undiversified households were found to have greater family size than the diversified households.

PART II

4.2 IMPACT OF LIVELIHOOD DIVERSIFICATION ON INCOME

4.2.1 Impact of livelihood diversification on the overall study area

Following Adelekan & Omotayo (2017), Bierkamp et al. (2021), and Gebreyesus (2016), the Two-Stage Least Square methodology was adopted to analyze the impact of livelihood diversification on the income of the households. This is an extension of the OLS method. To analyze the impact, first, the independent variables are regressed against the value of SDI as the dependent variable, as shown in Equation 2. In the second stage, equation 3 was estimated where the predicted value of livelihood diversification index (SDI) was used as an endogenous independent variable with log total household income as the dependent variable. The interpretations of the regressions will be discussed below.

In the first stage of the regression, the R^2 with 44 percent proved the model to be a good fit. In the first stage, livelihood diversification is regressed against the selected variables, which are the age, gender, and education qualification of the head of households, number of employments in the non-farm, off-farm, and farm sectors, and the size of the households. This regression is done to get the predicted value of the SDI. The existence of a severe multicollinearity problem between the variables was checked using the variance inflation factor (VIF). The VIF result revealed that each coefficient of the parameter is less than 10 indicating that the data have no serious problem of multicollinearity.

The regression from Table 4.2.1 shows that the household size and high school passed head of household has a significant negative impact on livelihood diversification at 1% level of significance. Whereas gender, the number of employments in the off-farm sector and farm sector has a significant positive impact

on livelihood diversification at 1% and 5% levels of significance. A unit increase in the number of employments in the off-farm and farm sector increases the diversity by 0.18 and 0.17 units of diversity level.

Table 4.2.1: First-stage OLS regression results of LDI

Dependent Variable: Livelihood Diversification Index

$R^2 = 0.44$

$F=47.43$ (0.00)

Mean VIF = 1.234

Variables	Coefficient	Std.Error	t-value
Gender	.0663185	.02432	2.73***
Age	.000852	.0007239	1.18
Education			
Primary	-.0248903	.0342034	-0.73
Highschool passed	-.0746967	.0342861	-2.18**
Higher Secondary Passed	-.0483557	.0382257	-1.27
Graduate	-.025818	.0461074	-0.56
PG & above	.0300755	.0780338	0.39
Household size	-.0172211	.0051406	-3.35***
Non-farm	-.0083365	.008809	-0.95
Off-farm	.1807002	.0183327	9.86***
Farm	.1743137	.0099722	17.48***
Constant	.1040983	.0548556	1.90**

Source: Field survey (2020-2021)

***, **, * indicates 1 percent, 5 percent and 10 percent significance

In the 2nd stage of the SLS, the log total household income is regressed with the predicted SDI and other socio-economic variables (Table 4.2.2). The model is a good fit with 52 percent R^2 and 65.69 F values. The Durban-Hausman test was used to test for endogeneity. The test result shows the p-value to be .0006 which rejects the null hypothesis that all the variables are exogenous and confirms the fact that there exists an endogeneity problem. Therefore, the IV method was used to remove this endogeneity problem. The income from farm activities is taken as the instrumental variable. In the model, the Hansen J statistic is applied to test the validity of the instruments which shows that there is no over-identification. Also, a high value of the

F-test (305.995) shows that the instruments are strong enough. The Variance Inflation Factor (VIF) was used to test for multicollinearity. The mean of the value of VIF was less than 10 which rejects the possibility of potential multicollinearity in the data.

Table 4.2.2: Second-stage OLS regression estimates of total income.

Dependent Variable: Log total household income

Variable	Coefficient	Std.Error	t-value
predicted SDI	.3903698	.1426328	2.74***
Gender	.1171206	.061827	1.89*
Age	.0020346	.001816	1.12
Education			
Primary	.21256	.0854726	2.49**
Highschool passed	.3899625	.0867877	4.49***
Higher secondary passed	.6521143	.0961351	6.78***
Graduate	.7426272	.1151816	6.45***
PG & above	1.262903	.1942889	6.50***
Household size	.0700331	.0126664	5.53***
Non-farm	.369983	.0221661	16.69***
Off-farm	-.0660296	.0526662	-1.25
Constant	8.952703	.1385462	64.62***
Model summary			
F value (p-value)	305.995 (0.000)		
Durbin (score) chi2	11.7376 (p=0.0006)		
Wu-Hausman F (1,654)	11.787 (p=0.0006)		

Source: Field survey (2020-2021)

***, **, * indicates 1 percent, 5 percent and 10 percent significance

Livelihood Diversification Index: After controlling the endogeneity problem, the result of the regression shows that livelihood diversification has a positive significant impact on the income of the household. From the table, it is seen that as SDI increased by one unit, the value of the total income increased by 0.39 units.

Some of the other significant household characteristics in the total income equation are:

Gender: The gender of the head of the household also impacts the household's income. From the table, it is seen that male heads of household have a positive impact on the income of households at a 10% level of significance. A household with a male head of household increases the income of the household by 0.117 units.

Education: The education level of the head of the household impacts the income of the household differently. They are discussed below.

Primary passed: A head of a household with primary education, that is, less than 6 years of schooling, has a positive impact on the income of the household at a 5% level of significance. A head of household with primary education will have an increase in the household income by 0.212 units.

High school passed: Head of household with less than 13 years of schooling (High School passed) also positively affects the income of the household at a 1% level of significance. A head of a household with high school level education will have an increase in the household income by 0.389 units.

Higher secondary passed: Heads of households who have higher secondary degrees also have a positive significant impact on the income of the household at a 1% significance level by 0.65 units.

Graduate: A graduate head of household has a positive significant impact on household income at a 1 % level of significance. A graduate head of household will have an increase in the household income by 0.742 units.

PG and above: The head of household having an education degree postgraduate and above has a positive significant impact on the income of the household by 1.26 units at a 1% significance level. This signifies that the higher the education level of the head of household, the higher the income of the household. The probable reason is that, with the increase in the education level, there is specialization in the occupation, which is high paying and ultimately increases the income of the household. In other words, the higher their education, the higher the income they enjoy.

Household size: The size of the household was found to have a positive impact on the income of the household at a 1% level of significance. A unit increase in the household size will increase the income by 0.07 units.

Number of employment in the non-farm sector: The number of employment in the non-farm sector has a positive significant impact on the income of the household at a 1% significance level. A unit of increase in the employment in the non-farm sector will have a 0.369 unit increase in the income of the household.

4.2.2 Impact of livelihood diversification on Kohima district

Table 4.2.3: First-stage OLS regression results of LDI in Kohima district

Dependent Variable: Livelihood Diversification Index

$R^2 = 0.611$ $F = 68.78$ Mean VIF = 1.298

Variables	Coefficient	Std.Error	t-value
Gender	.0233219	.0155171	1.50
Age	-7.85E-06	.0005209	-0.02
Education			
Primary	-.0474367	.0227147	-2.09**
Highschool passed	-.0409775	.0215138	-1.90*
Higher secondary passed	-.0817912	.0247328	-3.31***
Graduate	-.0678632	.0323614	-2.10**
PG & above	-.0946481	.0554799	-1.71***
Household size	.0036001	.0036001	0.29
Non-farm	-.0065518	.0057232	-1.14
Off-farm	.1305013	.0124462	10.49***
Farm	.144054	.0067005	21.50***
Constant	.0785412	.035131	2.24**

Source: Field survey (2020-2021)

***, **, * indicates 1 percent, 5 percent and 10 percent significance

In the first stage of OLS for Kohima district, the R^2 is 61 percent, which is a good fit for the model. Here, the livelihood diversification Index is regressed against the other variables (Table 4.2.3). The table shows that the number of employments in

the off-farm and farm sectors has a significant positive impact on livelihood diversification at 1% significant levels. An increase in the number of employment in the off-farm sector will increase livelihood diversification by 0.13 units and an increase in employment increase in the farm sector will increase livelihood diversification by 0.14 units. Education of the head of households at all levels was found to have a significant negative impact on the income of the household.

The Durbin-Hausman test was used to test for endogeneity. The test result shows that there is no endogeneity problem in the dataset for Kohima district. Since the right-hand side contains only exogenous variables and is uncorrelated with the disturbance term u_i , the OLS can be applied straightforwardly. Therefore, in the analysis for Kohima district, the OLS regression with log income as the dependent variable is applied directly. Table 4.2.4, shows the significance of the relationship between log household income and livelihood diversification in Kohima district with a value of 0.54 percent R^2 indicating a good fit for the equation. The VIF of each of the parameters was found to be less than 10 with an F value of 48.11.

Livelihood Diversification Index (LDI): In Kohima district, it was found that livelihood diversification does not have a significant impact on the income of the households. Though not significant, the coefficient was found to be a negative value signifying a unit increase in livelihood diversification will have a 0.03 unit decrease in the household total income. This negative impact of livelihood diversification on household income confirms that in Kohima district, a household having multiple activities does not allow households to have a higher income than undiversified (specialized) households.

There are a few justifications for this result. One reason may be that the multiple activities people are engaged in pay less or, in other words, that there is less return on those activities. Another reason may be that higher-income households do not diversify as they are yielding enough income and are comfortable with their level of income. It may also be the case that there is less opportunity in the high-return sector for a person to engage, though they have the required asset base.

Table 4.2.4: OLS regression estimates of total income in Kohima district

Dependent Variable: Log total household income

Variable	Coefficient	Std.Error	t-value
SDI	-.0303942	.1972833	-0.15
Gender	.1728306	.067296	2.57**
Age	.004363	.0022539	1.94*
Education			
Primary	.24109	.0987254	2.44**
Highschool passed	.3611892	.0934354	3.87***
Higher secondary passed	.7752135	.1082228	7.16***
Graduate	.9265572	.1406587	6.59***
PG & above	1.471067	.2407731	6.11***
Household size	.0657945	.0155781	4.22***
Non-farm	.3313316	.0247966	13.36***
Off-farm	.0056699	.0596898	0.09
Farm	.065424	.0405975	1.61
Constant	8.944887	.152791	58.54***

Source: Field survey (2020-2021)

***, **, * indicates 1 percent, 5 percent and 10 percent significance

This result coincides with the findings of Gautam & Andersen (2016), who found that livelihood diversification does not contribute to the well-being of the people as diversifying into high-return activities depends on a household's available resources and assets, which makes it unable for the poor to get involved and thus are forced to proceed with their low return diversification. Iiyama (2006) also stated that it is impractical to expect capital-lack poor households to adopt multiple livelihood strategies with high financial gains.

Gender: The male gender of the head is seen to have a positive impact on the income of the household at a 5 % level of significance. A household with a male head of household increases the income of the household by 0.17 units.

Age: The age of the head of household was also found to have a positive significant impact on the income of the household at 10% level of significance. As the age of the head of household increases by a unit, the household income increases by 0.004 units.

Education: The education level of the head of the household impacts the income of the household in different values. However, it is seen that with the increase in the education of the head of household, its impact on income also increases. A head of household with a primary level of education increases the household's income by 0.24 units at 5% level of significance, a household with a high school passed head of household will have 0.36 units increase in income, and households with higher secondary school passed heads have 0.77 units increase in income. Also heads of households with graduate degrees and PG and above degrees have an increase in the income of the household by 0.926 units and 1.47 units at 1% levels of significance.

Household size: As expected, the number of members of the household positively impacts the income of the household at a 1% level of significance. The result shows that as the member of a household increases by 1 unit, the total income increases by 0.657 units. This may be because of the fact that as member of the household engages in different activities, their income from these multiple activities enhances their total income.

Number of employments in the non-farm sector: The result shows a clear positive association between the number of employments in the non-farm sector and the income of the household. A unit increase in the number of employment in the non-farm sector increases the income by 0.331 units.

In the first stage of OLS regression for the Phek district, it was found that only the number of employments in the off-farm and farm sectors are significant variables that are positively significant at a 1 % level of significance. The model is a good fit with an R^2 of 61 percent and an F value of 68.78 (Table 4.2.5). A unit increase in the off-farm and the farm sectors will increase livelihood diversification by 0.269 units and 0.196 units.

4.2.3 Impact of livelihood diversification on Phek district

Table 4.2.5: First-stage OLS regression results of LDI in Phek district

Dependent Variable: Livelihood Diversification Index

$R^2 = 0.33$ $F = 6.93$ (0.00) Mean VIF = 1.492

Variables	Coefficient	Std.Error	t-value
Gender	.0680584	.0938344	0.73
Age	-.0010659	.0020231	-0.53
Education			
Primary	-.077725	.1077469	-0.72
Highschool passed	-.0961991	.1382689	-0.70
Higher secondary passed	-.0171399	.1368103	-0.13
Graduate	-.0570895	.1521223	-0.38
PG & above	.1675776	.2298088	0.73
Household size	-.025243	.0232025	-1.09
Non-farm	.0092671	.0308572	0.30
Off-farm	.2691046	.0530895	5.07***
Farm	.1961005	.0314359	6.24***
Constant	.3023595	.18814	1.61

Source: Field survey (2020-2021)

***, **, * indicates 1 percent, 5 percent and 10 percent significance

The 2nd stage of the OLS regression for Phek district is shown in Table 4.2.6. For testing endogeneity issue, the Durban-Wu-Hausman test was applied which shows a test result of p-value 0.0001 which rejects the null hypothesis that all the variables are exogeneous and confirms the fact that there exists an endogeneity problem. Therefore, the IV method was used remove this endogeneity problem. The income from farm activities is taken as the instrumental variable. In the model, the Hansen J statistic is applied for testing the validity of the instruments, which shows that there is no over-identification. Also, F-test value of 38.914 shows that the instruments are strong enough. The Variance Inflation Factor (VIF) was used to test for multicollinearity. The mean of the value of VIF was less than 10 which rejects the possibility of potential multicollinearity in the data. In this stage, the dependent

variable, log total household income, is regressed with the predicted value of the SDI and other socio-economic variables.

Table 4.2.6: Second-stage OLS regression estimates of total income in Phek district
Dependent Variable: Log total household income

Variable	Coefficient	Std.Error	t-value
predicted SDI	1.015575	.2487265	4.08***
Gender	.0172251	.1498562	0.11
Age	.0019888	.0031453	0.63
Education			
Primary	.3591288	.1713013	2.10**
Highschool passed	.4083601	.2169259	1.88*
Higher secondary passed	.5066328	.2130868	2.38**
Graduate	.8167689	.2384253	3.43***
PG & above	1.093565	.3533149	3.10***
Household size	.0345499	.0354963	0.97
Non-farm	.4301918	.0471905	9.12***
Off-farm	-.169223	.0983139	-1.72*
Constant	8.564885	.3123348	27.42***
Model summary			
F value (p-value)	38.914 (0.000)		
Durbin (score) chi2	15.072 (p=0.0001)		
Wu-Hausman F (1,654)	15.2735 (p=0.0001)		

Source: Field survey (2020-2021)

***, **, * indicates 1 percent, 5 percent and 10 percent significance

Livelihood diversification: The livelihood diversity index, after controlling the endogenous variable, is found to have a positive significant impact on the income of the household in Phek district at a 1% level of significance. With a unit increase in livelihood diversification, the income is found to increase by 1.015 units. This proves the fact that in the Phek district, diversification is more advantageous than specialization.

Some of the other socio-economic variables are discussed below:

Household size: The household size also impacts the income of the household positively at 1% significance level. As the household size increases by 1 unit, the income of the household also increases by 1.20 units.

Education: Like that in Kohima district, education have positive impacts on the income in Phek district. The income of the households increases by 0.359 units, 0.408 units, 0.506 units, and 0.816 units and 1.093 units in households with heads of households having an education qualification of primary, high school, higher secondary, graduate and PG and above at 1%, 5% and 10% levels of significance.

Number of employments in the non-farm sector: As expected, the number of employments in the non-farm sector positively impacts the income of the household at a 1% level of significance. A unit increase in the number of employment in the non-farm sector increases the income of the household by 0.43 units.

Number of employments in the off-farm sector: Unexpectedly, the number of employments in the off-farm sector negatively impacts the income of the household at a 10 % level of significance. A unit increase in the number of employments in the off-farm sector decreases the income of the household by 0.169 units.

4.4.4 Livelihood diversification and income groups

It is also essential to understand which income group diversifies more/less than their counterparts. Some studies argue that it is more beneficial for the lower income group to diversify (A. Asfaw et al., 2017; S. Asfaw et al., 2015; Zhao, 2014), while some argue that such income group will face problems in diversifying to high-return activities. The main focus of difference here is that richer households are more likely to diversify as a choice or for contentment by venturing out even high-risk or high capital-required activities. On the other hand, poorer households face the difficulty of choice where they are compelled as a necessity to diversify into any available low-entry barrier activities. Hence, the relationship between income status and employment-generating activities is examined by dividing the households into 4 quartiles on the basis of the level of their total income. The first quartile is regarded as

the lowest income groups whose income does not exceeds RS. 22000 in the overall study area (refer to Appendix Table A 3 for quartile division). The mean of income for this quartile is RS. 15111.45 (Table 4.2.7). The next is quartile 2, with a total household income between Rs. 23000 to Rs. 42000 and a mean of Rs. 31758.62. The third quartile is the top 50 of the income group with a total income of Rs. 43000 to Rs. 70000 and Rs. 54837.66 as the mean income. The fourth quartile is classified as the highest income group with a total income of Rs. 71000 and above and a mean of Rs.117884.4.

Table 4.2.7: Regression of SDI on different groups of income

Quartile	Kohima		Phek		Overall	
	SDI	Mean Income	SDI	Mean Income	SDI	Mean Income
Quartile 1	0.57	16834.64567	0.62	15111.44578	0.65	11930.23256
Quartile 2	0.54	35673.55372	0.53	31758.62069	0.61	22347.82609
Quartile 3	0.36	60153.22581	0.44	54837.66234	0.55	37425
Quartile 4	0.26	126185.9504	0.28	117884.375	0.44	81414.63415
R-Square	0.903967989		0.959863374		0.976930708	
p-value	0.049227688		0.020273827		0.011601948	
Coefficient	-2.41736E-08		-1.99171E-08		-7.61825E-08	

Source: Field survey (2020-2021)

The regression table depicted a negative relationship between the income group and livelihood diversification, indicating that households tend to limit their income source as the income group increases. In other words, the higher the income, the lower the diversification. This shows that lower-income households are more likely to diversify with low-return activities. This result allows us to reject the null hypothesis that higher-income groups have higher livelihood diversification.

This result is supported by Adepoju & Oyewole, (2014) and Ijaiya et al., (2009), who found that diversification does not increase household well-being and that it increases the income gap. As mentioned in Chapter 1, the diversification process in this study was found to be ‘diversification for survival’.

PART III

4.3 INCOME DISTRIBUTION

When livelihood diversification is discussed in rural development studies, income distribution also becomes a key concern. As livelihood diversification is expected to increase income, reduce inequality, and aid a household to come out of poverty, it pitches up questions concerning equality in distribution and its favourability in distribution. Diverse sources of income become vulnerable to inequality, which prompts the requirement to study the impact of these sources of income on inequality. The main concern for this section is to look into the impact of different income sources on overall income inequality using the decomposition technique.

Inequality decomposition examines the value of particular income sources to income inequality. Based on the sources of income presented in the previous chapters, the contribution of the different sources of income to inequality is estimated in the table below.

Table 4.3.1: Gini decomposition by the three sectors in the study area

Source	Contribution of income source k to total income (S_k)	Gini coefficient for income source k (G_k)	Gini correlation of income source k with total income (R_k)	Absolute contribution of income source k to the overall income inequality ($S_k G_k R_k$)	Percentage contribution to the overall income inequality
Non-farm	0.8760	0.4325	0.9694	0.8731	-0.0029
Off-farm	0.0365	0.8881	0.5625	0.0433	0.0068
Farm	0.0875	0.7648	0.5253	0.0836	-0.0039
Total Income		0.4206			

Source: Field survey (2020-2021)

The overall Gini coefficient of total income for the sample area is 0.4206, which indicates that the probable difference in income of any two randomly selected

households from the entire population is 42 percent. Thus, this obtained value can be considered as a moderate extent of income inequality (Table 4.3.1). This result is found similar with the finding of Omilola (2009) who found similar Gini coefficient result of 0.467 on finding the contribution of sources of income to income inequality.

The S_k denotes the share of a single income source to the overall income. The table shows that non-farm income contributes the maximum share of the total income. The farm and off-farm share contribute 8 percent and 3 percent, respectively.

The next column, G_k , shows the equity in income distribution from each particular source of income to the total inequality. The decomposition of the Gini coefficient in the table indicates that the non-farm sector is the most equally distributed despite being the highest contributor to the overall total income. The off-farm is the highest source of income inequality, though it contributes the least to the total income; it is then followed by the farm income.

The Gini correlation (R_k) value lies between -1 and +1. This value is the highest in the non-farm sector (0.969), which indicates that the Gini correlation between non-farm income and total income is high. This shows that non-farm income is concentrated towards the households in the higher income groups, in other words favouring the richer households. Whereas both the off-farm and the farm sectors show minimal favouritism, income is distributed almost equally among all the household income groups.

In the last column, income from non-farm shows that a marginal increase in non-farm income, all else being equal, decreases the Gini coefficient of total income by 0.2%, indicating that non-farm income is an inequality-decreasing income source. Income from the farm sector is also seen to be an income-equalizing source. However, the elasticity of off-farm to Gini is seen as an inequality-intensifying income source, as a marginal increase in the off-farm income will increase Gini by 0.6%. This implies that an unequally distributed income source may also have an equalizing effect on the distribution of total income.

In conclusion, income from non-farm activities contributes the highest percentage of the overall income and also has the highest share in the overall income

inequality. However, among the three sources of income, non-farm is the most equally distributed source of income (G_k). This shows that the households deriving this income from non-farm sources are quite rich. Farm income which is the second most contributor to the total income is the second most contributor to overall income inequality as well. Although the correlation of income from this source to Gini shows minimal favouritism, it is found to be unequally distributed among the households. Income from non-farm and farm sources has an income-equalizing effect on income inequality. Off-farm income being the least contributor to the total income, is the most unequally distributed source of income. Although this source contributes the least to the overall income inequality, it is the most inequality-intensifying source.

4.3.1 Within the three sectors in the study area

Table 4.3.2: Gini decomposition by non-farm income sources

Source	S_k	G_k	R_k	Share	% Change
Non-farm					
Trade	0.1346	0.9060	0.2989	0.0821	-0.0525
Handicraft & Artisanship	0.0457	0.9493	-0.0125	-0.0012	-0.0470
Formal Employment	0.6168	0.7045	0.7888	0.7721	0.1553
Service Provision	0.1755	0.8774	0.3568	0.1237	-0.0517
Rental	0.0275	0.9825	0.3836	0.0233	-0.0042
Total		0.4439			

Source: Field survey (2020-2021)

The above table (Table 4.3.2) shows the income distribution in the non-farm sector. The overall Gini coefficient in the non-farm sector is found to be 0.4439, which is in a moderate level of equality. This means that the probable difference in the income of two randomly selected households engaged in non-farm activities is 44.3 percent.

The total share of income from the formally employed activities is the highest at 62 percent, and the lowest is the rental activities at only 2.7 percent. Income from rental activities, Handicrafts and artisanship, and trade are the major sources of income inequality where its distributions favour the poorer households. The values of R_k are

the highest in the formal employment activity and the lowest in the handicraft and artisanship which are 0.788 and -0.012, respectively. The positively high 0.788 value of the formal employment activities implies that income from these activities is not distributed uniformly but rather the distribution is focused on the households in higher income groups, i.e., favouring the richer households. The negative value of R_k for handicraft and artisanship activities implies that the income from these activities is focused on the households at the bottom income groups, i.e., favouring the poor. Formal employment is also found to be the most important contributor to income inequality (77.2 percent) and has a positive inequality-increasing effect. However, all the other non-farm activities this is, such as trade, handicraft and artisanship, service provision, and rental activities, have an equalizing effect on household income.

Table 4.3.3: Gini decomposition by off-farm income sources

Source	S_k	G_k	R_k	Share	% Change
Off-farm					
Wage labour	0.9484	0.8437	0.9892	0.9472	-0.0011
Forest products	0.0370	0.9943	0.8755	0.0385	0.0015
Fishing related activities	0.0146	0.9970	0.8147	0.0142	-0.0004
Total		0.8356			

Source: Field survey (2020-2021)

The overall Gini coefficient for the off-farm sector is 0.8356 (Table 4.3.3). This obtained value is considered a high extent of income inequality. The probable difference in income of two households randomly selected that are engaged in off-farm activities is 83.5 percent.

Wage laborers constitute the highest share in the total income with 94 percent and contribute 0.9472 (94 percent) in the total income Gini. However, the negative percentage of -0.0011 indicates that wage labourer activity helps in reducing income inequality. Both forest products and fishery are also major sources of income inequality and are not uniformly distributed. These sources of income are concentrated on the richer off-farm income households. Income from fishery reduces income

inequality however, income from forest activities is found to be an inequality-increasing source of income.

Table 4.3.4: Gini decomposition by farm income sources

Source	S_k	G_k	R_k	Share	% Change
Farm					
Crop	0.3933	0.8738	0.7730	0.3909	-0.0024
Livestock & by-product	0.2995	0.9150	0.8122	0.3274	0.0280
Poultry	0.1941	0.9069	0.5844	0.1513	-0.0427
Floriculture	0.1131	0.9714	0.8061	0.1303	0.0172
Total		0.6797			

Source: Field survey (2020-2021)

The overall Gini coefficient for the farm sector is 0.6797 (Table 4.3.4). This obtained value is considered a higher extent of income inequality. The probable difference in income of two households randomly selected that are engaged in off-farm activities is 67.97 percent.

The decomposition of income inequality by income source in the farm sector shows that income from cropping is the highest contributor to income inequality although it constitutes the highest percentage of the farm's total income (39 percent). Income from poultry was seen to be the least favoured-concentrated source of income. It is intriguing to observe that, despite floriculture income being the most unequally distributed source within the farm sector which is also concentrated in the richer households, its contribution to the overall income inequality is the least (13 percent). This is likely due to the fact that income from floriculture makes up the smallest share of the total farm income. Furthermore, it can be seen from the table that, of all the four sources of farm income, income from cropping and poultry are inequality-decreasing sources of income whereas, income from livestock and by-products and floriculture are inequality-increasing sources of income.

PART IV

4.4 MOTIVE FOR DIVERSIFICATION

Table 4.4.1: Motive for diversification in the study area

Motives	Overall	Kohima	Phek
To educate children	15.42	2.16	33.66
No major source of income	30.42	35.97	22.77
To supplement income	25.83	33.81	14.85
For pleasure	7.92	7.91	7.92
Large family members	20.42	20.14	20.79
Total	100	100	100

Source: Field survey (2020-2021)

As depicted in Table 4.4.1, respondents in the study area exhibit a range of motives for diversifying their livelihood activities. Key motivations include, firstly, insufficient earnings from a primary source to cover household expenses; secondly, the desire to supplement their overall income for greater disposable income and earnings; and thirdly, the need for additional income to support their children's education. Some individuals pursue additional activities simply out of personal enjoyment, while others do so due to the presence of large family members involved in different activities. Nonetheless, the predominant motive across the study area is the lack of a high-return main activity. It is also likewise in Kohima district, however, in Phek district, the primary motive is the necessity to secure more income to support children's education. Overall, this pattern reveals that most households diversify their livelihood activity out of necessity rather than choice. This is characterized as a 'push factor' driven by challenges such as small land holding for agriculture, limited opportunities in domestic industries, and the inability to obtain employment in the service sector due to lack of expertise/ skill or qualification.

PART V

4.5 CONSTRAINTS TO LIVELIHOOD DIVERSIFICATION

The portfolio of multi-activity is tempered by different opportunities and constraints depending on region by region and household by household (Mehta et al., 2022). Livelihood is highly erratic and risk-veiled in rural areas due to the socio-economic, demographic, and geographical conditions generating distinct constraints and prospects on livelihood diversification. As discussed in Chapter 1, a considerable percentage of households (almost 58 percent) have no diversification. Overall, it can be said that there is low or moderate diversity in the study area. Therefore, understanding the basic constraints of livelihood diversification is crucial for identifying the challenges of rural development and interceding to elevate the people's livelihood. Given this, the catalyst for the non-diversification of households was identified to gain insight into it, which can enable interventions to improve adaptation capability. This chapter explores some of the main limitations for diversification by recording their priority for each constraint.

4.5.1 Constraints in the overall study area

Credit refers to the stock of money households save, the assets they possess, or their capability to access financial services in any way (Bekalu et al., 2019). The fear of taking risks arises when there is a lack of asset base. It can be observed from Table 4.5.1 that the lack of credit facilities, which stands in rank number 1, is the primary constraint for diversification in the study area with an index value of 0.55, which hinders households from setting up self-employment activities or any start-up business. As found by Mishi et al., (2018), the major factor for the suffering of the poor is because of lack of government financial assistance, hence they suggest reasonable loans by government to start livelihood projects and improve the living of the rural households.

Mitra & Akanda (2019) found that a person with higher income-generating knowledge or experience will have higher livelihood diversification. According to Bekalu et al., (2019), training and awareness are two essential steps in motivating households, especially in rural areas, to diversify their livelihood strategies. In the

study area, the majority of the respondents stated that lack of proper guidance or knowledge is one of the significant constraints to livelihood diversification, which ranks 2 with an index of 0.38. Respondents are mostly unaware of the opportunities or portfolios that are feasibly available to them. And in the absence of such knowledge, they remain stagnant and naïve of all the perks and benefits.

Time constraints were also one of the major constraints in the study area (0.28 index), capturing the third rank. Though people are willing and want to go for alternative income sources, they cannot make adequate time to work on it. Proper time management also plays a vital role in diversifying livelihood activities. Upon observation, it can be seen that inadequate family labour, referring to the situation where more members of the family are dependent on age group or school-going, was also found to be a main constraint to livelihood diversification (0.20) as a large family does not necessarily mean more diversified.

Table 4.5.1: Constraints to livelihood diversification in the study area

Sl. No	Constraints	Number in respective priorities					Total responses	RPI	Rank
		I	II	III	IV	V			
1	Lack of proper guidance/knowledge	70	63	12	12	7	164	0.38	II
2	Inadequate family labour	52	29	6	4	2	93	0.20	IV
3	Health issues	9	3	3	1	4	20	0.03	VIII
4	Age	8	8	1	0	3	20	0.04	VII
5	Lack of credit facilities	44	48	31	9	3	135	0.55	I
6	Lack of proper marketing facility	37	37	20	5	0	99	0.19	V
7	Non-availability of land	2	8	8	13	19	50	0.12	VI
8	Time	40	65	4	2	2	113	0.28	III

Source: Field survey (2020-2021)

The marketplace is the platform where there is interaction between the customer and the seller, as well as the social system. Lack of marketing facilities in terms of poor infrastructural development for local goods was also a huge barrier to

livelihood diversification in the study area with an index value of 0.19, as this limits their selling options. Good infrastructure helps directly or indirectly in diversifying livelihood activities, reducing vulnerability, and achieving livelihood outcomes (Saha & Bahal, 2012).

The non-availability of land creates a hindrance to livelihood diversification in the study area, which has a 0.12 index. With the increase in population, there is a decrease in size in the fragmentation of land, which is leading to low productivity. Also, with the problem of land located far away from their residence, commercial cropping becomes impossible. Hence, people are unable to diversify in the farm sector. High age and health issues are also found to have lower ranks with index values of 0.04 and 0.03, respectively. This shows that compared with other types of assets, such as social assets, natural assets, etc., human assets are found to be the least challenging factor in diversifying livelihood in the study area.

4.5.2 Constraints in Kohima District

As shown in Table 4.5.2, the lack of credit facilities in the number one rank with a 0.57 index is the major constraint that hinders people from diversifying their livelihood activities in the Kohima district. Money serves as the lifeblood of an economy. Without a proper credit source, evaluating and managing resources would be a challenge that can hamper resource allocation, foster innovation, and ensure economic development, which is in overall economic development. Also, lack of time and poor guidance regarding innovations, technologies, institutes, etc., in the second and third rankings were found to be considerable constraints with an index value of 0.50 and 0.41, respectively.

One main problem of livelihood diversification found is inadequate family labour, which is in the fourth rank with an index of 0.25. These are households that constitute more of a dependent population or fewer family members where the available member has to engage in unpaid family work. The contribution of family members also plays a vital role in diversifying livelihood.

Good infrastructure or marketing facilities is an essential ingredient for livelihood diversification. Its existence allows the exchange of products at negotiable

prices and the subsistence of products. The absence of a developed market for local finished goods and storage purposes emerges as one major constraint to livelihood diversification, with an index of 0.20 in the fifth rank.

There are also households that are unable to diversify their livelihood activities in the farm sector because they do not possess any land or cultivable land. Thus, the non-availability of land is a constraint found in the Kohima district with an index of 0.09. Also, old age and poor health conditions are two main constraints perceived by households with 0.05 and 0.04 indexes, respectively.

Table 4.5.2: Constraints to livelihood diversification in Kohima district

Sl. No	Constraints	Number in respective priorities					Total responses	RPI	Rank
		I	II	III	IV	V			
1	Lack of proper guidance/knowledge	54	48	8	0	0	110	0.41	III
2	Inadequate family labour	35	25	3	0	0	63	0.25	IV
3	Health issues	9	2	1	0	4	16	0.04	VIII
4	Age	8	4	0	0	3	15	0.05	VII
5	Lack of credit facilities	34	38	13	0	0	85	0.57	I
6	Lack of proper marketing facility	19	22	12	0	0	53	0.20	V
7	Non-availability of land	2	7	2	5	4	20	0.09	VI
8	Time	37	59	3	2	2	103	0.50	II

Source: Field survey (2020-2021)

4.5.3 Constraints in Phek District

It is evident from Table 4.5.3 that in the Phek district, the lack of credit facilities scoring rank one is the main constraint in diversifying their livelihood activities with an index value of 0.87. People seldom seek loans from formal institutional sources. When they do, they usually borrow small amounts due to concern about their ability to repay. Therefore, they often borrow from non-institutional informal sources such as their family members or neighbours, which is more comfortable for them and less intimidating compared to credit institutions. Secondly, a lack of proper guidance or

proper knowledge on how to go about diversifying livelihood activities is found in the second rank with a 0.67 index value. A well-educated and skilled workforce makes a more crucial and impactful contribution to the income and standard of living of a household.

Table 4.5.3: Constraints to livelihood diversification in Phek district

Sl. No	Constraints	Number in respective priorities					Total responses	RPI	Rank
		I	II	III	IV	V			
1	Lack of proper guidance/knowledge	16	15	4	12	7	54	0.67	II
2	Inadequate family labour	17	4	3	4	2	30	0.26	V
3	Health issues	0	1	2	1	0	4	0.03	VIII
4	Age	0	4	1	0	0	5	0.05	VII
5	Lack of credit facilities	10	10	18	9	3	50	0.87	I
6	Lack of proper marketing facility	18	15	8	5	0	46	0.36	IV
7	Non-availability of land	0	1	6	8	15	30	0.39	III
8	Time	3	6	1	0	0	10	0.10	VI

Source: Field survey (2020-2021)

Thirdly, as land plays a vital role in the livelihood of rural households, the absence of land poses a massive hindrance to diversifying livelihoods (0.39), especially in rural areas like Nagaland. Land is considered to be an important factor in production and is indispensable for any livelihood activity. Fourthly, the lack of marketing facilities in terms of the local market for their produce is a significant barrier to livelihood diversification in the Phek district, with a 0.36 index. There is a lack of proper infrastructure with storage facilities and no hygienic marketing area with proper sanitation facilities where a person can sell their farm products, handicrafts, or any locally made finished goods. Fifthly, households with the majority of its members below or above the working age or are students also face the problem of inadequate family labour (0.26) to diversify their livelihood activities. Lastly, time constraints, old age, and health issues are barriers to diversifying livelihood activity, with indexes of 0.10, 0.05, and 0.03, respectively.

CONCLUSION

The chapter explores the effect of livelihood diversification on the total household income, the extent of diversification on each income group, the inequality in the distribution of income, and the motive of the people for diversifying their livelihood activities. It also discusses the most significant constraints faced by the respondents in the study area. Firstly, the first stage of OLS in the study area shows that the number of employments in the off-farm and farm sector increases the diversity level and the second stage shows that the age of the household and head of household who have high education level (PG and Above) have a positive impact on the income of the household. In addition, the number of employment in the off-farm and farm sectors also increases the income of the household. The regression result showed that livelihood diversification affects the total income positively. In Kohima district, livelihood diversification proved to have a negative impact on the total income of the household. However, in Phek district, it is seen from the regression that livelihood diversification does increase the income of the household. From the above result, it can be said that income from livelihood diversification is low or that the multiple activities that a person engages are low-return activities which do not have a significant impact on the total income of the household. In short, it can be concluded that in lieu of diversification, there is specialization of employment with a higher return in the study area. Secondly, on studying the intensity of livelihood diversification on different income groups, it was found that there is a negative significant relationship between income groups and livelihood diversification. This signifies that, unexpectedly, the regression result has failed to accept the null hypothesis which hypothesized that higher-income groups have higher livelihood diversification. Thirdly, on analyzing the distribution of income using the decomposition of the Gini Index, the study found that there is moderate inequality of distribution of income in the study area with the non-farm sector being the most equally income-distributed sector. Fourthly, a bird's eye view of the motive of the diversified household showed that the top motive for diversifying livelihood activities in the study area was because the households do not have an occupation in which they are able to earn adequate income to cover their household expenses. The case was also found to be the same in Kohima district

however, in Phek district, the top reason was found to be for the education of their children. Phek district being rural in nature, it was seen that most of the children are sent to schools and higher studies outside of the district, to districts or states that are more urban and advanced. This may be the probable reason why diversified activities take place in this particular district which will enable them to earn enough income to finance their children for a better, higher education. Lastly, the main problem the respondents found was the lack of credit facilities in the study area which is followed by a lack of proper guidance/ knowledge and time constraints. However, besides all these constraints, Nagaland is a state with rich biodiversity and a pleasant climate, which has a lot of prospects for providing a better and sustainable livelihood for its people.

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Appendix

Table A 4. 1: Variance Inflation Factor (VIF) of the variables

Variables	VIF		
	Kohima	Phek	Overall
Gender	1.19	1.18	1.12
Age	1.43	1.27	1.29
Education	1.17	2.23	1.19
Household size	1.49	2.06	1.29
Non-farm	1.55	1.32	1.49
Off-farm	1.19	1.25	1.2
Farm	1.07	1.14	1.06
Mean VIF	1.3	1.49	1.234
Durbin-Watson	1.85	1.99	1.69

Table A 4. 2: Test of endogeneity and instrument identification test

	Durbin Wu-Hausman	
	Test (p-value)	Eigenvalue (F-Value)
Overall	0.0006	305.995
Kohima	0.1034	462.212
Phek	0.0001	38.914

Table A 4. 3: Quartile division of the total income of the households

	Kohima			Phek			Overall		
	Minimum	Maximum	Count	Minimum	Maximum	Count	Minimum	Maximum	Count
Quartile 1	3000	25000	127	5000	17000	43	3000	22000	172
Quartile 2	26000	45000	121	18000	27000	46	23000	41000	160
Quartile 3	46000	76000	124	28000	47000	40	42000	69000	165
Quartile 4	77000	420000	121	48000	215000	41	70000	420000	166

CHAPTER 5

CONCLUSION

5.1 INTRODUCTION

Livelihood practices keep changing from time to time owing to the continuous dynamic nature of development and structural transformation. Agriculture, being vulnerable to climate change, insecurity, and decreasing farm sizes, which results in low productivity, has failed to guarantee sufficient livelihood. Diversification, therefore, extricates a household to adapt to this incessant perplexity, keeping livelihood sustainable and maintaining a level of affluence and comfort of life.

Livelihood diversification remains an important strategy adopted by individuals/households worldwide, which affirms that a household can escape poverty and enhance its well-being. It can be considered a characteristic of economic development that exhibits an expansion in the people's livelihood activities, including both on-farm and off-farm activities, which are undertaken to yield auxiliary income.

In rural areas, livelihood diversification is a means to secure a living. Rural areas are vulnerable to shocks that disrupt their chart of income and consumption flow, depletion of household resources, increase inequality, and intensify the poverty level for the already poor households (Mudzielwana et al., 2022). As a result, diversifying livelihood activities enables households/individuals to cope with these associated shocks and improve their welfare. Thus, on-farm and off-farm sectors have become an essential element of livelihood for rural households. In other words, rural households make their diversification decisions out of desperation rather than opportunity.

Dr. P. Baishya has rightly written about the economy of Nagaland in his book, *Economy of Nagaland in Transition: A Case Study on Infrastructure Facilities* (2012)¹; *“Despite its vast natural resource endowments, Nagaland could not exploit and utilize these resources judiciously due to the lack of capital,*

¹ P. Baishya (2012), *“Economy of Nagaland in Transition: A Case Study on Infrastructure Facilities”*; pp.27

technology, knowledge, and persons with right attitude for entrepreneurship. The ineffective administrative and political structure is also a big hindrance to economic development.... The development of road and transport is found to be unsatisfactory.”

This chapter brings out the key findings from this research and highlights some policy suggestions based on the present research. Finally, it gives a concluding remark on the research work and concludes by giving a brief overview of the scope for future research.

5.2 FINDINGS

Based on the findings of this research gives an unexpected result that though the diversification of livelihood activities is widespread in the study area, it does not generate the expected growth in the income of the household. From the perspective of this finding, the study shows that livelihood diversification is a response to poverty, risk, and deficit income. Thus, it signifies that livelihood diversification is a relevant preference to alleviate poverty, mitigate risk, and abstain from insufficient income. Furthermore, education was found to have a negative impact on livelihood diversification, proving the fact that households headed by lesser-educated heads are more diversified than those households with better-educated household heads.

5.2.1 Employment Diversification

- a) Out of the total number of employment in the study area, 69.19 percent of the employment was found to be from the non-farm sector, 22.45 percent from the farm sector, and only 8.36 percent was found to be from the off-farm sector.
- b) In Kohima district, 73.41 percent of the employees are engaged in the non-farm sector, 19.45 in the farm sector and only 7.15 percent of the workforce are in the off-farm sector.
- c) Whereas, in Phek district, 56.85 of the workforce is in the non-farm sector, 31.24 in the farm sector, and 11.91 percent in the off-farm sector.

- d) The maximum number of households was found to have two sources of income which are mainly the employment of the parents of the households followed by 3 income sources. And among the activities, the highest percentage of employment was found in the formal employment activity.
- e) With the use of the Simpson diversification index, the study found employment diversification in the study area to be at a moderate level. It was found likewise in Kohima district; however, the diversification level was found to be higher in Phek district. This signifies that employment activities in Phek districts are more diverse.
- f) In the study area, the farm sector was found to be most diversified which is followed by non-farm sector and then off-farm sector., indicating that employment in the farm sector are more diverse with no activity dominating. The findings were found to be the same in Kohima district. In Phek district, both farm and non-farm sectors were found to have the same level of diversity.
- g) Among the different activities, handicrafts, and artisanship was found to be the most diversified activity. No doubt portraying the skill and creativity of the Naga people.
- h) On classifying the households according to their degree of diversification, the highest number of households have no diversification, that is, either there is only one employment activity in the households or the workforce is engaged only in a single type of activity.

5.2.2 Income Diversification

- a) The highest percentage of income in the study area was found to be from the non-farm sector. From within this sector, the maximum percentage of the income was earned from formal employment activities. In the farm sector with 8.75 percent of the total income, the highest percentage was earned from cropping activities. And the

off-farm sector with only 3.65 percent of the total income, the highest income is earned from wage labor activities.

- b) The highest percentage of the household was found to be earning Rs. 15000-20000 monthly which is a bare minimum for most of the households.
- c) The study found income diversity to be low in the study area with only 0.22 SDI showing an income gap between the different activities. Kohima district was found to be at a lower level with 0.19 SDI, and Phek district with 0.36 SDI on a moderate level.
- d) Sector-wise, the farm sector has the highest income diversity in the study area, followed by the non-farm sector and then the off-farm sector.
- e) In Kohima district, the farm sector is the most income diversified with 0.72 SDI, the non-farm sector with 0.45 SDI, and the off-farm sector with only 0.06 SDI.
- f) In Phek district, the farm sector was also found to be the most diversified as well with 0.62 SDI, the non-farm sector with 0.44 SDI, and the off-farm sector with 0.16 SDI which is higher than the overall and Kohima district.
- g) Classification of households based on the level of income diversification showed that more than half of the households have no diversification with no household having a very high diversity.

From these findings, it has been proved that Phek district is more diversified than Kohima district both in employment and income. Thus, the study has failed to accept the second hypothesis.

5.2.3 Gender and livelihood diversification

- a) In the study area, 82.05 percent of the households were found to be male-headed households with only 17.95 female-headed households. One main reason is that females are considered the head of the household only if she is a widow or divorcee.

- b) Out of the total households, 95.40 male heads are employed and 85.71 female heads are employed.
- c) On measuring their diversity level, male-headed households are found to be more diversified than female-headed households. Contritely, female-headed households were found to be more diversified than male-headed households in Phek district. While the diversity level between genders is the same with 0.45 SDI each in Kohima district.
- d) Sector-wise, female-headed households are more diversified in the farm sector in the study area and Kohima district. Whereas, In Phek district, female-headed households are more diversified both in the non-farm and farm sectors, showing the concentration of male heads in only few activities in these sectors.

5.2.4 Age and livelihood diversification

- a) The age of the head of household also has a great impact on the livelihood of the household. In the study area, the maximum percentage of the heads of households are between the age of 45 to 55 years.
- b) Households from the youngest age group were found to be the most diversified in the study area and Phek district. In Kohima district, households with the youngest heads and households with 75-85 years are the most diversified. These households with older heads are more diversified because, at this stage, household members are old enough to venture out into new activities.
- c) In the non-farm sector, households with old-aged heads are the most diversified, which are most probable the retired heads. Also, in the off-farm sector, households with 75-85-aged heads are the most diversified and in the farm sector, households with mid-aged heads are the most diversified households.

- d) Households with a 75-85 age head of household are the most diversified in the non-farm and off-farm sectors in Kohima district and 55-65 years in the farm sector.
- e) In Phek district, households with the youngest ages are the most diversified non-farm, and households with 75-85 years head in the off-farm sector and in the farm sector, it is the households with 45-55 and 65-75 years head.

5.2.5 Education and Livelihood Diversification

- a) The level of education of the head of the household is an important determinant of livelihood diversification. The type of occupation and the standard of job demands different skills and knowledge of the people, additionally, education impacts the mindset of the people. Therefore, it is seen from the study that, though the higher percentage of the heads of households are towards the lower educated side, the level of education of the head of household and the diversity level have a negative relationship. It is a downward sloping curve, indicating that the higher the education, the lower the diversification of livelihood of the household and vice-versa.
- b) It was also found that sector-wise, the non-farm sector, and diversification also have a negative relationship. However, it is interesting to know that, there exists a positive relationship between the level of education of the head of household and the level of diversification in the farm sector; the lower, the education level, the lower the level of diversification and vice-versa.
- c) The findings in Kohima district found similarity with the overall study area with livelihood diversification having a negative relationship with the non-farm sector and a positive relationship with the farm sector.
- d) However, in Phek district, there is an up-and-down slope in the curves; indicating that different levels of education have significantly varying impacts on the livelihood of the household.

5.2.6 Household size and livelihood diversification

- a) A maximum of the total households in the study area have 3 to 6 household members with a U-shaped diversity curve. Kohima district also has an almost U-shaped curve however, in Phek district, the slope of the curve increases and decreases, showing an up-and-down curve. This indicated that different household sizes in Phek district have significant impacts on the level of diversification.
- b) Sector-wise, non-farm and farm sectors have an almost straight line of relationship with household size and livelihood diversification with an upward-sloping curve in the off-farm sector. The result found similarity with that in Kohima district. However, in Phek district, with a straight line relationship in the non-farm sector, the curve in the farm sector was found to be a V-shaped curve and a high upward-sloping curve in the off-farm sector.

5.2.7 Impact of livelihood diversification on income in the study area

- a) On using the two-staged least square regression model to analyze the impact of livelihood diversification on income, it was found that, in the first stage, the household size, the female gender, and high school passed the level of the head of household have a significant negative impact on livelihood diversification at 1% and 5% levels of significance. Whereas the number of employments in the off-farm sector and farm sector has a significant positive impact on livelihood diversification at a 1% level of significance.
- b) In the second stage, after controlling the endogeneity problem, the total income of the household is regressed against the predicted value of SDI and other socio-economic variables. The result of this analysis showed that livelihood diversification has a positive impact on the total household income in the study area. The result also showed a positive significant relation between the total income of the household and the age of the head of household, the number

of employment in the off-farm and farm sector, and the head of household with education qualification with PG and above. Additionally, it shows a negative relationship between the household total income and the household size, female-headed households, and the lower level of education of the head of households.

5.2.8 Impact of livelihood diversification on income in Kohima district

- a) In the first stage of OLS for Kohima district, it was found that the education qualification of the head of household has a negative impact on livelihood diversification at a 1%, 5%, and 10% level of significance. Whereas, the number of employment in the off-farm and farm sector has a significant positive impact at 1% level of significance.
- b) In the second stage, it is found that variable livelihood diversification does not have a significant impact on the income of the household in Kohima district. The level of education of the heads of the households was also found to have a positive impact on the total household income with the highest impact on the households with heads having a graduate education qualification. Male-headed households and also age of the head of the households were also found to have a positive impact on the income of households. The number of employment in the non-farm sector also shows a clear positive impact on the total household income.

5.2.9 Impact of livelihood diversification on income in Phek district

- a) In the first stage of the OLS, only the number of employment in the off-farm and farm sectors is found significant that be positively significant at 1 % in Phek district.
- b) In the second stage, it is interesting to find that livelihood has a positive impact on the total income of the household in Phek district. Education qualification of the heads of the households also

has a positive impact with the highest being the households with graduate heads. The number of employment in non-farm sectors has a positive impact on the total income however, the number of employment in the off-farm sector was found to negatively impact the income of households.

5.2.10 Livelihood diversification and income groups

On dividing the different groups of income into quartiles, it was found that in the study area, as well as in both the districts, there is a negative relationship between income groups and livelihood diversification. The higher the income, the lower the diversification. This result allows us to reject the first hypothesis that higher-income groups have higher livelihood diversification.

5.2.11 Income Distribution in the Study Area

- a) The distribution of income becomes an important issue when livelihood and rural development are discussed as diverse sources of income become vulnerable to income inequality. Therefore, with the use of the Gini coefficient index, the income inequality in the study area was found to be moderate (0.426). This indicates that the probable difference in income of any two randomly selected households from the entire population is 42 percent.
- b) The analysis also showed that the non-farm sector contributes the maximum percent to the total income and is also the most equally distributed. The non-farm sector was also found to be concentrated towards the higher income group households, however, the sector is found to be an inequality-decreasing income source.
- c) The off-farm sector contributes only 3 percent to the total income and was found to be the highest source of income inequality among the three sectors. The off-farm sector shows minimal favouritism (not favouring any income group), however, this sector was found to be an inequality-intensifying income source.

- d) The farm sector contributes 8 percent to the total income and is a high source of income inequality. The farm sector also shows minimal favouritism and is found to be an income-equalizing source.

5.2.12 Income Distribution in the non-farm sector

- a) The Gini coefficient showed a moderate level of inequality in the non-farm sector (0.4439). This means that the probable difference in the income of two randomly selected households engaged in non-farm activities is 44.3 percent.
- b) The share of income from each group of non-farm activities to the total non-farm income of the households showed that formal employment contributes the highest percentage and rental activities the lowest to the total non-farm income. It is also interesting to find that formal employment activity is the most equally distributed income source while rental activity is the highest source of income inequality. Distribution of income in the formal employment activity favours the richer households and the other activities such as trade, service provision, and rental activities favour the lower income group. The negative value for handicraft and artisanship shows that the income from these activities favours the least income groups. The analysis also showed that all the activity groups in the non-farm sector are inequality decreasing with formal employment being the inequality-intensifying income source.

5.2.13 Income Distribution in the off-farm sector

The analysis showed that there is a high extent of income inequality in the off-farm sector. From the activities, income from wage laborers contributes the most to the total off-farm income and is also the most equally distributed. Except for forest products, which are found to contribute to an increase in income inequality, both the other two wage labour and fishery activities contribute to the decline in inequality.

5.2.14 Income distribution in the farm sector

The overall Gini coefficient for the farm sector shows a higher extent of income inequality (0.6797). Income from cropping has the largest share in the total farm income followed by income from livestock and by-products. Income from cropping was also found to be the most equally distributed income source. Income from livestock and by-products and also from floriculture were found to favour the richer income group followed by the income from cropping. Income from poultry was found to be neutral without much favouritism. Income from cropping and poultry was found to be an income-equalising source while income from livestock and by-products and floriculture were found to be income intensifying source.

5.2.15 Motive for diversification

There are various reasons which can prompt a household to diversify its livelihood activities. One of the main reasons found in this study is that a household does not have a main source from which they can earn enough income to cover the expenses of the household. The second reason is that they want to supplement their main income. In Phek district, the main motive for diversification was found to be to earn enough money to sponsor their kids' education.

5.2.16 Constraints to Livelihood Diversification

Lack of credit facilities was found to be the main constraint for livelihood diversification in the study area which is mainly related to the fear of taking risks. The next was found to be the lack of proper guidance or knowledge which is the result of lack of sensitization, lack of career guidance at a young age, or lack of information leading to unawareness and ignorance. The next constraints are time constraints, inadequate family labour, lack of proper marketing facilities, non-availability of land, old age, and other health issues.

5.3 POLICY IMPLICATIONS

Livelihood diversification is the dominant procedure for earning income in rural areas. For decades, several policies, schemes, and approaches have been adopted by the government and also private citizens to broaden the mindset of the people to increase and diversify their livelihood options in the state. However, the outcome displays limited success. Based on the findings of this study, a few policy implications are proposed for better performance and improved results of livelihood diversification and the enhancement of livelihood options.

- a) Though several schemes and programs have been initiated by the Central Government to provide livelihoods, such as employment activities or investment for start-up entrepreneurs, only a handful from rural areas like Nagaland are aware of it. State government should take the initiative to bring out certain programs to sensitize the people and enable them to access all these benefits.
- b) The division of formal and informal workers should be minimized and the dignity of labour should be encouraged. The Government and policymakers should also promote the creation of job avenues in unorganized sectors where the people, especially the youth, will be able to earn during off-seasons or study breaks.
- c) Either public or private investment in the form of small-scale industries and small manufacturing units should be introduced to establish quality industries in the state.
- d) In this present scenario where health concerns are gaining increasing importance and to fulfill the increasing demand for fresh food products, organic products have become an essential requirement. In light of this growing demand, to avoid wastage, and also to provide quality hygienic packaging of

food products, proper cold storage facilities, and clean infrastructures should be constructed by the government with appropriate pricing that aligns with both market demand and the cost of production.

- e) Farmers should be motivated and encouraged to practice multiple cropping which can yield them more income from a single land and can have produce throughout the year. Agricultural production should be encouraged not only for self-sustenance but also for exporting to other parts of the states or countries.
- f) Since most of the government policies on agriculture are mainly outlined to increase production, landless households or households with non-cultivable lands are often disadvantaged. Therefore, policies or projects that can also benefit the landless agricultural households should be introduced more where they can sell their labour.
- g) The performance of the farm/agricultural sector is an important source of revenue for the household as well as the public budget as agriculture is considered to be the backbone of every economy. Since these households play the role of both the consumer and producer, they are most capable of setting a proper pricing framework. However, there are often mismatches between the cost of production and the price of the product. Therefore, agricultural households are obliged to take part in it while fixing a pricing policy for agricultural goods and other allied products.
- h) Based on the findings, credit access, infrastructural facilities, and market access are the fundamental requirements for diversifying into other activities. The government should increase its spending on physical and social infrastructure considerably. For instance;

Loan easily accessible with low interest: It is brought to the knowledge through this survey that a significant number of people are unable to pursue new business ventures or entrepreneurial activities or explore employment opportunities because they lack financial capital. Additionally, the complicated

paperwork and high interest rates associated with loans make it challenging for them to obtain funding. Making loans more accessible could greatly expand employment opportunities for these individuals.

Better market facility: It is observed from the findings that there is a fair amount of people who want to and are willing to sell their handicraft products such as woodwork, weaved items, and other accessories, agricultural products, handmade eatables, etc.-though not on a daily basis, but rather when their products are ready. However, there is a lack of appropriate space and facilities for this purpose. Improving and establishing such spaces could provide a significant opportunity for these individuals to earn income. Establishing common markets is essential for the community as it helps to enhance awareness and unity within the area.

Agency to help sell products: People from remote villages who come to town to sell their products often encounter difficulties in transporting unsold items back home, which is both challenging and costly. This predicament forces them to sell their products at very low prices. Additionally, some skilled individuals struggle to find a proper marketing site (both online and offline) to sell their goods. In such cases, having a selling agency that can assist in marketing and selling the products at a better price would be highly beneficial.

Better transportation facility: Effective connectivity is crucial for the efficient operation of an economy. Enhanced public transportation services and well-maintained roads for traveling between localities, villages, and districts, whether for job searching or daily commuting to work, will enable them to aim for varying activities and also help to manage their time more efficiently. Moreover, good connectivity promotes trading and tourism and enables the movement of goods and services at cost-effective prices.

- i) Livelihood options for livestock activities should be promoted, which can help decrease the imports of livestock from other states. Modern methods of livestock farming and proper marketing systems can help increase people's income and also provide healthy and hygienic livestock products.

- j) To upgrade the state's economy, there should be simultaneous development both in the farm and non-farm sectors. Due to the linkage effect, the development of one sector is important and beneficial for the other sector and vice versa. This calls for the need to promote balanced sectoral approaches.
- k) The chain between the government, firms, and workers should be strengthened and follow the concept of comparative advantage. With development, and more advanced techniques of production, the market expands and society transforms. Therefore, the government should adopt new technology that firms can rely on for innovation and increase in production. Firms will in turn hire workers for production and management. Finally, the consumer will enjoy a range of products and society will evolve.
- l) Through this study, it has been observed that people with knowledge of modern advanced technology, machinery, and laboratories often migrate out of the state for work, remain unemployed, or work in jobs where the individual skills exceed the requirements of the work. This calls for immediate action for the adoption of advanced technologies and machinery, such as modern medical laboratories, digital firms, and chemical laboratories, to help create more employment opportunities in these fields which can also help in the improvement of the state's economy.
- m) As a tribal state, the intrusion of modernization and development has caused Traditional Ecological Knowledge (TEK) and Indigenous Traditional Knowledge (ITK) to decline slowly. This is causing an adverse impact on the environment and traditional society for sustainable livelihood. Efforts should be made to pass down such knowledge to the present and future generations, to secure a livelihood with the use of traditional methods. Also, strict government policies should be introduced for the commercialization and business-related activities of forest resources.

5.4 CONCLUDING REMARK

The findings from the study conclude that livelihood diversification is evident in the study area. However, employment is concentrated in the non-farm sector, with a significant proportion of households relying on salaries for their monetary income rather than on wage-based activities. The research also observed the existence of considerable income inequality distribution in the region. While households do diversify their income sources, most of the diversification is low-income occupations, probably due to the relatively low barriers to entry in these activities. Consequently, it can be inferred that livelihood diversification is associated with the lower-income groups, whereas wealthier households tend to specialize more. In other words, poorer households are found to be more employment flexible compared to their wealthier counterparts. Overall, the study concludes that livelihood diversification has a positive impact on household income, particularly in rural areas, as Phek is considered to be more rural than Kohima. Therefore, this finding suggests that livelihood diversification is more beneficial in rural areas, while specialization proves more beneficial in less rural areas like Kohima. Furthermore, income generated from diversification was found to be for survival rather than accumulation.

5.5 SCOPE FOR FUTURE RESEARCH

The present study has made a contribution to the livelihood scenario concerning the employment and income structure in the study area. Still, there is a great deal of need for additional research in addition to the current study. The findings of the study cannot be generalized to the entire state as the scope of the study was restricted to two districts, the Kohima and Phek districts. Therefore, efforts can be made to carry out additional research in the remaining districts. The impact of schemes/projects/programs related to livelihood diversification can also be explored. Research can also be carried out on the livelihood diversification study in the state by exploring the various pentagon of livelihood assets as mentioned in the Sustainable Livelihood Framework.

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ANNEXURE I

Ph.D. Questionnaire on
“LIVELIHOOD DIVERSIFICATION IN NAGALAND: A case study of Kohima and
Phek districts”
Nagaland University, Lumami
Department of Economics
(This Information will be used for Research Purpose only)

Name of the Interviewer
KEVIKUONUO
Research Scholar

Name of the Supervisor
Dr. T. ZARENTHUNG EZUNG

A. GENERAL INFORMATION

District:	Constituency:	Village:
Contact No:	House No:	Date:
Respondent's Name:	Gender: [] Male [] Female	
Address:		

B. HEAD OF HOUSEHOLD (HoH) DETAILS

1. Name:
2. Gender: [] Male [] Female
3. Age:
4. Marital status:
[] Unmarried [] Married
[] Divorced/Separated [] Widow
5. Educational qualification:
[] Uneducated/Illiterate
[] Primary school level (below class-5)
[] Below class 10
[] Class 10
[] Class 12
[] Graduate
[] Post-Graduate (PG)
[] Above PG

6. Employment:

- ☐ Regular
- ☐ Temporary
- ☐ Contractual
- ☐ Self-employed
- ☐ Casual
- ☐ Unemployed

7. Employment sector:

- | | |
|---|--|
| ☐ Central government | ☐ State government |
| ☐ Semi government | ☐ Private undertaking |

8. Income pattern:

- | | |
|----------------------------------|-------------------------------------|
| ☐ Daily | ☐ Weekly |
| ☐ Monthly | ☐ Seasonally |
| ☐ Yearly | |

9. Income (monthly):

- ☐ Less than Rs. 5000
- ☐ Less than Rs. 10,000
- ☐ Less than Rs. 20,000
- ☐ Less than Rs. 30,000
- ☐ Less than Rs. 40,000
- ☐ Less than Rs. 50,000
- ☐ Less than Rs. 60,000
- ☐ Less than Rs. 70,000
- ☐ Less than Rs. 80,000
- ☐ Less than Rs. 90,000
- ☐ More than Rs. 1 lakh

C. HOUSEHOLD STRUCTURES *(Please fill the details for all family members.)*

Sl.no	Name	Relation with HoH*	Marital Status	Gender	Age	Educational Qualification	Employment	Income pattern	Income	Employment sector

****HoH: Head of Household***

D. SOCIO-ECONOMIC DETAILS

1. Type of Family:

☐ Nuclear ☐ Joint

2. House type:

☐ Kutchha ☐ Pucca
☐ Thatch house

3. Ownership:

☐ Rental house ☐ Private house

4. Communication:

☐ Mobile cell phone ☐ Landline phone
☐ None of the above

5. Entertainment/ Source of information:

☐ Television
☐ Computer
☐ Radio
☐ Newspaper
☐ Internet
☐ None of the above

6. Water sources:

☐ Ring well
☐ Private Pipeline
☐ Public tap
☐ Common well
☐ Rain-water harvesting

7. Electricity:

☐ Electrified ☐ Not electrified

8. Cooking:

☐ LPG
☐ Wood
☐ Kerosene
☐ Electricity

9. Sanitary facility:

☐ Private ☐ Public toilet

10. Do you own any land?

☐ Yes ☐ No

11. Transportation:

- ☐ Private Vehicle
- ☐ Public Transport
- ☐ None of the above

12. Do you have daily access to public transport?

- ☐ Daily
- ☐ Once a week
- ☐ More than once a week
- ☐ Rarely available

13. Do you have access to weekly market?

- ☐ No
- ☐ Yes, with walkable distance
- ☐ Yes, but not walkable distance

14. Do you practice agriculture?

- ☐ Yes
- ☐ No
- ☐ Not anymore
- ☐ Recently started

Reason: _____

If yes,

- ☐ For self-consumption only
- ☐ For self-consumption and commercial

15. Skills you have:

- ☐ Carpentry
- ☐ Baking
- ☐ Handicraft
- ☐ Weaving
- ☐ Farming
- ☐ None

16. Do you use your skill to earn your livelihood?

- ☐ Yes
- ☐ No

If no, why? _____

17. Do you have bank accounts?

- ☐ Yes
- ☐ No

18. Do you have savings in your bank account?

- ☐ Yes
- ☐ No

19. Have you availed any loan for your livelihood activities from any bank?

- ☐ Yes
- ☐ No

20. If yes, how many times? _____

Please specify the reason/purpose: _____

Name of the bank/ institution: _____

21. Do you avail any government subsidies/incentives for undertaking your livelihood activities?

[] Yes

[] No

If yes, how many times:

Please specify the reason/purpose: _____

22. Do you have ration card?

[] Yes

[] No

If yes, do you get ration monthly?

[] Yes

[] No

Is it sufficient for your family for 1 month?

[] Yes

[] No

23. Are you a member of any scheme?

[] Yes

[] No

If yes, what are the benefits you get? _____

Name of scheme: _____

24. Do you have any plan/desire to change your occupation?

a) If yes, why? _____

If yes, change from _____ to _____

b) If no, why? _____

25. Are you satisfied with your income?

[] Very satisfied

[] Satisfied

[] Not satisfied but okay

[] Not satisfied at all

Reason: _____

26. What are the problems you are facing to increase/raise your monthly/annual income?

- a) _____
- b) _____
- c) _____

27. What do you suggest in order to solve the problems you are facing to increase your income?

- a) _____
- b) _____
- c) _____

28. How many months do you work in a year? _____

29. During off- season, what do you do? Does it contribute to your income?

E. Personal Priority Preferences

1. Reason for Non-Diversification (*No multiple income source*)

Reason	Rank
Non-availability of credit facilities	
No good market facilities	
Sufficient income	
Lack of knowledge (career guidance)	
Non-availability of land	
Child caring	
Others (Specify)	

Rank: Please indicate ranking as 1st, 2nd, 3rd and so on according to your experience.

‘OR’

2. Reason for Diversification (*Multiple income source*)

Reason	Rank
To educate children	
No major source of income	
To supplement income	

For pleasure	
Others (Specify)	

Rank: Please indicate ranking as 1st, 2nd, 3rd and so on according to your experience.

*Suggestions from the respondent (if any):

Please mention the name and the type of job your family members are engaged in to earn your living

A. NON- FARM ACTIVITES

Trade	Name	Name of activity	Income (Monthly)
Grocery, Stock Business, Middleman, Contractor, Livestock, Cattle feed, Garments, Food grain, Drugs, Lumber, Foods, Kerosene, Fruit, Meat, Fish, Vegetables, Home-brewed beer, Seasonal business, Stationary shop, Xerox shop.			
Handicrafts & Artisanship	Name	Name of activity	Income (Monthly)
Pottery, Blacksmith, Tannery carpentry, Basket making, Roof thatching, Mat making, Carpet making, Bamboo work, Weaving, Goldsmith, Baking, Jeweler,			
Service provision	Name	Name of activity	Income (Monthly)
Cobbler, Barber, Butcher, Mechanic, Transport, Musician, Grain mills, Traditional medicine, Tailor, Money lender, Fortune teller, Guide, Salesman, Driver			
Formally employed	Name	Name of activity	Income (Monthly)
Teacher, Health worker, Veterinary, Surgeon, NGO worker, Local agent of party, Council member, Maid, Guard, Defense service, Church ministry, Peon, Banking services, Sweeper, Govt. servant, Office assistant, Pensioner,			
Rental Income	Name	Name of activity	Income (Monthly)
Animals, Tools, Tractor, Land, House,			

B. OFF-FARM ACTIVITIES

Wage labourer	Name	Name of activity	Income (Monthly)
Food for work, Agricultural labour, Porter, Sand collection, State Farm labourer, carpentry,			
Forest products	Name	Name of activity	Income (Monthly)
Charcoal, Wood, Grass, Lumber			
Fishing	Name	Name of activity	Income (Monthly)
Fish catching, Repairing nets and equipment, Transporting fish.			

C. FARM ACTIVITIES

Crops	Name	Name of activity	Income (Monthly)
Maize, Wheat, Rice, Vegetables, Fruits, Oil, Seeds,			
Livestock & Livestock by-products	Name	Name of activity	Income (Monthly)
Cattle, Goats, Milk, Yogurt, Meat, Pig,			
Horticulture	Name	Name of activity	Income (Monthly)
Plants for ornament, Tea, Coffee, Rubber, Spices,			
Poultry	Name	Name of activity	Income (Monthly)
Chicken, Turkey, Duck, Geese, Egg,			
Flouriculture	Name	Name of activity	Income (Monthly)
Nursery, Fresh flower,			