

**DYNAMICS OF LIVELIHOOD DIVERSIFICATION OF RURAL FARM
HOUSEHOLDS IN INDIA**

**A Thesis Submitted to the University of Hyderabad
in Partial Fulfillment of the Requirements for the Award of**

DOCTOR OF PHILOSOPHY

IN

ECONOMICS

BY

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CERTIFICATE

This is to certify that the thesis entitled “**Dynamics of Livelihood Diversification of Rural Farm Households in India**” submitted by **Ruma Kumari** bearing Reg. No. **17SEPH10** in partial fulfilment of the requirements for the award of Doctor of Philosophy in **Economics** is a bonafide work carried out by her under my supervision and guidance. This thesis is free from Plagiarism and has not been submitted previously in part or in full to this or any other University or Institution for the award of any degree or diploma.

A paper related to this thesis has been published in the following:

1. Ruma Kumari and R. V. Ramana Murthy (2022): “Determinants of Livelihood Diversification of Farm Households in Rural India: Evidence From National Sample Survey”, Journal of Asian and African Studies, Sage Journal, DOI: <https://doi.org/10.1177/00219096221130343>

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Further, the student was exempted from doing coursework on the basis of the following courses passed during her M.Phil. Program and the M.Phil. Degree was awarded:

Course code	Name	Credits	Pass/Fail
EC701	Advanced Economic Theory	4.00	PASS
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EC751	Study Area	4.00	PASS

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DECLARATION

I, Ms. Ruma Kumari, hereby declare that this thesis entitled, “Dynamics of Livelihood Diversification of Rural Farm Households in India” submitted by me under the supervision of Prof. R.V. Ramana Murthy is a bonafide research work which is also free from plagiarism. I also declare that it has not been submitted previously in part or in full to this University or any other University or Institution for the award of any degree or diploma. I hereby agree that my thesis can be deposited in Shodganga/INFLIBNET.

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DEDICATION

I DEDICATE THIS WORK TO MY BELOVED BROTHER

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It has been a journey through vales and hills, through these all, the Almighty from whom all knowledge and wisdom flows have been kind and faithful. Today, I am penning to say, "Thank you" to those who walked along with me; some for a short while, some for a long, and still, some I know will linger on throughout my life here. All the while, I imprint footprints of warm memoirs.

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Table of Contents

Chapter-1

Introduction, Issues and Objectives of the Study

1.1. Introduction.....	12
1.2. Importance of Livelihood Diversification in India.....	14
1.3. Rationale of study	14
1.4. Research Questions.....	16
1.5. Objectives of the Study.....	17
1.6. The hypothesis of the study.....	17
1.7. Data Source.....	17
1.8. A Brief Methodology.....	20
1.9. Significance of the study.....	20
1.10. Scope and Limitations of the study.....	22
1.11. Structure of the Study.....	22

Chapter-2

Review of Literature

2.1 Concepts of Livelihood and Diversification.....	25
2.2 Theory on Livelihood diversification.....	27
2.3 Studies on Different Countries.....	30
2.4 The Sustainable Rural Livelihood Framework.....	32
2.5 Dynamics and the recent trend of rural livelihood in India.....	35
2.5.1 All India level debate on livelihood diversification over the period of time.....	36
2.6 Status of Farm and Non-Farm Activities in India.....	39
2.7 Sources of Income of the Rural Households in India.....	40
2.8 Conclusion.....	43
2.9 Research Gap.....	44

Chapter -3

Determinants of Livelihood Diversification of Farm Households in Rural India: Evidence from National Sample Survey

3.1	Introduction	46
3.2	The View of Livelihood Diversification.....	49
3.3	Procedure of Estimation.....	50
3.4	Sources of Data and Details of Measurement Variables.....	51
	3.4.1 Data source.....	51
3.5	Measurement Variables.....	53
3.6	Empirical Framework.....	57
	3.6.1 Descriptive statistics analysis.....	57
	3.6.2 Econometric Analysis.....	62
3.7	Results.....	62
	3.7.1 Determinants of income diversification in non-farm enterprises.....	62
3.8	Conclusion and policy implication.....	68

Chapter-4

Livelihood Diversification and Wellbeing of the Farm households in Rural India: A Decomposition Analysis

4.1	Introduction.....	70
4.2	Data source.....	73
4.3	Empirical Framework.....	73
	4.3.1 The Blinder-Oaxaca Decomposition	74
	4.3.2 Descriptive Statistics of Principal Variables (T-TEST).....	80
4.4	Econometric Analysis.....	82
	4.4.1 Blinder-Oaxaca Decomposition: Threefold Decomposition Method.....	86
	4.4.2 Contributions of socio-economic characteristics to the consumption expenditure gap and income gap.....	88
4.5	Conclusion and Discussion.....	92

Chapter-5

Impact of Institutional Credit on the Participation of Farm Households in Non-Farm Enterprises

5.1	Introduction.....	95
5.2	Characteristics of rural credit markets in India.....	96
5.3	Data Source.....	99
5.4	Empirical Strategy.....	99
	5.4.1 Descriptive Statistics.....	100
5.5	Regression Results.....	104
5.6	Discussion and Conclusion.....	108

Chapter-6

Summary and Conclusions

6.1	Conclusions	111
6.2	Specific Contribution of the Study.....	115
6.3	Policy Suggestions.....	116
6.4	Limitations of the study.....	118
6.5	Future Scope of the Study.....	119
	BIBLIOGRAPHY.....	120

List of Tables

S. No.	Title	Page No.
Table 2.1	Percentage Share of the Principle Sources of Income of the Rural Households for Different types of Farmers in India	42
Table 3.1	Percentage Share of Income Diversification of farm households in NFEs in different Agro-climatic Zones	48
Table 3.2	Description and Measurement of Principal Variables	55
Table 3.3	Descriptive Statistics of Principal Variables	59
Table 3.4	Determinants of Income Diversification of Farm Households in Rural Non-farm Enterprise	65
Table 4.1	Percentage of Rural Households Taking Part in Non-Farm Enterprises	72
Table 4.2	Definition of variables and their summary statistics	76
Table 4.3	Two-Sample T-Test With Equal Variances of Measurement Variables	81
Table 4.4	Linear Regression Model Result	83
Table 4.5	Consumption Expenditure gap and Income gap	86
Table 4.6	Aggregate Decompositions of Consumption gap and Income gap	88
Table 4.7	Grouped Decomposition of Consumption gap and Income gap (% gap)	89
Table 5.1	The Percentage share of loans by formal and informal sources	98
Table 5.2	General characteristics of institutional and non-institutional borrowers (t-test)	101
Table 5.3	Purpose of Loans Taken from Formal and Informal Sources	103
Table 5.4	Impact of access to institutional credit on Livelihood diversification	105

List of Figures

S. No.	Title	Page No.
Figure 2.1	Sustainable Rural Livelihood Framework	34
Figure 2.2	Proportion of farm and non-farm employment in India over the period of time	41
Figure 2.3	Percentage Share of the Principle Sources of Income of the Rural Households for Different types of Farmers in India	43
Figure 5.1	Purpose of Loans Taken from Formal and Informal Sources	104

CHAPTER 1

INTRODUCTION

1.1. Introduction

Livelihood diversification is an important process of transformation of a traditional economy. The social and economic mobility to enhance their standard of living is an essential part of rural households towards more productive activities within and outside the village. It is an attempt by individuals and households to discover alternative ways to increase incomes and lessen environmental risks (Hussein & Nelson: 1997). It is defined as one of the coping mechanisms and the process through which rural families build a diverse portfolio of activities and social support capabilities in their struggle for survival and to improve their standards of living (Ellis, 1997). Livelihood diversification refers to a means of gaining a living (Chambers, 2005) and it encompasses the assets, capabilities, and activities needed for a way of living (Scoones; 1998, Farrington et al, 1999; Liu &Liu, 2016). It is also defined as the continuous alteration and maintenance of wide-ranging occupations and economic activities that minimize household income variability, lessening the adverse impact of seasonality, and providing additional income or employment (Barrett et al. 2000; Loison, 2015).

The activities of livelihood diversification are broadly two types, on-farm and off-farm diversification. On-farm diversification implies a strategy of farmers that provide safeguard contrary to both production and market risks that are common to individual agricultural commodities. A conventional example includes mixed cropping, which means growing two or more crops on the same field “to take an advantage of complementarities between crops for their use of soil type variations, and climatic variations to reduce the risk with a small loss in total income” (Ellis, 2000). Off-farm diversification comprises all non-agricultural activities in the rural economy. It includes processing, manufacturing, marketing, wage/salary, and casual employment in rural areas. The non-farm activities are commonly interchangeable with the activities of off-farm diversification. A wide range of studies suggests that these activities are highly diverse and heterogeneous in different regions. It is said that the diverse type of non-agricultural activities provides opportunities for poor households and the rich as well. The poor always seek work outside the farm sector and are led by distress into low-quality off-farm activities (e.g. brewing, basket making, earthenware making, seasonal labour migration, etc.) (Reardon & Webb, 2001). Whereas, rich households work in high returned income activities such as processing, conveyance, shipping, manufacturing, etc. (Barrett et al. 2001).

In theory, several studies advocate that the motivations of rural households who diversify their livelihood activities emerge from two factors, push and pull (Davis, 2006). A

push factor is related to the coping mechanism caused by environmental degradation, risks, shocks, and climatic changes. On the other hand, the pull factors appeals rural community to generate extra income for living and support the livelihood. (Haggblade et al., 2007). Moreover, the driving forces for income diversification in non-farm enterprises or business have been characterized into two parts, demand-pull and distress-push (Davis, 2003; Haggblade, 2007). The demand-pull includes opportunity-driven activities from the advancement of technology and emerging new markets while the distress-push is triggered by shocks, small land holdings, lack of opportunities, poor quality of soil, and crop failures. Thus, all together, the significance of pull and push factors are divided into two categories; one, that work a last resort to the rural poor and two, that offer high returned income opportunities for the rural rich.

While reliance on income diversification away from agriculture and shifting towards non-farm enterprises (NFEs) in developing countries is recognized at larger scale, but all households do not have equal opportunity to access the non-farm activities. The several scholars Barrett et al. (2001) shown that the livelihood diversification away from farm is caused by the factors such as diminishing returns of labour or time-varying, market failures, ex-ante risk management, and ex-post coping with adverse shocks (Barrett, Reardon, and Webb 2001). In other words, the poor diversify out of necessity while diversification of better-off households is led by choices and demand driven (Ellis 2000; Reardon et al., 2001). Therefore, diversification takes place out of desire or uncertainty involved associated with the rural households or individuals living conditions. It works in two distinct ways, one as a protection (safety valve) for the poor and two as a means of accumulation for those who are well-off (Ellis, 1998).

The focus on the transformation of livelihood is central to the discussion of poverty reduction in rural areas (Kim, 2011). Millions of people were able to escape poverty by receiving better income from farm and non-farm sources and migration which improved their rural livelihood conditions (World Bank, 2008). Rural development was considered an important goal for the policymakers, where poverty reduction and structural reform measures have been proven to end. Evidently, developing countries experienced 30 percent to 35 per cent of the income generated from non-farm activities (Haggblade et al., 2007). At the same time, several scholars argued that in a situation of a risk-prone agriculture sector and incidence of poverty, poor farmers are forced to look for alternatives source of income and they engage in low-quality and sometimes risky non-farm work (Barrett et al. 2001; Loison & Loison, 2016).

1.2. Importance of Livelihood Diversification in India

In India, the agriculture sector employs approximately half of the population and contributes as a good source of livelihood, although the reliance on cultivation has gone down over the period of time. The growth rate of the non-agricultural economic activity has exceeded the agriculture after the 1991 economic reform period and stands at 4.2% (Biswanger, 2013) whereas the growth rate of farming sector stands only at 1.2% (Economic Survey, 2015-16). According to a World Bank report (2008), in the last ten years, non-farm employment has increased four times larger than employment in the farm sector (World Bank, 2011). However, this figure of the non-farm sector represents the overall non-farm growth in India, including the manufacturing and tertiary sector. Moreover, the farm sector in this country is characterized by the declining size of holding, low productivity, low levels of output per hectare of land, high degree of subsistence farming, and an increase in the volume of production is predominantly driven by area, not by the yield growth (Jirstrom et al. 2011). The land is the main source of livelihood for small holder farmers that include marginal and small. These farmers are becoming unsustainable over a period of time and not meeting their daily requirements for survival (Hiremath, 2007). In other words, agriculture is not proven to be a sustainable livelihood for the larger section of communities in the country. In this situation, livelihood diversification becomes important, and work as a supporting source of income, resulting in a reduction of poverty and increased living standard.

1.3. Rationale of study

Diversification is relevant for the rural households of India because more than one-third of the population is directly or indirectly dependent on agriculture and facing livelihood challenges. The increasing population growth and marginal growth of the farm sector (3% per annum growth rate during 1990-1991 to 2012-2013) creates disguised unemployment. At the same time, the average size of the landholding is confronting a continuous decline and is largely dominated by marginal and small holdings and leading to low per capita income (Birthal et al., 2014). The climatic variability and environmental risks create distress among the poor, about 60% of the land is rain-fed which is highly dependent on the monsoon season. This causes a steady decline in the share of agricultural Gross Domestic Product (GDP) with the rate of 3.35% it came down from 30%(1990-1991) to 13.7% (2012-2013). In this context, the rural community are going through a critical situation with having a huge burden of debt from informal and formal sources.

There have been biases in policy (Chand, Saxena, & Rana, 2015) which provide an imperfect market mechanism and inadequate support for the farmers who get the benefit of remunerative prices as a last resort. This situation compels the rural household to adopt a survival-led strategy rather than an opportunity-led strategy for income diversification (Khan et al., 2019). By definition, the survival-led strategy is referred to those households that have fewer resources such as land, capital, credit, livestock, etc. and engages in low-return work and risky non-farm work (Barrett et al., 2001; and Le Lay, 2008). While opportunity-led diversification is referred to those households that have ample resources with lesser risks and vulnerability leading to maximizing their profit and wealth accumulation (Loison & Loison, 2016). Evidently, researchers have observed a significant shift of agricultural households entering the non-farm sector and reported that off-farm activities have huge potential to boost farmers' income and alleviate poverty and inequality in developing countries (Adams & He, 1995; Lanjouw et al. 1999; Janvry & Sadoulet, 2001; Reardon, Barrett, & Stamoulis, 2007). Having concerns over such an effect, the government of India also envisioned looking into the issues by bringing policy to have a target of doubling farmers, income by 2022. Thus, as per this policy target, the utilization of resources in a planned way may reduce the prevailing obstacles in the agriculture sector, although it is uncertain.

Despite showing a positive effect of the non-farm employment sector on poverty reduction and factors determining the livelihood diversification of rural households (Van Leewen & Dekkers 2013; Tsiboe et al., 2016), there are some research gaps in the existing literature in the context of India. First, the previous studies focused mainly on non-farm entrepreneurship and non-farm employment as a whole including all manufacturing and tertiary sector, however, its dynamics are different when compared to the sub-categories of non-agricultural work in rural areas. Second, the aspiration of rural community to diversify their income strategy is increasing over the period of time but there is little known about the impact of livelihood diversification on well-being in specific, who is most benefited and how is the well-being of poor households who diversify their activities. In other words, following the national-level data of the government of India, this study examines the effect of livelihood diversification on farm income and the monthly consumption expenditure of rural households. Third, inaccessibility to formal financial institution and incomplete market information may discourage rural communities to take part in non-farm diversification (Davis et al., 2002; Schwarze & Zeller, 2005). Several researchers (Birthal, Roy, & Thorat, 2007; Joshi & Gulati, 2007) argue that institutional factors influence the decision of the farmer to get access to such diversification. Therefore, this present study intends to examine the role of

institutional credit and non-institutional credit on rural households who diversify their activities in non-farm enterprises.

Another, key motivation for this study is to investigate the role of agro-climatic zones in the welfare and livelihoods of rural India, especially of poor farm households who mainly depend on economic resources. The physiographic features of agro-climatic zones depend on the soil and climatic conditions including sub-tropical, intermediate cold-arid and temperate zones in India (NSSO, 1998). To meet the requirement of staple foods, farm households adopted area and time-specific cultivation practices depending on the agro-climatic suitability. About 60% of the land in India is still rain-fed and highly dependent on the monsoon season. This creates uncertainty for the farm household about their products that may discourage them to take the decision to enter into non-farm enterprises. Also, the viability of agriculture in different geographical regions gets affected by a lack of infrastructural support, capital inadequacy and market accessibility of the produce. For instance, unlike the plain land, the hilly region keeps limits on mechanical farming and transportation of the product, especially for horticulture products. Hence, this study undertakes the agro-climatic zone as an important determinant for the households who diversify their livelihood activities in rural India.

1.4. Research Questions

In the present context, works of literature put attention to non-farm activity as income-generating activity showing a diversification pattern in the rural economy of India. Hence, the present study is designed to frame the following research questions to assess the ongoing patterns and trends and changes in the rural economy of India, which is relevant for the present work.

- (i) Why do rural farm households diversify their livelihood and how do different resources and constraints influence their decision to take part in non-farm enterprises?
- (ii) What are the trends, patterns and effects of livelihood diversification in the rural community of India?
- (iii) What is the effect of livelihood diversification on farm income and consumption expenditure of rural households?
- (iv) How do formal and informal sources of credit influence the choices of farming community who participate in non-farm enterprises and what is its impact in rural India?

1.5. Objectives of the Study

The present study aims to answer the above-raised questions. In other words, the purpose of this work is to understand the concept of livelihood diversification of farm households in rural India with an improved approach. Therefore, the specific objectives to follow in this study are:

- (a) It aims to investigate the determinants of livelihood diversification of farm households in rural India whose primary source of income is the cultivation and involved in non-farm economic activities.
- (b) It estimates the effect of livelihood diversification on a household's well-being with a particular focus on farm income and consumption expenditure.
- (c) It investigates the role of different formal and informal credit institutions on livelihood diversification of farm households.

1.6. The hypothesis of the study

Based on the above objectives, the following hypothesis is formulated for the present research.

- i) Rural households' diversification is resource neutral.
- ii) There is a significant association between farm income and livelihood diversification.
- iii) There is a significant association between consumption expenditure and livelihood diversification.
- iv) Diversified households have more access to formal finance.

1.7. Data Source

To get estimation on income dynamics, one should follow the time series data but in India, there is such data available on farmers' income. India lacks in providing such time series data give reliable information on the income of the farm households (Bhatnagar 2017). To evaluate the condition and situations on livelihood of farm households, the National Sample Survey Office (NSSO) and India Human Development Survey (IHDS) are the only sources that provide information on farmers' income. Related to the livelihood situations of farm households, so far National Sample Survey Office has conducted the three repetitive rounds namely, the 59th (2002-2003) round of the Situation Assessment Survey of Farmers (GoI,

2005), the 70th (2012-2013) round of the Situation Assessment Survey of Agricultural Households, (GoI, 2014) and the 77th (2018-19) round of Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households, (GoI, 2021). To assess the income and other factors of farming community from these surveys, we can only compare the last two rounds and not the first round. Because, in the definition for the farm households used in the 59th round is based on possession of land and operational holding, these two factors were considered as a necessary condition which is entirely different from the last two rounds. Hence, the present study used the 70th (2012-13) and 77th (2018-19) rounds of the Situation Assessment Survey (SAS) of agricultural households that follow the identical definition. The definition used to define farming community was adopted in the latest two surveys by NSSO are based on income cut-off who gets receipts from self-employment in agricultural activities. In other words, the last two rounds of SAS are motivated by the large range of activities which covers the livelihood parameters of farmers that are fundamental for the research questions which we address in this present study.

The 70th round (2012-13) defines an agricultural household as “if one or more members are engaged with self-employed in agriculture either in the principal status or in subsidiary status and having a total value of produce more than ₹3000/- during the last 365 days”. Similarly, 77th round (2018-19) defines an agricultural household as “a household receiving value of produce more than Rs. 4000/- from agricultural activities (e.g., cultivation of field crops, horticultural crops, fodder crops, plantation, animal husbandry, poultry, fishery, piggy, bee-keeping, vermiculture, sericulture, etc.) and having at least one member self-employed in agriculture either in the principal status or in subsidiary status during last 365 days”. The data on the SAS was conducted in separate two visits in both rounds by National Sample Survey Office. In the 70th round of Situation Assessment Survey, visit 1 was canvassed for the Kharif season from July to December, 2012 and in visit 2 the survey was done in the rabi season from January to June, 2013. During the first visit 1, the total number of households were interviewed comprise 35,200. Out of which only 34,907 households were interviewed again during visit 2. This means 293 households could be missing during visit 2 of the survey. Therefore, combining both visit 1 and visit 2 would give us information on farm households for the complete agricultural year 2012–2013. The survey categorizes agricultural households based on principal source of income. The sources of income are crop cultivation, farming of animals, non-farm enterprises, wages and salaries, remittances, pensions, and others. However, the survey also provides information on receipts

and expenses from other four sources such as income from crop, livestock, non-farm, wages and salaries. There is no information on receipts from pension, remittances, and others.

Similarly, the 77th rounds also provide the information on livelihood situations of farm households in two different visits. The survey in visit 1 was conducted during July-December, 2018 (Kharif season) and visit 2 during January-June, 2019 (rabi season). Thus, by combining these two provides information on farm households for the whole agricultural year 2018-19. Similar to the 70th round, this round also categorizes the farm households based on principal sources of income such as agriculture, non-agricultural, livestock, wage and salaries, and others. Broadly, these round categorizes the principal source of income into three (1) self-employment in crop production, livestock, other agricultural activities, and non-agricultural enterprise (2) regular wage and salaried earning in agriculture, non-agriculture, and (3) casual labour in anon-agriculture, others (pensioners, remittance recipients, student, engaged in domestic activities, etc.). During visit 1, the total numbers of households surveyed were 58,035 and in visit 2, the surveyed households were 56,894 again out of 58,035. This means 1,141 were the missing households at the time of visit 2. Both rounds offer comprehensive data on households and farm characteristics and on a number of individuals. It covers the institutional, socioeconomic, and organizational characteristics agriculture. It provides data on size of landholding, irrigation, crop yields, cost of production, access to credit, demography etc.

Further, to examine the impact of climatic conditions, this study used the six different Agro-climatic zones. NSSO conducted a survey on Common Property Resources as part of the 54th round during January to June 1998 at the district level across the country. The survey delineates the agro-climatic zones into 15 categories that are based on soil, climatic condition, and availability of water resources. Further, to make the analysis, the present study clubbed the given 15 zones into 6. These six zones are Himalayan Region (Western& Eastern), Gangetic Plains (Lower, Middle, Upper &Trans), Plateau and Hills (Eastern, Central, Western & Southern), Coastal plains and Hills (East Coast, West Coast, and Gujarat Coast), Western Dry Region, and All Islands. Initially, criteria to decide these agro climatic zones by NSSO was based on a study by H.G.Hanumappa of the IISec, Bangalore which had identified districts belonging to different zones by blowing up a small map showing approximate boundaries in the country and matches with the latest available India-Administrative-1:6m map produced by National Atlas Thematic Mapping Organization, Department of Science and Technology, GoI.

1.8. A Brief Methodology

The present research uses the unit-level data from the National Sample Survey Office (NSSO) on a situation assessment survey of the farm household for two rounds that are 70th round (2012-2013) and 77th round (2018-2019). A pooled probit model has been applied to investigate factors which determine the livelihood diversification of agricultural households entering into non-farm activities. The study uses the linear regression model to assess the effect of livelihood diversification on farm households' well-being. In addition, to understand the factors which are responsible for the difference or called as "gap" in the farm income and consumption expenditure between households who are not diversified and who are diversified, the B-O decomposition method is used. And further, to evaluate the effect of institutional and non-institutional sources of credit on the livelihood diversification of farm households it uses descriptive statistics and a Probit regression model following the data from the 77th round of NSSO.

1.9. Significance of the study

A number of studies from developing countries emphasize the importance of livelihood diversification strategy in non-farm enterprises which have massive potential to improve farmers' income, mitigate the risks and curtail poverty and inequality (Adams & He, 1995; Janvry & Sadoulet, 2001; Lanjouw, 1999; Reardon et al., 2007). Pondering over such evidence, the Indian government also understood the importance of non-farm activity and set a policy target of doubling farmers' income by 2022. However, this announcement by the government was made in light of the agrarian distress that the current farming communities are going through (Chandrasekhar & Mehrotra, 2016). A scholarly study on farm income in India is mainly discussed by Chand et al (2015), who suggest that there has been a drastic decline in farm income and dropped to around 1%, particularly after 2011-2012, and this has led to the sudden rise in agrarian distress. In this context, the present study aimed to examine the determining factor which affects the rural farm household to diversify their income source in non-farm activities.

The role of climatic and soil conditions in different regions of the economy is most important when talking about the sustainability of agricultural practices. Keeping this in view, this study analyzed the livelihood diversification of numerous agro-climatic zones in India. NSSO conducted a survey on Common Property Resources as part of the 54th round during January to June 1998 at the district level across the country. The survey delineates the agro-climatic zones into 15 categories that are based on soil, climatic condition, and

availability of water resources. Further, to make the analysis, the present study clubbed the given 15 zones into 6 by combining similar geographical features. These zones are Himalayan Region (Western & Eastern), Gangetic Plains (Lower, Middle, Upper & Trans), Plateau and Hills (Eastern, Central, Western & Southern), Coastal plains and Hills (East Coast, West Coast, and Gujarat Coast), Western Dry Region, and Islands.

In addition, the process of diversification is markedly varied in its nature in the arena of social and economic framework. In other words, the process is distinguished in causes and effects with several factors pertaining to vulnerability, demography, location, education, etc. Thus, one has to understand the cause and effect of such issues that could help in both ways, first to tackle if the diversification is driven by vulnerability and second, it could encourage the farmers to participate in additional income-generating activities if it is driven by opportunity-led factors such as educations and others. The finding of the present study provides an impact evaluation of livelihood diversification on the well-being of the farm households by analyzing farm income and consumption expenditures. Hence, the result of the study could help the stakeholders of policymakers to provide adequate suggestions to the government for rural development.

Furthermore, this study also adds to the existing literature by assessing the impact of formal institutional credit on livelihood diversification (Ghosh et al., 2000) advocate that the accessibility of credit is essential in developing countries, including India and it plays a pivotal role in the lives of the rural community in multiple ways. In a situation where rural households are majorly engaged in agriculture and face large climatic variations and seasonal fluctuations, accessibility to credit supports them in farming practices and smoothening consumption. In rural India, formal and informal credit institutions work as two sides of the same coin, yet the informal sources provide loans at an exorbitant rate of interest. Moreover, the rural households are very well aware of the high rate of interest provided by informal loan providers such as local money lenders, relatives and friends but still they prefer to take a loan from such sources. The reason for such action is the absence of regulated formal credit institutions such as commercial banks, regional rural banks, insurance companies, cooperative banks, etc. (Townsend and Ueda, 2006). Therefore, the present study examines the impact of institutional credit on the livelihood diversification of farm households into non-farm economic activities, which could add some justification for the policy implication in the process of rural development.

1.10. Scope and the Limitations of Study

The analysis of this study is confined to the latest two rounds 70th and 77th rounds of Situation Assessment surveys of farmers conducted by NSSO during 2012-13 and 2018-19. Both the rounds provide information on large range of activities which cover the livelihood strategy of farm households that addresses the fundamental research questions of this study. This study opens up a way ahead for further exploration in the process of diversification and its impact on the welfare of farm households in rural India. This study majorly offers three major characteristics of livelihood diversification of agricultural households. First, it examines the factors which determine the income diversification of farm households to support their livelihood. Second, it assesses the well-being of farm households who chose to diversify their activities in non-farm enterprises with a particular focus on their income and consumption. And third, it examines the role of different credit institution on the households that diversify their activities.

1.11. Structure of the Study

The present study comprises six chapters. Chapter 1 introduces the concepts and significance of livelihood diversification followed by the research question, objectives, data source and methodology. It also highlights the rationale for the study and proposes some hypotheses based on objectives which are tested empirically.

Chapter 2 provides a broader analysis of the literature review to conceptualize the process of rural livelihood diversification worldwide and in India. It brings the detailed definition and concepts of livelihood diversification followed by a sustainable livelihood framework.

Chapter 3 provides a detailed analysis of the factors that determine and influence the farm households who chose to diversify their livelihood in rural India. The analysis is classified into three major categories: first, it gives a detailed figure of the percentage share of livelihood diversification in rural India in six different agro-climatic zones using the pooled data from two rounds of the Situation Assessment Survey of households. Second, it provides the summary statistics of measurement variables followed by its comprehensive definition. And the third set of analyses in this chapter offers an empirical investigation which examines the decision of influencing factor of the farmers entering into non-farm enterprises based on pooled probit model,

Chapter 4 presents an effect evaluation of livelihood diversification on the well-being of the farm household through lenses of farm income and consumption expenditure. The analysis is based Blinder-Oaxaca (B-O) decomposition method. To assess the well-being of farm households, this study decomposes the income and consumption expenditure into not-diversified and diversified households, using B-O decomposition method. The B-O decomposition evaluates the characteristics of determining factors lying behind the difference or “gap” in income and consumption expenditure of not-diversified and diversified households. The decomposition of the income and consumption expenditure is done separately.

Chapter 5 is titled “Impact of Institutional Credit on the Participation of Farm Households in Non-Farm Enterprises”. This chapter explains the role of institutional credit and non-institutional credit sources on farm households who decide to enter into a new set of income-generating activities apart from agriculture known as diversified households. To assess the impact of institutional credit on the livelihood diversification of farm households, the study uses a probit model based on the 77th round conducted on the Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households survey of NSSO during 2018-19.

Finally, chapter 6 brings a summary and conclusions of the findings drawn based on the results and analysis and the policy implication of the present study.

CHAPTER 2

LITERATURE REVIEW

A detailed review of the literature is presented with a view to understanding and identifying the issues done in various research works. The literature reviews consist of international and national-level studies on rural livelihood diversification. This literature review aims to identify the research gap, followed by theoretical, conceptual and descriptive approaches covered by researchers. From the existing work, the study analyses the structure, determinants and policy implications of the farm households who choice to diversify, globally and in India. Which helps in developing intellectual and practical answers to the problem of existing work in the field of study through the application of empirical or scientific methods.

2.1 Concepts of Livelihood and Diversification

The concept of livelihood emerged with rural development thinking in the decade of 1990s, with the perspective, of how diverse people in diverse places live and what they do for a living (Chambers, 1995). The notion of livelihoods revolves around the opportunity set afforded by a required means of living (Chamber and Conway, 1992). Livelihood is more than just income, therefore, it comprises income both cash and in-kind, property, gender relations, individuals or households with their endowment and their special division of those assets across numerous activities to produce a stream of income (Barrett and Reardon 2000). Further, livelihood is defined as the capabilities, resources, assets (store, claims and access) and activities rights and social institutions (i.e. kin, family, vicinity, village etc.) are needed to sustain and carry forward their way of life (Ellis, 1998). A livelihood is understood as sustainable when it recovers from shocks, risks and stresses and can cope with or improves its assets and capabilities both in present and future without compromising the natural resources (Ellis, 1998; Niehof, 2004).

Literature on livelihood is mainly concerned with coping, survival and other approaches that individuals or households adapt in given social, economic and environmental circumstances which influence them in taking decisions to generate additional income. The coping mechanism is directly or indirectly associated with the risk or vulnerability that plays an important role in the livelihood strategy of rural households. The response of the household to risk is categorised into two, one as ex-ante risk management strategies and the second as ex-post coping strategies (Ellis, 1998). The ex-ante risk management strategy refers to the forward planning through that risk is spread across a diverse set of activities, so as to evaluate the degree and factors involved in the risk attached to each source of risk'. While of ex-post coping mechanism is a techniques that an individual and household adopt to survive

when facing sudden failure of livelihood either gradually or suddenly (Ibid. p. 13). In addition, a coping strategy works as a safety valve for rural households including in the modification of consumption and savings behavior, and selling the asset. The strategic management of livelihood risk is associated with the concept of adaptation. While livelihood adaptation understood as a unending process of changes livelihood strategy which enhances existing income, security and try to reduce poverty and vulnerability” (Davies & Hossain 1997). Therefore, adaptation is closely related to diversification but both are not synonymous. Diversification is linked with a varied types income sources such as farming, non-farm, transfers, remittances etc.) as its prevailing characteristic.

Diversification refers to a process in which individuals or households interchange their assets and distribute the resources voluntarily or involuntarily across numerous activities in order to realise an optimum balance between predicted returns and risk and shocks encountered by imperfect markets for credit, land and labour (Barrett et al. 2000). The diversification process is understood as a self-insured activity where individuals exchange their forgone expected returns to reduce income changeability by choosing a range of activities and asset (Barrett et al. 2000; Reardon et al. 2001). Diversification draws attention to different sources of income such as farm, non-farm, remittances etc. and their relationship with income distribution, asset levels, etc. Diversification is defined as a means of potential well-being and a source of income growth (Ersado, 2006).

Agriculture sector cannot be denied as the main source of livelihood but it has failed to provide sufficient means of survival for the rural households. As a result, people search for an alternative way of living or source of income. In developing countries, livelihood diversification remained a survival strategy for larger rural population. The definition and its concepts are diverse and broad in different geographical territories and locations. In underdeveloped world, the process of livelihood diversification is subjected to pressure and choice that reason families to accept diverse types of livelihood strategies. In particular, this process is defined as a “means through which rural families build a diverse portfolio of activities and social support capacities in their struggle for survival and improving their living standards” (Ellis, 1997). Further, the next study by Frank Ellis (1999), put forth his view to answer what causes the income diversification and what are its effect. Also, demonstrates the implication and critically evaluate the determinant of household livelihood. His study has done a systematic review of literature, particular focus on Asian countries, and the reasons that diversification is born due to desperation such as poverty, vulnerability, disaster and lack of assets.

Rural livelihood diversification encompasses two types of activities, on-farm and off-farm through which additional income are generated. On-farm activities refer to main household agricultural activities that produce agricultural goods whereas off-farm activities are understood as non-agricultural activities apart from farm activities such as goods and services, the sale of waged labour, self-employment in small firms or business and other strategies that minimise the shocks and risk (Das and Kumar (2018)). In addition, on-farm diversification refers to diversification between crop and animal husbandry like livestock, dairy, poultry, fishery, etc. and within the crop basket as well. It could be a farmer's strategy to hedge against both production and market risks endemic to individual agricultural commodities. While off-farm diversification refers to the extent to which farmers participate in non-agricultural activities. The sources of income for the non-farm sector include net receipts from non-farm business, and wages and salaries that the members of the household receive by working in either the private or public sector including public work programs.

2.2 Theory on Livelihood diversification

Livelihood diversification in rural areas from the farm to the non-farm sector has been understood as a method of broadening and strengthening the income sources of rural households. However, all investigators do not follow the same conventions to define the character and nature of livelihood diversification. Broadly, the diversification process involves the exit of the agricultural workforce in the rural economy as a part of the structural transformation and is viewed as a gradual and inevitable process. Kuznets' (1949) concepts on modern economic growth highlighted the structural change in the rural economy. He advocates that there is an inverse relationship between economic progress and the extent of dependence agricultural workforce on the one hand and a simultaneous rise in the dependence of labourers on the secondary and tertiary sectors.

The process of diversification is influenced by so many factors either it could originate from within the rural location or outside the rural location. Two alternative approaches has been developed which define this process. The first approach is a conventional locative approach in which the off-farm economic activities are executed in a location that falls within selected rural areas. The second approach is based on the linkage approach in which firm or business enterprise makes significant development linkages with rural households (Saith, 1992; Kristiansen, 2003; Davis, 2006). Further, combining these two approaches, four categories have been developed as follows;

- (a) Rural located, rural linked,

- (b) Rural located, urban linked,
- (c) Urban located, urban linked and
- (d) Urban located, rural linked.

The first three categories cover a wide variety of activities and enterprise in rural areas that reflects all types of livelihood strategy of the households. Moreover, rural livelihood diversification is categorised into three distinct sectors, namely; (a) non-farm enterprises that focus on the surplus generation and growth with the employment of labour who possess technical skills, (b) seasonal products or activities that employ unpaid family labour and use outdated technology and cater to the immediate local market and (d) paid labor characterized by low earnings and fragmented markets for labour supply (Saxena, 2003).

There are theories that explain that characteristics of the households who diversify their livelihood strategy from the one sector to another sector in the village economy, mainly away from farm sector. Stephen Hymer and Stephen Rensick (1969), theorised the growth of the non-agricultural sector within the neoclassical framework and named it as a Z-goods sector. The main proposition of the H R Model was that in a two-sector agrarian economy, non-farm sector activities (Z- activities) will decline as the economy grows. The rational assumption is that the Z-goods are produced by the small household and it is very much a village activity that is primarily used for home consumption. The Z-goods are inferior in comparison to those imported goods produced in urban areas, the supply of which has a tendency to grow as the economy increases. The inferiority of the Z-goods is not adequate to bring about a decline in the sector R. Bautista (1971). Adding to the same argument, Raul Fabella (1985) pointed out that in a rural economy model the sectors like a food sector, a more dynamic manufacturing sector and a Z-goods sector, specialize in commodities of which the rural economy enjoys a comparative advantage rather than inferiority that promote manufacturing sector and speculate the demise of the Z-goods sector.

An experience from East Asian countries like Japan, Taiwan and Korea shows a substantial increase in off-farm income which has a great contribution to the development process at different stages Oshima, (1984). A model developed by Oshima, (1987) offers a different stage of growth that emphasises growth in Asian countries and gives importance to non-farm activities and incomes. His main argument suggests that the low farm incomes in the monsoon season have held back Asia historically. The transition from agriculture to industry is impossible without a substantial and consistent rise in these incomes. In addition, agricultural household incomes must increase not only with an increase in yields per hectare but with various cropping and diversification and with off-farm activities. However,

Oshima's model explains three-stages of agro-industrial transition and, eventually, movement to a service-oriented economy. In the first stage of the agro-industrial transition, off-farm activities are majorly traditional, and the supply of labour is season based. The larger portion of non-farm job opportunities lies in sectors relating to construction, transport and services. In the second stage of transition, non-agricultural incomes have shown major acceleration. The scarcity of labour has emerged as full employment is achieved. At the same time, the migration towards big cities in response to higher wages has decelerated. In the third stage of the agro-industry transition, the movement is towards a service sector. In this transition stage, modern services dominate the economy where trade falls and is replaced by personal services. The higher valued service sectors of education, health, and culture increase significantly.

Further, the activities of rural non-farm enterprises are divided into two types, low return activities and high return activities. The low paid job require unskilled labour and micro or small enterprises such as construction labour, weaving, cleaning services, daily or weekly street vendors in the market etc. While, high paid job demands skilled labour employed in small enterprises such as petty grocery shops, teaching to local children or schools, police, health services, transportation etc. Further, Hossain (2004) advocates that resource-poor households with a low level of education and lack of access to capital are engaged in business and service sector activities which end up in a low productivity scale. Micevska and Rahut (2008) revealed that a low level of education and little access to land is the major reason for the low-return off-farm activities. Thus, the activities of rural off-farm enterprises (RNFEs) are heterogeneously defined.

In addition, theories also explain why rural households diversify their livelihood activities rather than specialising. Sherren et al. (2016), summarised the reason for the diversification as follows; attribute, ex-post coping strategy, self-insurance against risk, consumption diversification and inability to specialise caused by imperfect markets. The non-farm opportunity provides incentives for the labour allocated to, with better comparative earnings, need for investment into agriculture earned from non-farm sources, and avoid risk in the farm sector (Reardon, 1997; Barrett et al. 2007; Marenja & Barrett, 2007; Martin & Lorenzen, 2016). The extent of the risk-averse attitude of the farm households is positively linked with the necessity for diversification in terms of insurance, and conversely, it could be negatively related to coping strategies emerging from shock and risks (Ellis, 2000). The strategic management of risky livelihood is associated with the concept of livelihood adaptation which is defined as the process of continuous change in portfolio of income or

asset to reduce poverty and vulnerability or increase wealth and security (Davies & Hossain 1997). The process of adaptation is closely associated with diversification but both are not synonymous. The characteristic of diversification is explicitly understood as a different source of income from agriculture, non-agriculture, remittances etc.

Therefore, the present study is largely supported by the theory developed by the Hymer and Stephen Rensick (1969) model in present context. The kind of diversification takes place in the two sector agrarian economy produces very low quality goods (Z-goods) by small households which is primarily used for home consumption. They also assumed that once the economy will grow and develop, these Z-activities will decline. Thus, adding to this argument, the present study infers that the rural economy is more dynamic in its nature and has a larger scope to grow. A more dynamic manufacturing sector and a Z-goods sector will specialize in commodities of which the rural economy enjoys a comparative advantage rather than inferiority and could promote manufacturing sector and speculate the demise of the Z-goods sector.

2.3 Studies on Different Countries

A research study at the world level provides a different aspect to look at the process of livelihood diversification from the farm to the non-farm sector. In Taiwan, the share of non-agricultural income is inversely related with the size of farm and non-farm income mostly benefits the poor and helps in reducing rural income inequality (Chinna.D., 1979). In Sri Lanka, those with the larger landholding are able to educate their children and find additional support from income coming from outside the farm and invest in agricultural productivity (B.M. Morrison, 1980). In the Gambia, vulnerability has increased over the decades for those who are poor and have fewer assets in response to the coping strategy. The nature of diversification is associated with the small towns which are connected with the villages, mainly the male who migrate and look for an alternative source of income there Housainon Taal (1989).

In developing countries, slow growth of labor absorption in agriculture and increasing class division in rural areas had intrigued the farm household to take part in non-agricultural activities. Also, non-farm activities emerged as a result of the high elasticity of demand for services and non-food goods with respect to changes in agricultural output and rural incomes Danis et al. (1998). Chambers (1989), highlighted that there the coping strategy of poor and deprived households that differ with the region, location, social group, time, age, community,

and season. Thus, diversification should be supported to those who are poor and try to diversify their portfolio of assets.

Frank Ellis (1998), work brings some facts from Sub-Saharan Africa and examined the strategies of rural households and diversification of livelihood in developing countries. He defines livelihood diversification as “the process by which rural families construct a diverse portfolio of activities and social support capabilities in order to survive and to improve their standards of living”. The reason to diversify was born due to desperation such as poverty, vulnerability, disaster and lack of assets. The factors which determine livelihood diversification are- seasonality, risk strategies, coping behaviour, imperfection in the credit market, differentiated labour markets and investment strategies. The author also mentioned that the following factors affect diversification first, to moderate the risk of overall income failure since people chose to work in a different sector. Second, it lessens the intra-year variability in income, by curtailing the effect of seasonality in agriculture. Third, it decreases inter-year income instability caused by variability in farm-based production and markets.

Kassie et al (2017), brought an empirical investigation of the influencing factors that determine the probability of rural households that participates in non-farm income diversification in Ethiopia. An empirical investigation with implication of logit model was used to see the probability. The result advocates that the one who has land-right and cooperative membership has significant association with the households entering into non-farm enterprises. Whereas, the factors like education, age and distance to the proximate market show negative associations with the decision of agricultural households who chose to participate in non-farm diversification activities. The second set of empirical analysis using and the Seemingly Unrelated Regression (SUR) model that examines the livelihood situations with the system of equation. The findings show that households with male-head and having membership of cooperatives have a positive effect on non-agricultural income, whereas the road distance from the nearest market and credit accessibility have a negative effect on off-farm income. However, male-headed households and raising livestock indicates a positive association with the non-agricultural diversification.

Meraner et al. (2014) brought up an empirical study on the determinants of farm diversification in the Netherlands by using a binary logit model to determine the characteristics influencing the diversification decision in general. They defined livelihood diversification in two broader aspects, one is distress driven and the second is choice or opportunity driven. The authors tried to analyze the rational choice of the farmers by using the utility maximization model. The true utility function is not observable directly so the

diversification of livelihood is considered to be an observable utility which is a linear function of socio-economic, demographic and geographic characteristics of farms and farmers. Thus, the major factors or determinants took part in the decision to diversify are the socio- demographic (age of the main farm operator, availability of family workforce, number of family workers in full-time equivalents), economic characteristics (farm size, farm type based on main source of income), and geographical characteristics (urbanization, population density that is measured in terms of inhabitants per km² at municipality level, type of soil).

Rahut et al (2017) study analyses the rural livelihood diversification strategies and their impact on household welfare taking insights from Bhutan. The findings from multinomial estimation suggest that asset endowment, labor availability, education and sex of the household head play a pivotal role in the diversification of livelihood into non-farm sectors. Another set of an empirical study that is propensity score matching estimates that the rural households who diversify outside agriculture gets higher income and have lower poverty levels in comparison to those who does only farming for their survival.

Barrett et al (2001) brought a detailed study focusing on the causes and consequences of the households who decide to diversify their income strategy in Africa. The reason to diversify towards the non-agricultural sector has two aspects one is the push factor and the second is the pull factor. The pushed diversification of livelihood is caused by the factors such as population pressure, failure of farm input markets, curtailment of risk, lack of credit facilities, shocks and disasters and scarce farm output. The demand-driven activities are led by greater revenues from the non-agricultural activities, increase in technology, skill and endowments leading to comparative advantage, the demand for urban life and additional income that meets household needs.

2.4 The Sustainable Rural Livelihood Framework

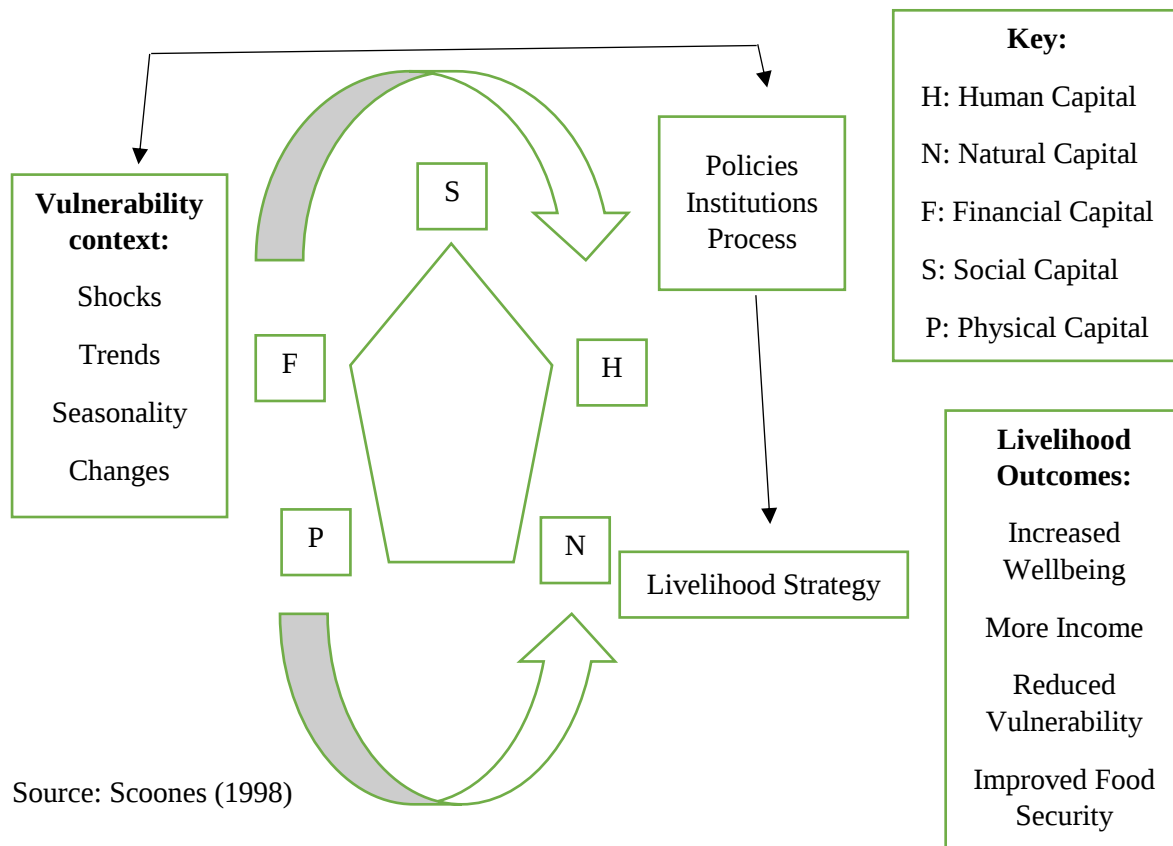
A sustainable livelihood approach has emerged with a wider shift in approaches from development toward human well-being and sustainability rather than economic growth. In other words, a shift in its approaches is related to the shifting of biasness of development thinking from macroeconomic to people-centric, in which the people are considered as a means as well as ends of development (Hussein & Nelson, 1998). Under the sustainable livelihood framework, people are considered as dynamic decision-makers who rationalize their decision to attain their different sources of livelihood. However, people are not absolutely free to make their choices rather the given set of situations play a central role in their decision-making (Ellis, 1998). Thus, the concept of the framework of sustainable

livelihood combines structure as well actor together (Scoones, 1998; Carney, 1998). In this concept, the household is considered a basic unit that combines all sources of livelihood together.

A model on sustainable livelihood was put forward in the report of an Advisory Panel of the World Commission on Environment and Development (WCED). The main proposal of the report was sustainable livelihood security as an integrating concept WCED (1987). Livelihood was defined as a sufficient stocks and flows of foodstuff and liquidity of money that meet the basic necessities. The another term included in this definition was security, that is defined as secure ownership, resources accessibility and income generating activities such as assets and reserves to cope with risks and to meet contingencies. A rural household could achieve a sustainable livelihood security in numerous ways, either through ownership of land and secured employment with suitable return, livestock or trees, right to fishing, grazing or through a varied set of activities. The panel addressed in the report was an inclusive approach where livelihood security was proposed as a sustainable in the environment when there are stable human population, sufficient prerequisite for animal husbandry and society is well managed. Hence, the approach to sustainable livelihoods consists of both means of serving the objectives of equity and sustainability (Chambers and Conway, 1991).

Modifying the WCED concept, the “Sustainable Livelihood” implies a livelihood situation that can cope with risks, recovers from shocks, and maintain its capabilities and assets both now and in the future, while not damaging the present natural resource base. The sustainable livelihood approach (SLA) framework shows a way to the rural livelihoods when the diversification and other development activities take place. It draws main attention to the factors that affect rural livelihoods and their relationship with such factors. This framework can help in bringing the plan of some activities in rural areas which play a major role in the adoption of new livelihood approaches. Based on Chambers and Conway’s (1991) approach, Scoones (1998) developed the framework of sustainable livelihood which is presented in figure 2.1.

Figure 2.1: Sustainable Rural Livelihood Framework.



The factors that affect rural households to persuade different strategy depends upon the basic social, material and tangible or intangible assets, drawing down on an economic metaphor in which livelihood resources may be seen as ‘capital’ (Hussein & Nelson 1998, Canary 1998, Scoones 1998, Ellis 2004, Swift 2006, Davis 2007). According to Goodwin (2003), five different types of capital or assets are identified in this context.

Natural capital: This terminology the natural capital is used for the stock of natural resources such as land, water, sky, air, and other genetic resources and environmental conveniences like hydrological cycle and pollution sinks and etc. From these resources or products we derived the livelihoods. In the context of rural India, natural capital is cultivable land, crop varieties, water, forest, marines and wild resources.

Physical capital: Physical capital is also known as produced capital which includes infrastructures such as rail, road, electricity, production equipment and technologies etc. This capital is produced by using human productive activities, natural capital and it is also able to generate goods or services to remote areas where many poor people live.

Financial capital: Financial capital includes capital base such as cash, savings, credit or debt, and other economic assets such as land or livestock that are needed to achieve the livelihood objectives and facilitate economic production or work as stores. Financial capital is not an end rather it is meant to eradicate poverty and vulnerability.

Human capital: Human capital implies productive capacity of an individual, consisting of both inherited and attained through education, ability to labour, skills and training, knowledge and physical capability and good health etc.

Social capital: Social capital could be understood in different dimensions though, it implies social resources upon which people persuade their livelihoods. The main pillars of social capital are networks and associations, social claims, social relations, affiliations, etc. which help in taking joint or collective actions. In India, somehow social relations are maintained.

Assets do not only relate to the resources that people use in building their livelihoods rather, it is assets which give the capability to the households to act upon. Assets reflect the course of action which people did in past to make their livelihood as well as gives them the ability to use it, transform it or reproduce it (Swift 2006, Bebbington 1999). Thus, these assets help rural people to find the most suitable livelihood strategy which enables them to persuade higher income, improve living standards, reduce vulnerability and improve food security. The framework of a sustainable livelihood focuses on the five types of endowment which helps rural poor household cope with stress and shocks with the support of various institutions and national policies. Therefore, the households can make more money and reduce vulnerability and improve their living conditions. The entire framework works in a circular way.

2.5 Dynamics and the recent trend of rural livelihood in India

In India, diversification of livelihood activities from farm to non-farm sector has been debated more in literature mainly after the economic reform period. However, the contributions of non-agricultural activities are not remarkable when compared to the developed countries. In developing economies including India, only 29% of the households diversify their livelihood activities into non-farm enterprises (Ghosh & Ghosh, 2021). Evidently, for a long period of time, the country has been facing inadequate infiltration of technological advancement, less profit earned from the agriculture sector, natural disasters and vulnerability which created obstacles for the non-farm economic activity diversification. On the other hand, policies of economic liberalization of 1991 and recently developed

innovative technologies are showing some hope to the rural people to generate additional income from the non-farm enterprise (Misra, 2013; Gupta, 2016). In addition, the flow of capital from urban to rural in the form of remittances of migrated workers somehow pushed the rural non-agricultural activities.

The pace of rural transformation of the Indian economy is not identical across the region (Kesar, 2020). It varies with the geographical location and the accessibility of natural resources, demographic features and policies. Various schools of thought talk about the changes in the rural economy, linkages, growth and determining factors of the non-farm enterprise (NFEs). There are two contrasting arguments put forward in the context of livelihood diversification; demand-pull, known as opportunity-driven and distress-push is vulnerability-driven. The employment growth in off-farm activities depends on agricultural growth or prosperity, improvement in education level, and development of infrastructure, new market opportunities, technological skills, technological availability and the aspiration of increasing income portfolio of the households in rural areas (Mahajan and Gupta, 2011). National Bank for Agriculture and Rural Development Consultancy Services (NABCONS, 2015) found that employment in non-agricultural activities is expected to be the residual of farming sector employment when the agriculture sector saturates and it spillover the farm labors which gets transferred in the non-farm activities within the village economy. On the other hand scholars like (Abraham, 2009; Jatav & Sen, 2013) discuss that the landlessness, low productivity in agriculture, low agricultural wages and natural disasters are causes rural community to move towards non-farm diversification.

Yet, the structure of rural non-farm employment in India is highly heterogeneous, as it differs from place to place, the activities include woodworking and traditional earthenware work based on the system of Indian society, trade and commerce, transport and other services in the village economy (Unni, 1991, 1998). Still, the rural economy constitutes 70% per cent of the population and is largely found in agriculture which cannot be denied. Debnath and Ray (2017), argued that the high population growth and population density have led the rural household to diversify their activities. This indicates the distress-led diversification of rural non-farm activities.

2.5.1 All India level debate on livelihood diversification over the period of time

The academic discourse on income diversification away from farm sector is not new in the context of India, though, its importance was realized after the liberalization period. Hague T. (1985), argued that “despite employment shift in the rural sector the country's rural

economy may still continue to remain largely crop-based and no generalized relationship between rural diversification and poverty could be established in the years to come". The author measured the diversification by considering the relative percentage share of various non-crop activities in the aggregate net domestic products of the farming sector, although the distribution of rural population between the agricultural and non-agricultural occupations was also used as a broad indicator of diversification.

Planning commission (1990), produced a working paper on the status of employment in the country. It is observed that agriculture and other agricultural activities are not sufficient enough to provide employment to all rural workforce at an adequate and increasing level of income for a longer period of time, even if they get a reasonably higher growth rate. However, the situation requires rural households to diversify their activities into non-agricultural activities that can provide employment to the growing rural workforce and also reduce rural-urban inequality. S Mahendra Dev(1990), highlighted in his study that during the 1972-73 to 1982-83 period, the share of the rural non-farm sector in the total rural workforce increased. He argued that unemployment in the rural manufacturing sector was higher than that of the farm sector and within the non-farm sector incidence of unemployment was higher in construction, transport, and mining and quarrying. His result shows that the incidence of poverty in the non-agriculture sector was more than that of agriculture in many states of rural India.

India achieved the sufficiency of food with the arrival of the "Green Revolution" in the decade of 1960s. Which brought confidence to the economic literature, where several scholars believed that agricultural growth has led the non-farm diversification in rural areas. C.P. Chandrasekhar (1993), argued that over the one and a half decades, rural India is perhaps not the fall-out of rural dynamism in the wake of the green revolution, rather it is a reflection. Yet, the country much has to experience from the process of the Green Revolution that began in the country. When we combine rural India as a whole, some regions are in a mature Green Revolution phase where the impact of changing agrarian structure on rural non-agricultural activity tends to be positive.

Vyas (1989) and John Harris (1991), advocate that the livelihood diversification that has occurred can only partially be explained in relation to agricultural growth and the agricultural growth may be a necessary condition for rural livelihood diversification, but it is certainly not sufficient. Further, Ramasamy et al. (1991), argued that rural non-farm economic activities are driven by agricultural growth. Non-agricultural income earned in the form of wages, from a family-owned business, has become more relevant for

specialized non-agricultural households, as well as for small farmers and landless labourers.

The distribution of livelihood diversification is not identical in the country, in this respect, Basu and Kashyap (1992), brought a study which looks at the different agro-climatic conditions in rural Kerala. They mentioned that mainly institutional factors and job opportunities offered by small and medium towns enable the wage rates to be determined in a broader spatial context rather than conditions in the villages. Such findings could be generalized or applicable to certain pockets of the country. Sukhadeo Thorat (1993), in his study, found that the land ownership status of rural households not only influences the extent of their participation in non-farm enterprises but it also determines the nature of the non-farm activity in which rural households decide to participate. Also, he highlighted that occupational diversification is higher among landless and marginal households than in those who have higher landholdings.

The feature of livelihood diversification in India is not very impressive in comparison to developed countries where non-farm diversification takes place out of choice. Basant and Kumar (1994), discussed in their study that the proportion of non-agricultural workers varies inversely with the size of landholding both for males and females. This represents a distress situation among the rural communities, particularly those who choose to diversify their activities. In addition, Basant and Harish (1994), examined that there are limited possibilities of distress diversification into the non-farm sector due to limited demand for such activities. In rural India, distress co-exists with agricultural prosperity, large landholding and good infrastructural facilities. The poor households diversify out of weakness and participate in less productive non-farm activities while the rich diversify into productive non-farm businesses with strength due to access to resources and education.

Saleth. M. (1997) found in his study that diversification indicates direct linkages between employment and income and between crop and livestock. He also found that landless and small farmers have a relatively greater potential for income or employment diversification with a limited resource capacity, in comparison to large farmers. Verma and Verma (1995), present evidence from eastern India in which they argue that there is no weak inter-linkage between agriculture and the urban non-farm sector. On the contrary, they point out that, there is a possibility of strong inter-linkage between agriculture and urban non-farm sector given the urban bias in the consumption of rural rich households where most of the inputs of modern agriculture come from the units

located in urban areas. Further, Unni (1998), concluded his study in two broader points. First, the better-endowed households prefer to specialize in a single activity and second, agricultural workers have higher chances to diversify their activity into more than one economic activity as compared to non-agricultural workers.

Lanjouw et al (2001), broadly focused on issues and evidence of the rural non-farm sector in developing countries including India. They characterise the non-farm sector as a low-productive sector which produces low-quality goods. This sector is expected to wither away as a country's income rise and develops. A recent study on the livelihood diversification of farm households was brought by Chetan et al (2021), which shows that rural India is experiencing a new form of non-farm activity which has taken shape in developing new census towns, affiliated with the village economy.

2.6 Status of Farm and Non-Farm Activities in India

Indian economy grew at an annual rate of 6% during 1980-81 and 2014-15 (GoI, 2017) but there was significant differences. The growth of agriculture remained slow about 3 per cent and experienced a sharp fall in the gross domestic product, from 36% to about 15%. However, the importance of agriculture did not fade down and transcends its income contribution. It remained as the largest source of livelihoods for more than half of the population of the country. Several studies revealed that the growth of the agriculture sector could be more effective in case of poverty reduction (Datt and Ravallion, 1998; Kotwal et al. 2011). But the pro-poor effect of Indian agriculture has gone down in the recent past (Ravallion and Murgai, 2016) in the field of several areas such as increasing pressure on employment in agriculture, declining size of holdings and growing pesticide stresses. The average farm size has shrunk by 52%, from 2.28 hectares in 1970-71 to 1.08% in 2015-16 (Agriculture Census, 2015-16). While, the workforce in agriculture declined from 60.5 per cent in 1981 to 54.6 per cent in 2011 (GoI, 2017). Hence, the scope of agriculture is becoming limited over the period of time accordance with the decline share of the workforce.

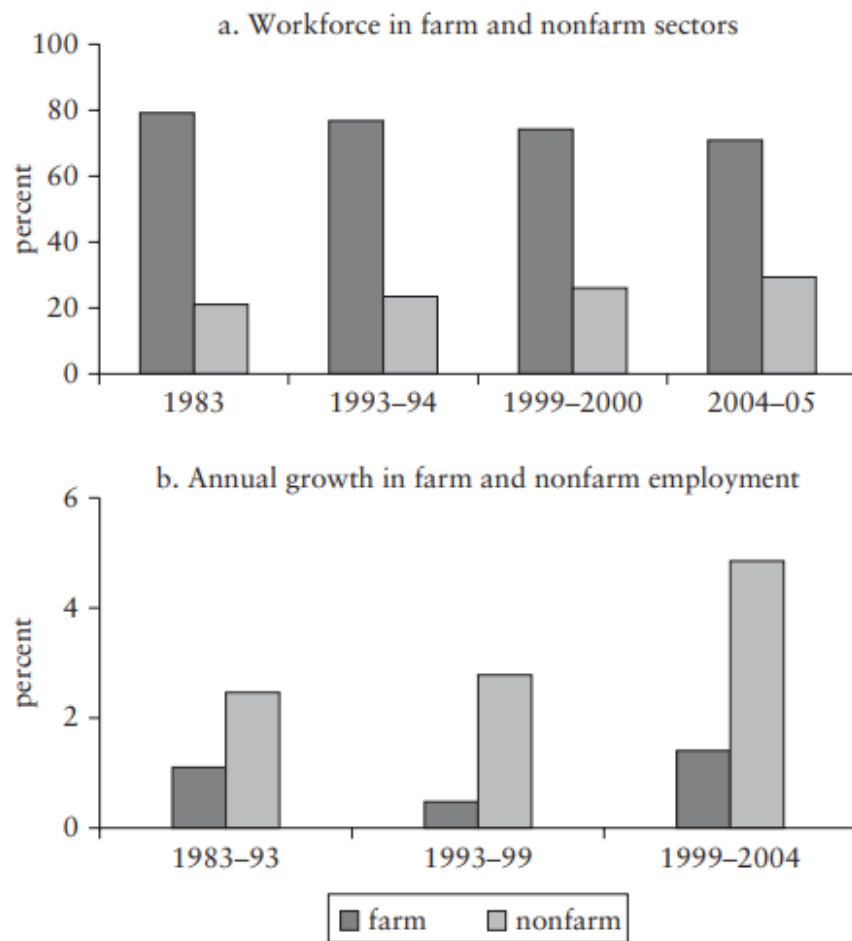
Risk and seasonality in agriculture has triggered income and occupational diversification among rural communities. Ellis (2005), stated that participation in non-farm activities reduces risk by combining a set of activities which have a different risk profiles, and enhance labor and consumption smoothening problems associated with seasonality). Therefore, the farm sector continues under pressure to provide livelihood support to majority of rural population and the share of growth of the non-farm sector

started picking up at slower pace. According to World Bank report (2011), all the rural activities other than the agriculture comprises 30 per cent where millions of people spend most of the time working in non-farm enterprises. Figure 2.2 presents the time period since the decaying of Indian agriculture sped up and resulted into the expansion of the non-farm sector. The reliance on agriculture abridged immediately after the reforms in the early 1990s, and the diversification away from the farm sector picked up in the decade 1993-2004. During 1983 to 1993-94, the annual average growth of non-farm employment was just about 2 percent and from 1993-94 to 1998-99, it increased to 3 percent and from 1999- 2004 reached 4 per cent. Hence, between 1993 and 2004, growth rate of non-farm employment sector surpassed agriculture where 56 million new rural jobs were created over that period and around 6 out of every 10 were engaged in non-farm activities (World Bank, 2011).

2.7 Sources of Income of the Rural Households in India

Despite the importance of the agriculture sector, in the field of providing food, employment, and contributing to national income, Indian agriculture is not a sustainable livelihood for the marginal and small farmers, the majority of them work on a seasonal basis, and in the off-season, they search for the alternative sources of income. Due to the insufficiency of daily expenses earned from the cultivation, the poor and small-holder farmers diversify their activity into non-farm enterprises where larger farmers are more engaged with the agricultural activities. On the other hand, a larger portion of the agricultural land is dependent on agriculture, which creates unsustainability in the poor households who work in this field.

Figure 2.2: Proportion of farm and non-farm employment in India over the period of time.



Source: World Bank Report (2011)

Several scholars categorized the sources of income differently when they refer to a diverse set of income portfolios. Slater (1991) classified the farm and off-farm income into subcategories, where farm income is calculated based on all the agricultural, animal husbandry and horticultural activities while off-farm income is calculated based on all secondary and tertiary sector employment. Further, Saith (1992) reported that farm income includes value of crop production and livestock while non-farm income is calculated based on wages which labourers received from farm and non-farm activities. The non-farm income include non-farm rural wage employment, self-employment in non-farm enterprises, and property income in the form of rents, remittances with the country and abroad. Further, Adams (1995) provide another method, in which he consider only farm income is only from agricultural and non-farm income is generated from livestock, rental, domestic remittances and international remittances.

The present study consider the sources of income categorized by the National Sample Survey Office (NSSO) conducted on Situation Assessment Survey of farm Households 70th round (2012-13) and 77th round (2018-19). The principal source of income is divided into three and further sub categorized into nine categories that come under the household classification. (A) Self-employment in: (i) crop production, (ii) farming of animals, (iii) other agricultural activities, (iv) non-agricultural enterprise, (B) regular wage/salaried earning in: (v) agriculture, (vi) non- agriculture, (C) casual labour in: (vii) agriculture, (viii) non- agriculture, (ix) others (pensioners, remittance recipients, student, engaged in domestic duties, etc.). In this context, Table 2.1 presets the percentage share of the principal source of income for the different categories of farmers. The one who has larger land holding are mainly concentrated in agriculture when compared with small-landholdings such as marginal and small farmers. The marginal are small farmers also get income working as casual labour in farm and non-farm activities.

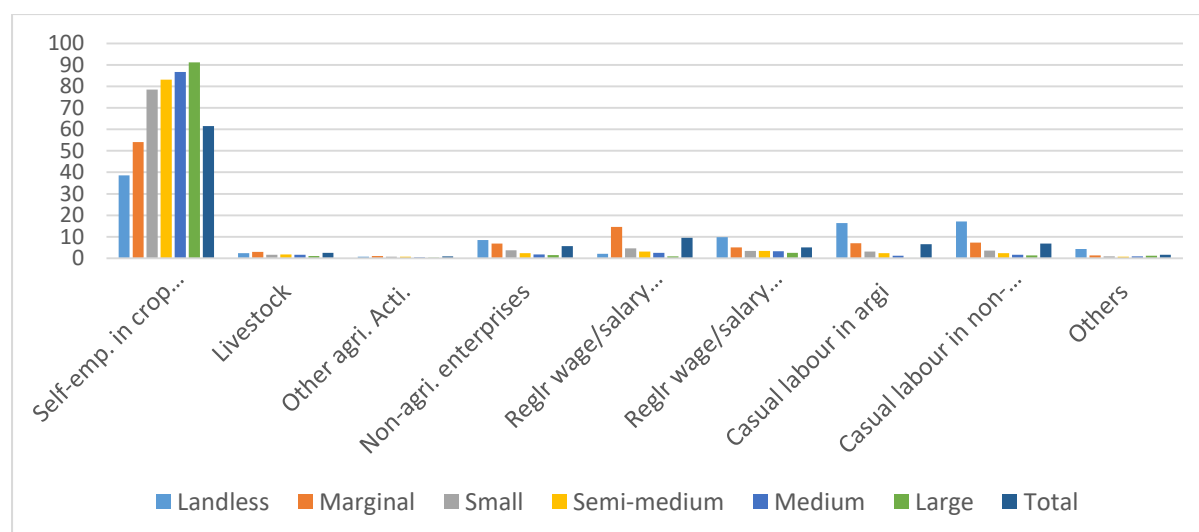
Table 2.1: Percentage Share of the Principle Sources of Income of the Rural Households for Different types of Farmers in India.

Types of farmers	Self-emp. in crop prodn.	Livestock	Other agri. Acti.	Non-agri. enterprises	Reglr wage/salary earns in Agri	Reglr wage/salary earns in non-Agri	Casual labour in argi	Casual labour in non-argi	Others	Total
Landless	38.63	2.32	0.77	8.54	2.12	9.86	16.30	17.17	4.29	100.00
Marginal	54.09	2.98	0.98	6.77	14.59	5.07	6.93	7.22	1.37	100.00
Small	78.51	1.59	0.73	3.66	4.59	3.34	3.05	3.60	0.93	100.00
Semi-medium	83.07	1.71	0.75	2.37	3.13	3.37	2.44	2.36	0.79	100.00
Medium	86.65	1.60	0.43	1.83	2.45	3.32	1.11	1.66	0.95	100.00
Large	91.20	1.01	0.35	1.46	0.95	2.47	0.11	1.32	1.12	100.00
Total	61.48	2.45	0.85	5.68	9.50	5.05	6.53	6.91	1.55	100.00

Source: Calculated from pooled data of the 70th and 77th rounds.

Graph 2.3 present the distribution of different sources of income into different categories of farmers graphically based on table 2.1. Result shows that, cultivation (crop production) is the main source of income which comprises 91.20 %. Whereas, the landless laborers and marginal farmers are also working as a casual labourer in farm and non-farm activities, despite being in agriculture. Landless labourers work as a casual labourer in agriculture by 16.30% and in non-agriculture by 17.17% respectively. While marginal farmers engaged as casual labour in agriculture and non-agricultural activities by 6.93 % and 7.22 respectively.

Figure 2.3 Percentage Share of the Principle Sources of Income of the Rural Households for Different types of Farmers in India



Source: Calculated from pooled data of the 70th and 77th rounds

2.8 Conclusion

The entire concept of livelihood diversification revolves around the Theory of “Economic Development with Unlimited Supplies of Labour” produced by Arthur Lewis (1954). In his theory, Lewis proposes that the capital accumulation in the modern industrial sector so as to draws labour from the subsistence agricultural sector. Further, T.N. Srinivasan (2008) argues that the development strategy has ignored history of economics, he advocates that a successful development lies in the transformation of the economic structure by shifting a substantial part of the large initial share of the labour force in farming and other low productivity activities in the informal sector to more productive non-farm activities through rural and urban industrialization. However, in India the process of diversification and its concepts differs from the developed countries. The households who diversify in this country are majorly from the vulnerable section groups who lack in assets and other economic resources. On the other climatic factors are involved in which push people to diversify their activities. Basant and Kumar (1994), found that in their study that the proportion of non-agricultural workers varies inversely with the size of landholding both for males and females. This represents a distress situation among the rural communities, particularly those who choose to diversify their activities.

2.9 Research Gap

Works of literature majorly put attention to non-farm activity as income-generating activity and provide scope to improve income. But the process of diversification is not the everywhere same when we contrast developed countries with poor countries like India. Hence, this study demonstrates some research gaps based on existing literature.

- (i) The literature addresses the growth and patterns of the non-farm sector at a larger scale but there are some specific questions which not been yet looked at the macro level in rural India in contemporary times. Why do rural farm households diversify their livelihood and how do different resources, and constraints influence their decision to take part in non-farm enterprises? To fill this gap, the present study examines the determinants of livelihood diversification in rural India.
- (ii) In addition, the existing literature on income diversification into non-farm enterprises has not much focused on the contribution of non-farm enterprises to households' wellbeing (Lanjouw & Lanjouw, 2001; Deininger & Olinto, 2001), which makes it difficult to assess the contribution of the non-farm sector on the wellbeing of farm households. Thus, to assess the well-being of farm households, this study examines the impact of livelihood diversification on wellbeing of farm households.
- (iii) Furthermore, there has been a huge discussion on agricultural credit in rural India (Binswanger and Khandker, 1995) but the relationship of institutional finance to non-farm diversification has not been addressed and examined. Thus to fill this gap, the present study answers how institutional and non-institutional credit influence the decision of farmers to enter into non-farm enterprises and what is its impact in rural India.

CHAPTER 3

Determinants of Livelihood Diversification of Farm Households in Rural India: Evidence from National Sample Survey

3.1 Introduction

Structural transformation is an important part of the process of economic development. The kind of transition that ensued in developed countries from a traditional to a modern economy remains an elusive goal for most poor countries, like India. While some believe that such transformation is happening albeit, at a slower pace, others believe that probably may not occur at all (Nayyar, 2012, Sanyal 2007). Considering the slower transition discourse, there is lesser clarity too whether the countryside would diminish in employment towards urbanization, or it would follow an intermediate stage of development/enlargement of a non-farm sector within the countryside as well. The modernization of agriculture is likely to generate considerable linkages with a local non-farm sector. Given the poor urban absorption and high population growth in the rural areas, there is going to be a substantial non-tradable sector within the rural sector that may come up to give rise to considerable labour demand and income generation.

Scholars like Haggblade et al. (2007), observed that about 30 to 45 per cent of rural income is generated from non-farm activities across developing countries. Reardon et al. (1998) demonstrated that non-farm income accounts for 42% in Africa, 32 % in Asia, and 40 % in Latin America as a share of total Income. Moreover, the strategy of livelihood diversification is understood as means to boost farmers' income and promote sustainable development. While complete transition for poor countries under current global conditions for poor countries may not be easy, Humanshu et al. (2016) and Lanjouw et al. (2004) stated that a possible maximum of optimum non-farm opportunities could improve the overall standard of living for farm households in developing countries.

In India, the growth of non-farm employment has surpassed agriculture in the post-reform period sharply; between 1970-1983, six out of every ten were in the farm sector, whereas during 1993- 2004, 56 million new rural jobs were created and six out of every ten is found in the non-farm sector (World Bank, 2011). Biswanger (2013) finds that the growth rate of the non-farm sector stands at 4.2% and for agriculture at 1.2%. At the same time, there is increased advocacy for livelihood diversification of farm households into non-farm enterprises (NFEs), and linked with the development prospects. Many researchers (Bhalla: 1997, Lanjouw et al: 2001, Birthal et. al. 2007: Himanshu et al: 2011) found that the growth of non-farm activities and changing structure of rural livelihood played a major role in poverty reduction in the country. However, rural livelihood diversification is not impressive enough in India when compared to the experience of developed countries (Ghosh and Ghosh, 2021). The ongoing debate in India also holds that the growth of non-farm livelihood

activities is largely distress-driven in the country (Abraham, 2009; Jatav & Sen, 2013; Biswanger, 2013). The reasons are instability in prices of low agricultural prices increased indebtedness of the farmers, poor competitiveness, lack of back-end infrastructure and adverse climatic conditions, etc. (Abraham, 2009).

Rural households diversify their income and activities in order to get an incentive that is classified as push and pull factors (Ellis, 2000). However, the outcomes of push and pull factors are different in dynamic and stagnant regions. Push factors are subject to the coping mechanism with risks and shocks caused by indebtedness, crop failures, environmental and climatic change factors such as drought, flood, and environmental degradation, etc. On the other hand, the pull factors attract rural households to pursue additional livelihood activities to generate extra income for living. These factors tend to occur in more dynamic and less risky agricultural environments. (Haggblade et al., 2007). In developing countries, the strategy of non-farm diversification is adopted more by poor households sooner than the wealthier ones. The poor participate in low-return self-employment activities such as rickshaw-pulling, petty business, brewing, basket making, etc. whereas the rich are engaged with high earnings-remunerative activities such as business, manufacturing, transportation, processing, etc. (Barrett et al. 2000). However, the process of livelihood diversification in curtailment of poverty and improvement in living standards of rural households cannot be ignored for both the rich and the poor in these countries.

Despite the huge potential in reducing poverty by non-farm activities, there is little work exploring the determinants of livelihood diversification in developing countries (Lanjouw & Lanjouw, 2001; Loening et al., 2008). Many studies, though, have tried to identify the determinants of non-farm diversification (Deininger & Olinto, 2001; Babatunde & Qaim, 2009) but haven't given enough clues for policy. In India, given the wide geographical differences, the agro-climatic zones are an important factor to examine the issue. The soil and climatic conditions are considered a mainstay of agricultural activities and also play a decisive role in non-farm diversification. Loison, (2015) argued that rural households tend to mitigate the risk by diversifying their activity in order to make income and consumption less volatile in such an environment.

Table 3.1: Percentage Share of Income Diversification of farm households in NFEs In different Agro-climatic Zones

Agro-Climatic Zones	Non-diversified	Diversified	Total
Himalayan Region	133,934 (84.46) [20.70]	24,645 (15.54) [25.50]	158,579 (100.00) [21.35]
Gangetic Plains	236,465 (91.10) [36.61]	23,115 (8.90) [23.91]	259,580 (100.00) [34.96]
Plateau and Hills Region	176,173 (84.48) [27.27]	32,354 (15.52) [33.47]	208,527 (100.00) [28.08]
Coastal Plains & Hills	89,364 (85.90) [13.84]	14,671 (14.10) [15.18]	104,035 (100.00) [14.01]
Western Dry Region	9,145 (84.23) [1.42]	1,712 (15.77) [1.77]	10,857 (100.00) [1.46]
Islands	845 (83.42) [0.13]	168 (16.58) [0.17]	1,013 (100.00) [0.14]
Total	645,926 (86.98) [100.00]	96,665 (13.02) [100.00]	742,591 (100.00) [100.00]

Note: Values in parentheses () represents percentage share row-wise and values in brackets [] represents percentage share column-wise. Source: Authors' calculations based on Situation Assessment Survey of Farmers NSSO-Pool Data (70th and 77th round).

This study takes the agro-climatic factor into the centre for analyzing livelihood diversification. Table 3.1 shows the percentage share of income diversification of farm households into non-farm enterprises in different agro-climatic zones of India. The overall percentage of diversification in rural India is 12.86. There are six different agro-climatic having disaggregated: the percentage share in Gangetic plain is lowest (about 8.52%) and in plateau and hills region is highest (about 16.29%). The reason for lower diversification in the Gangetic plain is fertile land which plays a crucial role for the agricultural household to work on a farm field.

Moreover, these regions are dominated by high levels of poverty, and larger population density that could hinder the households to take part in NFEs. Whereas in the plateau and hills regions the landscape is dominated by plateau and dry land which is not suitable for major crops. Thus, these regions show a higher percentage of diversification. Similarly, the Himalayan, coastal region and dry lands also have a comparatively higher percentage due to the land not being suitable for major farming activities. Table 3.1 shows that the rural households combine a significant portion of the activities of farming with non-farm enterprises in different agro-climatic zones in rural India. Therefore, it is important to examine the motives and pattern of such diversification and its determining factors.

The objective of this paper is to examine the determinants of rural livelihood diversification into non-farm enterprises of farm households whose primary source of income is cultivation. To address the research gap, this study uses the nationwide pooled data of two rounds of the National Sample Survey (NSS) on the Situation Assessment Survey of Farm households of rural India over the interval from 2012-13 (70th round) to 2018-19 (77th round). The 70th round of the survey is based on the Situation Assessment Survey of Agricultural Households whereas, the 77th round is based on Land and Livestock Holdings of Households and Situation Assessment of Agricultural households. The analysis includes household and farm characteristics, access to credit, agro-climatic zones, education and age of the household head, and social characteristics that play a crucial role for the farm household who decides to participate in NFEs. The important point we analyze in this study is that the survey provides the information only for the farm households who either choose to specialize or diversify their livelihood strategy into non-farm enterprises. The result of this study brings a significant contribution to the literature on rural development, and to the growing importance of NFEs.

The following section of the paper is organized as follows. The next section 3.2 provides a broad discussion on the rural livelihood diversification into NFEs in India and the rest of the world. The third section presents the empirical framework of the study. Section fourth describes the data source and measurement variables that are used in the estimation of the determinants of livelihood diversification into NFEs. Section fifth, discusses the empirical results, section sixth gives the conclusion of the paper and the last section provides the limitations of the study.

3.2 The View of Livelihood Diversification

The income diversification of livelihood in rural non-farm enterprises has drawn major attention and more debated recently in India. In the last three decades, the reliance on

agriculture has gone down accompanied by its declining share of the workforce, contribution to GDP, and income generation to the rural poor. Evidently, the growth rate of the non-farm sector is 4.2% (Biswanger, 2013) and of agriculture 1.2% (Economic Survey, 2015-16). In this context, T.N. Srinivasan (2008) argues that the policies on agriculture may be important but the central factor for low productivity in agriculture lies in the non-farm sector. In other words, the fundamentals of development lie in the transformation of the economic structure by shifting a significant portion of the agricultural workforce and other low-productivity activities in the informal sector by setting up industries in rural and urban areas to have more productive non-farm enterprises. His argument reflects the theory of A. Lewis has put forward his model of “Economic Development with Unlimited Supplies of Labor” which emphasizes the capital accumulation in the modern industrial sector so as to draw labor from the subsistence agricultural sector to the modern sector” (Arthur Lewis, 1954).

Some studies suggest that the growth of the non-farm sector has played a major role in poverty reduction in rural India (Lanjouw et al., 2001; Himanshu et al., 2011). The share of rural income increased from 35 % to 62 % and rural employment from 22.3 % (1980-81) to 31.5 % (2004-05) (Lanjouw & Murgai, 2008). However, the stress in Indian agriculture continues due to several reasons such as fragmentation of land, increasing population, and climate change. And there is a serious threat to rural-based livelihoods, especially for smallholder farmers because the sub-division of land ownership cannot provide sufficient means of survival to the majority of farm households. In this context, income diversification in non-farm enterprises (NFEs) could be one of the possible strategies to improve living condition. Thus, this study aimed to examine the access of farm households’ diversification in NFEs and the determining factors that affect the decision of farmers who search for an alternative source of Income in India and in different agro-climatic zones.

3.3 Procedure of Estimation

The dynamics of livelihood diversification were examined through cross-tabulations of diversified and non-diversified with different socio-economic variables. Further, this section presents an estimation procedure through econometric approaches that are used to identify the variables which decide the choices of farm households to participate in NFEs. A pooled probit model is used to capture the characteristics and relationship between the decisions of farm households who take a part in NFEs over time. Such analysis provides a different pattern of behavior of every farm household that can be evaluated together at different times. Mathematically, the probit model can be expressed as:

$$P_i = P(Y = 1 | X) = P(Z_i \leq \beta_1 + \beta_2 X_i) = \Phi(\beta_1 + \beta_2 X_i)$$

Where $P(Y = 1 | X)$ means the probability that an event occurs given the values of the explanatory variables (X) and where Z_i is the standard normal variable, i.e., $Z \sim N(0, \sigma^2)$ (Gujarati, 2004). Here, the P_i is the probability of rural households being engaged in non-farm (dependent variable) and x_i 's are independent variables affecting participation in NFEs

Where Φ = standard normal cumulative distribution function (CDF), which is written explicitly as:

$$\Phi(Y_i) = 1/\sqrt{2\pi} \int_{-\infty}^{y_i} e^{-z^2/2} dz = 1/\sqrt{2\pi} \int_{-\infty}^{\beta_1 + \beta_2 X_i} e^{-z^2/2} dz$$

3.4 Sources of Data and Details of Measurement Variables

3.4.1 Data source

An analysis of the income dynamics should follow the time series data but in India, no such series are available on farmers' income. There is a dearth of data sources to get reliable information on the income of the agricultural household (Bhatnagar 2017). To evaluate the livelihood situations of farm households, the National Sample Survey Office (NSSO) and India Human Development Survey (IHDS) are the only sources that provide information on farmers' income. The three repetitive rounds have been conducted by the National Sample Survey Office (NSSO) namely, the 59th round of the Situation Assessment Survey of Farmers during 2002-2003 [Government of India (GoI), 2005], the 70th round of the Situation Assessment Survey of Agricultural Households, 2012-2013 [Government of India (GoI), 2014] and the 77th round of Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households, 2018-19 (GoI, 2021). To get an estimation of income and other factors of farm households from these surveys, the last two rounds are comparable except for the first round. In the 59th round, land possession and operational holding were considered necessary conditions for agricultural households which is different from the second and third rounds of the Situation Assessment Survey (SAS). Therefore, the present study uses the 70th (2012-13) and 77th (2018-19) rounds of the Situation Assessment Survey of farmers that follow the identical definition.

The definition used for the agricultural households was adopted by the NSSO in the latest two surveys are based on income cut-off for those who get receipts from self-employment activities in agriculture. The 70th round (2012-13) defines an agricultural household as "if one or more members are engaged with self-employed in agriculture either in the principal status or in subsidiary status and having a total value of produce more than

₹3000/- during the last 365 days”. Similarly, 77th round (2018-19) defines an agricultural household as “a household receiving value of produce more than Rs. 4000/- from agricultural activities (e.g., cultivation of field crops, horticultural crops, fodder crops, plantation, animal husbandry, poultry, fishery, piggery, bee-keeping, vermiculture, sericulture, etc.) and having at least one member self-employed in agriculture either in the principal status or in subsidiary status during last 365 days”.

Moreover, the data on the situation assessment survey was conducted in separate two visits in both rounds. In the 70th round of SAS, visit 1 was canvassed for the Kharif season from July to December 2012, and visit 2 was canvassed for the rabi season from January to June 2013. The total number of households interviewed during the first visit 1 was 35,200. Out of the 35,200 households, only 34,907 were interviewed again during visit 2 of the survey. This implies that 293 households could be missing or “casualty” households during visit 2 of the survey. Thus, combining the two visits would give us information on farm households for the entire agricultural year 2012–2013. The survey categorizes farm households by the principal source of income which includes crop cultivation, farming of animals, non-farm enterprises, wages and salary, remittances, pensions, and others. However, the survey reports information on receipt and expenses only from four sources such as crop income, livestock income, non-farm income, and wages and salary. It does not provide information on receipts from remittances, pensions, and others.

Likewise, the 77th rounds also cover the livelihood situations of farmers in two separate visits. Visit 1 was conducted in July-December 2018 (Kharif season) while visit 2 was conducted in January-June 2019 (rabi season). Thus, combining both the visits we get the information on farm households for the entire agricultural year 2018-19. This round also categorizes the principal sources of income of farmers from cultivation, livestock, non-agricultural activities, wage and salaried, and others. The other source of income includes pensioners, remittance recipients, students, engaged in domestic duties, etc. Hence, the principal source of income at a broader level has been categorized into three (1) self-employments in crop production, livestock, other agricultural activities, and non-agricultural enterprise (2) regular wage and salaried earning in agriculture, non-agriculture, and (3) casual labour in anon-agriculture, others (pensioners, remittance recipients, student, engaged in domestic activities, etc.). The A total number of households were surveyed during visit 1 were 58,035 and in visit 2, only 56,894 were surveyed again out of 58,035. This implies that the 1,141 households could be missing or casualty households during visit 2 of the survey. Both the rounds provide comprehensive information on household-level characteristics and

on a number of individuals. It covers the socio-economic, organizational, and institutional aspects of farming such as landholding size, crop yields, irrigation status, cost of crop production, access to credit, and demographic and social characteristics of the households. The focus of this study is on farmers' income and its components. Hence, the analysis of this study is confined to the last two rounds which are motivated by the large range of activities covered in terms of livelihood strategy as well as the latest survey that are fundamental for the research questions which we address.

Further, to examine the impact of climatic conditions, we use six different Agro-climatic zones. The 54th round (January to June 1998) of the NSSO survey as a part of Common Property Resources in India, delineated these zones into 15 categories based on soil, climatic condition, and availability of water resources at the district level across the country. In addition, this study clubbed these zones into six those are Himalayan Region (Western & Eastern), Gangetic Plains (Lower, Middle, Upper & Trans), Plateau and Hills (Eastern, Central, Western & Southern), Coastal plains and Hills (East Coast, West Coast, and Gujarat Coast), Western Dry Region, and All Islands. Moreover, NSSO has identified districts belonging to different zones by blowing up a small map showing approximate boundaries of different zones based on a study by H.G. Hanumappa, of the Indian Institute of Social and Economic Change, Bangalore, and matching it with the latest available India-Administrative-1:6m map produced by National Atlas Thematic Mapping Organization, Department of Science and Technology, Government of India (GoI).

3.5 Measurement Variables

The dependent variable shown in equation 1 is a binary variable that is equivalent to 1 or 0; if it is 1 then a farm household participates in at least one non-farm enterprise (NFE) and 0 means a farm household does not participate in any NFEs. Thus, the binary dependent variable has been named as livelihood diversification or we can call it income diversification of farm households into non-farm enterprises. The independent variables encompass household and farm characteristics, access to credit, and agro-climatic zones. The details of these variables are presented in Table 3.2. The household characteristics include religion, caste, and class of land holdings, family size, household heads' education level, household heads' age, and household head gender. And the farm characteristic includes the farm income and per capita irrigated land possessed in hectares, crop insured, and awareness of MSP. Access to credit and Agro-climatic zone are also used as independent variables.

Farm income is one of the important factors and can give a clear explanation of the non-farm diversification whether is distress driven or led by agricultural growth. There are conflicting opinions on direction of causation between farm and non-farm growth. Mellor (1976) argued strong agricultural growth will spur non-farm activities. Chandrashekar (1993) found farm to non-farm linkage stronger than otherwise. S Chand (2015) observed that one percent fall in farm business income growth has fallen to 1 percent in 2011, causing severe rural distress in India, particularly for lower land-size classes, due to poor diversification. As Jatav and Sen observed (2013) households with less than 1 acres of land only were able to diversify. On the other hand, households with larger farms were also not in a position to diversify into non-farm, for the reasons of looking after large farms. Per capita irrigation is yet another important variable that determines diversification (Benjamin 1994, Mishra and Goodwin 1997). Finally, caste factor played a significant role in diversification. People belonging to Scheduled tribes (STs), and Schedule castes (SCs) are more likely to enter Non-farm activities when compared to middle castes in India called Other Backward Classes (OBCs) (Jatav & Sen, 2013). Medium farmers belonging to upper castes also diversify more than others.

The type of headship is worth mentioning as a determining factor in the discourse on the participation of families in non-farm enterprises (Asfaw et al., 2017). The highest level of education is a good indicator of human development that encourages farm households to participate in non-farm activities (Lanjouw & Shariff, 2004). If the head of the household are educated would build networks in the community and could have easier access to deal with any type of information (Azam et al., 2012). Further, the household lead by male play major role in the diversification process and women-headed households are significantly less likely to engage in the rural NFEs (Malek and Usami 2009). Evidently, the ability and accessibility of women to work outside the home are limited Chinwe (2015). In India, the percentage share of diversification of women-headed households is 21% while for male-headed is 24%. The lower participation of women reflects several reasons such as social and economic restrictions. Finally, age of the household head and size of the family also plays crucial role for non-farm diversification. The probability of household head entering into NFEs declines with increase in age (Akaakohol & Aye, 2014). In addition, Jatav and Sen (2013) argued that a large family size has lesser chances to diversify in comparison to small family size, though, this is a counter-intuitive argument, and the larger family size should be more into non-farm activities.

Table 3.2.: Description and Measurement of Principal Variables

Variables	Definition
Dependent variable	
Livelihood Diversification in in non-farm enterprises	1 If any member of the household is engaged in non-farm enterprises, 0 otherwise
Independent variables	
Log farm income	Natural log of total income received from Cultivation in Indian rupees
Per capita Irrigated land	The total irrigated area of land possessed in hectares is converted in per capita terms at the household level
Type of farmers	1 = Landless (land holding < 0.002); 2= Marginal (land holding <1 hectare); 3 = Small (land holding < 2 hectare) 4 = Semi-Medium (land holding < 4 hectare); 5= Medium (Large (land holding <10 hectare) 6= Large (land holding > 10 hectare
Household Size	The size of the household is categorized into four 1-4 Members; 5-8 members; 9-12 members; And 13 above
Religion	Religion [1= Hindu; 2= Muslim; 3= Christianity and 4 = Others religions]
Head Education	Level of education achieved by the household head [1 = Not literate; 2 = Higher secondary; 3 = Diploma 4 = Graduates]
Caste	1= Schedule Tribe (ST); 2 = Schedule Caste (SC); 3 = Other Backward Class (OBC); 4=Upper Caste (General)
Head Age	Age of the household head [1 = Young age (16-29 years); 2 = Adult age (30- 64 years); 3 = Old age (65 years above)]
Head Gender	Gender of the household head [1= Male; 2= Femle]
Source of Loan	Sources of loans are broadly categorized into two; 1= formal Institutions; 2= Informal Institution
Awareness of MSP	1= farmers are aware of MSP and 2 = farmers are not aware of MSP
Crop Insured	1 = Insured only when received loan; 2 = Not insured
Loan amount outstanding	Amount of loans taken from the formal or informal institutions
Agro-climatic Zones	1= Himalyan Region (Western& Eastern) ; 2 = Gangetic Plains (Lower, Middle, Upper &Trans); 3= Plateau and Hills (Eastern, Central, Western & Southern); 4 = Coastal plains and Hills (East Coast, West Coast and Gujarat Coast); 5 = Western Dry Region; 6= All Islands.

Source: Situation assessment survey of farmers, NSSO- pool Data (2012-13 and 2018-19)

The different categories of agro-climatic zones are used to capture the effect of climatic risks which is faced by the farm households. These regions are categorized based on the soil and climatic conditions of the geographical regions in the country at the district level. Agricultural households face several challenges such as loss of yields, droughts, and floods due to changing conditions of climatic factors. According to Kaur et al. (2010), risks have an adverse impact on agricultural yields that influence the decision of farm households regarding farm and non-farm activities and the welfare of households, especially for food consumption. In this context, this study utilizes the agro-climatic zone as one of the determining factors for the choices of farm households to participate in non-farm economic activities.

The accessibility of crop insurance could promote the farmers entering into non-farm business and mitigate the risks involved in the cultivation process. Awareness of minimum support price (MSP) also plays a decisive role in the participation of NFEs. This could protect the farm households from “market failure” and their crops are easily sold at the optimum price declared by the government. In addition, access to credit is also an important factor that plays a major role and encourages non-farm diversification. However, access to credit is not everywhere proven to be advantageous that could only encourage the start-up business, rather it could be taken as a loan for household requirements subject to health conditions, marriages, and other family needs. Moreover, the source of the loan also plays a decisive role in the process of income diversification of farm households. The majority of rural households take loans from informal sources than the formal institution such as local money lenders to do some small and petty businesses. This indicates that the proximity and acquaintance with the local money lender or may be having less awareness about the formal procedure with the bank could be one reason for such action.

The concept of diversification is not one-dimensional, it varies with the subject and disciplines of the research work. Broadly there are two types of diversification on-farm and off-farm. The first implies crop diversification within the crop baskets on the same farm field and the second is activity and income diversification respectively. Hence, this study focus on the income diversification of farm households into non-farm enterprises (NFEs). The strategy of agricultural households to diversify their income or activity ultimately depends on the individual assessment to cope with the risk. The ability to take risks is lower for small farmers and, as a result, the risk of non-farm enterprises is likely to be an important consideration for them (Reardon et al. 1997). Further, the factors that determine the income diversification of farm households into NFEs could be categorized into two broad groups: one, that is associated with distress non-farm diversification, and two explaining growth-led

diversification. The factors associated with the distress are farm income, social group belonging to SCs and STs, the small size of landholding, and larger household size. And the factors could be linked with the growth non-farm diversification are level of education, age group (between 30-64) of the household head, crop insurance, and sources of loan.

3.6 Empirical Framework

In this section, the study presents the summary statistics of fundamental variables that are used in the analysis. A descriptive statistical analysis shows the mean difference between households that are diversified and those are not diversified with the particular factors of the estimation model. Finally, this section ends with the econometric analysis of the pooled probit model and the marginal effect.

3.6.1 Descriptive statistics analysis

In Table 3.3, the descriptive summary statistics presents the mean of the full sample and the difference of the mean of the independent variables used in empirical analysis. From table 3.3, the average farm income for the diversified is lesser than the one who is not diversified. This implies that income diversification in non-farm enterprises is not promoted by the farm sector growth rather it is driven by distress or compulsion. Jatav and sen (2013), argued that the non-farm activity is completely distress-driven since the structural transformation started taking place from rural to urban areas. However, this proposition will be tested with an econometrical model in the following section to get a significant result.

The per capita irrigated land plays an important role in deciding whether to diversify or not for the farm households. On average, approximately 0.36 hectares of per capita irrigated land are possessed by undiversified farm households whereas, about 0.33 hectares are possessed by diversified households. Hence, the per capita irrigated land is larger for the farm household which does not diversify. This indicates that the irrigation facilities encourage farming rather than diversification. The size of the farmers further has been categorized into six; followed by landless, marginal, small, semi-medium, and medium and large. On average, smallholder farmers including marginal, small farmers, and also landless are having larger mean value for non-farm diversification while, semi-medium, medium, and large farmers are having a lesser mean value.

The size of the households categorized into four groups shows a significant mean difference for both diversified and non-diversified. The mean the small family size of 1-4

members is larger for the farm households who enter into the non-farm business. And as family size increases the mean values increase for the non-diversified one. The education of the household head is one of the most important factors in the decision-making for the farming community to participate in NF economic activities. Table 3, shows that the one who possesses higher educational qualifications (e.g., Secondary and postgraduates) has a larger average value for the non-farm income diversification in opposite to one who does not have educational qualifications (not literate). Further, table 3 also presents the descriptive statistics of different social groups (caste). As we all know that the Indian social system is heterogeneous and categorized into castes. In the language of the Constitution, we have four castes followed by Schedule Tribe (ST), Schedule Caste (SC), Other Backward Caste (OBC), and General caste. On a larger scale, the lower caste SC and ST are observed to possess lower wealth and are poor compared to the other two. And their average percentage shown by the SAS data is approximately 33 percent of total farm households in the sample and they are more inclined to engage in non-farm activities. The analysis also shows that the adult age group (between 30-64) of the household head is significantly different from the old aged in the entry of NFEs. This implies that adult households are more capable of participating in such businesses. Further, the source of loans is an important decisive factor to one wants to take part in non-farm business. The analysis from table 3.3, suggests that there is a significant difference between the farm households that participate in NFEs and those who do not in terms of having access to credit from the informal institution.

Awareness of MSP for the household also shows the mean value more for the non-diversified one. This implies the one who is aware of the prices of their product is likely to engage with agriculture. Further, the mean difference of insured crops is higher for the farm household who participate in the non-farm sector. This indicates that crops with insurance increase the probability of farm households entering in NFEs. Furthermore, the categorical variable of different agro-climatic zone such as the Himalayan region, plateau & hills, and coastal region presents a significant mean difference for the farm households who participate in non-farm activities. The reason for having a lower mean value for the not diversified in Gangetic plain is due to the fertile land. As a result farm households stick to agricultural activities. These regions are also dominated by high levels of poverty, and larger population density than the other part of India which could thwart the households to take part in NFEs.

Table 3.3: Descriptive Statistics of Principal Variables

	Full Sample	Sub Sample		
Independent Variables	Full Sample Mean	Mean of Non-diversified Households	Mean of Diversified Households	Mean difference (T-Test)
Farm Income	50047.57	51078.72	43003.03	8075.697***
Per capita irrigated land	0.359	0.362	0.337	0.025***
Land Class				
• Landless	0.053	0.053	0.054	-0.001**
• Marginal	0.338	0.333	0.371	-0.037***
• Small	0.240	0.240	0.236	0.004***
• Semi-medium	0.239	0.241	0.224	0.016***
• Medium	0.114	0.118	0.091	0.027***
• Large	0.017	0.017	0.012	0.005***
Household Size				
• Household size: 1-4	0.407	0.391	0.511	-0.119***
• Household size: 5-8	0.472	0.482	0.406	0.075*
• Household size: 9-12	0.087	0.091	0.067	0.023*
• Household size: 13 and above	0.031	0.034	0.014	0.020***
Religion				
• Hindu	0.807	0.806	0.815	-0.008**
• Muslim	0.085	0.089	0.058	0.030***
• Christianity	0.060	0.059	0.073	-0.014*
• Others religions	0.045	0.044	0.052	-0.007***

Source: Authors' calculations based on SAS, NSSO - Pool Data (2012-13 and 2018-19)

***, ** and * demonstrate the statistical significance at 1 %, 5 % and 10 % levels respectively.

Table 3.3 (Cont.): Descriptive Statistics of Principal Variables

Independent Variables	Full Sample	Sub Sample		
	Full Sample Mean	Mean of Non-diversified Households	Mean of Diversified Households	Mean difference (T-Test)
Head Education				
• Not literate	0.344	0.345	0.344	0.001***
• Secondary	0.443	0.435	0.469	-0.033***
• Diploma	0.189	0.197	0.164	0.033***
• Graduates	0.0222	0.0221	0.0223	-0.0001***
Caste				
• General	0.270	0.278	0.216	0.062***
• OBC	0.420	0.429	0.363	0.065***
• SC	0.111	0.111	0.116	-0.004***
• ST	0.197	0.180	0.303	-0.123***
Head Age				
• Young age	0.045	0.036	0.074	-0.038***
• Adult age	0.743	0.711	0.847	-0.135***
• Old age	0.211	0.251	0.078	0.173**
Head Gender				
• Male	0.899	0.897	0.906	-0.008
• Female	0.100	0.102	0.093	0.008
Source of loan				
• Formal institution	0.854	0.855	0.845	0.010***
• Informal Institution	0.145	0.144	0.154	-0.010***

Source: Authors' calculations based on SAS, NSSO - Pool Data (2012-13 and 2018-19)

***, ** and * demonstrate the statistical significance at 1 %, 5 % and 10 % levels respectively

Table 3.3 (Cont.): Descriptive Statistics of Principal Variables

Independent Variables	Full Sample	Sub Sample		
	Full Sample Mean	Mean of Non-diversified Households	Mean of Diversified Households	Mean difference (T-Test)
Awareness of MSP				
• Aware	0.247	0.251	0.251	0.027***
• Not aware	0.752	0.748	0.776	-0.027***
Crop Insured				
• Insured	0.054	0.052	0.061	-0.009***
• Not insured	0.928	0.929	0.919	0.009***
Loan amount outstanding	10.72	10.76	10.48	0.279
Agro-Climatic Zone				
• Himalayan Region	0.206	0.203	0.231	-0.028***
• Gangetic Plains	0.348	0.365	0.239	0.125***
• Plateau and Hills	0.291	0.281	0.359	-0.078***
• Coastal plains & Hills	0.137	0.135	0.150 -	0.015***
• Western Dry Region	0.014	0.013	0.017	-0.003
• All Islands	0.015	0.015	0.014	0.001

Source: Authors' calculations based on SAS, NSSO - Pool Data (2012-13 and 2018-19)

***, ** and * demonstrate the statistical significance at 1 %, 5 % and 10 % levels respectively.

3.6.2 Econometric Analysis

From the above descriptive statistics, we saw there was a significant mean difference between non-diversified and diversified households for the factors associated with farm characteristics and household characteristics. Further, to assess the determining factor of the NFE diversification, this study uses the pooled probit model. Since the estimated parameters of the probit model only offer the direction of the effect of the explanatory variables on the dependent variable. These estimates do not give the actual magnitude of probabilities. Therefore, the marginal effect is used that measures the expected change in the probability of a particular choice that is made in respect of a unit change in the exogenous variable presented in the study.

3.7 Results

3.7.1 Determinants of income diversification in non-farm enterprises

Table 3.4 presents the result from pooled probit model that examines the factors which determine the choices of the farm household entering into rural non-farm enterprises. The results are consistent with the t-test result shown in table 3.3. The likelihood ratio statistics are significant at the 1% level which is indicated by the χ^2 statistic. Table 3.4, presents the coefficient of farm income is negatively related to the income diversification of the households whose primary source of income is cultivation. It is very true in the case of India unlike developed countries because rural households diversify not out of choice but out of necessity. In the past three decades, the growth of agriculture has also come down where farmers are not able to get enough income from the cultivation, let alone invest their income in non-farm businesses. The existing literature (S. Chand, et al., 2015), revealed that the growth of farm income dropped to 1% after 2011-12 and this has created agrarian distress in the rural areas. Thus, the negative relationship between farm income and livelihood diversification is very apparent in the country. In addition, the marginal effect (-0.010) showed that a unit increase in farm income could result in a decrease in the chances of NFEs diversification of farm households by about 1%. This implies that the income diversification of agricultural households in non-farm enterprises is not growth driven but it is distress driven. In other words, the NFEs diversification is pushed by the agrarian distress and another environmental risk of the farming community in rural India.

The coefficient of per capita irrigated land is significantly negative, suggesting that the farm household that possesses irrigated land has lesser chances to participate in non-farm businesses. The 70th round of NSSO, on Situation Assessment Survey of Farmers, revealed

that about 52% of the total farm households are in debt in India. This is an obstacle for the farmers to succeed in their life. The coefficient of loan amount outstanding is negatively related to the livelihood diversification of farm households. The marginal effect (-0.009) suggests that a unit increase in the loan amount of farmers would lead to a decrease in the NFEs diversification by 0.9%. The coefficient of the larger size of the family is negatively related to income diversification of farm-households in comparison to a lesser member in the households. Thus, the members from smaller households have higher chances to enter in NFEs. The marginal effect also represents a similar sign of the household size affecting such diversification shown in table 4.

The farmers possess large landholding are less likely to diversify their livelihood strategy in non-farm activities (Asfaw, et al., 2017). This implies farmers having large land size depend majorly on crop cultivation than going out of agriculture. Whereas, the coefficient of smallholder farmers is positively related to livelihood diversification which indicates the farmers possessing lesser land have more chances entering into NFEs. The reason could be the increasing population pressure that encourages them to look for an alternative source of income outside agriculture. The statistical evidences shows the positive diversification for those who possess less land size than the large ones. In our study, marginal farmers have less chances to diversify significantly. Further, semi-medium and medium farmers shows significant negative diversification towards the non-farm sector. The large farmers here is showing negative diversification significantly. It is fact that the small-holder farmers including marginal and small create additional income by diversifying their livelihood strategy outside of agriculture. The farmers having lesser landholdings have high labour endowments and are hardworking which encourages them to diversify their livelihoods. The marginal effect (0.079) and (0.007) shows that a unit increase in farm size could lead to increase the probability of marginal and small farmer to engage with NFEs activity by 7.9% and 0.7% respectively, other things remain constant. On the other hand, the marginal effect for semi-medium (-0.027), medium (-0.071) and large (-0.063) farmers show the negative sign. That means, one unit increment in farm size could result in decreasing the probability of large landholding entering into NFEs by 2.7%, 7.1% and 6.3%, other things remain constant respectively.

The Indian society is heterogeneously categorized in the caste system which could play a very important role in choice-making for the non-farm diversification. The lower caste is generally endowed with lower wealth and different assets. As a result, they try to look for alternative sources of income outside agriculture. In our study, results suggest that the

schedule Tribe and schedule castes have more chance to diversify in comparison to upper castes and the other backward caste have less chance to diversify in the non-farm activities. The marginal effect (0.003) and (0.065) is represented for the ST and SC respectively and for OBC (-0.026). The level of education is among the preventing barrier to the entry of rural households who participate in non-farm activities (Asfaw et al., 2017). Table 3.4 presents the result of the categorical variable of the level of education of the household head suggesting that the head of the household possess higher educational qualification are having higher chances to diversify in the NFEs. The one who possesses a diploma degree are having a probability to diversify by 27%. And the graduate has a 34% chance to diversify indicating a positive relationship with non-farm income-generating activity. While low qualified household head shows a negative relationship with non-farm diversification at 8% per cent. The marginal effect of 0.006 for diploma certificate holders suggests that one additional year of training could increase the probability of farm households' engagement in NFEs by 0.6% when other things remain constant. The marginal effect of 0.009 graduated household head shows that one extra year of education could increase the probability of farm household engagement in NFEs by 0.9% when other things remain constant. This means a higher level of education is an important factor for the farm household to look for the existing opportunities for income-generating activities and in calculating risks.

The gender of the household head is proven to be an important factor in the decision-making process of the family. It is very evident that the male enjoys all opportunities and the ability and accessibility of women to work outside the home are limited Chinwe (2015). At this juncture, the gender of the household as a determining for livelihood diversification remains important. The result from the regression supports the hypothesis that the probability of women-headed households is lesser entering into non-farm enterprises. Further, the age of the household head is one more relevant factor. The existing literature (Akaakohol and Aye: 2014 and Asfaw et al., 2017 demonstrates that the probability of participating in non-farm enterprises decreases with the increasing age of the household head. In this study, differences were observed among two categories of head age. The age of the household head between 16 to 29 and 30 and 64 show higher chances to diversify in non-farm income-generating activities significantly. While the old age comprising 65 and above has fewer chances to diversify in rural non-farm enterprises.

Table 3.4.: Determinants of Income Diversification of Farm Households in Rural Non-farm Enterprise

Dependent variable =	income diversification in rural non-farm enterprises	
Independent Variables	Coefficients (SE)	Marginal effects (dy/dx)
Farm Income	-0.041*** (0.010)	-0.010
Per capita irrigated land	-0.050** (0.022)	-0.012
Land Class		
Marginal	0.284*** (0.075)	0.079
Small	0.027 (0.077)	0.007
Semi-medium	-0.116 (0.077)	-0.027
Medium	-0.328*** (0.084)	-0.071
Large	-0.287** (0.0142)	-0.063
Household Size		
. Household size: 5-8	-0.138*** (0.029)	-0.035
. Household size: 9-12	-0.303*** (0.064)	-0.072
. Household size: 13 and above	-0.463 * (0.152)	-0.102
Religion		
Muslim	0.102** (0.049)	0.026
Christianity	-0.047 (0.126)	-0.011
Others religions	0.035 (0.058)	-0.008
Head Education		
Secondary	-0.080** (0.033)	-0.019
Diploma	0.027 (0.037)	0.006
Graduates	0.349*** (0.067)	0.009
Caste		
OBC	-0.013 (0.032)	-0.026
SC	0.243*** (0.048)	0.065
ST	0.104 (0.059)	0.003

Source: Author calculation based on the pool data from two rounds of SAS, NSSO 70th & 77th round
Notes: Number of obs = 10,056; Wald chi2 (21) = 782.34; chi2 = 0.0000; pseudo-R2 = 0.3912,
Log-likelihood = -4147.3728; dy/dx is for discrete change of dummy variable from 0 to 1. *, ** and *** Statistically significant at 10%, 5% and 1% level of significance, respectively. All results are rounded to the nearest three decimal place Source. In parenthesis, the value represents standard error.

Table 3.4 (Cont...)
Determinants of Income Diversification of Farm Households in Rural Non-farm Enterprise

Dependent variable =	income diversification in rural non-farm enterprises	
Independent Variables	Coefficients (SE)	Marginal effects (dy/dx)
Head Age		
Young age	0.770*** (0.078)	.
Adult age	0.631*** (0.042)	.
Old age	Omitted	.
Head Gender		
Female	-0.056 (0.059)	-0.013
Source of loan		
From Informal Institution	0.054 (0.043)	0.014
Awareness of MSP	-0.030** (0.030)	-0.007
Crop Insured	0.278*** (0.043)	0.076
Loan amount outstanding	-0.037*** (0.010)	-0.009
Agro-Climatic Zone		
Gangetic Plains	-0.204*** (0.063)	-0.048
Plateau and Hills	0.167** (0.066)	0.045
Coastal plains & Hills	0.201*** (0.068)	0.055
Western Dry Region	0.085 (0.129)	0.022
Constant	-.560*** (0.172)	
Observation	12,468	12,468
Log-likelihood	-5613.6794	
Pseudo R2	0.0859	

Source: Author calculation based on the pool data from two rounds of SAS, NSSO 70th & 77th round
Notes: Number of obs = 10,056; Wald chi2 (21) = 782.34; chi2 = 0.0000; pseudo-R2 = 0.3912, Log-likelihood = -4147.3728; dy/dx is for discrete change of dummy variable from 0 to 1. *, ** and *** Statistically significant at 10%, 5% and 1% level of significance, respectively. All results are rounded to the nearest three decimal place Source. In parenthesis, the value represents standard error.

Moreover, the religion and household size in the household characteristics also play an important role in non-farm diversification. Table 3.4, presents that the households belonging to the Muslim religion are having higher chances to diversify when compared to the Hindu and other religions. The household that has a larger family size shows a negative relationship with non-farm diversification. Lack of financial accessibility could obstruct the investment in non-farm income-generating activities in terms of high sharing capital or operational cost (Barrett et al., 2001). Our study presents that 14% of sample households have access to credit from formal institutions while 16% from informal institutions are diversified in non-farm activities. In table 4, the result suggests that a farm household that takes a loan from an informal institution has a higher chance (53%) to participate in NFEs than those who take a loan from a formal institution. This means the accessibility of informal institutions like local money lenders in villages may be easily accessible with no formal paperwork, unlike formal institution banks. However, the local money lender provides loans at exorbitant rates but due to acquaintance and proximity, farm households might take a loan from them. The awareness of MSP also shows a negative relationship with income diversification into non-farm enterprises. This result is consistent with the t-test presented in table 3. Insurance for crops is another important factor that affects the income diversification of farm households positively. When the crop is insured, the fear of farmers from any weather or climatic risk is covered. Hence, this could promote the farmers to generate additional income from non-farm sources.

Further, this study presents six different agro-climatic zones as determining factors to observe the region-specific risk associated with the non-farm diversification of farm households in India. The Gangetic plain shows a negative relationship with the non-farm diversification by 24.1%. The reason to have negative relation in the plain is naturally fertile land and having more irrigation facilities due to the flowing of rivers originating from the Himalayas. The river Ganga comprises several tributaries that support the agricultural fields on the entire Gangetic plains. In these plains, farm households are having a lesser probability of non-farm diversification and concentrating on agricultural activities. Other regions such as Plateau & Hills Region, Coastal Plains & Hills, and Western Dry Region shows positive relation with livelihood diversification. It can be inferred that the plateau, coastal, hills, and dry regions are not very favorable in terms of soil and climatic conditions. As a result farm household shows more probability to diversify their income strategy in the non-farm sector. The marginal effect follows the similar sign of the probit model for the NFEs diversification for these agro-climatic zones.

3.8 Conclusion and policy implication

The paper tried to examine the determinants of income-generating non-farm activities among farm households. The analysis of this study suggests that smaller-size farm holdings, households with educated members, age groups between 30-64 years, form social categories belonging to lower castes (SC and ST), households with access to credit only from the informal institution, households which have crop insurance, and households of plateaus & hill Region, Coastal Plains & Hills among agro-climatic zones are found to be significant households which are able to diversify into non-farm activities. Access to credit from informal institutions has a positive relationship with NFEs diversification. This indicates that the nearness and acquaints of the farm household with the local money lender encourage them to take a loan and participate in non-farm activities. However, the exorbitantly high-interest rates are local village informal money lenders providing loans that stifle the prospects. On the other hand, higher farm income and higher irrigation also negatively influence non-farm income diversification. This implies that the diversification is led more by distress, to begin with. Good irrigation and higher farm activity are likely to tie the households to farming. Further, the result also indicates that the farm households of rural India residing in Gangetic plains are less inclined towards diversification than their counterpart in Plateau & Hills Region, Coastal Plains & Hills regions. The Gangetic plain is very fertile and has moist soil that is favorable for agricultural activities and may encourage less to involve in non-farming activities.

The results found in this study have important policy implications, the development policies should focus on strengthening the livelihood diversification of small farms. Since it constitutes a large portion of Indian agriculture and plays a major role in securing the foods of the millions in the country. Policymakers and other government stockholders should put emphasis on providing microfinance which will eradicate the entry barriers to the rural household in participation of farm households into the non-farm sector. At the same time, it is also important to provide the formal credit nearest to their village that might discourage the rural community to take loans from local money lenders at an exorbitant rate and encourages them to generate additional income with the support from formal financial institutions. Further, results suggest that the government should provide some financial and other facilities to the farmers which can boost their income as a result they can invest in NFEs activities. Consequently, rural farm households could overcome poverty and contribute to the overall development of the country.

CHAPTER 4

Livelihood Diversification and Wellbeing of the Farm households in Rural India: A Decomposition Analysis

4.1 Introduction

In low-income countries, subsistence farmers and small agricultural wage labourers in village economy constitute more than 60 per cent on the earth and most of them are living under poverty and are food-insecure (IFAD: 2010; FAO et al.: 2014). Even facing the several life challenges such as uncertainty and risks, the small land-holding households and agricultural wage labourers confront countless structural, institutional and environmental shocks, risks and stresses. As a result, they become vulnerable to meeting their basic necessities of life (Tschakert: 2007; Harvey et al., 2014). Research evidence suggests that the diversification from agriculture to the non-agriculture sector supports rural households to have better earnings, increase farm produce by smoothing capital constraints, enhance food security and cope with environmental stresses (Barrett et al.: 2001; Babatunde and Qaim: 2010; Hoang et al.: 2014). But such inclination towards diversification are not identical to low-income nations like India. Farmers in advanced economies do not diversify only to cope with risks and shocks rather they diversify for augmenting better economic returns (Barbieri and Mahoney, 2009).

Livelihood diversification is a common phenomenon among rural communities as they adopt multiple sources of earnings (Ellis: 1988; Dzanku: 2015). Diversification refers to a process in which individuals or households undertake a voluntary or involuntary interchange of their resources across many activities to maintain and accomplish an optimum stability between estimated earnings and avoids risks faced by imperfect markets for loans, labour, or land (Barrett and Reardon: 2000). The process of diversification is understood as a self-insured activity in which individuals exchange their forgone expected returns to reduce income instability by choosing a portfolio of income and activities which are negatively related with the income (Barrett et al. 2000; Reardon et al.2000). Diversification draws attention to different income sources such as agriculture, non-agriculture remittances etc. and their relationship with income distribution, asset levels, income levels and other factors. Diversification is defined as a means of potential well-being and a source of income growth (Ersado, 2006).

In India, livelihood diversification is not very impressive compared to developed countries where non-farm diversification takes place out of choice. Basant and Kumar (1994), observed that the proportion of non-agricultural workers varies inversely with the size of landholding both for males and females. This implies a distress situation among the rural communities, particularly those who choose to diversify their activities. However, the existing literature highlights two contrasting arguments related to the growth of non-

agricultural activities; one is “demand-pull” or opportunity-driven and the second is “distress-push” or need-driven. The first implies that the employment growth in the off-farm sector depends on agricultural prosperity, educational improvement and development of infrastructure, new market opportunities, technological skills, technological availability and the ambition of surplus income of the households who live in rural areas (Mahajan and Gupta, 2011). While second refers to a situation where the non-farm economic activities are likely to be the remain as a residual of farm employment. This implies when the agriculture sector becomes saturated and then it spillover of farm labourers which gets transferred to the non-farm sector within the rural area National Bank for Agriculture and Rural Development Consultancy Services (NABCONS, 2015).

Therefore, in rural India, distress co-exists with agricultural prosperity, large landholding and good infrastructural facilities. Where the poor households diversify out of weakness and participate in less productive off-farm economic activities while the rich diversify into productive non-farm businesses with strength due to access to resources and education. In this context, table 4.1 presents the percentage of workers who take part in non-farm enterprises. It is very clear that the resource-poor are the main participants of these activities. Unpaid family labour (29.51%), casual labourer (2.51%), working in Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) (9.18%) and the other type of workers (27.28%) are the larger contributor to the process of diversification and taking part in non-farm enterprises. In total, the casual labourer, working in MGNREGA, and other types of workers constitute 68.48% while the self-employed in household activities only comprise 29.42%. Therefore, based on this evidence a question arises here how can a casual labourer, unpaid family labour, and working in MGNREGA have a better well-being than the rich households who have larger landholdings and are economically well-off? The present study intends to examine the impact of livelihood diversification on the well-being of farm households with particular focus on income and monthly consumption expenditure in rural India.

Table 4.1: Percentage share of Rural Households Taking Part in Non-Farm Enterprises

Work Undertaken in Non-farm Enterprises	Percentage
Worked in the household enterprise (self-employed)	29.42
Employer	1.33
Unpaid family worker	29.51
Worked as a regular salaried/ wage employee	0.97
Worked as casual wage labour	2.51
Worked in MGNREG works	9.18
Other types of workers	27.28
Total	100

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

In the field of rural economic transformation study, the concept of farmers' wellbeing remains central to the analysis. In general, well-being implies a desirable and positive living conditions. Further, well-being is defined as a condition of how good a life of a person is moving on (Crisp. R. 2015). A quality of life is accompanied by having possessions of 'prudential values' (Griffin, 1986). The basic wishes of life require being amply nourished and getting free from morbidity and having self-respect, a life of dignity and being involved in the life of the society/community (Sen, 1993). The notion of a person's decent life makes well-being thus, in a relative sense the terms well-being is defined by the material conditions, existence of a person in a community in a social and cultural context, individual preferences etc. This kind of notion to define well-being of an individual is has envisaged people's approaches to shift from money-metric measures to subjective measures of well-being in terms of considering happiness and perception of an individual, satisfaction, security and freedom (Costanza et al., 2007).

To understand the concept of well-being, different empirical evidence defines well-being with different socio-economic factors. Narayan Parker & Patel (2000) in their study of sixty countries adopted social group and location to specify well-being. Further, Gautam& Andersan (2021) uses tangible/quantifiable assets to address the well-being of the household in Nepal. The components of well-being they choose were food security, housing arrangements to assess the basic amenities of the household such as the critical illness in a member of a family or crops failure caused by environmental calamities which brings households into an additional fiscal burden. However, the existing literature on income

diversification into non-farm enterprises has not much focused on the contribution of non-farm enterprises to households' wellbeing (Lanjouw & Lanjouw, 2001; Deininger & Olinto, 2001). Thus, to evaluate the well-being of rural community or farm households, this study decomposes the income and consumption expenditure into two groups that are not-diversified households and diversified households, using the Blinder-Oaxaca (B-O) decomposition method. The Blinder-Oaxaca decomposition evaluates the characteristics of determining factors lying behind the difference or "gap" in farm income and consumption expenditure of non-diversified and diversified households. The decomposition of the income and consumption expenditure (CE) is done separately.

4.2. Data source

The present study is based on the pooled data from the latest nationally-representative national sample survey office (NSSO) conducted on the Situation Assessment Survey of Farm households. Till now three repetitive rounds have been conducted by the National Sample Survey Office (NSSO) on the issue of Situation Assessment Survey of Farm households namely, the 59th round (2002-2003) [Government of India (GoI), 2005], the 70th round (2012-2013) is also Situation Assessment Survey of Farm Households [GoI, 2014] and the 77th (2018-19) round that is based on of Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households, [Government of India (GoI, 2021). To evaluate the farm income and other livelihood situations of agricultural households, only the last two rounds could be compared. Because in the 59th round, the possession of land and operational holdings are considered to define the agricultural households whereas, in the last two rounds the produce value of rules 3000/- (in the 70th round) and rupees 4000/- (in the 77th round) has been considered to define the agricultural households, and value is adjusted for the inflation in the final rounds. Hence, the present study uses the latest two rounds.

4.3 Empirical Framework

In the first stage, the detailed definition of key variables used in the model is presented and the summary statistics of the variables are also shown. In the second stage, we explored the differences in key variables across the households of farm income and consumption expenditure using descriptive statistics. In the third stage, the multiple linear regression model is used to evaluate the impact of livelihood diversification on the well-being of farm households. And in the fourth stage, the Blinder-Oaxaca Decomposition method is applied to understand the characteristics of the determining factors involved in the "gaps" of outcome

variables (i.e. farm income and monthly consumption expenditure) between non-diversified households and diversified households.

4.3.1 The Blinder-Oaxaca (B-O) Decomposition

The B-O decomposition method is widely used in the literature in the field of economics of labour studies (Blinder, 1973; Oaxaca, 1973). This method has become as one of the best technique to decompose the differences or “gaps” in outcome variables (e.g. income or wages or expenditure) between two sub categories of population. Usually, the divided two sub categories of population in a study should not affect the outcome in question (Madden, 2007); rather, it is affected by the determining variables in the module such as socio-economic characteristics and farm characteristics. In other words, differences or gaps in outcome variables partitioned in two groups are characterized on the basis of farm socioeconomic statuses such as gender, race or economic work status. Further, these decomposed outcome variable into two parts are explained in two parts; one is accounted for by differences in explanatory variables (i.e. differences in characteristics) and two is accounted for by differences in coefficients (i.e. differences in the return to characteristics). Different studies used B-O decomposition methods with the application of different econometric models such as logistic regression, count models etc. But the present study adopts the linear regression model for B-O decomposition which fit exactly at the average of the sample.

Mathematically, the B-O decomposition are demonstrated with the following linear regression equation represented as follows-

$$Y_i = X_i'\beta_i + \varepsilon \quad \dots (1)$$

And $C_i = Z_i'\beta_i + \varepsilon \quad \dots (2)$

Where Y_i means farm income of rural households i (who may be non-diversified and diversified), and X_i is a vector of explanatory variables of farm income (e.g. size of land holding, educational status, age, social category etc.), β_i is the coefficient associated with X_i and ε_i is an error term which follows a normal distribution $(0, \sigma\varepsilon)$. Similarly, C_i is the consumption expenditure of rural households i (who may be non-diversified and diversified), and Z_i is a vector of explanatory variables of consumption expenditure (e.g. size of land holding, educational status, age, social category etc.), β_i is the coefficients associated with Z_i and ε_i is an error term which follows a normal distribution $(0, \sigma\varepsilon)$. Thus, the standard Blinder-Oaxaca decomposition method is then broken down into differences between non-diversified and diversified households, which can be shown mathematically

$$\bar{Y}_{nd} - \bar{Y}_d = (\bar{X}_{nd} - \bar{X}_d)' \hat{\beta}_{nd} + \bar{X}'_d (\hat{\beta}_{nd} - \hat{\beta}_d) \quad \dots(3)$$

And
$$\bar{C}_{nd} - \bar{C}_d = (\bar{Z}_{nd} - \bar{Z}_d)' \hat{\beta}_{nd} + \bar{Z}'_d (\hat{\beta}_{nd} - \hat{\beta}_d) \quad \dots(4)$$

Where, $\bar{Y}_{nd}$ = Predicted mean of farm income for non-diversified, $\bar{Y}_d$ = predicted mean of farm income for diversified households, $\bar{X}_{nd}$ = mean vector of influencing factors (variables) for non-diversified households which determine farm income, $\bar{X}_d$ is mean vector of the determining parameters (variables) for diversified households which influence the farm income, $\hat{\beta}_{nd}$ coefficient of estimated returns associated with the farm income for non-diversified and $\hat{\beta}_d$ coefficient of estimated returns associated with the farm income for diversified households. Similarly for Consumption expenditure, $\bar{C}_{nd}$ = Predicted mean of consumption expenditure for non-diversified, $\bar{C}_d$ = predicted mean of consumption expenditure for diversified households, $\bar{Z}_{nd}$ = mean vector of determining factors (variables) for non-diversified households which determine consumption expenditure, $\bar{Z}_d$ is the average vector of determining factors for diversified households associated with the consumption expenditure, $\hat{\beta}_{nd}$ coefficient of estimated returns associated with consumption expenditure for non-diversified and $\hat{\beta}_d$ coefficient of estimated returns associated with consumption expenditure for diversified households.

Thus, starting with the empirical framework, table 4.2 presents the detailed definition and summary statistics of principle variables taken in the model. The income and consumption expenditure of the farm households have been used as the principal variables to explain the differences in income and consumption expenditures of diversified and non-diversified households. The present study takes the log of both variables. Hence, the summary statistics presented in table 4.2 provide the mean value, standard deviations, and min and max value of the variables used in the estimation process. The average value of the log of farm income is 9.816 and the log of consumption is 8.924. Further, the average value of irrigated land is 1.51 hectares, the minimum irrigated land is zero and the maximum is 3400 in hectares terms. Similarly, other variables used in the model have been described through summary statistics in table below 4.2.

Table 4.2: Definition of variables and their summary statistics

Key variables	Definition	Mean	Stand. Dev.	Min.	Max.
Log of Farm Income	Natural log of total income received from Cultivation in Indian rupees	9.816	1.507	0.693	16.45
Log of consp. exp.	Natural log of Monthly consumption expenditure	8.924	0.574	0	14.02
Irrigated land	The area of land irrigated possessed in hectares	1.513	9.643	0	3400
Land Class					
. Landless	Dummy: 1 if a farmer has land size (< 0.002) and 0 if otherwise	0.085	0.280	0	1
. Marginal	Dummy: 1 if a farmer has land size (0.002 > 1.000) and 0 if otherwise	0.417	0.493	0	1
. Small	Dummy: 1 if a farmer has land size (1.00 > 2.000) and 0 if otherwise	0.197	0.397	0	1
.Semi-medium	Dummy: 1 if a farmer has land size (2.000 > 4.000) and 0 if otherwise	0.194	0.396	0	1
. Medium	Dummy: 1 if a farmer has land size (4.000 > 10.000) and 0 if otherwise	0.091	0.288	0	1
. Large	Dummy: 1 if a farmer has land size (> 10.000) and 0 if otherwise	0.013	0.113	0	1
Key variables	Definition	Mean	Stand. Dev.	Min.	Max.
Household Size					
.Household size: 1-4	Dummy: 1 if a household size is 1-4 and 0 if otherwise	0.430	0.495	0	1
.Household size: 5-8	Dummy: 1 if a household size is 5-8 and 0 if otherwise	0.465	0.498	0	1

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Table 4.2 (Cont.): Definition of variables and their summary statistics

Key variables	Definition	Mean	Stand. Dev.	Min.	Max.
.Household size: 9-12	Dummy: 1 if a household size is 9-12 and 0 if otherwise	0.081	0.273	0	1
.Household size: 13 and above	Dummy: 1 if a household size is 13 and above and 0 if otherwise	0.022	0.148	0	1
Religion					
. Hindu	Dummy: 1 if religion is Hindu and 0 if otherwise	0.795	0.403	0	1
. Muslim	Dummy: 1 if religion is Muslim and 0 if otherwise	0.096	0.294	0	1
. Christianity	Dummy: 1 if religion is Christian and 0 if otherwise	0.064	0.245	0	1
.Others religions	Dummy: 1 if religion is others and 0 if otherwise	0.043	0.204	0	1
Head Education					
. Not literate	Dummy: 1 if household head is not literate and if 0 otherwise	0.343	0.474	0	1
. Secondary	Dummy: 1 if household head has secondary level education and if 0 otherwise	0.458	0.498	0	1
. Diploma	Dummy: 1 if household head has diploma degree and if 0 otherwise	0.168	0.373	0	1
. Graduates	Dummy: 1 if household head is postgraduates and if 0 otherwise	0.030	0.171	0	1

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Table 4.2 (Cont.): Definition of variables and their summary statistics

Key variables	Definition	Mean	Stand. Dev.	Min.	Max.
Caste					
. General	Dummy: 1 if Caste is General and if 0 otherwise	0.187	0.390	0	1
. OBC	Dummy: 1 if Caste is OBC and if 0 otherwise	0.137	0.344	0	1
. SC	Dummy: 1 if Caste is SC and if 0 otherwise	0.407	0.491	0	1
. ST	Dummy: 1 if Caste is ST and if 0 otherwise	0.267	0.442	0	1
Head Age					
. Young age	Household head age is 16-29 years and if 0 otherwise	0.052	0.222	0	1
. Adult age	Household head age is 30- 64 years and if 0 otherwise	0.758	0.428	0	1
. Old age	Household head age is 16-29 years 65 years+ and if 0 otherwise	0.189	0.391	0	1
Head Gender					
. Male	Dummy: 1 if household gender is male and if 0 otherwise	0.879	0.324	0	1
. Female	Dummy: 1 if household gender is Female and if 0 otherwise	0.120	0.324	0	1
Source of loan					
.Formal institution	Dummy: 1 if household takes a loan from formal institution and if 0 otherwise	0.821	0.382	0	1

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Table 4.2(Cont.): Definition of variables and their summary statistics

Key variables	Definition	Mean	Stand. Dev.	Min.	Max.
.Informal Institution	Dummy: 1 if household takes a loan from informal institution and if 0 otherwise	0.178	0.382	0	1
Key variables	Definition	Mean	Stand. Dev.	Min.	Max.
Aware of MSP					
. Aware	Dummy: 1 if household is aware of MSP and if 0 otherwise	0.246	0.430	0	1
. Not aware	Dummy: 1 if household is not aware of MSP and if 0 otherwise	0.753	0.430	0	1
Crop Insured					
. Insured	Dummy: 1 if crop is insured and if 0 otherwise	0.048	0.215	0	1
. Not insured	Dummy: 1 if crop is not insured and if 0 otherwise	0.933	0.248	0	1
Agro-Cli Zone					
Himalayan Region	Dummy:1 if agro climatic region belong to Himalayan Region (Western& Eastern) and 0 otherwise	0.215	0.411	0	1
Gangetic Plains	Dummy:1 if agro climatic region belong to Gangetic Plains (Lower, Middle, Upper &Trans) and 0 otherwise	0.322	0.467	0	1
Plateau and Hills	Dummy:1 if agro climatic region belong to Plateau and Hills (Eastern, Central, Western & Southern) and 0 otherwise	0.270	0.443	0	1

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Table 4.2 (Cont.): Definition of variables and their summary statistics

Key variables	Definition	Mean	Stand. Dev.	Min.	Max.
Coastal plains & Hills	Dummy:1 if agro climatic region belong to Coastal plains and Hills (East Coast, West Coast and Gujarat Coast) and 0 otherwise	0.167	0.373	0	1
Western Dry Region	Dummy:1 if agro climatic region belong to Western Dry Region and 0 otherwise	0.020	0.141	0	1
. All Islands	Dummy:1 if agro climatic region belong to All Islands and 0 otherwise	0.004	0.063	0	1

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

4.3.2. Descriptive Statistics of Principal Variables (T-TEST)

Table 4.3 presents the result of descriptive statistics which shows the mean difference in farm income and consumption expenditure between two groups that is non-diversified and diversified households. In detail, the households who do not take part in non-farm activities have an average value of farm income equal to Rs. 52270.73/- annually in contrast to the one who takes part in non-farm enterprises have an average value of farm income is Rs. 43142.41/- annually. Hence, the non-diversified households have higher farm incomes than the diversified ones. And the significant difference in farm income between non-diversified and diversified households is Rs. 9128.31/- per year. Similarly, the monthly consumption expenditure of the non-diversified household is Rs. 8994.72/- and of the diversified one Rs. 7822.17/-. And the difference in monthly consumption expenditure between the two is Rs. 1172.54/-.

Table 4.3: Two-Sample T-Test with Equal Variances of Measurement Variables

	Full Sample		Sub Sample		
Dependent variable	Mean	Mean of Non-diversified Households	Mean Diversified Households	of	Mean difference (t-test)
Farm Income	51089.33	52270.73	43142.41		9128.31***
Monthly Consumption Expenditure	8835.17	8994.72	7822.17		1172.54***

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

The average farm income of the households who are diversified is lesser than the one who are not diversified presented in table 4.3, implying that diversification of livelihood in non-farm enterprises is not driven by agriculture sector growth rather it is caused by distress. In India, the size of land holding has gone down very sharply in the last three decades and agriculture is not proven to be a very sustainable livelihood for the larger rural poor or small-holdings farmers. This resulted in forced non-farm diversification in India in the sector as mentioned in table 4.1. Jatav and sen (2013), demonstrated that off-farm activity is emerges out of distress-driven in the era of structural transformation after the economic reform period in the country. In addition, the monthly average monthly consumption expenditure is also lesser for the diversified one than for the non-diversified one. The result in chapter 3, also shows that the marginal and small farmers and castes belonging to the Schedule Caste (SC) and Schedule Tribe (ST) only diversify and the large landholding farmers and upper castes do not take part in non-farm diversification in rural areas. Thus, based on the above result in table 2 and table 1, and in chapter 3, how can one expect better well-being for the vulnerable farmers who diversity most?

With this background, this study aims to understand the impact of livelihood on farm income and consumption expenditure. To sees the effect of livelihood diversification, this study uses a linear regression model. While, to understand the factors which are responsible for the difference or called as “gap” of farm income of rupees 9128.31/- and monthly consumption expenditure of rupees 1172.54/- between the household who are non-diversified and the one who diversify their activities, the B-O decomposition method is used.

4.4. Econometric Analysis

Table 4.3 based on descriptive statistics which demonstrate that there is a significant mean difference in the income of farm households and their consumption expenditure between the household who does not diversify and the one who is diversified. Further, to assess the impact of livelihood diversification on the well-being of farm households, this study uses the linear regression model. Table 4.4 shows the regression result where livelihood diversification is negatively related to the income and consumption expenditure. The impact of large landholding farmers, social groups belonging to upper caste, the highest educational degree and the size of households is shown positive on the farm income. On the other hand lesser size of holding, a social category belonging to Schedule Caste (SC), Schedule Tribe (ST) and Other Backward Class (OBC), females of the households head, a crop not insured, the one who is not aware of MSP shows a negative relationship with the farm income. Similarly, livelihood diversification is negatively related to consumption expenditure followed by different socio-economic characteristics such as small-landholdings, caste belonging to SC and STs, a crop not insured, not aware of MSP, an agro-climatic region such as Gangetic plain, Plateau and Hills, and western dry region show a negative relationship with the consumption expenditure. On the other hand large landholding farmers, social groups belonging to upper caste OBC, the highest level of education, and the size of households that possess more members greater than four shows positive relationship consumption expenditure.

Table 4.4: Linear Regression Model Result

	Dependent variable		Dependent variable	
Independent Variables	Farm Income		Consumption Expenditure.	
	Coefficient	(Std. Err.)	Coefficient	(Std. Err.)
Livelihood Diversification	-0.142***	(0.029)	-0.016***	(0.006)
Area of irrigated land	0.124***	(0.004)	0.028***	(0.001)
Land Class				
Marginal	-0.355***	(0.659)	-0.056**	(0.010)
Small	-0.074	(0.067)	-0.098***	(0.011)
Semi-medium	0.362***	(0.066)	0.031***	(0.011)
Medium	0.682***	(0.069)	0.117***	(0.012)
Large	0.643***	(0.103)	0.382***	(0.021)
Household Size				
. Household size: 5-8	0.117***	(0.023)	0.729***	(0.005)
. Household size: 9-12	0.189***	(0.046)	0.899***	(0.012)
. Household size: 13 and above	0.227**	(0.093)	0.030***	(0.026)
Religion				
Muslim	-0.110*	(0.042)	0.239*	(0.009)
Christianity	0.059	(0.112)	0.233***	(0.019)
Others religions	0.689**	(0.042)	0.534***	(0.010)
Head Education				
Secondary	0.113***	(0.028)	0.123***	(0.006)
Diploma	0.141***	(0.031)	0.087***	(0.007)
Graduates	0.260***	(0.058)	0.237***	(0.015)
Caste				
ST	-0.275***	(0.059)	-0.192***	(0.012)
SC	-0.079**	(0.050)	-0.138***	(0.011)
OBC	-0.131***	(0.052)	-0.068***	(0.011)

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Table 4.4 (Cont.): Linear Regression Model Result

Independent Variables	Dependent variable		Dependent variable	
	Farm Income		Consumption Expenditure.	
	Coefficient	(Std. Err.)	Coefficient	(Std. Err.)
Head Age Young				
Young age	-0.657	(1.253)	0.270	(0.451)
Adult age	-0.647	(1.250)	0.331	(0.451)
Old age	-0.731	(1.251)	0.274	(0.451)
Head Gender				
Female	-0.177***	(0.048)	-0.093***	(0.010)
Source of loan				
From Informal Institution	0.016	(0.036)	0.077***	(0.006)
Not awareness of MSP	-0.283***	(0.025)	-0.098***	(0.005)
Not Crop Insured	-0.004***	(0.038)	-0.077***	(0.008)
Agro-Climatic Zone				
Gangetic Plains	-0.004	(0.054)	-0.157***	(0.012)
Plateau and Hills	0.022	(0.057)	-0.273***	(0.012)
Coastal plains & Hills	0.191***	(0.059)	0.018*	(0.012)
Western Dry Region	0.121	(0.107)	-0.092	(0.029)
Islands	0	(omitted)	0	(omitted)
Constant	10.662	(0.452)	8.402**	(0.452)
Number of obs	12,469		31,402	
Prob > F	0.0000		0.0000	
R-squared	0.2616		0.3734	
Adj R-squared	0.2597		0.3728	

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

The result presented in table 4.4 shows the one who has lesser access to land holding, lower castes such SC, ST and OBC, being female head of the household, for whom crop is not insured and those are not aware of minimum support price (MSP) show a negative relationship with the income and consumption expenditure. On the other hand, the land class who possesses large farm size, the social group belonging to the general caste, the one who holds highest educational qualifications including secondary, diploma and graduation degree, and the agro-climatic zone belonging to Coastal plains and Plateau and Hills regions shows a positive relationship with the outcome variables (farm income and consumption expenditure). Hence, the resource poor and socially backward have lesser income and expenditure in comparison to the resource-rich and socially privileged class. This compels the poor households to take part in rural non-farm activities majorly in low-paid jobs as mentioned in table 4.1, being as a casual labourer, unpaid family labour, and working in MGNREGA job.

Therefore, in India, the rural households who diversify their income or activities into non-farm enterprises are not economically well-off in terms of having large land-holding, educationally advanced, and socially privileged. How can they assess good well-being? The answer is, in the environment of not sustainable agriculture and not getting subsistence earnings from the farm sector, the resource-poor diversifies their activities out of compulsion. This could only substantiate their basic and everyday necessities of life, let alone thinking of their good well-being. According to Gautam & Andersen (2016), rural households can enhance their well-being only when it pulls into their livelihood portfolio in the high-return sectors among various non-farm opportunities available. However, pulling into high-return and profitable sectors is not a matter of free choice rather it is decided by the economic conditions available to them. Therefore, when a well-off family diversify, they diversify not only to just survive but for generating wealth (V. Braun and P. Lorch, 1991).

Further, to understand the causal effect of livelihood diversification on the well-being of farm households the following section presents the analysis of the Blinder-Oaxaca (B-O) model, considering income and consumption expenditure as a parameter for well-being. The characteristics of the non-agricultural activities and the given pre-conditions to the rural families are subject to the socioeconomic, geographical and institutional factors (Gautam & Andersen, 2016). In India, we found that the resource-poor and socioeconomic backwards are having lower income derived from cultivation only and lower consumption expenditure in comparison to the one who has larger land holding and are socially privileged. In this context, it is important to understand the reason which creates or causes the differences/ gap in farm income and consumption expenditure resulting in higher for the non-diversified and lower for

diversified households. Therefore, the B-O model explains the factors which cause the differences or gaps in the income and consumption expenditure of not diversified households and diversified households.

4.4.1. Blinder-Oaxaca Decomposition: Threefold Decomposition Method

To understand the characteristics of socio-economic factors which are responsible for the “gaps” in income and consumption expenditure between households who do not diversify and who diversify, this study uses the Blinder-Oaxaca three-fold decomposition method. The B-O model, decomposes the predicted farm income between two groups (not-diversified households and diversified households) and similarly for consumption expenditure separately which is presented in table 4.5. The diversified households with a low average farm income and low average consumption expenditure are selected as the reference for the analysis.

Table 4.5: Consumption Expenditure gap and Income gap

	Farm	Income		Consumption	Expenditure	
Two Groups	Coef.	Std Err.	z-value	Coef.	Std Err.	z-value
Non-Diversified Households	10.374***	0.014	716.9	8.949***	0.003	2438.91
Diversified Households	9.976***	0.029	343.31	8.822***	0.006	1297.44
Observed Gap	0.398***	0.032	12.27	0.127***	0.007	16.52
Endowment	0.318***	0.028	11.09	0.128***	0.006	18.78
Coefficient	0.146	0.029	4.90	0.020*	0.006	3.08
Interaction	-0.066**	0.025	-2.60	-0.020**	0.005	-3.67

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Table 4.5 shows the estimated income gap and consumption expenditure gap between two groups (the households who do not diversify and one who diversify). On average, the estimated farm income of non-diversified households is Rs. 10.37 per year; for diversified ones, the estimated farm income is Rs. 9.97 per year. Hence, the observed income gap between non-diversified and diversified households is Rs. 0.398 representing an annual income gap of 3.83% (0.398/10.374). Similarly, non-diversified households have an

estimated consumption expenditure is rupees 8.949/month, while diversified households have a mean consumption expenditure of Rs. 8.82/month, representing the estimated observed gap of Rs. 0.127/month, implying that the non-diversified outperformed the diversified household by 1.41% ($0.127/8.949$).

The estimated average gap in farm income of household as well as their consumption expenditure is significant at 1%. Here it is argued that the estimated farm income gap of the household and consumption expenditure gap of the household are high considering the important role of the households who do not take part in rural non-farm activities. The reason for the higher income of non-diversified households in India is very much related to the resource-rich households that only concentrate on agriculture and have higher landholdings. In India the society is heterogeneously categorized into a caste system where the lower castes such as Schedule Castes and Schedule Tribes are mostly considered resource-poor and able to take part in non-farm diversification when compared with OBCs and Upper caste (chapter 3). With this background, the following table 4.6 present the aggregate decomposition of income gap and consumption expenditure gap between diversified and non-diversified households using three-fold and two fold methods.

The aggregate decomposition shows the overall effect of determining factors which are responsible for such gaps between two groups. In detail, the endowment effect represents the contributions of differences in explanatory variables across groups, while the coefficients effect represents the part that is group differences in the coefficients terms. And the interaction term accounts for the fact that cross-group differences in explanatory variables and coefficients can occur at the same time. The result from table 4.6 shows that the disparity in farm income is explained by about 0.80% ($0.318/0.398$) due to the different distribution of the predictors (endowments). While about 0.36% ($0.146/0.398$), of the disparity, was attributed to the differential effect of the covariate entered in the model (coefficients effect). The interaction effect contributes in the farm income gap between the two groups are about -0.16% ($-0.066/0.398$). And the disparity in consumption expenditure is significantly explained by the different distribution of the predictors (endowments) by 1.00% ($0.128/0.127$). While about 0.15% ($0.020/0.127$) of the disparity, was attributed to the differential effect of the covariate entered in the model (coefficients effect). And interaction is about -0.15% ($-0.020/0.127$). At the aggregate level, in addition, the factors which explain the gap in farm income accounted for 31.87% and consumption expenditure accounted for 12.80% shown in table 4.6.

Table 4.6: Aggregate Decompositions of Consumption gap and Income gap

	Farm Income	Consumption Expenditure
Three-way Decomposition		
Endowment Effect	0.800***	1.003***
Coefficients Effect	0.366	0.159*
Interaction Effect	-0.167**	-0.163**
Two-way decomposition		
Explained	31.876***	12.808***
Unexplained	7.940	-0.046

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

4.4.2. Contributions of socio-economic characteristics to the consumption expenditure gap and income gap.

The detailed decomposition from table 4.7 suggests that the differences in Income and consumption expenditure are caused by differences in specific factors such as access to large land-holdings, Social group belonging to OBC and upper caste, old age, large household size, gender belonging to a female, the households whose crop is not insured and agro-climatic region belonging to Plateau and Hills and the coastal regions are more contributor for the consumption expenditure gap of the rural households. This implies that if households who diversify their activity were given the same access to land, belong to the upper caste and there would not be any gender biases, then the process of diversification would increase in rural India and it would not have been part of vulnerability. In other words, In India, if the rural households would have rich resources and are socially not unequal then livelihood diversification would become part of the pull factor not the push factor when compared with the developed countries.

Table 4.7: Grouped Decomposition of Consumption gap and Income gap (% gap)

Variables	Farm	Income		Consumption	Expenditure	
	Endowment	Coefficient	Interaction	Endowment	Coefficient	Interaction
Area of irrigated land	18.560***	-0.412	2.193	20.706***	22.225***	63.845***
Land Class						
Marginal	-14.580**	-0.281	-1.588	-11.14***	-20.354**	43.019***
Small	-0.191	-3.767	-1.631	0.163	17.403***	-9.398
Semi-medium	10.275**	-1.610	8.409	1.198	-0.954	-2.993
Medium	22.143***	-0.910	16.381	4.720***	-0.613	-2.878
Large	4.950***	-0.219	6.572	4.733***	0.800	15.968*
Household Size						
Household size: 5-8	-1.036	8.960***	-14.928	10.802***	-26.581***	-29.756***
Household size: 9-12	-1.669	8.960**	-21.213**	14.062***	-1.354	-9.011*
Household size: 13+	-1.250	1.379	-11.031**	5.985***	0.145	2.423
Muslim	-0.487	0.254***	-4.922	0.047	-2.905**	2.264
Christianity	-0.983	-2.648***	-5.538	-3.161***	2.843***	-8.780*
Others religions	22.217***	-1.477***	57.146** *	20.211***	0.685	6.788

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Table 4.7(Cont.):Grouped Decomposition of Consumption gap and Income gap (% gap)

Variables	Income			Consumption	Expenditure	
	Endowment	Coefficient	Interaction	Endowment	Coefficient	Interaction
Head						
Education						
Secondary	0.575	-3.795	-2.941	2.113***	-9.015**	-4.153**
Diploma	-0.005	2.486	0.086	0.485	-1.184	-0.357
Graduates	-0.286*	3.069***	6.866*	-0.845	2.886***	-1.960
Caste						
SC	-2.993	2.214	-3.559	-5.782***	-4.054*	14.445*
OBC	0.492*	-0.774	0.213	4.097**	6.242**	-15.693**
General	-2.022	-0.625	-18.591	15.075***	18.218***	7.287***
HH head						
Age						
Young age	1.804	5.867	8.033	-4.204	9.922	-25.455
Adult age	32.586	1.553	179.755	-42.883	193.77	-223.21
Old age	-10.842	79.613	-50.889	44.391	16.928	272.29
Head						
Gender						
Female	-0.008	1.630	0.571	0.423	-0.235	0.139
Source of						
loan						
From	-0.479	-1.118***	-2.765	-3.481***	9.688	-
Informal						11.585***
Institution						

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Table 4.7(Cont.): Grouped Decomposition of Consumption gap and Income gap (% gap)

Variables	Farm	Income		Consumption	Expenditure	
	Endowment	Coefficient	Interaction	Endowment	Coefficient	Interaction
Not aware of MSP	4.641***	-3.047	0.652	0.854	36.654***	-12.195**
Not Crop Insured	-4.670***	0.621	-7.449	-1.108	-41.888***	-3.566**
Agro-Climatic Zone						
Gangetic Plains	-5.975	9.180	-29.484	-29.678	-34.054***	-100.02***
Plateau and Hills	0.059	5.813	0.666	22.246***	-50.631***	72.209***
Coastal plains & Hills	-4.468	0.199	-9.936	8.059***	-41.304***	60.964***
Western Dry Region	-0.133	-2.763	-1.078	-0.101***	-3.288	-0.626

Source: Calculated by author based on Pool Data from Situation Assessment Survey of Farmers NSSO- (70th and 77th round).

Among the explanatory factors (endowment) the major contributors to the gap in farm income between households who are non-diversified and the one who are diversified households are medium and large farmers, contributing by 22.14% and 4.95% respectively. Social category belonging to OBC contributor of this gap is about 0.49%. Among them the large farmers, large size of households and the old age people contributed the most. For the gap in consumption expenditure, the factors are responsible are the medium and large farmers who accounts for 4.72% and 4.78% respectively. The social category belonging to OBCs contributed to this gap is about 4.09% and 15.07%. And the age group belonging to above 65,

gender being as female contributed by 44.39% and 0.42%, respectively. Those who are not aware of MSP contribute to the consumption expenditure gap by 0.85%. Thus, the table 6 concludes that the large landholding, educational advancement, upper caste and OBC contributed the largest percentage to the income gap and consumption expenditure gap.

In addition, the result shows that the area of irrigated land contributes 18.56% to the income gap and 20.70% to the consumption expenditure gap between two groups (non-diversified households and diversified households). This implies that if both the groups (non-diversified households and diversified households) are given the same level of irrigated land, then the farm income for the diversification would increase by 18.56% at par with the non-diversified households. Similarly, for consumption expenditure, if the non-diversified and diversified households are given the same level of irrigated land, then the consumption expenditure for the diversified households increases by 20.70% significantly. Further, the coefficient components also known as discrimination components contribute to the income gap and consumption expenditure gap between the two groups, however, it is not significant for all the factors similar to the endowment. The final interaction effects show the significant impact, showing the large landholding, educational advancement, upper caste and OBC contributed the largest percentage to the income gap and consumption expenditure gap.

4.5. Conclusion and Discussion

The findings of this study characterize the general understanding of livelihood diversification and the well-being of farm households in rural India through the lenses of income and consumption expenditure. The regression result (table 4) shows that the rural households who diversify their income or activities into non-farm enterprises are not economically well-off in terms of having large land-holding, educationally advanced, and socially privileged. In other words, the resource-poor and socially backward are having lower income and consumption expenditure in comparison to the ones who have larger land holdings and are socially privileged. In this context, to understand the causes for differences/gaps in income and consumption expenditure between two groups (i.e. non-diversified and diversified households), the Blinder-Oaxaca model has been used. The result from the B-O model suggests that the differences in income and consumption expenditure are caused by differences in specific factors such as access to large land-holdings, social group belonging to OBC and General caste, old age, large household size, gender belonging to a female, the households whose crop is not insured and agro-climatic region belonging to Plateau and Hills

and the Coastal Regions are more contributor to such gaps. This implies that if households who diversify their activity were given the same access to land, having social status and there would not be any gender biases, then the process of diversification would increase in rural India and it would not have been part of vulnerability.

In other words, if the rural households would have rich resources and are socially not unequal then livelihood diversification would become part of the pull factor not the push factor when compared with the developed countries. In addition, the result shows that the area of irrigated land contributes 18.56% to the income gap and 20.70% to the consumption expenditure gap between non-diversified households and diversified households. This implies that if non-diversified and diversified households are given the same level of irrigated land, then the farm income for the diversification would increase by 18.56% at par with the non-diversified households. Similarly, for consumption expenditure, if non-diversified and diversified households are given the same level of irrigated land, then the consumption expenditure for the diversified households increases by 20.70% significantly.

CHAPTER 5

Impact of Institutional Credit on the Participation of Farm Households in Non- Farm Enterprises

5.1. Introduction

The importance of accessibility of institutional credit to rural households has been widely used in developing countries as a policy to improve livelihoods and rural development. At the same time, rural households lack in taking loans from formal institutions and preferring informal sources. And the problem of liquidity remains associated with the highly imperfect and informal rural credit markets (Binswanger and Khandker, 1995). In detail, inadequate accessibility of institutional credit to the rural resource poor is one of the major concerns. Evidently, smallholder farmers do not have the advantage to borrow from a formal institution because it could only provide credit if the borrowers have physical collateral (Mehta, 2018). As a result, households with lesser landholding or agricultural labourers and socially deprived etc. are voluntarily or involuntarily involved in taking loans from informal sources.

In India, formal and informal financial institution co-exists together although, the financial methodologies of both sources vary significantly. The formal sources refer to commercial banks, cooperative banks, regional rural banks, insurance, etc. while informal sources include local moneylenders, landlords, relatives and friends, etc. Despite access to formal credit institutions, informal sources continue to provide loans among rural communities due to adequate and easier accessibility (Pal, 2002). According to Bhattacharjee (2014), whether people borrow from formal or informal sources, the repayment behavior of rural households depends on how efficiently the loan amount outstanding had been utilized and whether the purpose of the loan met the criteria. And society could only be beneficial from institutional credit programs if they overcome liquidity problems associated with imperfect credit markets in rural areas (Binswanger and Khandker, 1995).

Several researchers (David et al. 1980; Braverman and Guash, 1989) have focused on the role of policies focusing on institutional credit and farmer repayment behavior and have estimated the benefits of institutional credit in underdeveloped countries (Carter, 1989; Pitt and Khandker, 1996; Narayanan, 2016). These studies reveal that access to credit from formal sources contributes to an increase in the productivity of the agricultural sector and household income. However, in spite of the significance of the above initiatives in increasing the flow of formal credit to agriculture, the links between formal credit and household income linked with the diversified farm households are not explored in India and not well documented. Therefore, the present study intends to evaluate the impact of institutional credit on the participation of farm households in non-farm enterprises in rural India.

Access to credit for farm households plays a significant role in meeting their financial gap and diversifying their livelihood activities (Abrha, 2015). But such opportunity is not

accessible for every household due to given economic and societal preconditions. The economic conditions such as access to natural resources and employment opportunities decide the ability to buy the loan from formal institutions in terms of having physical or financial collateral. While social conditions refer to social categories belonging to different castes, races, gender etc. which play a pivotal role in availing loans from formal sources. Evidently, the result found in chapter 3, shows that the major participants in the off-farm activities are marginal and small farmers, the social group belonging to scheduled castes (SCs) and scheduled tribes (STs), not literate, gender belonging to female etc. The above findings suggest that these groups are socially and economically backward, how could they approach formal financial institutions to take loans and start a new business outside agriculture? Thus, to avoid paperwork and documentation, these groups may prefer informal financial sources like local money lenders and relatives and friends. However, this hypothesis could only be validated with empirical evidence in the further section of this chapter.

Despite of increased share of formal financial institutions, rural India still accesses loans from informal sources about 38%. Many questions have been raised over the effectiveness of government interventions in the rural credit market and banking systems. Intensifying access to institutional credit at lower interest rates has also been justified as protecting the rural poor from exorbitant interest rates imposed by informal sources. However, the non-repayment behavior could be improved when there would be easier accessibility of credit. Hence, source and purpose both are very essential for the smooth functioning of the credit market in rural areas. With this background, the present study attempts to provide empirical evidence for the institutional credit on the households who diversify their livelihood activities. For the source and purpose of the loans, the study has used 2018-19 nationally representative households survey data conducted as the 77th round by the National Sample Survey Office (NSSO) on Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households (GoI, 2021).

5.2. Characteristics of rural credit institutions in India

The process of borrowing and lending is not a new phenomenon, it has existed for years and years whether through formal or informal institutions. Under the British-India, the positions of moneylenders were strengthened and appeared as taking advantage of debts imposed on farmers and grabbing their lands (Walker and Ryan, 1990). After the independence in 1951-52, the farmers were only able to borrow 9% from formal institutions and the share of the co-operative sector was 3% and the local money lenders contributed 83% (Binswanger and

Khandker, 1995). Later on, formal credit institutions became guiding principles and in 1969 there was major banking sector reform and the 14 banks were nationalized. The Reserve Bank of India issued minimum guidelines to provide credit to agricultural households in rural India. Somehow, the penetration of the formal banking sector increased the credit flow in rural areas but not effectively. The growth in the agricultural capital stock per farm was not so impressive even after increasing institutional rural lending (Binswanger and Khandeker, 1995).

Moreover, the existence of formal and informal credit institutions has been a key feature of the rural credit market in developing countries as well as in India (Kumar et al. 2016; Hoff and Stieglitz, 1990). In rural India, the accessibility of overall institutional credit has gone up over the period of time from 32% (1971) to 61.30% (National Sample Survey, 77th round). Table 5.1 reveals that informal sources of loans account for 38.70% overall in the economy. The agricultural moneylender (4.81%), professional moneylender (13.17%) and relatives and friends (11.96%) are the larger contributors among the non-institutional sources. While input supplier accounts for 2.43%, market commission agents/traders account for 1.36% and other accounts for 4.38%. At the same time, nearly 62% of the loan is accessible from formal credit sources (see Table 5.1). Scheduled commercial banks (28.27%), regional rural banks (7.07%), and cooperative societies (10.10%) are the largest contributor. Nonetheless, India has a vast network of formal financial institutions but the informal sources also continue to persist in the rural credit market. Which is clearly shown the table 5.1.

Table 5.1.: The Percentage share of loans by formal and informal sources

Share of Formal Sources		Share of Informal Sources	
Type	Percentage	Type	Percentage
Scheduled commercial bank	28.27	Landlord	0.55
Regional rural bank	7.07	Agricultural moneylender	4.81
Co-operative society	10.10	Professional moneylender	13.17
Co-operative bank	2.54	Input supplier	2.43
Insurance companies	0.04	Relatives and friends	11.96
Provident fund	0.00	Chit fund-19	0.04
Employer	0.02	Market commission agents/traders	1.36
Financial corporation/institution	0.92	Other	4.38
NBFCs including micro-financing institution	2.37		
Bank linked SHG/JLG	8.17		
Non-bank linked SHG/JLG	1.35		
Other institutional agencies	0.44		
Total Share of formal sources	61.30	Total share of informal sources	38.70

Source: Author calculation from 77th round of Situation Assessment Survey, NSSO.

The larger sections of the literature have focused particularly on agricultural credit in the context of rural India and its effectiveness on the farming sector (Walker and Ryan, 1990; Binswanger and Khandeker, 1995, Kumar et al. 2016). There is a dearth of literature on rural credit taking loans for different purposes and diversifying their activities in the non-farm sector within rural areas. Because in a country like India the effectiveness of the informal rural credit market is more prominent than formal credit. Thus to fill this gap, the present study tries to investigate the purposes of loans and examines the impact of institutional credit on farm households that diversify their livelihood activities. In this light, the following sections of the study are organized as follows. Section 5.3 mentions the data sources and section 5.4 describe and explains the estimation approach used to assess the impact of institutional credit on livelihood diversification. And next section 5.5 presents the descriptive

statistics of the dataset and section 5.6 discusses the regression results. Section 5.7 concludes the paper.

5.3. Data Source

The present study used the 77th round of nationally-representative data from the national sample survey office (NSSO), conducted on the Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households survey, 2018-19 (GoI, 2021). This survey covers all the livelihood situations of farmers including socio-economic, organizational, and institutional aspects of farming such as landholding size, crop yields, irrigation status, cost of crop production, access to credit, and demographic and social characteristics of the households in two separate visits. Visit 1 was conducted in July-December 2018 (Kharif season) while visit 2 was conducted in January-June 2019 (rabi season). Thus, combining both visits we get the information on farm households for the entire agricultural year 2018-19. The total number of households surveyed during visit 1 was 58,035 and in visit 2, only 56,894 were surveyed again out of 58,035. This implies that the 1,141 households could be missing or casualty households during visit 2 of the survey. The present study focused is maid on access to credit and other socio-economic characteristics.

5.4. Empirical Strategy

In the first stage, it presents the distributional figure of rural households taking out loans for different purposes from formal and informal financial institutions. In the second stage, it explored the differences in key variables across the households taking out loans from formal or informal sources using descriptive statistics. In the third stage, to test empirically the impact of institutional credit on livelihood diversification, the present study used the Probit model. While using the Probit model, we assume that in our livelihood choices, the decision of the *i*th household to diversify its activity or not depends on observable and unobservable characteristics. Thus, index Y_i is expressed as follows-

$$Y_i = \beta_1 + \beta_2 X_i + \beta_3 Q_i + \epsilon_i \quad (1)$$

Where the Y_i is the probability of rural households being engaged in non-farm economic activities (dependent variable), and X_i is a categorical variable for access to credit sources from formal and informal sources, taking value '1' if the household has taken a loan from formal sources and, '2' if a household has taken a loan from informal sources. Q_i is the vector (with a coefficient vector) of other household variables impacting livelihood

diversification such as land size, caste, types of farmers, gender of the household head, education level etc, and ε_i is an error term. If a variable X follows the normal distribution with mean μ and variance σ^2 , its probability distribution function (PDF) is written as

$$f(X) = \frac{1}{\sqrt{2\sigma^2\pi}} e^{-(X-\mu)^2/2\sigma^2} \quad (2)$$

and its cumulative distribution function (CDF) is expressed as-

$$F(X) = \int_{-\infty}^X e^{-(X-\mu)^2/2\sigma^2} \quad (3)$$

5.4.1 Descriptive Statistics

Access to institutional credit is not scale-neutral in spite of several measures adopted to promote financial inclusion in India. The larger sections of rural communities still remain deprived of the formal credit system. In the absence of collateral availability or guarantors, poor households are often excluded from formal credit markets (Ray, 1998; Shoji et al., 2012). Rural households with better resources avail more credit from formal financial institutions and they find them easier in comparison to the resource-poor. Kumar et al (2016) mentioned that almost half of agricultural households do not borrow any money and about 48% are excluded from the financial markets. However, the non-borrowing attitude of agricultural households is not voluntary, they might lack collateral, documentation and repayment norms. In this context, table 5.2 presents the differences in key variables (different socioeconomic characteristics) across the households taking out loans from formal or informal sources using descriptive statistics (t-test).

The result from table 5.2 reveals that the one who possesses land size borrows more money from formal sources than informal sources. Secondly, monthly consumption expenditure is significantly higher for those who borrow from formal institutions. Also, there appears to be a gender bias in access to formal credit, as the share of female-headed households receiving credit from institutional sources was lesser than the share of male-headed households (Kumar et al. 2016). This correlates with the findings of the present study. Further, Indian society is heterogeneously classified into castes which play important roles in every aspect of life throughout history. Hence, in terms of availing the financial facility from institutional sources, the lower castes such as scheduled castes (SCs), scheduled tribes (STs)

Table 5.2.: General characteristics of institutional and non-institutional borrowers
(t-test)

Variables	Formal Sources	Informal Sources	Difference in mean/proportions (t-test)
Socio-demographic variables			
Land Size (hectares)	2.33	1.78	0.549****
MPCE	2318.68	2020.49	298.18****
Age (years)	34.62	31.87	2.75****
Male headed households	0.908	0.903	0.004
Female-headed households	0.091	0.096	-0.004
Social Groups			
Schedule tribe	0.098	0.134	-0.035****
Schedule caste	0.139	0.173	-0.033****
Other backward caste	0.462	0.479	-0.016**
General Castes	0.299	0.213	0.085****
Types of farmers			
Marginal	0.435	0.483	-0.047****
Small	0.132	0.160	-0.027****
Semi-medium	0.214	0.198	0.016*
Medium	0.180	0.137	0.042****
Large	0.036	0.020	0.016****
Education level of HHs head			
Not literate	0.291	0.413	-0.122****
Secondary	0.424	0.382	0.042****
Higher Secondary	0.204	0.155	0.049****
Diploma	0.014	0.009	0.004****
Graduation & above	0.066	0.039	0.026****
Source of income			
Agriculture and allied activities	0.816	0.805	0.010
Non-Agri. activities	0.183	0.194	-0.010

Source: author calculation based on 77th round of NSSO, Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households survey, 2018-19

and other backward classes (OBCs) are lacking. Whereas, upper castes have more credit access from formal institutions than informal ones. In addition, access to institutional credit reveals a direct relationship with the level of education. The difference between households who borrowed from institutional sources and those who borrowed from non-institutional sources is more prominent with higher levels of education. The strata of landholding or types of farmers are most important when we explain the conditions of the rural economy in this context. Thus, the above table 5.2, demonstrates that marginal and small farmers significantly borrow more money from informal sources than formal ones. Whereas, medium and large farmers get more access to credit from formal sources. The reason to get larger farmers more access to credit from formal institutional sources is very much valid in terms of having a higher share of landholding which they could show as collateral to Banks. But the marginal and small farmers have up to two hectares of land which is not sufficient as documentation required by the Banks.

Further, the source of income is most important when we look at the livelihood aspect and strategy of rural households. In this context, the result from table 5.2 reveals that the one whose main source of income is agriculture and allied activities (i.e. cultivation, farming of animals, and other agricultural activities), has more access to credit from formal sources than the informal sources. On the other hand, one whose main source of income is non-agricultural sources within rural areas has lesser accessibility to formal institutional credit and gets more from informal sources. And it is very much evident that the households who work in non-agricultural activities and do not have access to farming activities are mostly labourers. They neither have land nor possess ownership of the business, so how will they get a facility of formal credit institutions? Hence, the households whose main source of income is non-farm activities, have lesser access to formal credit and larger accessibility to the informal credit market in rural India.

Table 5.3, summarized the behavioral patterns of rural households who take loans for different purposes from formal and informal sources. Farm households who borrow loans for the purpose of cultivating land as a form of making a capital expenditure in farm businesses, constitute the largest percentage (81.43%) from formal sources, and for making revenue expenditure in farm business constitute about 78.71% from formal sources. Also, the households who starts non-farm business as an owner of the firm, take more loan from formal sources (69.89%) than informal one (30.11%). The house loan is also taken more from formal sources which constitute about 60.06% whereas, informal sources contribute about 39.94%.

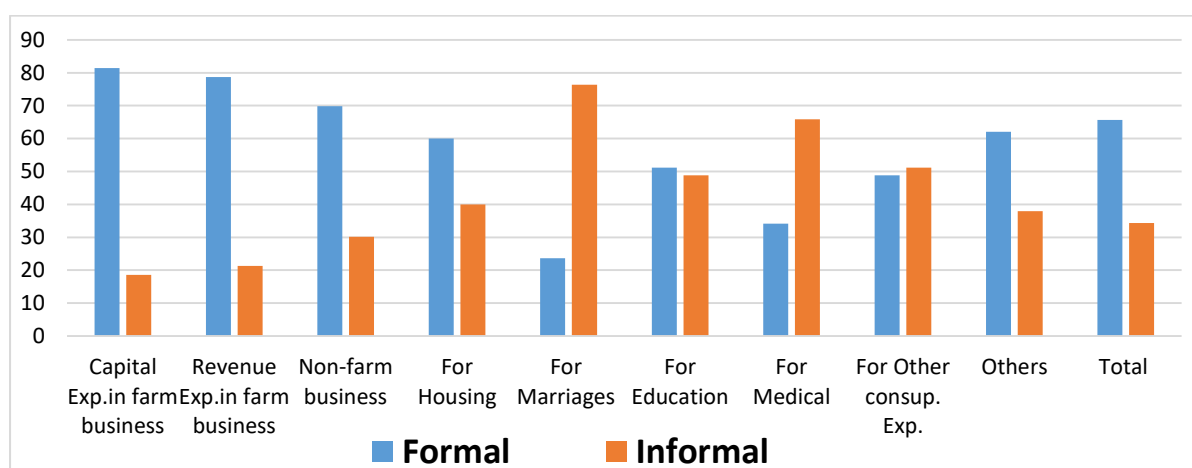
Table 5.3.: Purpose of Loans Taken from Formal and Informal Sources

Purpose of loan	Formal Institution (%)	Informal Institution (%)	Total
For Capital expenditure in farm business	81.43	18.57	100
For Revenue expenditure in farm business	78.71	21.29	100
For Non-farm business	69.89	30.11	100
For housing	60.06	39.94	100
For Marriages and ceremonies	23.60	76.40	100
For Education	51.19	48.81	100
For Medical	34.15	65.85	100
For the Other consumption expenditure	48.79	51.21	100
Others	62.10	37.90	100
Total	65.68	34.32	100

Source: author calculation based on 77th round of NSSO, Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households survey, 2018-19

The largest contribution by informal financial sources such as local money lenders, relatives and friends in rural India is in the field of marriages and ceremonies. For the purpose of marriages, the households taking loans from informal sources is 76.40% which is huge. The reason for such a situation could be poverty, financial illiteracy and the prevalence of the dowry system. At the time of marriage, the bride side family feels so much responsibility to satisfy the groom side family in a short period of time, in such a situation, to avoid the paperwork or to hide the total expenses from the society where they live, the rural households borrow money from a close acquaintance. Similarly, for medical expenses, rural people buy more loans from informal sources which constitute about 65.85%. The purpose of educational loans is higher for the formal sources but still, rural households access the informal credit market for the purpose of educational loans about 48.81% which is very high. For the other consumption expenditure, rural households take loans 51.21% from informal sources and only 48.79% from formal sources. This distributional figure is also shown in the bar graph in figure 5.1.

Figure 5.1.: Purpose of Loans Taken from Formal and Informal Sources



Source: author calculation based on 77th round of NSSO, Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households survey, 2018-19

5.5. Regression Results

From the above descriptive statistics, we saw there was a significant mean difference in the households belonging to different socio-economic backgrounds in terms of having access to credit from formal and informal financial sources. We also saw that the one who has lesser economic resources such as land take more loan from informal sources. Thus, to estimate and establish a relationship between access to institutional credit and the households who diversify their activities, the present study uses the probit model. The dependent variable shown in equation 1 is a binary variable that is equivalent to 1 or 0; if it is 1 then a farm household participates in non-farm economic activities (NFEAs) and 0 means a farm household does not participate in any NFEAs.

Thus, the binary dependent variable has been named as livelihood diversification or we can call it income diversification of farm households into non-farm enterprises. Whereas, the independent variables access to credit is categorical in nature; if access to credit is equal to 1 then households take loans from a formal institution and if it is equal to 2 then the households take loans from informal institutions. Along with access to credit, the model also includes control variables impacting livelihood diversification such as land size, caste, types of farmers, gender of the household head, education level etc.

Table 5.4.: Impact of access to institutional credit on Livelihood diversification

Dependent variable =	Livelihood diversification in rural non-farm enterprises			
Independent variables	Probit model		Marginal Effect	
	Coefficient	Standard Error	Coefficient	Standard Error
Access to Credit				
Informal Sources	0.0721***	0.016	.0214***	.00488
MPCE	-0.0001***	1.751	-3.211***	5.212
Land possessed (ha.)	-0.0090	0.006	-.0027	.0019
Gender of hhs. head				
Female-headed hhs	-.0315	.0286	-.0093	.0085
Social Groups				
SCs	0.391***	.0300	0.116***	.0088
OBCs	-.591***	.0250	-0.175***	.0072
General Castes	-.719***	.0272	-0.214***	.0078
Types of farmers				
Small	.1762***	.0238	.0524***	.00709
Semi-medium	-.1202**	.0265	-.0357***	.00789
Medium	-.1941***	.0427	-.0577***	.0127
large	-.5349***	.1179	-.1592***	.03508
HHs head Education				
Secondary	0.0142	.0185	.0042	.0055
Higher Secondary	0.0164	.0233	.0048	.0069
Diploma	-0.0957	.0946	-.0285	.0281

Source: author calculation based on 77th round of NSSO, Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households survey, 2018-19.

Notes: chi2 = 0.0000; pseudo-R2 = 0.0461; dy/dx is for discrete change of dummy variable from 0 to 1. *, ** and *** statistically significant at 10%, 5% and 1% level of significance, respectively. All results are rounded to the nearest three decimal place Source. In parenthesis, the value represents standard error.

Table 5.4(Cont.): Impact of access to institutional credit on Livelihood diversification

Dependent variable =	Livelihood in rural non-farm enterprises			
Independent variables	Probit model		Marginal Effect	
	Coefficient	Standard Error	Coefficient	Standard Error
Graduation & above	0.047	.0368	.0142	.01097
Constant	0.0471			
Log likelihood	-16956.76			
Number of obs	32,105		32,105	

Source: author calculation based on 77th round of NSSO, Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households survey, 2018-19.

Notes: chi2 = 0.0000; pseudo-R2 = 0.0461; dy/dx is for discrete change of dummy variable from 0 to 1. *, ** and *** statistically significant at 10%, 5% and 1% level of significance, respectively. All results are rounded to the nearest three decimal place Source. In parenthesis, the value represents standard error.

Table 5.4 presents the result from the Probit model that examines the impact of institutional credit on the participation of farm household entering in rural non-farm enterprises. The results are consistent with the t-test result shown in Table 5.3. The result from table 5.4 suggests that the coefficient of access to credit from informal sources is positively related to the households who chose to diversify their livelihood activities in the rural non-farm sector, in comparison to formal sources. This implies that the households who diversify their income source are resource-poor in terms of having less landholding, educationally backwards and also affected by social conditions, and are not able to borrow from formal financial institutions in rural areas. Because the formal institutions require collateral whether in terms of physical properties or monetary evidence and also require documentation, paperwork and grantors. Which is not available to poor households, that is why they are lacking in taking loans from formal sources even though, the number of formal credit institutions has increased over the period of time.

The coefficient of the marginal effect of the access to credit from informal institutions in comparison to formal credit institutions is also positively related to the households who decide to diversify in non-farm economic activities in rural areas. This indicates that one unit

increase in the number of informal financial sources could result in an increase in the chances to take a loan for diversified households by 2.14%. Further, the control variables included in the model also affect livelihood diversification in one and another way. Those are landholding, monthly per capita consumption expenditure, social group, gender, and education level of the households. The monthly per capita consumption expenditure (MPCE) is negatively related to the diversified households. This is very much related to the findings of chapters 3 and 4, this implies that poor households who diversify their activities do not have positive consumption expenditure. Thus, their well-being is not good as the richer households who do not diversify (Chapter 4).

The size of land is negatively related to the household who diversifies their activities, which implies that the one who possesses land are majorly cultivators concentrated on farming activities and do not choose to diversify in other sectors. The marginal effect implies that the one-unit increase in landholding leads to a decrease in the choices of farmers to engage in livelihood diversification by 0.90%. Further, the coefficient of the female head of households is negative. This implies that in comparison to male-headed households females are not diversifying in the non-farm sector. This finding correlates to the study of Akaakohol and Aye (2014); Asfaw et al. (2017), which argue that male enjoys all opportunities and that the ability and accessibility of women to work outside the home are limited. Further, Indian society is categorized in the caste system which could play a very important role in taking decisions about household work outside of agriculture. The lower caste is generally endowed with lower wealth and different assets. As a result, they try to look for alternative sources of income outside agriculture.

Therefore, lower castes (STs and SCs) have more chance to diversify when compared with the upper castes and the other backward castes (OBCs) in non-farm activities. The marginal effect (0.116) and (-0.1755) is represented for the SCs and OBC and for the general caste (-0.214). The farmers who possess large landholdings are less likely to choose livelihood activities outside of agriculture (Asfaw et al., 2017). Also, Jatav and Sen (2013) observed that households with less than 1 acre of land or landless labourers only were able to diversify their activities in the non-farm sector. On the contrary, households with larger farms were also not in a position to diversify into non-farm. The coefficient of small farmers is positively related to livelihood diversification. This implies that the farmers possessing lesser land have more chances of entering into non-farm economic activities. Whereas, the coefficient of semi-medium, medium and large farmers is negatively related to non-farm income diversification. Thus, the farmers who have lesser landholding have positive

livelihood diversification and farmers who have larger landholding have negative livelihood diversification.

The level of education is work as a catalyst for the entry of rural households who participate in non-farm activities (Asfaw et al., 2017). The result from table 4, reveals that if a head of the household possesses higher educational qualifications, their chances are more to diversify in comparison to the not literate one. The one who holds a secondary and higher secondary degree have greater chances to diversify by 1.42% and 1.62% respectively. Also, the graduates are positively related to diversification by 4.7% however, the coefficient is not significant. The marginal effect of an education level suggests that one additional level of education qualification could increase the probability of farm households' engagement in non-farm activities by 0.42%, 0.48% and 1.42% for the one who possesses secondary, higher secondary and graduation and above level of education.

5.6. Discussion and Conclusion

This study examined the dynamics of credit sources and how accessibility to formal and informal sources helps in diversifying the livelihood activities of farm households in rural non-farm enterprises in India. The data explored in the study is based on the 77th round of the national sample survey office (NSSO), conducted on the Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households survey, 2018-19. Empirically, the descriptive study from table 5.3 presents the characteristic of socio-economic variables accessing credit from formal and informal sources. The findings reveal that the one who has larger landholdings have higher monthly per capita consumption expenditure (MPCE), belong to upper castes, have a greater level of education get more access to credit from a formal financial institution. On the other hand, the one who has lesser landholding such as marginal and small farmers, belonging to lower castes, and having a lesser level of education borrow loans from informal sources in rural areas.

Further, the empirical estimation based on the Probit model examines the impact of institutional credit on the participation of rural households in non-farm enterprises, known as diversified households. Table 5.4 demonstrates that access to credit from informal institutions affects positively to the farm households who take part in non-farm enterprises, in comparison to formal financial institutions. This is very evidently related to previous findings of chapter 3 and 4 which reveals that the resource-poor are the main participants in non-farm activities. Hence, the socio-economic poor (e.g. marginal and small farmers, lower castes, not literate, having lower consumption expenditure etc.) lack showing collateral, paperwork,

documentation, guarantors etc. to the Banks. This is why they prefer taking loans from informal sources such as local money lenders, relatives and friends.

CHAPTER 6

SUMMARY AND CONCLUSIONS

6.1 Conclusions

Structural transformation is an important part of the process of economic development. The kind of transition that ensued in developed countries from a traditional to a modern economy remains an elusive goal for most poor countries, like India. While some believe that such transformation is happening at a slower pace, others believe that probably may not occur at all (Nayyar, 2012, Sanyal 2007). Considering the slower transition discourse, there is less clarity too whether the countryside would diminish in employment towards urbanization, or it would follow an intermediate stage of development/enlargement of a non-farm sector within the villages as well. The modernization of agriculture is likely to generate considerable linkages with the local non-farm sector. Given the poor urban absorption and high population growth in the rural areas, there is going to be a substantial non-tradable sector within the rural sector that may come up to give rise to considerable labour demand and income generation.

The present study has tried to understand the livelihood diversification strategy of farm households in rural India. It answers why rural farm households diversify their livelihood and how different resources and constraints influence their decision to take part in non-farm economic activities. The existing studies at the world level show that livelihood diversification is not a linear outcome of the process of development rather it is a part of area-specific characteristics influenced by several economic, social and cultural forces. However, there are certain developed countries where the process of diversification is high and led by push factors but it is not the case in poor countries like India. The evidences show that the unsustainability of agriculture resulting in distress is not a short-term stress but a part of the long-term crisis faced by the poor countries of Asia and Africa.

The rural livelihood defined in the study is based on the composition of the main income source of the households. This study used two rounds of the Situation Assessment Survey (SAS) of Farmers, conducted as the part of 70th round and the 77th round by the National Sample Survey Office (NSSO). The agricultural households considered for the present study are defined based on income cut-off. The surveys cover the socioeconomic, organizational, and institutional aspects of farm households such as landholding size, crop yields, irrigation status, cost of crop production, access to credit, and demographic and social characteristics of the households. Thus, to define livelihood diversification of the farm households, this study considers those households whose primary source of income is cultivation and are also engaged in any rural non-farm economic activities.

This present chapter summarizes and produces the major results related to the research questions presented in chapter 1 of the thesis. The present study was conducted to

answer why rural farm households diversify their livelihood and how different resources and constraints influence their decision to take part in non-farm economic activities and what is the impact of livelihood diversification on the well-being of rural households and how institutional and non-institutional credit affects livelihood diversification. First, the study examined the determinants of livelihood diversification which affects the decision of farm households to enter into non-farm enterprises. Second, it examined the impact of livelihood diversification on the well-being of farm households with a particular focus on their farm income and consumption expenditure. And third, it examined the impact of institutional and non-institutional credit on the participation of farm households in non-farm diversification. Different econometric models were used to analyze the driving forces of participation in non-farm economic activities and their impact on different indicators of rural households' well-being. Blonder-Oaxaca decomposition methods were used to estimate the differences in farm income and consumption expenditure between non-diversified households and diversified households.

With regard to livelihood or income activities in rural India, the main source of income comes from cultivation is about 61.47 per cent, livestock 2.45 per cent, non-agricultural enterprises 5.68 per cent, regular salaried/wages in agriculture 9.5 per cent regular salaried/wages in non-agriculture 5.05 per cent, casual labour in agriculture 6.5 per cent and casual labor in non-agriculture 6.9% and others contribute 1.55 per cent. Thus, cultivation has emerged as an important source of income, whereas other sources like non-farm enterprises, casual labor and other services like remittance recipients, students, engaged in domestic duties, etc. just remained as a survival strategy to the life of rural people. Based on the above distributional figure of the evidence, the study reveals that the overall percentage of livelihood diversification is only about 14 per cent which seems very low in the country. Therefore, it is important to understand the differentials of socio-economic structure which play a crucial role in the participation of income diversification into non-farm economic activities.

Thus, the result from chapter three (Table 3.4) revealed that the one who possesses smaller-size farm holdings are categorized into marginal and small farmers shows higher chances to diversify their activities in NFEs. While the one who possesses larger land holdings are categorized into semi-medium, medium and large farmers and show significant negative diversification towards the non-farm sector. The social categories belonging to lower castes (SC and ST) have higher chances to diversify in comparison to upper castes. While OBCs also show lesser chances to diversify their activities. Further, the ones who have

the highest educational qualification, age groups between 30-64 years, households with access to credit only from the informal institution, households which have crop insurance, and households living in plateaus & hill Regions, Coastal Plains & Hills among agro-climatic zones are found to be significant households which are able to diversify into non-farm activities. On the other hand, those who are aware of MSP, and the households residing in Gangetic plains have lesser chances to diversify than their counterpart in Plateau & Hills Region, Coastal Plains & Hills regions. This implies that the households residing in Gangetic plains work more in the agricultural field because these lands are naturally favorable for farming activities or maybe due to the highest population and poverty in these areas.

In addition, higher farm income and higher irrigation negatively influence non-farm income diversification. This implies that the diversification is led more by distress, to begin with. Good irrigation and higher farm activity are likely to tie the households to farming. Thus, this is very much related to the class structure of the farm households. In the above para, we just saw that those who possess lesser landholding are the main players in the diversification process, implying smallholder farmers have lesser income which is why they are diversifying. Hence, the process of diversification is initiated more by distress than by choice or growth-driven activities. However, we are already facing declining growth in the agricultural sector which is another concern. A study by S. Chand, et al. (2015) revealed that the growth rate of the agriculture sector has gone down in the past three decades and dropped to 1% (2011-12), which has created agrarian distress in rural areas.

For a nuanced understanding of the well-being of rural farm households, this study examined the differences in farm income and consumption expenditure as an indicator of the well-being of diversified and non-diversified households. The findings from chapter 4, show that the rural households who diversify their income or activities into non-farm enterprises are not economically well-off in terms of having large land-holding, educationally advanced, and socially privileged. In other words, the resource-poor and socially backward are having lower farm income and consumption expenditure in comparison to the ones who have larger land holdings and are socially privileged. In this context, to understand the causes for differences/gaps in income and consumption expenditure between two groups (i.e. non-diversified and diversified households), the Blinder-Oaxaca model is used. The findings based on the B-O model suggest that the differences in income and consumption expenditure are caused due to differences in specific factors such as access to large land-holdings, social group belonging to OBC and General caste, old age, large household size, gender belonging

to a female, the households whose crop is not insured and agro-climatic region belonging to Plateau and Hills and the Coastal Regions are more contributor/responsible for such gaps.

This implies that if households who diversify their activity were given the same access to land, had the same social status and there would not be any gender biases, then the process of diversification would increase in rural India and it would not have been part of vulnerability. In other words, if the rural households would have rich resources and are socially not unequal then livelihood diversification would become part of the pull factor not the push factor when compared with the developed countries. In addition, the result shows that the area of irrigated land contributes 18.56% to the income gap and 20.70% to the consumption expenditure gap between non-diversified and diversified households. This implies that if non-diversified and diversified households are given the same level of irrigated land, then the farm income for the diversification would increase by 18.56% at par with the non-diversified households. Similarly, for consumption expenditure, if non-diversified and diversified households are given the same level of irrigated land, then the consumption expenditure for diversified households increases by 20.70% significantly.

Access to credit is another important factor which plays a crucial role in the decision-making process for the livelihood strategy. In India, formal and informal financial institution co-exists together although, the financial methodologies of both sources vary significantly. In spite of access to formal credit institutions, informal sources continue to provide loans among rural communities due to adequate and easier accessibility (Pal, 2002). The study shows that even after the enlargement of the institutional credit system, still rural India borrows 38% of the loan from the informal credit market particularly from local money lenders, family, friends etc. Who are the main borrower from such institutions and what are the major purposes for which they borrow are examined in chapter 5. The findings reveal that the one who has larger landholdings, have higher monthly per capita consumption expenditure (MPCE), belong to upper castes, and have a greater level of education get more access to credit from a formal financial institution. While the one who has lesser landholding such as marginal and small farmers, social group belonging to lower castes, and having a lesser level of education borrow loans from informal sources in rural areas.

Further, the empirical estimation examined the impact of institutional credit on the participation of rural households in non-farm enterprises. The result in Table 4 (Chapter 5) demonstrates that in comparison to a formal financial institution, access to credit from informal sources affects positively to the farm households who take part in non-farm enterprises. This is very evidently related to previous findings of chapter 3 and 4 which

reveals that the resource-poor are the main participants in non-farm activities. The socio-economic poor (e.g. marginal and small farmers, lower castes, not literate, having lower consumption expenditure etc.) lack showing collateral, paperwork, documentation, guarantors etc. to the Banks. This is why they prefer taking loans from informal sources such as local money lenders, relatives and friends.

6.2 Specific Contribution of the Study

- The estimate suggests that income diversification into rural non-farm economic activities significantly depends on the households and farm characteristics such as level of education, age groups between 30-64 years, access to credit from informal sources, households has crop insurance etc.
- It was found that households living in plateaus & hills, Coastal Plains & Hills regions engage more in non-farm diversification in comparison to those living in Gangetic plains.
- The analysis in chapter 4 suggests that the one who does not diversify has larger farm income and consumption expenditure than those who diversify.
- The result from the Blinder-Oaxaca decomposition method suggests that the differences in farm income and consumption expenditure between non-diversified households and diversified households are caused due to differences in specific factors such as access to large land-holdings, social groups belonging to upper castes and OBCs, large household size, gender belonging to a female, the households whose crop is not insured and agro-climatic region belonging to Plateau and Hills and the Coastal Regions are more contributors/responsible for such gaps.
- Further, it was examined that the one who has larger landholdings, have higher monthly per capita consumption expenditure (MPCE), belong to upper castes, and have a greater level of education get more access to credit from a formal financial institution. While the one who has lesser landholding such as marginal and small farmers, social group belonging to lower castes, and having a lesser level of education borrow loans from informal sources in rural areas.
- The result from the probit model suggests that access to credit from informal financial sources affects positively to the farm households who take part in non-farm enterprises in comparison to formal financial institutions.

6.3 Policy Suggestions

The present study induces three important characteristics of rural households who chose to diversify in non-farm economic activities. Based on observation during this study, the following suggestions could help policymakers to promote non-farm diversification in rural areas.

- (1) First, rural areas are not just about agriculture dependency but it is connected to the economy of distinct activities. Thus, any change in the policy would directly or indirectly affect the life and livelihood of the people of the area and could increase the participation of rural households in non-farm enterprises. The recent days are also experiencing new census towns increasing in the rural areas (Robbin 1919), which could increase the opportunity for income diversification for rural households. The entire young and adult population, who are connected to both agriculture as well as non-farm activities associated with the newly developed urban areas, could contribute to the changing way of life, thoughts, behaviour, and choices etc. in rural households. Not only at the economic level but at the social level also, rural areas are connected to newly developed towns and urban centres can provide improved living standards to rural households.
- (2) Second, a multi-spatial household disseminates its labour force in distinct fields or places. Hence, for the development of the livelihood strategy of a household, not only multi-sectoral approach is required, but there have to be policy initiatives focusing to accommodate mobility or diversification in the development agenda. The households who diversify their activities must be secured and protected economically or financially as well as socially or culturally.
- (3) Third, the present study provides some justification for the policies that encourage non-farm diversification and focus on the income and welfare of rural households. Along with agriculture, diversification has to be accepted as a reality of life. The development policies should focus on strengthening the livelihood diversification of small farms. Since it constitutes a large portion of Indian agriculture and plays a major role in securing the food of the millions in the country. Policymakers and other government stockholders should put emphasis on providing microfinance which will eradicate the entry barriers to the rural household in participation of farm households into the non-farm sector. At the same time, it is also important to provide the formal credit nearest to their village

that might discourage the rural community to take loans from local money lenders at an exorbitant rate and encourages them to generate additional income with support from formal financial institutions. Furthermore, results suggest that the government should provide some financial and other facilities to the farmers which can boost their income as a result they can invest in NFEs activities. Consequently, rural farm households could overcome poverty and contribute to the overall development of the country.

The results have numerous policy implications for different indicators of the well-being and overall development of households in rural India. To promote non-farm economic activity in the rural economy and increase the contribution of this sector to the overall income of the households, there is a need to overcome the entry barriers faced by disadvantaged groups. The findings from the econometric analysis suggest that those who were disadvantaged in terms of educational attainment, financial facility, infrastructure, etc. are constrained to participate in more profitable income-generating activities and participating in just local low-quality jobs. Removing the barriers will require provisions of educational programs, provision of physical infrastructure such as good roads, electricity, and water, access to credit schemes, the establishment of non-farm enterprises in rural areas, etc. will promote non-farm diversification in the country and contribute to the national income. Improved opportunities could help in the reduction of massive rural-urban migration with the concomitant development policies focusing on rural areas.

Further, the result of the thesis could be linked with other policy implications, as inequality is neutral to changes in farm incomes, policies should lay stress on the intensification and livelihood diversification of small farms because it dominates Indian agriculture and makes a greater contribution to national food security. At the same time, there is a need to develop infrastructure, markets, and institutions that promote the non-farm sector and move on the path of sustainable development. Small farmers generally practice animal husbandry at a wider level. Livestock contributes to the smoothening of consumption during crop failure in case of natural shocks faced by small farmers and reduces income inequality and provides them additional income support. Thus, policy efforts must be done toward the development of livestock. Rural poor families are largely dependent on their wages and salaries for their livelihoods in comparison to the rich. Therefore, this requires the creation of financially secure and sustainable job opportunities in the non-farm sector.

Policies focusing on the improvement of access to credit are not enough, it requires investment which increases the possibility of rural farm households entering into non-farm

activities. Accessibility of credit makes it easier for farm households to invest in farm and non-farm businesses and increase productivity in agriculture by bringing new technologies. Hence, the government's efforts in doubling farm income could be tackled through the establishment and increase the functionality of cooperatives and microfinance. Also, there is a need for financial literacy in rural India to make them aware of the procedures of loans taken from formal financial institutions. Rural families are always apprehensive about the legalities and documentation required by the Banks to show as collateral even though they have physical assets. Thus, policymakers should focus on awareness about the loan proceeds to the farm households which will encourage them to participate in non-farm enterprises, and contribute to the overall development of the economy.

6.4 Limitations of the study

- An analysis of the income dynamics should follow the time series data but in India, no such series data are available on farmers' income. There is a dearth of data sources to get reliable information on the income of the agricultural household.
- To evaluate the livelihood situations of farm households, the National Sample Survey Office (NSSO) and India Human Development Survey (IHDS) are the only sources that provide information on farmers' income.
- So far, three repetitive rounds have been conducted by the National Sample Survey Office (NSSO) namely, the 59th round of the Situation Assessment Survey of Farmers during 2002-2003 (GoI, 2005), the 70th round of the Situation Assessment Survey of Agricultural Households, 2012-2013 (GoI, 2014) and the 77th round of Land and Livestock Holdings of Households and Situation Assessment of Agricultural Households, 2018-19 (GoI, 2021).
- To get an estimation of income and other factors of farm households from these surveys, the last two rounds are comparable except for the first round. In the 59th round, land possession and operational holding were considered necessary conditions for agricultural households which is different from the second and third rounds of the Situation Assessment Survey (SAS).
- Therefore, this study is confined to the latest two rounds of Situation Assessment surveys of farmers conducted in the 70th (2012-13) and 77th (2018-19) rounds of NSSO which is motivated by both the large range of activities covered in terms of

livelihood strategy and the latest survey that is fundamental for the research questions which we address.

- This study does not claim to answer the long-term impact on welfare for the transition of the rural economy of India, but it opens up a way ahead for further exploration in the process of diversification.
- This study majorly offers three broader characteristics of the income diversification of rural households in non-farm economic activities. First, it offers the determining factors which play a major role in the decision of farm households to participate in the diversification of their income strategy in non-farm enterprises. Second, it provides the impact of livelihood diversification on the well-being of farm households who diversify their activities. And third, it presents the impact of institutional credit on households that diversify their activities.

6.5 Future Scope of the Study

The rural non-farm sector as a new way of income-generating activities continues to be an important topic where limited research has been conducted. While this thesis fetches new insights using the most recent data available on farm income and sources of income conducted by the National Sample Survey Office (NSSO) as the 70th (2012-13) and the 77th (2018-19) rounds on the Situation Assessment Survey of Farm Households in India. So far NSSO does not follow the same households while conducting the survey. But in future, data filtration and more data collection following the same households could help the researchers in making a panel analysis and see the long-term effect in this field. However, some important shortcomings are also left in the database including a poorly aligned questionnaire that impedes good estimates of the livelihood situations of the farm households. Additional data collection, incorporating relevant information and covering different thematic areas would thus open up new possibilities for researchers in this field. The limited time, resources and finances available to the scholar did not permit such analysis, which is an obvious gap in this research. The researcher will pursue herself to carry out some of these analyses in future to gain a deeper understanding of livelihood situations in India.

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