Household Income Gains from Livelihood Diversification in Rural Jammu and Kashmir: Evidence from Doda and Kishtwar

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Abstract: *Livelihood diversification plays an important role in influencing rural household income, especially in regions where small landholdings, production risks, and limited employment opportunities constrain agriculture. This study examines the effect of livelihood diversification strategies on household income using primary data collected from rural areas of the Doda and Kishtwar districts of Jammu and Kashmir. A total of 396 households were selected using purposive multistage sampling to capture diverse livelihood conditions. Households were categorised into different livelihood strategies based on their engagement in farm, nonfarm, and off-farm activities. The descriptive results show that agriculture remains the dominant livelihood source, with 55% of households relying exclusively on on-farm activities. This is followed by households combining on-farm and non-farm activities (31%), while 11% engage in both on-farm and off-farm activities. Only a small proportion of households (1.52%) adopted highly diversified strategies involving on-farm, off-farm, and non-farm activities, indicating limited higher-order diversification in the study area. To assess the income effects, a multiple linear regression model was employed with the natural logarithm of total household income as the dependent variable. Livelihood diversification strategies are included as key explanatory variables, along with household, asset, and location-specific controls. The results reveal that diversification strategies involving non-farm activities significantly enhance household income compared to farm-only strategies. In contrast, diversification limited to off-farm activities does not yield significant income gains. Among the control variables, landholding size and livestock ownership were significant determinants of income, whereas demographic factors such as age and education had limited influence. Overall, the findings highlight that income gains from diversification depend on the type and combination of activities adopted by the farmers. Policy efforts should therefore move beyond agriculture-centric approaches and promote access to higher-return, non-farm livelihood opportunities to strengthen rural income growth and resilience.*

Keywords: Household Income, Livelihood Diversification, Rural Livelihoods, Regression Analysis

INTRODUCTION

Rural households in developing economies are increasingly confronted with multiple overlapping sources of uncertainty. Small and fragmented landholdings, reduced soil productivity, fluctuating output prices, and rising climate variability have reduced the capacity of agriculture alone to provide stable and sufficient income. Consequently, many rural families now combine agricultural and livestock production with a range of off-farm and non-farm activities, including wage labour, petty trade, migration, transnon-farmmmmon services, and small businesses. This shift towards multiple income sources, commonly termed livelihood diversification, has become a widespread and persistent feature of rural transformation (Loison, 2015). Two broad perspectives dominate the literature on household diversification. The first view diversification as an opportunity-driven response: better-educated households, or those with access to credit, markets, and information, deliberately add higher-return non-farm activities to increase income and accumulate assets. The second frames diversification as distress-driven: households with limited land or hit by shocks diversify into low-return, casual work to survive. Empirical studies frequently find evidence for both motives operating simultaneously, with the relative balance depending on asset endowments, market access, and institutional support in the study area (Abebe et al., 2021).

"Diversification of the rural economy" describes the gradual expansion of the rural non-agricultural economy through the diversification of rural activities across many sectors, encompassing both farming and non-farming activities (Loison, 2015). "Diversification of livelihood" is a strategy employed by households in rural areas to develop a variety of assets and activities for survival (Ellis, 2000). This diversification involves transitioning from low-income crops to more valuable crops, livestock, and non-farm activities that yield higher economic returns per unit of labour (Ahmed et al. 2015).

In the past, agriculture in India offered lower wages to its workers than the industrial and service sectors. Approximately 42.3% of the Indian population is engaged in agriculture, which contributes only 18.2% to the nation's GDP, whereas the industry and service sectors contribute 27.6% and 54.7%, respectively (Economic Survey, 2023-24). In India, nearly 85% of agricultural households consist of marginal and small-scale farmers who face challenges in sustaining themselves owing to low agricultural productivity

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(Birthal et al., 2012). Recognising this issue, the Indian government in 2016 shifted the primary focus of its agricultural strategy from merely increasing productivity and production to doubling farmers' incomes by diversifying into high-value agriculture (Economic Survey, 2023-24). This approach not only enhances farm income but also mitigates financial risks at the farm level (Deogharia, 2018).

The economy of Jammu and Kashmir is predominantly reliant on agriculture. Approximately 70% of the population of Jammu and Kashmir depends directly or indirectly on agriculture. Agricultural development is crucial for boosting farmers' income and creating job opportunities (Digest of Jammu & Kashmir, 2019). Jammu and Kashmir have the highest potential for production increase through diversification in the country, as a 1% shift in land use from food grains to non-food grains results in a crop output growth rate exceeding 3% (Chand, 1996).

REVIEW OF LITERATURE

High population density in rural areas leads to limited farmland availability for farming households, negatively affecting their agricultural livelihoods and resulting in low incomes. To address these challenges, people often seek to diversify their income sources to boost their household earnings. Research indicates that diversifying income sources has a significant positive impact on household income (Gebreyesus, 2016). Consequently, adopting a livelihood diversification strategy is essential for generating income in rural households. Compared to female-headed households, those led by men are more involved in livelihood diversification and contribute more significantly to household income (Wabara, 2020). Mengistu and Balda (2024) found that households engaging in diverse activities, such as on-farm or off-farm, earn more than households that rely solely on one activity. When households in rural areas expand their sources of income beyond agriculture, they experience higher income levels and reduced poverty compared to those who focus solely on farming. Diversifying income sources beyond agriculture can reduce poverty by up to 6–9%, highlighting the importance of livelihood diversification in decreasing poverty and increasing household income (Rahut et al. 2018).

In India's rural Himalayan regions, non-farm activities contribute approximately 58% of the household income (Rahut et al., 2012). Mahama and Nkegbe (2021) noted that livelihood diversification boosts household income and estimated that household consumption expenditure in Ghana increased by 26.0%. Salam et al. (2019) observed that non-farm livelihood diversification strategies, particularly wage employment and migration, enhance per capita income. Basu (2014) demonstrated that agroforestry systems in India offer both environmental and economic benefits, providing opportunities for low-income individuals to improve their quality of life due to agroforestry's significant job creation potential. Mengistu and Belda (2024) found a positive relationship between income and livelihood diversification measures, with 79% of household income derived from on-farm activities. Overall, this synthesis provides substantial evidence that diversifying income sources is positively correlated with higher income levels in developing countries.

The existing literature suggests that increasing household income, decreasing poverty, and enhancing food security can all be achieved by diversifying income sources. Both off-farm and non-farm activities are essential diversification strategies to support the agricultural sector. Notably, the research region has seen the widespread use of livelihood diversification techniques. To supplement their largely agriculture-based incomes, farm households in Doda and Kishtwar have adopted a range of livelihood strategies. According to the researcher's understanding and the literature reviewed, there has been no prior research on the income distribution linked to each strategy of livelihood diversification or the income gains from the combination of different diversification strategies. This study set out to analyse how various livelihood diversification strategies contribute to household income and their effect on boosting overall income in the study area.

Objectives of the Study

1. This study investigates the pattern of livelihood diversification strategies used by rural farm households in the Doda and Kishtwar districts of Jammu and Kashmir.

2. To evaluate how livelihood diversification strategies affect the income of rural farm households in the research region.

RESEARCH METHODOLOGY

Data Source

The primary data for the study were obtained from a household survey conducted in the rural areas of Jammu and Kashmir's Doda and Kishtwar districts. Primary data were gathered using a structured questionnaire designed to capture information on household socioeconomic characteristics, livelihood activities, income sources, and asset ownership. The use of primary data allowed for a detailed and context-specific analysis of livelihood diversification and household income patterns.

Sampling Design

The study sample was selected using a multistage sampling approach. The districts of Doda and Kishtwar were purposefully chosen in the first stage from among the 20 districts of Jammu and Kashmir. These districts were chosen because of their predominantly rural population, hilly terrain, and dependence on agriculture, which makes them suitable for examining livelihood diversification in a rural mountainous context. The final sample comprised 396 households.

Model specification and purpose

This study estimated the impact of livelihood diversification strategies on household income using a multiple linear regression model. Given the highly skewed nature of income data, the natural logarithm of the total household income was used as the dependent variable. This transformation improves normality, reduces heteroskedasticity, and allows the coefficients to be interpreted in percentage terms.

The model is specified as follows:

$$\text{Ln (Income)} = \beta 0 + \beta 1 Strategiesi + \beta 2 Xi + ei$$

In the model, Xi comprises various socioeconomic control factors, whereas *ei* is the stochastic error term.

The dependent variable in this study is household income, measured as the natural logarithm of total annual household income to address skewness in income distribution and enable interpretation of results in percentage terms. The main independent variable is livelihood diversification, captured through household livelihood diversification strategies that reflect different combinations of farm, non-farm, and off-farm activities, with farm-only households serving as the reference group. The analysis isolates the impact of livelihood diversification on income by controlling for key household characteristics, asset endowments, and location-specific variables, such as the household head's age and education, household size, landholding size, irrigation availability, livestock ownership, and distance from the market. These control variables were included to account for differences in demographic endowments, productive assets, and market access that may independently influence household income.

Table 1: Description of variables included in the regression model

Variables name	Type	Definition/description	Measurement/coding
Ln_income	Dependent	Natural log of household income per annum	Ln (total household income in rupees)
Strategies of livelihood diversification	Main explanatory	On-farm only On farm plus off farm On-farm plus nonfarm On-farm plus off-farm plus nonfarm	Categorical
Gender	Control	Sex of the respondent	Dummy 1=male, 2 females
Age	Control	Age of the respondent	Years
Education	Control	Education level of the respondent	Categorical
Household Size	Control	Number of family members	Continuous
Landholding	Control	Size of operational land owned	Hectares
Livestock	Control	Livestock ownership	Number of livestock units/animals
Irrigated	Control	Irrigated land	Dummy, 1=yes, 2=no
Market accessibility	Control	Proximity to the market	In kilometers

RESULTS AND DISCUSSION

Types of livelihood diversification

In the study region, rural households engage in various livelihood strategy activities. As detailed in Table 2 from the survey results, 221 households, representing 55.81% of the sample, were involved exclusively in on-farm livelihood strategies. Additionally, 124 households 31.31 % participated in both on-farm and non-farm livelihood strategies. Meanwhile, 45 households, accounting for 11.36% of the total, engaged in both on-farm and off-farm livelihood strategies. The remaining six respondents, comprising 1.52% of the sample, were involved in on-farm, off-farm, and non-farm livelihood strategies. The findings of this study are consistent with those of Mengistu and Belda (2024).

In this context, on-farm income includes diversified agricultural activities such as crop cultivation, horticulture, floriculture, and livestock production, reflecting that diversification *within* agriculture is an important pathway for risk management and income generation (Salam et al., 2019). The predominance of on-farm only households suggests that agriculture remains the principal economic base for most rural households, and that farming diversification strategies, including variation in crop types and integration of livestock and high-value horticulture, are central components of livelihood portfolios that sustain household livelihoods in settings where non-farm opportunities are limited (Mengistu and Belda, 2024). Historically, the primary industry, which comprises horticulture, agriculture, fishing and aquaculture, forestry, and logging, has been a key component of J&K's economy. The crop sub-sector, led by horticulture, remains the primary contributor within the primary sector, followed closely by livestock. The significance of the primary sector is underscored by its role in providing livelihoods to a large proportion of the population. According to the PLFS 2023-24, this sector employs the largest share of the workforce (42.99 percent) (Economic Survey 2025-2026). The sizeable group engaged in on-farm + non-farm activities indicates that a significant share of households is supplementing their core agricultural income with self-employment or small business ventures in the rural non-farm economy, a pattern observed in other rural diversification studies, where non-farm activities emerge as the second most common income source (De la O Campos, 2025; Werdofa et al., 2024). This pattern reflects broader empirical evidence that while agriculture, including diversified agricultural enterprises such as crop, livestock, horticulture, and floriculture production, continues to dominate rural income portfolios, diversification into non-farm sources is a common complementary strategy as households seek to stabilise their income and enhance their welfare (Abebe et al., 2021).

Table 2. Strategies of livelihood diversification

Types of livelihood strategies of the household head	Frequency	Percent	Cum
On farm only	221	55.81	55.81
On farm plus off farm	45	11.36	67.17
On farm plus, non-farm	124	31.31	98.23
On farm plus off farm plus nonfarm	6	1.52	100.00
Total	396	100	

Source: own survey result (2024-25)

Livelihood diversification strategies' effect on household income

Before estimating the multiple linear regression model, the Variance Inflation Factor (VIF) was used to assess whether multicollinearity existed among the explanatory variables. The average VIF value, according to the results, is 1.49, which is far less than the generally recognised threshold of 5. This implies that the calculated coefficients are stable and trustworthy, and that multicollinearity is not a problem in the model. Therefore, all selected explanatory variables were retained in the econometric analysis. Robust standard errors were applied to address potential heteroscedasticity.

Econometric results and analysis

Table 3 outlines the outcomes of the multiple linear regression analysis, which evaluates the influence of livelihood diversification strategies on household income, with income represented in logarithmic form. The model explains a considerable portion of the variance in household income, as evidenced by an R-square of 40.82 percent, indicating robust explanatory power for cross-sectional household data.

The regression findings indicate that livelihood diversification strategies exert a significant and differentiated impact on household incomes. Compared to the reference group (households solely dependent on farming), those engaging in both on-farm and off-farm activities do not show a statistically significant income difference, suggesting that this diversification approach alone may not generate meaningful income gains for farmers. This could be attributed to low and unpredictable returns from casual off-farm employment in rural areas.

In contrast, households that integrate on-farm and non-farm activities demonstrate a positive and highly significant impact on income. The estimated coefficient (0.599, $p < 0.01$) suggests that these households earn considerably more than farm-only households, assuming that other factors remain constant. Likewise, households participating in on-farm, off-farm, and non-farm activities concurrently experience even greater and statistically significant income benefits (coefficient = 0.721, $p < 0.01$). These findings clearly illustrate that more diversified and higher-return livelihood combinations are associated with better income outcomes.

Table 3: Effects of Livelihood Diversification Approaches on Household Income

Variables	Coefficient	Robust std. err.	P value
Strategies			
On farm plus off farm	-0.032	0.0699	0.644
On farm plus nonfarm	0.599	0.046	0.000***
On farm plus off farm plus nonfarm	0.721	0.128	0.000***
Gender	0.102	0.0622	0.100
Age	-0.0035	0.0024	0.142
Education			
Primary	-0.1403	0.7033	0.047**
Secondary	-0.0132	0.064	0.837
High secondary	-0.0856	0.074	0.253
Graduation &above	-0.079	0.0983	0.421
Family size	0.0079	0.0116	0.492
Landholding	0.4332	0.069	0.000***
Irrigated	0.058	0.048	0.233
Livestock	0.0158	0.0087	0.070*
Distance	-0.0028	0.0231	0.903
constant	12.312	0.2152	0.000***
Number of observations=396 R square= 40.82% Mean VIF=1.49			

Source: own survey (2024-25)

***significant at 1%, ** significant at 5%, and *significant at 10%

On-farm only is taken as the reference category

DISCUSSION

The findings provide robust evidence that livelihood diversification is not a uniform process and that income outcomes depend critically on the type and combination of activities adopted by the households. While simple diversification into off-farm activities does not necessarily enhance income, strategies that incorporate non-farm employment alongside agriculture, generate substantial income gains. This supports the view that diversification driven by opportunity, rather than necessity, leads to better economic outcomes.

The insignificance of most education categories, coupled with the negative effect of primary education, suggests that structural constraints in rural labour markets limit the returns to school. In such contexts, livelihood strategies and asset ownership appear to matter more for income determination than demographic characteristics. The strong role of landholding further emphasises that diversification complements, rather than replaces, traditional productive assets.

Overall, the results indicate that diversification functions both as an income-enhancing strategy and as a mechanism to reduce reliance on agriculture, but only when households shift toward better-paying non-farm opportunities.

CONCLUSION

This study examined the effects of livelihood diversification on household income using primary data from 396 rural households in the Doda and Kishtwar districts of Jammu and Kashmir. The descriptive analysis revealed that agriculture continues to be the predominant source of livelihood, with over half of the households solely dependent on farming activities. While some households have adopted diversified livelihood strategies, engagement in advanced diversification involving non-farm and off-farm activities is still limited. The econometric analysis suggests that the impact of livelihood diversification on income varies across strategies. Households that combine farming with non-farm activities earn significantly more income than those relying solely on farming. Additionally, households involved in a mix of on-farm, off-farm, and non-farm activities experience the highest income gains. In contrast, diversification limited to off-farm activities does not significantly improve income. These results suggest that income gains depend largely on the type of diversification adopted by farmers. Among the control variables, landholding size plays a significant role in determining household income, whereas livestock ownership contributes positively but modestly. Demographic factors such as age and education show limited influence, indicating that access to productive assets and livelihood opportunities is more important for income generation. Overall, the study shows that household income can be increased through livelihood diversification, but only if families choose higher-return livelihood strategies.

Policy Recommendations

The results underscore the importance of expanding beyond solely agriculture-focused development plans and encouraging access to profitable, non-agricultural livelihood options in rural regions. Skill development initiatives should align with local job opportunities to facilitate effective diversification. Ongoing support for productive resources, such as land and livestock, coupled with enhanced access to credit, can further bolster income outcomes. Crucially, policies should aim to foster opportunity-driven diversification rather than low-yield, distress-induced activities to ensure sustainable growth in rural income. Ideally, the integration of agricultural and nonagricultural livelihood activities has been strongly linked to increases in household income. Consequently, agricultural policies should be crafted to allow rural farming households to participate in both on-farm and non-farm activities simultaneously. Policymakers can incorporate off-farm and non-farm livelihood diversification into their rural strategies as a holistic approach to improving rural livelihoods. Additionally, the government should prioritise creating employment opportunities in off-farm and non-farm sectors for different categories of farmers, including those without land, the unemployed, and landowners. This approach can boost the pursuit of supplementary income sources from off-farm and non-farm livelihoods, thereby reducing unemployment and enhancing livelihood security.

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