Research Article

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Livelihood Diversification and Rural Household Economic Security in Central and Bundelkhand Regions of Uttar Pradesh, India

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HIGHLIGHTS

- Daily wage employment, as a low-yield livelihood strategy, had a negative correlation and influenced the well-being index.
- Social and educational elements influenced the decision to embrace different livelihoods, such as farming, manual work, and paid jobs.
- Households belonging to the general social groupings were more inclined to pursue paid jobs rather than engaging in agriculture and daily wage activities.

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ABSTRACT

The livelihoods diversification in recent years have been characterised by a significant phenomenon, often referred to as occupational diversification. The research was carried to quantify the influence of diversifying sources of income on the financial welfare of households, as well as to evaluate the socio-economic factors that influenced the decision to pursue various livelihood choices. The systematically collected data of 480 farmers collected in August and September 2022 from Uttar Pradesh was analysed using indicator approach, multiple linear regression and the binary logistic regression model. The finding indicates that examining future lives in the context of increasing economic disparity highlights the significance of education in attaining fresh economic prospects. The results emphasise the need for urgent governmental measures that focus on education, particularly for lower social groups and economically disadvantaged individuals. These efforts should aim to provide new job prospects for these groups.

INTRODUCTION

Agriculture is the foundation of the Indian rural economy, contributing 18.20 per cent to the country's gross domestic product (GDP) and employing over 60 per cent of the population (Saha & Paul, 2021). Over the last 15 years, the GDP growth rate has consistently declined, decreasing from 18.81 per cent in 2005-06 to 4.2 per cent in 2019-20. India has seen a transition in its agricultural livelihood pattern in recent years, with non-agricultural economic activities playing a more significant role in contributing to the country's total GDP (Chithani et al., 2021). Moreover, the combination of shifting climate patterns, increasing global temperatures, and other environmental hazards has heightened the vulnerability of this position (Adzawla et al., 2020), compelling rural populations to seek other sources of income. Subsistence farmers encounter a range of long-term and temporary environmental and institutional pressures and disturbances, as well as various individual risks that make them vulnerable to falling below the minimum level needed for survival (Pathak and Amardeep, 2024). In the last decade, severe events caused by climate change have posed a significant danger to the agricultural sector (Singh, 2020a).

Rural regions in low- and middle-income nations, such as India, are more susceptible to the impacts of climate change and structural transformations, which lead to increased vulnerability in terms of livelihoods (Jatav & Singh, 2023). It is crucial to have a clear understanding of the local conditions in which people live and their economic situation in order to evaluate the effectiveness of policies aimed at reducing poverty and achieving the sustainable

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development goals of zero hunger and no poverty (Nirmala et al., 2024). These goals specifically focus on ensuring the economic security of the poor and highly vulnerable population (Gautam & Peter, 2016). Rural livelihoods have been characterised by livelihood diversification, often referred to as occupational diversification (Singh et al., 2023). Livelihood diversification serves as a measure to reduce risks for economically disadvantaged people, while for the effluents, it presents an opportunity for future advancement. Families with lower wealth and less liquid assets are more likely to invest in low-return sectors compared to families with higher wealth, more assets, and better education (Singh & Sanatan, 2020). Parameters like income from animal husbandry, income from marginal works and income from labouring, arc positively correlated with diversity (Pal et al., 2017).

To adapt from fluctuating environmental disturbances and declining agricultural yields, farmers employ agricultural intensification, livelihood diversification, and migration to nearby urban areas or towns (Srinivas & Giridhar, 2022). A study conducted by Kassie et al., (2017) in Ethiopia found that families who varied their sources of income by engaging in non-farm-based activities were successful. Nevertheless, those who expanded their sources via farm-based activities did not have significant success in increasing their income levels. Therefore, it is necessary to examine the practice of livelihood diversification and its complexities in depth. To fully comprehend this situation, it is crucial to grasp how strategies for generating revenue and improving livelihoods are strengthened in order to promote the development of skills and abilities.

METHODOLOGY

The study was conducted in two regions of the most densely populated State of India, namely the Bundelkhand region and the Central Region of Uttar Pradesh (UP). By using systematically sampling method, field survey data was collected. An on-site investigation was conducted during the months of August and September 2022. Originally, Uttar Pradesh was selected. As far as the sampling procedure is concerned, in the first step, the most densely populated state (i.e., Uttar Pradesh) was chosen. In the second step, two regions (i.e., Bundelkhand and Central) were purposefully chosen. In the third step, two districts from each region were chosen. Jhansi and Lalitpur districts were chosen from the Bundelkhand region, while Lucknow and Barabanki districts were chosen from the Central region. In the fourth step, two development blocks (micro-administrative units) were chosen from each district. In the fifth step, two villages from each development block were randomly chosen. Lastly, 30 samples from each village were collected using a systematic random sampling method. Thus, 1 state, 2 regions, 4 districts, 8 development blocks, 16 villages, and 480 samples were chosen to study the factors influencing livelihood diversification.

The research employs an indicator-based methodology to compute the household well-being index utilizing data mentioned in Table 1. As work employs differential data in order to compute the household well-being index, thereby necessitating consideration of normalization procedure (Jatav, 2022). Therefore, following equations are employed using min-max method. Equations 1 and 2 were used to represent indications of the larger-the-better and smaller-the-worse types, respectively.

$$Z_{ij} = \frac{X_{ij} - Min(X_{ij})}{Max(X_{ij}) - Min(X_{ij})} \quad \text{... (1)}$$

$$Z_{ij} = \frac{Max(X_{ij}) - X_{ij})}{Max(X_{ij}) - Min(X_{ij})} \quad \text{... (2)}$$

$i = 1,2,\ldots I$ and $j = 1,2,\ldots$.

Where, Z_{ij} is the variable index value, X_{ij} is the actual value, $Max(X_{ij})$ and $Min(X_{ij})$ is the maximum and minimum value of i^{th} indicator for the j^{th} household. Finally, the household well-being index for each household/district is calculated as an average of the Housing and sanitation, assets and facilities, agriculture land and livestock, and income index.

Further, linear regression model was used to examine the factors influencing the household well-being as follows.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + U_i$$

Where, X_1, X_2, X_3, X_4 & X_5 are cultivators, dairying, daily wage workers, businessman, and salaried job, while U_i is error term.

Moreover, the Binary Logistic regression (BLR) model was adopted for identifying the key influencing determinants of livelihood diversification in the surveyed farmers (Jatav & Sanatan, 2022). The logistic distribution function for the decision on livelihood diversification decision can be specified as:

$$Logit\ (P) = \log\left(\frac{P}{1-P}\right) \quad \text{... (3)}$$

Let $P_i = P_r\left(\frac{Y=1}{x=x_i}\right)$, then model can be written as ... (4)

$$P_r\left(y - \frac{1}{x_i}\right) - \frac{exp^{x'b}}{1+e^{x'b}}; = \log\left(\frac{P}{1-P}\right) = logit\ (P_i) - \beta_0 + \beta_i \quad \text{... (5)}$$

Where; P_i is a probability of livelihood diversification (dummy variable; 1 if farmer have diversified their livelihoods as cultivation, labour or salaried job and otherwise = 0), X_i'S are independent variables, β_0 is the intercept and β_i is the regression coefficient of livelihood diversification strategies.

RESULTS

District wise household well-being index

Household well-being may be described as a state characterised by positive emotions (such as happiness and contentment) and positive aspects of functioning (such as engagement and self-acceptance). Well-being encompasses the amalgamation of an individual's possessions, their ability to use them, and their cognitive perspective on their possessions and capabilities. Presently, policymakers place great importance on prioritising well-being as a means to improve sustainability and enhance living circumstances (Pathak and Amardeep, 2024). It is often referred to as the field of positive psychology.

The household welfare was computed for several examined districts (Table 1). The findings indicate that households in the Lucknow district exhibit a comparatively higher index score of

Table 1. District wise household well-being index

Indicators	Lucknow	Barabanki	Jhansi	Lalitpur
Nature of House	0.856	0.650	0.792	0.725
Access to Toilet	0.900	0.620	0.880	0.630
Access to Safe Drinking Water	0.920	0.660	0.550	0.580
Access to Electricity	0.980	0.780	0.890	0.450
Access of Clean Energy for Cooking (LPG cylinder)	0.910	0.480	0.810	0.650
Possession of Mobile	0.980	0.900	0.950	0.880
Possession of Motor Vehicle	0.680	0.450	0.550	0.350
Agricultural Land	0.980	0.950	0.910	0.920
Livestock	0.450	0.550	0.680	0.880
Monthly Income	0.650	0.560	0.450	0.400
Savings	0.550	0.450	0.400	0.420
Household well-being Index	0.805	0.641	0.715	0.626

Source: Field Survey, 2022.

0.850, while families in the Lalitpur district have a substantially lower index score of 0.626.

Livelihood diversification strategies and household economic well-being

The linear regression analysis provides predictions on the influence of socio-economic background and livelihood diversification on the economic well-being of households, as shown in Table 2. The model accounts for 87 per cent of the total variance in the dependent variable, which is household well-being. Out of all the implemented livelihood methods, only daily wage workers were negatively correlated with household economic well-being. The compensated work significantly contributed to the overall well-being of the family, thereby qualifying it as a high-yield livelihood activity. Conversely, daily wage employment, which was classified as a low-yield livelihood strategy, had a negative coefficient and influenced the well-being index. Wage employment was primarily selected by scheduled and scheduled tribe households as a final means of securing a livelihood due to insufficient agricultural land for cultivation, lack of livestock for dairying, limited skills for self-employment, inadequate resources to start small-scale businesses, and low education levels for obtaining salaried jobs. Crucially, there were social and educational elements that influenced the decision to embrace different livelihoods, such as farming (low return), manual work (low return), and paid jobs (high return).

Table 2. Relational between economic well-being and livelihood diversification strategies

Variables	Coefficient
Cultivator	0.346**
Dairying	0.049*
Daily wage worker	-0.541**
Businessmen	0.065**
Salaried job	0.492*
Constant	0.264*
R^2	0.870
p	0.0001

Source: Field Survey Data, 2022.
Note: dependent variable is household economic well-being Score.
*, ** & *** indicate 1, 5 & 10 per cent level of significance.

Determinants of livelihood diversification strategies

Table 3 presents the outcomes of Binary Logistic Regression (BLR) models that forecast the likelihood of adopting basic, low, and high return sectors based on certain background factors. In BLR models, the dependent variable was binary, with a value of 1 indicating the adoption of a certain livelihood diversification approach by a family, and 0 indicating that it was not adopted. The BLR data indicate a negative correlation between the backward socio-economic group and the basic and low return sectors, while showing a favourable correlation with the high return sector, namely paid jobs. The computed odds ratio suggests that households belonging to the broad social groupings were more inclined to pursue paid jobs rather than engaging in agriculture and daily wage activities. Put simply, families belonging to the general social group have a 2.35 times greater likelihood of diversifying their livelihoods into paid jobs compared to those from scheduled caste and scheduled tribe backgrounds.

In contrast to the less educated group, education was strongly correlated with all three techniques for diversifying livelihoods. The study indicates that the household has a low educational level in comparison. The education variable was divided into two categories: 1 represents households where the head has an education level higher than secondary, while 0 represents households where the head has an education level lower than secondary. The BLR findings indicate a favourable correlation between education and both essential livelihood and paid employment, while showing a negative correlation with manual work. The estimated odds ratios indicate that households with an education level higher than secondary have a 4.25 times greater likelihood of diversifying their livelihood towards paid employment rather than working as daily wage labourers.

The presence of a big household size suggests a greater reliance on the head of the home, who was the only breadwinner in the family. The BLR findings indicate a favourable correlation between

Table 3. Determinants of livelihood diversification strategies

Independent Variables	Cultivation (Fundamental livelihood)	Labour (Low Return Sector)	Salaried Job (High Return Sector)
Backward group (SC & ST = 0; otherwise =1)	-0.261*(0.631)	-0.514**(0.468)	0.561*(2.35)
Education level (Above from Secondary = 1; otherwise = 0)	0.642**(2.65)	-0.102**(3.24)	0.354**(4.25)
Household size (up to 4 members =1; otherwise = 0)	0.364*(2.95)	0.439**(3.64)	0.214**(1.65)
Land ownership (Yes = 1; otherwise = 0)	-	0.635**(2.65)	0.101*(1.45)
Constant	0.054**(0.94)	0.354**(0.75)	0.019*(0.85)

Source: Field Survey Data, 2022. *Note:* *, ** & *** indicate 1, 5 & 10 per cent level of significance. Parenthesis values are odd ratio.

household size and the use of all livelihood diversification measures. In the field of agriculture, it offers a consistent source of labour for small-scale farming, while for daily wage workers, it assures financial stability for their households and increases the likelihood of them pursuing higher-paying employment, such as salaried jobs. The estimated odds ratio findings indicate that households with a larger membership (up to 4 persons) have a 2.95 and 3.64-fold greater likelihood of diversifying their livelihoods towards farming and labour compared to paid jobs. Finally, families who owned agricultural land were less inclined to engage in low-yield sectors such as agriculture.

DISCUSSION

The study indicates that the adoption of a livelihood strategy in rural India was not voluntary, but rather influenced by the socioeconomic backgrounds of households and intangible assets, such as agricultural land owned by the households, as well as the institutional and geographical context of the areas. Having a paid employment is crucial for the financial stability and overall welfare of households, particularly in terms of off-farm income. However, the level of participation in this industry is influenced by several socioeconomic factors that vary across families. The results are in the line of findings of Onuwa et al., (2022). They found the likelihood of livelihood diversification among the respondents was significantly influenced by age, educational level, household size, farm size, access to credit and ownership of productive assets in Shendam, Plateau State, Nigeria. Likewise, a study conducted by Kassegn & Umer (2023) in Ethiopia found that agriculture livelihood strategy was positively and significantly associated with male headed household, land holding, cooperative membership, and participation in rural productive safety net programme; while it was negatively and significantly affected by distance to market. Non-farm livelihood strategy was positively and significantly affected by dependency ratio, education level, total income, and remittance; while it was genitively and significantly affected by the sex of household head and participation in rural productive safety net programme. Off-farm livelihood strategy was positively and significantly influenced by sex of household head; while it was negatively and significantly affected by the land holding, total livestock unit, cooperative membership, credit use, participation in rural productive safety net programme. The findings are also in the line of Saha & Ram (2014) and found that non-farm and off-farm activities made an important contribution to livelihoods. They found that diversification activities made a greater contribution to cash incomes from poorer households. Similar results were also reported by Sharma et al., (2022) in State level analysis in India. They have applied multinomial logit model to examined the determinants of livelihood diversification. They found that household size, age, education and gender of the head of family, number of adults and dependents in the family, social group and land category of a household, access to technical advice, per capita income and the household choosing different combinations of livelihood options in relation to cultivation. the unequivocal message of the study is that promotion of non-farm business as one of the options along with cultivation holds the key to enhance farmers' income and pull them out of poverty.

Regardless of their socioeconomic origins, families improved their economic well-being via schooling. In addition, the impoverished segment of the population, who did not have the opportunity to choose high-yield (non-agricultural) sectors, were compelled to engage in low-yield economic activities such as farming. A study conducted by Abera et al., (2021) in Ethiopia. They found that agriculture (43.2%), agriculture plus non-far (25.5%), agriculture plus off-farm (19.3%) and a combination of agriculture plus non-farm plus off-far (12%) activities are the most pertinent livelihood strategies were adopted by farmers. It was found that agriculture has a leading contribution to the total household's income (72.5%) followed by non-farm (20%) and off-farm activities (7.5%). The logit regression mode results revealed that land holding size, educational status, livelihood holding, sex, ag, market distance, credit access, annual income, access to training and household sizes were the major determinants of livelihood diversification strategies. moreover, poor infrastructural development, lack of working capital, absence of technical support, inadequate skill training and lack of awareness were major constraints to livelihood diversification in the area. Nevertheless, the participation in low-yield livelihood strategies has ensnared impoverished families in sectors with low returns, leading to a further exacerbation of economic inequality as a whole (Mandal et al., 2023).

CONCLUSION

The objective of this research was to quantify the influence of diversifying sources of income on the financial welfare of households, as well as to evaluate the socioeconomic factors that influenced the decision to pursue various livelihood choices. The research indicates that examining future lives in the context of increasing economic disparity highlights the significance of education in attaining fresh economic prospects. The results of this research emphasise the need for urgent governmental measures that focus on education, particularly for lower social groups and economically disadvantaged individuals. These efforts should aim to provide new job prospects for these groups.

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