

Socio-Economic Status and Smallholder Structure among Hilly Rural Farming Households in the Pithoragarh District of Kumaon Himalaya: An Empirical Study

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Abstract

The hilly agricultural terrain of the hill state of Uttarakhand is characterised by agriculture with small and marginal holdings and limited livelihood resources. The present study analyses the socio-economic and demographic status and landholding structure of 100 selected rural farmer families in Gangolihat, a development block in Pithoragarh district, Uttarakhand. In this study, the scores obtained by descriptive and inferential statistical techniques were analysed. The results showed a plurality of respondents who were relatively middle-aged farmers with an average educational status of primary and less than five acres of land. An analysis based on the economic category of the respondents found 53 per cent of the households to be under the Below Poverty Line category. No meaningful relationship was found between the respondents' economic class and family structure, while no meaningful differences were found between economic class and land holding, education, and age separately. This leads to the conclusion that no one socio-economic factor can explain the economic status of hill farming families. It depends on a multi-pronged approach, so along with agriculture, income diversification and local employment opportunities also need to be given equal importance for development in these areas.

Keywords: Socio-economic Status, Smallholder Farmers, Livelihood Diversification, Economic Status, Kumaon Himalaya.

1. INTRODUCTION

Agriculture in the hilly areas extends beyond food production to establish the livelihood of local rural families, food security, and an important base of the local economy. Heterogeneous geographical and ecological conditions differentiate hilly terrain agriculture from the plains. Factors such as the limitation of arable land, cultivation on alluvial land, small agricultural holdings, agriculture's dependence on rainfall, and traditional agricultural practices make the resource base of farming households relatively limited here. Most farming households in hill regions hold less than 0.50 hectares of arable land, and local livelihoods are largely dependent on traditional agriculture and forest resources, reflecting the small-holding-based agrarian structure of the region (Roy et al., 2014; Goswami & Srivastava, 2014; Sati et al., 2026). Hill

farming systems in the Himalayas remain vital for food security and livelihoods yet face increasing pressures from migration, climate variability, and market challenges (Sati et al., 2026).

In the hilly terrain of the state, this situation is not limited to the size of the land but is also linked to the overall socio-economic structure of the local rural households. Families depend on agriculture as well as animal husbandry and other non-agricultural activities amid the limitation of agricultural resources. This livelihood diversity is seen as an important feature of livelihood security here. Agricultural diversification and other economic activities, typically due to limited resource availability, serve as a means to reduce economic exposure and develop alternative income sources (Negasa & Tolera, 2026; Rana et al., 2026). Diversified livelihoods combining farming,

livestock keeping, and non-farm income are characteristic of many rural households worldwide (Neudert et al., 2020). In the hill region of Uttarakhand, the major contribution to total household income comes from the non-farm sector, accounting for about 80% of farm household income (Goswami & Srivastava, 2014).

The smallholder structure also becomes important in a hilly rural economy as it cannot in itself be considered an absolute indicator of a family's economic status. The economic status of households with such holdings can vary based on indicators such as agricultural productivity, use of available resources, available labour, alternative income sources, and locally available economic opportunities. Social and demographic factors — including age, sex, education, occupation, household size, labour force participation rate, and landholding size — help in assessing the economic status of rural farmers (Siva et al., 2019). Socio-economic status influences accessibility to resources, livelihood patterns, and food and nutritional security (Roy et al., 2014). In the Almora district of Uttarakhand, the average landholding was 0.40 hectares, and while agriculture was the sole occupation for only 25% of farmers, others maintained subsidiary occupations such as labour, shopkeeping, and driving (Roy et al., 2014).

Not only this, but the generational changes in the hill village economy are also significant. Factors such as the lack of a relatively young population in the agricultural sector and the trend towards non-agricultural employment have had a significant impact on the labour structure of hill agriculture. The migration of youth from rural areas towards non-farm occupations is leading to significant structural changes in the hill agricultural landscape (Sati et al., 2026; Rana et al., 2026). Hill farming communities display an ageing workforce and a predominance of nuclear families, reflecting migration-driven restructuring (Sati et al., 2026). Younger households are relatively more engaged in non-farm and off-farm activities than older households, whose participation in diverse livelihood strategies decreases as age increases (Abera et al., 2021). On this basis, demographic characteristics such as age, education, family structure, and the size and type of

land holdings become crucial for understanding the socioeconomic structure of rural households (Kumari et al., 2022; Kaur et al., 2023).

The present study focuses on the important question of whether the economic status of hill rural farming households is actually statistically determined by selected socioeconomic factors such as landholding size, age, education, and family type. In view of smallholder farming in this hilly terrain, the question becomes especially important because the economic well-being of the family cannot be judged on the basis of land alone, but the livelihood structure of these families also plays an important role. Diversification towards sectors with high returns was found to be the most instrumental factor in enhancing household economic well-being (Patidar et al., 2024). However, well-being was not associated with diversification per se but rather with a household's involvement in high-return sectors such as trade or salaried employment (Gautam & Andersen, 2016). Education, landholding size, livestock possession, and credit access were identified as major determinants of livelihood diversification strategies (Abera et al., 2021; Negasa & Tolera, 2026). Recent research has also highlighted the important dimensions of livelihood of hill rural households, such as the co-existence of agriculture and animal husbandry and other non-agricultural activities (Rana et al., 2026; Neudert et al., 2020).

2. REVIEW OF LITERATURE

Research on rural farming households in the Kumaon Himalaya and comparable Himalayan regions identifies seven interconnected themes shaping agrarian livelihoods: socio-economic characteristics, smallholder farming structures, mountain agriculture constraints, livelihood diversification, land fragmentation, migration, and household economic vulnerability. The following review synthesises evidence across twenty studies to build a literature foundation for empirical research on these dimensions.

2.1 Socio-Economic Characteristics and Smallholder Farming: In a Kumaon Himalayan watershed, land holdings ranged from 0.57 to 2.57 ha, yet 51–80% of farmers operated farms smaller

than 0.50 ha, underscoring the predominance of marginal and small holdings (Yadav et al., 2017). Across Uttarakhand's hill districts, five distinct farmer types were identified based on resource endowment and agricultural orientation, with high-resource farmers adopting capital-intensive strategies while low-resource farmers progressively disengaged from farming (Shukla et al., 2019). Female participation in hill farming reached 54.1%, with an ageing workforce and 86.9% nuclear families, reflecting migration-driven household restructuring in Garhwal Himalaya (Sati et al., 2026). Literacy levels among smallholders in Western Himalaya averaged secondary education, while pastoralist communities showed 87.6% illiteracy, indicating sharp socio-economic differentiation across livelihood groups (Kapruwan et al., 2024).

More than 85% of farming in the Kumaon Himalaya is rainfed and managed through traditional practices, including agroforestry alongside forest produce (Yadav et al., 2017). Agroforestry, livestock rearing, and labour employment constitute the major income sources, with household income positively correlated with livestock and traditional farming (Yadav et al., 2017). In Central Himalayan Uttarakhand, 80.13% of the population depends on multiple income sources, though livelihood diversification shows no statistically significant influence on annual household income (Naudiyal et al., 2019). Agricultural diversification and integration of high-value crops provide greater economic returns and ecosystem services in shifting agricultural systems (Hazarika et al., 2024). A gradual shift toward market-oriented horticulture is observed in mid-altitude Garhwal, but this transition remains uneven and coincides with declining food self-sufficiency and increased labour burdens on women (Pandey et al., 2026).

2.2 Land Fragmentation, Migration, and Economic Vulnerability

Land fragmentation driven by inheritance practices — land divided among children at marriage creates progressively smaller parcels, with 46.5% of farm households classified as resource-constrained smallholders (Innazent et al., 2022). Out-migration

of youth from Uttarakhand hills has left farming landscapes depopulated and farmlands abandoned, as agriculture fails to meet youth expectations (Rana & Bisht, 2023). Farm exit is significantly influenced by livelihood diversification, number of migrants, number of female family members, and irrigation availability (Naudiyal et al., 2019). Food security in the Kumaon Himalaya is threatened by a 25% decline in agricultural productivity over 30 years, creating a 65% annual food deficit and reducing remittances by 20–25% (Tiwari & Joshi, 2012).

2.3 Household Economic Vulnerability and Climate Linkages: Villages with higher climate vulnerability are characterised by lower literacy, smaller land holdings, poor soil fertility, greater crop losses, and lower livelihood diversification (Hazarika et al., 2024). Female-headed families and disadvantaged social groups are identified as more vulnerable, with higher exposure to climatic extremes, dependency on natural resources, and lack of financial assets (Sujakhu et al., 2019). Vulnerability and resilience of mountain communities vary along altitude gradients, with mid-altitude zones recording vulnerability scores of 0.54 and high-altitude zones reaching 0.65 (Jha et al., 2021). Lower social groups rely more heavily on ecosystem-based adaptation strategies due to limited access to technology and financial resources available to higher social groups (Choudhary et al., 2025). Marginal and smallholder farmers, along with landless households from socially backward communities, are disproportionately affected by food insecurity and declining purchasing power (Tiwari & Joshi, 2012). Mountain farmers are more likely to adopt off-farm activities and temporary migration as climate adaptation strategies compared to plains farmers (Kandel et al., 2023). Livelihood resilience of smallholders is greater than that of pastoralists, with settlement bringing positive changes through improved access to basic facilities (Kapruwan et al., 2024).

Research Gap - The majority of studies on rural agriculture and livelihoods in the hilly regions of the Kumaon Himalayas are based on specific problem-centred analyses, but there appears to be a substantial lack of understanding of the various factors interrelated and integrated at the household

level. Thus, the major research gap in the existing available literature is that of integrated household-level empirical analysis of the relationship between agriculture, socioeconomic status of households, and smallholder structure. Addressing this gap, the study is based on an attempt to understand the underlying diversity of hill farming families based on a combined analytical framework of the socioeconomic and demographic characteristics of the respondents, the size of landholdings and holdings, and household circumstances.

3. OBJECTIVES

The main objectives of the study are:

1. To study the socioeconomic and demographic status of the selected respondent families of the study area.
2. To analyse the economic status and landholding structure of the respondent families.
3. To examine the relationship between the economic class of the respondent families and the family structure.
4. To examine the statistical differences in land holdings, education, and age of the respondent families on the basis of economic category.
5. To suggest suitable policy measures for hill rural development.

4. HYPOTHESES

Based on the objectives of the study, the following null hypotheses have been determined –

1. H01: There is no statistically significant relationship between family type (Joint / Single) and economic class (APL / BPL) of agricultural households.
2. H02: There is no statistically significant difference between the economic class of agricultural households and the selected socio-economic characteristics - landholding, education, and age.

5. METHODOLOGY

5.1 Research Design and Study Area: The study adopted a cross-sectional and field-based empirical research design. The area of study was the

socioeconomic status of rural farming families, their landholding structure and family finances in Gangolihat, a development block in the hill district of Pithoragarh in the state of Uttarakhand. The study is based on a regional survey.

5.2 Sampling and Sample Size: A multi-stage random sampling was adopted in the selection of study units, under which the development block Gangolihat was selected randomly in the first stage. In the second stage, ten villages were randomly selected from the selected development block. In the third stage, ten villagers from each selected village were selected as a sample using the simple random sampling method. Thus, 100 rural farming families were included in the entire study. The family/household was considered the primary analysis unit of the study.

5.3 Data Collection: The study was mainly based on primary questionnaires that were collected during field visits through a structured questionnaire and direct interviews. Group interviews with villagers were also conducted to obtain the contextual information needed to interpret the quantitative findings. The questionnaire included demographic characteristics, land holdings, livelihood characteristics, etc.

5.4 Variables and Statistical Analysis: The study included the key variables: socioeconomic, economic class, and agricultural holdings. The measurement of land holding was done in the local unit drain. For descriptive analysis of quantities, frequency, percentage, mean, median, standard deviation and coefficient of variation were included. In graded variables, the Chi-square test of independence was used to find the relationship between family type and economic class, and the Mann-Whitney U test was used to test differences in economic class and land holding, age, and education. The significance level of the statistical tests was determined to be 5 per cent. The results were interpreted based on statistically derived group differences.

6. RESULTS AND DISCUSSION

6.1 Socio-demographic Status of Respondents:

The average age of the respondents in the study was

found to be approximately 50.92 years, and the standard deviation was 15.63 years. The respondents' minimum age of 24 years and maximum age of 90 years indicate the presence of all age groups in the sample, and the relatively high mean age suggests that mature and older household members constitute an important part of the respondent population. Studies by Raghuvanshi et al. (2018) on agriculturists in Uttarakhand also found the dominance of middle-aged agriculturists. This finding is significant for hill agriculture, as Rana and Bisht (2023) concluded in their study that migration of youth from rural areas of Uttarakhand and a shift towards non-farm jobs is changing the agricultural labour structure of the region, resulting in a significant and increasing role of relatively older farmers in hill agriculture. Therefore, the average respondent age of about 51 years in the present study should not be seen as a mere demographic statistic; it is also an important indicator of generational transition and agricultural labour availability in hill agriculture. The agricultural population of the sample in the study region is socially heterogeneous, which holds importance in the study of agricultural problems, as the social background of farmers can make a difference in their access to resources, institutional support, credit status, knowledge of government schemes, and access to benefits of government schemes. In an agricultural study of Uttarakhand, Shah et al. (2019) found substantial variation in the social characteristics of the respondents. Some variables were seen as important contextual indicators in their study.

Respondents' average number of years in schooling was 5.82 years, and a standard deviation of 4.79 years represents substantial differences in their educational attainment. Their educational status may be related to information processing capacity, access to agricultural information, and use of institutional programs. Studies by Raghuvanshi et al. (2018) and Shah et al. (2019) also found a significant presence of respondents with primary education and included education as an important socioeconomic characteristic of agricultural behaviour. 96 per cent of respondents in the study area fall under the married category. It is more useful to understand the marriage status variable in terms of household

labour organisation and agricultural responsibility rather than just as a demographic variable. Fifty-eight per cent of respondents were found in the joint family category, which demonstrates the coexistence of both the traditional joint family system and the changing nuclearisation in the rural structure of the study area. Thus, family type can influence the labour availability and resource pooling of agricultural households.

Thus, the socio-demographic findings of the present study can be seen in the context of an ageing agricultural population within a changing rural household economy, where farmers are part of a rural ecosystem that exhibits a structural relationship between an ageing agricultural population, family-based agricultural labour, small and marginal landholdings, migration and attraction of youth to non-agricultural sources, agricultural labour and pressures on economic viability.

6.2 Economic Status of Respondents: Three major observations regarding the economic status of the respondents emerge from the analysis of the data. First, the presence of 53 per cent of BPL households in the current sample indicates a substantial presence of economic vulnerability in the region. Below Poverty Line (BPL) being the largest economic group corresponds to the structural reality of hill agriculture, where agriculture contributes significantly to the food security of households in these areas but is unable to generate cash income. 44 per cent of Above Poverty Line (APL) respondents indicate heterogeneity among respondents. Studies by Naudiyal et al. (2019) and Rana & Bisht (2023) also point out that income from agriculture alone may not be sufficient to ensure family economic security for households engaged in hill agriculture. Secondly, the diversification of income sources of the respondent households clearly indicates that the hill rural economy is moving towards a mixed livelihood economy rather than being solely dependent on agriculture. Pathak & Amardeep (2024) and Goswami et al. (2017) have also considered diversification of livelihoods as an important means of economic adaptation and income growth in their studies. Third, livelihood diversification is not automatically synonymous with economic prosperity, as it acts as a coping

mechanism rather than eliminating household vulnerability if it results from activities such as distress migration or low-paid casual labour.

The economic dependence of the respondents is not just on a single economic activity; other diverse sources such as small business, farm and casual employment, etc. account for the income of these households. This diversification of livelihoods is seen as an important survival strategy in these areas. Studies by Pathak & Amardeep (2024) also corroborate this. The diversity of income sources among respondents illustrates in the present study how households are balancing the uncertainty of their agricultural income with other economic activities.

6.3 Status of Landholding Structure: An analysis of the responses received regarding agricultural land

shows that the land distribution in the study area is the size of the available land among the respondents from 0.50 Nali to 25.00 Nali. The average land size was 5.93 Nali, and a standard deviation of 5.86 Nali was obtained in the study area. In the study area, 41 per cent of the respondent farmers have land with 2 Nali or less, and 63 per cent of the farmers have land with less than 5 Nali, making it clear that the agrarian problem faced by the respondent farmers is not just limited to productivity but also to the scale of operation. Another important analysis obtained here is that the coefficient of variation of 98.8 per cent illustrates that the variance in land distribution is high compared to the average. This reveals the disparity between land holdings.

Table 01: Landholding Size and Smallholder Structure among Sampled Farming Households

Landholding Measure	Value
Mean	5.93 Nali
Median	4.00 Nali
SD	5.86 Nali
Minimum	0.50 Nali
Maximum	25 Nali
CV $\approx$	98.8%
41% $\leq$ (No. of respondents)	2 Nali
63% < (No. of respondents)	5 Nali

Source: Primary Survey [1 Nali = 0.02 Hectare (<https://housing.com>)]

6.4 Economic Status and Selected Socio-economic Characteristics: To check whether there is any relationship between family structure and economic status?

Relation of Variables	Test	Statistic	p-value	Significant?
Economic Category Vs Family Type	Chi-Sq.	2.790	0.248	Not Sig.
Economic Category Vs Landholding	U-Test	985.00	0.188	Not Sig.
Economic Category Vs Education	U-Test	1026.50	0.468	Not Sig.
Economic Category Vs Age	U-Test	1157.00	0.951	Not Sig.

Source: Primary Survey [$\alpha=0.05$]

The results of the chi-square test ($\chi^2=2.790$, $p=0.248$) make it clear that there is no statistically significant association between family type and economic category. The analysis does not provide sufficient statistical evidence of an association between family type and economic category in the sampled households. That is, economic vulnerability cannot be determined by family size alone; many other family characteristics may be more important. Analysis of the relationship between economic rank

and the size of the landholding is important in understanding the economic structure of respondent households. Possible asymmetric distribution and high dispersion in the ground light led to the Mann–Whitney U test ($U=985.00$, $p=0.188$). This does not confirm that both economic groups are statistically significant and clarifies that the findings do not provide sufficient evidence of a statistically significant difference in landholding between APL and BPL households, but are also influenced by

factors such as land productivity, availability of irrigation means, nature of agriculture, real income from agriculture, market access, availability of labour, and income from non-agricultural sources. Thus, the empirical evidence from the study makes it clear that land size and economic rank exhibit distinct patterns descriptively, but this difference does not indicate a statistically meaningful relationship.

Testing to find any differences between the family economic category and the education of the respondents found no differences among the sample respondents ($U = 1026.50$, $p = 0.468$). This is a particularly important finding as not only education but also various factors such as family income, size of landholding, structure of employment, income from agriculture and other income sources influence the determination of a family's economic status. Thus, it will be necessary to see education as a component of the broader socioeconomic structure in the present study. The difference between the economic category and the age of the respondent was not found to be statistically significant in the test result ($U = 1157.00$, $p = 0.951$). The findings indicate that economic classifications of respondents by age do not vary, and it would be appropriate to take into account other important factors in understanding economic status.

Thus, rather than treating the division between economic categories of respondents in the study area as a single variable, it would be more appropriate to view it as a multidimensional economic security, and this approach is also important for mountain development policy, which would require integrated measures of livelihood diversification and local income generation.

7. CONCLUSION

The present study makes it clear that the socio-economic structure of rural farming households in selected villages of the study area reflects the small size of land holdings, relatively older farmers in agricultural work, limited educational level, as well as the interconnected structure of diversified sources of livelihood. The high prevalence of Below Poverty Line (BPL) and families with less than 5 acres of land in the sample underscores the economic

vulnerability as well as the limited agricultural base in the hilly rural economy. However, the findings of the inferential statistical tests make it clear that the economic status of the respondent farmers cannot be statistically explained on the basis of age, education, family type, or landholding size alone. The relationships or differences between these variables were not found to be statistically significant, indicating that the economic status of the selected respondents in the study area is a multidimensional livelihood phenomenon, in which factors such as agricultural productivity, diversification of income sources, available labour force, use of resources, as well as local economic opportunities become important. Thus, integrated policies aimed at income diversification, local employment generation, and rural economic opportunities may be more effective for hill rural development than agriculture focused solely on land resources or traditional approaches.

8. POLICY IMPLICATIONS

As the findings of the study make clear, the economic status of hill farming households is not determined by socio-economic factors such as land holding, age, education, or family structure alone; its determinants are a mix of multidimensional variables, hence the need to design hill rural development programmes with a multidimensional livelihood approach in mind –

There will also be a need to strengthen various non-farm employment and income diversification opportunities at the local level along with increased agricultural productivity for small and marginal farmers.

Collective farming, value addition, processing, and better market linkages can be addressed for small and fragmented landholding farming families.

It will be necessary to develop entrepreneurship and employment opportunities based on local resources for the hill rural working population, which will reduce their external dependence for livelihood and also curb migration to some extent.

Promoting integrated and region-specific policies can be more effective for the economic stability of mountain rural households as well as for long-term rural development.

9. LIMITATIONS OF THE STUDY

The present study was conducted under certain limitations, including the fact that the district is geographically limited to 100 respondents from selected villages of Gangolihat block of Pithoragarh. Therefore, its findings should be generalised to the entire Uttarakhand Himalayan region with caution.

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