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Analysis of Livelihood Security of Households: A Case Study from Rural Areas of Bundelkhand

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ABSTRACT

Livelihood security is defined as securing the possession or access to income-generating assets and activities, including reserves and assets, to the offsets. The study was conducted from 2018-19 to 2020-21 in Bundelkhand, which includes Uttar Pradesh (7 districts) and Madhya Pradesh (6 districts). Based on the broad literature assessment and discussion with experts, indicators were developed to measure dairy farmer livelihoods. Information was collected by personal interviews using a structured interview schedule. The survey found that the majority of smallholder farmers earn a low to moderate income. The average livelihood security index for marginal farmers was 0.55, and the average livelihood security index for middle-class farmers was 0.57. Education, land ownership, annual income, milk sales, and extension contacts had highly significant positive relationships with livelihood security.

INTRODUCTION

The agricultural population is growing at an annual rate of about 1.84 per cent, and the average size is getting smaller year by year. Nearly 40 per cent of farmers would give up farming given the choice (Singh, 2008). The dairy production system contributes significantly to the sustainable livelihoods of the Jharkhand people. Yet it is an integral part of their daily activities, food security and traditional lifestyle (Kumar et al., 2016). Capture fisheries account for 36 per cent of the state's total fish production and play a central role in socio-economic development and livelihoods, although the productivity of capture fisheries has declined in recent years (Gogoi et al., 2015). The introduction of integrated agriculture has improved the livelihoods of smallholder households by providing more housing options, safe drinking water and sanitation (Sharmin et al., 2012). Farmers' daily income is not enough to cover their daily needs. Most of these farmers suffer from poverty and unemployment, which means that over time they will not be able to feed the households they need. The improvement goes simultaneously with achieving the aspiration of a hunger-free India. The majority of dairy households employ integrated crop-livestock systems, thus earning income from both dairy and crops, increasing their level of economic development (Khan et al., 2010). Subsistence decision-making is of vital importance to families, and while the most imperative decisions associated to agriculture and stock were made by male members, female respondents also shared some decisions, but the final decision Rights belonged only to men (Awasthi et al., 2020). The tobacco harvest made it easier for farmers to build wealth and improve the health care and schooling of their kids. Tobacco harvesting had the greatest blow on society progress, providing not merely a livelihood, but in addition a high-quality standard of livelihood for tobacco farmers in the Bidi tobacco-growing region of Gujarat (Srinivas et al., 2022). The livelihoods of arable, dairy and sericulture farmers are more stable owing to their elevated yearly incomes and enhanced financial security. They are also characterized by high food consumption, good health, wealth households, and high levels of education (Harishkumar et al., 2016). The additional comprehensive

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livelihood security indicator indicates that a quarter of the women in the Kangra district are trapped in the security of the lowest livelihoods. (Shyamalie & Saini, 2010). Integrating two or more farms in an irrigated setting increases farmer efficiency, prosperity and food security, maintain soil productivity by recycling organic nutrients from the farms involved (Desai et al., 2013).

METHODOLOGY

The study was conducted from 2018-19 to 2020-21 in Bundelkhand, which includes Uttar Pradesh (7 districts) and Madhya Pradesh (6 districts). Two districts were selected from each state: Lalitpur and Banda from Uttar Pradesh, and Datia and Damoh from Madhya Pradesh. Then from each district randomly selected two blocks. Two villages were randomly selected from each block. Respondent selection is a critical task and great care has been taken in selecting respondents. From each selected village, a list of dairy farmers was generated based on land ownership, and respondents were selected based on a proportionally stratified random sampling procedure. From each village, 20 dairy farmers were selected on a pro-rata basis from a list provided. Therefore, a total of 320 dairy farms was selected for the study. The multifaceted aspects of livelihood security include seven indicators: food security, economic security, health security, education security, social security, institutional security, and infrastructure security. The indices were processed according to the 14 informal criteria recommended by Edwards (1957). Selected parameters were evaluated by a jury on the 3-point continuum. Relevance weights and mean relevance weights were calculated separately for the selected indicators. A respondent's livelihood is calculated based on the sum of all parameters. Data were collected by personal interviews using a structured interview schedule. In addition, we used correlation tests to calculate r-values to know the relationship between livelihood security and independent variables. Multiple regression was performed to determine the magnitude of the contributions of selected independent variables to livelihood security.

RESULTS AND DISCUSSION

Livelihood security of dairy farmers

A perusal of Table 1 reveals that the majority (>80%) of the surveyed livelihood security among low-income farmers is low to moderate, based on the overall livelihood security of different categories of farmers. Among the smallholder farmers, half of those surveyed had average means of subsistence. More than half of respondents from medium-sized farmers had moderate livelihood security overall. Most of the respondents (53.34%) from large farmers had high overall livelihood stability and 20 per cent of them had low livelihood stability. The above results conclude that the majority of respondents in the study region had low to moderate livelihoods overall. Overall farmer livelihoods and individual livelihood indicators showed low to moderate safety levels for different categories of farms. Government agencies and policy makers need to focus on improving various parameters of socio-economic development in the study area because of the need to improve not only overall livelihood security but also all livelihood indicators.

Table 1. Distribution of respondents according to livelihood security

Category of respondents	Category of Livelihood security index	No. (%)
Marginal (n= 81)	Low (<0.45)	37 (45.68)
	Medium (0.45-0.71)	29 (35.80)
	High (>0.71)	15 (18.52)
Small (n= 74)	Low (<0.45)	26 (35.14)
	Medium (0.45-0.71)	37 (50.00)
	High (>0.71)	11 (14.86)
Semi-medium (n=78)	Low (<0.45)	29 (37.17)
	Medium (0.45-0.71)	40 (51.29)
	High (>0.71)	9 (11.54)
Medium (n=57)	Low (<0.45)	18 (31.58)
	Medium (0.45-0.71)	22 (38.59)
	High (>0.71)	17 (29.83)
Large (n=30)	Low (<0.45)	6 (20.00)
	Medium (0.45-0.71)	8 (26.66)
	High (>0.71)	16 (53.34)

Indicators of livelihood security index for different categories of farmers

Livelihood security indicators for different categories of farmers According to Table 2, the total value of the livelihood security index was 0.59. Mean survival index scores were higher for large farmers (0.68), followed by medium farmers (0.58), and small farmers (0.58). This is probable due to large-scale land holdings and securing income from various livelihoods, not just agriculture and animal husbandry. The average livelihood security index for marginal farmers was 0.55 and for semi-middle farmers (0.57). Marginal and small farmers had small landholdings, depended primarily on agriculture and daily wages for their livelihoods, and were not highly diversified.

Table 2 is represented in a radar-style chart showing the contribution of various indicators to overall livelihood coverage for respondents in the study area. To determine respondents' overall livelihood security, food security, economic security, health security, education, security, social security, institutional security, and infrastructure security, which contribute to respondents' overall livelihood security, were analyzed. These seven indicators contributed in different ways to each respondent's overall livelihood security. After determining the safety rating for each indicator, out of the seven indicators, health security contributed the most (60%) to the overall life security of the respondents.

Correlation between socio-economic characteristics and livelihood security

Table 3 shows that there was a positive and significant association between age and livelihood security (r = 0.349). The elderly were heavily involved in farming and their livelihoods were mainly related to farming. Therefore, it is conceivable that livelihood security positively correlates with the farmer's age. Our current

Table 2. Indicators of Livelihood security for different categories of farmers

Indicators	Index Value (0 to 1)					
	Marginal (n=81)	Small (n=74)	Semi-medium (n=78)	Medium (n=57)	Large (n=30)	Pooled (n=320)
Food security	0.56	0.58	0.56	0.58	0.68	0.59
Economic security	0.54	0.57	0.56	0.59	0.70	0.59
Health security	0.55	0.59	0.58	0.59	0.70	0.60
Educational security	0.56	0.59	0.58	0.57	0.67	0.59
Social security	0.57	0.57	0.60	0.58	0.65	0.59
Institutional security	0.55	0.57	0.57	0.56	0.68	0.58
Infrastructural security	0.55	0.57	0.57	0.57	0.66	0.58
Overall Composite Index	0.55	0.58	0.57	0.58	0.68	0.59

Table 3. Correlation between independent variables and livelihood security

Variables	Correlation coefficient (r)	Regression value coefficients (b)	"t" value
Age	0.349*	0.068	2.391*
Education	0.496^{**}_{NS}	-0.106	2.037^{*}_{NS}
Experience in dairying	0.093_{NS}	0.071	1.283
Social participation	0.211_{NS}	-0.063	2.379*
Occupation	0.119	0.127	4.206**
Land holding	0.473**	0.082	3.695**
Livestock holding	0.384*	0.024	2.937**
Annual income	0.681**	-0.065	4.861^{**}_{NS}
Milk production	0.383*	-0.114	1.259_{NS}
Milk sale	0.427**	0.008	1.728
Mass media exposure	0.296*	0.052	2.304*
Extension contact	0.516**	0.136	3.362**
		R^2= 0.641; F stat= 18.429**	

** p<0.01, * p<0.05, NS: Non significant

findings contradict those of Mishra et al., (2020). The education was established to be positive and significantly (r=0.496) associated with livelihood security. Education enhances individuals' knowledge and understanding, enables them to recognize new technologies more quickly, embrace novelty with self-confidence (Kumar et al., 2019), and increases their experience to technical acquaintance. Similarly Educated people are technically extra capable and more knowledgeable (Kademani et al., 2020).

The association between the experience and livelihood proved insignificant (r = 0.093). This can be accredited that livelihoods depend on how farmers allow earnings and possessions to congregate their vital needs in a passable and sustainable manner. A positive significance was observed for the association between annual income and livelihood (r = 0.681). This is mainly due to higher incomes, which offer more opportunities for innovative additional earnings and smart savings. The current results agree with the results of Sunanda et al., (2014) & Ramya et al., (2017).

Mass media presence shows a positively significant association (0.296) with livelihood (Pradhan et al., 2021). The connection between counseling contacts and securing a livelihood proved to be positively significant (r = 0.516). Interacting with a variety of advisory bodies gives individuals greater flexibility to improve their knowledge and skills, and gathering more information helps farmers compose their livelihoods stronger, further varied and extra competitive. Our current findings were consistent with studies by Pal et al., (2017) & Ramya et al., (2017).

Influence of socio-economic characteristics on livelihood security

Table further shows the results of a regression analysis performed to isolate the predictive power and magnitude of variation explained by independent variables related to overall livelihood. Beta coefficients and their corresponding values indicate different contributions to the dependent variable within the study. Regression analysis was run on the data to confirm the R^2 value, and it was found that the independent variables were cumulative to explain 64.10 per cent of the variation in the dependent variable (livelihood security). The fitted regression model was observed to be significant at the 1% significance level with an F stat value of 18.429. In addition, the variables occupation, land tenure, livestock, annual income, and extension contact were found to be highly significant ($p < 0.01$).

CONCLUSION

It could be concluded that based on the overall index of livelihood security, most marginal farmers had low levels, small and medium-sized farms had medium levels, while large farmers had high level. The overall composite index was highest for large farmers and lowest for marginal farmers. A positive significance was established for the connection between annual income and livelihood security. This is largely due to increased income, with more opportunities for innovative additional income and savings. In addition, the variables occupation, land ownership, animal husbandry, annual income, and extension contact were found to be significant.

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