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Livelihood Diversification in Rural India

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Abstract

This study aims to ascertain the level of livelihood diversification and examines the socio-economic contexts of livelihood diversification in rural India. Employing data from India Human Development Survey (IHDS-II), 2011-12, an Inverse Herfindhal-Harschman Diversity Index (IHHDI) was calculated incorporating eleven income sources (livelihood strategies). In addition, the contribution of each strategy in households' total income has been calculated. Furthermore, binary logistic regression was applied to predict the households' engagement in each livelihood strategy and the likelihood of high IHHDI. Results indicate that the higher livelihood diversifications were found among the households with large size, high dependency, lower social groups, low educated, landless, marginal and small farming and economically poor. This study also highlights the significance of diversification strategies in raising households' income. It is suggested that broadened policy support is required to promote diversification for economic development in rural India.

Keywords: Livelihood Diversification; Livelihood Strategy; Household Income; Rural India

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Introduction

The world has witnessed rapid economic development in the last few decades. Nonetheless, the subsistence agriculturists and farm wage labourers in the rural areas of low-income countries (LICs) constitute more than two-thirds of the global poor and food insecure populace (FAO et al., 2014; IFAD, 2010). Moreover, due to several environmental risks and structural and institutional stresses, the rural people are highly vulnerable to be livelihood insecure (Eakin, 2005; Harvey et al., 2014; Morton, 2007; Tschakert, 2007). However, rural people are often engaged in diverse livelihoods, mainly in developing countries, to meet consumption needs, accumulate wealth, and reduce risk exposure during the crisis (Cavendish, 2000; Ellis, 1998; Reardon, 1997). Empirical studies show that the non-farm livelihood diversification strategies enable rural households to enhance food security, obtain improved incomes, increase agricultural production and cope with environmental stresses (Babatunde & Qaim, 2010; Barrett et al., 2001; Bezu et al., 2012; Hoang et al., 2014; Liu et al., 2008).

Rural India is home to 833 million people (68.84 per cent of the country's total population) (GOI, 2011). Agriculture is the mainstay of livelihood and rural economy in India as it employs more than 50 per cent of the total workforce in India (GOI, 2018). The climatic extremities, soil degradation, water scarcity, diminishing resources, rising cost of agriculture, and increasing population have triggered livelihood challenges in rural India in recent decades. A considerable share of rural people in various states is livelihood insecure (Patidar, 2019). Rural livelihood in India is undergoing a rapid environmental and social-economic transformation (Chand et al., 2017; Sujithkumar, 2007). Studies demonstrate that farming activities are gradually developing in India (Bhandari, 2013; Israr et al., 2014; Khatun & Roy, 2012; Ramchandani & Karmarkar, 2014), and diversification helps the households in raising income (Israr et al., 2014; Saleth, 1997; Sharma,

2018; Sharma & Singh, 2019; Sujithkumar, 2007). Studies on rural livelihood in India have figured out the determinants of livelihood diversification. Nonetheless, there is a lack of empirical studies that have analysed livelihood diversification in how various livelihood strategies (income sources) contribute to the total income of rural households in India. This study aims to ascertain the level of livelihood diversification and examines the socio-economic determinants of livelihood diversification in rural India. This study begins with a description of the methodology deployed for this study. Following this, it discusses the results and discussion of the study—livelihood diversification and its contribution to the households' total income and socio-economic determinants of livelihood diversification.

Methodology

Data

In this study, we have used data from IHDS II having the samples of 27,579 rural households, collected from 1,503 villages from 35 states and union territories (UTs). The IHDS is a nationally representative, multi-topic collaborative panel survey conducted by the National Council of Applied Economic Research (NCAER), New Delhi and the University of Maryland. The data have been procured online from IHDS website, https://ihds.umd.edu/ (Desai et al., 2015).

Household Characteristics (Covariates)

In this study, we have selected some household characteristics as determinants of livelihood diversification, that include: size of household, dependency ratio, caste and religion, the highest adult education in the household, (a proxy of household educational condition), agricultural landholding, livestock owned and valued, and household poverty status as per the estimation of Tendulkar Committee (GOI, 2009).

Livelihood Strategies and Calculation of Livelihood Diversity Index

Livelihood diversifications, including a combination of agriculture and non-agricultural activities, have been termed livelihood

strategies. The select livelihood strategies are crop income (LS1), income from livestock rearing (LS2), income from agricultural property (LS3), income from agricultural labour wages (LS4), income from businesses (LS5), income from salary (LS6), income from property and pension (LS7), income from remittances (LS8), income from Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)[1] wage labour (LS9), income from Non- MGNREGA wage labour (LS10), income from cash benefits from governments through various schemes (LS11).

The livelihood diversity index has been calculated by following the method of the Inverse Herfindhal-Harschman Diversity Index (IHHDI) as suggested by Anderson & Deshingkar (2015).

$$IHHDI_s = \left[\frac{1}{\sum_{i-1}^{n} a_j^2} \right]$$

In the model, each 'a_j' represents the proportional contribution of each of the livelihood activities 'j' to the households 'i' income. The maximum possible value of this index is the total number of different income sources, which is attained if total income is distributed equally between each source. The minimum possible value is one when all income is obtained from one source only.

Statistical Analysis

In order to predict the likelihood of livelihood diversity and likelihood of engagement in various livelihood strategies, two kinds of dependent variables have been recognised. First, the engagement of a household in each of the livelihood strategies (LS1 to LS11) have been made dichotomous (household engaged= 1; household not engaged= 0), and second, IHHDI has been made dichotomous (Below 1.338 as low diversification= 0; above 1.338 as high diversification= 1). Further, the likelihoods of household engagement in various livelihood strategies (LS1 to LS11) and of high IHHDI have been predicted across various household characteristics using the logistic regression model.

$$Logit(Y) = \ln\left(\frac{\pi}{1-\pi} \right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + ... \beta_n X_n$$

Where π indicates the probability of the engagement of households in each of the livelihood strategies (LS1 to LS11) and the likelihood of high IHHDI, α is the Y intercept, β_n is the regression coefficients associated with the reference groups, and the X_n are a set of predictors.

Results and Discussion

Livelihood Diversification and its Contribution to the Households' Total Income

Rural households are often engaged in multiple portfolios to meet their basic needs. The motivation for livelihood diversification for the households lies in the attempt to support the livelihood and well-being (Gautam & Anderson, 2016). In this study, among all the livelihood strategies, crop income (LS1) contributed nearly 21 per cent of the total rural income, while this strategy was performed by about 56 per cent of rural households at varying scale with an average income of INR 48041 per annum, followed by

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[1] Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is an Indian labour law and livelihood security programme, passed in 2005 with an aim to guarantee the 'right to work' and enhance livelihood security in rural areas by providing at least 100 days of wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work (Government of India, 2016).

Non-farm Non-NREGA labour (LS10) (19.7 per cent), agricultural labour (LS4) (17 per cent). Income from Salary (LS6), a regular and high return livelihood strategy, contributed 12.5 per cent. However, nearly 20 per cent of households received income from this strategy. Businesses (LS5) and Remittances (LS8) contributed 8.6 and 7.2 per cent respectively. Income from non-farm activities in the form of liquid cash may be crucial to intensify agricultural and purchase the farm inputs, improve farm practices and hire wage labour and enhance farm productivity (Ellis et al., 2003; Ellis & Mdoe, 2003). The combination of farm and non-farm livelihoods may be highly complementary that provide positive strengthening (Martin & Lorenzen, 2016). MGNREGA, a rural employment programme also contributed 2.6 per cent to the total income which made a significant contribution to household income during the seasonal unemployment in rural India. Rural households (39.80 per cent) were also directly assisted by governments with several cash benefits under various programs (LS11), which contributed 3.4 per cent to the household income with an average cash incentive of INR 3471.88.

Studies have evidenced that relative socio-economic distinctions are important determinants in livelihood diversification and their contribution to income and well-being (Gautam & Anderson, 2016; Jiao et al., 2017; Martin & Lorenzen, 2016). The results show that large households were found to be more diverse (1.405) than medium (1.335) and small size (1.296). However, crop income (LS1) was the major contributors (27 per cent) in the total income of large households which was higher than medium (19.1 per cent) and small households (20.6 per cent). The reason might be the small fragmented agricultural land and higher number of livestock which were survived by relatively larger households. While, non-MNREGA wage labour (LS 10) was the largest income contributor (21.7 per cent) for medium size households. The small households got their income through agricultural labour (LS4) and

remittances (LS8) which was comparatively higher than a large household. The contribution from governments through various programmes and schemes (LS11) decreased with increasing household size (Table 1). The households with a medium dependency ratio recorded higher diversification than others (Table 1). The contributions from farm strategies (LS1, LS2 and LS3), farm labour (LS4) and salary (LS6) were found decreasing with increasing dependency ratios, while, the contributions from other strategies (LS8, LS9, LS10 and LS11) were increasing with increasing households size (Table 1).

Livelihood diversification was recorded to be varied across social and religious groups. The results of this study reveal that Scheduled Castes (SCs) (1.478) had the highest livelihood diversification, followed by Scheduled Tribes (STs) (1.386), Other Backward Classes (OBCs) (1.315), Muslims (1.314), Brahmins (1.305) and other upper castes (1.199). SCs, due to the poor socio-economic conditions and being largely unskilled, were engaged in agricultural labour (LS4) and non-farm labour (LS10) which contributed together more than 52 per cent to their total income. Likewise, STs too made nearly 45 per cent of total income from LS4 and LS10, although a substantial share of income of STs came from crop income (LS1). Patidar and Singh (2010) found that tribal in South-East Rajasthan were highly engaged in primitive economic activities. However, these social groups, being largely unskilled, took part in non-farm economic pursuits, despite low wages, in order to reduce vulnerability to poverty as these strategies were available round the year and were the mean of regular income (Rigg, 2006). On the other hand, forward castes (26.8), other religious groups (29.6), OBCs (23.5) and Brahmins (20.2) earned the major share of their income from crop income (LS1), salary (LS6), businesses (LS5) and remittances (LS8) with the smaller shares of contribution from farm and non-farm labourers (LS4 & LS10).

Table 1: Contribution of Various Livelihood Strategies (LS) in the Households' Total Income

Background Characteristics	Percentage of contribution from various livelihood Strategies in households' total income											Mean IHHDI
	LS1	LS2	LS3	LS4	LS5	LS6	LS7	LS8	LS9	LS10	LS11	
Household size (No of members)												
Small (3 & below)	20.6	2.1	03.7	17.6	6.5	10.2	3.9	11.7	2.0	15.6	5.5	1.296
Medium (4 to 6)	19.1	3.4	01.1	18.7	9.3	13.4	2.1	5.3	3.3	21.7	2.4	1.335
Large (7 & more)	27.0	3.7	01.8	11.4	9.5	13.2	2.6	6.1	1.7	19.8	3.2	1.405
Dependency ratio												
Low (Below 50%)	20.8	3.9	1.9	18.0	9.3	15.6	2.4	5.6	2.6	17.5	2.0	1.340
Medium (50% to 79%)	23.0	3.6	2.1	15.8	8.5	11.8	3.1	5.9	2.4	20.3	3.4	1.365
High (80% & above)	20.0	2.0	1.9	16.7	7.9	09.7	2.7	9.8	2.8	21.4	4.8	1.318
Caste and Religion												
Brahmin	20.2	6.8	4.2	2.8	11.2	18.9	8.3	11.2	1.5	11.4	3.3	1.305
Forward castes other than Brahmins	26.8	9.7	3.1	10.4	8.6	14.8	5.5	7.3	1.9	9.4	2.1	1.199
Other Backward Classes (OBCs)	23.5	4.0	2.1	15.9	10.2	10.7	2.0	8.1	2.8	16.9	3.6	1.315
Scheduled Castes (SCs)	13.9	-0.8	0.8	23.4	5.6	12.7	1.8	5.7	2.7	29.1	5.0	1.478
Scheduled Tribes (STs)	21.6	1.3	1.3	25.6	4.4	12.1	1.4	3.9	5.4	19.5	3.4	1.386
Muslim	17.8	-0.9	1.6	14.7	13.1	11.4	1.3	9.7	0.8	28.8	1.3	1.314
Christian, Sikh, Jain and others	29.6	4.7	4.4	3.5	9.6	17.7	6.4	9.4	0.4	11.8	1.8	1.110
Highest Adult Education												
No education	21.2	0.1	2.4	22.1	4.9	4.6	0.7	11.6	2.8	22.8	6.5	1.387
Below primary	16.6	-3.2	3.3	31.0	6.0	6.2	0.8	7.1	5.0	23.0	4.0	1.369
Primary but below secondary	21.4	3.3	1.2	18.4	8.4	9.2	1.6	6.5	3.3	24.0	2.7	1.351
Secondary but below high secondary	22.3	5.3	1.9	12.7	10.6	15.8	4.3	5.4	2.1	17.6	1.7	1.271
High secondary but below graduation	23.1	5.9	2.1	10.3	11.6	20.5	4.5	5.1	1.5	13.1	2.1	1.301
Graduation & above	18.5	7.7	2.6	5.0	12.5	31.3	7.8	5.5	0.7	6.0	2.3	1.300
Agriculture landholding												
No landholding	0.0	0.1	0.0	24.9	11.4	16.4	2.3	6.8	2.7	29.9	4.8	1.406
Marginal (Below 1 hectare)	39.2	5.7	3.7	14.4	6.0	7.8	2.0	5.1	2.8	11.1	2.2	1.236
Small (1 to 2 hectares)	30.7	7.8	2.3	8.7	7.6	10.1	1.9	9.5	2.4	17.0	2.0	1.290
Semi-medium (2-4 hectares)	38.1	1.1	4.2	2.2	7.8	14.2	5.3	9.0	2.2	13.3	2.7	1.330
Medium (4 to10 hectares)	18.2	4.4	1.8	5.3	6.5	14.8	7.0	19.0	4.1	15.7	3.1	1.463
Large (Above 10 hectares)	25.3	3.3	2.2	19.3	7.7	11.2	3.0	6.8	2.2	15.5	3.5	1.373
Livestock owned /value												
No livestock	11.4	0.6	2.2	20.9	10.5	15.3	3.0	6.7	2.2	22.7	4.0	1.369
Law value (below INR 20000)	20.7	-0.8	1.9	18.1	7.8	10.3	2.0	8.9	4.4	23.2	3.5	1.442
High value (INR 20000 & above)	34.9	9.8	1.7	10.5	6.5	10.2	2.9	6.8	1.9	12.5	2.4	1.211
Household by poverty line												
Non-poor	21.4	3.9	2.1	15.6	9.3	13.7	3.2	7.8	2.2	17.7	2.9	1.310
Poor	19.4	0.0	1.5	22.6	5.5	7.5	0.6	5.0	4.4	27.7	5.5	1.453
Total	21.0	3.1	2.0	17.0	8.6	12.5	2.7	7.2	2.6	19.7	3.4	1.338

Source: Computed from IHDS II, 2011-12 (Desai et al., 2015)

Education is a critical explanatory cause of cumulative processes of rural differentiation (Francis & Hoddinott, 1993). Occupational opportunities vary as per the skills and education (Ellis, 1998). The educational and skill constraints leads to poverty (Carcillo et al, 2017), and economically poor undergoes exclusion from the highly remunerated occupations (Dercon & Krishnan, 1996). The results indicate the uneducated (1.387), followed by primary (1.369) and secondary educated (1.351), recorded higher livelihood diversification than others. The households having the highest adult education above graduation got 31.3 per cent income from salary (LS6) and the share of income from this livelihood strategy decreased with decreasing level of education (Table 1). The uneducated and below primary education household having the highest adult education as zero and low earned the larger share of their income from agricultural labour (LS4), non-farm labour (LS10) and crop income (LS1). The educated households also catered good income from Businesses (LS5) and Property and pensions (LS7) that steadily decreased with declining level of education (Table 1).

It is well accepted that despite the increase in non-farm economic portfolios, livelihoods and well-being are very much dependent on agriculture and linked to land ownership. Land poverty is another constraint in non-farm employment by limiting cash revenues from farming needed to start non-farm businesses or support migration (Reardon et al., 2000). Nearly

38 per cent rural households reported not to own landholding and therefore, did not obtain any crop income (LS1), and depended largely upon agricultural labour (LS4) and non-farm labour (LS10). Nevertheless, the highest livelihood diversity (1.463) was found among households with medium scale farming, followed by the landless households (1.406), depicting an inverse convex line if arranged as per landholding and livelihood diversity. Agricultural land is crucially important for households including poor as well as better off households (Martin & Lorenzen, 2016). The households with marginal farms produced a major share of income from crop income (LS1), and recorded the lowest diversification index (1.236), while for households with small and medium farming land, salary (LS6) constituted a major share of total income (Table 1). It is worth mentioning that several households, which did not own agricultural landholding, drew income from salary (LS6) and therefore, 16.4 per cent of income for households without landholding was obtained from LS6.

The synergies between agriculture and livestock rearing are quite common as the crop residues are used as livestock feeds and the animal manures are widely used as natural fertilisers. The interactive relation between these livelihood strategies reduces the cost and enhances livelihood insurance among rural households. Livestock rearing (LS2) contributed slightly higher than 3 per cent to total rural income. Nonetheless, about 58 per cent earned an average of INR 6689.10 per annum from this strategy. Many households (about 25 per cent) had livestock of value below INR 20000, yet that provided them a smaller share to the income. The livelihood diversification was found the highest (1.442) among households having livestock value below INR 20000 households than others. The Households with livestock of value above INR 20000 recorded the lowest diversification index (1.211), and obtained nearly 45 per cent of total income from these synergic livelihood strategies (LS1 and LS2). On the other hand, the households without and low value livestock, Non-farm labour (LS10), agricultural labour (LS4) and Salary (LS6) made the major contributions along with other livelihood strategies.

The poorer households recorded high livelihood diversification (1.453) than the non-poor (1.310). Over 50 per cent of total income of poorer households was acquired from only Non-farm labour (LS10) and farm labour (LS4), while obtaining small shares of income from other strategies. However, the non-poor households still strived to diversify their livelihood for the additional insurance from natural and economic risks. The distress causing low and irregular income is the primary reason for higher diversification among poor households.

Socio-Economic Determinants of Livelihood Diversification

Table 2 presents the results from binary logistic regression. The results reveal that in reference to small households, medium (OR=1.136, $p<0.001$) and large households (OR=1.460, $p<0.001$) are more likely to have high livelihood diversification. Likewise, the likelihood of the households' involvement in each of the livelihood strategies, except LS3, is higher among medium and large households than the smaller households (Table 2). The households having a high dependency ratio are likely to be less diversified (OR=0.784, $p<0.001$), while households with medium dependency ratio (OR=1.010, ns) is likely to be slightly higher than households with low dependency ratio. The households with high dependency ratio are likely to be less involved in all the livelihood strategies except the LS3, LS7, LS8 and LS11 than households with low dependency (Table 2).

Caste and religious background is also the significant predictor. In reference to Brahmins, SCs (OR=1.304, $p<0.001$), STs (OR=1.095, ns) and OBCs (OR=1.069, ns) are likely to have high livelihood diversification, while Christians, Sikhs and Jains (OR=0.658, $p<0.001$), Muslims (OR=0.807, $p<0.01$) and Forward castes (OR=0.853, $p<0.05$) are likely to be less diversified than Brahmins. The lower social groups are more likely to involve in crop income (LS1), farm labour (LS4) and non-farm labour (LS10), whereas the higher social strata are likely to involve in more remunerative livelihood strategies such as businesses (LS5), salaried job

(LS6), property and pensions (LS7) and remittances (LS8) (Table 2). Education is negatively associated with livelihood diversity. In reference to households having no education, households with the higher education— up to primary (OR=0.896, p<0.01), secondary (OR=0.791, p<0.001), high secondary (0.905, p<0.05) and graduation and above (OR=0.857, p<0.01) are likely to be less diversified. Nonetheless, the high remunerative livelihood strategies that require less physical works (LS5, LS6 and LS7) and crop income (LS1) are more preferred strategies with an increasing level of education. Contrary to this, the labour-intensive and low remunerative strategies (LS4, LS8, LS9 and LS10) are left to be involved by the households without education and low education.

Rural households which have agricultural landholding have better livelihood diversification options than the households without any landholding. In reference to households with no landholding, marginal (OR=1.759, p<0.001), small (OR=1.904, p<0.001), semi-medium (OR=2.275, p<0.001), medium (OR=2.785, p<0.001), and large farmers (OR=1.935, p<0.001), are likely to be more diversified. Nonetheless, many of the salaried households do not have landholding and therefore, salaried job (LS6) is more preferred by households without any landholding. At the same time, the likelihood of involvement in farm labour (LS4) and non-farm labour (LS10) also decrease with increasing possession of agricultural landholding (Table 2). The households having livestock of value below INR 20000 (OR=1.310, p<0.001) are likely to be highly diversified than households with no livestock. But the likelihood of high diversification remains insignificantly low for the households with high-value livestock (OR=0.985, ns). The households without livestock are well involved in salary (LS6) and businesses (LS5) which provide them sustained income, and therefore, despite the absence of livestock, they are less vulnerable. On the other hand, households with low-value livestock are more vulnerable to livelihood security and, therefore, more involved in diversified strategies. Households with highly valued livestock go for less diversification as they receive better remunerative outcomes from crop income (LS1) and remittances (LS8). The poor households (OR=1.193, p<0.001) are likely to be more diversified than the non-poor. This indicates how the poor households, being more vulnerable to diversity more than non-poor. Poor households are likely to involve more in less remunerative strategies (LS1, LS4, LS9, LS10) than non-poor households, while high remunerative strategies (LS5 and LS6) are well preferred by the non-poor. The results of this study accord to the theory that poverty causes distress diversification.

Conclusion

The results reveal that diversification strategies are commonly a combination of agriculture and non-agriculture activities, including remittances and governments' financial supports. This study highlights that diversification increases household income. The wage labours, both farm labour and non-farm labour, constitute the major part of the income of the lower social castes, low educated, landless, marginal and small farming households and economically poor. The households with better social and economic advantages have also been found striving for diversification in order to accumulate wealth to mitigate against the future natural and economic risks. Despite rapid economic development and several livelihoods raising efforts, the livelihood conditions in rural India is still much disgraceful due to the growing population and climatic extremities. This study highlights the positive aspects of the diversification strategies for rural households for raising their income. Therefore, it is suggested that the poverty alleviation programme must be extended to support and encourage livelihood diversification and inclusive mobility across livelihood to increase the rural income.

Household Characteristics	Likelihood of engagement of households in various livelihood strategies *(Odds Ratio)*											IHHDI *(Odds Ratio)*
	LS1	LS2	LS3	LS4	LS5	LS6	LS7	LS8	LS9	LS10	LS11	
Household size (no of members)												
Small®												
Medium	1.934***	1.775***	0.614***	1.384***	1.766***	1.883***	1.013 ns	0.560***	1.155***	1.758***	1.558***	1.136***
Large	2.435***	2.944***	0.647***	1.348***	2.942***	3.039***	1.278**	0.706***	1.044	2.401***	2.513***	1.460***
Dependency ratio												
Below 50% ®												
50 to 79%	0.954 ns	0.969 ns	1.080 ns	0.871***	0.922 ns	0.771***	1.348***	1.001 ns	0.933 ns	1.011 ns	1.421***	1.010
80% & above	0.770***	0.779***	1.141**	0.705***	0.674***	0.501***	1.015 ns	1.154***	0.808***	0.688***	1.352***	0.784***
Caste and Religion												
Brahmins ®												
Forward caste other than Brahmins	1.360***	0.923 ns	0.732**	1.749**	0.842 ns	1.022 ns	1.208 ns	0.709**	1.103 ns	0.806*	0.711***	0.853*
OBCs	1.767***	0.864 ns	0.668**	3.194**	1.063 ns	0.985 ns	0.735**	0.815*	1.425***	1.127 ns	1.227**	1.069 ns
SCs	1.684***	0.691*	0.604**	4.134**	0.627**	1.158 ns	0.635**	0.672**	2.254***	1.687***	1.572***	1.304***
STs	2.271***	0.815 ns	0.746**	3.857**	0.733*	1.084 ns	0.686*	0.500**	2.353***	1.301**	1.117 ns	1.095 ns
Muslims	1.774***	0.483***	0.718**	1.871**	0.954 ns	0.889 ns	0.469***	0.826*	1.085 ns	1.582***	0.627***	0.807**
Christians, Sikhs, Jains and others	1.424 ns	0.828 ns	0.834 ns	0.643*	0.650*	1.003 ns	0.918 ns	0.876 ns	0.561**	0.922 ns	0.683***	0.658***

Table 2: Logistic Regression Model Predicting the Engagement of Households in Various Livelihood Strategies and the Likelihood of High Livelihood Diversification (IHHDI) Across Various Household Characteristics

Highest Adult Education												
No education ®												
Below primary	1.092 ns	1.023 ns	1.033 ns	1.084 ns	1.303* ns	0.981 ns	2.133***	0.688***	1.035 ns	1.205***	0.764***	0.988 ns
Primary but below secondary	1.526***	1.157 ns	0.932 ns	0.732***	1.454***	1.450***	3.808***	0.577***	0.930 ns	1.354***	0.705***	0.896**
Secondary but below high secondary	1.381**	0.904 ns	1.082 ns	0.492***	1.542***	1.995***	6.804***	0.513***	0.699***	0.974 ns	0.573***	0.791***
High secondary but below graduation	1.267**	0.882 ns	1.036 ns	0.406***	1.835***	2.875***	8.462***	0.538***	0.618***	0.797***	0.553***	0.905*
Graduation & above	1.344***	0.818 ns	1.338***	0.243***	2.218***	4.636***	13.515***	0.455***	0.531***	0.483***	0.447***	0.857**
Agriculture landholding												
No landholding ®												
Marginal (Below 1 hectare)	-	2.313***	-	1.111*	0.860*	0.625***	1.146 ns	1.131*	1.367***	0.756***	1.136***	1.759***
Small (1 to 2 hectares)	-	2.464***	-	0.511***	0.940 ns	0.754***	0.980 ns	1.606***	2.206***	0.929 ns	1.061 ns	1.904***
Semi-medium (2-4 hectares)	-	3.087***	-	0.410***	1.006 ns	0.851*	1.444***	1.504***	1.604***	0.958 ns	1.323***	2.275***
Medium (4 to10 hectares)	-	2.515***	-	0.265***	0.733*	0.728***	1.566***	2.543***	3.363***	1.017 ns	0.923 ns	2.785***
Large (Above 10 hectares)	-	1.926***	-	1.235***	1.187*	0.742***	1.173 ns	1.601***	1.107	0.827***	1.179***	1.935***
Livestock owned /value												
No livestock ®												
Low value (below INR 20000)	2.678***	-	0.763***	1.282***	1.003 ns	0.851**	0.742***	1.593***	1.420***	1.288***	1.214***	1.310***
High value (INR 20000 & above)	4.572***	-	0.734***	0.945 ns	0.864*	0.798***	0.943 ns	1.254***	1.119**	0.768***	1.080*	0.985 ns
Household by poverty												
Non-poor ®												

Poor	1.249***	0.819***	0.859*	1.491***	0.744***	0.828***	0.449**	0.735***	1.202***	1.206***	1.106**	1.193***
Constant	0.000	0.091	0.000	0.209	0.071	0.079	0.011	0.323	0.126	0.158	0.361	0.259
Significance level- *** P<0.001, **P<0.01, * P<0.05; ®- reference category; ns - not significant												

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Conflict of Interest

We confirm that we do not have any potential conflict of interest at the personal level, nor with any financial and other relationship with our own institute or any other organisation that may influence our or their work.

Author Contribution Statement

While the first author did conceptualisation, designing the study, and data curation and drafting of original work, both the authors reviewed and edited the final draft.