Research Paper

Determinants of Livelihood Diversification among the Thadou-Kukis of Manipur, India

Seitinmang Guite[*], Hanjabam Isworchandra Sharma and Lynda Thoudam

Department of Economics, Manipur University, Manipur, India

*Corresponding author: guitemangku84@gmail.com (**ORCID ID:** 0000-0002-8674-5462)

ABSTRACT

This paper examined livelihood diversifications among the Thadou-Kuki tribes of Manipur using the Simpson index and also finds out the determinant of livelihood diversification using multiple regression. The study uses household-level data collected from a census survey of 15 villages scattered across three Thadou-Kuki dominated districts. The mean Simpson Diversity Index (SDI) value is 0.42 that indicates most of the households diversify moderately and livelihood diversifications are mainly for meeting their subsistence need rather than for accumulation. The multiple regression results show that the distance of the village from the market, number of farm household members, number of non-farm household members, wet-land area, and access to forest resources positively impacts the livelihood diversification, and average educational attainment of workers and cash cropland negatively impacts the livelihood diversification**.**

HIGHLIGHTS

◎ The overall villages' diversification level was low and found to be at 0.42 levels.

◎ Majority of the households were engaged in mixed livelihood strategies for their survival and income.

◎ Market distance, households' member workers in farm and non-farm sectors, operational wet-land, and access to forest resources are positively associated with LD; while the average education level of the workers and operational cash lands are negatively associated with LD.

Keywords: Simpson Diversity index, livelihood, *jhum*, subsistence

Diversification in rural livelihoods is a dynamic process of socio-economic and political undertakings that have the ability to adapt to changing situations (Loison, 2015). As put by Ellis (1998), "livelihood diversification is the process by which rural households construct a diverse portfolio of activities and social support capabilities in their struggle for survival and to improve their standards of living". Rural livelihood diversification as a livelihood strategy is often articulated in different interrelated goals such as reducing rural poverty, households risk strategy, rural growth linkages; a shift from farm to non-farm, seasonality, low credit accessibility, migration, and population pressure (Loison, 2019).

Livelihood diversification is critically important for rural uplands in India because of the impinged constraints i.e., anthropogenic and natural causes on economic development (Kothari, 2013). The Himalayas are young fold mountain ranges having fragile and unstable eco-systems that are vulnerable to natural calamities like earthquakes and landslides that destroyed a huge amount of arable and non-arable lands (Svalova *et al.* 2019). With the sustained increase in demographic pressure over the years
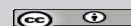
there is an increasing demand for income and foods to support the growing population which is often met through the exploitation of additional resources like land, water, and forests, etc., thereby adding stress on natural resources. The population depends largely on agriculture and allied activities for their source of income and livelihoods (). These natural resources-based livelihoods are no longer sustainable due to population pressure, ecological degradation, the marginality of land holding, and foraging by wild animals (Poudel and Shaw, 2015 and Everard *et al.* 2019). Agriculture sector is most vulnerable to climate change owing to over dependence on seasonal rain and exposed water stress besides the existence of large poorly equipped farmers (Rao *et al.* 2018). Further, economic development in the hills is also hindered by its inherent inaccessibility, remoteness, marginality, soil degeneration, and other ecological changes hostile to the environment (NCOF, 2005). In addition, some other factors such as labour shortage, low market network, poor productivity, lack of post-harvest management, and poor human capital support hinder the process of economic development in the hilly regions (Partap, 2011). Specifically, one constraint found in the north-eastern Himalayan states is the existences of diverse ethnic tribes who share major demographic composition in the region continue to practice their age-old *jhum* cultivation which was found to be extremely vulnerable (NEC, 2015 and Tiwari and Joshi, 2015). Nevertheless, the grievous problem facing farmers are local climate variability, market mechanism, and lack of research knowledge about agriculture compatible with the hill regions.

Fragility and vulnerability to climate and other constraints imposed on subsistence-based economy in the hills and mountainous regions compel the farmers to seek for new opportunities and diversify their livelihood activities to suit the changing environment (Wu *et al.* 2014). Agriculture diversification is largely taking place in the Himalayan states including in the north-eastern part of India (Das, Kaarthick, and Pariari, 2018). The common livelihood diversification activities are confined to cash crops cultivation, horticulture, animal husbandry, and niche based tourism development (Badar and Bahadure, 2020 and and Samriti *et al.* 2021). In addition to the above mention activities, the northeastern Indian farmers increasingly commercialised forest resources (Pandey, Geetarani and Hazarika, 2019). Outmigration of rural youth to urban towns and cities for better employment opportunities and earning better income is also one of the emerging livelihood strategies adopted in the hilly regions (Naudiyal, Arunachalam, and Kumar, 2019). Again, some of these livelihood options are besotted with new generation unsustainability that can be prevented by further diversification, for example, pollination failure in apple farms in Uttranchal can be corrected by honey bee rearing (Partap, 2011).

The present study was conducted in the hill districts of Manipur, one of the Himalayan states in north-eastern India. It possesses similar characters with the rest of the Himalayan states in terms of a geo-ecological system. Several ethnic tribes inhabited the hills of Manipur and among them, the Thadou-Kukis tribe is the largest in the state as per census reports until 2011. These tribes heavily practice *jhum* farming in all parts of the hill region and they are much rooted in their traditional cultures and livelihood practices. However, in recent decades their traditional laden food crops lose their grip from overwhelming emphasis in production basket and they began to diversify their activities towards high-value crops, and other commercial crops for generating income (Punitha *et al.* 2016). Most of the production items include cash crops, varieties of fruits, vegetables, spice crops, and tuber crops (Chiphang and Roy, 2018). Diversifications within agriculture are rampant and also include no-farm activities or a combination of farm and non-farm as livelihood strategies among the tribes (Haokip and Ansari, 2018).

The paper examined determinants of diversification of livelihoods among the Thadou-Kukis of Manipur. The rationale for choosing the Thadou-Kukis is that they are the largest ethnic tribes in the state, who scattered in all the hill districts[1] of Manipur. Further, the research is important because the previous literature barely cover LD and analysis on drivers of livelihoods diversification among the Thadou-Kukis of Manipur. Hence, the study examined the drivers of diversification and investigated the extent and degree of livelihood diversification among the Thadou-Kukis of Manipur.

---

[1]Here districts referred to - Chandel, Churachandpur, Senapati, Tamenglong, and Ukhurul that exist before bifurcation into two each, as per the Government of Manipur order vide No. 16/20/20/16-R. Dated: 08-12-2016.

MATERIALS AND METHODS

The data had been collected from four cluster villages in the three districts – Chandel, Churachandpur and Senapati of Manipur. One cluster region each- Chakpikarong and Henglep was selected in the Chandel and Churachandpur districts, while two regions namely Saikul and Tujang Waichong were selected in Senapati because of the widespread of the Thadou-Kukis population in heterogeneous agro-climatic regions. Purposive technique was used in selection of the villages and the cluster regions. At the same time due importance is also given to distance and location of the villages under study. A census method of data collection was used and a total of 442 households were surveyed that spread across the fifteen villages. The Thadou-Kukis villages are inordinately small and the numbers of households are in the range of 15 to 80 households (Ray, 1990). The villages in this study consist of small, medium, and large sizes with varying distances representing prototypes villages of the Thadou-Kukis (Table 2).

Estimation tools

A large number of households in the villages were engaged in mixed or multiple activities over the years for their livelihoods (Table 5). To capture the diverse nature of livelihoods and to identify the drivers of LD among the Thadou-Kukis of Manipur, the study used the Simpson index and multiple linear regressions for analysis.

Simpson index

Simpson index finds a wide application over the others in measuring livelihood diversification because of its robustness and simplicity in computation (Khautan and Roy, 2012). The research used the Simpson Diversification index equation:

$$SDI = 1 - \sum_{i=1}^{n} P_i^2$$

Where,

N= number of income sources; P_i = proportion of the ith source of income. The *N* consist of nine different sources of incomes such as- (1) paddy income; (2) vegetable and horticulture crops income; (3) income from forest products; (4) income from animal husbandry; (5) off-farm income; (6) regular income from service sector; (7) non-farm casual income; (8) income from remittances; (9) miscellaneous income. The value of SI varies between 0 and 1. When there is full specialisation its value is 0 and tends toward 1 with an increase in diversification level. It is fully diversified when SDI reaches 1 level. The level of diversification is based on the value of SI which is classified on five categories: no diversification (SI < = 0.01); low level of diversification (SI = 0.01 - 0.25); medium level of diversification (SI = 0.26 - 0.50); high level of diversification (SI = 0.51 - 0.75); and very high level of diversification (SI > 0.75) (Ahmed *et al.* 2018).

Multiple linear regressions

A multiple linear regression method of estimation is adopted to identify the factors influencing on livelihood diversification. It has been calculated using Licensed S*tata Version 15* of the department of Economics, Manipur University. The equation is given below:

$$SDI_{ij} = \beta_0 + \beta_i X_i + \mu$$

Where,

SDI = level of diversification of household *i* measured in terms of number of economic activities *j* undertaken by family and the value ranges from 0 to 1. In order words, the SDI of each family is the dependent variable; β_0 and β_i = the vectors of parameters that determine LD; X_i = explanatory variable; and μ = the error term. Description of the variable is given in Table 1.

The traditional chieftainship system is fundamental to the economy of the Thadou-Kukis in Manipur. As per the chieftainship system, all types of lands and natural resources within the village territory are under the framework of community property. However, the current generation witnesses a slight change in the land management system, thereby affecting the evolution of the private land ownership system in the Thadou-Kukis society. Consequently, three types of different land categorisations are made corresponding to variation in ownership rights in Table 1. *Jhum* lands and cash lands are under community assets but have slight variation in functions and some negligible areas under the latter are loosely owned by private households with the chief as the legal owner. On the other hand, wet-lands are exclusively owned by private households.

Table 1: Description of Variables

Sl. No.	Independent variables	Unit of measurement	Expected outcome/ sign
1	Distance of the villages from the market	Kilometres	+
2	Average education attainment of household workers	Years	-
3	Household member engaged in farm	Number	+
4	Household member engaged in non-farm	Number	-
5	Wet land holding*	Acres	+
6	*Jhum* land holding*	Acres	+
7	Cash land holding*	Acres	+
8	Access to forest resources	Dummy (1 if yes and 0 otherwise)	+
9	Household head's occupation	Dummy (1 if non-farm and 0 otherwise)	-
10	Access to credit	Dummy (1 if yes and 0 otherwise)	+

Table 2: Villages Profile

District	Cluster region	Villages	Local market	Market distance (in Km)	No. of Households	Total population	Avg. Family size	Sex ratio	Literacy rate
Senapati	Saikul	Denglen	Saikul	9	53	342	6.45	921	76.09
		Gallam	Saikul	17	33	179	5.42	864	95.54
		Phaikon	Saikul	16	45	223	4.96	1009	57.53
		Puleijang	Saikul	15	22	131	5.95	1079	66.67
		Tolthang	Saikul	19	19	114	6	868	61.54
		Walpabung	Saikul	18	27	179	6.63	826	73.97
	Tujang Waichong	Gelnel	Kangpokpi	44	54	361	6.69	920	84.47
		Joupi	Kangpokpi	46	13	88	6.77	955	75.10
Chandel	Chakpikarong	New Keipham	Sugnu	3	16	100	6.25	1272	94.57
		Teijang	Sugnu	12	39	227	5.82	1101	81.86
		Y. Thingkangphai	Sugnu	7	42	209	4.98	882	81.32
Churachandpur	Henglep	L.Khaopijang	Churchandpur	105	34	210	6.18	1100	52.78
		Napphou	Churchandpur	102	11	48	4.36	777	73.81
		Thinghijang	Churchandpur	96	12	70	5.83	750	71.21
		Vungmoul	Churchandpur	100	22	124	5.64	1137	76.42
All Villages					442	2605	5.89	961	71.98

Source: Field Survey.

Village profile

The village is the basis of socio-economic and political organisation for the Thadou-Kukis. Gangte (2012) in his *the Kukis of Manipur* noted that the livelihood activities of the Kukis cannot be separated from the chieftainship institution. The Thadou-Kukis in Manipur continue to practice the traditional chieftainship system in governing their villages. The chieftainship institution is central to the socio-economic and political lives of the Kukis. The chief as formal owner of land (Ray, 1990) is responsible to allocate a parcel of *jhum* fields and cash lands to the villagers who need land for cultivation. Therefore, land is made available to the households subject to their needs, and the amount of labour they owned as surplus labour is negligible.

There are large variations in literacy and sex ratio among the villages (Table 1). A higher literacy rate indicated better economic development and a lower unemployment rate in the society (Rahman, 2013). In the case of societal development, factors like location, village infrastructure, and other-socio economic variables took an important part in determining the level and extent of the development. It reveals wide variations in health and education outcomes of the villages under study. The village's

overall average sex ratio and the literacy rate of 71.98 percent and 961.6 are still lower than that of the state's average of 76.94 percent and 985 in 2011. It reflects that much more welfare objectives are yet to be facilitated and achieved in the Thadou-Kukis dominated areas. The size of a family varies from family to family, though its average family size is about 5 members.

RESULTS AND DISCUSSION

Households Livelihood strategies

The households were found more accentuated on on-farm and off-farm activities by having about 42 percent of them (Table 4). The second most adopted strategy falls on a combination of on-farm, non-farm and off-farm activities that account for about 36 percent of the households. Though, some households engaged in the non-farm sector, only a few of them were employed in regular paid jobs. It is observed that most of the households adopted multiple livelihoods activities for their livelihoods and incomes.

Table 3: Households' Livelihood Strategies

Strategies	Frequency	Percent
Only on-farm	10	2.26
Only non-farm	27	6.11
On-farm + non-farm	53	11.99
On-farm + off-farm	190	42.99
On-farm + non-farm + off-farm	162	36.65
Total	**442**	**100**

Range of Livelihood Diversification

The study found that about 26 percent of the households have a low level of diversification and 29 percent of them with a medium level of diversification, while about 39 percent have a high level of livelihood diversification (Table 5). On the contrary, only a few households are in the two extremes of *no diversification* (0.9 percent) and *highly diversification* (3.17). The mean SDI value is 0.42 that indicates most of the households diversify moderately and livelihood diversifications are mainly for meeting their subsistence need rather than for accumulation. The result is closed to what Roy and Basu (2020) had found that household livelihoods in a coastal community in Bangladesh were moderately diversified at 0.39 levels. Similarly, in West Bengal, a study found SDI of 0.46 which was a moderate level of livelihood diversification (Saha and Bahal, 2010). Factors that are responsive to livelihood diversification need to be paid more attention to for their economic resilience. In this regard, Kassie, Kim, and Fellizar (2017) had noted that factors such as secure land ownership and membership in cooperatives were effective in livelihood diversification in rural Ethiopia.

Determinant of Livelihood Diversification

The study found that out of the 10 predictors on LD, market distances, households' member workers engaged in farm and non-farm, operational wet-land were statistically significant at 'p<0.01'; and access to forest resources at p<0.05 level of

Table 4: Ranges of villages Livelihood Diversification in the villages

Cluster Regions	Villages	0	0.01-0.25	0.26-0.50	0.51-0.75	0.76-1.00	Total	Mean	SD
Saikul (Senapati dist.)	Gallam	0(0)	10(30.3)	16(48.48)	7(21.21)	0(0)	33(100)	0.35	0.16
	Denglen	0(0)	19(35.85)	26(49.06)	8(15.09)	0(0)	53(100)	0.32	0.15
	Phaikon	0(0)	15(33.33)	19(42.22)	11(24.44)	0(0)	45(100)	0.36	0.17
	Puleijang	0(0)	10(45.45)	7(31.82)	5(22.73)	0(0)	22(100)	0.35	0.19
	Tothang	0(0)	8(42.11)	6(31.58)	5(26.32)	0(0)	19(100)	0.33	0.19
	Walpabung	0(0)	14(51.85)	5(18.52)	8(29.63)	0(0)	27(100)	0.32	0.21
Tujang Waichong (Senapati dist.)	Gelnel	0(0)	3(5.56)	15(27.78)	30(55.56)	6(11.11)	54(100)	0.57	0.18
	Joupi	0(0)	0(0)	2(15.38)	9(69.23)	2(15.38)	13(100)	0.6	0.13
Chakpikarong (Chandel)	New Keipham	0(0)	6(37.5)	5(31.25)	5(31.25)	0(0)	16(100)	0.35	0.21
	Thingkangphai	2(4.76)	19(45.24)	10(23.81)	11(26.19)	0(0)	42(100)	0.3	0.24
	Teijang	0(0)	11(28.21)	6(15.38)	22(56.41)	0(0)	39(100)	0.45	0.24
Henglep (Churachandpur)	Khaopijang	0(0)	2(5.88)	5(14.71)	21(61.76)	6(17.65)	34(100)	0.62	0.16
	Napphou	0(0)	0(0)	0(0)	11(100)	0(0)	11(100)	0.64	0.07
	Thinghijang	1(8.33)	0(0)	4(33.33)	7(58.33)	0(0)	12(100)	0.5	0.18
	Vungmoul	1(4.55)	1(4.55)	4(18.18)	16(72.73)	0(0)	22(100)	0.54	0.17
Total	**15**	**4(0.9)**	**118(26.7)**	**130(29.41)**	**176(39.82)**	**14(3.17)**	**442(100)**	**0.42**	**0.22**

Figures in the parenthesis indicate percentage.

Table 5: Determinant of Livelihood Diversification: Regression Results

Independent variables	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Market distance	0.003	0.000	8.78	0.000	0.002	0.003	***
Avg. education of workers	-0.003	0.002	-1.70	0.091	-0.007	0.001	*
Member in farm	0.023	0.007	3.16	0.002	0.009	0.037	***
Member in Non-farm	0.050	0.011	4.77	0.000	0.030	0.071	***
Operational Wet-land size	0.078	0.008	9.51	0.000	0.062	0.094	***
Operational *Jhum* size	0.027	0.022	1.21	0.229	-0.017	0.070	
Operational cash crop land	-0.018	0.009	-1.90	0.058	-0.036	0.001	*
Forest resources (No)	0.000	.	.	.	.	.	
Forest resources (Yes)	0.039	0.020	1.97	0.049	0.000	0.077	**
Head Occp (Farm)	0.000	.	.	.	.	.	
Head Occp (Non-Farm)	0.024	0.026	0.93	0.354	-0.027	0.076	
Credit access (No)	0.000	.	.	.	.	.	
Credit access (Yes)	0.007	0.017	0.41	0.680	-0.027	0.041	
Constant	0.226	0.029	7.83	0.000	0.169	0.282	***
Mean dependent var		**0.424**	SD dependent var		**0.218**		
R-squared		0.418	Number of obs		442.000		
F-test		41.088	Prob > F		0.000		
Akaike crit. (AIC)		-309.425	Bayesian crit. (BIC)		-264.421		
Mean VIF		1.433					

*** p<0.01, ** p<0.05, * p<0.1

significant; while average educational level of the workers and operational cash land are at p<0.1 level of significance. On the contrary, operational *jhum*, household heads' occupation, and access to debt were statistically insignificant to livelihood diversification. The data reveal that all the estimated co-efficients have the outcome sign as expected except family members engaged in non-farm sector, cash land holding, and household head occupation. The R-squared, F value and mean VIF value show the consistency of the regression model.

Distance of the villages from the market has greatly influenced the family's decisions towards diversification and here the result shows a high level of positive association with the LD. While the villages farther from the local market tend to diversify their economic activities more for meeting their basic needs without much dependence on the market for their sustenance. The villages that are closed to local markets tend to specialised on their activities related to marketable productions as well as engaged only in some non-farm-related works.

Households with their workers having higher average educational attainment have the advantage of possessing the abilities to distinguish better jobs compare to their counterparts. Here, as per the hypothesis, the average education level of

the households is negatively related to livelihood diversification. The higher the educational attainment of the workers, the greater they specialised in a few works for earning incomes and livelihoods,

Excluding the heads, household workers who are engaged in farming have highly influenced on diversification of livelihood activities. Since most of the farming communities are marginal farmers, they have diversified their income sources to meet the basic needs of their families.

Family members other than the heads who are engaged in the non-farm sector are expected to specialise only in a few jobs; rather the assumption contradicts the result which shows a highly positive relation with LD. However, a large proportion of some non-farm workers are found engaged in carpentry, driving, private teaching etc., that are mostly seasonal and casual in characters. These occupations are unstable and the revenue accrues are meager and usually, they earned a low income. While only a few non-farm workers are employed in regular paid services.

Land is one of the most crucial assets for economic development in the hills of Manipur as a large part of their livelihoods revolved around lands and forests. Arable lands are assumed to have a positive relation with LD. However, only operational

wetland holdings show consistency with the assumption; while operational cash land sizes have a negative relation with LD. Wetlands were mainly used for paddy production which is the staple food crop of the region. Production of sufficient foods in the family helps the workers to diversify in other activities of high return works.

On the other hand, cash croplands are now highly important for the tribes in the hills of Manipur due to demographic pressure; a large proportion of marginal landholdings; low productivity; climate change; and land degradation that confronts development of their economy. The farmers are found to focus more on the cultivation of commercial crops over the traditional food crops because of the huge scope for earning more incomes. As per the field experience, farmers engaged in commercial farming in bigger lands tend to specialise in fewer activities. These are some of the supportive pieces of evidence regarding the negative relation with livelihood diversification.

On the contrary, operational *jhum* sizes are found to be statistically invalid relationship with livelihood diversification. *Jhum* lands are community asset, its accessibility depend on the availability of adequate land. It is commonly used for the production of paddy in the upland areas, but owing to low productivity, more labours requirements over wet-land, and being liable to wild-foraging, *jhum* cultivation is no much-preferred option among the farmers compared to the past decades. Besides, households' food grains entitlement through PDS is also partly responsible for the lack of *jhum* cultivation in the regions. Traditionally, the forest is closely connected with the livelihoods of the Thadou-Kukis as they are one of the hill tribes. From food gathering to construction material and medicines, greater parts of the traditional livelihood activities were rooted in the forest and its by-products. To date, most of the Thadou-Kukis villages and more so to those villages that are in the interior areas are largely dependent on forests. The current generation exploitation of forests and their products are partly linked to commercial motives. The household head's occupation and access to credit were not statistically significant with livelihood diversification. This might be caused by the fact that though the household's heads influence the family decision, other members at the same time

has a say of it. The credits available to the farmers in the hills are of only informal types. It is mostly lent by usury and village moneylenders, charging a high rate of interest at the cost of the poor loanee. This has prevented most of the households from availing of the facilities; thereby credit has not much impact on LD.

CONCLUSION

The hill economy of Manipur is primarily agrarian. In recent decades, farming communities in the hills have largely diversified their economic activities towards the production of high-value crops. This has been reflected in the outcomes of SDI and regression analysis. However, most of the economic activities undertaken by the Thadou-Kukis revolve around the subsistence mode of livelihoods. The overall livelihood of the regions is moderately diversified at 0.42 SDI. In other words, the prevailing livelihood activities among the Thadou-Kukis are mainly for survival and meeting subsistence needs. The natural resources-based economy of the Thadou-Kukis is no longer sustainable due to many factors which are beyond this paper.

Nevertheless, proper channelization of the diversification process through paying attention on factors influencing diversification among the Thadou-Kukis will be helpful to relieve them from the burden of economic stagnation. In this regard, the paper recommends farm inputs and technological up-gradation; efficiency in linking producers to market for assuring better price to the farmer; and improvement in post-harvest management skills to avoid wastage

REFERENCES

Ahmed, M.T., Bhandari, H., Gordoncillo, P.U., Quicoy, C.B. and Carnaje, G.P. 2018. Factors affecting the extent of rural livelihood diversification in selected areas of Bangladesh. *SAARC J. Agri.*, **16**(1): 7-21.

Badar, R.N. and Bahadure, S.P. 2020. Assessing tourism sustainability in hill towns: Case study of Shimla, India. *J. Mt. Sci.*, **17**(9): 2241-2261.

Chiphang, S. and Roy, A. 2018. Economic Assessment of Lemon Production in Ukhrul District of Manipur. *Econ. Aff.*, **63**(2): 469-472.

Das, S., Karthik, C.S. and Pariari, A. 2018. Problems and Prospects of Hill Agriculture in India: A Review. *Int. J. Pure App. Biosci.*, **6**(4): 250-256.

Ellis, F. 1998. Household strategies and rural livelihood diversification. *J. Dev. Stud.*, **35**(1): 1-38.

Everard, M., Gupta, N., Scott, C.A., Tiwari, P.C., Joshi, B., Kataria, G. and Kumar, S. 2019. Assessing livelihood-ecosystem interdependencies and natural resource governance in Indian villages in the Middle Himalayas. *Reg. Environ. Change*, **19**(1): 165-177.

Gangte, T.S. 2012. The kukis of Manipur: A historical analysis. Gyan Publishing House, Delhi.

Haokip, P. and Ansari, M.A. 2018. An Empirical Analysis on Pattern of Employment Diversification among the Rural Households in Churachandpur District, Manipur. *Pratidhwani the Echo.*, **6**(4): 289-298.

Kassie, G.W., Kim, S. and Fellizar Jr, F.P. 2017. Determinant factors of livelihood diversification: Evidence from Ethiopia. *Cogent. Soc. Sci.*, **3**(1): 1-16.

Khatun, D. and Roy, B.C. 2012. Rural livelihood diversification in West Bengal: Determinants and constraints. *Agric. Econ. Res. Rev.*, **25**(1): 115-124.

Kothari, A. 2013. Development and Ecological Sustainability in India: Possibilities for the post-2015 framework. *Econ. Polit. Wkly.*, **48**(30): 144-154.

Loison, S.A. 2015. Rural Livelihood Diversification in Sub-Saharan Africa: A Literature Review, *J. Dev. Stud.*, **51**(9): 1125-1138.

Loison, S.A. 2019. Household livelihood diversification and gender: Panel evidence from rural Kenya. *J. Rural Stud.*, **69**: 156-172.

Naudiyal. N., Arunachalam, K. and Kumar, U. 2019. The future of mountain agriculture amidst continual farm-exit, livelihood diversification and outmigration in the Central Himalayan villages. *J. Mt. Sci.,* **16**(4): 755-768.

NCOF, 2005. Saving farmers and saving farming: From crisis to confidence. Second report, Government of India, Ministry of Agriculture, New Delhi.

NEC. 2015. Basic statistics of North Eastern region 2015. Government of India, North Eastern Council Secretariat, Nongrim Hills, Shillong.

Pandey, D.K., De, H.K., Geetarani, L. and Hazarika, B.N. 2019. Problems and prospects of agricultural diversification in shifting cultivation area of northeast India: An empirical study. *J. Pharmacogn. Phytochem.*, **8**(3): 69-73.

Partap, T. 2011. Hill agriculture: challenges and opportunities. *Indian J. Agric. Econ.*, **66**(1):33-52.

Poudel, S. and Shaw, R. 2015. Demographic changes, economic changes and livelihood changes in the HKH Region. p. 105-123. *In* R. Shaw and H.K. Nibanupudi (eds.) Mountain hazards and disaster risk reduction. Springer, Tokyo, Japan.

Punitha, P., Pandey, D.K., Feroze, S.M., Singh, R.J., Ram, D., Singh, N.O. and Monika, A. 2016. Socio-economic profile and perceived livelihood diversification choice of *Jhumias* of Manipur in North East India. *Progress. Res. Int. J.*, **11**(4): 4314-4319.

Rahman, M.S. 2013. Relationship among GDP, per capita GDP, literacy rate and unemployment rate. *Br. J. Arts Soc. Sci.*, **14**(2): 169-177.

Rao, C.S., Kareemulla, K., Krishnan, P., Murthy, G.R.K., Ramesh, P., Ananthan, P.S. and Joshi, P.K. 2019. Agro-ecosystem based sustainability indicators for climate resilient agriculture in India: A conceptual framework. *Ecol. Indic.*, **105**: 621-633.

Ray, A.K. 1990. Authority and legitimacy: A study of the Thadou-Kukis in Manipur. Renaissance Publishing House.

Roy, A. and Basu, S. 2020. Determinants of livelihood diversification under environmental change in coastal community of Bangladesh. *Asia Pac. J. Rural Dev.*, **30**(1-2): 7-26.

Saha, B. and Bahal, R. 2010. Livelihood diversification pursued by farmers in West Bengal. *Indian Res. J. Ext. Edu.*, **10**(2): 1-9.

Samriti, Sharma, R., Dev, K., Pathania, A. and Sharma, S. 2021. An Economic Analysis of Apple Cultivation in High Hills of Himachal Pradesh. *Econ. Aff.*, **66**(2): 265-270.

Svalova, V.B., Zaalishvili, V.B., Ganapathy, G.P., Nikolaev, A.V. and Melkov, D.A. 2019. Landslide risk in mountain areas. *Geol. Geophys. South Russ.*, **9**(2): 109-126.

Tiwari, P.C. and Joshi, B. 2015. Local and regional institutions and environmental governance in Hindu Kush Himalaya. *Environ. Sci. Policy*, **49**: 66-74.

Wu, N., Ismail, M., Joshi, S., Yi, S.L., Shrestha, R.M. and Jasra, A.W. 2014. Livelihood diversification as an adaptation approach to change in the pastoral Hindu-Kush Himalayan region. *J. Mt. Sci.,* **11**(5): 1342-1355.