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Determinants of Livelihood Diversification in PHEK District of Nagaland, India

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ABSTRACT

Nagaland is a state without any major industry, which has resulted in the people's dependence on the government, seeking government jobs. As a result, the need for survival and maintaining the standard of living has forced the household to diversify their livelihood activities by adopting multiple jobs. Numerous factors determine the ability of a household to diversify its livelihood. In this study, data was collected from 170 households. The Simpson Diversity Index is applied to measure diversity, and the censored To bit model is used to analyze the determinants of livelihood diversification. The study found that both non-farm and farm have a high diversity level and that many households do not diversify their livelihood activities. The result also shows that education has a negative significant impact on the household's decision to diversify their livelihood activities.

Keywords: Livelihood, Diversification, Farm, Livelihood Diversification, On-Farm, Off-Farm.

1. INTRODUCTION

The ever-increasing population has become one of the major causes of unemployment in the present world. The slow death rate and the high birth rate elevate a very high competition in seeking employment in the public sector. The evidence of smaller fragmentation of land also leads to low productivity and ultimately decreases the income and low marginal productivity of labor. As a result of these, diversifying livelihood activities has become an important component of livelihood, especially among rural households. According to Mutenje *et al.*, (2010), rural households combine multiple activities like cropping, livestock and forest production, wage work, and small industry to supplement income, and they also stated that the ability of rural households to diversify depends on the availability of assets they possess and the economic shocks that they have faced. Hoq *et al.*, (2022) refer to livelihood diversification as the effort of individual that enables them to find a number of ways to increase their income rather than depending on an activity alone so as to lessen exposure to livelihood shocks.

Households that are based on agriculture for survival are more vulnerable to natural hazards such as droughts, floods, and erosions (Ahmad & Afzal, 2020; Ferdushi *et al.*, 2019). To survive and cope with these environmental shocks, households adopt other activities that are either purely agricultural, activities that are not related to agriculture, activities to engage in during off-seasons, or a combination of them. Households also diversify their livelihood sources to meet their basic requirements (Barrett *et al.*, 2000) and to have their demands fulfilled. Studies frequently demonstrate that poorer households are more likely than richer households to have a variety of income sources. In short, livelihood diversification mainly happens due to the instability of income (Khai & Danh, 2018). While for the poorer households, it is a survival strategy, for the richer households, diversification of livelihood is a wealth accumulation strategy. Likewise, rural households do not depend on one activity alone; rather, they engage in multiple activities. These multiple activities are a combination derived from a range of activities, which together provide different livelihood strategies for the households. Diversification may result in an intentional household decision or an obligatory response to a shock (Adi, 2007). There is complexity in analyzing livelihood strategies as rural households

participate in a range of activities. Livelihood studies are often skewed toward a qualitative and descriptive nature, which is not possible to identify factors that firmly affect household decisions to make livelihood choices. Therefore, literature usually categorizes livelihood activities into three sources, namely, non-farm, off-farm, and farm sources (Kassie *et al*., 2017), and households are assumed to choose their livelihood strategies from the activities of one of these sources or a combination of these sources that are subjected to their capabilities or available assets. As described by Ellis (1998), households attain their best possible livelihood strategy by combining their capabilities, knowledge, and skills with resources that are accessible to them.

Numerous factors determine the ability of a household to diversify its livelihood, and extensive studies have been done on factors determining livelihood diversification. According to some studies, essential determinants of livelihood diversification are education of the head of household, age of the head of household, land access, farm size, market access, farming experience, etc. (Corral & Radchenko, 2017; Sarah, 2012; Tesfaye et al., 2011; Barrett et al., 2001). For some studies, the key determinants include poverty status, farm income, gender (Ayantoye *et al*., 2017), facilities, market distance, etc. (Gebreyesus, 2016). Hence, an understanding of the factors influencing households to branch out their livelihood activities is of utmost importance for policymakers and reformers to give them proper direction to initiate plans for the livelihood of their people. Nagaland is a state with the absence of any major industry, which has resulted in the dependence of the people on the government, seeking government jobs. As a result, the need for survival and to maintain the standard of living has forced the household to expand and diversify their livelihood activities by adopting multiple jobs. However, such studies in Nagaland are limited. Thus, this study fills this literature gap and fulfills the need for a micro household-level study of livelihood diversification in the study area.

Therefore, the main scope of this paper is to (i) examine the level and extent of livelihood diversification and (ii) identify the influential factors that determine livelihood diversification in the Phek district of Nagaland.

The structure of the paper is arranged as follows. The data and methodology will be discussed in the next section. The third section will explain and show the main findings of the field data. The fourth section will include the conclusion and policy recommendations.

JEL CODE: C01, E2, F66, J43, Q12, R11, R12

2. DATA AND METHODOLOGY

2.1 Study area

Nagaland, a hilly state of northeast India, is inhabited by varied tribal communities with extensive history. Agriculture is considered to be the main occupational activity of the people of the state. However, this produce is mainly for self-consumption, and very little portion of the produce is used for commercial purposes. Nagaland economy is a developing economy that struggles to advance its social and economic conditions mainly due to its remoteness and inaccessibility. The continuous and enormous growth of the labor force on the one hand and the absence of big industries and small fragmentation of land on the other have failed to provide employment opportunities in the formal sector, which calls for the need for and the requirement for employment opportunities in the informal sector. Although the dependency of the state on agricultural activities has declined from as much as 96.5 % in the 1950s to about 68% in 2000, agriculture still remains as the primary source of livelihood. Therefore, in order to adapt to this pattern of change, people adopt multiple activities and try to engage in activities that can provide them a source of return and an income certainty for precautionary motives. At present, people of the state adopt modern technologies and practice floriculture, horticulture, handloom, handicrafts, and other cottage industries to earn their livelihood. For the purpose of this study, data were collected from Phek district of Nagaland.

Phek district is a mountainous region with 70% of its land covered with thick evergreen forests rich in flora and fauna. According to the 2011 census, Phek district has 14 administrative circles with 5 Rural Development Block (RDB) covering 117 inhabited villages. Agriculture, with terrace rice cultivation, is considered to be the main livelihood activity of the people. The district has a varied geo-climatic condition, which is favorable for vegetation, spices, horticulture, floriculture, and other crops. However, due to inadequate infrastructure and transportation, these riches

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largely remained unutilized. In recent times, various houses in the district have undertaken diverse livelihood activities rather than focusing on agriculture alone.

2.2 Sampling design

The data was collected from random household survey in Phek district of Nagaland. Firstly, four blocks were randomly selected from the district and one village each from these four blocks were randomly selected as the sampled villages namely, Lasumi village, Pfutseromi village, Enluhumi village and Porba village. For the sample households, 10 percent of households were randomly selected from these four villages. Household data were collected mainly from the head of the households through semi-structured questionnaires and interview methods on their livelihood activities and factors that may have influenced the diverse livelihood strategies. A total of 170 households are selected as the sampled household for this study.

3. METHODS OF DATA ANALYSIS

3.1 Measurement of livelihood diversification

To analyze the determination of livelihood diversification, first, the livelihood diversification Index is measured by using the Simpson Diversity Index. This index is used as it takes into account the evenness in the distribution of activities (Agyeman *et al*., 2014; Sultana *et al*., 2015).

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

Here, i=1,2,3…n; where n is the number of sources of livelihood. P_i *is* the proportion of income from the i^{th} source. The value of the index is limited from 0 to 1 where 0 meaning no diversity and 1 meaning high diversity. When the index is less than 0.01 it means there is no diversification. If it is equal to 0.01-0.25, it means low diversification; if it is equal to 0.26-0.50, it is moderate diversification; if it equals 0.50-0.75, it means high diversification, and very high, if it is above 0.75.

3.2 Determinants of livelihood diversification

After calculating the diversity level, the determinants of livelihood diversification are analyzed using the censored Tobit regression. As the value of SDI ranges from 0 to 1 and the presence of zeros in the dependent variable, this censored model is applied (Agyeman *et al*., 2014; Balense & Debebe, 2020; Vatta *et al*., 2018). The model is as specified below;

$$SDI = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u$$

$$SDI = {}^{0\ if\ SDI \le 0}_{1\ if\ SDI \ge 1}$$

Where *SDI* is taken as the dependent variable, β*'s* are the coefficients and u is the error term. The explanatory variables that were used in the regression analysis were measured as *X1 = Gender of the household head, X2 = Age of the household head, X3 = Education of the household head, and* X_4 *= Household size.* The descriptions of the variables are given in Table 1.

Table 1: Description of the variables used

Name	Description of variables
SDI	Livelihood diversification Index
Gender of household head	Gender as in male or female
Age of the household head	Age of the household head in years
Education of the household head	The highest education level of the household head
Household size	The total household size

Source: Field survey. (2020-2021)

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Gender: The gender of the head of household with 1=Male and 0=female is used as male-headed households are mostly hypothesized to be more diversified than households headed by females.

Age: The age of the head of household is used as most studies found a negative relationship between the age of the head of household and the level of diversification. That is, households with younger heads of households are more diversified.

Education: Here, the highest education attainment of the head of household is taken into consideration. It is often shown that there exists a positive relationship between education and livelihood diversification, indicating that higher education attainment offers more opportunities in the labor supply.

Household size: The total number of members of the household used. With the increase in the members of the household, there are more chances for diversification to cater to the needs of the household members.

4. FINDINGS AND DISCUSSION

4.1 Socio-economic characteristics of the households

The socio-economic features of the households are considered to have essential implications for livelihood diversification. Table 2 below revealed that the highest percentage (29.41%) of the heads of households are in the age group 45-55 years, indicating that most of the heads of households are at their prime mid-age of life. 12.94 percent are less than 30 years of age, while 16.47 percent are between 35-45 years. 22.35 percent and 8.24 percent are between 55-65 years and 65-75 years, with 8.92 percent between 75-85 years and 1.76 percent above 85 years of age. It is also seen from the table that the maximum percentage of the households in the study area are headed by males (88.24 %), and only 11.76 percent of the households are headed by females. The highest percentage of household heads have only a primary level of education (46.47%), 10 percent and 19.41 percent have only high school higher secondary education level, and 12.35 percent are graduates. Only 2.35 percent have education at a master's level and above, and 9.41 percent are illiterate heads in the study area. The majority of households (55.88 %) have 3-6 members in their household, 15.29 percent have up to 3 members, 25.88 percent have 6-9 members, and 2.94 percent have more than 9 members in their household.

Table 2: Socio-economic characteristics of the sampled households

Head of Household on the basis of Age		
Age group	Frequency	Percentage
<35	22	12.94
35-45	28	16.47
45-55	50	29.41
55-65	38	22.35
65-75	14	8.24
75-85	15	8.82
Above 85	3	1.76
Head of Household on the basis of Gender		
Gender	Frequency	Percentage
Male	150	88.24
Female	20	11.76
Head of Household on the basis of Education Level		
Education level	Frequency	Percentage
Illiterate	16	9.41
Below 10	79	46.47
10	17	10.00
12	33	19.41

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Graduate	21	12.35
Pg & above	4	2.35
Distribution of households on the basis of Household Size		
Household size	Frequency	Percentage
>3	26	15.29
>6	95	55.88
>9	44	25.88
9 & above	5	2.94

Source: Field survey. (2020-2021)

4.2 Level of livelihood diversification

Based on the literature available, this study identifies three types of sources of livelihood. These livelihood sources are non-farm, off-farm, and farm sources. Activities that are non-agricultural, such as trading, business, formal and public services, pensioners, rental activities, handicrafts, and artisanship, are included in the non-farm source. Off-farm sources include daily wage laborers both in agricultural and non-agricultural activities such as carpentry, woodwork, charcoal making, etc. Farm sources include farming own-land, livestock, horticulture, and floriculture (Bhakar *et al.*, 2007; Ellis, 2000; Saha & Bahal, 2014).

Table 3: Diversity index levels of the sources

Sources	Percent	SDI
Non-farm	56.9%	0.63
Off-farm	11.9%	0.14
Farm	31.2%	0.63

Source: Field survey. (2020-2021)

From the above Table 3, it is seen that the maximum percentage of individuals are employed in non-farm sources (0.56.9 percent). This is followed by 31.2 percent from the farm source, with only 11.9 percent of employment in the off-farm source. With the use of the Simpson Diversity Index, it was found that both non-farm and farm sources have a high diversity level of 0.63 each. This indicates that though the number of employed in non-farm activities is high, employment from the farm source is broadened and distributed evenly among the different employment activities related to the farm sector. As seen, the off-farm source has the lowest percentage of employment and the lowest diversity level, with only 0.14 SDI.

The extent of livelihood diversification

It is seen from Table 4 that the maximum percent of the household has no or very low diversification. This means that there is one employment activity in these households or maybe that they are employed in the same type of activity. Only 4 percent of the households have a moderate level of diversity, and more than 50 percent of the households are seen to have high or very high diversity, which indicates that there is a multiplicity of employment activity in these households. From this result, it is certain to say that there is livelihood diversification taking place in the study area.

Table 4: Distribution of households by the extent of diversification.

SDI Range	No. of household	Percentage
Below 0.01	76	45%
0.01-0.25	0	0%
0.26-0.50	7	4%
0.51-0.75	48	28%
Above 0.75	39	23%
Total	170	100%

Source: Field survey. (2020-2021)

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Determinants of Livelihood Diversification of the Household

Descriptive statistics of the variable used

The descriptive statistics of the variables are shown in Table 5. In the study area, the maximum percentage of the households are headed by males (88.24 percent). The minimum age of the head of the household is 24 years, while the maximum age is found to be 98 years, with 52.25 being the mean age. This shows a productive age range that is capable of doing both farm and non-farm activities. The average family size is 3.22, and it ranges between 1 and 11 members. The maximum percentage of household heads have an education degree below high school, while the minimum percentage is post-graduate and above. This shows that most household heads have low education qualifications.

Table 5: Descriptive statistics of the variables used.

Variables	Mean	SD	Minimum	Maximum
Livelihood diversification (SDI)	0.43	0.03	0	1
Male-headed households (%)	88.24	0.32	0	1
Age of Head (Years)	52.25	1.19	24	98
Family size	3.22	0.13	1	11
Education of Head (%)	16.67	6.29	2.35 (PG & above)	45.88 (Below High school)

Source: Field survey. (2020-2021)

Before the estimation of the Tobit model, the Variance inflation factor (VIF) was used to check the degree of multicollinearity. The result from Table 6 shows that there is no serious multicollinearity problem, as all the values of VIF are below 10. Breusch-Pagan / Cook-Weisberg test was used to check for heteroskedasticity, which showed no problem of heteroskedasticity ($\chi^2 = 0.5126$).

Table 6: Variance Inflation Factor

Variable	VIF	1/VIF
Age	1.22	0.821351
Gender	1.11	0.897993
Education qualification	2.02	0.493922
Household size	1.88	0.530641
Mean VIF	1.56	

Source: Field survey. (2020-2021)

Regression results

The determinant factors influencing the livelihood diversification activities among the respondents in the study area are shown in Table 7 using the Tobit regression model. To run this model, the Simpson Diversity Index is taken as the dependent variable, and age, gender, highest level of education of the head of household, and the household size are taken as the independent variables. The regression model applied left censoring, which is equal to or below 0 of the dependent variables. The result of the model indicates that the education qualification of the head of household plays a significant role in determining livelihood diversification in Phek district of Nagaland. The coefficient results values from the result showed that the education level of the head of household has a negative significant relationship with livelihood diversification. This indicates that household with illiterate heads was found to be more diversified than households with heads who are literate or have any years of schooling. This is probably because households with educated heads are found to specialize in only a few high-paying jobs, whereas households with less educated heads tend to diversify their income sources, which are usually low-paying, to meet the needs of their families. This study found a similarity with the findings of Kassie *et al*., (2017), where they found that educated households tend to specialize in particular activities rather than diversifying. Although statistically insignificant, the study shows that

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females and also the age of the head of household have a negative impact on livelihood diversification, which means that diversification decreases as the age of the head of household increases or when the head of household is female. However, household size was found to play a positive role in determining livelihood diversification. This signifies that large households are more likely to practice multiple activities as they have enough labour to participate in varied occupations.

Table 7: Tobit regression result to determine livelihood diversification

Variables	Coefficient	Standard Error	*t-value*
Age	-.0021483	.0023244	-0.92
Household size	.0156915	.02480428	0.63
Gender	.1116756	.1086989	1.03
Education levels			
Primary	-.22141*	.1206653	-1.83
Highschool	-.2513014*	.1553549	-1.62
Higher secondary	-.2543265*	.150006	-1.70
Graduate	-.3705356**	.1674955	-2.21
PG & above	-.2455323	.2480428	-0.99
_cons	.681805***	.2127157	3.20
/sigma	.6812805	.0303204	
Pseudo R2	0.0209		
Observation	170		
Log likelihood	-98.660101		
76 left-censored observation at sdi <=0; 94 uncensored-observations.			

Source: Field survey. (2020-2021)

Note: ***, **, and * denotes 1%, 5%, and 10% significance levels.

5. CONCLUSION AND RECOMMENDATION

The study was focused on the Phek district of Nagaland, India, where rural livelihood is seen to be expanding due to the incorporation of new activities besides agriculture. This study used the Simpson Diversity Index to check the level of diversification and applied the censored Tobit regression model to analyze the determinants of livelihood diversification in the study area. The study found that while farming activities still remain the main livelihood activity of most households, almost half of the total households (56.9%) are now engaging in non-farm activities. It has also been found that the level of diversity is high in both the non-farm and farm sources, with 0.63 SDI each. This may indicate that there are multiple activities in the non-farm and farm sources, and also, the share of employment in these two sources is almost equally shared among the households. Furthermore, the diversity level of each household shows that a maximum percent of the household (51%) earns their livelihood from diversified strategies rather than remaining on one activity alone. The regression results also demonstrated that, unlike many other studies that found education to play a giant role in determining livelihood diversification, the study found that education has a negative significant impact on the household's decision to diversify their livelihood activities. This signifies that with the increase in the level of education, there is the possibility that there will be a specialization of livelihood rather than diversification.

Thus, based on the findings, the following are some recommendations for policymakers to provide the most suitable ways to improve the overall livelihood status and enhance the adoption of livelihood diversification strategies in the study area. More employment opportunities should be encouraged in the farm sector, and more investment in infrastructure and machinery should be made. And proper training and understanding of the modern practices should be given to the older age people. Proper guidance is to be given for employment in the off-farm sector, where a person can earn while in the period of the off-season. The study also suggested that focus should be given to women for awareness and skill acquisition programs. Credit facilities are to be made easily accessible for younger and illiterate

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households for investment motives for essential start-up businesses. Finally, proper guidance and knowledge should be given to broadening the mindset of the people to adopt multiple livelihood activities so as to enhance income and improve their living conditions.

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REFERENCE

Adi, B. (2007). Determinants of Agricultural and Non-agricultural Livelihood Strategies in Rural Communities: Evidence from Eastern Nigeria. *The Journal of Developing Areas*, *40*(2), 93–94. https://doi.org/10.1353/jda.2007.0012

Agyeman, B. A. S., Brempong, S. A., & Onumah, E. E. (2014). Determinants of Income Diversification of Farm Households in the Western Region of Ghana. *Quarterly Journal of International Agriculture*, *53*(1), 55–72.

Ahmad, D., & Afzal, M. (2020). Flood hazards and factors influencing household flood perception and mitigation strategies in Pakistan. *Environmental Science and Pollution Research*, *27*(13), 15375–15387. https://doi.org/10.1007/s11356-020-08057-z

Ayantoye, K., Amao, J. O., & Fanifosi, G. E. (2017). Determinants of livelihood diversification among rural households in Kwara State , Nigeria. *International Journal of Advance Agricultural Research*, *5*, 82–88.

Balense, A., & Debebe, S. (2020). Analysis of Income Diversification and Livelihood Strategies Among Pastoral and Agro-pastoral Households' in Southern Ethiopia. *Journal of Investment and Management*, *9*(3), 72. https://doi.org/10.11648/j.jim.20200903.12

Barrett, C. B., Reardon, T., Bezuneh, M., Chavas, J. P., Clay, D., Coppock, L., Little, P., & Smith, K. (2000). *Asset , Activity , and Income Diversification Among African Agriculturalists : Some Practical Issues*.

Barrett, C. B., Reardon, T., & Webb, P. (2001). Nonfarm income diversification and household livelihood strategies in rural Africa : concepts , dynamics , and policy implications. *Food Policy*, *26*, 315–331.

Bhakar, R., Banafar, K. N. S., Singh, N. P., & Gauraha, A. K. (2007). Income and Employment Pattern in Rural Area of Chhattisgarh : A Micro View. *Agricultural Economics Research Review*, *20*(December), 395–406.

Corral, P., & Radchenko, N. (2017). What's So Spatial about Diversification in Nigeria ? *World Development*, 231–253. https://doi.org/10.1016/j.worlddev.2017.02.028

Dinku, A. M. (2018). Determinants of livelihood diversification strategies in Borena pastoralist communities of Oromia regional state, Ethiopia. *Agriculture and Food Security*, *7*(41), 1–8. https://doi.org/10.1186/s40066-018-0192-2

Ellis, F. (1998). The Journal of Development Studies Household strategies and rural livelihood diversification Household Strategies and Rural Livelihood Diversification. *The Journal of Development Studies*, *351*(March 2013), 1–38. http://www.tandfonline.com/action/journalInformation?journalCode=fjds20%5Cnhttp://dx.doi.org/10.1080/00220389808422553

Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, *51*(2), 289–302. https://doi.org/10.1111/j.1477-9552.2000.tb01229.x

Ferdushi, K. F., Ismail, M. T., & Kamil, A. A. (2019). Perceptions, knowledge and adaptation about climate change: A

DOI: 10.47505/IJRSS.2024.12.1

study on farmers of haor areas after a flash flood in Bangladesh. *Climate*, *7*(7), 1–17. https://doi.org/10.3390/cli7070085

Gebreyesus, B. (2016). Determinants of Livelihood Diversification : The Case of Kembata Tambaro Zone, Southern Ethiopia. *Journal of Poverty, Investment and Development*, *23*(2005), 1–10.

Hoq, M. S., Uddin, M. T., Raha, S. K., & Hossain, M. I. (2022). Determinants of households ' livelihood diversification strategies to adapt to natural hazards : evidence from ecologically vulnerable haor region of Bangladesh. *Natural Hazards*, *114*(3), 3255–3291. https://doi.org/10.1007/s11069-022-05514-5

Kassie, G. W., Kim, S., & Fellizar, F. P. (2017). Determinant factors of livelihood diversification: Evidence from Ethiopia. *Cogent Social Sciences*, *3*(1), 1–16. https://doi.org/10.1080/23311886.2017.1369490

Khai, T. T., & Danh, N. N. (2018). *Determinants of Income Diversification and Its Effect on Household Income in Rural Vietnam*. *January*. https://doi.org/10.24311/jed/2014.221.05

Mutenje, M., Ortmann, G. F., Ferrer, S. R., & Darroch, M. (2010). Rural livelihood diversity to manage economic shocks: Evidence from south- east Zimbabwe. *Agricultural Economics Research Policy and Practice in Southern Africa*, *49*(3), 338–357. https://doi.org/10.1080/03031853.2010.503381

Saha, B., & Bahal, R. (2014). Livelihood Diversification Pattern among the Farmers of West Bengal. *Economic Affairs*, *59*(3), 321–334. https://doi.org/10.5958/0976-4666.2014.00001.1

Sarah, A. (2012). Determinants of Rural Household Income Diversification in Senegal and Kenya. *Lund University (Sweden)*, 1–18.

Sultana, N., Hossain, E., & Islam, K. (2015). Income Diversification and Household Well-Being : A Case Study in Rural Areas of Bangladesh. *International Journal of Business and Economics Research*, *4*(3), 172–179. https://doi.org/10.11648/j.ijber.20150403.20

Tesfaye, Y., Roos, A., Campbell, B. M., & Bohlin, F. (2011). Livelihood strategies and the role of forest income in participatory-managed forests of Dodola area in the bale highlands, southern Ethiopia. *Forest Policy and Economics*, *13*(4), 258–265. https://doi.org/10.1016/j.forpol.2011.01.002

Vatta, K., Singh, G., Sharma, N., & Bhoi, P. B. (2018). Regional Dimensions and Determinants of Income Diversification in Rural India. *Agricuture and Sustainable Development Goals*, 33–46. https://doi.org/10.5958/0974-0279.2018.00020.4

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DOI: 10.47505/IJRSS.2024.12.1