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Importance of Forest Resources in Improving Rural Livelihoods in Jalpaiguri Forest Fringe Area

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Abstract

Forest resources play an important role in rural livelihoods in forest fringe areas. The forest fringe people depend highly on firewood, timber and Non-Timber Forest Products (NTFPs). These Non-Timber Forest Products are directly related to the rural economy in forest fringe areas. The forest fringe people frequently collected forest products from the forest, like firewood, timber and Non-Timber Forest Products. The researchers collected data randomly from the forest fringe area of the Lataguri Forest Range. The researcher conducted a semi-structured questionnaire in the selected study area. The researchers conducted the survey and collected data from 60 households in the Lataguri Forest Range under the Jalpaiguri Forest Division. This paper highlighted the importance of forest resources in forest fringe areas. In the study area selected households and collected firewood, honey, leaf, fruits and flowers. The forest fringe people make various forest products for sale and develop their economy, like bamboo and cane chairs and tables. This forest product depends on the rural economy of the forest fringe area.

Keywords: Forest Fringe, Forest Resources, Livestock income, One-Way ANOVA

1. Introduction

Forest gives us timber and plays a vital role in social and ecological functions. Forest provides livelihoods of forest dwellers, protects and enriches soils, balances the hydrological cycle, affects local and regional climate and provides shelter for many animal species**.** Forest provides a wide range of benefits, specifically significant in supporting the livelihoods of rural communities in tropical developing countries. Forest fringe communities largely depend on renewable natural resources. Forest fragmentation is continuously occupied due to growing food and timber exploitation for export. Ghana's forest fringe Livelihood community realized that forest resources were lost due to deforestation and climate change. The forest provides the communities with fuel, wood, gum, medicine plants, food sources, and recreation. The changes in rainfall harm the livelihoods of the fringe communities, which are predominantly cocoa and subsistence crop farmers (Amisah *et al*., 2009) [3]. The people live in forest fringe areas and use forest resources. The forest fringe people collected firewood, timber and non-timber forest products (NTFP), grazing cattle, community hunting and carrying out cultural rituals. In the 19th century, timber traders rapidly increased the demand for construction, shipbuilding and railways industries (Banerjee *et al*., 2013) [5]. In our Indian forest fringe, people primarily depend on forest resources (Banday, *et al*., 2021) [6]. NTFPs (Non-Timber Forest Product) contribute to income and employment by ensuring food and livelihood security for the tribal economy. The tribal people collected honey, beeswax, nuts, fruits, turmeric etc from the forest area. This study indicates that the wages from NTFPs generated the most employment. But at present, the tribal people face the problem of collecting NTFPs, like government restrictions, limited employment opportunities etc. (Basavarajappa, T, P. 2008) [8]. The forest plays an essential role in the social and cultural life of the villagers. The villagers collected fruits, food, medicine and firewood. The Forest dwellers depend on forest resources & unequal extraction of forest products. Wealthy & medium-class families use forest products, while low-income families use forests for daily survival (Datta, S. 2012) [25]. The forest fringe household depends on a source of income

for their livelihoods. Household sale of crops, sale of livestock, sale of NTFPs etc (FAO. 2014). In India the livelihoods of the people living close to forest and forest are more related to forest ecosystems. Forest fringe people depend on forest products like food and fodder (Nayak *et al*., 2011) [33].

2. Objectives

1. To study the importance of forest resources in improving rural livelihoods in selected study area.
2. To analysis the role of Forest Department for improving rural livelihoods in selected study area.

3. Location of the study area

The study area is located in Jalpaiguri District of West Bengal in India. The Latitudinal extension from $26^0$15'47''N to $26^0$59'34''N Longitudinal extension $88^0$23'2''E to $89^0$7'30''E (Jalpaiguri District, Government of West Bengal). The Jalapiguri district consist of seven blocks, these seven blocks are Jalpaiguri Block, Rajganj Block, Maynaguri Block, Dhupguri Block, Nagrakata block, Mal Block and Matiali Block (Official Website of Jalpaiguri District, Government of West Bengal). The study area is mainly located in the Lataguri Forest Range, which is under the jurisdiction of the Mal and Matiali blocks. In the study areas, the Reserved Forest is located in the south-eastern part of the Matiali block. The name of the reserved forest is the Nimno Tandu Forest. Another reserved forest is located in the north-western part of the Matiali block. The name of the reserved forest is the Apalchand Forest. In the selected study area, there are ample tea gardens. The study area is mainly located in the Lataguri Forest Range, which is under the jurisdiction of the Mal & Matiali blocks (Fig:1).

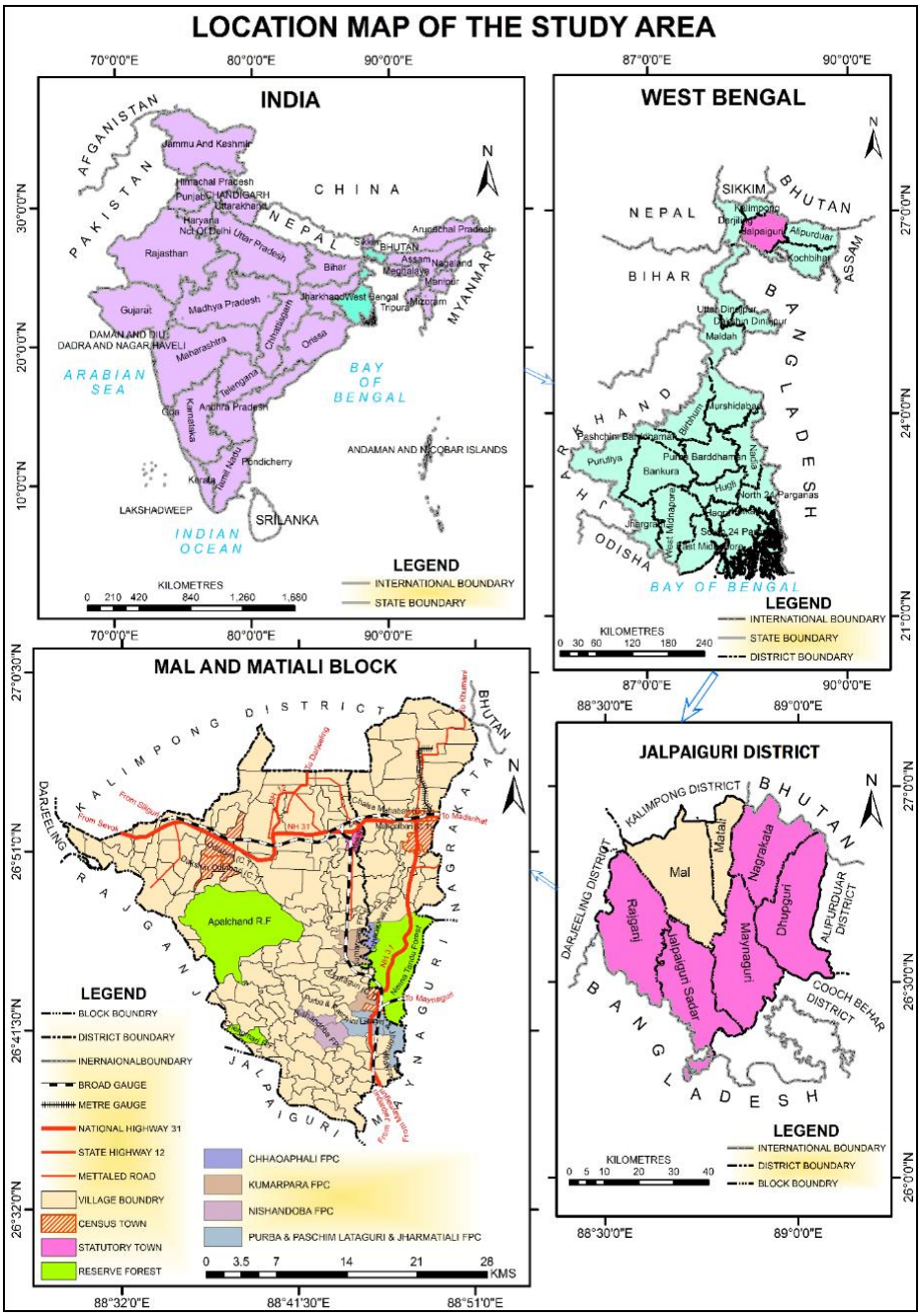


Fig 1: Location Map

4. Materials and Methods

4.1 Data Base: The database is very relevant to complete the research work. The researcher has collected the data of primary as well as secondary data and it is very significant of the entire research work. The primary data has been collected during the field survey in the selected study area. The secondary data has been collected from previous journals, articles and various secondary data highlighted the importance of forest resource in forest fringe area. The government scheme and policy-related information have been collected from secondary data of the Forest Department, DFO Office, Range Office and Forest Survey of India.

Table 1: Name of the FPCs Committees

Range Office	Beat Office	Name of FPC	No. of Sample (FPC Members)
Lataguri	Lataguri Beat Office	Jharmatiali	10
		Purba Lataguri	10
	Borodighi Beat Office	Chhaoaphali	10
		1064 Kumarpara	10
	Central Beat Office	Paschim Lataguri	10
		Nishandoba	10
			Total = 60

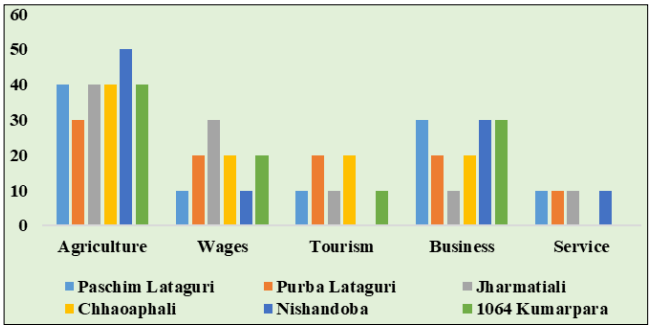
***Source*:** Lataguri Range Office, 2025

4.2 Methods

At first researcher collected different books, journals, research papers etc various sources. The researcher has visited the study area. The author has collected the Forest Report and Wildlife annual report of the DFO office. The researcher has selected 6 PFC committees and 60 FPC members in the Lataguri Forest Range. In the field stage the researcher has selected the study area and prepared pre discussed questionnaire schedule. The researcher has selected random sampling for the survey. The researcher has conducted interviews with Range Officers, Beat officers and forest fringe people during the field survey. The researcher collected perception data based on a survey questionnaire. Finally, the researcher collected all the information and prepared a suitable cartographic representation using Microsoft Excel. The researcher used One-way ANOVA Analysis on Collected Forest Products in the selected study area. The researcher has selected four variables for one-way ANOVA analysis, like Collected Firewood, Collected Honey, Collected Leaf and Collected Fruits & Flowers. The researcher also used One-way ANOVA Analysis on Different Income Sources in the selected study area. The researcher has selected three variables for one-way ANOVA analysis, these are Forest Income, Livestock Income and Agriculture Income.

5. Results and Discussion

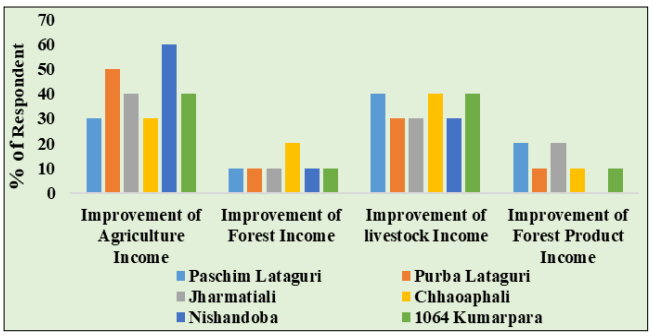
The figure (Fig; 2) shows the household income in the study area. This analysis indicates that the maximum household income is agriculture (average 40%). Another occupation is very much significant that is business (average 23.33%). Because in these area people prepare handmade forest product like bamboo table, chair & leaf bag etc. The third important point is daily wages (average 18.33%) because Forest Fringe people engaged in forest-related work. This opportunity was given by the Forest Department. In the forest area another important income source is tourism (average 11.66%). Some people engage in tourist lodges & participate in folk dance. In Chhaoaphali FPC members perform folk dance at daily evening time. Very few persons engaged in the service sector (average 6.66%) in the selected study area.



***Source*:** Primary Data, 2025

Fig 2: Household Income

The figure (Fig: 3) represents the Improvement of Income Sources in the selected study area. This analysis indicates that the agriculture income maximum improved (average 41.66%). Because in the selected study area paddy land was converted into a tea garden. The livestock income (35%) is very much significant in the study area. Because of various types of domestic animals there like cow, goat, hen, pig etc. The forest fringe people collected forest products like bamboo, tree leaf and cane. These materials are used and prepare handmade products. The handmade products are bamboo tables, chairs, leaf handbags etc. The improvement of forest product income average percentage is 11.66. The forest fringe people's response that improved forest income is 11.66%. So, it is significant that agriculture income and livestock income are maximum improved. Another forest income and forest-related product income is less compared to agriculture and livestock income.

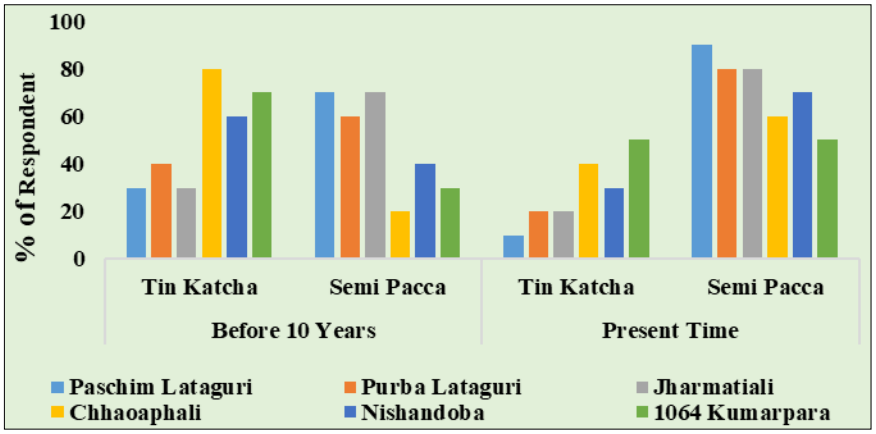


***Source*:** Primary Data, 2025

Fig 3: Improvement of Income Sources

The figure (Fig: 4) shows the type of house in the selected study area before 10 years ago and present time. Significantly, 10 years ago 51.66% (average percentage) of Tin Katcha houses and at present time 28.33% (average percentage) of Tin Katcha houses are identified. So, Tin Katchha house decreasing compare to the 10 years ago. Another Semi Pacca house is 48.33% (average percentage)

identified 10 years ago but in the present time Semi Pacca house is 71.66% (average percentage). So, this analysis indicates that the Semi Pacca house is increasing compared to the before 10 years ago.



***Source*:** Primary Data, 2025

Fig 4: House Types

Table 2: One-way ANOVA Analysis on Collected Forest Products

ANOVA						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Collected Fire Wood	Between Groups	173.333	5	34.667	2.836	.024
	Within Groups	660.000	54	12.222		
	Total	833.333	59			
Collected Honey	Between Groups	313.333	5	62.667	3.318	.011
	Within Groups	1020.000	54	18.889		
	Total	1333.333	59			
Collected Leaf	Between Groups	133.333	5	26.667	2.057	.085
	Within Groups	700.000	54	12.963		
	Total	833.333	59			
Collected Fruits & Flowers	Between Groups	548.333	5	109.667	6.807	.000
	Within Groups	870.000	54	16.111		
	Total	1418.333	59			

***Source*:** Calculated by the Researcher, Data Extracted from Primary Survey

The table represents the collection of forest resources like firewood, honey, leaf, fruits and flowers. Here, one-way ANOVA has been applied to show the collected forest product in different FPC committees in the study area. The collected forest firewood, collected honey and collected fruits and flowers are very significant in the study area. There is a significant difference between the selected six FPC committees in the study area. The variables of collected forest firewood, collected honey, collected fruits and flowers differences are identified among the FPC committees. The collected leaf variables indicate that their no significant difference among the FPC committees.

Table 3: One-way ANOVA Analysis on Different Income Sources

ANOVA						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Forest Income	Between Groups	250000.000	5	50000.000	.198	.962
	Within Groups	13650000.000	54	252777.778		
	Total	13900000.000	59			
Livestock Income	Between Groups	137083333.333	5	27416666.667	4.310	.002
	Within Groups	343500000.000	54	6361111.111		
	Total	480583333.333	59			
Agriculture Income	Between Groups	85483333.333	5	17096666.667	1.617	.171
	Within Groups	571100000.000	54	10575925.926		
	Total	656583333.333	59			

***Source*:** Calculated by the Researcher, Data Extracted from Primary Survey

The shows the different incomes like Forest Income, Livestock Income and Agricultural Income of the selected study area. Here, one-way ANOVA has been applied to show the income in different FPC committees in the study area. The Livestock income is very significant and there is a significant difference between the selected six FPC committees. The forest income and agricultural income there is no significant difference between the selected six FPC committees.

5.1 Role of Forest Department for Improving Rural Livelihoods

- The Forest Range Officer created a Folk-Dance Group in the Chhaoaphali FPC.
- Forest Department provide opportunity to forest related work like daily wage, Tree plantation or forest related work.
- The Forest Department gives concrete houses to Forest Villagers.
- The Forest Department also provides a Tube well, Gas oven, touch light and Latrine.
- The Forest Department gives a 25% share to every FPC member. Because all FPC members protect forest resources.

Photo 1: Domestic Animal Pig

Photo 2: Domestic Animals Goat

Photo 3: Collected Leafs & Firewood's

Photo 4: Domestic Hens

Photo 5: Collected Firewood

Photo 6: Handmade Table & Chair

5.2 Finding of the study

- It is very significant that the maximum forest fringe people collect firewood, tree leaf, fruits, flowers and honey.
- Livestock income is very significant in forest fringe areas because all forest fringe people have domestic animals like cows, hens, goats, and pigs.
- The Collected firewood, collated honey, collected fruits & Flowers are significant because all forest fringe people collected forest resources for their livelihood development.
- The forest fringe people use livestock animals for selling, consumption, milk selling and manure (organic) for agriculture.
- The Forest Department provides forest-related work like Daily wage and tree plantation.

- The forest fringe people collect bamboo, cane, leaf and prepare handmade bamboo tables, chairs and handbags.

6. Conclusion

This study aims to improve the livelihood of forest fringe people. The findings indicate that the two forest villages (Chhaoaphali FPC forest fringe people & 1064 Kumar Para FPC forest fringe people) are mostly involved in forest resources. They are collecting forest resources from forest areas for their development of livelihood. Furthermore, the results reveal that Paschim Lataguri FPC forest fringe people, Purba Lataguri FPC forest fringe people, Jharmatiali FPC forest fringe people and Nishandoba FPC forest fringe people have lower forest dependency, but they collect forest resources. Moreover, collected firewood, collected honey and collected fruits & flowers are significant difference between the selected six FPC committees in the study area. The Livestock income is very significant and there is a significant difference between the selected six FPC committees. The Forest Department provides various forest-related work like tree plantation, daily wages etc. for the development of their livelihoods. The forest fringe people collected forest products like fire wood, honey, fruits and flowers. The forest fringe people collected bamboo and cane, they prepared handmade bamboo chairs, tables, small handbags etc. So, forest resources play an important role in improving rural livelihoods in forest fringe area.

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