The Seybold Report

ISSN 1533-9211

DOI: 10.5281/zenodo.10025337

ASSESSING FOREST RESOURCES AND THEIR ROLE IN FOSTERING SUSTAINABLE RURAL LIVELIHOODS: AN INVESTIGATION INTO THE SUB-DIVISIONS OF DARJEELING HILLS, WEST BENGAL

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Abstract

Promoting sustainable rural development through the utilization of natural forest resources holds significant potential for enhancing rural livelihoods. It is imperative not to disregard issues concerning forest resources and their impact on rural livelihoods when making policy decisions and implementing interventions. Therefore, it is essential for various agencies to take proactive measures to ensure the efficient and responsible utilization of forest resources, as this stands as an effective means of enhancing the well-being of rural households. The study also underscores the lack of attention given to the cultural, traditional, and environmental value of forest resources in the Darjeeling hills. Awareness programs conducted by both governmental and non-governmental organizations in the study area are limited. Furthermore, some communal areas created through land reform processes often need to pursue their development independently, facing minimal or no external assistance. It has been observed that rural households employ a variety of livelihood strategies beyond agriculture and forestry income. Active involvement of local communities is pivotal in achieving sustainable development objectives.

Keywords: Forest Resources, Rural development, Sustainability, Darjeeling Hills, Rural Community, Forest Community, Rural Livelihood.

1. INTRODUCTION

Forest and by extension trees are a resource vital to the existence of life on the earth. Evaluating nature of forests and monitoring their status are important from the perspective of national wealth and prosperity and germane to the fundamentals of a knowledge economy. Forest resources constitute an immense value by contributing directly and indirectly to the welfare of individual. Directly, as a productive resource, it provides timber, fuel wood, bamboo and other non-timber forest products (NTFP) like fodder, honey, gums, resin, dyes, medicinal herbs and edible forest leaves.

Indirectly, the forest also performs a protective, social and aesthetic function like forest preserves biomass and bio-diversity, conserves moisture within the soil and prevents natural calamities like floods and droughts. Forest also performs irreplaceable ecological services. Therefore, the forest is crucial not just for the economic development and preservation of the world environment but also for maintaining all varieties of life on the terrestrial. Sustainable management of this forest area is essential for three key reasons.

First, forests shelter and feed hundreds of millions of people, including the poorest.

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ISSN 1533-9211
DOI: 10.5281/zenodo.10025337

Secondly, deforestation causes serious environmental damage locally and globally.

Third, a controlled/sustainable commercial exploitation of forest products could contribute to economic growth. However, the intrinsic characteristics of forests make sustainable management a challenge. The positive externalities provided by forests are uncertain, diffuse and difficult to assess. This symbiotic relationship between forest and human being has existed since the early man and its society.

The rapid growth of population and rising standard of living has brought increasing pressure on forest both directly and indirectly. The excessive exploitation of natural forest for the mere fulfillment of human needs and greed lead to multiple effects on the natural ecosystem, disappearance of plant and species, degrades forest ecosystem, loss of wildlife habitation, etc.

2. LITERATURE REVIEW

Florin-Constantin Mihai (2023) on his article remark entitled 'Circular Economy and Sustainable Rural Development' stated that, Agricultural and municipal waste fractions are improperly managed, which exposes rural areas to environmental degradation. Urban and rural communities both contribute to the growing global concern about plastic trash degradation of the environment. The convergence of circular economy strategies with other sustainable economic options, such as the bio-economy, blue economy, green economy, and digital economy, might lead to sustainable rural development. In rural areas, there is a need for better spatial planning, statistical data, legal enforcement, and monitoring of (plastic) pollution activities with community involvement.

Adhi Iman Sulaiman et. Al. (2022) describes on their paper titled 'Community Empowerment in Culinary Tourism as Sustainable Rural Development' that, with the involvement of all stakeholders, including business organizations, village administrations, and companies owned by the villagers, sustainable development may be achieved through cooperative initiatives. Participants in economic business groups are driven, idealistic, and independent as they work to create social models for the growth of their organizations without relying on empowerment programs provided by the local or regional governments. As a result of not being included in the creation of development initiatives, people feel excluded or alienated.

Giri Noel and P. Murugesan (2020) on their paper titled **"**A Situational Study of Forest Resources and Rural Livelihoods in Darjeeling Hills: Challenges and Sustainability" finds the study results which indicates that the cultural, traditional, and environmental importance of the forest resources in the Darjeeling Hills has received little attention. There are few awareness-raising initiatives on the usage and protection of forest resources in the study region from both government and non-governmental groups. Rural families don't actively participate in forest conservation measures since current forest management systems imply that forest resources are shared resources. The best approaches to consider while thinking about the development of rural livelihoods and the forest dwellers of the Darjeeling hills are improved resource management, routine monitoring on forests and its resources, and sustainable forest resource management.

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ISSN 1533-9211
DOI: 10.5281/zenodo.10025337

Erikson and Klapwijk (2018) in their article entitled, "Attitudes towards biodiversity conservation and carbon substitution in forestry: a study of stakeholders in Sweden", they examined the environmental problem, awareness, forest belief and environmental management attitudes (biodiversity conservation and carbon substitution) among stakeholders in Sweden, and explored the effect of local biodiversity versus global climate change frame on attitude. In Sweden forest, stakeholders include forest owners, the forestry industry, and groups representing various interests' viz. recreational, environmental and endogenous groups. They have studied supported both ownership and environmental/recreational interest groups (membership sample) and among the scholars (student sample). Further, they found that awareness of biodiversity loss and eco-social belief influenced attitudes towards biodiversity conservation among the stakeholders.

3. RESEARCH METHODOLOGY

Sample Design

The Darjeeling District in West Bengal consists of four sub-divisions along with nine blocks and four municipalities. This study was carried out specifically focusing on Darjeeling hill Sub-Division in three (3) blocks namely Darjeeling-Pulbazar, Rangli-Rangliot and Jorebunglow-Sukhiapokhri block.

These blocks were identified based on the hilly geographical location along with natural resources and rural livelihood. From each of the above-identified blocks, 5 (five) village Panchayats have been selected. Further, 20 (twenty) households from each village panchayat and a total number of samples selected for the present study it was 300 (three hundred) as detailed below, by using Disproportionate Stratified Random Sampling method.

Objectives

- To assess the present forest resources of Darjeeling hills and its impacts and importance of sustainable rural development of Darjeeling hilly region.
- To evaluate effects of socio-economic factors on forest resources. Analyze the various aspects of socio-economic factors such as gender, age, education, household, family income, economic status, employment status, house type on sustainable rural development with respect to forest resources.

Hypothesis

- There is a relationship between access and suitability of forest resources and sustainable rural livelihood among the dependents communities.

Data Analysis

The survey data, after evaluation and coding, have been entered into excel-spreadsheets. To understand the nature of the data, frequency tables were prepared, and subsequently, the analysis and tabulation have been carried out using research techniques based on the requirement.

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Further Chi-Square test and Binary Logistic Fittest Model and Factor Analysis have been performed on the data. In very general terms, Factor Analysis (FA) can be seen as approaches to summarizing and uncovering any patterns in a set of multivariate data, essentially by reducing the complexity of the data.

Principal component analysis is a multivariate technique for transforming a set of related (correlated) variables into a set of unrelated (uncorrelated) variables that account for decreasing proportions of the variation of the original observations.

4. RESULT AND DISCUSSION

The data provides valuable insights into the diverse demographic and socio-economic profile of the surveyed individuals. It includes information on respondents' sex, age, education, religion, community, occupation, marital status, income, type of family, food habit, and type of house. Such a thorough analysis of these characteristics is essential for understanding the social fabric of the surveyed population and can serve as a foundation for designing targeted development and policy initiatives.

Table 4.1: General Characteristics of Sample Respondents

Background characteristics / Variables	Development Blocks			Total %
	Jorebunglow-SukhiaPokhri	Darjeeling Pulbazar	Takdah-RangliRangliot	
	1	2	3	
1.1 Gender				
Male	77	75	67	219
	76.20%	68.20%	75.30%	73.00%
Female	24	35	22	81
	23.80%	31.80%	24.70%	27.00%
1.2 Age				
Below 18 years	6	9	11	26
	5.90%	8.20%	12.40%	8.70%
Between 19-30 years	48	45	37	130
	47.50%	40.90%	41.60%	43.30%
Between 31-55 years	37	36	27	100
	36.60%	32.70%	30.30%	33.30%
Above 56 years	10	20	14	44
	9.90%	18.20%	15.70%	14.70%
1.3 Education				
Illiterate	3	0	1	4
	3.00%	0.00%	1.10%	1.30%
Primary school	4	5	2	11
	4.00%	4.50%	2.20%	3.70%
High school	4	8	14	26
	4.00%	7.30%	15.70%	8.70%
Higher secondary	48	47	38	133
	47.50%	42.70%	42.70%	44.30%
Graduation	28	29	28	85
	27.70%	26.40%	31.50%	28.30%

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ISSN 1533-9211
DOI: 10.5281/zenodo.10025337

Post-Graduation	14	21	6	41
	13.90%	19.10%	6.70%	13.70%
1.4 Religion				
Hindu	51	46	44	141
	50.50%	41.80%	49.40%	47.00%
Buddhist	18	35	21	74
	17.80%	31.80%	23.60%	24.70%
Christian	29	27	22	78
	28.70%	24.50%	24.70%	26.00%
Muslim	3	2	2	7
	3.00%	1.80%	2.20%	2.30%
1.5 Community				
EWS	12	10	4	26
	11.90%	9.10%	4.50%	8.70%
ST	20	27	23	70
	19.80%	24.50%	25.80%	23.30%
SC	8	7	4	19
	7.90%	6.40%	4.50%	6.30%
GEN	18	28	13	59
	17.80%	25.50%	14.60%	19.70%
OBC	43	38	45	126
	42.60%	34.50%	50.60%	42.00%
1.6 Occupation				
Labour	3	2	2	7
	3.00%	1.80%	2.20%	2.30%
Business	24	21	18	63
	23.80%	19.10%	20.20%	21.00%
State Government Employed	18	17	10	45
	17.80%	15.50%	11.20%	15.00%
Private Job	23	32	19	74
	22.80%	29.10%	21.30%	24.70%
Self-employed	13	30	27	70
	12.90%	27.30%	30.30%	23.30%
Student	16	4	6	26
	15.80%	3.60%	6.70%	8.70%
Farmer	4	3	4	11
	4.00%	2.70%	4.50%	3.70%
Central Govt. Employed	0	1	3	4
	0.00%	0.90%	3.40%	1.30%
1.7 Marital Status				
Married	46	52	28	126
	45.50%	47.30%	31.50%	42.00%
Unmarried	55	58	61	174
	54.50%	52.70%	68.50%	58.00%
1.8 Income(monthly) in Rupees				
below 3000	7	10	9	26
	6.90%	9.10%	10.10%	8.70%
3000-5000	9	14	10	33
	8.90%	12.70%	11.20%	11.00%

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5000-8000	17	39	18	74
	16.80%	35.50%	20.20%	24.70%
above 8000	68	47	52	167
	67.30%	42.70%	58.40%	55.70%
1.9 Type of family				
Nuclear	97	101	80	278
	96.00%	91.80%	89.90%	92.70%
Joint	4	9	9	22
	4.00%	8.20%	10.10%	7.30%
1.10 Food Habit				
Non-Vegetarian	85	91	80	256
	84.20%	82.70%	89.90%	85.30%
Vegetarian	16	19	9	44
	15.80%	17.30%	10.10%	14.70%
1.11 Type of House				
Kuccha	1	3	0	4
	1.00%	2.70%	0.00%	1.30%
RCC	27	23	21	71
	26.70%	20.90%	23.60%	23.70%
With toilet	71	84	67	222
	70.30%	76.40%	75.30%	74.00%
Without toilet	2	0	1	3
	2.00%	0.00%	1.10%	1.00%

1.1 Gender

It is clearly evident from the above table that 73% of sample respondents are male and rest 27% constitutes of women respondents. It is clear that the ratio of men is higher in comparison to women is due to various reasons. Above table clearly shows that women respondents constituted below 25% in almost all the three study Development Blocks.

The gender distribution varies across the three development blocks. Takdah-RangliRangliot Development Block has the highest percentage of males (75.30%), followed by Jorebunglow-SukhiaPokhri Development Block (76.20%), and Darjeeling-Pulbazar Development Block (68.20%). Conversely, Darjeeling-Pulbazar Development Block has the highest percentage of females (31.80%), followed by Takdah-RangliRangliot Development Block (24.70%), and Jorebunglow-SukhiaPokhri Development Block (23.80%).

There is a gender disparity in each development block, with more males than females. Jorebunglow-SukhiaPokhri Development Block has the lowest gender disparity with a male-female ratio of approximately 3:1. Takdah-RangliRangliot Development Block has the highest gender disparity with a male-female ratio of over 3:1. Darjeeling-Pulbazar Development Block falls in between, with a male-female ratio of approximately 2:1.

1.2 Age

Darjeeling-Pulbazar Development Block has the highest percentage of individuals in the 19-30 age groups (40.90%). Takdah-RangliRangliot Development Block has the highest percentage of individuals in the 31-55 age groups (30.30%). Takdah-RangliRangliot

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Development Block has the highest percentage of individuals above 56 years (15.70%). Jorebunglow-SukhiaPokhri Development Block has the lowest percentage of individuals in all age groups. The 19-30 age group is the largest in all three blocks, indicating a significant youth population. Darjeeling Pulbazar Development Block has a relatively higher percentage of individuals in the 19-30 and 31-55 age groups. Takdah-RangliRangliot Development Block has a higher percentage of individuals in the 31-55 age groups. All three blocks have a relatively smaller percentage of individuals below 18 years.

1.3 Education Status

As shown in Table No. 1.3 the education levels as attained by the sample respondents in the three Development Blocks. It has been noted the illiterate percentage of three Development Blocks are Jorebunglow-SukhiaPokhri (3.00%), Darjeeling Pulbazar (0.00%) and Takdah-RangliRangliot (1.10%). The majority of individuals in all three development blocks have completed at least their higher secondary education, with percentages ranging from 42.70% to 47.50%. Graduation is the next most common education level, with percentages ranging from 26.40% to 31.50%. Post-graduation is the least common education level, with percentages ranging from 6.70% to 19.10%. The percentage of illiterate individuals is quite low, with an overall percentage of 1.30%. Primary school education is also relatively low, with an overall percentage of 3.70%. High school education falls in between, with an overall percentage of 8.70%.

1.4 Religion

Darjeeling Pulbazar has the highest percentage of Hindus among the three blocks (41.80%). Takdah-RangliRangliot has the highest percentage of Hindus overall (49.40%). Buddhism has a notable presence, particularly in Darjeeling Pulbazar and Jorebunglow-SukhiaPokhri, with percentages exceeding 30% in both blocks. This reflects the cultural and demographic diversity in the region, as Buddhism is a significant religion among certain ethnic groups. The Christian population is relatively consistent across the three blocks; with percentages ranging from 24.50% to 28.70%.This indicates that Christianity has a consistent presence in the region. The Muslim population is a minority in all three development blocks, with percentages below 3%. While the Muslim community is relatively small, it adds to the overall religious diversity of the area.

1.5 Community

The data reflects a diverse community composition in all three development blocks. Other Backward Classes (OBC) have the largest presence among the listed communities, with an overall percentage of 42.00%. Scheduled Tribes (ST) have a significant presence in all three blocks, with an overall percentage of 23.30%. General category individuals (GEN) also make up a notable portion of the population, with an overall percentage of 19.70%. Economically Weaker Sections (EWS) constitute a smaller percentage of the population, with an overall percentage of 8.70%. Scheduled Castes (SC) form the smallest community among those listed, with an overall percentage of 6.30%. The EWS category represents individuals who belong to economically disadvantaged sections of society. Despite being a relatively smaller percentage

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ISSN 1533-9211
DOI: 10.5281/zenodo.10025337

in all three blocks (ranging from 4.50% to 11.90%), they are an essential focus of social and economic development programs.

1.6 Occupation

The percentage of individuals engaged in labour is relatively low, ranging from 1.80% to 3.00% across the three blocks. This suggests that a small proportion of the population is involved in manual labour. Business-related occupations are moderately prevalent, with percentages ranging from 19.10% to 23.80%. This indicates that a significant number of individuals are involved in entrepreneurial and business activities. State government employment is notable in all three blocks, with percentages ranging from 11.20% to 17.80%. This suggests a substantial government workforce in the region. Private sector employment is relatively common, with percentages ranging from 21.30% to 29.10%. This indicates a significant presence of private industries and businesses providing employment opportunities. Self-employment is particularly prevalent, with percentages ranging from 12.90% to 30.30%. This suggests that many individuals are engaged in entrepreneurial ventures and self-sustaining businesses. The student population varies across the blocks, with percentages ranging from 3.60% to 15.80%.

1.7 Marital Status

The percentage of married individuals varies across the blocks, ranging from 31.50% to 47.30%. This suggests that a significant portion of the population in these blocks is married. The percentage of unmarried individuals also varies across the blocks, ranging from 52.70% to 68.50%. This indicates that there is a substantial unmarried population in the region. Marital status is an important demographic factor and can have implications for family structure, household dynamics, and social relationships. The percentage of married individuals is lower in Takdah-RangliRangliot (31.50%) compared to the other two blocks. This may indicate variations in marriage patterns across the region. The percentage of unmarried individuals is highest in Darjeeling Pulbazar (68.50%), suggesting a relatively larger unmarried population in that block.

1.8 Monthly Income

The percentage of individuals with a monthly income below 3000 Rupees varies across the blocks, ranging from 6.90% to 10.10%. Individuals with a monthly income between 3000 and 5000 Rupees are also present across the blocks, with percentages ranging from 8.90% to 12.70%. This represents a moderate income bracket. The percentage of individuals in the 5000-8000 Rupees income range varies, with the highest percentage (35.50%) in Darjeeling Pulbazar. This income bracket suggests a relatively higher income level compared to the previous categories. The income category of above 8000 Rupees has the highest percentage in Jorebunglow-SukhiaPokhri (67.30%) and Takdah-RangliRangliot (58.40%). This category represents individuals with a relatively higher income level.

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1.9 Types of Family

The prevalence of nuclear families, ranging from 89.90% to 96.00% across the blocks, indicates a significant trend toward family independence. In nuclear families, households typically consist of parents and their children, resulting in smaller, self-contained family units. In nuclear families, resource management is generally more straightforward, as the household's economic and social responsibilities are limited to a smaller group. Joint families are known for sharing resources such as land, labor, and income among family members. This communal resource-sharing approach can lead to more efficient resource utilization and contribute to economic stability, particularly in rural settings. Members of joint families tend to rely on one another for various aspects of their lives, including emotional, financial, and care giving support.

1.10 Food Habit

In Jorebunglow-SukhiaPokhri, there are a total of 256 individuals, whereas in Darjeeling Pulbazar, there are 110 individuals, and in Takdah-RangliRangliot, there are 89 individuals. In Jorebunglow-SukhiaPokhri, 85 individuals (84.20%) have a non-vegetarian food habit, while 16 individuals (15.80%) have a vegetarian food habit. In Darjeeling Pulbazar, 91 individuals (82.70%) have a non-vegetarian food habit, while 19 individuals (17.30%) have a vegetarian food habit. In Takdah-RangliRangliot, 80 individuals (89.90%) have a non-vegetarian food habit, while 9 individuals (10.10%) have a vegetarian food habit. Across all three development blocks, a majority of individuals have a non-vegetarian food habit, with an average of approximately 86.10% of the population being non-vegetarian and 13.90% being vegetarian.

1.11 Types of Houses

The table provides information on the total number of households in each development block based on the type of house (Kuccha, RCC) and the presence or absence of toilets. In Jorebunglow-SukhiaPokhri, there are a total of 4 households, out of which 1 (1.00%) have Kuccha houses, and 27 (26.70%) have RCC houses. In Darjeeling Pulbazar, there are a total of 110 households, with 3 (2.70%) having Kuccha houses, and 23 (20.90%) having RCC houses. In Takdah-RangliRangliot, there are a total of 71 households, with none (0.00%) having Kuccha houses, and 21 (23.60%) having RCC houses. Across all three development blocks, the majority of households have toilets. In Jorebunglow-SukhiaPokhri, 71 households (70.30%) have toilets, while 2 households (2.00%) do not. In Darjeeling Pulbazar, 84 households (76.40%) have toilets, while none (0.00%) do not. In Takdah-RangliRangliot, 67 households (75.30%) have toilets, while 1 household (1.10%) does not. It's interesting to note that in Jorebunglow-SukhiaPokhri, all households with Kuccha houses also have toilets, whereas in Darjeeling Pulbazar, all households with Kuccha houses also have toilets.

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ISSN 1533-9211
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Table 4.2: Distribution of Sample Respondents According to Forest Resources Related Details

Background Characteristics / Variables	Development Blocks			Total %
	Jorebunglow-SukhiaPokhri	Darjeeling Pulbazar	Takdah-RangliRangliot	
	1	2	3	
2.1 Household dependency of forest resources / products				
Directly	64	63	48	175
	63.40%	57.30%	53.90%	58.30%
Indirectly	24	28	32	84
	23.80%	25.50%	36.00%	28.00%
Both	13	19	9	41
	12.90%	17.30%	10.10%	13.70%
2.2 Duration of usage of forest resources				
Since Childhood	54	70	49	173
	53.50%	63.60%	55.10%	57.70%
My ancestors also used it	33	25	31	89
	32.70%	22.70%	34.80%	29.70%
New at place	14	15	9	38
	13.90%	13.60%	10.10%	12.70%
2.3 Number of village families' dependent on forest and its resources				
Above 10	101	110	89	300
	100.00%	100.00%	100.00%	100.00%
Less than 10	00	00	00	00
	00%	00%	00%	00%
2.4 Reason for dependencies				
Personal use	78	73	71	222
	77.20%	66.40%	79.80%	74.00%
Gives Income	15	23	14	52
	14.90%	20.90%	15.70%	17.30%
No other alternative opportunity than forest resources	8	14	4	26
	7.90%	12.70%	4.50%	8.70%

2.1 Household Dependency of Forest Resources

In the "Jorebunglow-SukhiaPokhri" development block, 63.40% of households have direct dependency on forest resources/products. In the "Darjeeling Pulbazar" development block, 57.30% of households have direct dependency. In the "Takdah-RangliRangliot" development block, 53.90% of households have direct dependency. Across all development blocks, on average, 58.30% of households have direct dependency. In the "Jorebunglow-SukhiaPokhri" development block, 23.80% of households have indirect dependency on forest resources/products. In the "Darjeeling Pulbazar" development block, 25.50% of households have indirect dependency. In the "Takdah-RangliRangliot" development block, 36.00% of households have indirect dependency. Across all development blocks, on average, 28.00% of households have indirect dependency.

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2.2 Duration of Usage of Forest Resources

In the "Jorebunglow-SukhiaPokhri" development block, 53.50% of respondents have been using forest resources since childhood. In the "Darjeeling Pulbazar" development block, 63.60% of respondents fall into this category. In the "Takdah-RangliRangliot" development block, 55.10% of respondents have been using forest resources since childhood. Across all development blocks, on average, 57.70% of respondents have used forest resources since childhood. 32.70% of respondents in the "Jorebunglow-SukhiaPokhri" development block reported that they had learned how to use forest resources from their ancestors. 22.70% of respondents in the "Darjeeling Pulbazar" development block fall into this group. 34.80% of responders in the "Takdah-RangliRangliot" development block had ancestor usage. An average of 29.70% of respondents indicates ancestral use across all development blocks. 13.90% of responders in the "Jorebunglow-SukhiaPokhri" development block are new residents. 13.60% of respondents live in the "Darjeeling Pulbazar" development block for the first time. 10.10% of respondents live in the "Takdah-RangliRangliot" development block for the first time. Across all development blocks, on average, 12.70% of respondents are new to the area. The data provides insights into the historical and generational use of forest resources among the surveyed population.

2.3 Dependency of Families on Forest and its Resources

In all three development blocks, 100% of respondents indicate that there are more than 10 village families dependent on forest resources. There are no respondents in any of the development blocks who reported "Less than 10" village families dependent on forest resources. This is represented as 0% for each block. The absence of respondents indicating "Less than 10" suggests a unanimous perception among respondents that a significant number of village families depend on forests. The data strongly indicates that, according to the respondents, there is a high level of dependency on forest resources among village families in all three development blocks.

2.4 Reason for dependencies on Forest Resources

In the "Jorebunglow-SukhiaPokhri" development block, 77.20% of respondents state that they are dependent on forest resources for personal use. In the "Darjeeling Pulbazar" development block, 66.40% of respondents fall into this category. In the "Takdah-RangliRangliot" development block, 79.80% of respondents cite personal use as the reason for dependency. On average across all development blocks, 74.00% of respondents mention personal use as the reason for dependency. In the "Jorebunglow-SukhiaPokhri" development block, 14.90% of respondents indicate that their dependency on forest resources is for generating income. In the "Darjeeling Pulbazar" development block, 20.90% of respondents cite income generation. In the "Takdah-RangliRangliot" development block, 15.70% of respondents rely on forest resources for income. On average across all development blocks, 17.30% of respondents mention income generation as the reason for dependency. In the "Jorebunglow-SukhiaPokhri" development block, 7.90% of respondents state that they have no other alternative opportunity than forest resources for their livelihood. In the "Darjeeling Pulbazar" development block,

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ISSN 1533-9211
DOI: 10.5281/zenodo.10025337

12.70% of respondents mention this reason. In the "Takdah-RangliRangliot" development block, 4.50% of respondents rely on forest resources due to a lack of alternatives. On average across all development blocks, 8.70% of respondents cite no other alternative opportunity as the reason for dependency.

Table 4.3: Distribution of Respondents According to Dependency on Forest Products

Background Characteristics / Variables	Development Blocks			Total %
	Jorebunglow-SukhiaPokhri	Darjeeling Pulbazar	Takdah-RangliRangliot	
	1	2	3	
3.1 Frequency of going for collection				
Weekly	65	81	56	202
	64.40%	73.60%	62.90%	67.30%
Occasional	29	23	27	79
	28.70%	20.90%	30.30%	26.30%
Seasonal	7	6	6	19
	6.90%	5.50%	6.70%	6.30%
3.2 Earnings from MFP in a month				
below 3000.	65	81	73	219
	64.40%	73.60%	82.00%	73.00%
3001-9999	36	29	16	81
	35.60%	26.40%	18.00%	27.00%
Above 10000	00	00	00	00
	00%	00%	00%	00%
3.3 Frequency in selling of MFP				
Weekly	9	18	8	35
	8.90%	16.40%	9.00%	11.70%
Monthly	6	19	11	36
	5.90%	17.30%	12.40%	12.00%
Occasional	0	3	1	4
	0.00%	2.70%	1.10%	1.30%
Not going for selling (domestic use only)	86	70	69	225
	85.10%	63.60%	77.50%	75.00%

3.1 Frequency of collection of Major Forest Products

The data is categorized into three groups: "Weekly," "Occasional," and "Seasonal," representing different frequencies of collection. In the "Jorebunglow-SukhiaPokhri" development block, 64.40% of respondents collect major forest products weekly. In the "Darjeeling Pulbazar" development block, 73.60% of respondents have a similar frequency of collection. In the "Takdah-RangliRangliot" development block, 62.90% of respondents collect major forest products weekly. On average across all development blocks, 67.30% of respondents collect major forest products on a weekly basis. A significant but smaller percentage of respondents (ranging from 20.90% to 30.30%) in the different development blocks collect major forest products occasionally. A very small percentage of respondents (ranging from 5.50% to 6.90%) in the different development blocks collect major forest products seasonally.

ISSN 1533-9211

DOI: 10.5281/zenodo.10025337

3.2 Earnings from MFP (per month)

In the "Darjeeling Pulbazar" development block, 73.60% of respondents fall into this income range. In the "Takdah-RangliRangliot" development block, 82.00% of respondents earn below 3000 in a month from MFP.On average across all development blocks, 73.00% of respondents earn below 3000 in a month from MFP. A smaller percentage of respondents (ranging from 18.00% to 35.60%) in the different development blocks earn between 3001 and 9999 in a month from MFP. There are no respondents in any of the development blocks who reported earnings above 10000 in a month from MFP. This is represented as 0% for each block. The data highlights that the majority of respondents in all three development blocks earn their income from minor forest products, with a significant percentage earning below 3000 in a month. This indicates the economic significance of MFP in their livelihoods. There is a notable variation in income levels, with some respondents earning between 3001 and 9999.

3.3 Frequency in selling of MFP

In the "Jorebunglow-SukhiaPokhri" development block, 8.90% of respondents sell MFP on a weekly basis. In the "Darjeeling Pulbazar" development block, 16.40% of respondents have a similar frequency of selling. In the "Takdah-RangliRangliot" development block, 9.00% of respondents sell MFP weekly. On average across all development blocks, 11.70% of respondents sell MFP weekly. A percentage of respondents (ranging from 5.90% to 17.30%) in the different development blocks sell MFP on a monthly basis. A very small percentage of respondents (ranging from 0.00% to 2.70%) in the different development blocks sell MFP occasionally. The majority of respondents (ranging from 63.60% to 85.10%) in the different development blocks do not go for selling MFP and use them domestically only.

5. FINDINGS AND SUGGESTIONS

- To secure the long-term availability of forest resources for rural communities, policies that support sustainable forest management practices must be developed and put into place.
- Encourage active involvement of local communities in forest resource management decisions and practices to enhance their ownership and responsibility.
- Put in place laws that guarantee fair access to forest resources, taking into consideration the socioeconomic makeup of localities and their proximity to forests.
- Create government-led awareness programs and educational initiatives to encourage local populations to value protecting the environment, especially forests.
- Need to encourage local communities and government organizations to work together more closely so that programs to manage forest resources are more successful.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10025337

6. CONCLUSION

The primary objective of this study was to assess the conservation and management of forest resources and their impact on sustaining rural livelihoods in three hill development blocks within the Darjeeling District. It is noteworthy that this study not only successfully addressed its objectives but also shed light on several key insights regarding the subject matter. One of the most intriguing findings of this research was the profound significance of forest resources for the livelihoods of the communities dependent on them. Simultaneously, it revealed the multifaceted challenges and constraints that these communities face in terms of accessing, utilizing, and controlling these vital resources. Notably, it became evident that the utilization of forest resources is, in certain cases, contingent upon the socio-economic characteristics of the community and the proximity of forests to their habitation. Additionally, there frequently exists a strained relationship between the local community and government institutions, a dynamic that poses a significant threat to the sustainability of livelihoods, particularly concerning forest-related matters. Moreover, while there is a growing belief in the potential of local communities to safeguard natural resources as a cornerstone for sustainable resource management and rural livelihoods, it is imperative to recognize that achieving this paradigm shift may require active government involvement.

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