

Assessing the Impact of Forest Resource Dependency on Sustainable Rural Development in the Hill Blocks of Darjeeling, West Bengal: A Case Study

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Abstract

This research paper examines the impact of forest resource dependency on sustainable rural development in Darjeeling's Hill Blocks, West Bengal. It draws attention to the ecological difficulties that nearby people confront as well as the important role that woods play in their lives. The study offers guidance for similar places worldwide and suggests legislative solutions to strike a balance between rural development and forest preservation. According to the research, local populations greatly value their woods, with forest products acting as essential sources of income, subsistence, and cultural identity. However relying heavily on forests also presents obstacles, such, as deforestation and the deterioration of habitats. The research highlights the importance of finding a balance, between conserving the areas wildlife and supporting the improvement of rural communities' livelihoods.

Keywords: *Darjeeling hills, Forest Resources, Sustainable Rural Development, Forest, Forest Dependent Communities, Rural Livelihood, etc..*

1. Introduction

The Darjeeling region, in West Bengal is known for its landscapes and the coexistence of communities with the surrounding forests for generations. These forests are not just rich in biodiversity. Also serve as lifelines for the locals offering sustenance, economic opportunities and a sense of identity. The lush greenery, dense canopies and pristine waterways have always been integral to the way of life in this area. However this strong connection, between the communities and their forest resources presents both opportunities and challenges that shape their lives. In recent years, the profound dependency on forests for subsistence and livelihood has emerged as a pivotal focal point for researchers, policymakers, and conservationists.

The dichotomy between this dependency and the imperative of forest conservation underscores the intricate dynamics at play in the Hill Blocks. While forests have been the foundation of local economies, they have also faced deforestation, habitat degradation, and threats to their ecological integrity. 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. 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. When ignored by policy makers, the magnitude of the private net benefits of deforestation may seem to outweigh the public benefits of conservation or sustainable management. As a result, deforestation and degradation continue without any real reward for economic development or poverty reduction.

2. Literature Review

Pandhari Rambhau Gore (2023) explains in his paper entitled ‘Agriculture and Rural development’ that, a more comprehensive approach to rural development and the role of farming in the process, including measures to diversify income sources, may be needed in other rural regions where agricultural employment only makes up a tiny fraction of the workforce. In poor and emerging nations, agriculture offers rural residents a significant number of job options. It is a crucial source of income. Landless labourers and small-scale farmers typically work in non-agricultural businesses including handicraft, furniture, textiles, leather, metal work, processing, and other services. It's time for an under developed nation's rural economy to be based on agriculture and related industries.

Yaw Okyere Akomaning et. Al. (2023) in their research paper entitled ‘Sustainable Management of Atiwa and Bobiri Forest Reserves of Ghana towards Rural development’ formulated that; the as long as wage employment and other forms of income are few, rural residents in developing nations will continue to be solely dependent on forest resources (both wood and non-timber). According to this perspective, the inclination to exploit and use forest resources improperly is considerable owing to population development and an increase in the use of agricultural activities. Nearly all of the project's operations that are carried out to preserve the woods are not actively participated in by the majority of people in the forest-fringe settlements. Therefore, in order to foster a sense of ownership among the people, the government must eventually include the community in environmental protection efforts. The government may utilize this method to educate rural residents who are interested in protecting the woods, which will eventually provide a source of income different from agriculture alone in the rural region.

Pizzi, S. et. Al. (2022) in their existing research has used literature reviews to summarize the relationship between specific domains and Sustainable Development Goals (SDGs). In recent years, many sustainable development studies have adopted statistical analysis as it reflects the general state of the art and changes the course of a research area. However, there is a lack of research on forestry and Sustainable Development Goals. Although forestry is closely linked to the Sustainable Development Goals, there are still many gaps in understanding the relationship between them. These gaps include which goals and Sustainable Development Goals relate to forests and forestry, the relationship between these Sustainable Development Goals, and the state of research on forestry and Sustainable Development Goals.

Giri Noel and P. Murugesan (2019) in their study paper entitled “A Study of Forest Resources for Sustainable Rural Development in Darjeeling Hills of West Bengal” highlighted study's findings have significant ramifications since bettering the quality of forest resources will have a long-term effect on lowering poverty and promoting sustainable rural development. According to popular thinking, resource reliance declines with affluence, therefore actions to strengthen the village's natural resource base would directly benefit the poorest of the poor. On the other hand, if both the affluent and the poor rely on these resources, improving them would have a long-term effect on poverty. Households will continue to rely on forest resources to make a livelihood even as family incomes rise. Additionally, governments have implemented a number of initiatives, yet despite their plans to reduce poverty, this problem persists. The current study demonstrates how dependent rural communities may survive thanks to the forest and its supplies. Planning at the micro level can thus place the highest importance on the preservation and effective management of the forest and its resources.

Chanie M.et. Al (2018) described aspects of the economic contribution of forest resources to sustainable rural development, with natural forest resources contributing significantly to rural livelihoods. Issues relating to forest resources and rural livelihoods should not be ignored in policy decisions and other interventions. Therefore, different agencies should take steps to make efficient use of forest resources, which would be one way to improve the livelihoods of rural households. The result of the study also indicates that very little attention has been paid to the cultural, traditional and environmental value of forest resources. Even awareness programs on the use and conservation of forest resources by various governmental and non-governmental organizations are limited in the study area (Maji area of south-western Ethiopia). Current forest management strategies suggest that forest resources are common resources, resulting in a lack of rural household participation in forest conservation practices.

3. Research Methodology

3.1. Sample Design

Darjeeling district lies between 26°31'N and 27°13'N latitude and between 87°59'E to 88°53'E longitude, the total area is about 3,149Km² and 1/5th cover of the total geographical area of Darjeeling district is hilly. There are four sub-divisions, nine blocks, and four municipalities in West Bengal's Darjeeling District. The three (3) blocks of the Darjeeling Hill Sub-Division—Darjeeling-Pulbazar, Rangli-Rangliot, and Jorebunglow-Sukhiapokhri block—were the primary focus of this study. These areas were chosen because of their rugged terrain, natural resources, and rural livelihood. There have been five (five) village panchayats chosen from each of the blocks mentioned above. Additionally, 20 (twenty) homes from each village panchayat and 300 (three hundred) samples overall were chosen for the current study utilizing the Disproportionate Stratified Random Sampling approach, as explained below.

3.2 Objectives

1. To conduct a comprehensive assessment to quantify the extent of forest resource dependency among the local communities in the Hill Blocks of Darjeeling.
2. To identify and propose strategies and policies that facilitates the coexistence of sustainable rural development and forest conservation.

3.3Hypothesis

A correlation exists between the accessibility and appropriateness of forest resources and the achievement of sustainable rural livelihoods within dependent communities.

3.4 Data Analysis

Following analysis and coding, the survey data were transferred into SPSS data. Frequency tables were created in order to comprehend the kind of data, and then research methodologies were used to analyze and tabulate the data in accordance with the requirements. On the data, further Chi-Square tests, Binary Logistic Fittest Models, and Factor Analysis have been carried out. Factor analysis, or FA, is a broad name for methods of distilling and identifying patterns within a multivariate data set by essentially making the data less complicated. A multivariate method called principal component analysis may be used to change a set of connected (correlated) variables into a set of unrelated (uncorrelated) variables that can explain dwindling percentages of the variance in the initial data.

4. Result and Discussion

This section presents an examination of the traits of the respondents. The information offers insights, into the demographics and socio economic backgrounds of the individuals who participated in the survey. Conducting an analysis of these attributes is crucial to comprehend the structure of the surveyed population and lays a strong groundwork, for crafting tailored development strategies and policy initiatives.

TABLE 4.1: Distribution of Respondents According to dependency on Forest Products

Background Characteristics Variables	Development Blocks			Total %
	Jorebunglow-SukhiaPokhri 1	Darjeeling Pulbazar 2	Takdah-RangliRangliot 3	
4.1.1 How far is the Forest from your House, One Way				
<1 KM	99	110	87	296
	98.00%	100.00%	97.80%	98.70%
between 2 - 5 km	2	0	2	4
	2.00%	0.00%	2.20%	1.30%
4.1.2 Mode of Transport				
By feet	101	110	89	300
	100.00%	100.00%	100.00%	100.00%
By any other mode of transport	00	00	00	00
	00%	00%	00%	00%
4.1.3 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%
4.1.4 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%
4.1.5 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%
4.1.6 Distance of the market				
Less than 5 km	38	26	25	89
	37.60%	23.60%	28.10%	29.70%
5Km – 10 Km	63	81	63	207
	62.40%	73.60%	70.80%	69.00%
Above 10K	0	3	1	4
	0.00%	2.70%	1.10%	1.30%
4.1.7 Requirement of permission for MFP collection				
Yes	66	52	55	173
	65.30%	47.30%	61.80%	57.70%
No	24	47	26	97
	23.80%	42.70%	29.20%	32.30%
No idea	11	11	8	30
	10.90%	10.00%	9.00%	10.00%

Source: Computed

4.1.1 Distance of forest (one way)

The table appears to describe the proximity of respondents' homes to the forest and can provide insights into the accessibility of forest resources for these communities. The data is categorized into two groups: "<1 KM" and "between 2 - 5 km," representing different distances from the forest. In the "Jorebunglow-SukhiaPokhri" development block, 98.00% of respondents live less than 1 kilometer from the forest. In the "Darjeeling Pulbazar" development block, 100.00% of respondents have a similar proximity to the forest. In the "Takdah-RangliRangliot" development block, 97.80% of respondents live within 1 kilometer of the forest. On average across all development blocks, 98.70% of respondents are located less than 1 kilometer away from the forest. Only a small percentage of respondents (ranging from 0.00% to 2.20%) in the different development blocks live between 2 to 5 kilometres from the forest. The data indicates that the majority of respondents in all three development blocks live very close to the forest, with nearly 99% residing within 1 kilometre.

4.1.2 Mode of Transport

Above table 100 percent of respondents in each of the three development blocks cite walking as their preferred means of transportation. This shows that the population questioned in these locations only uses walking as a form of transportation. In none of the development blocks did any respondents report utilizing any other form of transportation save walking.

This is represented as 0% for each block. The data suggests that walking is the sole mode of transport used by respondents in all three development blocks. It indicates that these communities may have limited access to motorized transportation options, which can affect their ability to reach distant locations, including markets, healthcare facilities, and educational institutions.

4.1.3 Frequency for collection of Major Forest Products

This table appears to describe how often respondents collect major forest products, which can provide insights into the role of forest products in their livelihoods. A weekly collection of key forest products is made by 64.40% of respondents in the "Jorebunglow-SukhiaPokhri" development block. 73.60% of respondents in the "Darjeeling Pulbazar" development block had a comparable frequency of collection. A weekly collection of key forest products is made by 62.90% of respondents in the "Takdah-RangliRangliot" development block. 67.30% of respondents, on average, harvest main forest products once a week across all development blocks. 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. This suggests that forest products play a vital role in their regular livelihood activities or household needs. While weekly collection dominates, there are also respondents who collect major forest products occasionally or seasonally. This variation may be influenced by seasonal availability or specific needs.

4.1.4 Earnings from MFP (monthly)

Above earning 64.40% of respondents in the "Jorebunglow-SukhiaPokhri" development block report receiving less than 3,000 from MFP per month. 73.60% of respondents in the "Darjeeling Pulbazar" development block are in this income bracket. 82.00% of respondents in the "Takdah-RangliRangliot" development block report receiving less than 3,000 from MFP per month. 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. 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. This may reflect limitations in the income-generating potential of MFP in these areas. Balancing income generation with conservation efforts is essential to ensure the long-term availability of minor forest products.

4.1.5 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. Those who sell MFP, whether weekly or monthly, likely rely on the income generated from these sales. This income can be vital for meeting household needs and improving livelihoods. The high percentage of respondents using MFP for domestic consumption suggests that these products play a crucial role in meeting daily needs, including food, fuel, and other essentials.

4.1.6 Distance of the market

The data is categorized into three groups: "Less than 5 km," "5Km – 10 Km," and "Above 10K," representing different distances from the market. In the "Jorebunglow-SukhiaPokhri" development block, 37.60% of respondents have a market located less than 5 kilometers away. In the "Darjeeling Pulbazar" development block, 23.60% of respondents have a market within this proximity. In the "Takdah-RangliRangliot" development block, 28.10% of respondents have a market less than 5 kilometers away. On average across all development blocks, 29.70% of respondents have a market located less than 5 kilometers away. A significant percentage of respondents (ranging from 62.40% to 73.60%) in the different development blocks have a market located between 5 and 10 kilometers away. There are very few respondents (ranging from 0.00% to 2.70%) in the different development blocks that have a market located more than 10 kilometers away. this analysis underscores the importance of market access in rural development and the economic activities of these communities. It highlights the need for infrastructure development and policies that facilitate market access while considering the unique circumstances of each development block.

4.1.6 Requirement of permission for MFP collection

In the "Jorebunglow-SukhiaPokhri" development block, 65.30% of respondents require permission for MFP collection. In the "Darjeeling Pulbazar" development block, 47.30% of respondents have a similar requirement. In the "Takdah-RangliRangliot" development block, 61.80% of respondents require permission. On average across all development blocks, 57.70% of respondents require permission for MFP collection. A percentage of respondents (ranging from 23.80% to 42.70%) in the different development blocks do not require permission for MFP collection. A small percentage of respondents (ranging from 10.00% to 10.90%) in the different development blocks are unsure whether permission is required. The data indicates that a significant percentage of respondents across development blocks require permission for MFP collection. This suggests the presence of regulatory frameworks governing MFP collection.

There is variation in the requirement for permission across development blocks, with some blocks having a higher percentage of respondents who require permission. This may reflect differences in local regulations or enforcement.

TABLE 4.2 Distributions of Respondents According to Forest Resources Details

Background Characteristics Variables	Development Blocks			Total %
	Jorebunglow- SukhiaPokhri	Darjeeling Pulbazar	Takdah- RangliRangliot	
	1	2	3	
4.2.1 Knowledge on Forest Resources declining				
Yes	101	110	89	300
	100.00%	100.00%	100.00%	100.00%
No comment	00	00	00	00
	00%	00%	00%	00%
4.2.2 View on the forest products for the past 5 to 10 years				
Remain same	31	21	29	81
	30.70%	19.10%	32.60%	27.00%
Reducing in quantity	62	70	53	185
	61.40%	63.60%	59.60%	61.70%
can't access	8	19	7	34
	7.90%	17.30%	7.90%	11.30%

Source: Computed

4.2.1 Knowledge on Forest Resources declining

The data is categorized into two groups: "Yes" and "No comment," representing whether respondents perceive a decline in their knowledge of forest resources. In all development blocks (Jorebunglow-SukhiaPokhri, Darjeeling Pulbazar, and Takdah-RangliRangliot), 100% of respondents mentioned that they perceive a decline in their knowledge of forest resources. Some respondents did not provide a specific comment on whether their knowledge of forest resources is declining. The data indicates that all respondents across development blocks perceive a decline in their knowledge of forest resources. This unanimous response suggests a shared perception of decreasing knowledge about forest resources.

4.2.2 Observation on the forest products (for the past 5 to 10 years)

In the "Jorebunglow-SukhiaPokhri" development block, 30.70% of respondents perceive that forest products have remained the same in quantity over the past 5 to 10 years. In the "Darjeeling Pulbazar" development block, 19.10% of respondents have a similar perception. In the "Takdah-RangliRangliot" development block, 32.60% of respondents perceive no change. On average across all development blocks, 27.00% of respondents perceive that forest products have remained the same. A significant percentage of respondents (ranging from 59.60% to 63.60%) in the different development blocks perceive a reduction in the quantity of forest products over the past 5 to 10 years. Some respondents (ranging from 7.90% to 17.30%) in the different development blocks mentioned that they can't access forest products. The data suggests that a majority of respondents across development blocks perceive a reduction in the quantity of forest products over the past 5 to 10 years. This indicates a common trend of resource depletion. The perception of reduced quantity highlights concerns about resource depletion and the potential implications for local communities.

TABLE 4.3: Forest and Its Resource Management Related Details

Background Characteristics Variables	Development Blocks			Total %
	Jorebunglow-SukhiaPokhri 1	Darjeeling Pulbazar 2	Takdah-RangliRangliot 3	
4.3.1 Knowledge of Traditional system of management of Forest (land, water, forest resource)				
Yes	84	81	79	244
	83.20%	73.60%	88.80%	81.30%
No	17	29	10	56
	16.80%	26.40%	11.20%	18.70%
4.3.2 Frequency of Forest Officials talk to people about management of forest and its resources				
Every month	3	6	6	15
	3.00%	5.50%	6.70%	5.00%
Every three months	3	6	6	15
	3.00%	5.50%	6.70%	5.00%
Every six months	58	57	44	159
	57.40%	51.80%	49.40%	53.00%
Every year	37	41	33	111
	36.60%	37.30%	37.10%	37.00%
4.3.3 Knowledge about Rights of Village Forest Committee (VFC) in Forest Management and its benefits sharing among forest dwellers				
Yes	38	41	40	119

	37.60%	37.30%	44.90%	39.70%
No	63	69	49	181
	62.40%	62.70%	55.10%	60.30%
4.3.4 VFCs action against illegal activities (if any) done by forest dwellers				
Regularly	25	33	23	81
	24.80%	30.00%	25.80%	27.00%
Occasionally	74	76	64	214
	73.30%	69.10%	71.90%	71.30%
Never	2	1	2	5
	2.00%	0.90%	2.20%	1.70%
4.3.5 Community involvement in managing forest resources will be safeguard on sustainable basis				
Don't Know	15	27	10	52
	14.90%	24.50%	11.20%	17.30%
Agree	31	30	43	104
	30.70%	27.30%	48.30%	34.70%
Strongly Agree	55	53	36	144
	54.50%	48.20%	40.40%	48.00%
4.3.6 Sustainable Forest resource management produces sustainable and positive results for forest dependent communities				
Don't Know	44	42	33	119
	43.60%	38.20%	37.10%	39.70%
Agree	47	41	41	129
	46.50%	37.30%	46.10%	43.00%
Strongly Agree	10	27	15	52
	9.90%	24.50%	16.90%	17.30%

Source: Computed

4.3.1 Knowledge of Traditional system of management of Forest (land, water, forest resource)

Knowledge of traditional forest management practices is a valuable aspect of cultural heritage, as it reflects the wisdom and practices passed down through generations. In the "Jorebunglow-SukhiaPokhri" development block, 83.20% of respondents indicated that they have knowledge about the traditional system of forest management. In the "Darjeeling Pulbazar" development block, 73.60% of respondents have similar knowledge. In the "Takdah-RangliRangliot" development block, 88.80% of respondents possess this knowledge. On average across all development blocks, 81.30% of respondents have knowledge about the traditional system of forest management. A percentage of respondents (ranging from 11.20% to 26.40%) in the different development blocks indicated that they do not have knowledge about the traditional forest management system.

4.3.2 Communication by Forest Management with locals

In all three development blocks, a small percentage of respondents (ranging from 3.00% to 6.70%) reported that forest officials engage with the community about forest and resource management every month. Similar to the "Every month" category, respondents across all blocks reported a small percentage (ranging from 3.00% to 6.70%) of interactions occurring every three months. The majority of respondents in each development block reported that interactions with forest officials regarding forest and resource management occur every six months. This category ranged from 49.40% to 57.40%. Another significant percentage of respondents reported interactions with forest officials occurring every year, ranging from 36.60% to 37.30% across the three blocks. The relatively low frequency of interactions may indicate an opportunity for increased engagement and communication between forest officials and the community. Frequent engagement can foster better understanding and collaboration. Effective communication between forest officials and the community is essential for sustainable forest management, conservation efforts, and addressing any concerns or issues.

4.3.3 Knowledge about Rights of Village Forest Committee (VFC) in Forest Management

The "Jorebunglow-SukhiaPokhri" development block, 37.60% of respondents have knowledge about the rights of VFC in forest management and benefits sharing among forest dwellers. In the "Darjeeling Pulbazar" development block, 37.30% of respondents have similar knowledge. In the "Takdah-RangliRangliot" development block, 44.90% of respondents possess this knowledge. On average across all development blocks, 39.70% of respondents have knowledge about VFC rights and benefits. A larger percentage of respondents (ranging from 55.10% to 62.70%) in the different development blocks indicated that they do not have knowledge about the rights of VFC in forest management and benefits sharing among forest dwellers. The data suggests that a significant percentage of respondents across all development blocks do not have knowledge about the rights of Village Forest Committees (VFC) in forest management and benefits sharing among forest dwellers. While there is some variation across development blocks, the overall pattern is that knowledge about VFC rights and benefits is limited. These findings highlight a potential need for educational and awareness-raising initiatives to inform local communities about the roles and benefits of VFCs in forest management.

4.3.4 VFCs action against illegal activities (if any) done by forest dwellers

In the "Jorebunglow-SukhiaPokhri" development block, 24.80% of respondents reported that VFCs take action against illegal activities regularly. In the "Darjeeling Pulbazar" development block, 30.00% of respondents indicated the same. In the "Takdah-RangliRangliot" development block, 25.80% of respondents reported regular actions by VFCs. On average across all development blocks, 27.00% of respondents stated that VFCs take action regularly against illegal activities. The majority of respondents in each development block reported that VFCs occasionally take action against illegal activities. These percentages range from 69.10% to 73.30%. A very small percentage of respondents (ranging from 0.90% to 2.20%) indicated that VFCs never take action against illegal activities.

The data suggests that in the majority of cases, VFCs are taking action against illegal activities, either regularly or occasionally. While there is some variation across development blocks, the overall pattern is that VFCs are actively involved in addressing illegal activities in the forest. The active role of VFCs in addressing illegal activities reflects their importance as local governing bodies in forest management.

4.3.5 Community involvement in managing forest resources

On average across all development blocks, 34.70% of respondents agreed with the importance of community involvement. In the "Jorebunglow-SukhiaPokhri" development block, 54.50% of respondents strongly agreed that community involvement is essential for sustainable conservation. In the "Darjeeling Pulbazar" development block, 48.20% of respondents held the same view. In the "Takdah-RangliRangliot" development block, 40.40% of respondents strongly agreed. On average across all development blocks, 48.00% of respondents strongly agreed with the importance of community involvement. The analysis reveals that the majority of respondents, especially in the "Takdah-RangliRangliot" development block, emphasize the importance of community involvement for sustainable forest resource conservation. This recognition reflects the understanding of the significance of community-led efforts in forest conservation and management.

4.3.6 Relation between Sustainable Forest resource management and forest dependent communities

All development blocks, 39.70% of respondents expressed uncertainty regarding the impact of sustainable forest resource management. In the "Jorebunglow-SukhiaPokhri" development block, 46.50% of respondents agreed that sustainable forest resource management leads to positive outcomes. In the "Darjeeling Pulbazar" development block, 37.30% of respondents shared this view. In the "Takdah-RangliRangliot" development block, 46.10% of respondents agreed. On average across all development blocks, 43.00% of respondents agreed with the positive impact of sustainable forest resource management. In the "Jorebunglow-SukhiaPokhri" development block, The analysis reveals that a significant proportion of respondents, especially in the "Jorebunglow-SukhiaPokhri" and "Takdah-RangliRangliot" development blocks, believe that sustainable forest resource management leads to positive and sustainable results for forest-dependent communities. This reflects an understanding of the importance of sustainable practices in supporting both environmental conservation and the livelihoods of forest-dependent communities.

5. Findings and Suggestions

- A vast majority of the sample households stated that they have followed conservation strategies to ensure the sustainability of rural livelihoods. But, major concern reported by the rural households is due to lack of knowledge and awareness of sustainable use of forest and its resources, proper balanced conservation of forest resources are not maintained so far. The reasons for not taking up conservation activities in certain cases were mainly due to lack of awareness on conservation strategies and sustainable development practices. Hence, it has been analyzed that sustainable rural livelihood is not maintain in an adequate form.
- The study indicated that the sample households had the knowledge of decline of forest resources in the study areas. Due to unawareness, the management practice is very rare resulting in overexploitation of these resources. It has been observed that, the reduction in forest and its resources is mainly due to human settlement (increasing population), encroachments by rural households, unemployment and developmental programme.
- The study has shown that the local community had little control over forest resources governance and people were lacking in knowledge of management and conservation of forest resources. It has been reported that regular communication and peoples' involvement are very less in the rural hill sub-divisions by the forest department. Active involvement and participation of local residents are very less. These reasons have also contributed to the decline of forest resources in the study areas.
- It was interesting to note that majority of the households were having regular access to the forest resources for their domestic use. However, due to unawareness, the management practice is very rare resulting in overexploitation of these resources.
- The householders in the study areas have also worried of as to whether the upcoming generation will realize the importance of forest resources or not. It was suggested by the locals that providing more employment opportunities and creating provisions under the government schemes at local level would help the upcoming generation to cope-up with the possible decline of forest resources in the future.
- Non-Timber Forest Products are those items which do not pose major and direct threat to forest and when its collection is done in a proper and scheduled manner it may last longer for the use of dependent communities. It was observed from the analysis that, lack of conservation activity, population increase, and management of Non-timber forest products education plays a major role in the degradation of forest and its resources in the study area.
- The Government authorities may use women SHGs and women cooperative societies to manage and protect the forest resources at the village level, which may enhance women empowerment and income generation for rural hill livelihoods.
- Traditional knowledge for conservation and management should be documented and implemented in a more scientific way. This will ensure local level conservation and also enhance the local skill.

- Promote eco-tourism by developing nature trails, setting up tourist facilities, and creating opportunities for local communities (especially youth) to benefit from tourism through services like tourist guide, Home-Stays Operators, adventure tourism etc.

Conclusion

In the Darjeeling Hill Blocks of West Bengal, our research has shown a complex picture of the relationship between sustainable rural development and the reliance on forest resources. Our research highlights how important woods are to the local communities' way of life, supporting their way of life, culture, and identity. But this link also presents ecological difficulties, highlighting the need for a well-rounded strategy that guarantees the preservation of forests while simultaneously improving rural livelihoods. The study's evidence-based insights and recommendations provide a valuable framework for policymakers, researchers, and conservationists striving to preserve the ecological integrity of the region while promoting the well-being of its forest-dependent communities. This research reinforces the importance of harmonizing the coexistence of nature and rural development for a sustainable future in Darjeeling's Hill Blocks and offers valuable lessons for similar regions worldwide.

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