



A STUDY ON MAJOR CHALLENGES FACED BY LOCAL COMMUNITIES IN FOREST CONSERVATION: A CASE OF NILGIRIS DISTRICT

DR. INDUMATHY

Assistant professor

Providence college for women

Department of Economics

Coonoor, The Nilgiris

ABSTRACT

Forests in the Nilgiris district of Tamil Nadu, part of the Western Ghats biodiversity hotspot, are crucial for ecological stability and the livelihoods of indigenous and forest-fringe communities. However, conservation efforts often conflict with community needs, creating complex socio-economic and institutional challenges. This study investigates the major problems faced by local communities, including Scheduled Tribes such as Todas, Kotas, Kurumbas, and Irulas, in forest conservation initiatives. Using both primary data from field surveys and secondary data from forest department records, the research identifies human-wildlife conflict, restrictions on Non-Timber Forest Produce collection, inadequate alternative livelihoods, weak implementation of the Forest Rights Act 2006, and limited participation in Joint Forest Management as key constraints. External pressures such as tourism expansion, invasive species, and climate variability further intensify these challenges. The study reveals that while communities value forest conservation, exclusionary policies and lack of benefit-sharing mechanisms foster negative perceptions and reduce cooperation. Findings emphasize that traditional ecological knowledge remains underutilized despite its potential for sustainable management. The research concludes that inclusive, community-centric approaches are essential for long-term conservation success. Recommendations include strengthening FRA implementation, ensuring timely HWC compensation, promoting forest-based sustainable livelihoods, and integrating indigenous knowledge into management plans. The study contributes to bridging the gap between conservation goals and community well-being, offering policy insights for participatory forest governance in the Western Ghats and similar landscapes.

KEYWORDS: Forest Conservation, Local Communities, Human-Wildlife Conflict, Forest Rights Act, Joint Forest Management, Traditional Ecological Knowledge, Participatory Conservation, Livelihood Security.

1.1 INTRODUCTION:

Forests are vital ecosystems that provide ecological, economic, and social benefits to humanity. The Nilgiris district in Tamil Nadu, part of the Western Ghats biodiversity hotspot, holds immense ecological significance with its unique shola-grassland ecosystem, rich flora-fauna, and as a catchment for major rivers. However, the sustainability of these forests is closely linked to the lives of local communities, including tribal groups like Todas, Kotas, Kurumbas, Irulas, and forest-fringe agricultural households, who have historically depended on forests for livelihood, culture, and sustenance.

While conservation policies and protected area regimes aim to safeguard biodiversity, they often create conflicts with the traditional rights, livelihood needs, and development aspirations of local communities. Issues such as human-wildlife conflict, restrictions on Non-Timber Forest Produce collection, lack of alternative livelihoods, land tenure insecurity, and inadequate participation in Joint Forest Management have emerged as major challenges. At the same time, communities face pressures from tourism, plantation expansion, invasive species, and climate variability, further complicating conservation efforts.

In this context, understanding the problems faced by local communities becomes crucial for designing inclusive and sustainable forest conservation strategies. The Nilgiris, with its high dependence of people on forests and rising conservation-development trade-offs, provides an ideal case to examine these challenges. This study aims to identify and analyze the major socio-economic, institutional, and ecological challenges faced by local communities in forest conservation, and suggest policy measures to bridge the gap between conservation goals and community well-being.

Forests are critical life-supporting systems that regulate climate, conserve biodiversity, maintain hydrological cycles, and sustain the livelihoods of millions of people worldwide. India, with 21.71% of its geographical area under forest and tree cover, has placed strong emphasis on forest conservation through legislative measures like the Forest Conservation Act 1980, Wildlife Protection Act 1972, and community-based programs such as Joint Forest Management. Despite these efforts, forest degradation and loss of biodiversity remain persistent concerns.

The Nilgiris district of Tamil Nadu forms a core part of the Nilgiri Biosphere Reserve, the first biosphere reserve in India and a UNESCO World Heritage Site within the Western Ghats. It is home to diverse forest types ranging from tropical wet evergreen forests to montane shola-grassland ecosystems. The district also sustains a large population of indigenous communities including the Todas, Kotas, Kurumbas, Irulas, and Badagas, along with other forest-fringe cultivators and plantation workers. For these communities, forests are not merely ecological entities but are deeply interwoven with culture, tradition, and livelihood through NTFP collection, grazing, small-scale agriculture, and spiritual practices.

However, the relationship between conservation objectives and community needs has often been contentious. The creation of protected areas, sanctuaries like Mudumalai and Mukurthi, and restrictions imposed under conservation laws have altered traditional access and use patterns. Simultaneously, local communities face escalating challenges such as human-wildlife conflict with elephants, gaur, and leopards, crop raiding, livestock depredation, and threats to human safety. The expansion of tea and exotic plantations, spread of invasive species like Lantana camara and Wattle, forest fires, and climate-induced changes have further stressed both ecosystems and livelihoods.

1.2 SIGNIFICANCE OF THE STUDY

Effective forest conservation cannot be achieved without the active cooperation and participation of local communities. Globally, conservation science has shifted from exclusionary “fences and fines” approaches to inclusive, people-centric models recognizing the role of communities as custodians of biodiversity. Yet, in practice, several socio-economic and institutional barriers hinder meaningful participation.

In the Nilgiris, while multiple stakeholders including the Forest Department, NGOs, and research institutions are engaged in conservation, field-level realities suggest gaps in policy implementation, benefit-sharing, and conflict mitigation. Documenting and analyzing the problems faced by local communities is essential to:

- ❖ Bridge policy-practice gaps in forest governance and JFM/FRA implementation.
- ❖ Reduce conservation conflicts by aligning livelihood security with ecological goals.
- ❖ Inform sustainable strategies that integrate indigenous knowledge with scientific management.
- ❖ Contribute to SDG goals, especially SDG 15: Life on Land, and SDG 1: No Poverty.

Despite the ecological importance of the Nilgiris and the presence of vulnerable tribal groups, there is limited empirical research that systematically captures community perspectives on conservation challenges. Most studies focus either on biodiversity or on policy, with inadequate attention to grassroots problems faced by respondents. This study addresses that critical gap.

1.3 SCOPE OF THE STUDY

This study will be confined to the Nilgiris district of Tamil Nadu and will focus on local communities residing in and around forest areas, including Scheduled Tribes and other forest-dependent groups. The study will:

- ❖ Identify and categorize major challenges faced by communities – socio-economic, institutional, legal, and ecological.
- ❖ Examine the intensity of human-wildlife conflict, access restrictions, and livelihood insecurity across different forest ranges/taluks.
- ❖ Assess the role of existing institutions like JFMCs, EDCs, and Forest Rights Act implementation in mitigating or aggravating these problems.
- ❖ Analyze community perceptions towards forest department, conservation policies, and alternative livelihood programs.
- ❖ Suggest location-specific strategies for inclusive forest conservation that balance ecological integrity with human well-being.

The findings will be relevant for policymakers, forest managers, NGOs, and researchers working on participatory conservation models in the Western Ghats and similar landscapes.

Research gap: Need to study community perspective for inclusive conservation

1.4 OBJECTIVE OF THE STUDY

1. To identify the major challenges faced by local communities in forest conservation in Nilgiris district.
2. To suggest strategies for inclusive and participatory forest conservation.

2 REVIEW OF LITERATURE

Nandigama (2019) examined gender dynamics in participatory forest management and found that women often remain underrepresented in forest governance despite their significant role in collecting forest resources and managing household livelihoods. Social norms, unequal access to decision-making, and institutional barriers continue to limit women's participation in conservation activities.

Murali Krishnan et al. (2015) investigated the adoption of eco-friendly conservation practices among farmers in the Nilgiris. The study found that education, training, extension services, and innovativeness positively influenced the adoption of conservation measures. The authors reported improvements in biodiversity, soil fertility, and farmers' confidence, suggesting that awareness and capacity building play an important role in conservation success.

2.1 STUDY AREA

The area selected for the study was Nilgiris district which comprises of four taluks namely, Udahgamandalam, Coonoor, Kotagiri, and Kundah. Sample was collected from four taluks randomly 55 samples.

3. RESULT AND DISCUSSION

3.1 Socio-Economic Status

Table 3.1 Socio-Economic Conditions of the respondents

S. No	Variables	Category	No. of. Respondent	Percentage
1	Gender	Male	38	38%
		Female	62	62%
2.	Age	18- 25	13	13%
		26-35	37	37%
		36-50	32	32%
		60 Above	18	18%
3.	Marital Status	Married	77	77%
		Unmarried	23	23%
4.	Educational	Illiterate	43	43%
	Qualification	Primary Education	37	37%
		Higher Secondary	12	12%
		Graduate	8	8%
		Total	100	100%

Sources: Primary data

The tribal of Demographic characteristics of the respondents in forest land is high on Female of about (62%), Aged from 26-35 is (37%), Marital Status married (77%), Education qualification Illiterate (43%). Few households were even entirely dependent on these resources and were having very small earnings through other sources. These households are faced with serious problems due to depletion of natural resources.

Table 3.2 Identify Major Challenges

Problem you face related to forests	Identify Major Challenges			Total
	Human-Wildlife Conflict	Restriction on forest entry	NTFP ban/restriction	
How often do you face crop damage by wild animals	Very Often	1	0	21
	Often	20	0	21
	Rarely	2	8	12
	Never	0	1	1
Total	23	23	9	55

Chi-Square Tests			
	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	76.623 ^a	6	.000
Likelihood Ratio	75.888	6	.000
Linear-by-Linear Association	36.150	1	.000
N of Valid Cases	55		

Sources: Primary data

The Chi-Square test of independence revealed a statistically significant association between the frequency of crop damage caused by wild animals and the major forest-related challenges identified by the respondents ($\chi^2 = 76.623$, $df = 6$, $p < 0.001$). Therefore, the null hypothesis is rejected, indicating that the perceived major challenges are not independent of the frequency of crop damage. Human–Wildlife Conflict emerged as the most prominent challenge among respondents experiencing frequent crop damage, highlighting the strong relationship between wildlife conflict and agricultural losses.

Hypothesis decision:

- **H₀ (Null Hypothesis):** There is no significant association between the frequency of crop damage by wild animals and the identified major forest challenges. **Rejected.**
- **H₁ (Alternative Hypothesis):** There is a significant association between the frequency of crop damage by wild animals and the identified major forest challenges. **Accepted.**

Table 3.3 Major Challenges

Descriptives									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
How often do you face crop damage by wild animals	Human-Wildlife Conflict	23	1.2174	.59974	.12505	.9580	1.4767	1.00	3.00
	Restriction on forest entry	23	2.0435	.36659	.07644	1.8850	2.2020	1.00	3.00
	NTPF ban/restriction	9	3.1111	.33333	.11111	2.8549	3.3673	3.00	4.00
	Total	55	1.8727	.81773	.11026	1.6517	2.0938	1.00	4.00
NeverAre you able to collect NTFP like honey, honey, gooseberry freely	Human-Wildlife Conflict	23	1.1739	.49103	.10239	.9616	1.3862	1.00	3.00
	Restriction on forest entry	23	2.2609	.68870	.14360	1.9631	2.5587	1.00	4.00
	NTPF ban/restriction	9	3.1111	.60093	.20031	2.6492	3.5730	2.00	4.00
	Total	55	1.9455	.93131	.12558	1.6937	2.1972	1.00	4.00
Do you get timely compensation for HWC losses	Human-Wildlife Conflict	23	1.5217	.84582	.17637	1.1560	1.8875	1.00	4.00
	Restriction on forest entry	23	2.1304	.54808	.11428	1.8934	2.3674	1.00	4.00
	NTPF ban/restriction	9	3.0000	.50000	.16667	2.6157	3.3843	2.00	4.00
	Total	55	2.0182	.84964	.11457	1.7885	2.2479	1.00	4.00
applied What is your opinion on current forest rules	Human-Wildlife Conflict	23	1.1739	.38755	.08081	1.0063	1.3415	1.00	2.00
	Restriction on forest entry	23	2.1304	.54808	.11428	1.8934	2.3674	1.00	4.00
	NTPF ban/restriction	9	3.1111	.33333	.11111	2.8549	3.3673	3.00	4.00
	Total	55	1.8909	.83161	.11213	1.6661	2.1157	1.00	4.00
Strategies for Inclusive ConservationAre you a member of JFMC / EDC	Human-Wildlife Conflict	23	1.5217	.51075	.10650	1.3009	1.7426	1.00	2.00
	Restriction on forest entry	23	1.6957	.63495	.13240	1.4211	1.9702	1.00	3.00
	NTPF ban/restriction	9	2.5556	.52705	.17568	2.1504	2.9607	2.00	3.00
	Total	55	1.7636	.66566	.08976	1.5837	1.9436	1.00	3.00
Are you aware of Forest Rights Act 2006	Human-Wildlife Conflict	23	1.7826	.73587	.15344	1.4644	2.1008	1.00	3.00
	Restriction on forest entry	23	1.8696	.34435	.07180	1.7207	2.0185	1.00	2.00
	NTPF ban/restriction	9	2.7778	.66667	.22222	2.2653	3.2902	1.00	3.00
	Total	55	1.9818	.68017	.09171	1.7979	2.1657	1.00	3.00
Main challenge in forest conservation	Human-Wildlife Conflict	23	1.7826	.79524	.16582	1.4387	2.1265	1.00	4.00
	Restriction on forest entry	23	2.0000	.79772	.16634	1.6550	2.3450	1.00	4.00

	NTPF ban/restriction	9	2.6667	1.32288	.44096	1.6498	3.6835	1.00	4.00
	Total	55	2.0182	.93276	.12577	1.7660	2.2703	1.00	4.00
Crop damage by animals	Human-Wildlife Conflict	23	1.7826	.73587	.15344	1.4644	2.1008	1.00	3.00
	Restriction on forest entry	23	1.8696	.34435	.07180	1.7207	2.0185	1.00	2.00
	NTPF ban/restriction	9	2.7778	.66667	.22222	2.2653	3.2902	1.00	3.00
	Total	55	1.9818	.68017	.09171	1.7979	2.1657	1.00	3.00
NTPF collection status	Human-Wildlife Conflict	23	1.7391	.75181	.15676	1.4140	2.0642	1.00	3.00
	Restriction on forest entry	23	1.7391	.54082	.11277	1.5053	1.9730	1.00	3.00
	NTPF ban/restriction	9	2.5556	.88192	.29397	1.8777	3.2335	1.00	3.00
	Total	55	1.8727	.74671	.10069	1.6709	2.0746	1.00	3.00
Aware of Forest Rights Act	Human-Wildlife Conflict	23	1.5652	.50687	.10569	1.3460	1.7844	1.00	2.00
	Restriction on forest entry	23	1.6957	.47047	.09810	1.4922	1.8991	1.00	2.00
	NTPF ban/restriction	9	1.6667	.50000	.16667	1.2823	2.0510	1.00	2.00
	Total	55	1.6364	.48548	.06546	1.5051	1.7676	1.00	2.00
What support is needed most	Human-Wildlife Conflict	23	1.5652	.50687	.10569	1.3460	1.7844	1.00	2.00
	Restriction on forest entry	23	1.7826	.42174	.08794	1.6002	1.9650	1.00	2.00
	NTPF ban/restriction	9	2.1111	.78174	.26058	1.5102	2.7120	1.00	3.00
	Total	55	1.7455	.55170	.07439	1.5963	1.8946	1.00	3.00
Attitude towards conservation	Human-Wildlife Conflict	23	1.5652	.50687	.10569	1.3460	1.7844	1.00	2.00
	Restriction on forest entry	23	1.6957	.47047	.09810	1.4922	1.8991	1.00	2.00
	NTPF ban/restriction	9	1.8889	.78174	.26058	1.2880	2.4898	1.00	3.00
	Total	55	1.6727	.54618	.07365	1.5251	1.8204	1.00	3.00

Sources: Primary data

Overall, the descriptive statistics reveal clear differences among the three respondent he descriptive statistics reveal clear differences among the three respondent groups in the Nilgiris district. Across most variables, **NTPF Harvesters consistently recorded the highest mean scores**, demonstrating their greater dependence on forest resources, higher awareness of forest policies, and stronger engagement in forest-based livelihood activities. Respondents affected by **Restriction of Forest Entry** generally showed moderate mean scores, reflecting limited access to forest resources while maintaining some dependence on forests. The **Human–Wildlife Conflict** group recorded comparatively lower mean values for most variables, indicating that although they experience challenges related to wildlife and conservation, their dependence on forest products is lower than that of NTPF harvesters.

Overall, the descriptive analysis suggests that **forest-dependent communities, particularly NTFP harvesters, play a central role in the forest economy of the Nilgiris district and possess greater awareness of forest-related issues.** These findings emphasize the need for **community-based forest management, improved livelihood support, enhanced awareness of the Forest Rights Act, better market opportunities for NTFPs, and effective measures to reduce human–wildlife conflict**, thereby promoting both sustainable livelihoods and biodiversity conservation.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
How often do you face crop damage by wild animals	Between Groups	24.351	2	12.175	53.844	.000
	Within Groups	11.758	52	.226		
	Total	36.109	54			
NeverAre you able to collect NTFP like honey, honey, gooseberry freely	Between Groups	28.208	2	14.104	39.372	.000
	Within Groups	18.628	52	.358		
	Total	46.836	54			
Do you get timely compensation for HWC losses	Between Groups	14.634	2	7.317	15.627	.000
	Within Groups	24.348	52	.468		
	Total	38.982	54			
What is your opinion on current forest rules	Between Groups	26.544	2	13.272	63.890	.000
	Within Groups	10.802	52	.208		
	Total	37.345	54			
Strategies for Inclusive Conservation	Between Groups	7.096	2	3.548	10.962	.000
	Within Groups	16.831	52	.324		
	Total	23.927	54			
Are you aware of Forest Rights Act 2006	Between Groups	6.905	2	3.452	9.931	.000
	Within Groups	18.077	52	.348		
	Total	24.982	54			
Main challenge in forest conservation	Between Groups	5.069	2	2.534	3.144	.051
	Within Groups	41.913	52	.806		
	Total	46.982	54			
Crop damage by animals	Between Groups	6.905	2	3.452	9.931	.000
	Within Groups	18.077	52	.348		
	Total	24.982	54			
NTFP collection status	Between Groups	5.017	2	2.509	5.199	.009
	Within Groups	25.092	52	.483		
	Total	30.109	54			
What support is needed most	Between Groups	1.982	2	.991	3.566	.035
	Within Groups	14.454	52	.278		
	Total	16.436	54			
Attitude towards conservation	Between Groups	.698	2	.349	1.178	.316
	Within Groups	15.411	52	.296		
	Total	16.109	54			

Sources : Primary data

The one-way ANOVA results for **Nilgiri District** reveal that significant differences exist among the respondent groups for most socio-economic and forest-related variables. Variables such as **frequency of crop damage, sale of NTFPs, daily dependence on forest products, opinions on forest rules, conservation–livelihood strategies, awareness of the Forest Rights Act, NTFP**

collection status, and support needed all show statistically significant differences ($p < 0.05$). These findings indicate that the three respondent groups have distinct experiences and perceptions regarding forest resource use, conservation policies, and livelihood activities.

However, **main challenges in forest conservation, perceptions of crop damage by wild animals, and attitudes towards conservation** do not differ significantly among the groups ($p > 0.05$). This suggests a broad consensus among respondents on these issues, regardless of their category.

Overall, the ANOVA findings demonstrate that **livelihood dependence and the level of interaction with forest resources influence respondents' perceptions and practices in Nilgiri District**, while concerns related to conservation challenges and general conservation attitudes are shared across the groups. These results support the need for **group-specific interventions in livelihood support and forest management, alongside district-wide conservation awareness and policy implementation**.

4. CONCLUSION

The study concludes that forest conservation in the Nilgiris is closely connected to the livelihoods of local communities. Tribal and forest-dependent people face challenges such as human–wildlife conflict and limited access to forest resources. Weak implementation of the Forest Rights Act and inadequate livelihood opportunities reduce community support for conservation. Expansion of tea plantations, tourism, invasive species, and climate change further increase pressure on forests. Local communities generally support conservation but seek greater recognition of their rights and needs. Traditional ecological knowledge of indigenous communities is valuable for sustainable forest management. Effective conservation requires active participation of local people in planning and decision-making. Timely compensation for wildlife-related losses can improve community attitudes towards conservation. Promoting sustainable forest-based livelihoods and strengthening Joint Forest Management Committees are essential. Overall, a community-based and inclusive approach is the key to achieving long-term forest conservation in the Nilgiris District.

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