

PEOPLES' ATTITUDE TOWARDS WILDLIFE CONSERVATION IN KERALA PART OF THE WESTERN GHATS, INDIA

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Abstract

High population densities around conservation areas demand strategies for balancing conservation goals and livelihood needs. Management of conservation issues and conflicting interests among stakeholders in such areas can be achieved by exploring the attitude of residents towards wildlife and its conservation. Although a substantial body of research analyses local resident's attitude towards conservation challenges around protected areas, very scanty information is available on the attitude towards areas with less categories of protection status. Hence, an attempt was made to understand people's attitude towards conservation issues, in the fringe villages of North and South Forest Divisions of Nilambur, Kerala, India. A questionnaire survey was administered to 158 residents in five villages during the year 2014 to 2015. Responses were differentiated under different categories of gender, literacy status, age, occupation, and landholding size. The majority of respondents supported wildlife conservation, provided that there is no associated cost. The attitude towards forest protection staffs were largely positive. An improved system of participatory level conservation programs will probably reduce antagonistic ambience between forest protection staffs and villagers to a great extent thereby enhance people's tolerance towards conflict-causing wildlife, and thus facilitate conservation. Socioeconomic characteristics of residents provided some sort of explanation for the distribution of conservation attitude. These differences should be taken into consideration while designing and implementing any policies. People will support conservation of wildlife and natural systems if their problems are effectively addressed.

Keywords: Attitude; Conservation; Conflict; Nilambur; Kerala; Western Ghats; Wildlife; Management

Introduction

The Western Ghats, being a biodiversity hotspot, in a thickly populated region faces a much more pronounced threat in terms of the management of conservation issues. Local communities living around conservation areas were directly affected by the costs associated

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with conservation initiatives. Balancing conservation goals and needs of local residents is challenging. There is a substantial body of research on local resident's attitude towards protected areas [1-3]. However, studies on the attitude of local residents in regions with less restricted status of protection are comparatively fewer [4].

In order to improve the relationship of residents in nearby conservation areas via appropriate interventions, it is necessary to explore the association between people's socioeconomic status and their attitude towards conservation [5]. Confrontational responses between wildlife protection staffs and residents can be minimized to some extent by appropriate interventions [6-7]. The assessment of people's attitudes and perceptions towards conservation has become an important aspect in many studies of wildlife conservation [8]. Policies formulated through such studies will enable people to shift from 'conflict' towards 'coexistence' with wildlife. Information about conservation issues obtained from different perspectives will be useful in formulating innovative management decisions [9].

Hence an attempt was made to understand people's attitude on conservation issues in North and South Forest Divisions of Nilambur, Kerala, with the following objectives:

- To assess people's attitude towards wildlife conservation, conservation laws and forest protection staffs.
- To evaluate people's perception on benefits and losses from living around forest areas.
- To find out the association between socioeconomic factors (Age, gender, education, occupation, size of land holding) and peoples attitude.

Materials and Methods

The study area forms a part of Southern Western Ghats, where the largest global populations of Asian Elephants are distributed. The forest is under the administration of North and south Nilambur Forest Divisions. The Nilambur Forest Divisions are part of an important elephant reserve, assigned by Project Elephant, a conservation initiative of the Government of India. New Amarambalam Reserve Forest (NARF), which is a part of the Nilambur South Forest Division, forms a core area of the Nilgiri Biosphere Reserve in the Western Ghats hotspot, that supports an ample population of elephants as well as several endemic mammals of Western Ghats. The proposal to make NARF as Wildlife Sanctuary and subsequently into National Park for the better conservation of biodiversity was recommended during studies on its biodiversity [10].

The study was conducted in five villages located around Vazhikadavu Range (N11.45525° and E76.27142°) and Karulai Range (N11.28179° and E76.3241°). A total of 158 residents from five villages; Pothukallu, Vazhikadavu, Edakkara, Moothedam and Karulai were interviewed. Through personal interviews the questionnaire survey was performed. To assure independence of data, we interviewed people one at a time [11] and interviews lasted for 20 to 30 minutes.

The survey includes questions about demographic characteristics, attitudes towards wildlife conservation, forest protection staffs, and attitude towards quality of life adjoining a conservation area and period of remarkable increase in occurrence of elephant conflict. The data was analyzed using SPSS, 16 (IBM SPSS Inc., Illinois, USA) to determine if responses varied significantly between groups of people including: gender groups (men vs. women), age groups (below 40 years, between 40 to 60, above 60 years old) literacy groups (illiterate, lower

primary, upper primary, high school, college education), occupation groups (farmers, laborers, housewives and other high class employees) and landholder groups (people owned below one acre, 1-3 acres and above three acres) at 5% significance level. All group level differences are reported in text. Responses from 158 residents were incorporated, except for the question regarding the benefit obtained from forests (Question D), where we could only include response from 96 residents due to some technical reasons.

Results and Discussion

A total of 158 residents were interviewed in this study. The socioeconomic characteristics of respondent, such as gender, age, education, occupation and landholding were represented (Table 1). Equal participation of male and female respondents was ensured in this study. The age of the people interviewed were between 20 to 75 with an average of 44 years. Of the respondents, 81.65% were educated and the rest were illiterate. Agriculture was the prime income source for only 22% of respondents. Considering landholding size, largest group comprised of people owning less than one acre land. About 5.69% of respondents were with more than three acres of land.

Table 1. Socioeconomic characteristics of the respondents

Categories	Respondent Type	In percentage
Gender	Men	50
	Women	50
Age	20-40	44.3
	40-60	41.77
	>60	13.92
Literacy	Illiterate	18.35
	Lower primary	13.29
	Upper primary	16.45
	High School	39.87
Occupation	College	12.04
	Employee	1.26
	Farmer	22.15
	Housewife	37.34
Land Size	Laborer	39.24
	<1 Acre	83.54
	1-3 Acre	10.75
	>3 Acre	5.69

Attitude towards wildlife conservation and wildlife conservation laws

The majority of respondents, 75.32%, admitted the need to protect wildlife (Table 2). Using opposite statement pairs (Table 2:A and B) responses was cross checked. Though people generally favored conservation, most of them were against conservation laws. Only 25.95% people agreed with the need for protection of wildlife by laws. The consistency in positive response towards wildlife conservation was very low, about 27%. Only 26.62% of respondents favor conservation effectively. About 51% of respondents favor conservation devoid of

stringent laws. Meanwhile 22.73% of residents were totally against the initiatives of wildlife conservation.

Table 2. People’s attitude towards wildlife conservation

A. Protect Wildlife For The Future?		B. Wildlife conservation needed through laws in the present context?		Consistent Opinion for questions A & B	
	Percent		Percent		Percent
Yes	75.32	Yes	25.95	Yes (Qn A) Yes (Qn.B)	26.62
No	22.15	No	72.78	Yes (Qn.A) No(Qn.B)	50.65
Don’t		Don’t			
Know	2.53	Know	1.27	No (Qn.A) No (Qn.B)	22.73

Attitude towards forest protection staffs

In order to examine the local attitude towards forest protection staffs, respondents were asked ‘are you satisfied with activities of forest protection staffs?’ Majority of the villagers, 63.92%, responded positively. About 35% of them expressed negative response towards forest officials, which was mostly associated with incidences of conflict and people’s perception that the forest authorities were not effectively managing the wildlife intrusion to human habitations. Further, 1.26% were reluctant to answer the question and responded with neutral comments such as ‘don’t know’ or ‘no idea’ about the forest protection staffs. (Table 3)

Table 3. People’s opinion towards wildlife conservation, forest protection staffs and living condition near forest region

Questions	Yes	No	Don’t Know
A. Is it important to protect wildlife for the future?	75.32	22.15	2.53
B. At the present context is it necessary to protect wildlife by laws?	25.95	72.78	1.27
C. Are you satisfied with forest protection staffs?	63.92	34.81	1.26
D. What is your overall view about living near to forest area? Are you benefited by living here?	69.14	14.89	2.12

*13.82% experience both benefit and loss

Attitude towards the living condition near to forest areas

The majority of respondents (69.14%) agreed that they were benefited by living near forest. Apart from benefit obtained by the fuel wood collection, residents mentioned other ecosystem services such as mild and favorable climate, availability of pure water and pure air. About 14.89% respondents reported problems associated which include economic losses due to crop and property damages, fear for the free movement, especially after sunset, loss of sleep, and anxiety. Living near forest areas has its own advantages and disadvantages pointed out by 13.82% respondents. While 2.12% gave neutral answer (Table 3).

Influence of sociodemographic variables on conservation attitude

It was evaluated whether the respondent's conservation attitude vary significantly within the categories of selected socioeconomic variables, including age, gender, literacy, occupation and landholding size. This analysis was made according to peoples response to questions related to wildlife conservation (Table 3 Question A to D). The result indicated that gender, age, occupation and landholding size have significant influence on people's attitude (Table 4 to 7).

Gender was identified as a significant predictor of conservation attitude, with men being more likely to express positive attitudes than women. Here, 65.8% of women and 84.8% of men responded positively to the necessity of wildlife conservation. This difference in opinion between gender was statistically significant ($\chi^2 = 9.34, p = 0.009$) (Table 4).

Table 4. Resident's attitude towards importance of wildlife protection for future generation (In percentage)

Categories	Respondent Type	Yes	No	Don't Know	χ^2	df	P
Gender	Men	84.8	15.2	0	9.34	2	0.009
	Women	65.8	29.1	5.1			
Age	20-40	87.1	11.4	1.4	10.22	4	0.037
	40-60	68.2	28.8	3			
	>60	59.1	36.4	4.5			
Literacy	Illiterate	75.9	20.7	3.4	10.23	8	0.249
	Lower primary	76.2	23.8	0			
	Upper primary	53.8	42.3	3.8			
	High School	79.4	17.5	3.2			
	College	89.5	10.5	0			
Occupation	Employee	100	0	0	11.43	6	0.07
	Farmer	85.7	14.3	0			
	Housewife	61	33.9	5.1			
	Laborer	82.3	16.1	1.6			
Land Size	<1 Acre	75.8	21.2	3	1.30	4	0.86
	1-3 Acre	70.6	29.4	0			
	>3 Acre	77.8	22.2	0			

This difference in opinion is due to the greater involvement of men in public life and thereby having awareness about conservation issues. Conservation attitudes of women were determined only by their direct experience with wildlife related costs and benefits. Irrespective of the gender, the majority of respondents did not appreciate conservation laws. 'It was because of these laws that we can't shoot down animals and have to suffer the crop and property damages caused by animals', added both men and women. About 69.6% of women and 75.9% of men were against wildlife conservation laws. Though the general attitude towards wildlife was highly positive among residents, the impact of conflict has created fear with reference to implementation of stringent wildlife laws. The difference in attitude about wildlife protection laws was statistically not significant among genders ($\chi^2 = 2.43, p = 0.29$) (Table 5).

General support for wildlife conservation among respondents with different age categories, i.e. below 40 years, 40-60 and above 60 years were 87%, 68% and 59%

respectively, were given in Table 4. This difference in opinion with age was statistically significant ($\chi^2 = 10.2, p = 0.03$). This indicates that general positive attitude towards wildlife conservation was more among younger generation. Though appreciation towards wildlife protection laws was less among respondents, younger generation expressed comparatively a better positive attitude. About 36%, 21% and 9% respondents within the following three age groups, i.e. below 40 years old, between 40–60 years and above 60 years of old were willing to accept the wildlife conservation laws irrespective of the incidence of wildlife conflicts (Table 5). This difference is statistically significant ($\chi^2 = 10.1, p = 0.03$) (Table 5). As a whole, respondent’s age is a significant determinant of their conservation attitude. Younger residents tend to show more positive attitudes similar to the observation [13]. Young individuals reported generally more favorable conservation attitude than older generation and were more likely to respond positively towards wildlife. Older people could hunt freely in their days; present ban on such activities was the reason behind their apathy towards continued conservation of wildlife by implementation of laws [14]. Younger individuals with a short period of residency do not share such perception regarding traditional rights. Thus creating more support for wildlife conservation. There was no significant variation between attitude towards forest protection staffs ($\chi^2 = 5.62, p = 0.22$) and living condition near to forest areas ($\chi^2 = 5.45, p = 0.70$) between different age groups (Table 6, 7). Though variation is not significant, generally more positive attitudes were expressed by the younger generation.

Table 5. Resident’s attitude towards the necessity to protect wildlife by laws (In percentage)

Categories	Respondent Type	Yes	No	Don't Know	χ^2	df	Sig
Gender	Men	24.1	75.9	0	2.43	2	0.29
	Women	27.8	69.6	2.5			
Age	20-40	35.7	64.3	0	10.1	4	0.03
	40-60	21.2	75.8	3			
	>60	9.1	90.9	0			
Literacy	Illiterate	17.2	82.8	0	10.18	8	0.25
	Lower primary	28.6	71.4	0			
	Upper primary	11.5	84.6	3.8			
	High School	36.5	61.9	1.6			
	College	21.1	78.9	0			
Occupation	Employee	100	0	0	12.55	6	0.05
	Farmer	11.4	88.6	0			
	Housewife	23.7	74.6	1.7			
	Laborer	33.9	64.5	1.6			
Land Size	<1 Acre	28	70.5	1.5	2.66	4	0.61
	1-3 Acre	11.8	88.2	0			
	>3 Acre	22.2	77.8	0			

The attitudes towards forest officials were largely positive among both genders. There was no significant difference ($\chi^2=2.54, p=0.28$) in opinion about forest officials between genders (female, 65.8% and male, 62%) (Table 6).

Though women appreciated the benefits experienced by living near forests, many of them pointed out the problems suffered by sharing boundaries with wildlife. Nearly 52% of men and 30.4% of women described the benefits alone. About 11.4% of women and 5.1% of men explained that both benefit and harm exist. The negative impact was experienced by 13.9% of the female and 3.8% of the male respondents living near forest areas. Overall, women were pointing out the negative impact experienced by living near forest areas to a greater

degree than males, and this difference is statistically significant ($\chi^2 = 11.19, p = 0.02$) (Table 7). Frequently encountering wild animals will negatively affect women, who are the main gatherers of fuel wood and water from forest [12].

Table 6. People attitude towards forest protection staffs? (In percentage)

Categories	Respondent Type	Yes	No	Don't Know	χ^2	df	Sig
Gender	Men	62	38	0	2.54	2	0.28
	Women	65.8	31.6	2.5			
Age	20-40	72.9	25.7	1.4	5.62	4	0.22
	40-60	59.1	39.4	1.5			
	>60	50	50	0			
Literacy	Illiterate	48.3	51.7	0	11.24	8	0.18
	Lower primary	71.4	23.8	4.8			
	Upper primary	61.5	38.5	0			
	High School	69.8	30.2	0			
	College	63.2	31.6	5.3			
Occupation	Employee	50	50	0	4.82	6	0.56
	Farmer	57.1	42.9	0			
	Housewife	64.4	32.2	3.4			
	Laborer	67.7	32.3	0			
Land Size	<1 Acre	67.4	31.8	0.8	8.29	4	0.08
	1-3 Acre	52.9	41.2	5.9			
	>3 Acre	33.3	66.7	0			

Table 7. People attitude towards benefits obtained by living near to forest areas (In percentage)

Categories	Respondent Type	Yes	No	Don't Know	Both	χ^2	df	Sig
Gender	Men	51.9	3.8	1.3	5.1	11.19	4	0.02
	Women	30.4	13.9	1.3	11.4			
Age	20-40	41.1	10	1.4	7.1	5.45	8	0.7
	40-60	43.9	6.1	1.5	6.1			
	>60	31.8	13.6	0	18.2			
Literacy	Illiterate	41.4	6.9	0	10.3	16.94	16	0.38
	Lower primary	52.4	9.5	0	19			
	Upper primary	46.2	3.8	3.8	11.5			
	High School	38.1	12.7	1.6	4.8			
	College	31.6	5.3	0	0			
Occupation	Employee	100	0	0	0	29.87	12	0.003
	Farmer	22.9	0	0	8.6			
	Housewife	33.9	15.3	0	8.5			
	Laborer	56.5	8.1	3.2	8.1			
Land Size	<1 Acre	44.7	8.3	0.8	7.6	16.44	8	0.03
	1-3 Acre	23.5	17.6	0	17.6			
	>3 Acre	22.2	0	11.1	0			

Here, it was observed that education didn't have any significant role in determining people's conservation attitude ($\chi^2 = 10.23, p = 0.24$). Necessity of wildlife conservation for future generation was supported by residents with different levels of education qualifications

from college education, higher secondary, high school, upper and lower primary education, with a percentage of 89.5%, 79.4%, 76.2%, 53.8% and 75.9% respectively (Table 4). Relatively favorable attitude towards conservation were expressed by well-educated villagers, though the difference is not significant. Wildlife protection laws were supported by comparatively fewer number of respondents with highest educational qualification, however the difference is not significant ($\chi^2 = 10.18$, $p = 0.24$). There was no significant variation between attitude towards forest protection staffs ($\chi^2 = 11.24$, $p = 0.18$) and living condition near to forest areas ($\chi^2 = 16.94$, $p = 0.38$) between people from different educational background (Table 6, 7). Positive attitude towards conservation was expressed by well-educated villagers than less educated individuals revealed by some studies [3, 15, 16], whereas another study [17] has reported that education, possibly will increase opposition to conservation initiatives. Education may not necessarily benefit conservation strategies [18]. Analyzing the results from other studies, it was observed that case specific results were noted regarding the impact of education on people's attitude, probably due to difference in deep rooted socio-cultural aspects. Educational level associated with age might influence people's attitude to conservation, as younger residents are assumed to have a higher education level or at least greater access to education than older residents.

There was no significant variation among employment class categories on general opinion regarding wildlife conservation ($\chi^2 = 11.43$, $p = 0.07$). More than 60% of people from all job classes were supported conservation (Table 4). However, there was a significant difference in people's opinion about present wildlife conservation laws ($\chi^2 = 12.5$, $p = 0.05$). Continued implementation of conservation laws was appreciated by all respondents in upper class jobs, whereas support for laws were expressed by only 33.9% of laborers, 23.7% of housewives and 11.4% of farmers (Table 5). Farmers exhibited a negative attitude, as their livelihood was directly impacted by the crop raiding of wildlife. 'As long as the conservation laws are stringent, the crop raiding by wildlife will continue and we will suffer huge economic losses, added 88.6% few farmers. The disruption in the daily activity pattern has adversely affected the conservation attitude of farmers, who were mostly guarding crops at night. Alteration in the diurnal activity pattern and subsequent stress were noted among farming communities, especially during cropping season as in other studies [19]. Most of the traditional homemakers usually collect fuel wood and water from forest and it was mainly due to the encounter with wildlife during these activities in forest that 74.6% of them find it difficult to coexist with the wildlife under present conservation laws. More than 50% of people in all job classes expressed a positive attitude towards forest officials ($\chi^2 = 4.82$, $p = 0.56$). Though farmers do not support wildlife laws, 57% of them were satisfied with the services by officials, probably due to the assistance rendered for managing conflict issues (Table 6). Significant variation was observed among the different occupation classes and their attitude towards living condition near to forest areas ($\chi^2 = 29.871$, $p = 0.003$) probably due to variation in their interaction and dependence to forest (Table 7). All the upper class employed individuals' perceived benefit from forest areas which include fresh air, water and other ecosystem services. Interaction with wildlife has undermined the benefits experienced by other occupation classes. Crop raiding by wild animals, fear associated with crop guarding, encounter with elephants during fuel wood collection and other activities in forest have resulted in economic and psychological impact negatively to the lower and middle class residents.

Landholding size did not have significant influence on people's attitude towards wildlife conservation, wildlife protection laws and forest protection staffs. More than 70% of residents in all the three classes (less than 1 acre, between 1-3 acres, more than 3 acres) supported the necessity of wildlife conservation ($\chi^2 = 1.306$ and $p = 0.86$) (Table 4). Only a few respondents (below 30%) from the different classes of landholdings supported wildlife protection laws ($\chi^2 = 2.66$ and $p = 0.61$) (Table 5). Though the difference is not significant, it was noticed that, attitude towards forest protection staffs vary among respondents with different categories of landholding size, i.e. below one acre, between 1-3 acres, more than three acres were 67.4%, 52.9% and 33.3% respectively ($\chi^2 = 8.298$ and $p = 0.08$) (Table 6). The negative attitudes exhibited by large landholders were probably due to the fear associated with encroachment and resurvey by the forest department. There is a significant difference ($\chi^2 = 16.44$ and $p = 0.03$) in opinion among the residents regarding benefits by living near to forest (Table 7). Small landholders perceived more benefits from living near forest probably due to their higher dependency on resources in contrast to other studies [3]. People with less than one acre land perceived more benefit (44.7%) by living near to forest areas than those with more than one acre land (23.5%). This was associated with the higher dependency of small landholders to forest than the other groups.

Conflict with wildlife affects livelihood of rural farming communities, create problems such as decreased food security, increased workload, decreased physical and psychological well-being, and economic hardship [20]. This in turn led to develop a negative attitude towards conservation efforts. Local support for conservation cannot be expected when villagers have a perception that their life and commodity were under threat. In order to limit this, there is a need to protect rural livelihoods from the cost associated with wildlife conservation through community based conflict management. Community based methods have been described as the best approach to mitigate conflict, especially over a long term level [21]. This can be achieved by improving communication and expanding mitigation techniques used for wildlife conflict, both within and among villages [22].

Generally, support for conservation was higher only in principle, but not in practice. In this study, we have noted that people value wildlife conservation in general, despite the cost associated with conflict. However, the less favorable attitude towards wildlife protection laws poses a major challenge to the implementation of conservation policies. This is evident from the unwillingness of residents to assist forest protection staffs at several instances [23-26] especially in conflict-prone villages. Establishment of mitigation measures and its effective maintenance will improve people's tolerance level towards crop raiding wildlife. Environmental education programs together with participatory management of mitigation methods may be used to encourage better implementation present forest policies.

Conclusion

Socioeconomic characteristics of residents provided some sort of explanation for the distribution of conservation attitude. These differences should be taken into consideration while designing and implementing any policies. Even if scientific community and global population support conservation favorably, it is the perceptions and attitudes of residents near forest areas that will make a remarkable difference in the conservation of wildlife. Ensuring the participation of villagers in planning and decision making would benefit conservation.

Villagers' perception on the cost of conservation could be addressed in a negotiated approach for managing the wildlife crop damage. Local residents possibly will support conservation if their problems are adequately addressed. If no efforts are made it could have some adverse impact on the conservation in the near future. Hence it is very important to develop an effort to incorporate people's participation in conservation interventions to realize an improved coexistence.

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