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Prospective Threats To Wildlife Conservation Due To Attitudes And Perceptions In The Ranthambore Tiger Reserve, Rajasthan.

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Abstract
Knowing the attitudes and perceptions of people towards wildlife conservation is a primordial factor and strategy. The success of wildlife conservation depends on the attitudes of the local population, and their perception of concepts and strategies put forth by conservation organizations. Although people in the area associate wildlife conservation with a refusal to access rights to the Park's resources, they are conscious of the further declines in wildlife population in their area and fear the extinction of this natural heritage shortly. Questionnaires and participatory rapid appraisal approaches were used to collect information from workers of some conservation. A total of 306 people in seven villages were sampled and their relative frequencies were calculated. Chi-square and ANOVA were used to examine the relationship between variables. Most respondents (83.2%) living near the Ranthambhore National Park were interested in wildlife conservation however contrastingly, 16.8% condemned conservation attributing it to lack of focus and rebuttal to access rights to their natural heritage, 74% said conservation is not beneficial to the local people while only 26% acknowledge its benefits. This study was a small part of the larger Conservation Education around Protected Areas. Following one year of questioning, interacting with people of the Ranthambore Area has shown that conservation can be a success within and around protected areas. To change the perception and attitudes of indigenous people around protected areas, environmental education through sensitization should be encouraged. These negative attitudes and perceptions can be well designed with carefully implemented conservation programs that also augment their livelihoods.

Keywords: Attitudes, Perceptions, Wildlife Conservation, Protected Areas, Ranthambhore National Park.

Introduction

Many factors are responsible for the success of wildlife conservation; these could be the attitudes of the local population, the understanding and implementation of the strategies by the conservation organizations, and many others. However, there is a feeling among the local people that wildlife conservation declines their access rights to the Park's resources. Still, at the same time, the local people are also concerned about the annihilation of this natural heritage. For the present study, Questionnaires and participatory rapid appraisal approaches were employed to generate data and facts from the people living around the protected area of Ranthambhore National Park (RNP). A total of 306 people in seven Ranthambhore National Park (RNP) villages were selected and questioned regarding this study.

This study was carried out using a sample size of 306 respondents, across seven villages, in rural and urban landscapes, around a 10 km radius of the RNP, considering the huge population around the Protected Areas. Exploratory Analyses were carried out among the variables and Chi-Square tests were performed to find significant relationships to answer some of the research hypotheses. For grouping respondents into different groups based on the similarity of responses we conducted Cluster Analysis, but the responses were almost similar so we are not able to define if any particular group of people is environment-friendly or conservation aware people.

The interaction with the respondents reflected that locals residing near Ranthambore National Park have shown that wildlife conservation can be a success within and around protected areas. Therefore, to change the attitude and perception of local people around protected areas, environmental education through sensitization and sustainable livelihoods ought to be encouraged. These unconstructive attitudes and perceptions can be well-premeditated with carefully designed and implemented conservation programs.

The formation of protected Areas (PAs) has been the most extensively contested way of biodiversity conservation, upheld by nationwide and global agencies. A growing body of empirical evidence now indicates that the transfer of "Western'' conservation approaches to developing countries has indeed had adverse effects on the food security and livelihoods of people living in and around protected areas and wildlife management schemes (Ghimire and Pimbert, 1997; Ghimire, 1994; Kothari et al, 1989. In many cases, local people have faced restrictions in their use of common property resources for food gathering, the harvest of medicinal plants, grazing, fishing, hunting, and collection of wood and other wild products from forests, wetlands, and pastoral lands. Denying resource use to local people severely reduces their incentive to conserve it.

Local people are vulnerable to the formation of PAs, chiefly in developing economies as their livelihoods are reliant on them (Rodgers, 1989) Historically, conservation strategies have been manipulated by endeavours to fence off-reserve areas for nature and exclude people from the restricted areas. (Adams & Hulme 2001). Nowadays, around 70% of global

forests are yet owned and administered by Governments. However, in most cases, the top-down exclusionary method to Protected Areas has not been able to stop deforestation and the associated loss of forest biodiversity that has become one of the main conservation issues in the world these days (Geist & Lambin 2002).

Conservation Areas are mainly administered by the Government in growing economies. Efforts are made to address people's needs in conservation by including them in decision-making, permitting them to allocate benefits of conservation, and bestowing them with measures to mitigate every adverse result of conservation. Though, in countless cases, people's perceptions of these efforts are scarcely elicited, analysed, and encompassed in decision-making procedures (Chase et al. 2004). It is extensively acknowledged that people living inside or in the vicinity of protected areas are critical to the accomplishment of conservation efforts. Local people are believed to have the vision, data, and incentive needed to grasp and preserve the resources they depend on. (Johnson 2001).

National Parks are the most extensive type of protected areas in India and globally.[1] The basic aim behind establishing National Parks is to (1) protect the ecological integrity of one or more ecosystems for present and future generations; (2) exclude exploitation or occupation detrimental to the purposes of designation of the area; and (3) provide a foundation for spiritual, scientific, educational, recreational, and visitor opportunities, all of which must be environmentally and culturally compatible[2]. National Parks comprise the highest percentage (23%) of the total area covered by protected areas worldwide[3].

Two methods have been established for the conservation of biodiversity in National Parks: one approach is the preservation approach, which aims at setting aside National Parks to exclude human activities except for tourism. Through this approach, direct use of natural resources in the park for commercial or subsistence purposes is prohibited[4]. This type of approach is often referred to as the "protectionism approach" or "the fines and fences" approach[5]. The preservation approach aims at excluding human activities considered inimical to the objectives of conserving biodiversity in National Parks. The preservation approach was the most dominant approach until the 1980s, but in some National Parks, it has now been substituted by the second approach called the community-based conservation approach that allows people (especially those that neighbour National Parks) to benefit socially or economically from parks[6]. The community-based conservation approach was proposed to address the problems associated with excluding human activities from the park.[7]

Objectives of the Study are:-

- To identify background factors such as demographic and socioeconomic variables, general values toward the RNP, and experience pertaining to damage caused by wildlife.
- To assess residents 'attitudes toward different motivations for hunting -hunting for consumption, hunting for commercial purposes, killing animals in retaliation for damage to crops, livestock, or human- and deforestation.

This study also aims to comprehend the behavioural impacts exerted by the various emotional and cognitive indicators of environmental identity on nature–protective commitments and decisions.

The assessment of peoples' attitudes and perceptions towards conservation has come to be a vital aspect in countless studies of wildlife conservation (Newmark et al., 1993). Wildlife conservation and accomplishment depend on the attitudes of people toward conservation (Osmond, 1994; Katrina, 2000). Equally, understanding factors that impact attitudes is vital to enable wildlife managers to apply ways that gain support from stakeholders and the general public. It is vital to pursue and attain the alert participation of possible stakeholders not merely in the technical efficiency of conservation knowledge, but additionally in the extent of fulfilling traditional, communal, and governmental considerations in nature that can aid change the attitudes of original people towards wildlife attendance and conservation (Newman et al, 1994). People additionally demand to be notified across specific awareness movements or environmental education that can help change their attitudes towards conservation. Tsi et al. (2008) clarified that in Northern Cameroon, inactive and less literate people who inhabit Areas encircling nationwide parks regions are extra prone to wildlife crimes. The attitude concerning the Willingness to Pay (WTP), an important concept in wildlife conservation, is affected because environmental subjects are a necessity and not a luxury (Hökby and Söderqvist, 2005).

The Ranthambhore National Park (RNP) area has been well documented and more sympathetically most communities who live around the PA depend upon the grass, firewood, and rearing of domestic animals for milk is the main activity. Recently, the RNP landscape has undergone substantial adjustments in socioeconomic and governmental words that

[1] S. Chape, S. Blyth, L. Fish, P. Fox, and M. Spalding, The 2003 United Nations List of Protected Areas, IUCN and UNEP-WCMC, Cambridge, UK, 2003.
[2] Ibid., at 44
[3] Ibid., at 46
[4] W. Adams, Against Extinction: The Story of Conservation, Earthscan, London, UK, 2004.
[5] Ibid., at 15
[6] S. Stolton, S. Mansourian, and N. Dudley, Valuing Protected Areas, The International Bank for Reconstruction and Development, Washington, DC, USA, 2010.
[7] R. A. Schroeder, "Geographies of environmental intervention in Africa," Progress in Human Geography, vol. 23, no. 3, pp. 359–378, 1999.

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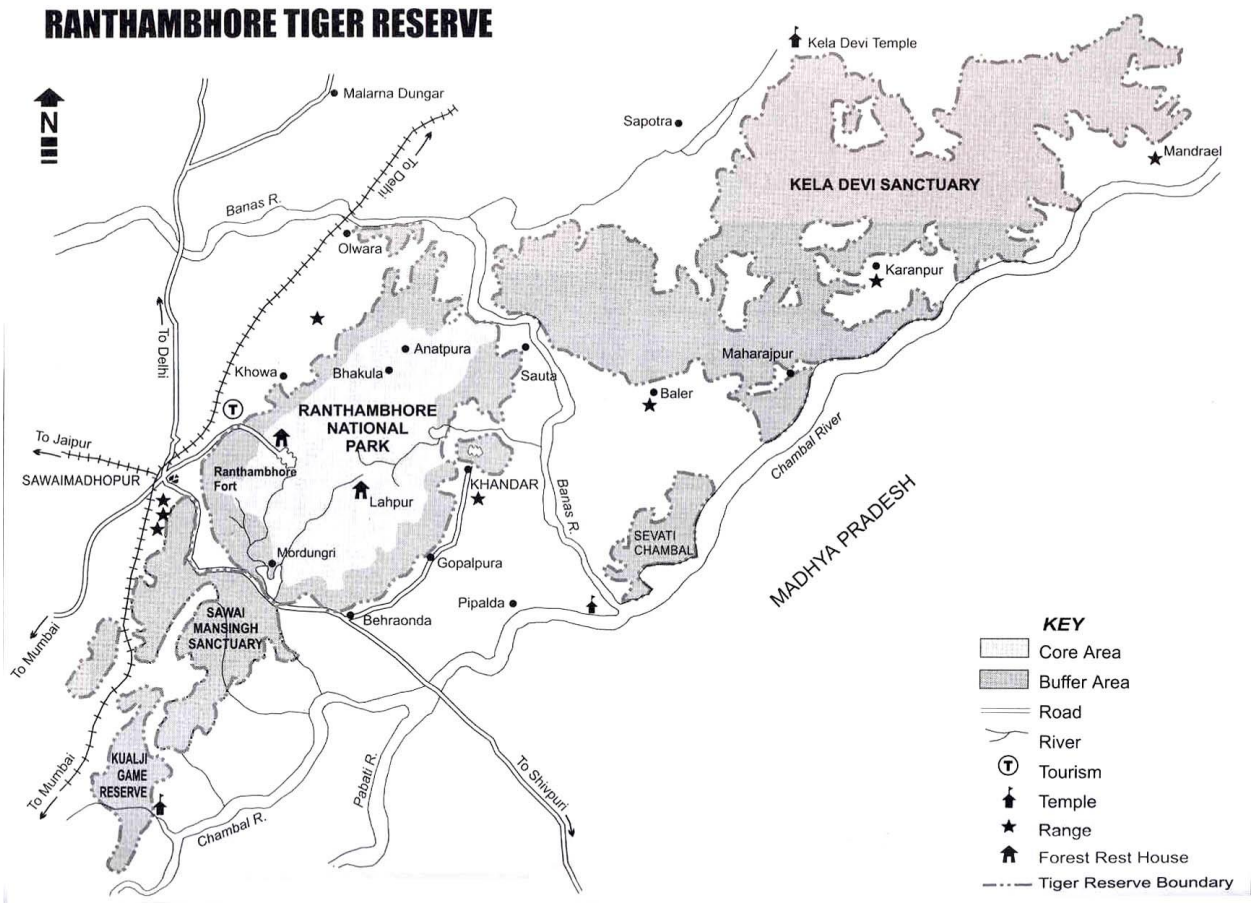
demand to be understood about wildlife conservation. In India, the westernmost populace of tigers is distributed in Ranthambhore Tiger Reserve (RTR), Rajasthan, Western India (Jhala et al.2008). The RTR is one of India's most critically protected areas because there is a high biomass of feral prey that can support high carnivore densities (Karanth and Nichols 2000) and, most considerably, the tiger populace it supports is genetically exceptional. Because RTR is at the westernmost allocation of their scope, the populace is sensitive to stochastic reasons for reduction at the populace or genetic level. Tigers inhabit merely 344 km2 of forest inside a 1,394 km2 reserve (Jhala et al. 2008), that is encircled by >300 villages inside 5 km of the park alongside >150,000 people and their livestock. Such reserves encircled by dense human populaces frequently are the main basis of colossal carnivore mortality and are susceptible to species loss. Land use practices outside RTR include intensive agriculture, and because there is a lack of native ungulates in the buffer area of RTR that constitutes tiger habitat, village livestock are the primary prey available for tigers in these areas.

Various wildlife projects that link conservation and progress have been implemented in and around protected areas to produce benefits for local communities that have or else been disenfranchised by protectionist policies. The rationale behind such initiatives is to engender support for conservation among local communities, by including them in association and decision-making and by bestowing benefits to offset the opportunity costs of protection. If such wildlife projects succeed, we should anticipate local communities to display extra affirmative attitudes towards conservation and associated projects. On the contrary, the respondent's awareness concerning each progress and livelihood wildlife projects like the Nationwide Bamboo Mission, Nationwide Horticulture Duty, etc by the Power in the periphery of RNP was restricted to 58.6%. Several studies have examined the subject of local attitudes towards conservation and progress. It has usually been discovered that prices associated with conservation (such as harmful wildlife, and crop depredation) have negative results on local attitudes, as benefits from conservation (such as game meat, and medicinal herbs) could have a little affirmative effect.

However, 17% differed from any compensation endowed by the Government for the damage provoked by wildlife to the residents who live near the National Park, as opposed to 71% who were cognizant of such compensation.

This study aimed to address this issue; the hypothesis is that receipt of benefits from protected area tourism results in larger support for conservation amongst the communities residing nearby. Approximately 91% of the respondents thought that the populace of tigers in India is reducing due to human pressures on their habitat and inside this segment 96% concurred that tourism will plummet if the number of tigers drops in this forest.

Figure-1: Ranthambore Tiger Reserve



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1. Materials and Methods

Geographical characteristics of the Study area

The Ranthambhore Tiger Reserve is composed of the following – Ranthambore National Park (RNP) (392 sq. km), Sawai Mansingh Sanctuary, Kualji close area and Keladevi Wildlife Sanctuary (676.38. sq km). There are 4 villages inside the park boundary 123 villages within 5 km having a cattle population of 51354 and 332 villages in the tiger Reserve covering an area of 1334.64 sq. km.

The Rivers Chambal in the South and the Banās in the North bound the National Park. The hills to the northwest of the fault line are the Aravalli's and typically have cliffs of sandstone on one side and the other side escarp slope. The hills southwest of the Great Boundary fault are the Vidhya's. The sandstone beds of these hills are flat-topped and form extensive table lands known as "Dangs". Small and short-lived streams have eroded deep in shale, long and narrow gorges that are locally known as "khos". The highest peak is called Gazel Peak 507 meters above MSL and lowest in the area of Bodal Village 244 meters elevation. Ravines along Chambal are as deep as 50 Mts. up to the park boundary.

History of RNP

The forests around the Ranthambore Fort were once the private hunting grounds of the Maharajas of Jaipur and the desire to Park the game in these forests for sport was responsible for their conservation. After independence in 1955, this area was declared the Sawai Man Singh Wildlife Sanctuary, and subsequently in 1972, Project Tiger was launched. At that time, it was estimated that there were around 1927 tigers in India, of which Rajasthan had 74, and the number of big cats in Ranthambore Sanctuary was 14. With the launch of Project Tiger, this sanctuary was brought under the National Project, along with eight other sanctuaries and national parks in 1973.

This Tiger Reserve in Rajasthan comprises the Sawai Man Singh and Keladevi Sanctuaries with varied conservation histories and virtually separated geographically, with narrow corridors linking them to the core-Ranthambore National Park. Keladevi Sanctuary is the northern extension of the Ranthambore Tiger Park in the Karauli and Sawai Madhopur districts.

2.1 Conservation Issues of RNP

The population around the Ranthambhore Tiger Park is mainly agriculturist, pastoralist, and working class, dependent upon the natural resources of the Park like grasses and small timber wood. The Park has some negative impacts on the population of the adjoining settlements, such as raiding by wild animals, livestock kills, etc. Based on the above-mentioned factors, the Zone of Influence (ZI) of the Park is "tentatively" identified as an area within a 10 Km radius of the legal boundaries of the Park.

There are 4 villages inside the Ranthambore National Park, 15 villages inside the Kela Devi Sanctuary, 4 villages inside the Sawai Mansingh Sanctuary & 3 villages inside the Sawai Madhopur Sanctuary. These villages are part of the Core and Buffer zones and are situated inside the Park boundaries.

Major communities living around the Project area

Meena: Meena is a scheduled tribe and the main landlords of this area. They are agriculturists and keep livestock to support their economy. This tribe is politically powerful and has an aggressive approach towards the negative impact of the PA. Their main dependency on the PA is for grazing, small timber, and building materials.

Gujjar: This is a forest-dwelling community and is mainly pastoralist. Gujjars do not have much land and are mostly dependent on animal husbandry for their livelihood. They depend on the PA for livestock grazing. Gujjars prefer free-range grazing of their livestock to stall feeding. They keep large herds of buffaloes and livestock of poor quality along with goats and sheep. Nearly all their livestock feed off the forests. They also collect wood for building their livestock pen, house, fuel, and also collect fodder from the PA.

Jat: Jats are not present in large numbers in the Sawai Mansingh Sanctuary; they reside mostly in the Khandar area of the PA. They are mainly agriculturists and keep small numbers of livestock to support their economy. They depend on the forest for small timber needs and for grazing their livestock.

Bairwa: Bairwa's are scheduled castes and consist mainly of workers. They provide work for agriculture, grazing, and the departmental works of forest and other line departments. They also keep livestock, goats to supplement their income. They use fuel wood, and small timber for building purposes and also graze their livestock in the forest.

Muslims: They are mainly agriculturists. They also engage in services like painting, building houses, running small businesses, and workshops. They depend on the forest for small timber, fuel wood, and fodder. They also poach ungulates which enter their fields.

Mogiyas: These are landless nomadic tribes. The community comprises professional hunters and is a real threat to wild animals. Farmers of all classes engage them to protect their crops from wild animals and stray livestock. They move camps depending on the availability of employment and wild animals that they hunt.

The Zone of Influence (ZI) outside the Park may be further divided into two parts. The first part is up to 2 Kilometres from the Park boundary and is most important from every aspect. The forest dependency of this area is maximum and the highest impact of the Park is felt by these areas. 88.9% of respondents agreed that the forest cover of the Park forms a catchment area for the surrounding villages, which is a major source of water. There are 112 villages in this area. This

area is classified as an "eco-development zone". The people living in this zone consider the Park as their resource to use and get antagonized when they are stopped from doing so.
As we go further from the boundaries of the Park, the dependency of the people on the Park decreases but seasonal dependency on the Park is still there. In the areas, further than 2 km from Park boundaries, the negative impact of the Park is not felt much, and as a result, the antagonism toward the Park is much less in the people of the area.

Demographic Profile of Project Area
Neemlikalan
This village is bordered by the sanctuary, where the village boundary and the sanctuary boundary blur, hence the villagers have direct access to the Park. 80% of the residents here graze their buffaloes and goats and sell the milk in Sawai Madhopur Town. This village has a Middle co-education school. Water is a scarce commodity here.

Total HHs	Total Popln	Male	Female	Literate	Illiterate	Livestock Holding -inclusive of Buffaloes/Cow/Sheep/Goat/Camel
154	998	547	451	321	677	2553

Neemlikhurd
This village also borders the sanctuary, villagers graze buffaloes and goats in the buffer area of the sanctuary. The milk is sold in the market in the town. Women who husband the buffaloes also cut fuel wood for their consumption. They also get green fodder for their Livestock. This village has a Middle co-education school. Water is a scarce commodity here.

Total HHs	Total Popln	Male	Female	Literate	Illiterate	Livestock Holding -inclusive of Buffaloes/Cow/Sheep/Goat/Camel
159	950	498	452	328	622	2311

Faloudi
One of the largest populated villages in our Project area. 50% of them engage in agriculture, 30% are daily wage earners, 20% are self-employed. Water is not available here which is a major issue. There are three schools, two private and one government-run school. Villagers are industrious hardworking and cooperative.

Total HHs	Total Popln	Male	Female	Literate	Illiterate	Livestock Holding -inclusive of Buffaloes/Cow/Sheep/Goat/Camel
800	6765	3856	2909	2276	4489	4685

Dungari
40% of the households here belonging to the scheduled caste like Dhobhi, Kandera, and Koli have no land holding hence they engage in daily wage work under the MNREGA, in other fields, or are engaged as security staff in the resorts around the Park. There are three schools, one private and two government-run, senior secondary schools.

Total HHs	Total Popln	Male	Female	Literate	Illiterate	Livestock Holding -inclusive of Buffaloes/Cow/Sheep/Goat/Camel
273	1656	923	733	554	1102	1723

Buripahadi
60% of the population is dependent on agriculture. 15% of the villagers are dependent on daily wage earnings, and 15% are working in the government sector like Railways, Education, and others. Almost all the households visit the forest for fuel wood and timber wood and graze their livestock in the forest. The availability of potable water is a major issue here.

Total HHs	Total Popln	Male	Female	Literate	Illiterate	Livestock Holding -inclusive of Buffaloes/Cow/Sheep/Goat/Came
1050	3038	1642	1396	1160	1878	3989

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Basso Khurd

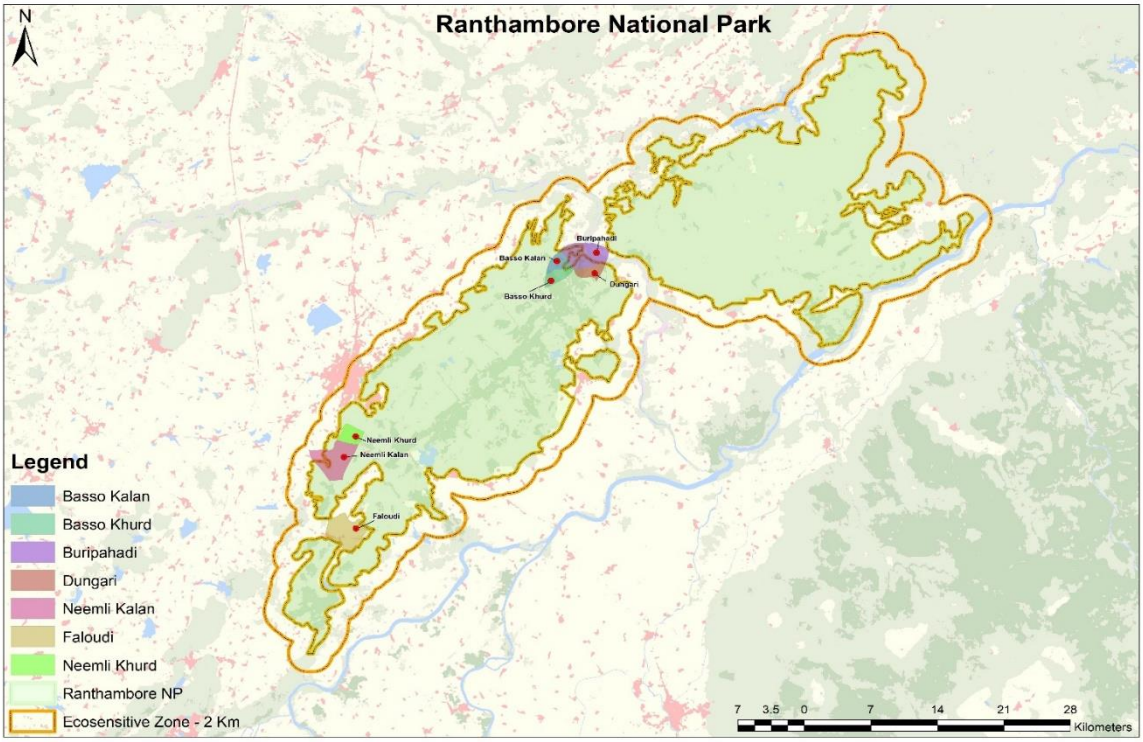
80% of villagers are engaged in agriculture, and 20% are employed in the government and banking sectors. The availability of potable water is a major issue here. This village is problematic; hence, many government-run programmes cannot take off here. A milk collection is also run here by the villagers. They take fuel wood and timber wood from the forest and also graze the livestock in the forest. It has an upper primary or Middle school.

Total HHs	Total Popln	Male	Female	Literate	Illiterate	Livestock Holding -inclusive of Buffaloes/Cow/Sheep/Goat/Came
420	1546	866	680	626	920	2384

Basso Kalan

The men here are obstinate and boisterous and therefore will not let their women come forward or voice their opinion. But they had no issues with the survey for our work. They also engage in extracting stones from the forest land and selling them for construction work in the township area. These villagers are infamous for extracting timber wood from the Park.

Total HHs	Total Popln	Male	Female	Literate	Illiterate	Livestock Holding -inclusive of Buffaloes/Cow/Sheep/Goat/Came
250	846	451	395	346	500	1935



Study areas in the Ranthambhore National Park, Sawai Madhopur, Rajasthan

Data Collection

This study is primarily based on a questionnaire survey and includes both closed and open questions, and addresses knowledge and attitudes about wildlife conservation, tigers, park management, climate change, and self-identity measures for avoiding man-animal conflict, pro-environmental values and self-identity, pro-environmental behaviours. Questionnaires were piloted with 30 residents from Sawai Madhopur District, following which certain modifications were made to the questionnaire.

A multi-level collection sampling technique (de Vaus, 1996), using structured interviews based on a questionnaire (opened and closed), in the local language, was used to collect information from the community areas experiencing

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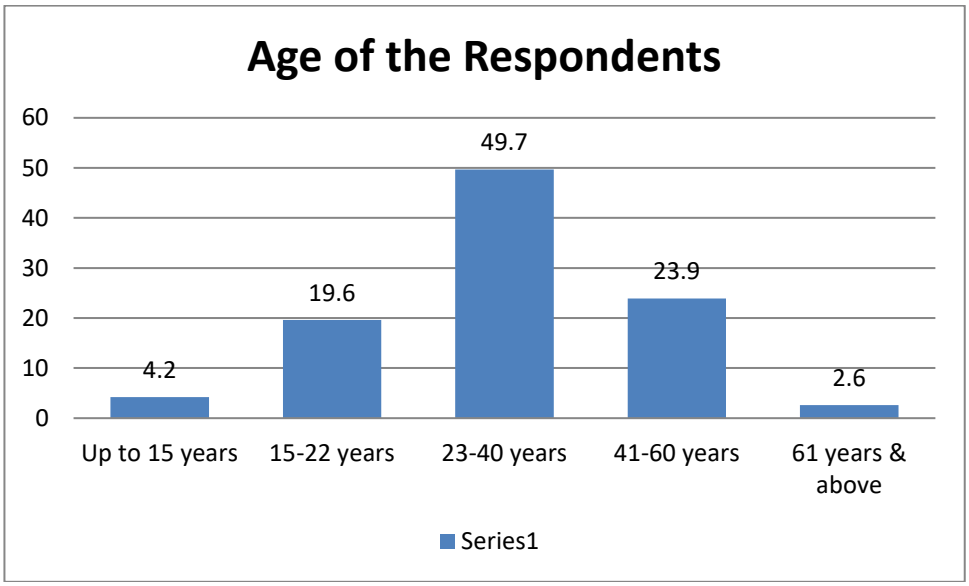
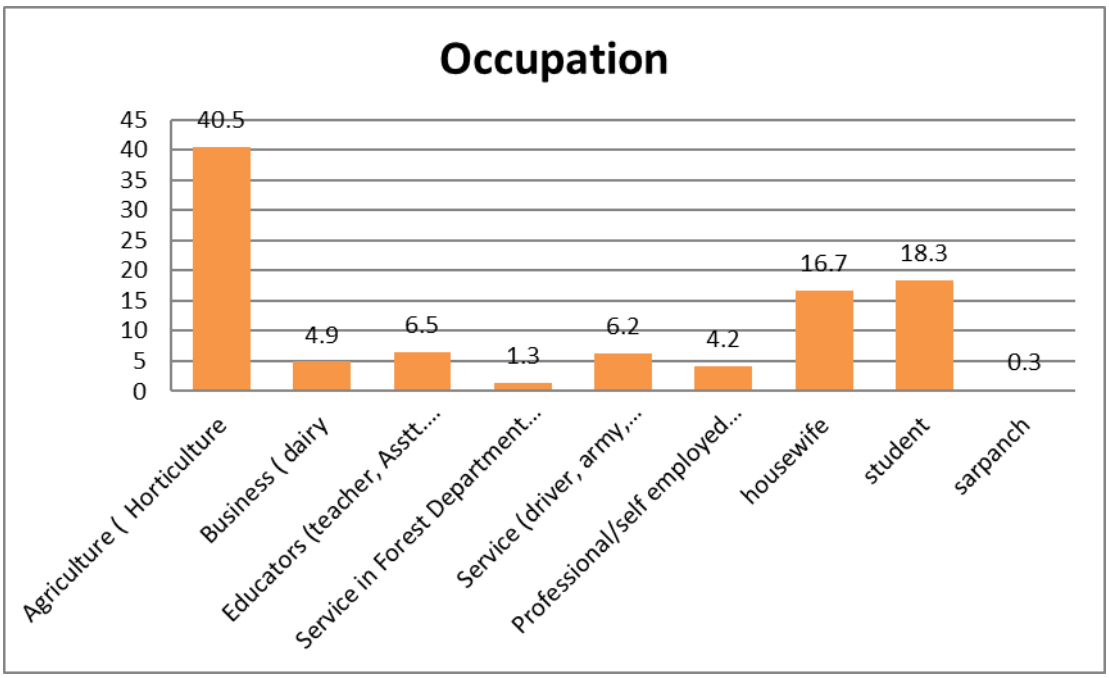
wildlife losses. The villages surrounding the RNP were chosen based on their proximity to the Park and the local community's use of resources from the Park.
Respondents from 16 years of age to 60 years were sampled.



Graph 1: Age of the Respondents



Graph 2: Occupation of the respondents

Preliminary analysis had shown that an increase in the sample size would not have increased the precision (de Vaus, 1996) to gain an understanding of the wide range of variation between families in areas with different wildlife losses. Pilot testing was performed on a sample of 30 respondents randomly selected and a questionnaire of 100 questions was administered to them. Based on the understanding levels and the multiplicity in framing the questions, some questions were rewritten before the final administration (de Vaus, 1996). A pre-test was conducted with two village assistants' one male and one female, to ensure that the questionnaire was fully understood. Some of the challenges met during the administration of the questionnaire were, that people found it difficult to comprehend questions that spoke of a utopian scenario, but understood those questions, which related to their situation and in the now. We also found that the levels of comprehension were commensurate with the education levels of the proponents.

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Methodology

In this study, both bivariate and multivariate analyses were employed. The bivariate analysis involved calculating the descriptive statistics of the knowledge, attitude, and behaviour (KAB) domains. The Mann-Whitney U test, a non-parametric method, was used to examine the differences in KAB domains by gender, as the KAB scores did not follow a normal distribution. Similarly, the Kruskal-Wallis's test, another non-parametric method, was used to test the differences by education groups, given that there are more than two categories in the education group, and the KAB scores were not normally distributed.

Considering the multiple indicators under KAB domains, Principal Component Analysis (PCA) was utilized for simplicity in analysis. PCA is a dimension reduction technique that constructs uncorrelated dimensions using correlated indicators. These dimensions were then used by PCA to create a composite score for the knowledge, attitude, and behaviour domains. Furthermore, to investigate the impact of education and gender on the awareness of livelihood projects, a sequential multiple binary logistic regression model was employed, given that the outcome variable of awareness is binary in nature (i.e., 0-no, 1-yes). The first model examined the unadjusted relationship between gender and awareness, while the second model focused on the unadjusted relationship between education and awareness. In the final model, the covariates of education and gender were considered while controlling for other factors such as age, religion, occupation, and sector.

Statistical analysis

The questionnaire consisted of 60 questions which were grouped as Indicators of knowledge, attitude/perceptions, and behaviour/practices forming four different sets of responses. Relative frequencies were calculated based on the total number of responses. The chi-square test has been used for the test of significance and the means of responses of subgroups within the gender and education groups have been compared for analysis with the help of Cross-tabulation analysis.

Results

The table-1 provides demographic information about the respondents. Approximately 53.4% of the respondents fall within the 20-40 age bracket. The majority of respondents are male (72.4%) and reside in rural areas (88.6%). When considering economic groups, around 49.0% of the respondents own land ranging from 5-10 bighas or more. In terms of occupation, 40.5% of respondents are engaged in agriculture, while 18.6% are students. Concerning education, 23.3% of respondents are illiterate, whereas nearly 54% have completed education up to the 8-10th standard.

Table 1, Background information of the respondents (n=306)

Indicators	Number of respondents	% of respondents
Age group		
Below 20 years	61	19.9
20-40 years	164	53.6
40-60 years	73	23.8
60+ years	8	2.7
Gender		
Male	222	72.6
Female	84	27.4
Religion		
Hindu	282	92.2
Muslim	22	7.2
Jain	1	0.3
Sikh	1	0.3
Sector		
Urban	35	11.4
Rural	271	88.6
Economic group		
Landless	56	18.3
<1 bigha	1	0.3
1-5 bigha	99	32.4
5-10 bigha	78	25.5
>10 bigha	72	23.5
Occupation categories		
Agriculture	124	40.5
Business	15	4.9

Service	10	3.3
Housewife	51	16.7
Student	56	18.3
Others	50	16.3
Education		
Illiterate	71	23.3
08-10 Pass	165	53.9
12 Pass	20	6.5
Graduate	33	10.8
Post-Graduate	16	5.2
Ph.D.	1	0.3
Total	**306**	

T**able-2** exhibits the descriptive statistics of knowledge, attitude, and behaviour indicators. All these indicators are reported on a Likert scale ranging from 1 to 5, where 1 represents strongly disagree and 5 represents strongly agree. In the case of the knowledge domain, more than 90% of the respondents agreed to knowledge indicators, except indicators number 4, 7, and 9. For indicator 4, only 71.9% agreed to be aware of the compensation given by the government for the damage caused by wildlife to the residents living around the national park. Further, 15.4% know indicator 7 which is "the demand for tiger parts in South and Southeast –East Asian countries will lead to the extinction of Tigers from India".
In the domain of behaviour, it's notable that over 85% of participants concurred with all the behavioural indicators. This is further evidenced by the average score of these indicators exceeding 3.9, suggesting that the typical participant either agrees or strongly agrees with the behavioural indicators. A similar picture can be observed for attitude indicators where the positive response is very high.

Table 2, Descriptive statistics of knowledge, attitude, and behaviour indicators

Domain	Number	Indicators	Respondent agreed to the indicators n (%)	Score		
				Average	Min	Max
Knowledge	1	**It is people who plan development projects, who are responsible for the safety of Tigers**	253 (82.7%)	3.79	2	5
	2	**I also know that if the Tiger is present then the ecological balance of the system is intact**	295 (96.4%)	4	2	5
	3	**The forest cover of the Park forms a catchment area for the surrounding villages, which is a major source of water**	298 (97.4%)	4.05	2	5
	4	**I am aware of the compensation given by the government for the damage caused by wildlife to the residents who live around the National Park**	220 (71.9%)	3.55	2	5
	5	**The income from tourism will reduce if the number of Tigers in this park declines**	295 (96.4%)	4.07	3	5
	6	**The population of tigers in India is reducing due to human pressures on their habitat**	285 (93.1%)	3.89	1	5
	7	**The demand for tiger parts in South and Southeast Asian countries will lead to the extinction of Tigers from India**	47 (15.4%)	2.94	1	5
	8	**It is only due to good proper management that the park has survived under high pressure from human population**	301 (98.4%)	4.01	2	5
	9	**I understand the importance of forests in carbon restoration and thus reducing global warming**	259 (84.6%)	3.91	2	5
	10	**The government was right in declaring this area a National Park otherwise we would have destroyed the forests**	302 (98.7%)	4.08	2	5
	11	**Grazing by cattle and goats causes damage to the ground cover**	296 (96.7%)	3.97	2	5

Behaviour	**1**	**I spend a lot of time in natural settings like forests, parks, and gardens**	305 (99.6%)	4.09	2	5
	2	**I call up rescue organisations when animals are trapped or in danger**	301 (98.4%)	4.09	2	5
	3	**I obey the rules and regulations when I visit the protected areas**	265 (86.6%)	3.90	2	5
	4	**I will not kill the leopard/Tiger that comes to my field**	306 (100%)	4.07	4	5
	5	**I will not cut the Dhok (Anogesis latifolia) tree from its roots**	303 (99.0%)	4.08	1	5
	6	**I will put up a barbed wire fence in my field so that it keeps away the vermins like Nilgai and Wild boar**	290 (94.8%)	3.91	2	5
	7	**I will grow fodder species on my farm and not send the cattle, buffaloes, or goats to the forest to graze**	305 (99.6%)	4.00	1	5
	8	**I will not kill the leopards/Tigers that come into my village area**	304 (99.4%)	4.08	2	5
Attitude	**1**	**I think of myself as part of nature and not separate from it**	302 (98.7%)	4.08	2	5
	2	**Every other species on this Earth has the same right to live on this Earth as humans**	302 (98.7%)	4.07	2	5
	3	**Learning about the natural world should be an important part of every child's upbringing**	299 (97.7%)	4.08	3	5
	4	**I am sensitive to the plants and animals around me and do not unnecessarily harm them**	292 (95.4%)	3.99	2	5
	5	**Telling stories about nature to children as they can be influenced to become sensitive to nature at a very young age**	257 (84%)	3.86	2	5
	6	**Gardening is an enjoyable activity for children to connect to the Earth**	256 (83.7%)	3.85	2	5
	7	**Pets, make children sensitive to nature and other forms of life**	287 (93.8%)	4.00	2	5
	8	**Tigers which are threatened by extinction urgently need us to protect them**	291 (95.1%)	3.94	2	5

Table 3 showcases the descriptive statistics of knowledge scores, which are computed from a variety of indicators within the knowledge domain. These aggregate scores were obtained using Principal Component Analysis (PCA). The table reveals that the average knowledge score for male respondents is higher than that of female respondents (P<0.01), a finding that is statistically significant at the 1% level as per the Mann-Whitney U test. Furthermore, there is a positive correlation between the level of education and the knowledge score. For instance, respondents with post-graduate education have an average score of 1.75, which is higher than less educated categories such as illiterate (-0.64) and 08-10 pass (-0.04). This pattern is statistically significant at the 1% level as per the Kruskal Wallis test. The significance is also maintained when comparing education categories across both genders.

Similar observations can be made in Table 4 and Table 6 for attitude and behavioural scores, which are also calculated using PCA. The behavioural and attitude scores are also higher among male respondents, and the results are significant at the 1% level. Additionally, these scores vary significantly by education group, with higher average scores observed among those with graduate and post-graduate education. However, the significance of the education category result is only applicable to male respondents.

Table 3, Descriptive statistics of knowledge scores by gender and education of the respondents

Indicators	**Knowledge score mean (min, max)**	**statistical test (P-value)**
Gender		
Male	0.180 (-4.21, 5.45)	Mann-Whitney U test (0.0007)
Female	-0.47 (-5.12, 4.63)	
Education*		
Illiterate	-0.64 (-512, 3.63)	kruskal wallis test (0.0001)
08-10 Pass	-0.04 (-4.09, 5.03)	

12 Pass	-0.06 (-2.94, 2.65)	
Graduate	0.63 (-2.45, 4.37)	
Post-Graduate	1.75 (-0.05, 5.03)	
Education if Gender= Male		
Illiterate	-0.38 (-4.22, 3.64)	kruskal wallis test (0.0001)
08-10 Pass	0.05 (-4.09, 5.04)	
12 Pass	0.09 (-2.95, 2.66)	
Graduate	0.75 (-2.46, 4.38)	
Post-Graduate	1.79 (-0.03, 5.03)	
Education if Gender= Female		
Illiterate	-0.98 (-5.13, -0.03)	kruskal wallis test (0.0002)
08-10 Pass	-0.34 (-2.61, 0.91)	
12 Pass	0.06 (-0.34, 0.57)	
Graduate	0.03 (-0.03, 0.05)	
Post-Graduate	1.59 (-0.06, 4.64)	

Note: PhD category is added in post-graduate as only a single sample is available

Table 4, Descriptive statistics of Attitude scores by gender and education of the respondents

Indicators	**Attitude score mean (min, max)**	**statistical test (P-value)**
Gender		
Male	0.189 (-6.26, 5.31)	Mann-Whitney U test (0.0003)
Female	-0.47 (-3.46, 4.21)	
Education		
Illiterate	-0.6 (-3.46, 1.98)	kruskal wallis test (0.0001)
08-10 Pass	-0.05 (-6.27, 5.12)	
12 Pass	0.65 (-1.44, 2.78)	
Graduate	0.56 (-3.11, 5.31)	
Post-Graduate	0.87 (-0.52, 2.55)	
Education if Gender= Male		
Illiterate	-0.28 (-3.21, 1.98)	kruskal wallis test (0.0004)
08-10 Pass	0.06 (-6.27, 5.12)	
12 Pass	0.83 (-0.5, 2.78)	
Graduate	0.55 (-3.11, 5.31)	
Post-Graduate	0.86 (-0.52, 2.24)	
Education if Gender= Female		
Illiterate	-1.00 (-3.46, 0.45)	kruskal wallis test (0.09)
08-10 Pass	-0.38 (-3.16, 4.21)	
12 Pass	-0.39 (-1.44, 0.13)	
Graduate	0.66 (0.13, 2.78)	
Post-Graduate	0.94 (0.13, 2.55)	

Note: PhD category is added in post-graduate as only single sample is available

Table 5, Descriptive statistics of Behaviour scores by gender and education of the respondents

Indicators	**Behaviour score mean (min, max)**	**statistical test (P-value)**
Gender		
Male	0.21 (-6.07, 6.65)	Mann-Whitney U test (0.0001)
Female	-0.55 (-4.21, 4.52)	
Education		
Illiterate	-0.45 (-4.21, 3.11)	kruskal wallis test (0.0001)
08-10 Pass	-0.11 (-6.07, 6.65)	
12 Pass	0.26 (-0.42, 4.52)	
Graduate	0.56 (-0.42, 6.42)	
Post-Graduate	1.14 (-0.42, 6.45)	
Education if Gender= Male		
Illiterate	-0.19 (-3.15, 3.11)	kruskal wallis test (0.009)
08-10 Pass	0.08 (-6.07, 6.65)	
12 Pass	0.09 (-0.42, 2.23)	
Graduate	0.66 (-0.42, 6.42)	
Post-Graduate	1.31 (-0.42, 6.45)	
Education if Gender= Female		
Illiterate	-0.77 (-4.21, 1.06)	kruskal wallis test (0.08)
08-10 Pass	-0.64 (-2.3, 0.95)	
12 Pass	1.23 (-0.42, 4.52)	
Graduate	0.02 (-0.42, 1.75)	
Post-Graduate	0.43 (-0.42, 0.95)	

Note: PhD category is added in post-graduate as only single sample is available

Table-6

Presents the results of a logistic regression analysis. Model-1 and Model-2 illustrate the unadjusted odds for gender and education, respectively. Model-1 reveals a significant association between gender and awareness about livelihood projects (P<0.10), with females having 0.614 times lower odds of awareness. Model 2 indicates that an increase in education is associated with 1.447 times higher odds (P<0.05) of awareness about the livelihood project. However, in Model 3, after adjusting for age, sector, religion, and occupation, only education remains significant (P<0.05). Thus, the logistic regression findings confirm that education is statistically associated with awareness about the livelihood project

Table-6, Result of logistic regression for awareness about the livelihood projects

Models	**Covariate**	**Odds Ratio (95% Confidence Interval)**	**P-value**
Model-1	**Gender**	0.614*(0.369, 1.029)	0.06
Model-2	**Education**	1.447** (0.689, 1.547)	0.03
Model-3	**Gender**	0.836 (0.451, 1.549)	0.57
	Education	1.594** (1.027, 2.474)	0.03

Note: Model-1: unadjusted odds of Gender, Model-2: Unadjusted odds of Education, Model-3: adjusted for age, sector, religion, and occupation; *P<0.10, **P<0.05

Discussion

Role of the local community's education towards conservation

The Central and state education boards have included environmental science in the school curriculum. The objective was to imbibe awareness and sensitization given the destruction and depletion of natural resources, forests, and wildlife and

the resulting global warming and other disasters. It is assumed that respondents who have completed school education and been sensitized about environmental issues during their formative years of learning are likely to show higher awareness about them, have more positive attitudes towards conservation, and practice favourable behavior towards conservation.

The total sample comprised 23% with no formal education while 54% were educated up to secondary level (10^{th}), 7% were post-secondary educated and 16% were graduates and Post graduates and doctorate. The objective of this analysis is to compare differences in knowledge, attitude, and behaviour between the group of respondents with no formal education and the educated and to find out differences in KAP due to different levels of education. Among women, 14 % had basic secondary and higher secondary education, while 10% had no formal education.

The behavioural and attitude scores are also higher among male respondents, and the results are significant at the 1% level. Additionally, these scores vary significantly by education group, with higher average scores observed among those with graduate and post-graduate education. The level of formal education associated with respondent's age influenced attitudes. The younger residents tended to have higher education levels than older respondents because the former had access to education than their counterparts who lived in the past. The educated people may have more knowledge on conservation-related issues which could have resulted from a high level of interaction at learning or educational institutions and exposure to media. These findings concur with those at Kossi Tappu Wildlife Reserve in Nepal, where respondents with higher household literacy rates had positive attitudes towards the reserve (Heinen 1993) The study also shows that attitude is not related primarily to the risk of incurring costs of the Park as measured by distance to the boundary, and hence likelihood of crop damage by wildlife.

Knowledge, Attitude, and Perception of Forest and Wildlife Availability

Most respondents perceived the conservation of forests and tigers are possible. 91% agreed that Tigers which are threatened by extinction urgently need people to protect them. A general and positive perception prevailed among 89% that every other species on this Earth has the same right to live on this Earth as humans. It was agreed (by 94% of the respondents) that pressures on human populations in and around RNP had been increasing and it was due to good proper management of the Park which has survived it. The government was right in declaring this area as a National Park otherwise we would have destroyed the forests (88%).

Knowledge about forests, their importance, and their uses play a crucial role in framing perceptions, attitudes, and behaviour. A good proportion of respondents were aware that the population of tigers in India is reducing due to human pressures on their habitat (91.5%).

The respondents reflected their opinion on a 5-point Likert scale on the questions to probe their knowledge, attitude, and behaviour towards the conservation of forest and wildlife issues. The combined results of respondents' knowledge showed a significantly good knowledge of the conservation of forests and wildlife, especially the tiger. The trend of opinion consisting of a significant level of agreement prevailed for attitude and behaviour also which indicates favourable attitude and behaviour of the respondents towards the forest and conservation.

Many communities in wildlife areas do not receive benefits and yet they bear the costs of living with wildlife. The proximity to the Park boundary may be one reason to develop an unfavourable attitude towards the Park and its wildlife than those who live further away and are not likely to incur heavy crop damage by wildlife. 17.6% disagreed that the Government provides for the damage caused by wildlife to the residents who live around the RNP National Park.

However, despite the costs of living with wildlife, some communities have retained a positive attitude towards conservation. A rapid decline of wildlife has been noted in areas where benefits are not accrued to the local community. This is because the community tries to engage in other land-use practices that are not only, detrimental to the wildlife population, but also result in increased conflicts.

The RNP landscape is a typical example of such an area. This study has shown that by denying people benefits and access to natural resources, they develop negative attitudes and engage in activities that are detrimental to conservation. Therefore, the future of wildlife becomes uncertain especially the large mammals.

94.1% considered the Nilgai and wild boars as 'vermins' and intended to keep them away. This indicates a negative attitude towards animals other than the tigers. On the contrary, 90% agreed and 9% strongly agreed that they would not uproot the "Dhok Trees (Anogesis latifolia)[8] from its roots due to its importance for various reasons.

For a more focused approach to raising awareness and building a positive conservation attitude among the inhabitants of villages around the protected areas, it is necessary to identify a set of well-matched target groups of the population. These target groups can work as advocacy groups to foster the need to protect and conserve the forest. Such groups can also be instrumental in building pressure on the forest department, program implementers service delivery systems that are operational within the forest and at the periphery.

[8] It is one of the most useful trees in India. Its leaves contain large amounts of gallotannins and are used in India for tanning. The tree is the source of Indian gum, also known as ghatti gum, which is used for calico printing among other uses. The leaves are also fed on by the Antheraea paphia moth which produces the tassar silk (Tussah), a form of wild silk of commercial importance, it also provides fodder to the herbivores.

Conclusion

The main challenge confronting forest management is reconciling short-term extractive needs with long-term conservation interests. But to be successful, the cooperation and support of the local communities are needed. Understanding how local communities perceive forest management by external agencies is important for designing management policies that address the dual goal of community interest and conservation. Apart from forest management aspects, people's perceptions of conservation issues are likely to be influenced by an array of socio-economic (for example level of education, wealth status, and other) demographic (household size, age of household head, etc.), and geophysical (distance of household from the forest or markets etc.) Gaining an understanding of these factors can provide information necessary for designing targeted policy measures to address people's aspirations in conservation and sustainable forest management. Environmental behaviour is different from many other behaviours that psychologists have tried to predict and influence, such as wearing a seatbelt in a car. Unlike these examples, many aspects of environmental behaviour are socially embedded, which makes it particularly suited for analysis from the perspective of social groups. Hornik (1989, 1997) argues in the field of health psychology that if social forces are structured to make individual behavioural change difficult, individual cognitive changes are unlikely to be productive in eliciting behavioural change. Public and social changes must occur to accommodate behavioural change. Similarly, Ockwell, Whitmarsh, and O'Neill (2009) argue that top-down policies to force pro-environmental behaviour need to be balanced with bottom-up grass-roots movements that can provide the social support necessary for accepting top-down regulation and enduring personal behavioural change. Expanding on these ideas, there are several theoretical reasons why environmental behaviour is particularly well-suited to group-level analyses.

Recommendations

The greatest adversary to wildlife conservation is the lack of knowledge of to conservation and management of natural resources. Therefore, the cooperation of all stakeholders (for example, community, government, conservationists) is crucial for long-term success in environmental protection programs. This initiative will require adopting proactive, mutually beneficial, environmentally friendly, and sustainable conservation strategies. Secondly, negative attitudes and perceptions can be shifted with carefully implemented conservation programs that serve to mitigate poverty by initiating entrepreneurial activities that can generate income for the residents to offset the costs incurred. At the same time, these initiatives serve to discourage land-use strategies that are incompatible with wildlife conservation.

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References

1. Adams, W & Hulme, D 2001, 'Conservation and Communities: Changing Narratives, Policies and Practices in African Conservation', in Hulme, D & Murphree, M (eds), African Wildlife and Livelihoods: The Promise and Performance of Community Conservation, Oxford, James Curry, pp. 9-23.
2. Chase, D.L., Pepper, J.S., Koelle, M.R. (2004). Mechanism of extrasynaptic dopamine signaling in Caenorhabditis elegans. Nat. Neurosci. 7, 1096–1103.
3. de Vaus 1996 Surveys in Social Research 4th Edition, Guildford: Biddles Ltd.
4. Geist HJ, Lambin EF. 2002. What Drives Tropical Deforestation? A Meta-Analysis of Proximate and Underlying Causes of Deforestation Based on Subnational Case Study Evidence. Louvain-la-Neuve (Belgium): LUCC International Project Office, LUCC Report Series no. 4.
5. Ghimire, K.B. and M.P. Pimbert, 1997. Social change and conservation. Environmental politics and impacts of national parks and protected areas. Earthscan and UNRISD, London.
6. Ghimire, K.B. 1994 Parks and People: Livelihood Issues in National Park Management in Thailand and Madagascar, Development and Change 25(1):195 – 229
7. Hökby S, Söderqvist T (2005). Elasticity of demand and willingness to pay for environmental services in Sweden. http://www.beijer.kva.se/publications/pdf-archieve/art-disc137.pdf
8. Heinen, Joel T. (1993) Park–people relations in Kosi Tappu Wildlife Reserve, Nepal: a socio-economic analysis. Environmental conservation, 1993 - cambridge.org
9. Jhala, Y.V., Gopal, R. and Qureshi, Q (eds.)2008. Status of tigers, co-predators, and prey in India by National Tiger Conservation Authority and Wildlife Institute of India. TR08/001, Print Vision, Dehradun, Pp. 164
10. Johnson, C.D., Lane, J.W., Jr., Williams, J.H., and Haeni, F.P., 2001, Application of geophysical methods to delineate contamination in fractured rock at the University of Connecticut landfill, Storrs, Connecticut: in Symposium on the

Application of Geophysics to Engineering and Environmental Problems, Denver, Colorado, March 4-7, 2001, Proceedings: Wheat Ridge, Colo., Environmental and Engineering Geophysical Society, CD-ROM.

11. Karanth KU, Nichols JD. Ecological Status and Conservation of Tigers in India. Final Technical Report to the Division of International Conservation, US Fish and Wildlife Service, Washington DC and Wildlife Conservation Society, New York. Bangalore, India: Centre for Wildlife Studies; 2000.
12. Kothari, A., P. Pande, S.Singh and R. Dilnavaz,., 1989. Management of national parks and sanctuaries
13. in India., status report, Indian Institute of Public Administration, New Delhi.
14. Katrina B (2000). People, parks, forests or fields: A realistic view of tropical forest conservation. Published by Elsevier Science Ltd Available online 24 July 2000.
15. Kurt Hornik (1989). Multilayer Feedforward Networks are Universal Approximators. Technische Universittit Wien. Neural Networks, Vol. 2, pp. 35Y-366, 1989.
16. Newmark, William D, Nancy L.L., Hashim. I. Sariko., and Deo-Gratias M.Gamassa.,(1993) Conservation Attitudes of Local People living around Five Protected Areas in Tanzania, Biological Conservation 1993,63, 177-183
17. Newmark WD, Manyanza DN, Gamassa Deo-gratias M (1994). The conflict wildlife and local people living adjacent to protected areas in Tanzania: human density as a predictor: Conserv. Biol., 8: 249-255.
18. Nji A (2004). Why poor people remain poor? Key elements for poverty reduction and sustainable development. Yaoundé, Cameroon Buma Kor Publishers. Pp. 240.
19. Ockwell, Whitmarsh, and O'Neill (2009) Reorienting Climate Change Communication for Effective Mitigation: Forcing People to be Green or Fostering Grass-Roots Engagement? Volume: 30 issue: 3, page(s): 305-327, Science Communication, Sage Journals.
20. Osmond P (1994). Wildlife-Human conflicts in Kenya: Integrating wildlife conservation with human needs in Masai Mara region; PhD Thesis, McGill University, Montreal
21. Rogers, M.E. (1989). Nursing: A science of unitary human beings. In J.P. Riehl-Sisca (Ed.), Conceptual models for nursing practice (3rd ed., pp. 181–188). Norwalk, CT: Appleton & Lange.
22. Tsi EA, Ajaga Nji, Wiegleb G (2008). The willingness to pay for the conservation of wildlife animals: case of the Derby Eland (Taurotragus derbianus gigas) and the African wild dog (Lycan pictus) in North Cameroon

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