



Wildlife Protection and Social Development: A Cross Sectional Analysis of Chitral

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Abstract: The major objective of this study was to measure the association between various interventions and ChitralGol National Park in preservation of biodiversity and socio-economic uplift. A sample size of 346 respondents (local people residents of buffer zone villages of CGNP) was randomly selected from total population of 3276 from the 4 purposively selected villages on the basis of close proximity namely Balach, Singore, Xang Bazar and Goledur study universe. A conceptual framework including dependent variable “social development” and independent variable Wildlife protection and development were devised. The data were analyzed through frequency and percentage distribution. Moreover, Chi-Square test was applied to know the relationship between dependent and independent variables at bi-variate level. In bi-variate analysis a highly significant ($P=0.000$) relation was found between protection/conservation of wildlife is essential to friendly environment, wildlife increased with the establishment of CGNP ($P=0.000$), initiatives taken by the government for the conservation of endangered wildlife are enough ($P=0.000$), deforestation is dangerous for the wildlife of CGNP ($P=0.000$), local people face any problem from the wildlife of CGNP ($P=0.000$), medicinal plants in CGNP are also protected in conservation strategies ($P=0.000$), measures adopted by CGNP are effective in wildlife protection ($P=0.000$) and social development. More participation of community to protect wildlife and biodiversity and arrangement of refresher courses for the staff to acquaint them with the skill of protection regarding themselves and wildlife were extended some of the recommendations in light of the study findings.

Keywords: Chitral National Park; Wildlife; Social Development; Chi-square.

1. Introduction

Cambridge English Dictionary define National Park as an area of a country which is protected by the government because of its natural beauty and peculiar history. As well as it can be illustrated as a comparatively a large area with outstanding scenic merit and national interest with the primary objective of protection and preservation of scenery, plants and animals in the natural state to which access for public recreation and research may be allowed” [1]. A protected area or National Park is a clearly defined geographical area, dedicated, recognized and managed, through legal or any other

means, to obtain the long term conservation of nature with associated eco-system services and preservation along with the co-existence of cultural values [1].

Historically in 1972, the idea of national park or conservation of nature under state ownership through legislation was started in the United State of America, which was Yellowstone National Park of Wyoming [2]. However, there are evidences that Yellowstone National Park was established after the Mongolian Mountain National Park Bogd Khan national Park, as it was established in 1778, so that seen as the oldest legally protected area. Canada made its first three national parks in the mid 1880's and an Australian park, Royal National Park, which is established in 1879. In the world, meeting the IUCN criteria, the largest national park which was established in 1974, is the Northeast Green National Park, covering an area of 972000km². In 2006 according to IUCN, there were 6555 national parks all over the world [3]. The fauna of the Argyll National Park of Scotland has great attraction, especially to naturalist and if the protection the wildlife within it territories is fully realized the number and variety of animals to be seen are likely to increase very considerably. Apart from the effect of the protection on the persistence of various species, which find great difficulty in surviving, it is well known that in protected areas wild animals soon become timid and in consequence are more easily observed by the ordinary visitors. In spite of the constant migration and change of animal's population, it is likely that when the growth of the forests is more advanced, the additional cover together with protection may result in a large increase in the present fauna[4].

In Pakistan there are 29 national parks in different localities of the country, covering 3% of the total land area. Among them 22 are under the supervision of the respective provincial government and the remaining are under the private care. The first national park of Pakistan is in Punjab, LalSuhanra National Park established in 1972, covering an area of 51,368 hectares. There are six National Parks in KPK, among the total of 29. The largest one is the Borogil National Park (Chitral), having total area of 0.13 million hectares. Other National Parks include SaifulMuluk National Park, LulusarDudipatsar National Park, Sheikh Badin National Park, Ayubia National Park and ChitralGole National Park. Yet, another with a specific name and the sole purpose of, ChitralGole National Park is an area allocated by the government of KPK for the protection of natural environment in the area. ChitralGole is named due to its proximal location to Chitral "Chitral" Town and the term "Gole" stands for stream in local language. The ChitralGole originates from ChitralGole National Park and pours into river Chitral. ChitralGole National Park (CGNP) is an alpine river catchment and bisects Chitral town into two equal halves [5].

1.2. Objectives of ChitralGole National Park

The main objective of the establishment of ChitralGole National Park is the protection of biodiversity. However, this park also serves for the public to administer for scientific purposes, education and recreation. People came here to enjoy and share the nature of the land and to learn about the factors and the people who shaped this through the centuries. Great scenery, magnificent places, natural plants and animals in natural state highlight impacts on visitors mind and in such a way it helps to convert people's attitude towards a healthy tract. Monuments, culture and the preservation of national natural heritage are all ensured by ChitralGole National Park, and it present all these to the public. This Park provides shelter to a vast diversity of animals specially Markhor, a kind of wild goat specie. It still holds the largest population of Astor Markhor in the world. A small number of Siberian Ibex, LadakhUrial and Asian black Bear also inhabit this park. The snow Leopard is seen there, but it is not the permanent resident of the park. Wolf, Fox, Himalayan Otter, the yellow throated Marten and many other animals are found in the park. The common birds are like as the bearded Vulture, the Himalayan Vulture, the golden Eagle, the demoiselle Crane, the peregrine Falcon, the Himalayan Monal, the snow Partridge and the rock Partridge [6].

In consistent with above, very few studies are conducted on the medicinal plants of Chitral, but ethno-botanically ChitralGole National park has never been explored in detail [7][8], however, enlisted some medicinal plants of Booni by[9], such as 111 medicinal plants of Mastuj valley was documented by [10] with exploration of 27 marketable medicinal plants of Kalasha valley was also prescribed by[11]. So this investigation is first attempt and is very important because CGNP is never been explored before, information and use of medicinal plants are decreasing day by day. A number of nomads migrate in Gohkhshal area are totally dependents on the forest for fodder, fuel wood, fencing and other requirements. As [5] disclosed that, in 1979 there were almost 520 animals in ChitralGole. The credit of increase in said population is due to better improvement steps taken and protection of animals. However Ahmad (quoted in valdez[12], stated that in 1987 the population of Markhor decreased to 197 in the Park, while Arshad et al.,[13] data shows that the Markhor population increased to 273 in 2003 and in 2006 it increased to 590. In addition, Ali reported that in 2006 the

population of Markhor was 612 with an annual growth rate of 7.7% [14]. Keeping in view the above stock of literature the present study was designed to find out the association of CGNP with wild-life protection through application of chi-square test statistics and by giving sound policies recommendations in the light of present study.

2. Material and Methods

A cross sectional study designed was conducted from the sample respondents based on simple random sampling procedure. A sample size stood of 346 respondents was selected from total 3276 population by the virtue of Sekeran[15] criteria; further sample size was proportionally allocated by using the formula given by Chaudray[16] where their interpretation of the subjective population is disclosed in table 1 respectively. A structured interview schedule was used for illiterate people and questionnaire was used for literate and having a high level of understanding with regards to the domain of the study. The present study was approved from the Board of Studies of the department of rural sociology, university of Agriculture Peshawar. This study has been thoroughly checked and approved by the board of studies consisting of nine members as professor, associate professor, assistant professor and lecturers with one member from director of advance studies of the university as conspicuous. Moreover, this study conducted under the financial corroboration of Wildlife Department Government of Khyber Pukhtunkhwa- Pakistan, with the sole aim of promoting tourism with reference to national park contribution. It is further to mention that all ethical consideration was taken on board by involving the respondents for interview. Such efforts included complete confidentiality of the respondents to be mandarin at. Efforts like making study more objective were made by quelling biasness. To make study more transparent the respondents were given a complete explanation regarding the activity and each and every ambiguity was explained and overcome subsequently. Moreover, the data was analyzed through frequency and percentage distribution (univariate analysis) and chi square statistics was ascertain the degree of association through indexation and cross tabulation was accelerated given by McCall and Robert [17]; as shown after table 1. The dependent variable was indexed and cross-tabulated with independent variable by showing the relationship in terms of significance level as well.

$$n = (n_i \times N_i / N)$$

Where

n= Required Sample size for each village

n_i = Total Sample size

N_i = Total population in each village

Table 1: Proportional allocation of sample size with respective villages			
S.No.	Village Name	Population Size (N)	Sample Size (n)
1	Singore (Shamirandeh)	986	101
2	Balach	1054	107
3	Xangh Bazar	519	59
4	Goledur	717	73
Grand Total		3276	346

N = Total population in study area

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{(O_{ij} - e_{ij})^2}{e_{ij}}$$

3. Results and Discussion

Perceptions of the respondents with regards to “wildlife protection and development”

Wildlife and Eco biodiversity are the two essential components in terms of reflecting the natural approach on forest management and preservation. Any society possessing a paradigm to protect wildlife in long term has the key to sustain ability. Failure to meet such requirements usually ends at alter failure, despites being embarked on protective initiatives. Table 2 shows a detailed perceptions of the respondents about the wildlife protection and development, the data indicated that conservation/protection of wildlife is essential to friendly environment as disclosed by (98.5%) were agreed, (2.6%) respondents were disagree. It is due to people mental and physical involvement restricting them to choose around for some unsocial events. There brings alluding towards outcome and also addressed Stolton and Dadly outcomes who stated that in Australia a movement entitled “*healthy parks and healthy people*” were initiated resulted into a positive impact on people psychological and others issues related to drugs addiction[18]. Likewise in CGNP there had 520 animals inhabited in 1979 as Aleem witnessed [5], but now Neely et al., also disclosed that the protection of wildlife has increased due to better protective steps taken by the government and community[19]. Similarly the study findings of Ahmad, had great alignment to the study findings that due to protection measures taken regularly, the Markhor population has increased to 273 in 2003 and 590 in 2006 respectively, along with annual growth rate of 7.7% and 616 Markhor were seen in 2008[14].

Furthermore, 94.5% of the respondents viewed that wildlife increased with the establishment of the CGNP, 2.6% were not agreed while 2.9% respondents had no idea about the said statement. It could be dedicated to the consistent efforts, adopted by the government and local community in the shape of CGNP. However, still concrete efforts are needed to make these initiatives more results yielding as pointed [9] out that the wildlife tremendously increased due to the persistence of CGNP, but unfortunately still poaching prevailed which led the population of Markhor decreasing day by day.

When it was asked about the initiatives taken by the government for the conservation of the endangered wildlife, the majority of the respondents i.e., 71.1% had the opinion that the initiatives taken by the government for the conservation of the endangered wildlife are not enough, 17.3% respondents were disagreed with the above statement, and 11.6% respondents had no idea regarding the said statement. It could be ascertained from the findings that government efforts had produced some magnified results; however, still efforts are needed to make these efforts more sound and free of any lope hole. Government initiatives in this respect are to be eulogized. Moreover, local community participation in this respect could for them strengthen these initiatives. In Indonesia government had taken some initiatives to protect the wildlife i.e. conservation of elephants and imposed penalty which led to positive consequences upon Indonesian parks [20].

Moreover, majority 87.9% of the respondents disclosed that deforestation is dangerous and 11.3% were not agreed with the above statement. Deforestation led to disastrous situation both at macro and micro level along with unhealthy ramifications for the local dwellers as well. These explanations are in lines to Stolton and Dadley [18] who dismantled about the “*Healthy parks and healthy people*” movement that National parks acts like therapy centers for the people living in the territories, Moreover, The effects of time spent in natural areas and the individual communication with each other reduce emotional and mantle fatigue and stress[21].

In addition a majority 94.2% of the respondents indicated that wildlife protection is important for healthy environment, 2.3% disagreed and 3.4% respondents were uncertain. These findings were in alignment to the preceding interpretation which elaborated that for living a healthy life the protection of wildlife ensures a keeping people entertained and in return healthy environment provokes a healthy person. In the border area of any national park and reserve, the cattle lifting is a common phenomenon. In Chit wan, 156 large mammals were killed by tiger; which included 2/3 were wild animals and 1/3 were livestock [22].

Similarly, 53.5% responded that local people don’t face problem from the wildlife of CGNP. The study also revealed that 55.8% of the respondents proclaimed that, medicinal plants are also protected in conservation strategies, 20.5% rejected and the remaining 23.7% had no idea about the said statement. Thus it could be assured that protection and preservation is a two way pronged approach. It not only protects wildlife but also preserve the endangered plant species. This statement is supported by[7], who stated that very few studies are conducted on the medicinal plants of Chitral, but ethno-botanically ChitralGole National park has never been explored in detail. Ethno-botanical fruit plants of Chitral, Some medicinal plants of Booni, 111 medicinal plants

of Mastuj valley, and 27 marketable medicinal plants of Kalash valley from which we can benefits were being lighted in national documentation so far[8,9,10].

Furthermore, the study also depicted that majority of the respondents 67.6% informed that the measures adopted by CGNP are enough, 21.4% of the respondents were not agreed and 11.0% were uncertain. It is vivid from these results that locals were highly satisfied from the measures taken by CGNP local participation in preservation is essential. It entails the taking on board the local culture, norms, which could save for a larger period of time as sustainable grounds. These findings were in support to Rao&Geisler[23], who were explored that it is very essential for the success of any park conservation objectives to give importance to the social and cultural values of the bordering people in the management and planning of the park, These findings also endorsed the success of these efforts as [13] data reflected that the Markhor population has increased to 273 in 2003 and in 2006 it increased to 590. Moreover, the population of Markhor was 612 with an annual growth rate of 7.7% in 2006[14].

Table No. 2. Frequency and Percentage Distribution of the respondents with regards to Wildlife Protection and Social Development

S. N o.	Statements	Yes	No	Uncertain
1.	Conservation/protection of wild life is essential to friendly environment.	342(98.5)	0(0.0)	4(1.2)
2.	Wildlife increased with the establishment of the CGNP?	327(94.5)	9(2.6)	10(2.9)
3.	Initiatives taken by the government for the conservation of endangered wildlife are enough.	60(17.3)	246(71.1)	40(11.6)
4.	Deforestation is dangerous for the wildlife of CGNP as it reduces the chances of survival of the endangered species.	304(87.9)	39(11.3)	3(0.9)
5.	Wildlife protection is important for healthy environment.	326(94.2)	8(2.3)	12(3.5)
6.	Local people face any problem from the wildlife of CGNP?	139(40.2)	185(53.5)	22(6.4)
7.	Medicinal plants in CGNP are also protected in conservation strategies.	193(55.8)	71(20.5)	82(23.7)
8.	Measures adopted by CGNP are effective in wildlife protection.	234(67.6)	74(21.4)	38(11.0)

Note: Number in table represent frequencies and number in parenthesis represent percentage proportion of the respondent.

3.1 Association between wildlife protection and Social development

Wildlife adds to biodiversity sustenance on permanent grounds. Any country, nation, who has a well-planned strategy on wildlife and social development, may ensure to sustain. Pebble condition of any of two is to be taken as collateral damage. Table 3 shows the association between social development and conservation of wildlife is essential for friendly environment. A highly significant ($P=0.000$) association was found between social development and conservation is essential for friendly environment. These results could be attributed to the people level of acumen of understanding the people and nature. Preservation of nature with respect to protection to fauna and flora entails the human being with artistic beauty by encouraging them with frequent visits to these areas. These findings were in lies to Bart et al., that preservation of endangered wildlife, habitat or unique cultural heritage is the primary objective of the protected areas. To understand and to enjoy the specialty of these areas, the tourists visit these areas and entertain themselves from the nature, environment or from the unique aspects of the culture of that area[24]. Stolton and Dadly also disclosed that in Australia a movement

entitled “*healthy parks and healthy people*” was initiated resulted into a positive impact on people psychological and other issues related to drugs addiction[18].

Likewise, the association between social development and wildlife increased with the establishment of CGNP was found highly significant ($P=0.000$). It could be attributed to CGNP effective measures, which resulted into protection of wildlife in the study area. Neeley et al., has also concluded that the protection of wildlife has increased due to better protective steps taken by the government and community. Due to protection measures taken regularly, the Markhor population has increased to 273 in 2003 and 590 in 2006 respectively[19]; along with annual growth rate of 7.7% and 616 Markhor were seen in 2008. It could be associated to the consistent efforts, adopted by the government and local community in the shape of CGNP[14]. However, still concrete efforts are needed to make these initiatives more results yielding as pointed out by [5] that the wildlife tremendously increased due to the persistence of CGNP, but unfortunately still poaching prevailed which led the population of Markhor on decline.

A highly significant ($P=0.000$) association was prevailed as depicted from the table 3 between social development and initiatives taken by the government are enough for the conservation of endangered wildlife. Based on these findings it is suggested as [20] disclosed that government efforts had produced some magnified results; however, still efforts are needed to make these efforts more target oriented and free of any loophole. Government initiatives in this respect are to be eulogized and people to be persuaded for participation as an integral part of conservation strategy. In Indonesia government had taken some initiatives to protect the wildlife i.e. conservation of elephants and imposed penalty which led to positive consequences upon Indonesian parks[20].

Similarly, a highly significant ($P=0.000$) association was found between social development and deforestation is dangerous for the wildlife of CGNP. It is obvious that people had the high acknowledgement regarding the co-relationship of forestation and preservation of nature. As supported by Stolton and Dadley who were dismantled that the “Healthy parks and healthy people” movement where the National parks acts like therapy centers for the people living in the territories. Moreover, the effects of time spent in natural areas and the individual communication with each other reduce emotional and mental fatigue and stress. Deforestation always leads to disastrous situation both at macro and micro level along with unhealthy ramifications for the local dwellers as well in terms of health and scarcity of reserves[18]. There was also found a highly significant ($P=0.000$) relation between social development and wildlife protection is important for healthy environment. These findings augmented the fore mentioned results in as reflected by Stolton and Dadley as well that for living a healthy life the protection of wildlife ensures keeping people entertained and in return healthy environment provokes a healthy person[18].

Furthermore, a highly significant ($P=0.000$) association was found between social development and local people face any problem from the wildlife of CGNP. Tmang supported these findings, that in the border area of any national park and reserve, the cattle lifting are a common phenomenon. In Chitwan, tiger killed 156 large mammals; which included 2/3 were wild animals and 1/3 were livestock. There are legal and practical facts, which the authorities have to deal with the local people. Practically, in less developed countries the life standard of the people of buffer zone areas may be compromised because of conservation policies[22,25], for which they get financial benefits from the wildlife. Like as spotted Hyenas kill livestock and the people accept the loss because of the compensation from wildlife department. Duffy further suggested that when the animals are sold to the hunters these affectors might be compensated[26].

Furthermore, the present study shows that in CGNP the people did not face any problem from the wildlife as indicated by a significance ($P=0.000$) association between social development and medicinal plants in CGNP are also protected in conservation strategies. It could be deduced that protection of wildlife is a two pronged strategy i.e. protection wildlife and the existing flora. The flora could include the endangered medicinal plants. Khan et al.,[7], has also endorsed these findings by exploring that very few studies are conducted on the medicinal plants of Chitral, but ethno-botanically ChitralGole National park has never been explored in detail. Ethno-botanical fruit plants of Chitral, some medicinal plants of Booni, 111 medicinal plants of Mastuj valley, and 27 marketable medicinal plants of Kalash valleys from which we can benefits were being enlisted in national documentation so far [8-10].

Furthermore, the study also revealed that there was a strong association ($P=0.000$) between social development and measures adopted by CGNP are affective in wildlife protection. It is vivid from these results that locals were highly satisfied from the measures taken by CGNP. Satisfaction of people is indicative of the facts that local culture, myths and traditions were kept under consideration while devising protective strategies by CGNP.

These findings were in support to Rao&Geisler, who explored that it is very essential for the success of any park conservation objectives to give importance to the social and cultural values of the bordering people in the management and planning of the park. The success of these efforts has shown a surge in reflected the Markhor population has increased to 273 in 2003 and in 2006 it increased to 590 respectively. Its population growth rate has reached to 7.7% annually[23,13-14].

Table.3.Association between Dependent variable and Independent variable

Wildlife Protection	Attributes	Social Development			Chi-square (P Value)
		Yes	No	Uncertain	
Conservation/protection of wild life is essential to friendly environment.	Yes	231(66.8)	0(0.0)	0(0.0)	X ² = 27.776 P= 0.000
	No	71(20.5)	0(0.0)	0(0.0)	
	Uncertain	40 (11.6)	0(0.0)	4(1.2)	
	Total	342(98.8)	0(0.0)	4(1.2)	
Wildlife increased with the establishment of the CGNP?	Yes	231(66.8)	0 (0)	0 (0)	X ² =137.986 P=0.000
	No	71 (20.5)	0 (0)	0 (0)	
	Uncertain	25 (7.2)	9 (2.6)	10 (2.9)	
	Total	327(94.5)	9 (2.6)	10 (2.9)	
Initiatives taken by the government for the conservation of endangered wildlife are enough.	Yes	60 (17.3)	171(49.4)	0 (0)	X ² =336.830 P=0.000
	No	0 (0)	71 (20.5)	0 (0)	
	Uncertain	0 (0)	4 (1.2)	40 (11.6)	
	Total	60 (17.3)	246(71.1)	40 (11.6)	
Deforestation is dangerous for the wildlife of CGNP as it reduces the chances of survival of the endangered species.	Yes	231(66.8)	0 (0)	0(0)	X ² = 328.100 P=0.000
	No	71 (20.5)	0 (0)	0 (0)	
	Uncertain	2 (0.6)	39 (11.3)	3 (0.9)	
	Total	304(87.9)	39 (11.3)	3 (0.9)	
Wildlife protection is important for healthy environment.	Yes	321(66.8)	0 (0)	0 (0)	X ² =145.694 P=0.000
	No	71 (20.5)	0 (0)	0 (0)	
	Uncertain	24 (6.9)	8 (2.3)	12 (3.5)	
	Total	326(94.2)	8 (2.3)	12 (3.5)	
Local people face any problem from	Yes	139(40.2)	92 (26.6)	0 (0)	X ² = 257.089

the wildlife of CGNP?	No	0 (0)	71 (20.5)	0 (0)	P=0.000
	Uncertain	0 (0)	22 (6.4)	22 (6.4)	
	Total	139(40.2)	185(53.5)	22 (6.4)	
Medicinal plants in CGNP are also protected in conservation strategies.	Yes	193(55.8)	38 (11.0)	0 (0)	X ² = 319.766 P= 0.000
	No	0 (0)	33 (9.5)	38 (11.0)	
	Uncertain	0 (0)	0 (0)	44 (12.7)	
	Total	193(55.8)	71 (20.5)	82 (23.7)	
Measures adopted by CGNP are effective in wildlife protection.	Yes	231(66.8)	0 (0)	0 (0)	X ² = 602.907 P= 0.000
	No	3 (0.9)	68 (19.7)	0 (0)	
	Uncertain	0 (0)	6 (1.7)	38 (11.0)	
	Total	234(67.6)	74 (21.4)	38 (11.0)	

4. Conclusion and Recommendations

It was concluded from the discussion of the participants regarding the issue at hand that government had taken a strong resolve to protect wildlife. Local villagers were involved constituting their committees and entrusted with the logo of protecting Markhor. This strategy had proved its worth which resulted into a surge in the population of Markhor. In addition, conservation was identified as environment friendly which had led to the surge in wildlife protection in the light of protective measures adopted through CGNP. Moreover, it was also found that people had an in-depth of the deforestation destructive effects and termed the sustainable preservation of wildlife closely linked with preservation of nature i.e. forests. The forestation effort has reflected its yields in the form of medicinal plants protection. This landed towards a compact whole that is protection of flora and fauna respectively.

Hunting of the local specie i.e. Markhor was identified as the cultural source of attractions for tourists specifically the hunters. Hunting though in practice but on prescribed patterns which didn't deplete the number of wild animals. Although generating monetary return was obvious but spending on judicious and sustainable ground must be ensured. This would serve as a protecting factor to the local community, which would anticipate further by taking roles and responsibilities.

Increase in wild animal has endangered the property particularly on farm productivity of the local farmers. Moreover, if the wild animals (snow leopard, wolf etc.) attack the domesticated animal of the locals, local should be given a proper financial cover in such cases. This would serve as bridge in establishing a strong support of local farmers and conservationists in a reciprocal and paradoxical shape.

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