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Chitral Gol National Park; A paradise or threat for biodiversity conservation and socio-economic conditions of local societies

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Research

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ABSTRACT
The current study was conducted to investigate the Chitral Gol National Park, as a bliss or risk for biodiversity safeguarding and socio-economic situations of regional people in the park region. The Chitral Gol National Park indicates a vital part in the improvement of the socio-economic situation and also in the management of the biodiversity in park area. The key aim of the park area is generally to enhance the societies' link in the park area for its better management and conservation through community-based conservation. For this aim, 160 open ended questionnaires were equally distributed and collected in the park area. Results revealed that the local public much satisfied from the park area. 11 villages openly profited from the park area in case of cash, employments and wood fuel etc. The local public greatly concerned in the management of park area. The ecological profits from park were reported well. The administration maintenance was noble in the park area and show energetic role in the management of plantation, flora cover, fauna species etc. Public education and awareness about park areas via education, workshops, seminars, walk campaign, and local government must take obligatory stages for their safeguard and management.

Keywords: Chitral Gol National Park, Local Community, Biodiversity Conservation, Socio-economic Conditions, Protected areas

1. INTRODUCTION

For biodiversity conservation and management, park areas have been reported a vital principal [1]. Certain park areas stay as "paper parks," world's protected areas prospered just 20 to 50 % [2]. The system of park areas commonly realized as a key of biodiversity protection [3]. 15% of the earth's surface is covered by protected areas [4]. It has been proposed that park areas reduce by several effects like forest fire and deforestation [2]. While, it has also discovered that tourism can openly deliver and motivate native people to play role towards the protection of environment and biodiversity conservation as well [5]. Park areas was firmly conserved for the native species of wildlife and their ecological functions [6]. "eco-tourists" are widely considered much wanted kind of park tourist [7]. While on other hand these tourists have much negative impacts on park areas such as deforestation, hunting, different types of pollution and disturbance in ecological system [8].

The rapid increase in rural populations in developing nations could add load on protected areas because local people in rural areas directly depending on biodiversity [9]. Though, park areas play important part in reduction and decreasing the problem of food scarcity in many nations worldwide [10]. Environmental degradation produced by anthropogenic activities finishing natural regions [11]. Such as habitat loss is the key issue in park area [12]. Climate change also disrupting ecosystems and creating variations in species varieties, community organization and specie's phenology [13]. Human and wildlife meetings are becoming one of the most severe problem in Pakistan as well as internationally [14]. People living nearby to protected areas have damaging attitudes towards hunting and as result producing problems to biodiversity [15]. Bumthang is the famous district of Bhutan where the many bears were killed due to human activities [16]. During the last year, 817 livestock were disappeared because of infections and hunter predation. Yearly financial loss of USD, 28,145 (USD, 189 each family) due to predation. Brown bear and black bear have destroyed yields of potato and maize which produce financial damages of USD, 16,330 (USD, 110 per household) [17]. The frequently calculated association between ecological degradation and poverty drives together, and protection sufferings local people living standard and life style as well as environmental degradation and loss of species harmfully and thus leading to more poverty [18].

Though Pakistan has a widespread linkage of park areas of excessive biodiversity, Hindu Kush and Himalaya's indigenous people have been attached to park areas without any rules and regulations of forest managing laws. It was in the period of foreign British [19]. In Pakistan, it is estimated that more than 600 different species of medicinal plants are existing here [20]. The Himalayan part of Pakistan is stately the newest and highest mountainous area in the world geographically. This area is actual very important for ecologists and protectors of Pakistan as well as world's biodiversity conservation [21]. Maximum of the protected areas are neared to the local communities. Guzara woodland offers feedstuff for the livestock and wildlife. Public collect legal and illegal timber from these woodland areas and natural species of flora become reducing due to the overgrazing of livestock, huge quantity of feedstuff, grasses and herbs are collected by resident women from May to November every year [22]. The study from Kirthar national park revealed ecological and flora data in Sindh, Pakistan. Kirthar is one of the biggest park areas in Pakistan, almost covered 3087 km^2, and total number of households assessed above than 100,000, and growing at an alarming rate of 4% annually [23]. Ayubia National Park, a best example of protected area in the moist temperate region of Pakistan with the total range of 33 km^2, around 50,000 citizens living nearby the park in 7 different big townships [17].

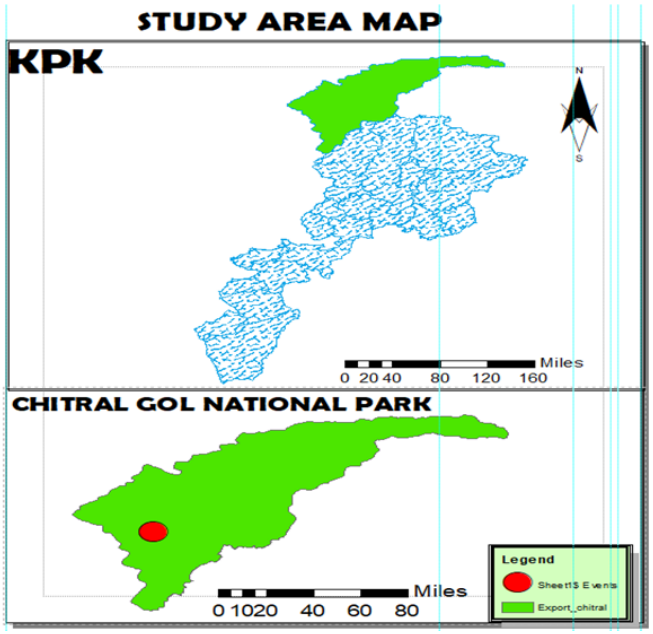

Figure 1. Map of Chitral Gol National Park in Northern region of Pakistan

2. MATERIALS AND METHODS

2.1 Research area

Chitral is one the biggest zone of Khyber Pakhtunkhwa and located in the northern region of Pakistan. Northern region shares with Wakhan; on eastern side Swat is located, Upper Dir attached to southern part and Afghanistan province Kunar is attached to western side. The coordinates of this park is 35°56′N 71°40′E. Chitral is covered almost 57 Km^2 of area and its inhabitants is around 0.448 million, established in 1984. It is situated between 1450 m to 5000 m from altitudes. The annual average rainfall in Chitral is expected nearby 462 ml. The climatic state is cold and arid. It situated at an altitude of over 2800 m above sea level [19].

Feedstuff transportation for livestock near park area

2.2 Research Plan

In the current research searches plan, counting both quantitative and qualitative method for the gathering of facts, the investigator used proper methodology to find the socio-economic situation of local people in the park area. Besides this the physical and socio-economic situation of people in park area was studied.

2.3 Data collection methods

The data was gathered from both primary data source quantitative and qualitative approaches as well as secondary record via pleased scrutiny and also from forestry and wildlife departments of Chitral.

2.4 Collection of Quantitative data

The collection of quantitative data is done by researchers through different methods given below.

2.5 Investigation survey

In this approach inquiry survey used as a tool for data collection. This survey was done to know the general condition of local people as well as the socio-economic conditions before the starting of research. For the achievement of such objectives, the investigators took interviews of local people about their life style and park area.

2.6 Domestic survey

The researcher carried out a household survey from 160 defendants' representative sample from all the strata via discussion plan. This survey was carried out using open ended and closed ended questions (Attached in annexure -A). The questionnaire was distributed and collected equally in the park area to gather data on the biodiversity conservation and socio-economic conditions of the park area.

Household questionnaire survey with local people

2.7 Inclusion Criteria

In this unique method the researchers interviewed randomly the old age local people in park area since they have much knowledge and experience about the specific situation of research area.

2.8 Focus Group Discussion

The investigators designed focus group discussion guidelines to argue and gather the desired data from park area. The focus group discussion contains of several objectives containing the socio-economic situation of the park area before and after its establishment. The issues of climate change and its impacts on park area, local people susceptibility and the managing approaches of the local people against these issues, the individual meetings were also scheduled and conducted.

2.9 Inclusion Criteria for FGD

In this method simply those participants contributed in focus group discussion who living in park area from last 20 years. Numerous kinds of participants were containing in the focus group discussion i.e. political leaders, farmers, teachers, traditional leaders, religious leaders, forest management group participants and participants from local district government. Other participant also contributed from forest sector, wildlife sector, Irrigation department, agriculture, and several non-governmental organizations like WWF-Pakistan GLOF Project and focus humanitarian assistance Chitral, Pakistan.

2.10 Key Informants Interview

In this method the researchers carried out key informant's interviews with different participants containing public elders, government employers, park area workers and young people as well. The investigators asked queries about socio-economic situation of park area, variations in agriculture yield and changes in environment. Opinion of the local people about available resources was measured in park area.

2.11 Field Observation

Further the above qualitative and quantitative methods a detailed and comprehensive field survey was conducted. The researcher passed more than two weeks' time with the local people in park area and perceived their socio-economic situation. The investigators perceived the susceptibility of local people particularly their living and linkage to park area.

Secondary type of data was collected from forest department, wildlife department, organization reports, research articles and books from peer reviewed journals.

Local people grazing their livestock near park area

2.12 Data Analysis

The quantitative and qualitative data was collected and analyzed properly. The quantitative data was explored in expressive form like figures were developed in OriginPro 9.0 software to present the current situation in the park area. The qualitative data was collected on the bases of several objectives and the outcomes of focus group discussion, key informer interviews and field observation were conducted on theme -wise. ArcGIS was used for making of all types of maps in park area.

3. RESULTS AND DISCUSSION

3.1 No. of persons per family in the park area

Figure 2 displays the no. of persons per family in the park area. 13.75% of the respondents had 3-4 persons in their families. Similarly, 36.25% of the respondents had 5-6 persons in their families and 50% had 7 or more family persons because of joint family system. The effects of the tiny families on the Park were lower because of low use of park assets. Average size of families was more reliant on park in comparison with tiny families. Big were much more reliant due to greater number of family persons and maximum of them were uneducated too. Activities of these families are poaching and much use of park assets.

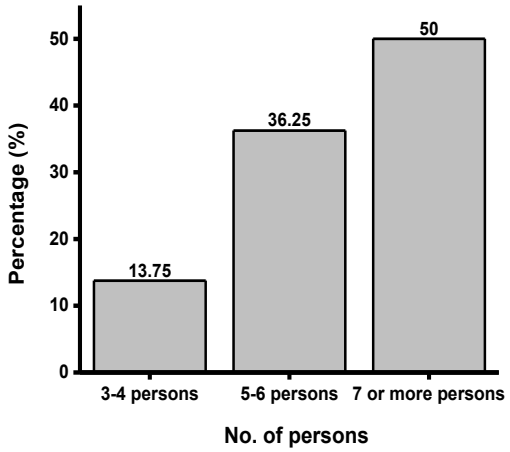

Figure 2. No. of persons per family in the park area

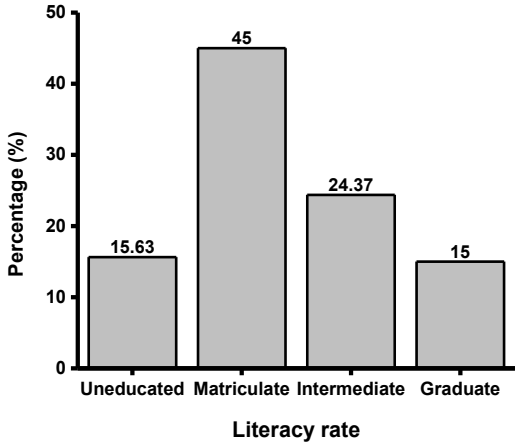

Figure 3. Literacy rate of peoples in research area

3.2 Literacy rate of peoples in research area

The Chitral Gol National Park performs a vital part in the improvement of socio-economic conditions of regional societies, as it is a plentiful and anciently more significant biodiversity. Protected areas are very crucial to resist variations in climate [24].

Figure 3 indicates the education levels of the peoples in research area. The study outcomes show that, 15.63% of the peoples were uneducated, 45% of peoples had a matriculate, 24.37% of peoples had intermediate and 15% had graduated. The protection of the Park is administered by the regional society in collaboration with state bodies for biodiversity goals. Protected areas (PAs) recognized as much essential for biodiversity protection from a long time. The policy of the PAs is generally measured a base of protection [1],[3]. In research area only 15.63% of the peoples were uneducated and all others had professions. The effects of uneducated and less educated peoples on the park were the excessive use of the park assets due to very little or no knowledge of the protection of species and unemployment. Intermediates peoples were also reliant on park assets e.g. poaching and cutting of firewood. Graduates peoples were not reliant on park assets due to more knowledge about protection of park.

3.3 Professions of peoples in research area

Studies show that only 11.25% of peoples were linked to agriculture activities because there was no plane area. Forestry associated actions were 15%, commerce related were 9.37%, 29.38% of peoples were working for state because number of jobs improved and forestry associated actions were decreased due to park establishment. The state provided jobs to regional public at Chitral Gol National Park. Moreover, 21.25% of peoples were linked with tourism associated actions, 8.12% of peoples were working abroad and 5.63% had other different activities. Due to park establishment, tourist related actions were improved and also enhanced the socio-economic situations in research area. Variations in economic situation, mainly extension of wide-ranging yields and other variations and land management policies [25].

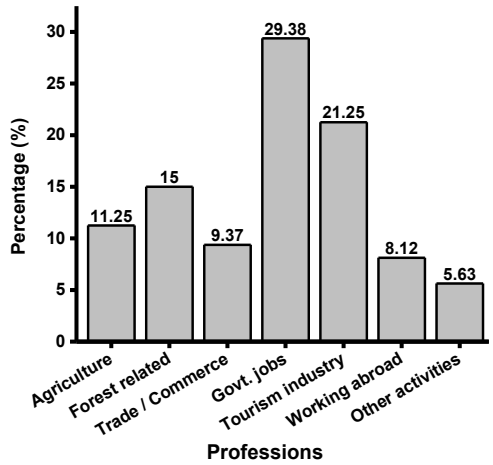

Figure 4. Professions of peoples in research area

3.4 Monthly revenue of peoples from various activities

Figure 5 indicates monthly revenue from various activities in research area. The revenue of 11.25% of farmers were 6k. Likewise, revenue of 15% of forest related respondents were 7-11k, revenue of 9.37% of trade related respondents were 30-35k, revenue of 29.38% of respondents working for state were 18-25k, revenue of 21.25% of respondents linked to hotels industry were 35k, revenue of 8.12% of respondents working in foreign were 35k and revenue of 5.63% respondents linked with other different activities were 8-12k. In the interest of a society to boost up the probable benefits supplied by the protected area and for society administration to cooperate efficiently with the society in protection outcomes. Though it is generally believed that protected areas have a single aim of protecting its biodiversity and the natural environment.

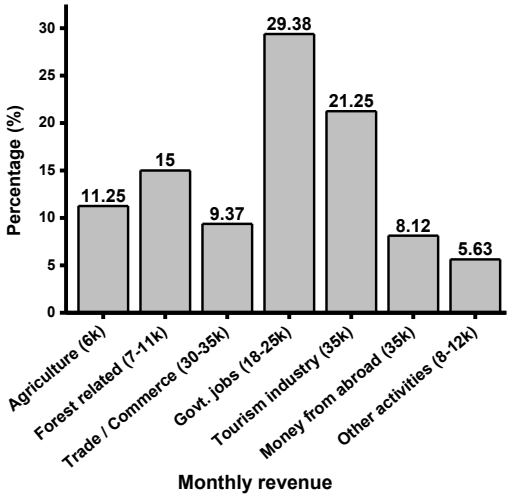

Figure 5. Monthly revenue of peoples from various activities

3.5 Uses of land holdings in near future

Figure 6 reveals the upcoming practices of property tenure in park area. During the survey in park area, 11.88% of participants reported that the land will be decrease because building of new marketplaces. Similarly, 21.25% respondents were agreed that most of the land will be covered by hotels, 60% of respondents were agreed that the land would be enclosed by household as far fast growing of people in park area. While the remaining 6.87% of participants reveal that the land will be parking area in the future. As the number of people increasing rapidly, so there will be more tourists in the park area which ultimately enhance the socio-economic condition of local people in study area.

But on other hand, because of rapid increase in population in future will cause damage to park area like deforestation, pollution and hunting of wild animals. Once deforestation occurred it will intensify soil erosion in park area, species extinction and migration and many other linked issues will be modified [26].

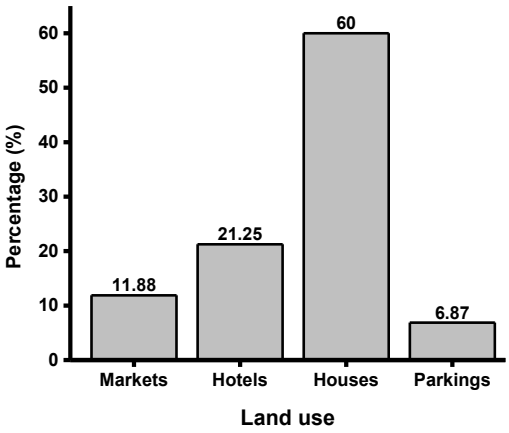

Figure 6. Uses of land holdings in near future

3.6 Feedstuff area for livestock before and after the park creation

Before the park creation, 50% of park area reported as a grassland for livestock because there was no rules and restrictions for grazing of animals as well as no awareness about the importance and conservation of biodiversity. The participants show that 45.63% of area was used as forestland and 4.37% of park area were for grown forage. Before the park establishment, the number of species rapidly reduced, such as Pinus wallichiana, Markhor and Cedrus deodara. Air and water quality effected, and landscape beauty disrupted rapidly. While after park establishment, biodiversity has been conserved and air and water quality and aesthetic values improved in the park area.

After park establishment, only 20% of area were left as a grassland for livestock, 13.75% of area as for-

estland, and 3.13% of area were for grown forage. After park establishment, the park area was banned for open grazing of livestock and hunting of birds and animals' species and cutting of trees as a result the biodiversity and environmental conditions improved in the study area [27].

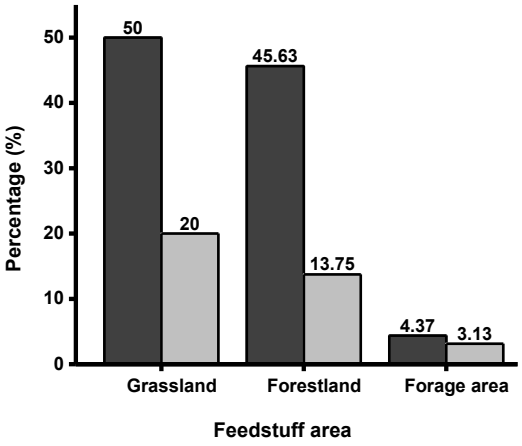

Figure 7. Feedstuff area for livestock before and after establishment of the park

3.7. Key role of the park area in conservation of the environment before and after establishment of the park

Figure 8 reveals the key role of park area in the conservation of environment before and after park establishment. Before park establishment the less aesthetic value, no biodiversity management and soil conservation in park area. In addition, no services for tourists, no rules and regulations for the conservation of environment and with no financial profits for livelihood improvements, while after the establishment of park, the aesthetic values increased, proper biodiversity management, proper soil conservation and improvement in the quality of air and water has been reported in the park area. Moreover, protection policies and strategies were adopted for the better management of biodiversity and environmental conservation.

Currently, the significance of park area is to conserve biodiversity from extinction and to enhance the socio-economic condition of local people which are directly dependent on that park [28].

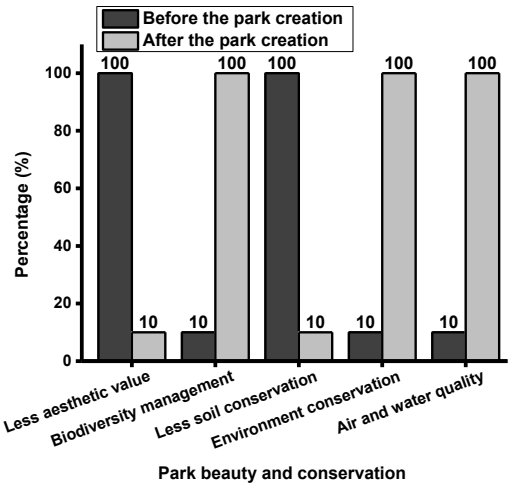

Figure 8. Key role of the park area in conservation of the environment

3.8 Condition of forest resources in park area before and after the establishment of park

The usage of forest resources was reported common in park area. There were open cutting of trees, herbs and shrubs before park establishment. Local people were using freely all resources of forest like firewood, timber, seeds, fruits and medicinal plants. But after the establishment of park the ratio of usage of forest resources gradually decline with the passage of time. Numerous park areas are trying to sustain and develop the linkage between local communities and protected areas for sustainable improvement of biodiversity conservation as well as to fulfill the needs of local people and make their living of standard better [29].

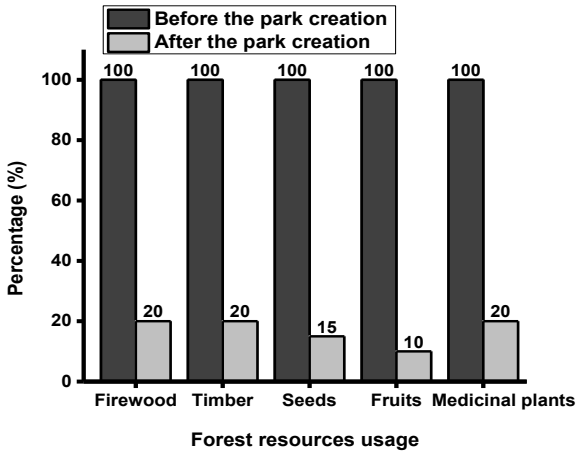

Figure 9. Forest resources usage in park area

Table 1. Important data associated to the biodiversity conservation in park area

Other data	Frequency	Percentage
Park area has historical and architecture interest	160	100
Special attention needed for the conservation of park area	160	100
Why special attention will be needed for conservation of park area	160	100
Legislation and knowledge for park area	160	100
Biodiversity conservation principal and cultural importance	160	100
Relevant knowledge and legislation for recreational area	160	100
Role of local government in the protection of park area	160	100

3.9 Important data associated to the biodiversity conservation in park area

Community based conservation approach to utilize the resources of park area in well-planned way to get the main theme of protected areas. Park areas are to protect the land and its biodiversity, nowadays, the basic theme of park areas in the improvement of local people idea and socio-economic benefits of protected areas [28]. Table 1 illustrates that 100% positive feedback of participants reported during survey like socio-economic values, cultural values, historic concern, legislation, conservation strategies and government attention all these needed for the park area. 11 villages in the park area have contributed a vital role in the management of park area on community-based conservation. Park areas are needed to fight with problem of climate change [24], park areas are real tool for safeguarding of biodiversity, as well as provide resources to local people and protecting cultural principles [28].

4. CONCLUSION

The park area plays a vital role in the growth of the socio-economic state and conservation of biodiversity in study area. The key aim of park area is commonly to develop the local people connection with the park area for its better management via community-based conservation. Results revealed a noteworthy and strong relationship in the biodiversity management and improvement of the socio-economic situations of the local people due to establishing of park area. Before the park formation the job opportunities, tourism, trade and agriculture associated actions were reported in a less number while after park establishment all these were reported in more. Similarly, the livelihood of the local people developed with the establishment of park. The socio-economic profits were not only associated from park area, but also ecological welfares were linked i.e. soil erosion conservation, air and water purification and wildlife management. After the park establishment aesthetic values, conservation of biodiversity, soil erosion control and water and air quality improved. Conserving habitats for biodiversity are the main technique to obtain the required objectives from the park area.

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