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Socio-economic Impact on Natural Resources in Musk Deer National Park (MDNP)-guraiz Valley, District Neelum, Azad Kashmir, Pakistan

[1,2]Abdul Jalil, [1]Khalida Khan, [1]Muhammad Arshad and [2]Li Yiping
[1]Centre for Integrated Mountain Research, University of the Punjab, Lahore-54590, Pakistan
[2]College of Environment, Hohai University, 1 Xikang Road, Nanjing, 210098, People Republic of China

Abstract: This study has been conducted to collect necessary socioeconomic information of the study area for development of the baselines for future planning, implementation and monitoring of different project interventions. The communities of Musk Deer National Park (MDNP) comprise 19 villages. The questionnaire and Participatory Rural Appraisal (PRA) exercises were designed to collect information and that data has been analyzed by advance technique of indexing each characteristic to get output in the form of percentage of level of dependence. The analysis provides clear view of their maximum level of dependence on natural resources, which are at harmful level of (46.6%). It is concluded that technical support on various management issues of MDNP, like, biodiversity conservation through community participation and socio-economic development of local communities by Village Level Investments and a socio-economic baseline of the communities around MDNP are needed to plan for conservation and social development interventions and to monitor the socio-economic impacts of these activities. Increasing the use of local resources (labour and materials), creating job opportunities for local community through productive planning, infrastructural development and maintenance are needed on urgent basis. Further, the decentralization of responsibilities and authorities has critical importance for good governance and local decision making to alleviate poverty.

Key words: Socio-economic, communities, development, biodiversity

INTRODUCTION

The basic purpose of this paper is to identify major issues and concerns, important to be considered while studying the socio-economic impacts on the livelihood of people and their level of dependency on natural resources in mountainous areas. Mountains are a major source of economic goods production, including energy, forests, minerals, agriculture, tourism and are home of many endangered species (Beniston, 2003). Nearly, 25% of the continental surface is covered by orographic features on earth (Kapos *et al*., 2000). In Pakistan, nearly 58% areas are mountainous and most of the population in mountainous area is living in the form of small communities. In socio-economic terms, mountain landscapes attract a large number of people in search of opportunities for recreation and tourism. However, the environmental stress imposed by growing numbers of tourists is placing an increasingly heavy burden on mountain resources (Godde, 2000).

District Neelum has its importance due to international boundary between two countries (Pakistan and India) and has also main strategic importance for Pakistan. Guraiz valley, in tehsil Sharda of district Neelum, is in the north east of Muzaffarabad and running parallel to the Kaghan valley. The total area of district Neelum is 3,621 sq. km. The study area is characterized by variegated topography, consisting of mountains, valleys, dissected small plains and gentle to steep slopes (Termizi and Rafiq, 2001). Precipitation occurs in the form of hails, which occur during March, September and October (PMD., 2013), cause to damage the fruits and crops.

The Government of Azad Jammu and Kashmir (AJ and K) has declared the Guraiz valley as National Park in 24th September, 2007 (Qureshi *et al*., 2013). Total area of national park is 130,510 acres. The whole Guraiz valley is covering an area of 13,532 ha (33,437 acres). One of the major issues, in this regard, is unregulated grazing and removal of dry fuel wood, which is practiced by communities (Ahmed and Mahmood, 1998).

Musk deer is considered as one of the endangered species in Pakistan (Sheikh and Molur, 2004), due to increasing demand for musk pod from mature male musk deer (Qureshi *et al*., 2004) and due to habitat fragmentation.

Corresponding Author: Abdul Jalil, College of Environment, Hohai University, 1 Xikang Road, Nanjing, 210098, People Republic of China

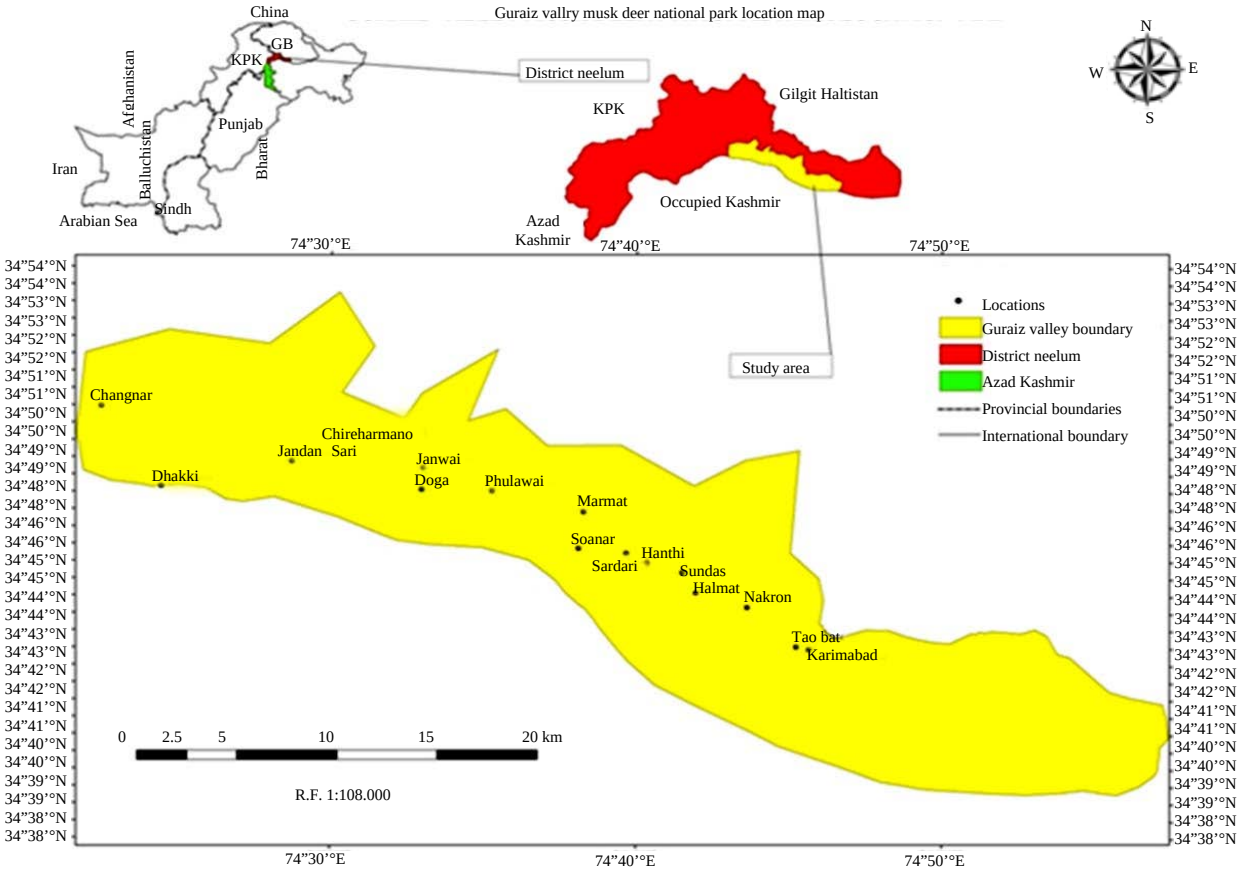


Fig. 1: Guraiz Valley Musk Deer National Park study area location map with complete overview

MATERIALS AND METHODS

The study area survey for data collection was conducted during June 2012 to August 2013 (Fig. 1). The technique adopted in the survey for data collection consisted of a combination of group and individual interviews and filling of the questionnaires. The questionnaires were developed in two parts. Part 1 concerned about the overall situation of the villages, like total population, major tribes, village accessibility, means of communication, health and education facilities, agricultural and forestry services, major land uses and their management, damage by the earthquake and its recovery and issues of landslides etc. Part 2 had detailed information at households' level, such as, household number, head of the household, its members, literate persons, earning persons, average annual income, sources of income, land holding, livestock, poultry, etc.

The primary data on socio-economic parameters and the dependence of the people on park resources collected through filling of questionnaires by interviews of the respondents. The Participatory Learning and Action (PLA) technique also adopted with the objectives to assess and understand the community socio-economic conditions and constraints specially related to environmental awareness.

The secondary data on the socio-economic conditions of people have been collected under different objectives and is not, in many ways, relevant to assess the economic dependence of the local population on park resources and to plan any conservation and social development intervention. Therefore, the secondary date on the socio-economic conditions of the people supplemented with the primary data. The communities of 19 villages of MDNP were grouped under two strata, (i) High dependence, (ii) Medium dependence, based on distance from the park and degree of usage of park resources. Listing of villages under each stratum is given in Table 1.

To measure the socio economic condition of the area, there are some basic indicators developed to describe the status of the area's socio-economic condition and their relation to natural resources management in the study area. The other analysis of the collected information completed at two levels, i.e., at village level and overall valley level.

Table 1: Dependency level of the villages of MDNP area

Dependency level	Name of the village	No. of villages
High	Taobat, Nakron, Karim Abad, Halmat, Sundas, Sardari, Hanthi, Saonar, Marnat, Phulawa, Changnar, Dhakki, Borinar	13
Medium	Pull Dhairi, Jandarseri, Chircharmano, Jamgar, Janawai, Doga	6
Total		19

RESULTS AND DISCUSSION

Social parameters: The major criteria for analyzing social stratification in the project area is ethnicity, class and gender, which are closely related to the social status, land, money and political power. A major point of the study area belongs to Mir, Syed, Chaudhary, Rajput, Sheikh, Minhas and Khawaja and forms the base of the social pyramid, having the control and property rights over natural resources. Occupational classes mostly belong to carpenters, blacksmiths and barbers.

There are 35,800 persons, living in 2,835 households in about 19 large and small villages in one Union Council called Guraiz. The male and female ratio is 49: 51, which shows that the number of females is 2% higher than the males. The average household size is 7.91 persons.

The main ethnic groups of the project area are: Butt, Lone, Syed, Harray, Tantray, Aakhoon, Chaudhry, Malik, Mughal, Raja, Kayani, Nasray, Gulamay, Awan, Sawati, Khan, Pathan, Budakhel and Mulakhel.

Out of 4,654 houses, 95% houses are "Kacha" (mudy), no Pacca house (cemented) is still constructed in the area, however, about 50% Glass and Iron (GI) sheet houses are constructed by the local community.

In the area, dominant castes are Tantray, Butt, Harray, Lone, Sayyed (Bukhari), Mughal, Awan and Gujar. The main languages of the area are mostly Kashmiri, Shina, Hindko, Gujari and Urdu (Anonymous, 2002). Languages of Shina, Pahari and Gujari along with Kohistani and Kashmiri are spoken in this region (Awan and Murtaza, 2013). Pahari and Kashmiri are the major media for communication in the public places and local bazaars while the Urdu is used in the offices.

The communities, living in Guraiz valley, MDNP, can be visited with their livestock, during summer season to more than 15 different Bheks (Pastures). Over the last two decades, people migrated to seek better education and other basic facilities.

The MDNP plays a vital role in organizing the Women Sub-committees of Village Conservation Committees (VCCs) and helps them by giving training and practices of handicrafts, kitchen gardening, backyard poultry, food preservation, agriculture and forest tree nurseries to improve their fake as well as, household economy. In case of activities pertaining to agriculture, fodder collection, fuel wood collection, livestock management, etc. are concerned, women can play a pivotal role.

A joint family system is practiced in the study area. The informal Jirga plays its role in resolving individual conflicts, matters of marriages, grass cutting, compensation for murder, quarrels, betrothals and construction of tracks and bridges. The precedents of these proceedings take the form of traditional laws for the community (Ahmad, 2000; Shahbaz and Ali, 2009).

Death rate of children is high and female reproductive health is uncertain. Major diseases of the area includes, skin problems-parasitic worm infestations, tuberculosis, fungal Infections, scabies, cracks in feet skin, coughing in winter and diarrhea caused by Guardia and Amoebic dysentery in summer.

Diseases specific to women include goiter and infertility, baby delivery problems due to non-availability of proper medical facilities, osteomalacia causing bone deformation and muscle, joint pains, painful ribs often due to Plevritis (as a result of tuberculosis). Male children have psychological issues due to social setup and women have psychological problems, due to ill-treatment from husbands or in-laws. The iodine deficiency is common, the reason being the use of crude table salt.

With reference to educational institutional setup, there are two colleges (one boys, one girls), five high school (three boys, two girls) and many primary schools in the entire valley area (Halmat, Karimabad, Nekrun, Toa Butt, Marnat and Janawai). The literacy rate is very low as described in Table 2, which reflects the rate supplied by the local teachers; the actual literacy rate is thought to be much lower. Net literacy rate in male is 58% and in female is 15%, while overall reported literacy rate is 21%. The detail information regarding the education condition in Guraiz Valley MNDP is mentioned in Table 2.

Economic parameters: Brief case studies illustrate that most of the economy in the project area depends on land-based livelihoods, like, forests, agriculture, livestock, employment and labour. In general, terms MDNP area counted as one of AJK least developed and backward regions. The economy of the project area is inherent due to the following features:

- Outflow of local resources causing problems for communities of the area
- Insufficient off-farm employment
- Community reliance on local livestock and forest resources
- Very less practices of subsistence agriculture

Table 2: Overall literacy rate in the project area

Gender	Net population	Net literacy ratio (%)	Education primary but below matric		Education above matric	
			Total literate	Ratio (%)	Total literate	Ratio (%)
Male	17,542	58	5765	33	1,099	6.3
Female	18,258	15	1456	7.9	96	0.53

Table 3: Income groups and their classification criteria

Rank	Indicator (per month)	No. of household	Percentage
Well to do or rich	income Rs. 15,000 or more	326	7
Better off or medium	income above Rs.5,000 and below Rs. 15,000	744	16
Poor	income between Rs. 3,000 to Rs.5,000	2,234	48
Very poor	>Rs. 3,000	1,350	29

Due to single cropping system, agricultural production is very limited. District Muzaffarabad required 1.5 million tonnes of wheat by the year 2010 (Afridi *et al*., 2008). There is a limited number of skilled labour in entire study area. Average production of each household is 150-250 kg of crop and 20-40 kg of beans, 75% of this production is being sold out by them for money. However, average about only 3-5% land used for cultivation purpose. Agriculture and livestock hardly make 31% of overall household income.

Community ranked poverty according to their own standards and definitions. The income groups and their classification have been described in Table 3.

The MDNP area presents a challenging physical and social environment for agricultural development. There are nearly 36,000 people living in the form of village communities, on approximately 157,284 acres (Qureshi, 1990). The seasonal movement of the entire population (transhumance) and an occurrence of sadistic clashes (mostly related to land) complicate development of the area.

Maize is the major food crop of the project area and due to the variation in the altitude of the area; three or four varieties of maize are grown. Red and white beans, grown in the area are usually sown with the maize crop. Other types of lentils and pulses are also grown on small scale. About 30% of these beans consumed locally. Previously, crops, such as, rice, barley and sorghum, were grown in the area. It seems that the main reason for giving up these crops was low quality seed and decreasing of average annual precipitation.

Majority of the locals collect vegetable from the forest, there are approximately forty types of vegetables found in the forests of the valley. The people of the valley prefer a fern locally known as 'Kunji', "Janjli Pias" and "Langroo", which are collected and dried for winter consumption.

This statistical data provides an evidence that study area has agriculturally sufficient lands and through adopting advance agricultural techniques and by providing proper training to farmers, agricultural productivity could be increased in multiples, especially, terrain cropping and fruit orchards could be the most beneficial farming in the study area.

Table 4: Average annual income per household

Content	Average income in PKR
Maize	2,000
Bean	1,500
Fodder for animals	14,500
Total	18,000

Table 5: Ranking of different income sources for livelihood of the local population

Forest	Livestock	Labour	Agri.	Employment	Business	Walnut
1	2	3	4	5	6	7

Traditionally, the tendency of planting orchards is very low. Scattered plants of apples and walnuts are found in the area. Some people tried to establish the orchards but due to lack of skill, these orchards were not successful. The communities in study area are getting average annual gross income per household from agriculture sector calculated in Table 4.

Primary source for food and fodder is maize but old varieties are being used, which are causing low productivity. There is a low rate of vegetables' utilization. In spite of considerable potential, fruit trees cultivation is not being practiced (Table 5).

Out of total 157,284 acres land, about 96% land is not under any agricultural use. Only 3.5% land is under cultivation, while the rest of the area covered either by forests or by pastures, due to the slope of the land, the plot size is very small and terraced cultivation is common. Agroforestry techniques in such case can increase the demand of agricultural productivity. Most of the agricultural land is irrigated by streams or springs, however, in some of the areas, the irrigation water is not available. Usually the land holdings are equally distributed among the families and there are less chances of land occupied by any family. Averaging about 16 Kanals (2 acres) of land is owned per household in project area (Table 5).

Overall, the cropping intensity is low in both seasons (66% summer and 15% winter). In winter, one fourth of the total fallow lands may be taken as reserve for rotational purposes. The livestock survey revealed that the total number of livestock of various kinds is about 384,026. With respect to composition of livestock in study area, there are average

50,371, among them, cows 11,393 (22%), bulls 30 (0.06%), goats 16,275 (32%), sheep 21,856 (43%) and equine and donkeys are 817 (1.62%). Average household livestock numbers present in the project area is about 13.54 by using above provided percentage.

The total number of migratory livestock passing through four camps established at key points along the main migratory routes amounted to 123,508 heads though none of these data collection points established in the study area (Anonymous, 1996).

The survey showed that the annual household income varied from Rs. 36,000 to 42,000 with an average income of Rs. 39,000. This survey reported that, livestock sector is generating 21% of the total annual income.

The poultry management practice is very poor due to which 95% mortality occurs every year. Reasons of high mortality are no vaccination, poor poultry management, harsh environment, inadequate feeding and improper treatment. The poultry management system and production parameters, like, housing, feeding, incubation of eggs, egg weight, weight gain, adult body weight, hatchability, brooding, hatch size and age of maturity are all unsatisfactory.

Hemorrhagic septicemia, pleuro-pneumonia, diarrhea, mange, black quarter foot and mouth, endo and ecto parasital diseases are common. New castles are causing 95% of poultry die every year. Currently, there is no government or private veterinary service available in the study area.

Infrastructure: There is only one road, which leads from Kel to Taobat Balla, having total length of 45 km. The existing roads are narrow, winding and often affected during rains. Construction of Neelum road has created changes in social, cultural, economic, agricultural and environmental aspects of the study area. Footpaths and cracks in the roads are being repaired by local community from long time (ERRA, 2007).

Some extend to agriculture and watermills almost wholly dependent on irrigation. The main sources of irrigation are 'kacha' water channels diverted from natural springs and streams.

Traditional structures, in which the millstones turned by waterpower, side-shot mill wheel is vital for milling of the staple crop maize in study area. In study area, water mills established nearby village and owned by single person or are shared.

The socio economic development of the selected processes and their outcome indicators are described in Table 6.

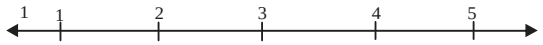
Table 6: Selected processes and their outcome indicators for evaluating socio-economic characteristics

No.	Characteristics	Indicators			Scale (1-5)	Level of confidence for each indicator (%)
		Processes		Outcomes		
1	Social	Study area		157,284 acre (19 villages)	2	40
		Education	Institutional setup	2 college, 5 high schools, 9 primary schools		
			Literacy rate	21%		
			Male/female	Male: 58%		
			Literacy ratio	Female: 15%		
		Gender	Gander ratio	Male: 49%		
				Female: 51%		
		Local	Women empowerment	Negligible strengthening of women	1	
			Ethnic groups	19		
			Castes	8		
			Local languages	10		
		Health	Health facility	3 dispensaries		
		Population	Total population	35,800	2	
			Population growth rate	2.3%		
			Average family size	4.2 persons		
		Housing	Total number of houses	2,835	3	
			Cemented houses	5%		
			Muddy houses	95%		
			Average household	7.91 persons		
			Average household land	2 acres (3.66%)		
2	Economic	Income and employment	Average family income	39,000 PKR	3	60
			Agriculture	10%		
			Labour and employment	9%		
			Forestry	46%		
			Total livestock	50,371		
			Livestock income production	21%		

Table 6: Continue

No.	Characteristics	Indicators: Processes	Indicators: Outcomes		Scale (1-5)	Level of confidence for each indicator (%)
			Business	8%		
			Average household life stock	13.54		
			Unemployment ratio	7%		
3	Natural resources availability and sustainable utilization	Total land	157284 acres	2	40	
			Agricultural land	3.5%		
		Pastures	Number of pastures	15		
			Land occupied	18%		
		Forests	Forest land	8%		
		Fruit orchards	Household fruit production	0.9%		
4	Total level of confidence for socio-economic impact consideration					46.6

Application of scale in the above index: The formulated composite scale was categorized into 5 levels of confidence that are given below:



- Disastrous level of social dependence on Natural resources
- Emergency state
- Medium dependence
- Self sufficient
- Developed socio-economic society

CONCLUSION

On the basis of above analysis, it can be concluded that park communities are mostly relying on the natural resources and are at extreme level of dependence on the forest and other resources, which is an alarming situation for resources conservation departments and other stakeholders. Remoteness of area, less availability of basic necessities and non-availability of jobs in the area are major causes of their dependence on the local natural resources.

The overall priority policy recommendation in this regard is the creation of awareness about the natural resources conversations amongst all stakeholders, followed by a comprehensive participatory natural resource management and development policy, which should be designed, planned, implemented, monitored and evaluated by all stakeholders by themselves.

Poverty in the park village is one of the major causes of dependency on parkland overuses and abuses. The major causes of poverty are unemployment, low literacy rate or lack of education and skill, access to credit and basic amenities of life. Some of the indicative activities, mentioned in Table 6, may help the improvement of the socio-economic conditions of the local community and natural resources of the study area.

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