Socio-economic Survey of Pir Lasorha National Park in District Kotli, Azad Jammu and Kashmir, Pakistan.

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Abstract: The study was conducted from March, 2008 to 25 October, 2008 to carry out the socio-economic survey of Pir Lasorha National Park (PLNP), District Kotli, Azad Jammu and Kashmir for biodiversity conservation. During the survey 248 respondents of 14 villages of four Union Councils, adjacent to Pir Lasorha National Park were interviewed. Results revealed that total population of the area was 10,502 individuals out of which, 48% has medium range of income and 18% respondents were involved in hunting activities. Literacy rate was noted as 88% while majority of the people were under matriculation. Maximum wood consumption was 100-150 kg monthly. Most important natural and anthropogenic threats to biodiversity were erosion (17%) and fuel wood consumption (23%) respectively. Majority of the population had no role in protection and management of the biodiversity at any level but only 30% were involved (employment) to protect biodiversity and other (24%) had opinion that education and awareness campaign should be started in the area to protect and conserve biodiversity. Major threats to the biodiversity of the park were overgrazing, agricultural practices, fire wood consumption and encroachment of land for housing or other practices.

Key Words: Socio-economic survey, Pir Lasorha National Park, Biodiversity, AJK

INTRODUCTION

Azad Jammu and Kashmir (AJK) is located in the foothills of Himalayas. It lies between 73° - 75° longitudes in the east and 33 ° -36° latitude in the north. It is bounded in the north by Northern Areas; in the west by Khyber Pukhtoonkhowa; in the south by Punjab and in the east by the line of control (IUCN, 1996, 1997, IUCN/FAO, 1992).

The topography of the area is mainly hilly and mountainous with valleys and stretches of plains. In AJ&K five types of forests; tropical thorn forests, sub-tropical forests, Himalayan moist and dry temperate forests and sub-alpine forests (Khan, 1997).

There are six National Parks administered by Wildlife and Fisheries Department of AJ&K (Wildlife Department, Muzaffarabad, 2008). The study area was Pir Lasorha National Park (PLNP), situated in District Kotli, 30 km towards the east of the Kotli city and is bounded on the east by Nakial, on the west by Khadgujran, on the north by Qamrooti and on the south by Karella-Majhan (Batool *et al.,* 2007). PLNP is located between 850 m to 2000 m elevation and covers an area of 1080 ha (Wildlife Department, Muzaffarabad, 2007). The important habitat of the area comprised of naturally vegetated areas and agricultural fields. Marble, lime stone, dolomite, iron and coal are minerals found in the area (Mineralogy Department, Muzaffarabad, 2008). The area consists of sedimentary and metamorphic rocks. The soil of the area is clay and loamy types consisting dark brown to radish brown color (Agriculture Department of Soil analysis Muzaffarabad, 2006).

The climate of area is pleasant to cold type in different months of the year. Temperature fluctuates from 2.0 to 20.2 °C. Relative humidity is generally higher at higher elevation. It remains low during the daytime than at night and evening. Hail storm generally occur during the mid July to September and cause considerable damage to Horticulture crops and Regeneration of young sapling. The area is covered with snow sheet in the months of December and January which may be up to 7 inches and melts within two to three days (Metrological Department Muzaffarabad, 2008).

A number of globally important species has been reported in the study area i.e. *Francolinus pondicerianus*, *Francolinus francolinus* (Black Partridges), *Alectoris chukor* (Chukor), *White crestee* (Kaleej pheasant) (Awan *et al*., 2004), *Panthera pardes* (Commen leopard), *Vulpes vulpes* (Red fox),

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Prionailurus bengalensis (Leopard cat) and *Paguma larvata* (Palm civet) (Batool *et al.*, 2007).

Dominant plant species recorded in and around the Pir Lasorha National Park are Cheer (*Pinus roxburghii*), Choh (*Olea ferruginea*), Shisham (*Dalbergia sisoo*), Dareak (*Melia azadroch*), Tamman (*Grewia villosa*), Palahi (*Acacia modesta*), Timber (*Zanthoxylem alatum*), Snatha (*Dodonea viscosa*), Dudal (*Euphorbia helioscopia*), Kachmach (*Solanum nigram*), Sursoon (*Brassica compestris*), Jarro gass (*Aristida adscensionis*), Khabbal (*Cynodon dactylon*) *and Sariyala* (*Heteropogon contortus*) (Batool *et al.*, 2007).

PLNP has been surveyed and sub-divided into forestry compartments. The boundaries are identified in most cases by permanent boundary markers. The area is marked with great diversity of physiographic and climatic features. Farming activities in PLNP community are generally practiced as fruit farming but relatively limited. Livestock maintained by community is poultry, cows, buffaloes, goats, sheep and donkeys. None of the households had any significant number of livestock (Batool *et al.,* 2007).

The PLNP custodian communities consists of 14 villages which fall under four Union Councils namely Qamrooti, Nakial, Khadgujran and Karella Majhan. All the villages are situated outside the park boundaries. The area has no population but is surrounded by highly populated villages.

Pir Lasorha National Park represents the Himalayan forest ecotype and at least 38 bird species and 40 plant species are found here. It is located between 850 m to 2000 m elevation and an area of 1080 ha (Wildlife Department Muzaffarabad, 2007). The aim of the study was to find out the socio-economic situations of the population in study area, including the basic requirements of the community and their opinions to reduce the use of natural resources and their improvement. Additionally we also aimed to establish a database for the future use in planning, management and policy making.

MATERIALS AND METHODS

Socio-economic survey of PLNP for biodiversity conservation was conducted from 25 March 2008 to 25 October 2008. For biodiversity conservation, the data sheets of semi-structured interviews and questionnaire-cum interviews were made to collect the data from community by using the book; Community tool box. The surveys were conducted randomly in fourteen villages of four Union Councils, 248 persons were interviewed from these villages. On the basis of interviews and other observations, the results are managed in the form of tables and graphs.

RESULTS & DISCUSSION

The total population of fourteen villages of four Union Councils within the PLNP is approximately 52,314 which cover an area of 27.082816 sq. km. The average number of households per union council is 1300 to 1600 and the village populations vary from 700 to 1200 persons. Average family size is 7 members per household (Kotli, Census Report, 1998). Almost all the respondents who were interviewed for qualitative data with regard to use of the park are predominantly males between the age groups of 30 to 60 years. The total population of the 29 Grama-Niladari Division (GNDs), (4 Divisional Secretariat Divisions (DSDs) covered is approximately 42,200. The average number of households per GND is 400 and the village sizes in the area vary between 1000 and 1500 persons (Table 1). Average family size is 5 members per household. Nearly all the respondents who were interviewed for qualitative data with regard to use of the park were predominantly males between the age groups of 31 to 40 years, whereas the village level information collected was from GND officers who were all male and were in the age group of 31-50 years (Khalid and Dharmasiri, 2006).

Table 1: Population, number of households, family size and gender characteristics of fourteen villages of four Union Councils of the study area.

Union Councils Population	Number of Households	Male	Female	Children	Total
Nakial	737	1953	1959	1985	5864
Qamrooti	306	591	620	753	1964
Karela Majhan	197	621	672	676	1944
Khad Gujran	53	227	239	264	730
Total	1293	3392	3490	3678	10502

MONTHLY INCOME

Income distribution was categorized in three levels, low income, middle income and high income groups. High income beyond 15,000, middle income had an average monthly income of Rs. 10,000 and low income belong to the Rs. 3000-8000 per month. Mostly (48%) respondents have monthly earnings in between the range of middle income, most of which was spent on daily food and household requirements (Table 2) and less than the monthly income of peoples within the Flood **Plains National Park (FPNP) in Sri Lanka** (Khalid and Dharmasiri, 2006)

Table 2: Monthly income distribution of four Union Councils

Income household group proponents	No of respondents	Percentage (%)
Low income group 3000-8000	67	27
Medium income group 8000-15000	119	48
High income group above 15000	62	25

SOURCE OF INCOME

In different union councils of PLNP most of the peoples were engaged in agriculture, skilled and unskilled labor, livestock rearing, government jobs and trading. Majority of the respondents were engage in government or private employment earring middle range income followed by abroad working (Fig 2). According to **Iftekhar and Takama (2007) some people were involved in** honey collecting, harvesting of medicinal herbs, cattle grazing and to collect lotus flowers, however most of these activities are limited to the dry season which is from May to September..

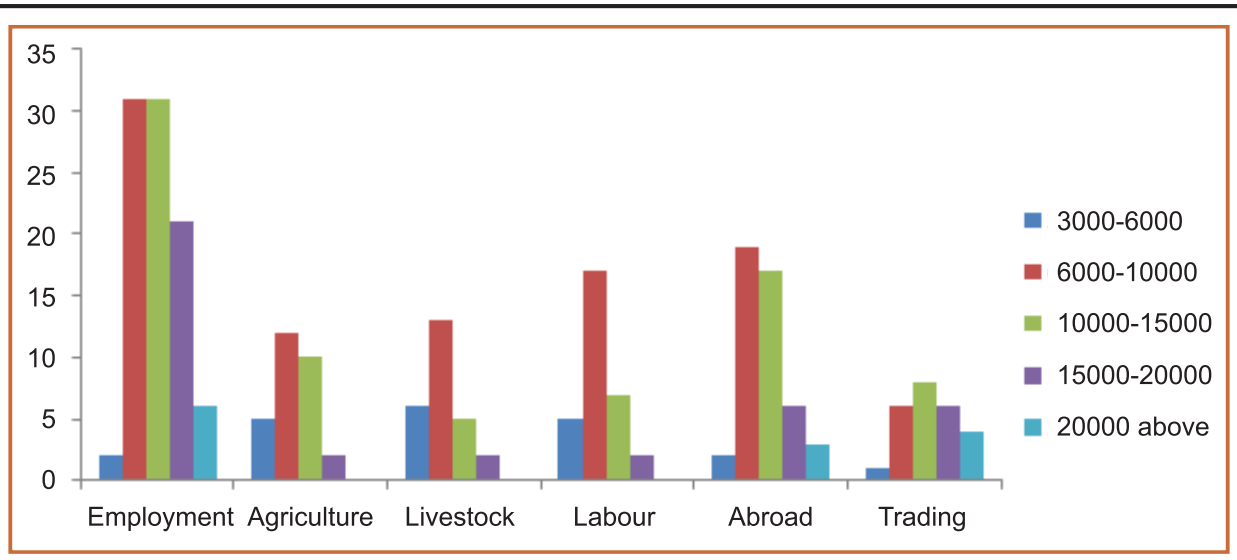

Fig 2: People's source of income in the study area.

LIVESTOCK

Livestock rearing is frequent among the households in the study area and 73% of the total population of the four union councils had buffaloes, cows, sheep, goats, chickens and donkeys etc. and were mostly attended by women. Goat was most preferred livestock followed by buffaloes and sheep (Fig 3). Mostly livestock was dependent upon the forest land and they grazed not only the grasses but also the important medicinal plants. Approximately 79 % households in three Union Councils within the Machiara National Park have livestock which includes buffaloes, cows, sheep, goats and chickens (Khan, 2000).

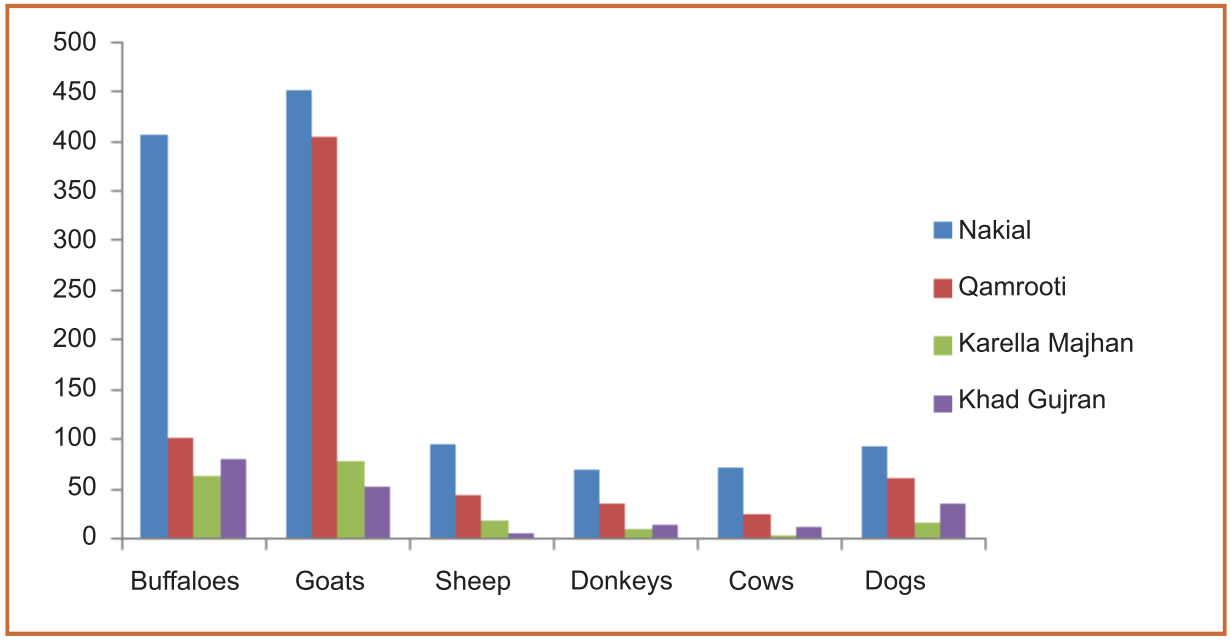

Fig 3: Live stocks of fourteen villages of four Union Councils

EDUCATION

The total literacy rate was 89 % out of which 56 % men and 33 % women were literate. Illiteracy was due to lack of proper awareness and poverty. Majority (66%) of the respondents were under matriculation followed by primary education (48%) and matriculate (45%) whereas minimum (7%) respondents were had master degree (Table 3).

Table 3: Education and level of qualification of fourteen villages of four Union Councils of the study area.

Responses	No of respondents	% age	level of qualification					
			A	B	C	D	E	F
Literate	220	88.70 %	48	66	45	30	24	07
Illiterate	28	11.29 %	-	-	-	-	-	-
Total	248	100 %	-	-	-	-	-	-

A = Primary, B = Middle, C = Matric, D = Intermediate, E = Graduation, F = Masters

Proper education would be a good tool to conserve biodiversity; however lack of awareness may increase people's reaction against conservation initiatives (Songorwa, 1999). The main reasons for children not attending school are lack of transport for schools, dearth of trained teachers, poverty and illiterate parents who failed to realize the importance of education (Khalid and Dharmasiri, 2006). Thus the literacy rate in peoples of 28 villages of Machiara National Park was 11-63 % males and 2-47 % females (Ahmed, 1997; Khan, 2000; Chap *et al.*, 2005).

FIRE WOOD CONSUMPTION

Most respondents (103) consumed 100 to 150 kg fire wood monthly followed by 150-200 kg and 200-250 kg. Minimum (25%) respondents consumed more

Table 4: Monthly fire wood consumption ratio in study area (n=248) of four Union Councils

Fuel-wood consumption (in kg)	No of families
100-150	103
150-200	71
200-250	49
250-above	25

All of the respondents were completely dependents upon natural resources for fire wood consumption

upon natural resources for fire wood consumption (Rauf, 1996). It is of prime importance that the excavation of fire wood is proved to be distractive for biodiversity, if it would be at large scale. The local people were allowed to collect firewood and driftwood in the Park. Eighty nine percent of the respondents collected firewood for their own use, whereas only 5% respondents collected firewood to sell in the villages only for the local peoples. This practice should be considered as illegal and must be forbidden (Khalid and Dharmasiri, 2006).

HUNTING TRENDS

Hunting is one of the important threats to wildlife and biodiversity of the study area. Mostly it is done by the non residents. Only 19 % of the population was involved in hunting within the study area (Table 5). Fifty two percent of the villagers were involved in fishing out of which 16 % were catching fish for commercial purposes. The average catch of the day varies between 5 to 6 kg with an average price of Rs.70/kg (Khalid and Dharmasiri, 2006).

Table 5: Hunting pressure of fourteen villages of four Union Councils

S. No	Activity	Number of respondents	Percentage
1	Hunting	46	18.54 %
2	No hunting	202	81.45 %
	Total	248	100.00 %

THREATS TO BIODIVERSITY

Pir Lasorha National Park is located on the land of reserve forest. The people of the surrounding villages have no legal rights over resource use. But the people have been enjoying the traditional and unrecorded rights. Among natural threats, erosion is the most important factor as pointed out by 17% of the respondents followed by climate change and landslides (Table 6). Biodiversity is facing magnificent anthropogenic threats to its survival than natural hazards. One of the primitive and consistent threats to biodiversity is extraction of fire wood as indicated by majority (23%) of the respondents (Table 6). Increase in human population resulted in increased demand of fire wood, hence upshot the pressure on existing forests (Sharma, 1996; Saeed & Awan, 2000). Unwise and ruthless tree cutting resulted in the destruction of natural habitat of various species. This practice is very common in the whole of Azad Jammu and Kashmir. Second important threat to biodiversity is grazing and fodder collection (19%) for the livestock of local inhabitants (Table 8). Overgrazing has broken the life cycle of various grass species that resulted in the scarcity of these species in next growing season (Planning Development, 2006, 2007, 2008). Trampling is another factor that proved destructive to seedlings and they die before the maturation. Other factors including torch wood extraction (5%), medicinal plant extraction (4%) (Bukhari, 1996) and encroachment (3%) have also damaged wildlife of the areas (Table 6). price of Rs.70/kg (Khalid and Dharmasiri, 2006).

Table 6: Threats to the biodiversity in study area

S. No.	Threats	Number of Respondents	% age
	Natural		
1)	Erosion	43	17 %
2)	Climatic Change	37	15 %
3)	Landslides	21	09 %
4)	Lightening/ Thunderstorms	13	05 %
	Man Made		
1)	Fuel wood	57	23 %
2)	Grazing and grass cutting	47	19 %
3)	Torch wood extraction	13	05 %
4)	Medicinal plant collection	09	04 %
5)	Encroachment	08	03 %

ROLE OF COMMUNITY IN MANAGEMENT AND PROTECTION

Human community of any area could play vital role in the conservation of the natural resources (Kaltenborn *et al*., 1996; Ejaz, 1998; Jafri *et al*., 2006). Unfortunately most of the respondents (70%) thought that they do not play any role in the conservation or protection of biodiversity (Table 7). And 20 % people thought that they are involved (directly or indirectly) in protection/conservation of natural resource while remaining 10% were involved in the management of national park. ice of Rs.70/kg **(**Khalid and Dharmasiri, 2006).

Table 7: Role of community in management and protection

S. No.	Role	% age
1	No role	70
2	Management	10
3	Protection	20

INCENTIVES

People were seeking government incentive for the conservation of biodiversity. Most of the respondents (30%) thought that if they are provided employment, it would reduce dependency on natural resource and thus will be helpful for the protection and conservation of biodiversity. In fact unemployment and low income have resulted in increased dependency on natural resources whereas in Azad Jammu and Kashmir, unemployment is very high. Another notable group (22%) of the respondents was desirous in seeking compensation for forage and fodder (Table 10). A total of 20% respondents were in thought that fire wood extraction must be compensated in the national park to reduce pressure on biodiversity followed by income generation activities (19%) and provision of health facilities (9%) to conserve the biodiversity of the area (Table 8).

Table 8:Incentives and developmental works in the study area

S. No.	Incentives	No. of Respondents	% age
1	Grazing concession/ Compensation	55	22 %
2	Employment	74	30 %
3	Income generation activities	47	19 %
4	Health facilities	22	09 %
5	Timber & fuel wood compensation	50	20 %

METHODS FOR THE IMPROVEMENT

From the results, most of the respondents (24%) were in favour of educating people to increase awareness about the importance of biodiversity. While other (19%) thought that ecotourism would be a good option to involve people in conservation and development activities followed by 18% whom were in opinion that road construction and their maintenance will play positive role (Table 9).

Table 9: Developmental works needed by the community

S. No.	Developmental Work	No. of Respondents	% age
1	Education	60	24 %
2	Roads	45	18 %
3	Recreational sports	35	14 %
4	Hiking tracks	23	09 %
5	Rest house	46	19 %
6	Job opportunities	39	16 %
	Total	**248**	**100 %**

As stated earlier unemployment is one of the major issues of the region, 16% respondents thought that government must provide employment to the people in order to protect/preserve its natural resources (Table 11). It was found that the peoples around the National Park have some knowledge of their environment (IUCN, 1997). Nevertheless, community remarked that their dependence on their resources is an economic necessity as well as lack of an alternative. It was observed that forest extraction by the local community was disproportionate when compared to Azad Kashmir logging and Sawmill Corporation (AKLASC), a Parastala organization responsible for the, supply of timber to various government departments and private organizations. Unsustainable forest extraction by AKLASC significantly contributed to environmental degradation. The community was aware of this problem yet they felt themselves relatively powerless to directly confront the corporations

CONCLUSION AND RECOMMENDATIONS

It was concluded that the inhabitants of the PLNP have low income, unawareness and low literacy rate. Unemployment and wood extraction are other major problems of the area. In order to conserve and develop natural resources, it is recommended that alternative employment opportunities would be created for sustainable economic development to prevent over-exploitation of these resources. Additionally alternative livelihoods can be developed from various initiatives such as bee keeping, in home gardens, fruits farming and vegetables growing that can be marketed in the cities. These initiatives are easy to implement since they require minimum investment. There is a dire need to educate the local people about the importance and sustainable use of biodiversity resources. If all the stakeholders are involved in the management, the biodiversity resources would increase and park will become an excellent ecotourism site. It is neither possible nor ecologically feasible to completely evacuate the domestic livestock. It is recommended that program to seek balanced approach between the needs of local grazer communities and needs of wild life, especially endangered species. Indiscriminate cutting and burning of wild grasses, bushes and trees must be stopped for the regeneration of new plants which will improve wildlife habitat. There is a direct need of collaboration between different research institutes including the departments of Forestry, Wildlife and Fisheries and Zoology, University of Azad Jammu & Kashmir, Muzaffarabad to put together their research and conservation efforts.

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