





Course- FRW- 602 Wildlife Management & Research

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9th Lecture

POTENTIAL VALUES OF PROTECTED AREAS (Cont'd)

B. NON-CONSUMPTIVE USES

-  Recreation
-  Education
-  Tourism
-  Research

OTHERS

-  Preservation of cultural heritage, sacred sites, cultural/traditional practices, traditional knowledge
-  Conservation of genetic material in natural habitats
-  Preservation of scenic beauty and rare species
-  Promotion of peace and international cooperation

SIGNIFICANCE OF PROTECTED AREAS

The World Conservation Strategy (WCS)

Major Goals:

1. Maintain essential ecological processes and life support systems on which human depend
2. Preserve genetic diversity on which depend the breeding programmes of crops and domesticated animals
3. Ensure that man's utilization of species and ecosystems is sustainable

PAs are necessary to:

- ✓ Ensure that samples of important natural regions are retained in perpetuity
- ✓ Biological and physical environment is maintained
- ✓ Wild genetic materials are conserved

CONTRIBUTION OF PROTECTED AREAS

PAs when designed and managed properly;

- Provide sustainable benefits to the society
- Play major role in social and economic development of natural environments
- Contribute to economic well-being and quality of life of communities
- Ensure conservation of world's natural resources to meet the material and cultural needs of mankind now and in future.

PAs also contribute to conservation and sustainable development by;

- Maintaining the environmental stability of surrounding region
- Reducing the intensity of floods and drought
- Protecting soil erosion and limiting the extremes of climate
- Maintaining the productive capacity of ecosystems, so ensuring the continuous availability of water, plants and animal products
- Provide opportunities for research and monitoring of wild species and ecosystems
- Conservation education for public and policy makers
- Opportunity for rural development and rational use of marginal lands
- Recreation and tourism

CATEGORIES OF PROTECTED AREAS IN PAKISTAN

National Park

A national park is an area set aside by the Government for the protection and preservation of outstanding scenery, flora and fauna in natural state. The national park shall be accessible to public for recreation, education and research, subject to such restrictions as the Government may impose. To facilitate public use and recreation, access roads, construction of rest houses, hostels and other buildings are permitted. Forests in national parks may also be so managed and forest products obtained provided that these activities do not damage natural ecosystem.

The following action shall be prohibited in national park;

- (i) Hunting, shooting, trapping, killing or capturing of any wild animals in a 'national park' or within one and a half mile radius of its boundary.
- (ii) Firing any firearm or doing any other act, which may disturb any animal or bird, or doing any act, which interferes with the breeding places.
- (iii) Felling, tapping, burning or in any way damaging or destroying, taking, collecting or removing any plant or tree there from;
- (iv) Clearing or breaking up any land for cultivation, mining or for any other purpose; and.
- (v) Polluting water flowing in and through the 'National Park'.

Provided that the Government may for scientific purpose or betterment of the national park or any other purpose, authorize the doing of any of the afore-mentioned prohibited acts.

Wildlife Sanctuary

A wildlife sanctuary is an area owned and notified by the Government as an undisturbed breeding ground for the protection of wildlife. Public access or residence in the sanctuary is prohibited and so is exploitation of forest except for reducing fire-hazards, epidemics, insect attacks or other natural calamities.

No person shall:

- (i) enter or reside;
- (ii) cultivate any land;
- (iii) damage or destroy any vegetation;
- (iv) hunt, kill or capture any wild animal or fire any gun or other firearm within one mile of the boundaries
- (v) introduce any exotic species or animal or plant;
- (vi) introduce any domestic animal or allow it to stray;
- (vii) cause any fire, or
- (viii) pollute water in a wildlife sanctuary

Provided that Government may for specific purposes as are deemed expedient, authorize the doing of the afore-mentioned acts (other than those mentioned in clause (iv)).

Game Reserve

A game reserve is an area owned and notified by the Government where hunting and shooting of wild animals is not allowed, except under a special permit. This permit may specify the maximum number of animals or birds that may be killed or captured, and the area and duration for which such permits are valid. Game Reserves provide no protection to habitat but only regulate hunting.

Private Game Reserve

The Government may declare an area as private game reserve if it is satisfied that the owner has dedicated this area with the purpose similar to a game reserve and if owner requests to do so. Hunting and shooting of wild animals by any person other than the owner of the area is not allowed in the reserve except with the permission of the owner.

The owner shall exercise the same powers in the game reserves as exercised by an officer under the Wildlife Act. Government can de-notify any game reserve through gazette notification if it is required to do so.




Community Controlled Hunting Areas

The controlled hunting areas are conservation areas managed jointly by the relevant Government department and concerned communities for the conservation of flora and fauna. These are notified by the relevant government departments in provinces/territories. Trophy/game hunting is regularized in these areas by the communities through the hunting permits by protection of wildlife. The proceeds of hunts go to the joint account of the community organizations and spent on communal development activities. A small portion of hunting fee also goes to government revenue.

POTENTIAL VALUES OF PROTECTED AREAS

A. CONSUMPTIVE USES

Goods

-  Access to natural resources, improved management, sustainable harvesting
-  Generate revenue through marketing of sustainable harvesting goods
-  Reservoir of genetic diversity for new crop varieties and livestock breeds improvement

- ✚ Representative sample of indigenous plants, animals, micro-organisms which are useful
- ✚ Conservation of wetlands for fish nursery
- ✚ Marine protected areas for maintaining fish stock for sustainable harvesting

Services

- ✚ Conservation of soil and watersheds
- ✚ Clean water
- ✚ Biotic processes
- ✚ Carbon sequestration
- ✚ Climate regulation
- ✚ Maintenance of buffer to natural disasters

SUMMARY OF PROTECTED AREAS IN PAKISTAN

Province/ Territory	National Park	Wildlife Sanctuary	Game Reserve	CCHA/ CMA	Total
Azad Jammu & Kashmir	7	1	12	0	20
Balochistan	2	15	8	2	27
Punjab	4	36	20	3	63
Khyber Pakhtunkhwa	6	8	38	52	104
Sindh	1	35	14	0	50
Federal Territory	1	1	1	0	3
Gilgit Baltistan	5	3	9	19	36
Total	26	99	102	76	303

CCHA= Community Controlled Hunting Area

CMA = Community Managed Area

RAMSAR SITES IN PAKISTAN

#	NAME	PROVINCE	AREA (ha)
1	Astola Island (WS)	Balochistan	5,000

2	Jiwani Wetland Complex	Balochistan	4,000
3	Miani Hor	Balochistan	55,000
4	Ormara Turtle Beaches	Balochistan	2,400
5	Hub Dam (WS)	Sindh-Balochistan	27,000
6	Deh Akro-ii (WS)	Sindh	20,500
7	Drigh Lake (WS)	Sindh	164
8	Haleji Lake (WS)	Sindh	1,704
9	Indus Delta	Sindh	472,000
10	Indus Dolphin Reserve	Sindh	125,000
11	Jubbo Lagoon	Sindh	706
12	Kinjhar (Kalri) Lake (WS)	Sindh	13,468
13	Nurri Lagoon	Sindh	2,500
14	Run of Kutch (WS)	Sindh	566,375
15	Tanda Dam (WS)	KPK	405
16	Thanedar Wala (GR)	KPK	4,047
17	Chashma Barrage (WS)	Punjab	34,099
18	Taunsa Barrage (WS)	Punjab	6,576
19	Uchhali Complex (Khabbaki, Uchhali & Jahlar Lakes) (WS)	Punjab	1,243

Major Issues with the current management of PAs

1 Policy/Legislation

Lack of Policy: Absence of comprehensive Government policy for viable Protected Areas network and its management in the country.

Dual ownership: Dual/multiple ownership of resources in PAs creating management conflicts between different agencies particularly the Forest and Wildlife Departments in majority of the PAs. Priority of the Forest Department is timber management and not the conservation of biodiversity, which is prime objective of creating PAs.

No demarcation of boundaries: Clear demarcation of PA boundaries does not exist in the country. Conflicts arise due to non-availability of clear boundary demarcation, such as in the matter of trophy hunting in the buffer zone/community-controlled hunting area, resource use by local people and other government departments.

Undecided rights of local communities: Rights and concessions of the communities residing inside or around the PAs are still undecided in majority of the cases. Park management and locals are confused and in conflict over the use of resources in PAs.

Inter-Agency Cooperation: Integrated approach for management and conservation of natural resources in the PAs is lacking. Cooperation between the relevant line departments and agencies is at its minimum.

Community involvement: Wildlife Protection Acts/Ordinances are silent about community participation/involvement in the management process of PAs, providing no legal coverage and rules for this important aspect.

2 Staff/Manpower

Insufficient Staff: Presently, there is no separate staff deputed at most of the PAs and where it has been in a few cases, it is insufficient to meet the requirements. Moreover, technical manpower is acutely short to deal with different disciplines including community matters, environmental education, tourism development, biodiversity research, etc

Lack of technical expertise: Generally, there is scarcity of technical knowledge of PA managers and most are unable to give technical input to the PAs management. Only manager can not do the job because technical input is required to deal with multiple issues such as wildlife management, habitat management, conserve natural resources, socio-economic issues of communities, promote eco-tourism in the park, etc.

Technical Education: No institution in the country is awarding separate degree in Wildlife management or Conservation Biology. Courses taught in forestry and wildlife to the forest graduates at Pakistan Forest Institute (PFI) are very out-dated. Graduates of Forestry, Biology or Zoology do not have professional competency required for PA management.

Provincial Secretariats: Most of the concerned decision-makers in the secretariats are non-technical having little knowledge about conservation of natural resources and biodiversity. Even the provincial Secretaries are not technical persons.

Job Security of Park Employees: Most of the PA employees hired in the projects are on contract basis for a few years. Due to lack of job security, they do not work hard with full attention.

3 Research Studies and Baseline Data

Shortage of data: Systematic and comprehensive studies to document the floral and faunal biodiversity have not been conducted in majority of PAs. Only scattered data exist from individual and occasional observations and from the local people, which do not provide base for the management planning of PAs.

Survey of threatened Species: Population census of threatened wildlife species in most of the PAs have never been carried out. Basic reason for this is lack of technical manpower and adequate resources.

Lack of social data: There is serious lack of data on socio-economic aspects of the communities living in and around the PAs. Hence, problems and prospects of their involvement in the management process have hardly been understood.

Lack of Management Plans: Management plans exist for only a few national parks. All other PAs have no management plans prepared yet. Hence, no specific guidelines are being followed by the respective authorities for their management. Management plans of some NPs are very old and do not address the recent issues.

4 Financial constraints

Inadequate budget: Annual separate budget is not provided to majority of the PAs. Even, most of the national parks are not given separate budget and where given, the budget is very low. Only establishment expenses can be met and hardly any funds are available for park operations.

Inadequate facilities: Financial resources for protection facilities including vehicles, communication system, establishment of watch towers, developing water points for wildlife and providing supplemental feed to the animals are very low.

Park Administration: Majority of the PA staff is very low paid which is disincentive to attract people with suitable qualification and experience. Office and residential accommodation for PA staff, wherever exist, are in poor condition. Capacity building opportunities such as trainings, exposure visits to other national parks in the country are also very limited.

Vehicles and equipment: In majority of the NPs, the vehicles and equipment are very old and need replacement. Current budget allocation is insufficient to get these replacements.

5 Social Aspects

Resource use by locals: Majority of the local population living inside and around the PAs depend on natural resources for their sustenance including livestock grazing, fuel wood collection, forage and fodder, medicinal plants, etc. These uses are not allowed in the NPs but this prohibition is hard to implement due to population pressure and political influence.

Illegal hunting: Hunting and poaching is not allowed in the PAs but it continues in majority of the cases by influential people.

Depredation by Predators: Currently, depredation by carnivores especially leopards on local livestock is a major problem in many areas. The local communities have already killed a few leopards as retaliation to this loss.

Encroachment: Many PAs are facing land encroachment problems by the local people mainly due to increase in local human population and increasing prices of property. Encroachment leads to habitat fragmentation and disturbance, creating problems for wildlife populations. In certain cases large chunks of PAs are taken away by other government agencies thus affecting the ecosystem.

Visitors problems: With the improvement of facilities in some of the national parks, number of visitors is increasing which adversely affect the natural resources if not properly managed. Garbage deposited by the visitors is also a major problem, especially the plastic water bottles which sometimes catch fire which could be dangerous to natural flora and fauna.

6 Law enforcement

Inadequate law enforcement staff: Law enforcement staff in the provinces is very few and is not equipped with legal power, vehicles, communication system, weapons and other necessary facilities. As a result, law enforcement in PAs is very weak leading to depletion and disturbance of natural resources in the PAs.

Illegal hunting and poaching: Illegal hunting and poaching occur in most of the PAs by the local as well as outsider visitors. In majority of the cases, poachers are influential people equipped with powerful vehicles and modern weapons, sometimes causing even life threat to the PA staff.

Violation of wildlife Act: Agencies working inside the PAs are bound to abide by the rules and regulations to maintain its sanctity in accordance with international agreements. In some cases, sensitive agencies have invaded the PAs getting control over their resources and concerned wildlife/forest departments are unable to stop them and in certain cases these departments are not allowed even to visit these areas.

Illegal allotment of land: Some illegal allotments have been made by the Revenue departments inside some PAs. This problem is amounting day by day primarily due to the people living close to the PAs and higher property prices. This problem is severe in the Margalla Hills NP, Lal Sohanra NP and many other areas.

Recommendations for PAs Management

Policy/legislation

Independent Wildlife Departments: In Balochistan, AJK and Northern Areas, there is no independent Wildlife Department to manage wildlife and PAs. Independent wildlife departments should be established where needed.

Ownership of Wildlife Department: As PAs have been declared under Wildlife Protection Acts/Ordinances, respective Wildlife Departments should be given full ownership of the resources in the PAs, where applicable, including forest resources which presently are with the Forest Departments. Wildlife Department should have full authority to manage those resources as per objectives of the respective PA.

Protected Areas Management Board: In line with the Forestry Board, there should be a Protected Areas Management Board under the Ministry of Environment comprising members from provincial Secretaries Environment and community representatives.

Special Judges to hear the Cases: Cases registered against illegal activities in the park are heard in the regular courts which do not pay much attention to these cases. As a result these cases are pending for many years which encourage the poachers and others. It is suggested that special judges may be deputed in the courts to hear cases against illegal use of PAs resources for their early decision.

Clarify customary rights: Rights of local communities in the PAs must be decided on priority basis in consultation with the concerned communities and other stakeholders to avoid ambiguities and conflicts. Wildlife Departments and local communities must be clear about their rights in the respective PAs. It would help to stop misunderstandings and end disputes with communities and to check any further loss/degradation of the park resources.

Revision of the Wildlife Laws: Present wildlife laws need to be revised and updated in respect of provisions for community participation and empowerment, collaborative management of PAs, wildlife habitat protection, increase in the fines, etc.

Buffer Zone for PAs: There should be provision in the law and efforts should be made for the establishment and management of buffer zone for each PA, especially the national parks.

Check Negative Political Influence: Most of the PAs are under heavy negative political influence for hunting and collection of other materials, adversely affecting the resources. This must be encountered at the higher management level for saving the PA resources. It sometimes poses threat to the park employees through fake cases against them and threats to their lives.

Institutional arrangements/Institutional Arrangement

National Park Management System

Regarding the management of National Parks in the country, provincial/territorial wildlife management authorities have mixed opinion. One point of the view is that:

There should be a Central National Parks Management Authority to manage the NPs in the country such as the National Park Service in USA or South Africa National Parks (SANParks) in South Africa. This authority would have the required technical manpower and resources for the management of NPs in the country. The authority must have adequate manpower deputed to each NP with necessary budget, equipment/mobility/communication, etc to implement management plans and handle other park operations. Nomenclature of NPs management staff may also be made uniform all over the country.

The other point of view, rather a strong one, was that:

It might not be appropriate and feasible in present circumstances to establish a separate federal agency for the management of National Parks in the country in the presence of NCCW. Also, complications may occur by adding another agency in PAs management in the provinces/territories because two departments i.e. Forest and Wildlife are already involved in it. Moreover, the provinces may consider it interference in their rights.

It was suggested that it would be more effective to strengthen the capacity of wildlife management authorities in provinces/territories and enhance their skills regarding PAs management including NPs. Provinces should be responsible for the management of their respective PAs. Each provincial/territorial wildlife management authority should have a separate National Park/PAs Management Unit for the management of national parks and other PAs under its jurisdiction. This unit must be made fully equipped with sufficient resources (funds, vehicles, equipment, etc) and technical manpower to take care of all aspects of the national parks/PAs including management, scientific research, education/awareness, cultural resources, eco-tourism, matters relating to community, etc. The unit should prioritize the programmes specific to each PA and work accordingly and as the needs emerge.

Federal government should assist the units technically and financially for effective NP management. These units in all provinces be linked with a central committee (PA Management Board) under the NCCW/ Ministry of Environment headed by IG (F). This committee should coordinate and facilitate the units and monitor their progress. Committee may be represented by provincial unit heads, conservators Wildlife of the provinces, AJK and NAs, NCCW, ZSD, 2-3 NGOs, etc. One DIG (F) should exclusively take care of the matters relating to this committee.

Re-defining the role of NCCW and building its capacity.

The need was strongly felt to re-organize and strengthen the NCCW for better coordination among the provinces and federal government for the management of wildlife/PAs. It must be developed into a strong, professional and active agency which can plan, coordinate and promote wildlife/PAs management programmes and deal with emerging challenges. NCCW should *inter alia* focus on;

- Technical assistance to provinces

- Coordination in matters related to wildlife/PAs management
- Exchange of expertise/experience/knowledge between provinces
- Financial assistance to the provinces
- Capacity building of staff in PA management
- Management planning of PAs, especially NPs

NCCW should particularly help and assist the provinces, NAs and AJK in scientific management of Protected Areas, especially National Parks in the country. It must be equipped with fresh knowledge and current status of NPs and sound technical manpower to assist the provinces, NAs and AJK to effectively perform the above functions.

Habitat management: Habitat degradation activities in the PAs must be checked to provide quality habitat to wildlife. Safe corridors for wildlife species need to be established in suitable areas around the PAs to protect them. For example, to deal with the livestock depredation problem, safe corridors for the movement of leopards are required around Ayubia NP which is only possible with the support and cooperation of local communities.

Exotic Invasive Species: In some PAs, there is a problem of invasion by exotic vegetation species which have altered the natural ecosystem and need to be gradually removed and managed. The endemic species should be promoted to provide quality habitat to wildlife. Wetland areas in some of the PAs also need to be maintained to safeguard the wetland ecology and associated biodiversity.

Inter-Departmental Coordination: The present low coordination and cooperation between relevant government departments with respect to PAs management must be improved. Integrated approach with the cooperation of all relevant agencies/ departments is essential for the conservation of biodiversity and natural resources in the PAs.

Boundary Demarcation: Boundaries of all PAs especially the NPs must be digitized using GPS coordinates and proper demarcation on the ground followed by erection of boundary pillars. This would help to avoid threats of possible encroachments in PAs and conflicts with the communities. Boundary fence in special cases may also be considered to provide protection to the park resources from the surrounding human population.

Land Use Planning: Shift the people living on higher altitudes inside the PAs closer to the park boundaries at lower altitude to reduce resource use pressure. Complete ban on commercial harvesting of trees/timber in the PAs is must. Development activities inside and around the PAs should be very limited.

Uniformity of signage: There should be uniformity in the signage at national level at least for the national parks

Wildlife Rehabilitation Centers: Due to increasing cases of accidents/damage to wild animals, wildlife rehabilitation centers should be established in each national park and other PAs where appropriate, to take care of injured/orphan wildlife species and their release back to wilderness.

Communication system. Most of the PAs are having vast areas with difficult hilly terrain where people are living and moving all around. The PAs staff must be fully connected with each other and park headquarter for effective protection. Wireless system, a reasonable number of vehicles and motorcycles may be provided to the staff to protect the areas against illegal users.

Staff/ Technical manpower

Increase the Staff strength: To protect and manage the PAs resources on scientific lines, more technical manpower and protection staff must be added to the existing staff. Vacant sanctioned posts, where available, must be filled at the earliest. To address the technical aspects of park management, experts of different disciplines should be added to the staff.

Capacity Building of the Staff. There is a severe shortage of technical staff for the PAs. The present park staff is not properly trained to tackle the issues of management in the park. Re-organize and upgrade the staff through in-service training in PA management especially to handle the communities residing in and around the park. Challenge would be to get their support for conservation of park resources and reduce the use pressure. Opportunities for Degree programs and short-term training to the senior staff should also be provided. Capacity building of the PA staff in wildlife census techniques, communication and conflict resolution is needed.

Experts of Related Disciplines: Management of PAs need wide range of skills especially the ability to resolve conflicts, public relations, marketing and communication skills are must for PA manager. Technical experts of different disciplines such as environmental education, tourism development, research, etc are needed which is becoming difficult to get. Major reason is probably the career development of these allied disciplines in the Wildlife Department. A suitable option could be to get these experts on deputation from other departments. The Wildlife Departments may also hire various experts for short duration on need basis to prepare and implement the management plan.

Improve the Service Structure: Present PA staff in majority of the cases is of very low cadre. They must be up-graded by providing more authority to deal with the PAs management and protection issues. Incentives must be provided through additional allowances such as hard area allowance, additional increments and yearly bonus to encourage and improve their working.

Research and Education

Establish Baseline Data on PAs: The baseline surveys should be conducted in all the PAs especially national parks to document the biodiversity resources, their current status and trend, major threats, etc. The baseline information is essential for effective management planning for these areas. Little recognition has been given to social research as an important tool for PA management. Socio-economic studies may also be conducted to assess the dependence of local communities on the PAs resources and to quantify the needs that could be safely accommodated.

Wildlife Studies: Scientific studies on wildlife and its habitat must be carried out for their sound future planning and management. Population census/estimates of threatened species in the PAs

need to be carried out immediately to assess the carrying capacity and devising corrective management measures. Monitoring system may also be developed.

Degree program in Wildlife Management: A separate degree program in Wildlife Ecology and Management, Conservation Biology should be started at a suitable university. Curriculum of Pakistan Forest Institute, Peshawar must be improved and upgraded, giving emphasis on biodiversity conservation, participatory management, community involvement, obligations of international Conventions and other emerging challenges in this field.

Exchange Visits: Respective Forest/Wildlife Departments must arrange exposure visits of their PA management staff and selected community activists to other well managed PAs of the country and CBOs residing in and around the national parks.

Internship Programmes: There is a strong need to initiate a regular internship programme for graduate and post graduate students of natural and management sciences. To achieve this objective, MoUs should be signed with suitable universities/institutions. The incoming scholars should share copies of their studies with the PA Management.

Mass Awareness Programmes: Public education and awareness is key to the success in nature conservation. Trained personnel in the field should be hired to initiate and strengthen the awareness campaign in and around the PAs to get support of local communities and general public for the conservation of biodiversity in the PAs. Environmental education and awareness may include education centers, school programmes, exchange tours, slide shows, development of ecotourism facilities and network through private tour operators.

Technical Assistance: Ministry of Environment/NCCW and Zoological Survey Department should extend technical assistance to the provincial wildlife departments in conducting resource surveys in PAs for developing baseline data. A central technical group may be established in the Ministry to organize, coordinate and conduct surveys in different PAs in the country.

Management Plans. A careful management review of PAs by the concerned authorities is required highlighting the issues pertaining to management, social, economic and ecological dimensions. There is an urgent need to prepare management plans and improve and up-date the older management plans for the PAs. New issues and pressures have emerged during the last decade which should be addressed in the plans for finding their solutions.

Involvement of Security Agencies: Security Agencies such as Army, Police and Rangers must be involved in wildlife conservation and special awards must be given to certain units/establishment for their outstanding contribution in wildlife conservation

Grant to Students: Thesis grant should be provided to post graduate students from the universities for carrying out research in national parks and other PAs on relevant wildlife and other aspects to be used in the management planning of PAs.

Community related aspects

Changing Public Attitude: PAs are to be seen as being value to the society if they are to survive. PAs should focus on conservation for the people and by the people. People's attitude towards nature conservation need to be changed through strong education and awareness campaigns about natural resources and biodiversity conservation and its sustainable use.

Alternate Energy Sources: The concerned communities should be provided alternate energy sources in order to relieve pressure on natural vegetation in the PAs.

Income generating activities: There is need to indicate potential avenues of income generation for neighboring communities through activities like eco-guides, bird watching, nature camping, nature photography contests and wildlife sighting. Initiate training programmes for women to involve them in economic activities. Young people could be involved in eco-tourism as guides for trekking.

Trophy Hunting: Existing trophy hunting programmes may be strengthened and new avenues for trophy hunting of suitable species could also be explored in the buffer zones of PAs through community involvement. Where applicable, the local community should also be involved in planning and management process of the PAs and in safeguarding the interests of PAs.

Promotion of Eco-tourism: There is a great potential of tourism development in a number of the PAs. As most of the people living around the PAs are poor, they depend to a great extent on the resources of PAs for their living. Development of tourism in these PAs can provide a source of income to these communities, reducing the resource use pressure from the PAs. Potential of developing tourism in the PAs need to be explored and then a plan prepared for the development of tourist facilities including improvement in visitor sites, picnic sites, camping sites, small restaurants, tourist huts, guest houses, etc.

Local people could be involved in these tourism related activities to get their support and provide income sources to improve their livelihood. Their capacity can be build through arranging short trainings for them in running guest houses and restaurants for the tourists, handicraft shops, act as guide in nature walks, hiking, bird watching, etc. initiate micro financing to the communities for establishing guest houses, restaurants, gift shops, etc. Simultaneously, a campaign for educating the visitors is also required to reduce the adverse impact of tourism on natural resources including wildlife in the PAs.

Community Involvement in PA management

This is now clearly understood that management of PAs is not possible without the support of local communities living in and around those PAs. Therefore, community participation has become an essential component of every conservation effort. In order to win their support in conservation, basic essential requirements of those communities are to be explored and fulfilled. For this, income generating activities for them need to be explored which are linked with the conservation of PAs. The following points might be considered in this respect.

- Establishment and development of buffer zone around the PAs, ensuring the provision of basic facilities to the communities including roads, education and health facilities, alternate fuel sources, etc.
- Development of agriculture and livestock through providing improved varieties/breeds to increase their income and reduce grazing pressure on PAs.
- Providing employment to the local people in the PAs protection and other staff where feasible.
- Providing training and micro financing to them to establish small enterprises for supporting their livelihoods.
- Involving reps of community organizations in the planning and management of respective PAs.

Financial Aspects

Increase the Budget: Annual operational budget for each PA should be increased substantially. Resources are required for infrastructure development, accommodation for the staff (offices, residences), patrolling vehicles, wireless communication system, guns for the staff to check poaching and other related activities.

Budget for NPs: Particularly, the budget allocation for the national parks should be substantially increased for the management operations and research studies. The park staff should also be facilitated including accommodation, mobility, communication, etc for proper protection and management of the park resources.

Endowment Fund: Establishment of an appropriate endowment fund for the national parks would be helpful in sustainability of park management activities. Funds are also required for the compensation of depredation losses of concerned communities.

Entry Fee: Entry gates for at least national parks should be constructed for imposing entry fee to the visitors that could be re-utilized by the maintenance of the respective NPs.