

**Park Management, Land Use Patterns and People's Perceptions: The Case of Desert National Park, Rajasthan, India.**

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**Abstract**

The Thar Desert is currently witnessing an intensification in the use of its natural resources. Human population growth, increased livestock numbers and State development policies have changed the land use patterns. The combined effect has led to ecological imbalances of resource degradation and depletion. As a part of a conservation endeavour which includes creating protected areas, the Government of Rajasthan, established a sanctuary in 1980, and named it as the Desert National Park (DNP). Desert National Park is part of a network of protected areas in India, where "wildlife and the environment" are provided with legal recognition, for their protection, propagation and development.

Presently, there are thirty-seven villages within DNP that are dependent upon the same natural resources that are being protected. In this paper attempt has been made to document local resource use, including people-wildlife interactions, and people's attitudes towards park management and conservation. The objectives further included to find ways and means to resolve these possible conflicts based upon people's perceptions, participatory approaches and sustainable land use strategies. The study was exploratory in nature and has therefore relied upon primary data collection. This information was attained through seventy informal personal interviews, group meetings and discussions, vegetation transects and direct observation.

The results of the study revealed that agriculture has displaced animal husbandry as the major source of income, and as the locally preferred type of land use. The local awareness of DNP as a protected area is limited even after a long time, due to weak information flow in both directions. The livestock population shows positive growth over the past three decades and a proper grazing management system is lacking.

Protection measures enacted by DNP management include not providing any further land allotments to local people, and to fence off areas within the sanctuary to prevent access for agriculture or livestock grazing. These activities are creating local dissatisfaction toward DNP management. Wild animal depredation of agricultural crops and livestock has previously not been documented. This fact was reported by the majority of respondents during the field study, and can in the future become source of further conflict.

There is lack of involvement of local communities in DNP management and as a result the state has not succeeded to achieve the set working plan objectives. A majority of the respondents favour conservation but not at the expense of being restricted to resource access. It is suggested that an integrated approach be applied to manage DNP and should involve local people combining DNP conservation efforts with sustainable development. The paper concludes that a clear definition of property regimes and change in policy is essential to enhance the success of conservation in the Desert National Park.

**PARK MANAGEMENT, LAND USE PATTERNS AND PEOPLE'S PERCEPTIONS:  
THE CASE OF DESERT NATIONAL PARK, RAJASTHAN, INDIA.**

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## **PARK MANAGEMENT, LAND USE PATTERNS AND PEOPLE'S PERCEPTIONS: THE CASE OF DESERT NATIONAL PARK, RAJASTHAN, INDIA.**

### **1.0 INTRODUCTION**

Population growth along with modernisation have modified human natural resource utilisation for food, water, shelter and energy. In many parts of the world, through overuse and misuse, natural resources have been depleted and degraded. Environmental awareness along with an initiative to reduce these impacts has given way to increased conservation. This endeavour involves sustainable human use of organisms and ecosystems (natural resources), along with their protection, maintenance, rehabilitation and enhancement (IUCN, 1985). Effective conservation of resources requires active involvement in management whether this undertaking is at the individual, community or state level. The establishment of protected areas provides a formal and institutional approach in conservation of the earth's natural resources.

### **1.1 PROTECTED AREAS AND POLICY IN INDIA**

India's protected areas per 1993 estimates cover 140,200 sq.km. (4.26 % of total land area) and are either national parks, wildlife sanctuaries or closed areas. This is an increase of Indian PAs by approximately 44,000 sq.km. from the 1980 inventory (GOI, 1993). Protected areas are constituted under the Wildlife (Protection) Act, 1972, epitomised from Article 48 of the Indian constitution:

*"The State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country"*

National parks protect wildlife and environment of national significance from all forms of exploitation, while sanctuaries can allow for regulated continuation of individual and community rights (IUCN, 1985). Officially stated there are 70 national parks and 416 sanctuaries in India. However, technically only twenty-five of the national parks have currently full legal status as such. In the remaining forty-five 'proposed and intended' national parks the State is still pursuing acquisition of all private and community rights to resource use, a prerequisite necessary for national park final notification. These PAs have not yet resolved issues over land rights and control, settlement claims and appropriate compensation with the local communities (WII, 1993).

Protected area establishment through the Wildlife (Protection) Act, 1972, empowers the State to impose protective and restrictive provisions for the conservation of wildlife and the environment. Since the Act was passed, India has kept a high national priority on conservation

by creating new PAs, as well as expanding the sizes of already established sanctuaries and national parks.

In 1975, India had five national parks and 126 sanctuaries, meaning nearly all of the present day national parks are recent establishments. New natural areas were declared national parks, existing national parks annexed new land, and PAs with sanctuary status were 'upgraded' to national parks. The Act has been used in a conservation policy to create protected areas, especially national parks, for the conservation of natural resources (environment and wildlife). The policy thereby extends and gives priority for the 'proposed and intended' national parks to receive their full legal status by completing the establishment process. In these forty-five cases the State is pursuing the matter of rights acquisition and providing just compensation by relocating villages to alternate land outside the proposed national park boundaries.

The Indian Government has serious concerns about its environment, and is establishing new and expanding already present PAs for natural resource conservation. Protected area management has been planned at the national level through co-ordinated efforts such as the species oriented 'Project Tiger' and the more recent 'Project Elephant', along with strengthening biodiversity protection as stipulated by the National Wildlife Action Plan (1983) and the National Conservation Strategy (1992). On the one hand, PA policy statements show a gradual change in thinking and reflect a new, integrated and people centred approach to conservation by promoting for example various ecodevelopment strategies. On the other, the State is opting for stricter conservation measures by excluding all local consumptive resource use in national parks and by further restricting activities in sanctuaries. These different approaches can effect the local communities as they reside within or surrounding a PA giving rise to People-park conflicts.

## **1.2 Methodology**

This study has attempted to identify the human wildlife interactions and people's perceptions and involvement in the Desert National Park (DNP). The fieldwork was carried out from July to November, 1994 in two separate visits. This involved primary data collection in DNP gathered through interviews, group meetings, informal discussions, vegetation transects and direct observation. The study period was chosen to coincide with much of the annual production on which the people living in DNP are dependant. A questionnaire applying open ended questions was prepared as a guideline in order to collect data related to socio-economic structure, local land use practices in DNP and human-wildlife interactions. In total 70 interviews were conducted in seven villages selected on the basis of location, size, land use practices, religion and caste structure.

### 1.3 Study area -Desert National Park

Within The Thar, DNP represents the largest contiguous area with a formal purpose of conserving biodiversity located in the districts of Jaisalmer and Barmer, in the state of Rajasthan, India. It covers an area of 3162 sq. kms and was declared as a sanctuary in 1980. It is situated approximately between north latitude 25°46' to 26°47' and from east longitude from 70°15' to 70°45'. DNP is one of the last havens for the highly endangered Great Indian bustard (*Choriotis nigriceps*). In fact one of the major reasons for the establishment of the DNP was to protect the habitat of this large ground feeding bird. Of the mammals, the Indian gazelle or the chinkara (*Gazella gazella*) is sure to be sighted by any visitor in DNP. The carnivores in DNP are the Desert fox (*Vulpes vulpes pusilla*), the Desert cat (*Felix libyca*) and the wolf (*Canis lupus*), which has been reported as an infrequent visitor (Prakash *et al*, 1992).

Since the establishment of DNP there were two proposals to change its sanctuary status. The first proposal was the intention to declare 10% of the sanctuary as a national park. Though this has not occurred it is still pending, and therefore DNP remains a 'proposed and intended' national park. The second proposal came under the UNESCO - Man and Biosphere Programme. A project document was submitted to the Government of India in 1988, recommending the constitution of The Thar Biosphere Reserve. The intended biosphere was to apply an integrated approach permitting a greater local share in the conservation efforts (GOI, 1988). There has not been any further action by the State concerning the proposal.

Despite the primary purpose of DNP being for the protection of wildlife, a specific management plan has not been prepared. What is being done is wildlife protection by creating closures. This is accomplished by fencing off areas with barbed wire, and have these areas patrolled by field staff to prevent encroachment by local people. To accommodate this purpose, many of the protection posts are situated nearby the closures. The closures constitute the major management activity, and on average utilise 60% of the funds allocated for sanctuary development. The projected rate of closure establishment by DNP is stated to be at 600 ha. annually (pers. comm.).

### 2.0 PEOPLE-PARK CONFLICTS

People-park conflicts (PPC) refer to the collective discord between local inhabitants (people), inside and/or surrounding a PA, towards the PA itself (park) and vice versa. PPC involve complex interactions of ethnic, social, economical, political, historical and biological kind (Mares, 1986).

The 'proposed and intended' national parks are encountering procedural difficulties, either as their proposal is not acceptable to the local communities or fulfilling the compensation demands becomes too costly for the State. Many communities do not favour dispossession of their private and community land and resource access, or to be relocated in neighbouring districts and villages. Communities also lack equal representation and are at a disadvantage in negotiating justified settlements. In PAs where the present boundaries were recently gazetted, PPC have escalated as relocated communities and other villages neighbouring the PA encroach onto State land for livestock grazing, poaching, fuelwood, timber and other forest product collection. Local communities complain and demand compensation for crop and livestock depredation by wild animals.

The Indian PAs have management objectives which broadly follow the provisions and restrictions presented in The Wildlife (Protection) Act. These objectives are applied in a management (working) plan for each respective PA. Protected area management plans present a contradiction in terms by wanting to benefit local communities only after they have been relocated, and attempts to do so by limiting any form of resource use from within the PA. A question raised is how can local people's bona fide needs be met without access to resources on which they are dependent.

Protected areas exclude local community involvement in how natural resources can be preserved or utilised by clearly separating conservation and development goals. Conservation has become protectionism in national parks and management is not considerate of local community knowledge, their interpretations and their perceptions of natural resources. Protected areas have met the increasing problem of encroachment by local people primarily by 'policing' activities meaning stricter enforcement of PA regulations. People park conflicts are presenting obstacles to PA management, diverting efforts and funds from resource conservation towards mitigation, compensation and enforcement. The enforcement measures reduce the legitimacy of protected area by consequently ignoring local people, and the very purpose of declaring a PA as a public good is defeated. The current attempts to resolve PPC are by the State offering social, economical and environmental development programmes as incentives for villages to relocate, and to designate these programmes on lands outside the protected area.

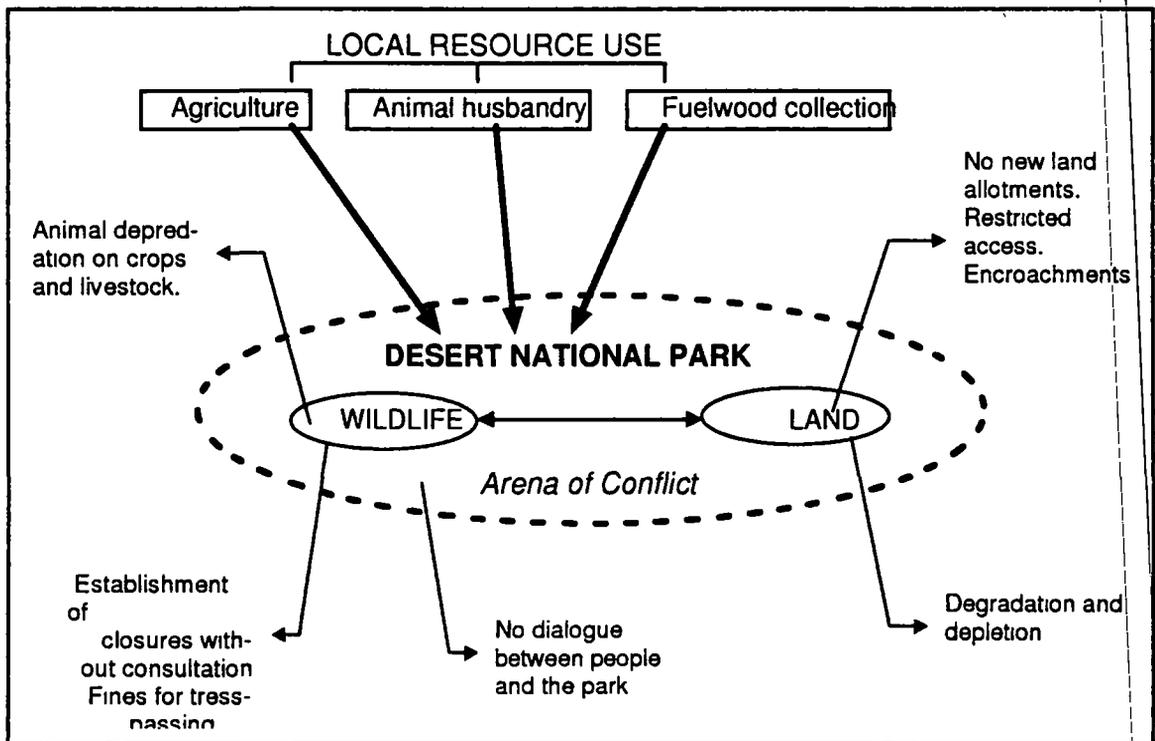
Increasingly the management of natural resources is being taken over by the State, involving formal conservation in establishing protected areas. Sanctuaries and national parks perform a vital role by giving legal recognition and status to protect genetic, species and ecosystem diversity. PA establishment also provides other multiple uses including educational, recreational and scientific.

## 2.1 Conflicts as represented in Land Use in DNP

In Desert National Park the local land use occurs on several types of property. Agriculture is on private land, while animal husbandry is on common land (*gochar*) and state land (*padath* or 'culturable waste'). From the 70 interviews conducted 53 (75%) respondents practised both animal husbandry and agriculture, with only five persons (7%) exclusively being pastoralists. In comparing the primary source of income 37 (53%) of the respondents stated agriculture, 24 (34%) respondents said animal husbandry while the remaining 9 (13%) respondents were dependant on wage employment for their livelihood. The size of land holding ranges from 1 to 50 hectares with 11.16 ha. being the average.

The land contained within DNP can in the future encounter additional problems than previously discussed. These potential threats have been identified as originating from two sources. The first is from the continuation of other resource use activities, than animal husbandry and agriculture, by the people living inside the park and the second is the result of State interests other than the conservation of wildlife and the environment. Crop and livestock depredation although not a serious problem has been reported by a majority of the respondents (field work). Conflicts over resource use in DNP is a new emergent property of the interactions among the various stakeholders as depicted below.

Figure 1. Interactions in Desert National Park resulting in conflict



## **2.2 Problems due to Anthropogenic Factors**

Fuelwood and building materials are resources required by local people in DNP. The village common lands are used first as they are closest to the village. When reserves here become exhausted, 'culturable waste' or padath is used.

Sixty-three (90%) respondents use primarily fuelwood for cooking purposes, consuming an estimated 5-6 kg. per household per day. During winter and summer, crop residues and cattle dung are also used. The remaining respondents relied more on cattle dung for cooking than fuelwood or crop residues. Fuelwood was perceived as a resource in sufficient supply by 54 (77%) persons, although they said greater distances were travelled and more time spent than before in collecting fuelwood. An additional burden on the fuelwood reserves is the pressure from from the military camps and tourist excursions which are competing with the local communities, but mostly so along the perimeter of DNP.

Mining in certain pockets of the Thar Desert can be a serious threat to the habitat due the quick returns involved and the high demand for the minerals at the regional and national markets. These areas potentially contain high grade limestone (with a low percentage of silica) and soft sandstone, besides several other minerals which will require further investigation to confirm their presence. There is no coordination between Forest, Mining and Revenue departments in determining the areas to be leased, or in enforcing measures to control illegal mining activities leading to forest destruction. The State derives considerable revenue from the Mining Department and it is interested in promoting mining, even in DNP. The Oil India Limited and Oil and Natural Gas Commission, which are public sector undertakings, have started exploring for oil and natural gas in the DNP region.

The Indira Gandhi Canal Project (IGNP) is now in its second phase and has entered Jaisalmer district. Along the canal courses, the State is allotting lands to private persons, converting padath to irrigated agricultural land. These activities have generated mass immigration from other districts in Rajasthan and elsewhere in India, notably Punjab, dramatically increasing the population and the economic value of land, as well as creating social imbalances. From the districts of Bikaner and Ganganagar, that are a part of the first phase of the IGNP, the land use changes due to the canal construction have been documented. The form of agriculture practised is intensive, with several annual crop rotations, producing cash crops, applying fertilisers and using heavy machinery. Improper water application (over watering) and seepage from the canal channels has caused problems of soil salinity and water-logging, which in turn reduced crop yields.

At present, the main canal channel terminates about 60 km. north of DNP, and the canal extension further south is expected to be complete within five years. There are plans of constructing an auxiliary (branch) canal which will pass through the north-west and west portions of DNP; nearby the village of Miyajlar, and enter Barmer district. During interviews and group meetings in this village, respondents viewed this development favourably, stating it would give the village an economic boost. As Miyajlar is one of the larger DNP villages, located in one of the major sand dune belts, agriculture is currently not a major land use activity. Converting to irrigated agriculture is seen as the best alternative locally, due to restrictions faced in grazing their livestock and as pastures (*gochar* and *padath*) are becoming degraded from over grazing. The prospect of the canal has generated immigration so to secure land if allotments are provided, as is the case further north in Bikaner and Ganganagar districts. As reported during the group meeting the form of immigration was generally of extended family from other villages (often the younger males) settling with in an existing ghar.

### **3.0 PROPERTY REGIMES**

The expansion of property claims by the State reduces and restricts the local institutional arrangements and therefore reduces options. There is less political, cultural and structural space within which local communities can solve perceived problems by the authority of existing institutions (Herring, 1995). Within a PA, property claims are for protection and not as a policy for sustainable development. Protected areas treated as isolated entities ignore that the people as well as the wildlife within are affected by outside influences. Biological resources are more than plants and animals, and include concepts that define how resources are perceived and used including how they can provide a social benefit. Especially so is the case in a sanctuary, as in DNP where the people on the 'inside' are still dependent on the resources available while still being influenced by external factors in how resources are used.

#### **3.1 Effects of Policy**

With the declaration of DNP in 1980, the allotment of land to the local people (private and common) has ceased. At the same time, for purposes of protecting habitat, closures have been created. These restrictions have occurred without any form of discussion with local people who do not clearly understand why DNP has been established or why they have to carry the cost of conservation. There is a strong feeling of discontent as characterised by this personal statement from Bida village:

*"... the government does neither allot land to us nor provides us with an alternative source of livelihood, and the only way which remains is to encroach on lands and cultivate them ...and I do not find anything wrong in it".*

State land policies in western Rajasthan favours privatisation. The traditional institutional arrangements, which earlier regulated grazing, are not legally recognised. This has created the incentive for individuals to claim possession of parcels of land previously under multiple uses, and to bring them under cultivation (Brara, 1987). The same trend is taking place in DNP. This is a result of a policy which promotes agriculture outside of DNP with land allotments, canal irrigation, and subsidised fertiliser. Markets are also more favourable for agricultural products than those from animal husbandry. Agriculture is given greater importance by the State even though animal husbandry is ecologically more viable.

People's attitudes towards property regimes in DNP indicate that they favour privatisation of *padath* for agriculture compared to livestock rearing. As observed during the field work and from satellite imageries, encroachment is increasing. The encroachment of common and state lands for agricultural production is probably the most serious threat towards conservation efforts in DNP.

### **3.2 Common property (*gochar*) and 'open access' (*padath*)**

What appears to the outside observer to be open access may often really involve tacit cooperation by individual users according to a series of rules. (Runge, 1981). *Padath* is not managed locally by a defined user group where specific rules exist. However, interviews and discussions at village group meetings reveal that there are some informal institutional arrangements for grazing on *padath*. As explained, the village closest to the *padath* generally enjoys greater access compared to a village located farther away from the same parcel of land. Within a village, access is set and organised at the household level and between social groups, i.e. caste. For example in Bida village (as a general rule), Rajputs use *padath* to the east of the village while the Megwhals have 'rights' to *padath* west of the village. The reason being that households belonging to these two castes are separated within Bida village itself, respectively to the east and west. The relations between village, caste and household are changing as immigration occurs, as the labour and occupational castes are beginning to own livestock, and as restrictions are being placed on *padath* access. Though grazing on *padath* is informally regulated, it can still be considered as 'open access' in DNP. This is due to the fact that there has been enough available *padath* to permit new users, thus changing the user group(s). There

are no cooperative 'rules' preventing individual action. The limitations are more ecological, relating to location of watering points (nadis, berris and tankas), livestock travel time and effects of drought.

*Gochar* which is managed as Common property is specifically owned by a village and has been allocated by the State. The State has formally provided the village *panchayat* with the authority to regulate use of common land. Field work revealed that *gochar* meant for grazing is in a degraded condition, and is in some cases being encroached upon for agricultural purposes. The *panchayat* as the management group has not been able to control grazing or to exclude new users, and the users themselves have not been willing to collectively share the resources available. However, the fault behind the present condition of *gochar* is not entirely due to the inefficiency of the management group and users. Instead it can be ascribed to three other identified reasons. Firstly, the area demarcated as *gochar* by the State is too small. Its size was based on the number of cattle, allotting approximately 0.8 hectare per ten head of cattle. This figure is a gross under estimation of the actual carrying capacity of the land in DNP. It also ignores the sheep and goats which are locally preferred (ecologically adapted) and which comprise the majority of the livestock population. Secondly, herders have had to migrate with their livestock due to drought and to reach markets. The third reason is that because the allotted common land is too small and since it cannot be the only source of fodder, the only alternative has been to use *padath*. At the same time, to reach *padath* from the village, livestock must pass (and return again) through *gochar* that surrounds each village.

The transfer of rights and responsibilities of land to local users, especially in the pastoral sector, have been particularly subject to attack on the grounds that they inevitably lead to resource degradation. In this perspective, the failure to manage village *gochar* in DNP is comparable to Hardin's theory of the "Tragedy of the Commons", in which he argues for the privatisation of common grazing lands. However, if the privatisation of land occurs (*gochar* or *padath*), local people will practice agriculture and not animal husbandry. Grazing lands in this desert environment require access being more open to communities than restricted. This is because the fodder biomass is dispersed, and the only available source is on *padath*, since the village *gochar* holding is too small.

In Desert National Park, local collective management of common lands is lacking because it has not been supported by the State. Already at the time of allocation, the common lands were of insufficient size to permit sustainable use. Thereby, the only recognised and formally established group, i.e. the *panchayats*, have not had any opportunity to regulate resources from within. Any potential gains from collective regulation would have been deficient, as fodder

reserves were inadequate. In the absence of their own land, local people have instead developed informal ties on State land.

The problem facing *gochar* is that there is no incentive for effective management amongst the livestock owners. An option in favour of providing greater incentive and control at the village level can be for the State to transfer a part of the *padath* to *gochar*. This would shift the current 'open access' regime to become common property. Furthermore, this action would institutionalise management with the *panchayat* by empowering the users. If there are sufficiently large tracts of common land, the once alternate *padath* will no longer be feasible to access for grazing. This is in conjunction with the current trend of these lands being allocated for other uses besides grazing by DNP (closures), military, mining, and agriculture, which further limits livestock migration.

Communal management can in DNP be a means for controlling access to resources since the villages are small in size but resources (fodder) are sufficiently valuable for it to be worth excluding outsiders (adapted from Toulmin et.al., 1992). On *padath* which is not converted, conservation measures (closures) can be given priority without conflicts arising with local people. This type of land reform can strengthen the role of animal husbandry, being a land use activity more in accord with the natural environment.

#### **4.0 PEOPLE'S PERCEPTION OF DESERT NATIONAL PARK**

People residing in or near protected areas do not capture any "benefit" from external conservation efforts, but instead bear many of the "costs" in terms of reduced access to natural resources (Wells, 1992). This is the also the case in DNP. However the situation of State restriction to resources has been magnified by the lack of specific information and furthermore by the absence of local involvement. These factors have been ignored though they can be of vital importance to help local people understand conservation objectives and why they can also gain from the endeavour. The local people have a right to information, as they are dependant on the resources within the area declared protected.

##### **4.1 People's awareness of Desert National Park**

The local awareness of DNP as a protected area is limited, even after almost fifteen years as a sanctuary. During the interviews it was asked what the State's intention or purpose was behind the establishment of DNP. The responses were uncertain and varied with a total of 58 (83%) giving a reply. Of these fifty-eight, 43 (61%) replied to protect animals like the chinkara and Great Indian bustard. Though their answer was 'correct' they did not know or had not been

told why this was necessary. Nine (13%) persons expressed that the State's intentions were to hand over the entire area to the military, while 6 (9%) thought mining interests were the reason. Their answers were based on State restrictions on land allotments and grazing on padath. The main source of local information was via the panchayats who were again informed not from the park management (Department of Forestry) but the Revenue Department which is responsible for collecting taxes, providing land allotments and settling land disputes, i.e. illegally encroached land.

At present this information gap about DNP intentions and conservation objectives has brought uncertainty to what the future will bring. The responses given, show the flow of information is very weak and that local people are being misled through unreliable sources of information. Local resentment and hostility towards DNP management is increasing, as are the cases of indiscriminate individual action, e.g. agricultural encroachment. The management has posted 'informative and educational', sign boards at some closures and park entry points, but serve very little purpose considering the low local literacy rate. Information dissemination, both within and outside the management is not properly organised lacking an effective system through which information can be developed and transferred to field workers and local people. The DNP field staff are referred to as 'area people' by the local villagers, and the feeling prevails that the task of the 'area people' is to create barbed wire fenced closures and to enforce restrictions.

A predicament faced by local people was the fear of relocation; an issue expressed during two group meetings. An elder in the village of Nimba was especially troubled by this thought, which was expressed by him saying:

*" .... we will rather die in our villages resisting against relocation. ...our forefathers are buried here and we would like to be buried with them ".*

#### **4.2 Involvement of Local People in Desert National Park**

There is a strong connection between the local awareness of DNP and local involvement. With the exclusion of local people in nearly all aspects of DNP they do not know nor understand its true purpose. This fact is represented by forty-nine (70%) people saying they have not had any form of contact with the park management.

The interactions which do exist between people and park are of a negative nature relating to not being allotted any land (private and community), having traditional pasture land (padath) being closed without any prior notice and having to pay fines for illegal grazing of land

encroachment. Only four (6%) respondents (all Megwhals) said they have benefited by DNP, by being employed constructing closures for the past six years.

As local people have had limited opportunity to become involved in DNP, it was unclear of how or what they could do to be included and what it means to be involved. On part of the authors this required extensive discussion firstly providing specific information about DNP and secondly telling of ways and means in which they could possibly participate applying aspects of sustainable development. Almost all respondents i.e. 66 persons (94%) were in favour of conservation, but not at the expense of being restricted resource access. Their perceptions of conservation were inclusive of continued agriculture and animal husbandry stating wildlife in this region had always been abundant and that these land use activities were not directly harmful. If they were to be restricted by the State then alternate sources of income, food and fuelwood needed to be provided.

If participation meant an improvement to local decision making which would benefit themselves then 48 (69%) respondents expressed their desire to be involved in DNP related activities at one stage or the other. Twelve (17%) persons preferred to remain indifferent to this idea, and the remaining 10 (14%) respondents did not want to be involved at all.

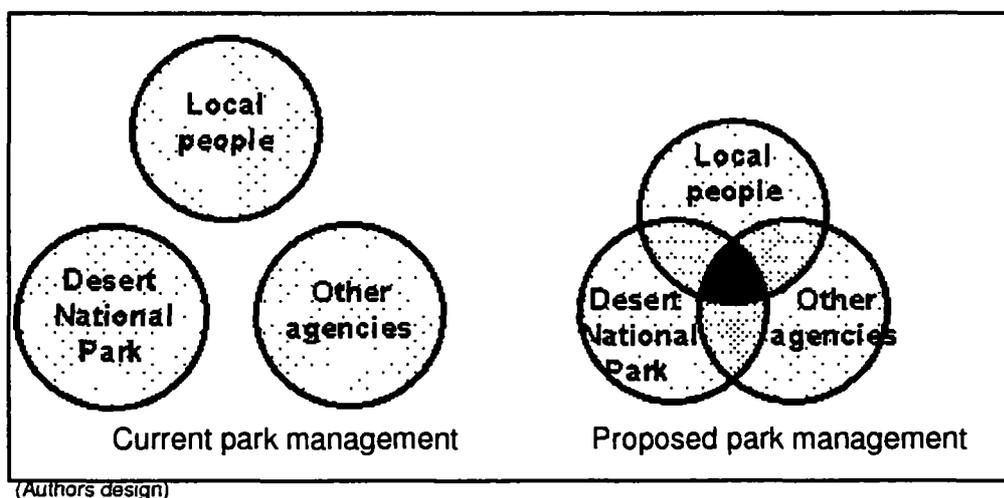
### **4.3 Potential Local People Involvement**

Conservation efforts in protected areas should be more than rules and regulations against local people, and instead should be based upon an ethic that stimulates sustainable use of natural resources. This requires an acknowledgement by the formal authority managing PAs that local people actually can contribute in conservation. Presently though, the greatest obstacle to overcome are the institutional constraints within the State itself, not accustomed to dealing from the bottom up. Fundamental shifts in perceptions are necessary along with the elimination of preconceived ideas and prejudices.

In Desert National Park the continuation of animal husbandry appears to be the best suited option for sustainable land use. Livestock rearing is collectively based on land used for multiple purposes. Potential local involvement in park management must therefore be preceded by the recognition of these (animal husbandry) institutions beyond that of the *panchayat*. Agriculture is also important but should remain linked with livestock (promote agro-pastoralism and not solely agriculture or pastoralism). The necessary broad based support for collective action in conservation and development will then be created. A policy can thereby be formulated which considers the economic and social needs of local people.

The future conservation of DNP depends on social and economic conditions present and the integration of various actors namely the local people, park management, other departments, NGOs, and research institutes. Currently the park operational model is without any unity. What can be desired is for all involved groups to integrate their efforts to promote a sustainable, cooperative way of managing the ecosystem. All working plan objectives need to be implemented, as they are integrated to perform a holistic approach to PA management. Research has to be carried out to undertake scientifically based species protection measures. Research promotes education and vice versa. Education provides an understanding of why conservation of wildlife and the environment is necessary. Comprehension by park and people can help to establish a platform upon which dialogue can be based. Tourism facilitates external interest, which in turn leads to awareness. An incorporated approach also combines conservation and on site development programmes to be inclusive of local communities.

Figure 2. A Participatory Management Model



## 5.0 RESEARCH FINDINGS

The field study in Desert National Park has revealed the following main issues:

- Agriculture is the preferred land use over animal husbandry due to State land use policies outside the sanctuary, and external markets demanding agricultural produce. This has resulted in illegal land encroachment on State and common lands.
- There is a prevalent dissatisfaction amongst the respondents due to no further land allotments, the establishment of closures and wild animal depredation to crops and livestock. The negative human-wildlife

interaction of the Desert fox killing of livestock (i.e. lambs and kids) has not previously been documented in DNP.

- An integrated approach in the management of DNP is lacking. This includes not meeting the stated working plan objectives, particularly education, research and tourism development. No form of local participation has been considered, and the aspects causing local dissatisfaction have not been recognised by the park management as a source of conflict.
- There is a lack of viable common property regimes and cooperative institutions. Private lands are favoured as the institutions governing common property are weak, institutions locally, at the State level and the arrangements between them are not coordinated towards conservation efforts.

Desert National Park has some unique features when compared to the other Indian protected areas. Some of these include that it is the only PA located in the extreme environment contained in the hot desert bio-geographic zone, its large size and that 37 villages remain distributed within the sanctuary. Another feature is that the status of the land is mostly under the category of padath ('culturable waste'), unlike other PAs where land is under the category of 'protected' or 'reserved forest'.

As a 'proposed and intended' national park, DNP actually has the legal status of a sanctuary. The State authority can potentially continue with its intention and begin the process of acquiring private and common rights. It is therefore essential to consider the issue of whether to keep the status of DNP as a sanctuary, where people have some access, or declare it a national park restricting their entry. Legal enforcement measures in protected areas have failed to preserve the biodiversity, and the lessons learnt from other PAs in the country should be considered while framing a future policy for DNP. Negative interactions have as a rule increased in a 'closed' type of PA, which further restricts access to local people. Restricting access in DNP will favour agriculture and illegal land encroachment, since if animal husbandry is going to continue, large tracts of land must remain available.

As a protected area, DNP has the formal status necessary for the conservation of wildlife and the environment. However, it has not been provided with the financial resources and political support to fulfil the proposed working plan objectives. The issues given priority have been limited to habitat protection. The institutional framework managing DNP is weak when it comes to involving people, and does not render a base for participatory approaches. It would be

more advantageous for the State to initiate dialogue at an early stage before conflicts do increase. Locally there is a positive attitude towards becoming involved in DNP management activities, and this should not be ignored.

## 6.0 CONCLUSION

For sustainable resource management, approaches and methods must be developed that more actively involve resident peoples in the planning and decision-making process. An FAO (1974) report indicates that, "good land use is the result of relating the ecological potential of the area in question to the needs and value systems of the users". The report further states "this can be only accomplished when political and economic institutions understand and accept the realities of ecological potential and the needs of human and wildlife inhabitants, and take steps to bring these aspects into balance". From the issues identified during the field study in Desert National Park, the overall aim of the future strategies should be to permit local people to share in conservation by involving them in how park resources are managed. Local perceptions should be considered and traditional practices combined with scientific data relating to sustainable land use should be realised through involving people in resource management.

The State has to acknowledge that the ecosystems within DNP are fragile, and more suited to be used for animal husbandry and by wildlife. Conservation has to uphold these values and discourage destructive land use policies promoting agriculture (irrigated) and mining on marginal and sub-marginal lands. Rehabilitation of the present organisational structure of DNP will help bring about an integrated management. The management requires flexibility to accommodate local community involvement and to appropriate their knowledge, skill and human resources. Broad based participation, involving all segments of the community and emphasising that individual action through a collective effort can make a difference, is necessary. This will be possible by motivating people to organise themselves and empower the new organisations at the village level, providing due representation of a common interest, or by empowering the existing organisations like *panchayat*. A multi-sectoral approach is important, recognising that economic diversification and development are essential to reduce direct dependency on desert resource base. The concept of ecodevelopment can be implemented placing emphasis on human resources. An approach needs to be realised where PAs are viewed as components of larger human ecosystems in which sufficient consideration is given to the links between natural resources and human aspects.

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