PROJECT BRIEF

1. IDENTIFIERS:

PROJECT TITLE:	**India: Conservation and Sustainable Management of Dryland Biodiversity, Phase 1**
DURATION:	7 years (Phase 1 = 3 years approx; Phase 2 = 4 years)
GEF IMPLEMENTING AGENCY:	UNDP
EXECUTING AGENCY:	Ministry of Environment and Forests, Government of India
REQUESTING COUNTRY:	India
ELIGIBILITY:	CBD ratification on 18 February 1994
GEF FOCAL AREAS:	Biodiversity
OPERATIONAL PROGRAMME:	OP 1, Arid and Semi-Arid Ecosystems, crosscutting with land degradation

2. SUMMARY:

The Jessore Sloth Bear and Balaram-Ambaji Wildlife sanctuaries of north Gujarat, India harbor unique assemblages of endemic and endangered fauna and flora, wild native crop varieties and endemic medicinal plants. However, these sanctuaries face threats from several anthropogenic factors particularly the sanctuaries' inhabitants that depend on the biodiversity resources of the area, especially for non-timber biodiversity products (NTBPs), grazing and fuelwood needs.

This project aims to promote the conservation of vulnerable, endangered and endemic wild animals, medicinal plants and wild varieties of important crops in the two sanctuaries. It will strengthen the sustainable use and management of silvi-horticulture systems, agrobiodiversity and medicinal plants, *inter alia* to promote alternative livelihood patterns and reduce resource pressures on the sanctuaries. The project strategy is built on four objectives. The first is to conserve and augment critically endangered flora and fauna in the sanctuaries. The second is to reduce resource pressures on the sanctuaries by developing sustainable alternative livelihood activities. The third is to improve the institutional and technical capacities of the sanctuary managers (the Forest Department) for biodiversity conservation and the fourth is to identify and initiate processes of change in order to overcome policy and institutional barriers hindering the sustainable management and conservation of the sanctuaries. The project features several innovative approaches to biodiversity conservation, including promoting indigenous knowledge and grassroots solutions for developing alternative livelihoods, and identifying and promoting native conservation ethics (Sacred Groves, Knowledge Forests, etc.) as the foundation for conservation awareness efforts.

The project has high replicable value, due to the fact that most local communities are inter-dependent on local biological resources, and have developed indigenous knowledge of their use and management in ecologically sustainable ways.

3. COSTS AND FINANCING ($ M):

GEF: Project	**$ 4.4200**
PDF B	$ 0.3296
Sub-total GEF:	$ **4.7496**
Phase I:	$ 1.7100
Phase II:	$ 2.7100
Co-financing: (Phases indicated in brackets)	
Government of India (in-kind)	$ 0.5450 (2)
Gujarat State Government/ Forest Dept. (in-kind)	$ 1.1800 (1, 2)
Local Communities (in-kind)	$ 0.2000 (2)
World Bank INFODEV (in-kind)	$ 0.0500 (1)
UNDP (cash)	$ 0.0750 (1)
NGOs (in-kind)	$ 0.0500 (1)
Donors (cash)	$ 1.5000 (2)
Sub-total co-financing:	$ 3.6000
Total Project Cost: (incl.PDF B)	**$ 8.3496**

4. OPERATIONAL FOCAL POINT ENDORSEMENT:

Name: Ms. Rita Acharya
Title: Deputy Secretary, Dept. of Economic Affairs
Organization: Ministry of the Environment & Forests
Date: 7 March 2001

5. IA CONTACT:

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Abbreviations

ANRED	Asil Navsarjan Rural Development Trust
BSI	Botanical Survey of India
CF	Conservator of Forest
CGB	Community Gene Bank
CSIR	Council of Scientific and Industrial Research
CWW	Chief Wildlife Warden
DFO	District Forest Officer
FMIS	Forest Management Information System
GAU	Gujarat Agricultural University
GEER	Gujarat Ecological Education Research Foundation
GEF	Global Environment Facility
GIAN	Gujarat Grassroots Innovation Augmentation Network
GIDR	Gujarat Institute of Development Research
GoI	Government of India
GSFDC	Gujarat State Forest Development Corporation
HYV	High Yielding Varieties
ICAR	Indian Council of Agricultural Research
IDRC	International Development Research Centre
IFDP	Integrated Forestry Development Programme
IIMA	Indian Institute of Management - Ahmedabad
ISRO	Indian Space Research Organization
IUCN	International Union for Conservation of Nature and Natural Resources
JFM	Joint Forest Management
MIS	Management Information System
MoEF	Ministry of Environment and Forests
MSU	Maharaja Sayajirao University
NTBP	Non-Timber Biodiversity Product
NGO	Non-Governmental Organization
NIF	National Innovation Foundation
NPD	National Project Director
PCCF	Principal Chief Conservator of Forest
PDS	Public Distribution System
PPLI	Participatory Patient Learning Interactions Technique
RFO	Range Forest Officer
SAC	Space Application Center
SEWA	Self-Employed Women's Association
SRISTI	Society for Research and Initiatives for Sustainable Technologies and Institutions
UNDP	United Nations Development Programme
WB	World Bank
WII	Wildlife Institute of India
WLPA	Wildlife Protection Act
ZSI	Zoological Survey of India

BACKGROUND AND PROJECT CONTEXT

Environmental context:

1. India is one of the world's 12 mega-biodiversity countries, which together account for 60-70% of the world's biological diversity. Gujarat accounts for 5.9% of the area of India, but only 2.5% of country's forests, which cover approximately 10% of the state. Gujarat is a crucial link and wintering ground in the flyways of millions of waterfowl (including cranes, ducks, geese and numerous waders) that migrate from central Asia and Western Europe to Peninsular India.
2. About 750 species of medicinal plants and 450 species of economically valuable plants have been identified so far in Gujarat. Gujarat also harbors a number of wild relatives of indigenous varieties of crops such as cumin, rice, and isabgol (*Plantago ovato*). The total forest area of Gujarat is approximately 18,000 km^2, mostly occurring in the southern part of the state. The forest area of the three northern districts (Banaskantha, Mehsana and Sabarkantha) which is classified as "dense" or "open" is only 1,451 km^2, and out of the 20% of the total forest area of Gujarat that is protected, only 747 km^2 is in these three districts.
3. This project site consists of two sanctuaries in Banaskantha district, namely the Jessore Sloth Bear and Balaram-Ambaji Wildlife Sanctuaries (Annex VI), lying at the southern tip of the Aravallis mountain range. The sanctuaries represent contiguous forest areas divided for a length of about 12 km by a national highway connecting Ahmedabad and Delhi. Jessore Sloth Bear Sanctuary covers an area of 180 km^2 while Balaram-Ambaji Sanctuary is 542 km^2. There are four bridges that pass over dry channels, and natural underpasses which wildlife and local people use.

Global significance:

4. The state of Gujarat falls under the broad Ethiopian bio-geographical realm, but due to the macro-topography of the sub-continent, it also represents the point at which the Ethiopian and Indo-Malayan realms merge, and consequently shares floristic characteristics of both. It is divided into three bio-geographic sub-regions: the Indian Desert, Semi-Arid Deccan-North Gujarat, and Semi-Arid Gujarat-Rajwara. These three sub-regions contain several unique ecosystems, including the dry thorn scrub forest with a predominance of *Acacia nilotica* and *Capparis deciduas*; and the dry deciduous forest with a predominance of *Tectona grandis* and *Anogeissus latifolia*. Wild relatives of several agricultural crop plants referred to in paragraph 2 are also found in these or associated ecosystems.
5. The two sanctuaries include both of these unique forest ecosystems, and contain at least 16 rare or endangered flora species. Formerly these forest ecosystems were much more widespread, but a long history of land degradation and deforestation has reduced forest cover severely. High quality forest is still found in some parts of the sanctuaries, but in few locations elsewhere in Gujarat or neighbouring states. The two sanctuaries represent the only location of northern thorn forest ecosystems that enjoy protected area status in the state. Already a number of rare and endemic species (such as the tree *Commiphora mukul)* have been lost in certain critical habitats, though they may not be totally extinct. Other plant species that are globally threatened include: *Anogeissus sericea, Ceropegia odorata, Commiphora wightii, Heliotropium baccifera, Pavonia arabica, Sterculia urenas, Solanum indicanum, Tecomella undulata, Capparis cartilagineus, Phoenix sylvestris,* and *Dendrocalamus strictus*. There are other medicinal plants as well as

wild relatives of traditional crop varieties like brinjal, black gram, green gram, amaranthus (pseudo cereal), wild castor, mustard, rape seed, hill millets, capsicum, Bitter gourd , smooth gourd, lady's finger, cow pea and many more found within the sanctuaries.

6. Gujarat is an important wintering ground for birds migrating from Central Asia and Western Europe to Peninsular India, as well as home to a number of resident birds. Migratory birds include the White Eye (*Zosterops palpebrosa*), White Throat (*Sylvia communis*), White Wagtail (*Motacilla alba*) and Yellow Wagtail (*Motacilla flava*), to name but a few. The sanctuaries represent an importat staging area for migratory birds en route to wintering grounds like the Rann of Kutch and Nalsarovar.
7. Endangered fauna found in the sanctuary include the sloth bear (*Melursus ursinus*), Indian pangolin (*Manis crassicaudata*), redspur fowl (*Galloperdix spadicea*), grey jungle fowl (*Gallus sonneratii*), whitebellied minivet (*Pericrocotus erythropygus*), Indian black ibis (*Pseudibis papillosa*), painted stork (*Mycteria leucocephala*), whitewinged black tit (*Parus nuchalis*), Asia openbill (*Anastomus oscitans*) and Indian python (*Python molurus*).

Socio-economic context:

8. There are 114 villages within the two sanctuaries, with about 15,262 households and a population of approximately 87,250. The people residing in the sanctuaries are largely Tribals and Maldharis. The Maldharis are an indigenous semi-nomadic pastoral group of cattle herders who move from one area to another in search of good pastureland. They have migrated from the neighbouring state of Rajasthan and many have settled down in sanctuary villages.
9. Ninety-three percent of all households have agriculture as their major occupation, yet about 17% do not own any land. Of those who do, the average holdings are a little over two hectares. Tribal families have a higher percentage of landowners (eighty-eight percent) than Maldharis.
10. Due to insufficient availability of legally-owned land, there is a tendency to cultivate clear-felled Forest lands without authorization. About eight percent of all families have illegally-cultivation Forest lands, but the area involved is very small. Sixty-eight percent of the households are estimated to cultivate less than half a hectare of Forest lands. The average ownership of animals among the sanctuary villages is unusually high, more than twelve per household in the case of Maldharis and eight in case of tribals.
11. The district has the dubious distinction of having the lowest female literacy rate and highest school dropout rate in the state. There is very little diversification of occupation, with about eighty-four percent depending on agriculture and six percent on animal husbandry. Mining, quarrying, labour in the hotel industry and other non-farm work make up the remaining ten percent. Many have some form of subsidiary occupation to supplement their incomes, but this is relatively marginal.
12. Cattle grazing and commercial firewood collection are two other main activities. There is significant collection of honey, gum, resin (Gugal: *Commiphora mukul*) and Timru (*Diospyros melanoxylon*) leaves and fruits from the forests. Average annual income generated from the sale of these and other non-timber biodiversity products (NTBPs) is less than $46 per household. The incidence of firewood collection for sale is lower in areas where NTBPs are more readily available. As described in FAO Forestry Topics Report 4 ("More than wood – special options on multiple use of forests"), it is not unusual in poorer communities in India – such as those in the project area – that 90% or more of the community members depend on forest products as

their main source of livelihood. Studies in similar forest ecosystems in other parts of India have revealed that NTFP's can constitute an average of 50% of household income, but that this percentage increases as opportunities for other sources of income decrease.

Policies, Legislation and Institutions:

13. The Government of India accords high priority to biodiversity conservation in the country as described in the approach paper to the Ninth Five-Year Plan (1997-2002). The Wildlife Protection Act (1972)[1] provides legal protection to species listed in its Schedules I to IV. Habitat protection is also provided under the Forest Act (1972), the Forest Conservation Act (1980), the Environment Protection Act (1988) and Draft Biodiversity Bill[2] (1999). Under Indian law, the *panchayats* (local village committees) are viewed as key actors in involving rural masses in grassroots decision-making and effective decentralized planning. The law devolves powers to rural communities and tribes with respect to management of watersheds, water bodies and community assets (e.g., pastureland).

14. The concerns for balancing conservation and development are reflected in the classification of Indian forests made in the Forest Policy of 1894. The first group consisted of protective forests, whose preservation was essential on physical or ecological grounds. The second group comprises productive forests, whose preservation is essential for supplying timber and other forest produce. The third group consisted of forests, whose preservation is essential to supply small timber, fuel wood and fodder. The fourth groups consisted of pasturelands.

15. The principal aim of the 1988 National Forest Policy is to ensure environmental stability and maintenance of ecological balance, which are vital for the sustenance of all life forms, human, animal and plant. The derivation of direct economic benefit is subordinated to this principal aim. India's Environmental Action Plan of 1993 lists "conservation of and sustainable utilization of biodiversity in selected ecosystems" as one of the top seven priorities for future action. Among the goals listed in the National Wildlife Action Plan (1983) are developing management systems for protected areas, with due regard for the needs of local people and ensuring their support and involvement. It also identified extension of conservation efforts beyond protected areas as one of the goals.

16. In the past twenty years, State Governments have, with national assistance, recognized the historic, current, and potential role of local communities in forest protection and maintenance of biodiversity. Through Joint Forest Management (JFM), decision-making and responsibility for control over Forest Department lands and usufruct rights are being shared between Forest Departments and local user groups. In response to pressure on protected areas, the Government has adopted a participatory approach called eco-development, which aims to conserve biodiversity by addressing the impact of local people on the protected areas and *vice a versa.*

17. National-level priority-setting for biodiversity conservation has recommended immediate action to protect the arid and semi-arid ecosystems of north Gujarat. The Government of Gujarat's forest and environmental policies, plans and actions reflect a significant, continuing

[1] The Act lays down procedures for declaration of sanctuaries and national parks. Sanctuaries and/or national parks could be constituted by the State governments for the purpose of (a) protecting, (b) propagating, or (c) developing wildlife, or its environment, on areas which State considered as having ecological, faunal, floral, geomorpholigical, natural, or zoological significance. Under the act: I) National parks are given a higher level of protection, with no grazing and no private land holding or right permitted within them. II) Sanctuaries are given a lesser level of protection, and certain activities may be permitted within them. The Chief Wildlife Warden is empowered to regulate, control, or prohibit the grazing or movement of livestock within the limits of a sanctuary. The concept of core zone and buffer zone are management concepts, and not specified in the Act (Shingi et al 1995:21)

[2] The NPD, Prof. Gupta was a member of the Working Group set up by MoEF to draft the National Biodiversity Bill, 1999.

commitment to biodiversity conservation. During the 5th Five-Year Plan, Gujarat amended the Indian Forest Act 1927 to provide for more stringent punishment for forest offences in accordance with the Forest (Conservation) Act, 1980. During the seventh and eighth Five Year Plans, the increased protection and modification of plantation schemes to include more water percolation measures resulted in a real increase in forest cover in Gujarat.

18. Protection of wildlife in Gujarat is provided for under the Wildlife (Protection) Act, 1972 (as amended in 1992) . In the two sanctuaries, the land according to ownership, may be classified as;

    a. Reserved forests (owned by the Forest Department),

    b. *Gauchar* (common property resources owned by panchayats),

    c. Wasteland (owned by panchayats/Revenue Department),

    d. Private land (settled land including land used for agriculture, quarrying and mining).

19. Given the honeycomb nature of the two sanctuaries and pending settlement, three different types of tentative classification have been proposed by FD:

    i) Core Protected Areas: Two to three large areas of the sanctuaries zoned primarily for wildlife and its improvement.
    ii) Non-Core Protected Areas: Protected areas other than Core Zones where afforestation and sustainable forestry may be carried out by the Forest Department taking into account community needs and habitat improvement.
    iii) Buffer Areas: non-critical zones where some anthropogenic activities may be regulated .

20. Land in the immediate vicinity of settlements does not fall under the jurisdiction of the Forest Department, but under the Department of Revenue. On these lands various economic activities are possible. Land ownership and use rights of local residents and migrant graziers have not yet been fully delineated, but the land settlement process is underway.

21. Protected areas are under the jurisdiction of the Gujarat Forest Department. The Wildlife Wing carries out conservation activities in the two sanctuaries, while Social Forestry activities are under the Mehasana circle. There are two DFOs (District Forest Officers) based in Palanpur, the district headquarters of Banaskantha district, to manage the activities of the two sanctuaries. Each DFO is responsible for wildlife and social forestry respectively. The Gujarat State Forest Development Corporation (GSFDC) is responsible for procurement, storage and marketing of nationalized NTFPs (Non-Timber Forest Products).

22. Within the framework of the Ninth five-year plan (1997-2002), the State Government's 1999-2000 Development Programme outlines a set of objectives and strategies for the forest sector. An outlay of $500 million has been made for the year 1999-2000. Overall, the programme aims to ensure the long-term conservation and sustainable management of the forests and the biodiversity contained therein.

Other State Departments

23. Other State Departments active in the protected areas include the State Revenue Department, State Agriculture Department, Animal Husbandry Department, Irrigation Department and Department for Rural Development. Developmental activities at the district level are coordinated by the office of the District Collector through the District Development Officer.

Among the important schemes implemented by the Banaskantha District Administration are: Integrated Rural Development Programme, Drought Prone Areas Programme, various Rural Employment Programmes, Integrated Rural Energy Programme, Tribal Area Sub-Plan and Re-survey/Revision Survey in Tribal Area villages.

24. The Department of Agriculture has a cadre of extension workers involved in agricultural activities. They co-ordinate the activities of farm communities, local governments and researchers, and transfer material (e.g. seeds, chemicals and tools), information and technology to communities. They organize demonstrations and relevant training programmes among farm communities, rural youth and women's groups.

25. The work of various government corporations *viz*. Gujarat Tribal Development Corporation, Gujarat Land Development Corporation, and Gujarat Mineral Development Corporation have a strong bearing on land use plans. The Gujarat Women's Development Corporation and rural banks in the district extend credit and marketing facilities to rural entrepreneurs.

Threats to Globally-significant Biodiversity

26. In the course of the project preparatory process, a number of threats have been identified through local consultative workshops[3] with communities and forest officials managing the sanctuaries.

27. One of the most important threats identified is **overgrazing**. According to a report in 1988, there were 51,748 domestic animals in the sanctuary villages. There are currently few limits on herd sizes. Herds expand due to natural population growth, and since the stock is of limited commercial value (due to lack of proper management and husbandry) attrition from sale or slaughter is minimal. In addition, Maldhari nomadic herders traverse parts of the Balaram-Ambaji Sanctuary with their herds while moving from the Rajasthan desert areas to grazing areas in the south. These herders move their livestock through areas with available grazing and water supplies, and some of these routes traverse peripheral areas of the Balaram-Ambaji Sanctuary.

28. **Over harvesting** of fuel wood, medicinal plants, wild-relatives of domestic crops and other non-timber biodiversity products (such as gum and honey) is another important threat. A study in November 1999 showed that every day more than 600 villagers carried head loads of fuelwood weighing 15 to 20 kg each for sale in nearby towns, traveling 8 to10 km to earn $1 per 40 kg of fuelwood. This amounts to an annual harvest of approximately 4,320 tonnes of fuelwood.

29. **Encroachment and clearing** of land has also caused a loss of unique biodiversity. This encroachment and land clearing occurs in various forms, including gradual encroachment of agricultural land, quarrying and mining activities in Sanctuary areas, temporary encroachment by pilgrims during pilgrimages to local shrines, and fires in forest areas (both deliberate and accidental).

30. **Soil and water degradation** represent the final major threat. The lack of water for agriculture, livestock and domestic consumption (exacerbated by recent droughts) is one of the most pressing resource issues being faced in the site area. This shortage obviously affects the local flora and fauna also. The drought is also partly responsible for soil erosion in hilly areas.

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4 As part of the PDF-B phase, eight consultations were held with Forest Department officials of both the sanctuaries during September to November-1999. GIDR and SRISTI also organised nine consultations with local communities during this phase of work.

Inappropriate agricultural techniques and a lack of proper soil management have also resulted in soil exhaustion in surrounding areas, which increases agricultural encroachment pressures on the Sanctuary areas.

31. Replacement of endemic species like *Dendrocalamus strictus* and *Plumbago zeylanica* with **exotic invasive species** like *Prosopis juliflora*, *Lantana camara* and *Parthenium hysterophorus* has occurred locally. Of the invasive species *Prosopis juliflora* (which was deliberately introduced by forest managers in the past) is the most prevalent.

Root Causes:

32. The threats to the globally significant biodiversity identified above stem from a number of underlying or root causes. These root causes may be grouped into three broad categories: issues relating to local communities and socioeconomic factors, issues relating to constraints in the management and approach of the Forest Department, and policy and institutional issues.

33. **Local community socioeconomic issues** centre around a lack of alternative livelihood resources and options, which result in ever-increasing pressure on the livelihood resources found within the Sanctuaries. Due to a lack of alternatives local villagers are forced to depend on the Sanctuary forests for fuelwood, fodder, NTBPs and food. A shortage of suitable grazing lands also forces local residents and migrant Maldhari herders to graze their livestock in the Sanctuaries. This latter problem is exacerbated by a decline in Common Property Resources (CPRs) over the last few decades.

34. In addition to a lack of livelihood resources, the use of inappropriate, expensive and ecologically harmful agricultural technologies and practices has also contributed to the deterioration of the local ecosystem. The use of high-yielding varieties of food crops, which require large agrochemical inputs and irrigation, has contributed to the degradation of soil and water resources. One key contributing factor here is a lack of research, awareness and institutional support for local knowledge systems and indigenous conservation ethics which are ecologically sustainable and socio-economically appropriate to local conditions and developmental levels.

35. The relationship between local communities and the ecosystem of the sanctuaries is also hampered by a lack of awareness of the importance of the area's biodiversity, and complicated by socio-cultural practices that degrade the forest areas. The latter practices include burning of forests as a form of sacrifice, the killing of local fauna for offerings and encroachment on forest areas during large-scale annual pilgrimages to local religious sites.

36. The **Forest Department**, as manager of the protected areas, is also hampered by a number of constraints. The primary constraint is inadequate technical and financial resources, which results in a lack of management, monitoring and enforcement capacity. The shortage of resources also hampers proper planning (e.g. the preparation of comprehensive and effective site management plans) and hinders the development of technical capacities through training and skills upgrading. Shortages of equipment and constraints on capital expenditure (e.g. for fencing, drainage, etc.) also hamper the proper management of the Sanctuaries.

37. The Forest Department suffers from a lack experience in building effective and synergistic partnerships with local communities in the area. Given the large number of people living in and around the Sanctuaries, it is absolutely essential that management of the sites be undertaken with the cooperation and genuine support of local communities. Although the Department's

relationship with local villagers is not hostile, inadequate emphasis has been placed (thus far) on genuine and comprehensive cooperation with local communities in managing the forest areas.

38. On the **policy and institutional level**, a number of issues have been identified as root causes of the threats to biodiversity. Policy barriers that need to be addressed include issues such as Maldhari rights of access versus the need for core exclusion zones, the prohibition on local community access to NTBPs and the recent Supreme Court decision that may bar all resource extraction in protected areas. The root cause for these problems is inadequate attention, at a policy level, to the needs and priorities of ecological conservation in making Government policy.

39. One key issue that hinders proper management of the sanctuaries is uncertainty regarding boundaries and land ownership. To date land ownership and boundary demarcation in the two Sanctuaries has not yet been finalised, and there remain conflicts between Government departments (e.g. the Forest Department and the Revenue Department) as well as amongst local inhabitants regarding land ownership. Negotiations on this issue are on-going, and it has been agreed that there will be no forced relocations of encroaching settlers. At the same time, it has also been agreed amongst the parties involved that core no-use areas (Core Protected Areas) will be demarcated and enforced to ensure protection of critical forest biodiversity. However pending the full land rights settlement process, lack of clarity about land ownership is a significant impediment to proper management of the sites.

40. The conflict between the Forest and Revenue Departments over land ownership is symptomatic of the lack of proper inter-agency and inter-sectoral coordination in the area. Other threats that have surfaced as a result of the lack of coordination between Government bodies include mining and quarrying activities in the Sanctuaries, inadequate management and supervision of pilgrims during major religious events and inadequate attention to conservation of the Sanctuaries in planning roads and transportation networks.

41. Ultimately the most critical policy and institutional issue to be addressed may be the lack of comprehensive land and water resource management on a watershed basis. The lack of proper watershed management has resulted in a critical shortage of water in the area, which has been brought into sharp focus by the on-going drought. This water shortage has given rise to a variety of problems, including encroachment by herders looking for pasturage and water sources for their livestock, increasing encroachment and resource extraction pressures from neighbouring villagers whose crops have been devastated by drought, and wildlife-human conflicts in areas around water sources. The water shortage also aggravates the alternative livelihood problems faced by local communities, and thereby further increases pressure on the sites' resources.

BASELINE COURSE OF ACTION

Wildlife Management in the State:

42. In spite of the limited forest area, Gujarat had been active in identifying areas rich in wildlife and establishing in them 21 sanctuaries and four national parks covering an area of 17,221 sq. km. Allocation of funds for these protected areas since formation of the State in 1960 had been meager. The IFDP project in the late 1990's provided some funds for wildlife conservation and habitat improvement, mainly for activities such as creating check dams, providing fodder, salt licks, and water facilities, removal of non-native species, fencing, and demarcation and surveys,

in addition to preparation of short term management plans. Approximately 40 per cent of IFDP outlay was allocated for infrastructure development, including for construction of buildings and purchase of vehicles, equipment, furniture and other expenditures like staff salaries and travel expenses. Though sporadically desired for, the State, like any other state in India, does not have a separate and specialized cadre of officers for wildlife management. A small pool of forest officials, formally trained, or in-service experienced, in socially and media-wise sensitive wildlife management, are recognized nationally and internationally for their individual contributions. However, departmental preparedness and competencies in independently assessing and dealing with emerging threats and newer opportunities in biodiversity conservation are rather weak. Limited action gets triggered by external support and pressures, including those from a small number of state-level, fund-starved NGOs aggressively alert on environmental issues. The state seriously lacks (a) baseline biological, ecological, and socio-economic databases; (b) data processing systems for management decision-making; (c) technical know-how for interpretations; (d) long term conservation plans; (e) scientific monitoring of critical changes in biodiversity status; and (e) trained capacity to undertake all these activities as well as much-needed capacity to influence the conservation orientation of other development departments. Well-appreciated involvement of the department in JFM during the last decade has, however, helped to develop internal acceptance and capacity to promote participatory mechanisms. But its application for biodiversity conservation planning still remains at demonstration scale and value. All these aspects are unlikely to undergo self-initiated major changes during the next 5 to 7 years in a "business as usual" investment situation.

Sanctuary Management in the Project area

43. Though various small-scale schemes (mainly to restore degraded forests through silvi-cultural operations and soil conservation through vegetative measures) were prepared during the last four decades for both the proposed project sites, these protected areas were not in the limelight as compared to a small group of well-documented and nationally debated national parks and sanctuaries of the State. Outlays provided under the State Plan budget therefore continued to be meagre for the project sites. In recent years (1996-2000), both the sanctuaries as well as the surrounding forest areas of the district together benefited from the funds under the IFDP project for habitat restoration and forest development. In addition to IFDP schemes, State- and Centrally-sponsored schemes primarily supported different types of plantations on a moderate scale. A larger project as a second phase of IFDP is under consideration.

44. A draft Management Plan for Jessore has now been prepared and approved, although this plan was developed largely from the Forest Department perspective. It envisages investment of $2.32 million for the next five years, the funding for which is still unconfirmed. Plan components include demarcation of settlement and sanctuary boundaries, habitat amelioration, improvement of food availability for the Sloth bear, improved watershed management, manipulation of invasive species, rehabilitation of degraded areas, creation and maintenance of water points, conservation of faunal and floral biodiversity, participatory eco-development, eco-tourism, and nature education. These activities, however, appear to be discrete entities rather than well-integrated, focused strategies. In spite of a need for greater involvement of local communities in the planning process to incorporate their knowledge and concerns, these communities had limited opportunity to participate in the preparation of these plans. A draft

management plan for Balaram-Ambaji Wildlife Sanctuary was also prepared and is under revision. Core areas in both the sanctuaries still remain to be identified[4].

45. Periodic censuses and species-specific counts were carried in the sanctuaries, but a gap still exists for detailed population surveys. Most of the database and competency related observations at the state level were valid for these sanctuaries as well. Preliminary surveys have been undertaken during the PDF-B phase by SAC, GSFDC, WII, ZSI, State Universities, and other prestigious institutes, however further work is still required.

Biodiversity Conservation in Sanctuary Area

42. Biodiversity conservation and sustainable use have always been the cornerstones of forest management practices, however efforts to conserve the sanctuaries have been hampered by local biotic pressures and there is a need to reorient these efforts in a coordinated manner. The State Government Departments of Industries, Mining, and Agriculture play an important role in the implementation of development activities and significantly influence the outcome of sanctuary management plans. Their functions, however, do not include considerations of biodiversity conservation. GEER, WII, ZSI, SRISTI, GUIDE, GIDR, SAC, IIMA GAU and MSU are among the formal organizations whose work includes aspects of biodiversity conservation and the promotion and preservation of indigenous knowledge. However, at present there is no networking among these organisations to share expertise or lessons learnt. A knowledge forest (a working model for promoting native conservation ethics and community based initiative for *in situ* conservation of wild native varieties of medicinal plants and other species) was established by a local healer in 1995, with the help of an NGO (SRISTI) and the Forest Department. There is no Government policy or funds specifically supporting this type of initiatives. Presence of JFM initiatives in the project sites is also negligible.

46. Fifty-six sacred groves have been identified to date in the two sanctuaries. These sanctuaries are mostly self-managed by local communities on shoestring budgets supported through donations from devotees.

47. Besides small-scale cottage industries in the sanctuary villages, about forty quarries operating inside the sanctuary area extract minerals and building material like limestone and marble. These quarries are generally small local operations extracting building material to service local demand.

48. Though prohibited, illegal extraction of NTFP is reported in the sanctuary area. There are forest areas outside the sanctuaries in which the Gujarat State Forest Development Corporation (GSFDC) and the locals are permitted to collect certain minor forest produce. Funds generated from the royalties are modest, but since the royalty rates are low, the royalties do not truly reflect the magnitude of extraction.

49. Current schemes and provisions of management plans indicate that existing strategies and activities are unlikely to (a) support or guide community initiatives and working models for promoting native conservation ethics such as knowledge forests or sacred groves, or revive traditional natural resource management systems; (b) intensify, encourage, substantiate, or make use of externally available research outputs on a sustainable basis for biodiversity conservation;

[4] Preliminary identification of core areas for the two sanctuaries was undertaken as part of PDF-B formulation, however these do not form part of the draft management plans developed by the Forest Department. This preliminary identification was carried out using a combination of satellite imagery and field surveys to identify suitably-sized areas of intact forest.

(c) develop and institutionalize incentive structures to regulate migratory grazing; (d) create a strong information base for trend analysis and decision making; (e) install monitoring and evaluation systems and mechanisms to design corrective interventions; (f) undertake demonstrations and capacity building programmes on multi-actor innovative practices for long-term biodiversity conservation; (g) develop systems and forums for responsive policy dialogue and conservation-oriented, domain-specific policy development; (h) activate coordinated activities within and outside the protected areas on land and livestock management, and pasture development in partnership with NGOs and other development departments within the framework of biodiversity conservation; (i) develop or strengthen public distribution systems for meeting energy needs; (j) undertake independently or in collaboration much needed watershed development programmes to mitigate the impact of frequent drought conditions in the project areas; (k) generate non-farm and non-forest-based alternative livelihood opportunities to regulate extraction of NTFP; (l) promote cultivation of medicinal plants and value addition enterprises among local communities; (m) recognize the significance of, and provide incentives for, conservation of agro-biodiversity; and (n) develop and/or enthusiastically support public awareness and education programmes in biodiversity conservation.

Fodder and Fuelwood Provision

50. As the State government is responsible for mobilizing resources to address drought relief activities, the sanctuaries give some priority to supplying fodder and water for local populations during the dry season. The Department of Animal Husbandry is responsible for the fodder public distribution system during severe crisis periods. But it provides fodder only as the last resort to prevent the death of livestock from drought. The State policy of allowing farmers and the tribal community to satisfy fodder requirements from Forest Department land contributes to habitat degradation. This policy also applies to lopping for fuelwood and medicinal plants for domestic needs. The implication of this policy is that villagers may access new lands once the existing land no longer provides enough NTBPs to satisfy domestic needs. Fodder provision for Maldhari nomadic herders is a particular concern, as (due to a Supreme Court decision affirming Maldhari rights to cross state boundaries unimpeded) these herders retain the constitutional right to encroach upon protected areas to graze their herds. No provision is currently being made to address Maldhari fodder needs specifically.

43. The Village *Panchayat*, a committee of democratically elected representatives, which derives its funds from grants and taxes to manage village affairs, is also responsible for managing all common property, including *gauchars* (common community grazing land). However, due to limited funds, the *gauchars* have a lower priority for receiving a sufficient share of resources. In the forestry sector, funds were allocated in the past to *gauchars* through components of externally aided projects. Apart from these exceptions, lack of resources has resulted in the complete degradation of the *gauchars.*

Livelihood promotion

44. Livelihood options are limited within the sanctuary, contributing to the threats of biodiversity loss. This has been addressed by some NGOs and different State departments. State departments provide loans, subsidies, and direct technical assistance to local farmers and tribal communities through various development schemes. These schemes have varied foci, such as agricultural development, watershed development, livestock management, village development, tribal welfare, women and children development, health, education, employment generation,

housing, drinking water, etc. Funds for the same activity are sometimes provided through different schemes. The State implemented close to 125 different schemes for crop husbandry alone, in addition to another 20 schemes for soil and water conservation, 22 schemes for animal husbandry, seven schemes for dairy development, and 33 schemes for the development of fisheries. However, different funds will have different emphases and levels of budgeted funds and may be targeted to different villages.

45. Almost all the villages in the district have members of the District Dairy Co-operative Federation. Their main task is to co-ordinate the activities of members, collect and purchase milk, ensure flow of productivity-enhancing inputs like dairy feeds and medicine, and information and technology to members.

46. The Integrated Rural Development Program undertook various activities to raise the level of income of rural poor families existing below the poverty line. Some of its components aimed at providing employment to at least one person from each family. The Department of Education is responsible for providing free and compulsory education to children between the age of six and eleven. Development schemes under social services included adult education, sports and youth services, technical education, public health, water supply and sanitation, rural housing, and nutrition.

47. The Gujarat State Land Development Corporation (GLDC) has been active in watershed development in the project area. It implemented a centrally sponsored Ninth Plan scheme called the National Watershed Development Project for Rain-fed Areas in the revenue areas of sanctuary. The program finds favor with the State Government, and is likely to continue with similar or increased levels of funding.

Public awareness and Environmental Education

48. Except the Forest Department, no other development department undertakes public awareness campaigns or activities on environmental awareness on a regular basis. NGOs in the sanctuary area play an important supporting role in helping the Forest Department improve public awareness for biodiversity conservation.

On-going Externally Assisted Projects:

51. The Department of Forests and Environment and Department of Agriculture are currently implementing several externally-assisted projects. In the recent past, two World Bank-aided projects have afforested 246,279 hectares of marginal lands in Gujarat. The Integrated Watershed Development Project for Saraswati & Setrunji river basins in Banaskantha and Sabarkantha districts is funded by $30.6 million of Japanese Government assistance. It also involves soil and water conservation.

52. Of these projects, the Integrated Forest Development Project is the most relevant to the project. IFDP has been implemented in the Banaskantha division since 1995-96. Various plantation activities have been carried out in the forest areas of Banaskantha under different schemes such as 'Rehabilitation of degraded forest areas having sufficient root stock'; 'Reforestation of degraded forest areas'; 'Peoples' participation for the regeneration of forest areas'; 'Soil and moisture conservation scheme'; 'Desert border plantation'; 'Teak (*Tectona grandis),* Khair (*Acacia catechu),* Bamboo (*Dendrocalamus strictus*) plantations'; 'Fuelwood

and small timber plantation on irrigated and rain-fed land'; the fuelwood and fodder project and the minor forest produce plantation and medicinal plantation.

PROJECT RATIONALE

Broad Development Goals

53. The national and state governments of India have economic development as a priority, and are particularly concerned with satisfying the critical need of people's food, water and energy requirements without endangering environmental quality. Towards this end, there are a number of government-supported programmes, including the Integrated Rural Development Programme, Employment Assurance Scheme, women and child development programmes, Integrated Tribal Development plans (or Tribal Sub Plans), and Public Distribution System, which all aim to tackle poverty. The PDS in particular is aimed at helping meet the nutrition and health care needs of women and children in terms of food grains and water, as well as subsidized energy resources.

54. The severity of poverty continues to increase and the government at both levels sees this project as contributing to alleviating this problem, which has been aggravated in the past year as a result of severe drought. Towards the aim of maintaining water supplies and controlling soil erosion, the government has seen the positive benefit of watershed management, which has resulted in significantly far less migration, as well as improvement in productivity and fuel supply and consequent reduction in pressure on forests to some extent. Joint Forest Management (JFM) programmes in fringe areas of forests have further helped in reducing the pressure for fuel by encouraging people to have plantations on degraded forestlands or village common lands.

55. In addition, the government has recognized the inherent value of India's biodiversity, in particular as a source of traditional medicines and economic livelihood. Traditional and contemporary knowledge and ecological ethics of local communities have made a significant contribution to the conservation of globally significant biodiversity in terms of their medicinal value and food security. While several approaches have been tried so far to conserve biodiversity in sanctuaries and areas around the same, the role of indigenous knowledge and institutions has not been fully explored in this process. This project tries to build upon a hitherto-neglected resource: the rich traditional knowledge and conservation ethics of tribal communities and other people dependent on forests.

Global Environmental Objectives:

56. The goal of this project is to conserve globally significant biodiversity within the two project sanctuaries while at the same time improving the standard of living of local people. This will occur through knowledge intensive biodiversity-friendly activities so that local stakeholders' intensity of forest resource use is reduced, while the value-added incomes and livelihood benefits derived from the resources are increased. The project will improve the protection of the wildlife to the extent that they are not threatened from human-induced activities, as well as removing barriers and demonstrating the sustainable use of medicinal plants, wild relatives of traditional crop varieties and other non-timber biodiversity resources.

Immediate project objectives:

57. The objectives of this project are (a) **to strengthen conservation of critically-endangered globally-significant biodiversity** (endemic and endangered wildlife and plants) within core protected areas, (b) **to develop sustainable alternative livelihood activities that build upon indigenous knowledge systems and practices**, as a means of reducing pressure on globally-significant biodiversity, (c) **to improve institutional and technical capacities** of the Forest Department for conservation of globally-significant biodiversity and (d) **to identify and overcome policy and institutional barriers** that hinder the conservation and sustainable management of globally-significant biodiversity in the sanctuaries.

Project Strategy

58. The project has been developed based upon certain key strategies. Amongst the most important is the focus on reducing human pressure on core protected areas of the sanctuaries, by developing alternative livelihood resources in surrounding areas. By developing alternative livelihood resources in these buffer areas, the project will reduce the demand for resources from within the sanctuaries, while simultaneously helping to improve the standard of living (and sustainable livelihoods) of local communities. One alternative livelihood option to be pursued is the development of suitable grazing lands for local and nomadic livestock herders. This will directly address the threat posed by livestock encroachment, through a participatory approach, including the negotiation and enforcement of user agreements.

59. Another alternative livelihood resource to be developed is value-enhancement of non-timber biodiversity products such as gums, resins and traditional medicines and agro-chemical substitutes. By removing product processing and marketing barriers, the project will help local communities to earn much higher revenues from NTBP activities, without increasing the quantity of NTBPs being harvested.

60. One unique feature of the project is the strategic emphasis on documenting, promoting and supporting indigenous knowledge systems and traditional conservation ethics. Many of the alternative livelihood activities being developed are based upon traditional local remedies and grassroots solutions to agricultural and rural problems. Traditional medical remedies and herbal pesticides and herbicides are being promoted as a means of enhancing revenues generated from local NTBPs. Traditional conservation practices, including the maintenance of Sacred Groves around religious sites, are being promoted as the basis for protecting core zones and in developing awareness of the benefits of biodiversity conservation. Linking the objectives and activities of the project to existing socio-cultural traditions and ancestral knowledge will build a stronger base of community support and buy-in, thereby improving the prospects for success and long-term sustainability.

61. Spatially the project is built around the delineation and differential management of three zones; a core protected area, a non-core protected area and a buffer area. The core protected area will be a no-use zone. The non-core protected area encompasses the remaining Forest Department lands within the sanctuaries, and in these areas limited, sustainable harvesting of NTBPs and other low-impact activities will be allowed. The buffer areas are zones outside the direct control of the Forest Department, including Revenue Department lands and the state lands between the two sanctuaries. Alternative livelihood activities will be concentrated in these areas as a means of reducing resource pressures on the protected areas.

62. The project duration is expected to be seven years. This will be divided into two phases, the first of which will last approximately three years. During this first phase the project's emphasis will be on overcoming policy barriers and implementing alternative livelihood activities under legally-binding user agreements, to reduce demand pressures on the core areas. Public awareness and environmental education programmes will be initiated to help build support for biodiversity conservation. Once the processes of overcoming policy barriers have been initiated and alternative livelihood and awareness activities have begun to show results, the primary biodiversity conservation activities (e.g. implementation of management plans, delineation and enforcement of no-use areas, capacity development, etc.) will be undertaken.

PROJECT OBJECTIVES, OUTPUTS, ACTIVITIES AND EXPECTED RESULTS:

63. Based on the threats and root causes identified during project development, the proposed project has been developed around four Immediate Objectives. These Objectives, and their associated Outputs and Activities, are described below:

Immediate Objective 1: To identify and conserve critically endangered flora and fauna in core areas of the Sanctuaries.

Output 1.1: Critically endangered fauna, medicinal plant species, wild native crop varieties and globally significant flora protected in Sanctuary core areas.

64. During implementation of the PDF-B, satellite imagery and ground transects were used to identify potential core areas. Preliminary discussions were also held with stakeholders concerning the location and management of these core areas (interrupted by the earthquake of January 2001). This work will be completed by confirming the boundaries of core areas having high biodiversity value, and securing the agreement of local communities to the demarcation of core areas. The size of the core areas will be based on the need to conserve minimum viable populations of species targeted for conservation. Those endangered species requiring immediate conservation action will be identified. The core areas will be monitored and emerging results will be used for adaptive management of core areas to ensure conservation. As a parallel measure germplasm of all target species will be registered and deposited in the National Bureau for Plant Genetic Resources. *In situ* conservation of critical fauna, flora and microorganisms will also be done through Knowledge Forests, sacred groves and Community Gene Banks.

65. The GEF will fund activities designed to secure global environmental benefits. These may include:

- Update and complete existing survey data of the sanctuaries to identify and map populations of critically endangered fauna, medicinal plant and wild native crop varieties, and their genetic diversity.
- Consult and negotiate agreements with community leaders on the establishment of core areas and develop participatory action plan for conservation activities
- Develop sanctuary core area adaptive management plans and strengthen institutional capacity for its effective implementation
- Manage target species in core areas according to an adaptive management regime
- Build local capacity to monitor and evaluate the conservation activities

- Establish and strengthen models of promoting native / indigenous conservation ethics such as Knowledge Forests, Sacred Groves[5], *Chabutaras* (institutions of feeding birds) and other community-managed CPRs for conservation and protection of local biodiversity
- Validate the accuracy and applicability of different indicators for monitoring long-term ecosystem interactions and ecosystem health through scientific action research.

66. Co-financing will be leveraged for activities such as:

- Strengthen the capacity of Community Gene banks, regional centers and the National Bureau for Plant Genetic Resources where germplasm of all target species (particularly unique species) will be conserved.
- Strengthen field gene-banks in order to facilitate the registration and storage of germplasm of target species.

Output 1.2: Developed and implemented an information and monitoring programme as a management tool for coordinating and planning biodiversity conservation activities

67. This output is an important management tool to monitor the implementation of programme activities for the conservation and sustainable use of medicinal plants and wild native crop varieties. This is an important complementary tool to ensure adaptive management of the sanctuaries and their core areas.

68. The GEF will funded activities may include:

- Update biodiversity inventories, including the cataloguing of agro-biodiversity, through involvement of local communities and systematic research
- Train local farmers and tribal communities in monitoring techniques and processes
- Monitor ecosystem health of core zone biodiversity through scientific assessment, longitudinal research studies and ecological assessments
- Set up a database of critical information (e.g. Forest management Information System) based on GIS to be used for planning and coordination

69. Co-financing will be leveraged for activities such as:

- Develop a wide area network comprising computer hardware and management information systems for Forest Department, community leaders, academic and research institutions

Immediate Objective 2: To reduce local community pressures on globally significant biodiversity in core areas, by developing sustainable alternative livelihood activities that build upon indigenous knowledge systems and practices.

Output 2.1: Alternative livelihood resources (fuel, food, fodder and income-generating resources) created and strengthened in Sanctuary non-core protected and buffer areas

70. This output will develop the capacities of the local communities to cultivate and harvest medicinal plants and wild native crop varieties (grown in degraded areas or private revenue lands) and non-timber biodiversity products (including suitable fuelwood species), and process

[5] A study on sacred groves conducted during PDF-B has received encouraging response in a workshop organized at IDS, Sussex, U.K. from 6th to 8th November,2000

them. Species listed in Annex VIII are over-used, vulnerable medicinal plants and wild native crop varieties or substitutes for them, and with which there is experience of cultivation. These species will initially be targeted for cultivation.

71. The GEF will funded activities may include:

- Initiate community-based NTBP activities like collection, processing, value addition and marketing
- Provide training to local communities and cooperatives to reduce transaction costs associated with joint ventures between private sector entities and communities for product processing and certification
- Broker use agreements in plots of degraded sanctuary areas to create the security of tenure necessary for private-sector/ community investment, cultivation and sustainable management of identified plots.
- Develop (SRISTI/ IIMA, GEER Foundation, Forest Department) and implement (Forest department in consultation with local NGOs and communities) a training and extension programme for medicinal plant and agro-biodiversity cultivation, harvesting, processing, and storage, including demonstration plots, and site visits to on-going commercial concerns
- Undertake training workshops (IIMA, SRISTI, SPIESR, GIDR) to familiarize communities with issues relevant to introducing products into the market such as joint ventures, production cycles, product certification, and such. These workshops will involve local communities and representatives of the government and private sector.
- Strengthen capacity of laboratory (SRISTI) to develop products based on local knowledge of wild medicinal plants, land races and agro-biodiversity
- Develop and implement a marketing strategy to promote medicinal plant products and services to tourists. This will include: promotion of goods and services through media, lectures, demonstrations, and publications on indigenous natural healingmedicines, , and direct sales of medicinal plant products.
- Carry out a feasibility study of a mechanism to ensure an adequate return of profits from the marketing of NTBPs to the sanctuary and participating communities and organizations. This will aim at securing a sustainable source of funds for the recurrent costs of agro-biodiversity conservation programmes. For instance, the recurrent costs associated with the application of agronomic techniques to ensure on-farm heterogeneity in terms of species, varieties, and landscapes.

72. Co-financing will be leveraged for activities such as:

- Promote cultivation of endemic and endangered medicinal plants on revenue lands
- The construction of a medicinal plant and agro-biodiversity centre/laboratory with simple equipment to demonstrate and promote post-harvesting activities, and provide a covered market for selling NTBPs. This centre/laboratory will also validate indigenous knowledge on the use of non-timber biodiversity products, as well as to certify products.
- Set up a small, capitalized revolving fund to promote community access to loans from a development bank for cultivation equipment[6]. The local institution (to be identified in the final stakeholders' workshop) will act as guarantor of the commercial loan. A percentage of the

[6] Capital from the revolving fund will be used as collateral against loans from a development bank. Hence the small amount of financing under the revolving fund will be able to leverage at least the same amount in loans. It is anticipated that loans will be required for repair of stone walls and wells, and simple cultivation equipment where necessary.

profits from medicinal plant sales will top-up the revolving fund for on-going training and extension work.

- Set up (biodiversity-friendly) apiary units for local honey collection, eri-silk (silkworms raised on castor plants), mushroom culture, etc. on revenue lands outside of the sanctuary
- Provide training to local communities to improve agricultural productivity of their lands
- Document and integrate best practices of biodiversity-friendly agriculture (indigenous knowledge or otherwise) into existing agricultural practices on revenue lands
- Strengthen institutional capacities of the departments of Agriculture and Animal Husbandry and state agricultural research stations
- Provide on-farm training and support to agriculture research and extension stations and NGOs. The experience generated by this activity will be linked up with the workshops facilitating exchange of information and experience within and between sanctuaries
- Strengthen and enforce regulation and zoning governing quarrying and mining activities. Quarrying and mining activities are to be phased out of the sanctuary
- Enforce government policy not to renew or issue new quarrying and mining leases and the rehabilitation of quarries by quarrying and mining companies

Output 2.2: Indigenous knowledge of local biodiversity (particularly alternative agricultural practices and resources) documented and promoted as intellectual property

73. Local communities have evolved indigenous knowledge on the value and management of critical medicinal plants and wild native crop varieties. One barrier to the conservation of these NTBPs is the lack of a policy framework that affords rights and benefits to the caretakers of these species. As a result, benefits are accrued to the Gujarat State Forest Development Corporation instead of the local communities. This component seeks to remove the barrier by promoting the legal recognition of indigenous knowledge and institutions. Lessons learned and best practices[7] will be drawn upon from the GEF Global Targeted Research MSP on benefit sharing.

74. The GEF will funded activities may include:

- Document general and cultural aspects of local biodiversity, its sustainable utilization and exchange.
- Inventory less-known and used but abundantly available seasonal and perennial biodiversity in and around revenue lands in the sanctuary areas and buffer zones
- Investigate options for protecting community property rights and the costs and benefits of those options, and recommend appropriate approaches for adoption by local communities
- Identify and build institutional capacity and draft legislation to legally recognize and administer the selected options (through partnership with local NGO)
- Develop and pilot-test benefit sharing models (both monetary and non-monetary incentives) for individuals and communities

75. Co-financing will be leveraged for activities such as:

[7] SRISTI has been honored with the Asian Innovation Award (Gold) by the Far Eastern Economic Review for its outstanding work in the field of biodiversity-friendly grassroots innovations.

- Raise awareness of the issues in recognizing community intellectual property rights among appropriate decision makers[8]

Output 2.3: Best practices for wild medicinal plant and agro-biodiversity collection and conservation introduced and collection levels regulated

76. The output will establish sustainable harvesting practices of wild medicinal plants and native crop varieties in the two sanctuaries.

77. The GEF will funded activities may include:

- Compile a compendium of biodiversity-friendly best practices and techniques from traditional and modern knowledge to minimize damage to wild resources and maximize the beneficial properties of collected resources
- Integrate these best practices, techniques and indigenous knowledge on the conservation and sustainable use of biodiversity (e.g. help develop seed-catalogues, promote farmer to farmer exchange and on-farm on-station evaluation of the local agro-biodiversity) into adaptive management plans being developed for the entire sanctuary
- Develop and implement a biodiversity-friendly invasive species control and native species reforestation programme (in particular in degraded areas) with a primary focus on developing biodiversity corridors between fragmented core areas
- Strengthen *Panchayats* and establish sanctuary management associations of community stakeholders to facilitate the effective implementation of the sanctuary adaptive management plans and village micro-plans
- Strengthen institutional linkages between formal scientific bodies and informal/traditional knowledge systems/individual to enhance the value of biodiversity conservation and management
- An awareness-raising and training programme for different stakeholders to sensitize them to the cause effect relationship of over-collecting wild medicinal plants and native crop varieties
- The development and implementation, through Forest department jointly with GEER foundation , SRISTI and IIMA, a training and extension programme in medicinal plant and native crop management best practices.
- Broker sustainable harvesting collection agreements with community leaders (Village Panchayats), limiting collection to sustainable levels. Agreements will need to create sufficient security for custodianship of resources by sectors of the community

78. Co-financing will be leveraged for activities such as:

- Develop a programme at the Village *Panchayat* level for the local communities to monitor and enforce brokered sustainable collecting agreements
- Scale up successful lessons through out the rest of the sanctuaries.
- Build CGB (Community Gene Bank) facilities to conserve active base collection of wild varieties of medicinal plants and agro-biodiversity

[8] Prof. Anil Gupta,, SRISTI-IIMA has developed three case studies on the use of IPR for grassroots innovators for WIPO. Mr. Sundaram Verma, an outstanding innovator and farmer breeder from Rajasthan and active member of SRISTI-Honeybee network has represented SRISTI in a round table on traditional knowledge held in Geneva, 1-2 November, 1999 and presented a knowledge Holders' practical perspective on protecting IPRs of farmers-breeders.

Output 2.4: Sustainable livestock management system developed and implemented

79. The lack of knowledge and poor livestock quality result in large herd sizes, which leads to inappropriate grazing behaviour and over-grazing. Lack of suitable alternative pastureland for grazing further compounds the barrier to biodiversity-friendly grazing practices. This output seeks to remove these barriers, including through legally-binding user agreements, under which herders will limit herd sizes and manage their herds in a manner consistent with the goals of the project in return for assistance in improving their livelihoods.

80. The GEF will funded activities may include:

- Strengthen state policy on the limitation of livestock numbers
- Building on stakeholder consultations begun under the PDF-B, jointly establish grazing routes and areas (not on Forest Department land), especially with Maldhari nomadic herders traveling from Rajasthan to southern grazing areas
- Train herders in modern rest and rotation techniques (e.g. rotational grazing)
- Broker sustainable grazing agreements with village and tribal leaders through extensive community consultations. (These agreements will be built upon communal stewardship of grazing areas, to ensure that improved grazing resources only benefit local communities in the site area and do not encourage unrestricted in-migration by other pastoralists. In exchange, communities will provide formal undertakings to respect project core areas.)
- Develop pastures in suitable areas around the sanctuaries (including enrichment planting of ecologically appropriate grasses) for use of local communities and tribal herders under the sustainable grazing agreements above.
- Monitor the impact of these activities on flora through longitudinal studies

81. Co-financing will be leveraged for activities such as:

- Design and implement a sanctuary-wide grazing strategy, based on lessons from GEF funded demonstrations in globally significant areas
- Promote best practices for livestock management, including use of common grazing lands, carrying capacity of grazing areas (to limit grazing pressure), alter livestock species composition to be more biodiversity-friendly, improve quality of pastures and grazing lands on degraded areas of surrounding lands.
- Enforce grazing agreements through Village *Panchayats.*
- State Governments of Gujarat to strengthen the network of common grazing areas on revenue land surrounding sanctuary. The Government of Rajasthan may be suitable involved at an appropriate stage
- Strengthen public distribution system for fodder (including fodder camps).

Output 2.5: Public awareness and environmental education campaign focusing on indigenous conservation ethics and knowledge systems developed and implemented

82. The GEF will funded activities may include:

[9] SRISTI has been honored with the Asian Innovation Award (Gold) by the Far Eastern Economic Review for its outstanding work in the field of biodiversity-friendly grassroots innovations.

[10] Prof. Anil Gupta,, SRISTI-IIMA has developed three case studies on the use of IPR for grassroots innovators for WIPO. Mr. Sundaram Verma, an outstanding innovator and farmer breeder from Rajasthan and active member of SRISTI-Honeybee network has represented SRISTI in a round table on traditional knowledge held in Geneva, 1-2 November, 1999 and presented a knowledge Holders' practical perspective on protecting IPRs of farmers-breeders.

- Support existing literacy drives to increase the minimum level of literacy to benefit from project awareness and environmental education outputs
- Provide training to teachers on biodiversity conservation
- Integrate *in situ* wildlife and agro-biodiversity conservation values into university, primary, and secondary school courses and/or modules like community seed fairs to promote the exchange of genetic material and the cultivation of different native varieties
- Prepare informative materials in the form of brochures, radio programmes, videos, multi-media kiosks, community radio, herbaria, prepared in local languages, among others, and supply these to various institutions, in particular public and school libraries
- Build interpretative centers (including multi-media kiosks)
- Carry out awareness-building events such as biodiversity contests, billboards, awards, nature camps, recipe contests, *shodh yatra* (exploration journeys), Van-kalyan shibirs etc.
- Awareness-reinforcing programmes on the socio-cultural roles and significance of Sacred Groves, Knowledge Forests and other indigenous conservation practices, emphasising their links with core protected areas and the overall biodiversity conservation ethic.

83. Co-financing will be leveraged for activities such as:

- Strengthen links (such as through memoranda of understanding) with regional, national, and international research programmes for mutual exchange of information, lessons learned, best practices and expertise in ensuring the participation of indigenous and local communities
- Post relevant information on the Internet through selected web sites

Immediate Objective 3: To ensure the sustainable management and conservation of the Sanctuaries by improving the institutional and technical capacities of the Forest Department for joint biodiversity conservation.

Output 3.1: Sanctuary management, monitoring and enforcement resources assessed and strengthened as required

84. This output will assess and, where required, augment the equipment and infrastructure used for management, monitoring and enforcement activities in the Sanctuaries. The GEF-funded activities may include procurement of equipment required to secure global environmental goals.

Output 3.2: Comprehensive management plans implemented

85. This output will assess existing and proposed management plans for the two Sanctuaries, and will identify additional objectives and activities required to ensure the conservation of globally significant biodiversity. Activities may include:

- Identify and commission baseline studies and/or field research (e.g. comprehensive flora and fauna inventories, hydrological studies, etc.) in support of management plans
- Implement modified, biodiversity-friendly management plans for the two Sanctuaries, to ensure the conservation and sustainable use of the areas while protecting globally significant biodiversity

Output 3.3: Training needs assessed, and training plans developed and implemented to upgrade technical capacities

86. One key area for GEF intervention is to improve technical and managerial skills of site managers, by introducing and promoting world-class Protected Area Management skills. This output will assess existing skill levels, and develop and implement a plan to upgrade the skills of site managers including Forest Department managers and field personnel. Activities may include:

- Conduct a training needs analysis, and develop a Protected Area Management training plan for field-level staff, site managers and decision-makers (IIMA)
- Implement the training plan, including (where necessary) on-site training for field staff and managers, off-site classroom or theoretical training, workshop, field visits and exchanges. Field visits and exchanges with other GEF projects nationally or regionally will be encouraged to share lessons learnt and develop professional links.

Output 3.4: Local community consultation and involvement strategies developed and implemented (NGO subcontract)

87. Activities may include:

- Further develop community involvement mechanisms instituted under the PDF-B, and promote stakeholder involvement/ participatory management of the sanctuaries.
- Develop and implement a participatory management training and sensitization programme for Forest Department staff (field, management and decision-making levels) and other relevant agencies
- Develop and implement a monitoring and feedback programme to measure local community perceptions of the Forest Department and degree of satisfaction with Sanctuary management, and changes in these indicators over the duration of the project

Immediate Objective 4: To identify and overcome policy and institutional barriers that hinder the sustainable management and conservation of the Sanctuaries, by developing comprehensive, inter-sectoral policy approaches.

Output 4.1: SWOT review undertaken of State and Central Government policies and legislation relevant to site management, and critical barriers identified and addressed (The responsible partis are the resource institutions such as IIMA, WII, GIDR etc.)

88. The institutional and policy framework within which the Sanctuaries are managed will be a key factor in the project's success or failure. Policies and legislation on protected area management and socio-economic development have a major bearing on the sustainability of the sites. This component will therefore review the policy and legislative framework within the systems boundary, and identify policy barriers that need to be addressed. Particular attention will be paid to the potential impact of Supreme Court decisions pertaining to local community rights of access and extraction of forest products from protected areas. Activities may include:

- Comprehensively define the policy and legislative systems boundary of the project, and undertake a SWOT review of relevant State and Central Government policies and legislation
- Identify critical barriers to success, and develop appropriate policy (and, if appropriate, legislative) recommendations to overcome these barriers

- Conduct policy briefings and workshops with Forest Department decision-makers and State and Central Government leaders (as appropriate) to discuss barriers and present policy recommendations for consideration

Output 4.2: Land rights settlement process completed, and accurate boundary demarcations agreed

89. Activities may include:
- Complete land rights settlement process, and resolve outstanding conflicts between the Forest and Revenue Departments on land ownership (Government)
- Using GPS or survey techniques, demarcate and sign-post Sanctuary boundaries, focusing on critical encroachment areas and boundaries of core protected areas (GEF funding)
- Develop and establish community-based dispute resolution mechanisms to address conflicts over land ownership and land tenure

Output 4.3: Existing inter-sectoral coordination mechanisms reviewed, and an effective inter-sectoral coordination mechanism developed and implemented

90. Activities may include:
- Identify key Governmental and institutional stakeholders relevant to the project and sites, and identify and review existing inter-sectoral coordination practices and mechanisms
- Develop a comprehensive inter-sectoral coordination mechanism, which is able to address all threats to the sustainability of the Sanctuaries on a watershed basis.
- In conjunction with Forest Department decision-makers, conduct briefings and workshops to present and promote the inter-sectoral coordination mechanism to Government and institutional stakeholders at local, State and Central levels

Output 4.4: A comprehensive, inter-sectoral, watershed-level land and water resource management plan developed and implemented (Half GEF, half Government co-financing)

91. Inefficient management of land and water resources has resulted in soil degradation and serious water shortages in the site area and its surroundings. The root cause of this problem is a lack of integrated, catchment-wide management strategies and plans. This output will develop water resource management and land-use planning are conducted in an efficient and sustainable manner. By improving the availability of land and water resources in surrounding areas, this output will also assist in reducing resource pressures on the Sanctuaries from local communities in the vicinity. This output will be partly funded by in-kind contributions of time, expertise and management resources by relevant Government stakeholders. Activities may include:
- Compile, collate and review existing management plans and strategies from relevant Government agencies and institutions responsible for management of the catchment area (GEF funding with Government in-kind support)
- In consultation with key stakeholders, develop and establish an inter-sectoral catchment resource management committee (or other suitable body) to act as a steering committee for the catchment management project (Government in-kind co-financing)
- Identify key barriers (threats, resource constraints and institutional barriers) affecting catchment resource management, and develop and implement an action plan to overcome these (GEF funding, Government in-kind support))

- Based on the action plan and responses thereto, develop a comprehensive catchment land and water resource management strategy, and obtain the steering committee's endorsement thereof (GEF funding)
- Provide technical support to the steering committee in implementation of the management strategy (GEF funding)

End of project situation:

92. At the end of this project, the following changes are expected:

- Critically endangered wildlife, medicinal plant species and wild native crop varieties will be protected in sanctuary core areas.
- An information and monitoring programme will be developed and implemented as a management tool for coordinating and planning biodiversity conservation activities.
- Alternative livelihood resources (fuel, fodder, food and income-generating resources) will be developed in the sanctuary non-core protected and buffer areas.
- A sustainable livestock management system will be developed and implemented.
- Best practices for the collection and conservation of wild medicinal plant and agro-biodiversity will be introduced, and collection regulated to sustainable levels.
- Indigenous knowledge of local biodiversity (particularly alternative agricultural practices and resources) will be documented and promoted as intellectual property.
- A public awareness and environmental education campaign focusing on indigenous conservation ethics and knowledge systems will be developed and implemented.
- Sanctuary monitoring, management and enforcement resources will be assessed and strengthened.
- Comprehensive sanctuary management plans will be developed and implemented.
- Technical capacities for sustainable management and conservation of the sanctuaries will be upgraded through the assessment of training needs and the development and implementation of training plans
- Local community consultation and involvement strategies will be developed and implemented to strengthen popular participation in sanctuary management.
- State and Central Government policy and legislative barriers will be identified and addressed
- The land rights settlement process will be completed, and accurate sanctuary boundaries demarcated and enforced with community support.
- An effective inter-sectoral coordination mechanism will be developed and implemented to ensure that all relevant Government and institutional stakeholders are working together to conserve and sustainably manage the sanctuaries.
- Land and water resource management will be undertaken on a comprehensive, inter-sectoral, catchment-wide basis through the development and implementation of an effective watershed management plan.

Project Beneficiaries:

93. Key stakeholders who will benefit from the project directly or indirectly are:

Local communities and local-level village institutions:

- Residents of villages inside the sanctuary and the buffer zone, who will benefit from development activities, learning, and improved dialogue if these reflect their aspirations and cultural moorings.
- Farmers in and around the sanctuary area who will have a more diversified and secure source of livelihood.
- Farmers in project area and elsewhere who will have an improved knowledge of seed selection and management procedures through increased contact with extension service and SRISTI to augment and exploit agro-biodiversity.
- Local tribal and other communities will realise that through value addition in biodiversity in and around revenue lands within and outside sanctuary areas might generate more sources of sustainable livelihoods.

Government staff and agencies:

- The Forest Department, which pursues increased protection of the sanctuaries, through harmonious relationship with the local communities
- Forest department staff and agencies participating in the project, benefiting from capacity building, new conservation approaches, learning, and exchanges
- Government staff and agencies with responsibilities in dryland development and occasional participation in project activities, benefiting from learning policy initiatives, and exchanges with public, private and community institutions

The General Public, Scientific and other institutions:

- NGOs and other groups working with communities benefiting from capacity building, learning, policy initiatives and improved dialogue
- Private business and herbal medicine ingredient traders and manufacturers who will have a greater range of resource material and NTFP from the area, biotechnology industry;
- Academic and research bodies whose capacity will be enhanced to undertake ethno-botanical research associated with land races and other floral diversity acknowledging the local knowledge and preserving their intellectual property rights.

STAKEHOLDER PARTICIPATION IN PROJECT DESIGN:

94. Consulting people living in and around the sanctuary villages was a key activity of the project development process, during which consultation were held in 2/3 of all villages in the project area. Preparation for the project has emphasised multiple stakeholder ownership, local participation and public involvement (e.g., information dissemination, local consultations, etc.). Outputs of the consultations held at various locations have been key inputs into the project design and development.

95. Thirteen major threats were identified based on various study reports and local consultations carried out in about two-thirds (seventy-five) of the villages within both the sanctuaries, which

represent different ecological regions and sub-regions. Focus group discussions were held[12] with (a) opinion leaders (seven to nine on an average per group) representing different local communities and (b) Range Forest officers, Foresters and Forest guards from all the eight ranges. The threats were prioritized depending upon their significance as perceived by local communities and the forest officials.

96. SRISTI prepared the project with the assistance of professional institutes, NGOs, the Gujarat State Forest Department, SRISTI collaborators and network members. We pursued a ***Participatory Patient Learning Interaction*** (PPLI) approach, using indicative planning in an innovative way based on sample views of local people about biodiversity issues. More than 500 persons including policy makers, scientists, officials, innovators, herbalists, and farmers have participated in various consultations and workshops organised under the project.

97. The suggestions of the local communities have been sought during the village survey of 72 villages carried out earlier as part of the indigenous knowledge study. The local consultations organized earlier by Gujarat Institute of Development Research (GIDR) had also addressed this aspect. Local NGOS working in and around sanctuary areas were also involved. A separate session was held with the NGOs to gain their assistance in consulting people in their respective project areas. Small consultations covering five to ten villages at a time were held and then all stakeholders were invited to a large consultation exercise.

98. Through these varied approaches a comprehensive picture of local stakeholder opinions and priorities was developed, and stakeholder were afforded a variety of channels through which to help shape project development.

ELIGIBILITY UNDER THE CBD:

99. This project is designed to support the primary objectives of the CBD (Conservation of Biological Diversity), the sustainable-use of its components, and equitable sharing of the benefits arising out of the utilization of these components. By integrating conservation and sustainable use of biodiversity into relevant plans and policies, the project will fulfil the requirements of Article 6: General Measures for Conservation and Sustainable Use.

100. Article 7: Identification and Monitoring and Article 8: *In-situ* Conservation will be supported through strengthening Park management, targeted species and habitat management, research and monitoring programme. Article 10: Sustainable Use of Components of Biological Diversity will be furthered through the development and demonstration of alternative, sustainable livelihood options that avoid or minimize adverse impacts on biological diversity, providing incentives for sustainable use (Article 11: Incentive Measures). The project also supports Article 17: Exchange of information, by providing training in technical and managerial areas, and developing linkages for exchange of information. Education and awareness-raising is also a project priority (Article 13).

ELIGIBILITY FOR GEF FINANCING:

101. The project is eligible for GEF assistance under Operational Programme #1: Arid and Semi-Arid Ecosystems, and will generate substantial global benefits. India, a recipient of UNDP

[12] The in itial round of consultation with local communities was organized during June-August 1999. The second round of consultation with the forest officials was organized during August-September 1999.

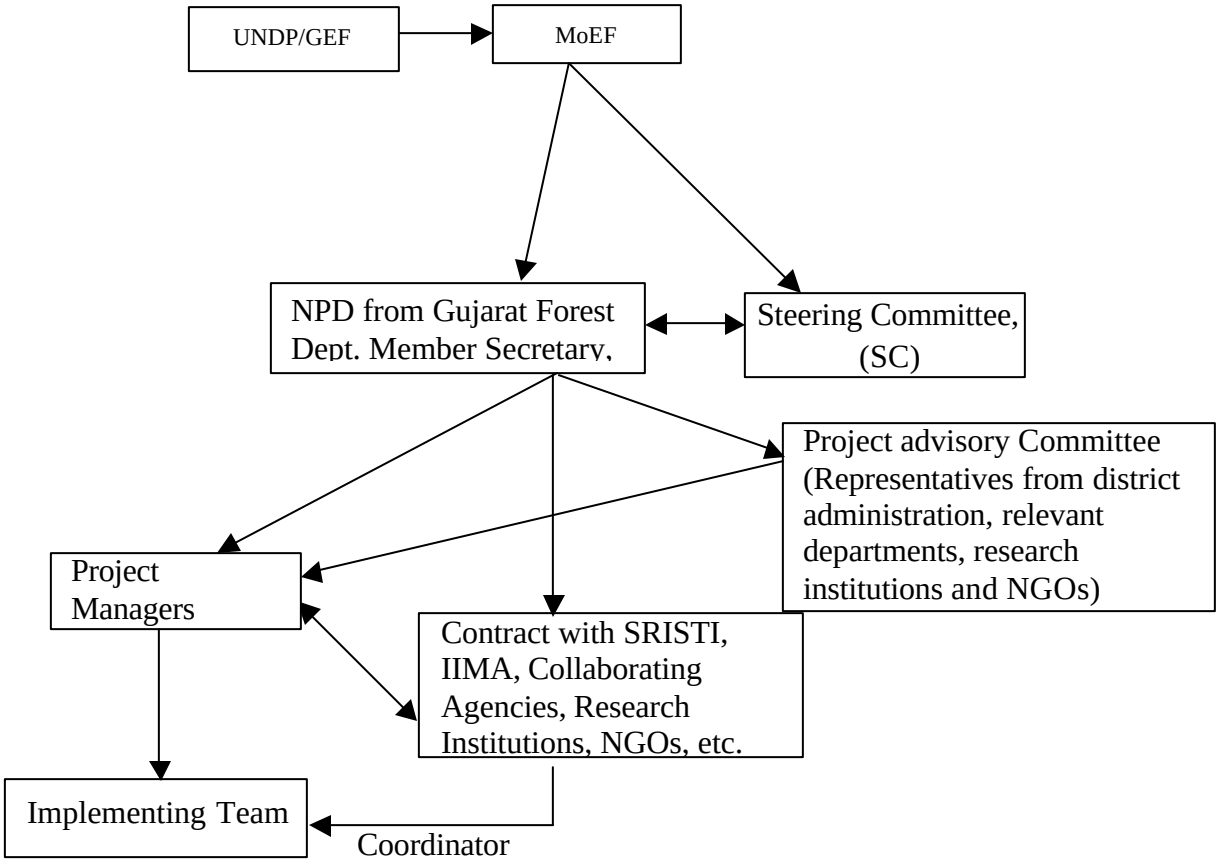
technical assistance and a participant in the restructured GEF as of May 12, 1994, is eligible according to the article 9(b) of the GEF instrument.

102. The project seeks to accomplish relevant aims and objectives set out in the Convention on Biological Diversity and the Global Plan of Action. In particular, Section 8a establishes the commitment of Contracting Parties to identify those areas where special measures need to be taken to conserve biological diversity. It also calls parties to respect, preserve and maintain the knowledge, innovations and practices of indigenous communities that allow the conservation and sustainable use of biological diversity (Section 8j). In line with the Global Plan of Action, the project encourages conservation and sustainable utilization of agro-biodiversity.

IMPLEMENTATION AND EXECUTION ARRANGEMENTS:

103. The Forest Department, Government of Gujarat, will assume overall responsibility for the execution of the major project, and the achievement of its objectives.

Project Implementation Arrangements



104. The Ministry of Environment and Forests (MoEF) will appoint a National Project Director (NPD) in consultation with the Gujarat State Forest Department. The NPD will help MoEF in constituting the Steering Committee (in consultation with UNDP) for efficient implementation of the project. The Steering Committee will comprise representatives of the MoEF, cross-sectoral Ministries including the Department of Economic Affairs, State Governme nt nodal agencies, NGOs, prominent experts, SRISTI, IIMA, representatives of local stakeholders, and UNDP. The tasks of the Steering Committee will be:

- To meet at least twice a year to provide overall direction and monitor the implementation of the project
- To approve the annual work plan and budget proposed by the NPD
- To promote inter-departmental co-operation and co-ordination at the State and National level.

105. The NPD will act as a member-secretary of the Steering Committee that will catalyze inter-departmental co-ordination through Project Managers. A Project Co-ordination cell will be set up under the NPD at the Gujarat Forest Department, which will be assisted by the Project Management Cell and coordinated by Project Managers.

Project Management Cell (PMC):

106. The PMC will be set up to carry out the day-to-day work of the project. The project team comprising technical and support staff will assist the PMC, headed by a Project Manager. The PMCs will assume the responsibility for overall co-ordination and management of activities, administration, and finances.

107. The Project Manager will report to the NPD. She/he will maintain close interaction with the institutions associated with the line departments and UNDP. She/he will also facilitate the work of the collaborating institutions and consultants in implementation of project components. UNDP/India will advise the MoEF and the local implementing agency on National execution procedures as necessary.

Project Advisory Committee:

108. A Project Advisory Committee will be constituted by the NPD to support the execution of the project at the Banaskantha District level. The Advisory Committee will have representatives from the District Administration, relevant departments and nodal agencies, lead bank, financial institutions, NGOs, prominent experts, and community representatives. The tasks of the Project Advisory Committee will be:

- To meet at least quarterly to receive reports on project implementation and offer appropriate advice and
- To promote inter-departmental co-operation and co-ordination at District and State level.

109. The Project Manager will act as member-secretary of the Project Advisory Committee. The Project Advisory Committee will appoint its own Chairperson to conduct its meetings.

110. The main GEF/UNDP project should have a specific District Conservator of Forests (DCF) appointed to work exclusively in these sanctuaries for the project with a team of Range Forest Officers (RFOs). They should directly report to the Chief Wildlife Warden or Conservator of Forests (CF), Wildlife. The DFO may also work as an Associate Project manager in the field.

INCREMENTAL COSTS AND PROJECT FINANCING

Incremental Costs:

111. The total project cost amounts to USD 8,349,600 of which agreed incremental costs to be financed by the GEF amount to US$ 4,420,000 excluding preparatory assistance. Co-financing amounting to US$ 3,600,000 has been leveraged, reflecting the fact that the project will generate domestic in addition to global benefits. The full incremental cost analysis (including the Incremental Cost Matrix) has been appended as Annex I. This analysis has been undertaken in close consultation with the Gujarat State Forest Department and represents an agreed estimate of total project costs.

Budget:

112. The total budget for the project is summarised below:

Project Outputs:	**GEF**	**Co-financing**	**Total* (Million $)**
1.1 Identify & protect critical biodiversity	**0.520**	**0.200**	**0.720**
1.2 Information & monitoring programme	**0.250**	**0.100**	**0.350**
2.1 Alternative livelihood resources	**0.216**	**0.400**	**0.616**
2.2 Livestock management system.	**0.150**	**0.400**	**0.550**
2.3 Medicinal plant & agro-bioD conservation	**0.120**	**0.050**	**0.170**
2.4 Indigenous knowledge	**0.075**	**0.145**	**0.220**
2.5 Awareness & environmental edu. campaign	**0.200**	**0.150**	**0.350**
3.1 Management, monitoring & enforcement	**0.720**	**0.250**	**0.970**
3.2 Management plans	**0.550**	**0.250**	**0.800**
3.3 Training	**0.350**	**0.150**	**0.500**
3.4 Local community involvement	**0.080**	**0.080**	**0.160**
4.1 Policy & legislative barrier SWOT review	**0.064**	**0.040**	**0.104**
4.2 Land rights & boundary demarcation	**0.125**	**0.085**	**0.210**
4.3 Inter-sectoral coordination mechanisms	**0.040**	**0.050**	**0.090**
4.4 Watershed resource management plan	**0.960**	**1.250**	**2.360**
Total:	**$ 4.420**	**$ 3.600**	**$ 8.170**

113. The detailed budget for GEF and co-financing by phase is summarised below:

Output	**Phase I**	**Phase II**	**Total GEF**	**Phase I**	**Phase II**	**Total Co-Financing**
1.1 Identify & Protect Critical Biodiversity	400,000	120,000	520,000	160,000	40,000	200,000
1.2 Information & Monitoring Programme	200,000	50,000	250,000	75000	25000	100,000
2.1 Alternative Livelihood Resources	176,000	40,000	216,000	350,000	50,000	400,000
2.2 Livestock Management System	50,000	100,000	150,000	300,000	100,000	400,000
2.3 Medicinal Plant & AgroBioD Collection & Conservation	80,000	40,000	120,000	40,000	10,000	50,000
2.4 Indigenous Knowledge Documented & Promoted	25,000	50,000	75,000	125,000	20,000	145,000
2.5 Awareness & Environmental Education Campaign	75,000	125,000	200,000	75,000	75,000	150,000
3.1 Management, Monitoring & Enforcement Resources	120,000	600,000	720,000	125000	125000	250,000
3.2 Management Plans	100,000	450,000	550,000	100000	150000	250,000
3.3 Training	120,000	230,000	350,000	60000	90000	150,000
3.4 Local Community Consultation & Involvement Strategies	20,000	60,000	80,000	40000	40000	80,000
4.1 Policy & Legislative Barrier SWOT Review	50,000	14,000	64,000	40000	0	40,000
4.2 Land Rights Settlement & Boundary Demarcation	100,000	25,000	125,000	85000	0	85,000
4.3 Inter-sectoral Coordination Mechanisms	10,000	30,000	40,000	20000	30000	50,000
4.4 Watershed Resource Management Plan	180,000	780,000	960,000	200000	1050000	1,250,000
Total	1,706,000	2,714,000	4,420,000	**1,795,000**	**1,805,000**	**3,600,000**

RISKS AND SUSTAINABILITY

Project Risks

114. There are several potential risks to project success, but none is perceived to be of such high probability as to endanger project implementation or continuation. Risks have been anticipated through the project's evolution, and measures have been taken to reduce their impact.

115. Significant risk factors include:

- Delays in delimiting the system boundaries for the two project sites may jeopardize future development. The settlement of rights in the two sanctuaries is yet to be completed. Any regularization of encroachments on Forest Department lands would require approval by the Central Government. The non-settlement of land rights in the area does inhibit land use planning and exercise of better administrative control. Because of non-demarcation, it is not clear whether those areas come under the jurisdiction of the Forest Department or the Revenue Department. The phasing of the project accounts for this risk.
- Pressures of population growth, poverty, and commercial interests. The focus on underlying causes addresses this risk.
- Dangers of unrealistic expectations in the context of several consultations with the tribals and rural poor, heightened tensions in local communities about the impact of possible resettlement on their future and their access to grazing areas. The consultative approach developed under the PDF-B reduces this risk.
- Misunderstanding or lack of perceived benefits by farmers is a possible risk.
- Limitations in implementation capacity - both technical and managerial - and potential lack of inter-departmental co-ordination. The capacity building component addresses this risk.

116. Although it is not possible to fully address macro problems of population growth, poverty and commercial interests, the project includes activities, and institutional mechanisms to address many of the risks. Project preparation has followed a participatory process including efforts to communicate project objectives. To encourage government commitment to participation, the project would allocate finances according to continuing review of work plans and progress reports. It is expected that the implementation capacity of key institutions would be assessed to determine their needs and gaps. To overcome limitations of institutional capacity, the project design includes measures for institutional strengthening and use of third party contracts.

Sustainability:

117. Institutional sustainability is assured through the capacity-building activities being undertaken under Immediate Objective 3, and through the development of effective inter-sectoral cooperation mechanisms under Immediate Objective 4. The project has been planned over a seven-year duration to ensure that the new institutional mechanisms and improved capacities being supported have adequate gestation periods. Financially the project has been structured to minimise incremental operational cost burdens. The Gujarat State Forest Department has provided assurances that all operational costs incurred in management of the sanctuaries will be adequately funded beyond the lifetime of the project.

MONITORING, EVALUATION AND LESSONS LEARNED

Monitoring and Evaluation:

118. A range of monitoring and evaluation indicators has been built into the project structure. These include participative and community-based biodiversity monitoring programmes (including genetic diversity analysis systems), and a community feedback programme to gauge changes in community-Forest Department relations. In addition, targeted research on the validation and applicability of long-term indicators has also been envisioned, particularly in the use of insect and microbial diversity as indicators of ecosystem health. An information and monitoring programme forms a specific output of the project (Output 1.2).

119. The project will be subject to at least two mandatory independent evaluations. A mid-term evaluation will be undertaken at the end of phase I. Critical project milestones to be assessed at this stage include progress in overcoming policy barriers and the status of alternative livelihood activities to reduce resource pressures on the sanctuary core areas. The implementation of core biodiversity conservation and capacity-building measures in the second phase will be contingent upon demonstrable progress as assessed during this mid-term evaluation. An independent final evaluation will be scheduled no later than three months before the end of the project. A Terminal Tri-Partite Evaluation will be scheduled upon project termination and UNDP, may, at its discretion, schedule additional independent evaluations if deemed necessary.

Lessons Learned:

120. Conservation and forestry projects in India and elsewhere suffered from several limitations, such as:

- Short time frame and routine practices that do not allow genuine community participation in project decision-making or local empowerment.
- Few opportunities for policy makers to understand or utilize indigenous knowledge, institutions and skills or learn from community development efforts
- Government staff and structures which lack the high level of capacity required for the effective formulation and implementation of dryland development policy
- Little interest in or opportunity for exchange and mutual co-operation among different dryland populations within the country and abroad.
- Lack of clear identity and mandate, uncommitted full-time staff, and inadequately delegated financial and administrative powers to the project co-ordination unit.

121. These experiences have highlighted the importance of:

- Building understanding and consensus on the project concept
- Avoiding top-down planning
- Using existing organizational structures and skilled specialists wherever possible
- Involving local and indigenous people in participatory resource management
- Developing capacity of major stakeholders, including the Forest Department
- Setting up a transparent and verifiable monitoring system to ensure accountability

122. A number of initiatives of the Government of Gujarat have aimed at overcoming these limitations. Notable among these are the Centrally assisted Eco-development Projects,

experiments with JFM, Tribal Area Sub-Plan, Drought Prone Area Programme and Dairy Development schemes. Noteworthy also is SRISTI's work in documenting indigenous technologies, ethnobotanical knowledge and indigenous institutions[13] managing natural resources. These initiatives of government and NGOs have made significant achievements, including:

- Clarifications of needs, both of local community and the government officials, and identification of key issues
- Creation / reinforcement of mutual understanding and awareness, among local communities as well as State Government Departments
- Promotion of several successful approaches to community-based dryland development and State-wide conceptualisation of decentralised village development models such as 'Gokul Gram' Scheme
- Impact on government bodies (e.g., GIAN, to help link green innovation, investment and enterprises) and communities (e.g., decentralised local governance, special needs of tribals and local communities residing around forest areas, capacity-building of Panchayati Raj institutions, and NGOs, increased income, improved sanitation, health & nutrition).

[13] Twenty-nine sacred groves have been studied in detail as a part of the indigenous knowledge study.

1. LIST OF ANNEXES:

Annex I: Incremental Cost Analysis

Annex II. Logical Framework/Project Planning Matrix

Annex III: Scientific Technical Advisory Panel Technical Review

Annex IV: GEF Focal Point Endorsement

Optional Annexes (Available upon request):

Annex V: Project Implementation Arrangements/Stakeholder Participation Summary

Annex VI: Map of Project Area

Annex VII: Threats/Root Causes/Proposed Actions Matrix

Annex VIII: Site Descriptions and Globally significant plants and animal

ANNEX I: INCREMENTAL COST ANALYSIS

1. **Broad Development Goals:**
2. **Baseline (Business as Usual):**
3. **GEF Alternative**
4. **Scope of Analysis**
5. **Costs and the Incremental Cost Matrix**

Incremental Cost Matrix

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
Output 1.1: Identify & protect critical biodiversity	Baseline	$ 60,000	Basic surveys of flora and fauna have been conducted by various institutes and draft management plans prepared by Forest Department but these are insufficient to ensure protection of globally-significant biodiversity	No specific activities to identify and protect critically-endangered globally-significant biodiversity
	GEF Alternative	$780,000	Improved local capacity to monitor and manage core protected areas, Community Property Resources established and strengthened as conservation mechanisms, germplasm conservation capacities strengthened at community, regional and national levels.	Baseline surveys completed to identify critically-endangered flora and fauna, core protected areas identified and demarcated, adaptive management plans for core protected areas developed and implemented, field gene-banks developed and strengthened to conserve target floral species.
	Increment	GEF: $ 520,000 Gov't in-kind (Forest Dept & Nat'l Bureau for Plant Genetic Resources: $200,000	Baseline data on sites completed, management capacities improved, conservation of biodiversity improved through gene banks and community-managed conservation areas (CPRs)	Critically-endangered globally-significant biodiversity protected in sanctuary core protected areas
Output 1.2: Information & monitoring programme	Baseline	$ 75,000	Basic research on flora, fauna, insect and microbial diversity conducted, no monitoring systems or processes in place in site areas. No comprehensive management and monitoring database available	Biodiversity inventories incomplete/ not up to date, insufficient baseline data to monitor project impact over time.
	GEF Alternative	$ 425,000	Community-based monitoring process developed, biodiversity inventories (including cataloguing of agro-biodiversity) conducted with community support, wide-area management information system developed and implemented to share management information with key stakeholders	Ecosystem health monitoring processes developed, including development of floral, faunal, insect and microbial indicators of ecosystem health. Comprehensive, map-based ecosystem inventory and database developed to monitor project impact over time.
	Increment	GEF: $250,000 Local community in-kind $50,000	Monitoring capacities for site management improved, and information exchange mechanisms with local communities and other	Effective monitoring system implemented, built upon comprehensive baseline data, to ensure that conservation

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
		$50,000 WB INFODEV $50,000	key stakeholders created.	of critically-endangered species is successful
Output 2.1: Alternative livelihood resources	Baseline	$ 2,000	Limited sustainable livelihood resources increase encroachment upon and unsustainable harvesting of sanctuary resources. Information and technical capacity barriers inhibit value-added processing of NTBPs harvested from the sanctuary area.	Unsustainable use of agrobiodiversity and NTBP resources in the sanctuaries causes degradation of genetic stock and loss of diversity, as well as potential loss of globally-significant species through over-harvesting.
	GEF Alternative	$618,000	Increased value derived from local community resource use in sanctuary areas, by improved cultivation, processing and marketing skills. Access to financing improved and alternative livelihood options (apiary, eri-silk units, etc.) provided. Sustainable agricultural practices developed based on indigenous knowledge and conservation ethics.	Harvesting of NTBPs in the sanctuary area reduced to sustainable levels, ecologically-sustainable livelihood practices introduced and technical and resource barriers overcome.
	Increment	GEF: $ 220,000 Co-financing: $ 300,000 Government in-kind: $50,000 Local community in-kind: $ 50,000	Local community livelihoods improved, long-term sustainability of NTBP resources enhanced, technical skills for producing and marketing NTBP-based value-added products improved	Agro-biodiversity and medicinal plant resources conserved by reducing harvesting to sustainable levels. Local community livelihood levels improved through removal of technical and resource barriers.
Output 2.2: Livestock management system	Baseline	$ 115,000	No comprehensive livestock management planning, no estimates of carrying-capacity or optimal herd sizes. Fodder provision on a reactive, crisis-driven basis only.	Lack of effective livestock management and carrying-capacity assessment increases degradation of sanctuary areas through over-grazing. Encroachment by nomadic tribal livestock herds degrades sanctuary agro-biodiversity.
	GEF Alternative	$665,000	Sustainable livestock management plan improves quality and value of standing herd and reduces degradation of grazing areas. Proper grazing land management reduces conflicts between local livestock owners and nomadic tribal herders. Improved public fodder distribution network reduces pressure	Improved livestock management reduces encroachment into core protected areas, proper grazing and fodder management reduces over-grazing in buffer areas, thus improving diversity and health of agro-biodiversity in the site area.

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
			on grazing lands during drought or crisis periods	
	Increment	GEF: $150,000 Co-financing: $200,000 Government: $200,000	Sustainable livestock management reduces degradation of grazing lands through over-grazing. Improved livestock management practices increases value of standing herd and thereby increases livelihood revenues of graziers.	Reduced encroachment into core protected areas reduces degradation of globally-significant biodiversity, development of alternative grazing areas and migratory routes reduces Maldhari nomadic encroachment during annual migrations.
Output 2.3: Medicinal plant & agro-biodiversity collection & conservation best practices	Baseline	$ 148,000	Harvesting and collection levels and techniques unregulated, and sustainable harvesting levels undefined. Local community awareness of, and involvement in sustainable resource management of medicinal plants and agro-biodiversity limited.	Unsustainable harvesting of medicinal plants and agro-biodiversity degrades populations in the sanctuary areas.
	GEF Alternative	$318,000	Harvesting of medicinal plants and agro-biodiversity sustainably managed through identification and promotion of traditional and indigenous best-practices. Community-based resource management improved by strengthening community institutions and improving local capacities.	Sustainable collection practices and harvesting levels ensures viability of medicinal plant and agro-biodiversity genetic stock.
	Increment	GEF: $120,000 Co-financing: $50,000	Community-based sustainable management of medicinal plant and agro-biodiversity resources implemented through identification and promotion of indigenous best-practices and sustainable harvesting regimes.	Genetic stock of medicinal plants and agro-biodiversity protected.
Output 2.4: Indigenous knowledge documented & promoted	Baseline	$ 20,000	Significant indigenous knowledge and native adaptations exist, however these are insufficiently documented and promoted. Policy barriers exist which inhibit local communities from exercising property rights over grassroots innovations and indigenous knowledge.	Local knowledge on the value, management and value-added use of medicinal plants and local crop varieties being lost due to policy and resource barriers.
	GEF Alternative	$240,000	Policy barriers overcome, and appropriate benefit-sharing models developed, to ensure	Local knowledge investigated, documented and promoted both at site

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
			that local communities are able to exploit local knowledge of indigenous medicinal plants and agro-biodiversity. Public awareness of the importance and benefits to be derived from indigenous knowledge raised.	level and more broadly, to enhance the proper valuation and sustainable utilisation of local medicinal plants and agro-biodiversity.
	Increment	GEF: $75,000 Co-financing: $25,000 Gov't in-kind: $20,000 Local community in-kind: $100,000	Policy barriers inhibiting community property rights over indigenous knowledge of conservation and wise-use overcome. Public awareness of the value of indigenous knowledge raised.	Indigenous knowledge and native conservation ethics documented, promoted and disseminated to enrich conservation and wise-use practices for medicinal plants and agro-biodiversity.
Output 2.5: Awareness & environmental education campaign	Baseline	$ 35,000	Limited public awareness of the importance of biodiversity conservation, limited materials available for public awareness and environmental education programmes. Awareness-raising activities largely limited to small-scale NGO efforts, complemented by some Forest Department work. Local community capacity to absorb environmental education messages limited by low level of basic education and literacy	Low levels of public awareness and support for biodiversity conservation inhibits widespread acceptance of conservation priorities and practices.
	GEF Alternative	$ 385,000	Basic environmental education activities at all levels (primary, secondary, tertiary, training-of-trainers, grassroots) build support for the conservation and sustainable management of the sanctuaries. Capacity-building for grassroots NGO environmental awareness activities through strengthened linkages with regional, national and international counterparts.	Multifaceted public awareness and environmental education programme, built upon existing socio-cultural conservation ethics (Sacred Groves, Knowledge Forests, etc.) creates greater public support for and understanding of biodiversity conservation priorities and practices.
	Increment	GEF: $200,000 NGO in-kind: $50,000 Gov't in-kind (educational system):	Public awareness of the importance of biodiversity conservation and overall environmental education levels improved.	Local community support for conservation of biodiversity improved. Linkage between biodiversity conservation activities and existing socio-cultural conservation ethic deepens indigenous commitment to conservation

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
		$100,000		of local flora and fauna in core protected areas.
Output 3.1: Management, monitoring & enforcement resources	Baseline	$ 85,000	Management, monitoring and enforcement resources in the sanctuaries are limited and insufficient to ensure the sustainable management of the sites. Limited infrastructure hinders proper management.	Lack of resources hampers management and conservation of globally-significant biodiversity. Lack of monitoring and enforcement resources exacerbates encroachment problems, and lack of management resources leads to inefficient management of the sanctuaries
	GEF Alternative	$1,055,000	Based on a comprehensive needs assessment, equipment procurement and infrastructural upgrading plans will be developed and implemented	Adequate, properly-planned equipment and infrastructural provisions will enhance management, monitoring and enforcement capacities, leading to more efficient sanctuary management and reduced encroachment. Infrastructural upgrading will focus specifically on requirements for monitoring and protection of core areas.
	Increment	GEF: $720,000 Gov't in-kind: $250,000	Improved equipment and infrastructural resources will improve overall sanctuary management, and enhance enforcement abilities.	Monitoring and enforcement of core protected areas will be enhanced, and encroachment into the broader sanctuary area will be reduced, resulting in reduced degradation and resource over-exploitation (particularly in the illegal harvesting of fuelwood and NTBPs)
Output 3.2: Management plans	Baseline	$ 150,000	Draft management plans have been developed for both sanctuaries, however these are limited by resource constraints. No comprehensive adaptive management planning has been undertaken.	Draft management plans do not address conservation of globally-significant biodiversity.
	GEF Alternative	$ 950,000	Revised adaptive management plans prepared, using a holistic, inter-sectoral, watershed-level approach to ensure the sustainability of the sanctuaries. Revised management plans will be based upon comprehensive baseline studies and field research to ensure that all significant threats are addressed and the most cost-	Revised management plans will specifically address the requirements of conserving globally-significant biodiversity. Baseline research will focus on identifying globally-significant flora and fauna as well as critically-endangered or endemic species

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
			effective, sustainable management strategies are applied.	endangered or endemic species.
	Increment	GEF: $550,000 Gov't in-kind: $250,000	Comprehensive adaptive management plans prepared for both sanctuaries, based upon detailed baseline studies and field surveys.	Management plans targeted to ensure conservation of globally-significant biodiversity as a central aim.
Output 3.3: Training	Baseline	$ 40,000	Training for Forest Department staff is limited, and technical and managerial skills are below global benchmark levels. Training resources are lacking, and no comprehensive, career-long training and skills-upgrading programmes are available.	Sub-optimal technical and managerial skills and limited training resources limit the effectiveness of sanctuary managers and guardians.
	GEF Alternative	$ 540,000	A Protected Area Management training plan will be developed and implemented based on a comprehensive training needs analysis. Training modules for field, supervisory, middle- and senior management levels will be implemented, to improve technical and managerial skills and knowledge.	Improved technical and managerial skills and knowledge, at all levels, will enhance site- and state-level Protected Area Management abilities. Field visits and exchanges with other GEF-funded projects will encourage the sharing of lessons learnt and improve professional links.
	Increment	GEF: $350,000 Gov't in-kind: $150,000	Improved technical and managerial skills will enhance site management.	The sharing of lessons learnt and exchange of information between protected area managers nationally and regionally will allow lessons learnt here to be disseminated to other protected areas.
Output 3.4: Local community consultation & involvement strategies	Baseline	$ 25,000	Sanctuary managers currently have limited specific training in or strategies for involving local communities in site management. The Joint Forest Management approach currently practiced focuses on sharing of resources rather than shared management of overall biodiversity.	The lack of local community input into site management reduces the communities' support for and 'buy-in' to sanctuary conservation and sustainable management. Community- Forest Department relations are somewhat adversarial, limiting community support for FD activities.
	GEF Alternative	$ 185,000	A participatory management strategy and action plan will be developed, and training and sensitization programmes will be	Local community participation in site management will be enhanced, leading to more effective and resource-efficient

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
			implemented to improve FD staff awareness of and skills in participative site management. A monitoring and feedback mechanism will be designed and implemented to measure changes in local community perceptions of and support for the Department, the sanctuaries and the project.	participative site management. Community-FD relations will be improved to enhance local community support for the conservation of the sanctuaries and the biodiversity they contain.
	Increment	GEF: $80,000 Gov't in-kind: $80,000	Improved Forest Department skills and technical capacities for participative management, and an objective evaluation mechanism to measure community support for the project's objectives.	More efficient site management through local community involvement and support, and increased community support for conservation and sustainable management of the sanctuaries.
Output 4.1: Policy & legislative barrier SWOT review	Baseline	$ 10,000	Existing policies and legislative structures inhibit the effective management of the sanctuaries, particularly in the adoption of innovative management mechanisms (participatory resource management, etc.) Recent Supreme Court judgments on tribal migration rights and local community access to protected area forest resources create uncertainties regarding sanctuary management strategies.	Policy and legislative structure makes no specific provisions for the conservation and sustainable management of globally-significant biodiversity. Policy barriers inhibit local community harvesting and value-added use of NTBPs.
	GEF Alternative	$ 114,000	Policy and legislative structures reviewed and barriers identified. Alternatives (policy and, if appropriate, legislative) developed and presented for consideration by appropriate policy-makers.	Conservation of globally-significant biodiversity incorporated into policy-making processes, barriers to local community use and management of NTBP resources lifted.
	Increment	GEF: $64,000 Gov't in-kind: $40,000	Policy and legislative barriers overcome through adoption of conservation-friendly approaches.	Increased awareness of biodiversity conservation priorities in policy-making, improved local community access to and stewardship of NTBP resources.
Output 4.2: Land rights settlement & boundary demarcation	Baseline	$ 60,000	Uncertainties regarding land rights and site boundaries make effective management planning difficult. Unresolved conflicts over land ownership (between Government agencies and with local landowners) inhibits community and institutional cooperation with	The lack of accurate sanctuary boundaries and land ownership conflicts hinder the demarcation and enforcement of core protected areas. Boundary uncertainties also hinder enforcement and

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
			the Forest Department in sanctuary management	exacerbate encroachment problems
	GEF Alternative	$ 270,000	Land rights and boundary demarcations resolved, and land ownership and institutional jurisdictions clarified. Land ownership and use rights conflicts amongst local villagers resolved through community-based dispute resolution mechanisms.	Resolution of boundary and land ownership issues through a land rights settlement process and GPS- or survey-based boundary demarcation allow for accurate zonation of the sanctuaries and core protected areas therein. Clear sanctuary boundaries allow for more efficient enforcement and monitoring activities.
	Increment	GEF: $125,000 Gov't (land settlement): $85,000	Clear land ownership and boundaries enables effective management of the sanctuaries, and reduced land rights conflicts enhance stakeholder commitment and cooperation.	Clearly-defined core protected areas enable more effective site management. Clearly-demarcated sanctuary boundaries assist in reducing encroachment.
Output 4.3: Inter-sectoral coordination mechanisms	Baseline	$ 15,000	Inter-agency and inter-departmental cooperation in biodiversity conservation is undertaken on an ad-hoc basis, as circumstances require.	No comprehensive review of inter-sectoral coordination requirements or optimal processes has been undertaken.
	GEF Alternative	$ 105,000	Inter-sectoral cooperation processes institutionalized through a coordination mechanism, which will be developed and adopted in close consultation with key stakeholders.	A broad, watershed-based review of key stakeholders will be undertaken, and a comprehensive inter-sectoral coordination mechanism developed based on best practice benchmarks from other GEF projects.
	Increment	GEF: $40,000 Gov't in-kind: $50,000	Inter-sectoral coordination processes institutionalized through the involvement of all key stakeholders in the watershed.	Best practices for inter-sectoral coordination will be identified and adopted to ensure that all relevant stakeholders work together to address threats to sustainability on a watershed basis.
Output 4.4: Watershed resource management plan	Baseline	$ 150,000	Land and water resource management activities in the watershed are fragmented, and overlaps exist in jurisdictions and resource allocation. The lack of a comprehensive, watershed-wide management approach results	Resource constraints, institutional and technical shortfalls and other barriers inhibit comprehensive watershed management, which therefore does not address the sustainability requirements of

COMPONENT	COST COMPONENT	COST (USD)	DOMESTIC BENEFIT	GLOBAL BENEFIT
			in resource management that is reactive and crisis-driven.	the sanctuaries. Water shortages in and around the sanctuaries cause conflicts, as local communities and wildlife compete for scarce water. Soil degradation increases agricultural encroachment, as villagers expand cultivated areas and replace exhausted fields.
	GEF Alternative	$2,360,000	A comprehensive, catchment-wide, inter-sectoral water and land resource management plan will be developed, built upon existing management plans and strategies. An inter-sectoral catchment management committee or similar body will be established in consultation with key stakeholders, initially to act as a steering committee for the catchment management project, and eventually to act as an inter-sectoral coordination mechanism for effective watershed management.	Key barriers will be identified, and an action plan developed and implemented to overcome them. A comprehensive catchment land and water resource management plan will be developed to address resource shortages, and technical and financial support will be provided to the steering committee for its implementation.
	Increment	GEF: $960,000 Co-financing: $1,000,000 Gov't in-kind: $250,000	Effective, coordinated inter-sectoral watershed resource management will be implemented to address existing land and water resource constraints	Barriers to comprehensive watershed management will be overcome. Comprehensive watershed resource management will help alleviate land and water resource constraints, reducing conflicts between communities and wildlife, and reducing agricultural encroachment into sanctuary protected areas.
Total	Baseline Increment GEF Altern. PDF B	990,000 8,020,000 9,010,000 329,600		
Total GEF Alternative		8,349,600		

ANNEX II: LOGICAL FRAMEWORK/ PROJECT PLANNING MATRIX

Objectives	Indicators	Means of Verification	Assumptions & Risks
Development Objective: To conserve globally significant biodiversity within the two project sanctuaries while at the same time improving the standard of living of local people to above the poverty line.	1. Population levels of globally-significant biodiversity within the two project sanctuaries increased 2. Standards of living of local populations in the sanctuary areas improved	1. Results of participative biodiversity monitoring programme. 2. Feedback from local communities through the monitoring and feedback programme	
Immediate Objective 1: To identify and conserve critically endangered flora and fauna in core areas of the Sanctuaries.	1. Populations of critically-endangered flora and fauna increasing in core areas of the Sanctuaries	1. Data from biodiversity monitoring programme	* Viable populations of globally-significant biodiversity are still present in the Sanctuaries.
Immediate Objective 2: To reduce local community pressures on globally significant biodiversity in core areas, by developing sustainable alternative livelihood activities that build upon indigenous knowledge systems and practices.	1. Changes in livelihood patterns discernable and alternative, sustainable livelihood activities developed	1. Feedback through community monitoring and feedback mechanism	* Development of alternative livelihoods will result in reductions in unsustainable livelihood practices
Immediate Objective 3: To ensure the sustainable management and conservation of the Sanctuaries by improving the institutional and technical capacities of the Forest Department for joint biodiversity conservation.	1. Improved management, monitoring and enforcement capabilities resulting in less encroachment and reduced conflicts with local communities.	1. Encroachment incident records, community feedback via the monitoring and feedback programme.	* Improved institutional and technical capacities will lead to more effective Sanctuary management.
Immediate Objective 4: To identify and overcome policy and institutional barriers that hinder the sustainable management and conservation of the Sanctuaries, by developing comprehensive, inter-sectoral policy approaches.	1. Policy changes and improved institutional coordination mechanisms.	1. Copies of policy documents, amended regulations or legislation and minutes of coordination meetings.	* Improved inter-sectoral coordination will result in more effective management and conservation of the Sanctuaries.
Output 1.1: Critically	1. Viable populations of all target species maintained in	1. Scientific assessment,	* External factors (e.g. drought) do not cause

Objectives	Indicators	Means of Verification	Assumptions & Risks
endangered fauna, medicinal plant species, wild native crop varieties and globally significant flora protected in Sanctuary core areas	Sanctuary core areas.	longitudinal research studies and ecological assessments	species loss.
Output 1.2: Developed and implemented an information and monitoring programme as a management tool for coordinating and planning biodiversity conservation activities	1. Improved information flow and better monitoring of Sanctuary conditions.	1. Comprehensive biodiversity inventories and updated GIS database incorporating accurate, exhaustive data on biodiversity and site ecology.	* Local communities (especially farmers and tribal communities) willing to cooperate in participative monitoring and inventories.
Output 2.1: Alternative livelihood resources created and strengthened in Sanctuary non-core protected and buffer areas	1. Improved cultivation, harvesting and marketing of NTBPs results in higher incomes	1. Feedback through NTBP cooperatives	* Market demand for (and prices of) NTBP products will grow as a result of marketing and promotion activities.
Output 2.2: Sustainable livestock management system developed and implemented	1. Herd sizes reduced. 2. Herders' incomes maintained or improved.	1. Standing headcount reduced. 2. Market prices for local livestock improved.	* Better-managed livestock herds will increase per-head revenue sufficiently to allow herds to be reduced to sustainable levels.
Output 2.3: Best practices for wild medicinal plant and agro-biodiversity collection and conservation introduced and collection levels regulated	1. Wild medicinal plant and agro-biodiversity collection levels and harvesting methods regulated at sustainable levels.	1. Field surveys show target species populations maintained at viable levels.	* Community-based resource management approaches are effective in managing the resource.
Output 2.4: Indigenous knowledge of local biodiversity documented and promoted as intellectual property	1. Legal recognition of indigenous intellectual property rights. 2. Benefit-sharing models developed and implemented	1. Relevant legislative or regulatory changes enacted. 2. Feedback from local communities.	* Government authorities are willing to initiate the necessary legislative or regulatory changes.
Output 2.5: Public awareness and environmental education campaign developed and implemented	1. Increased public awareness at all levels (schools, local communities, etc.)	1. Development and distribution of materials, number of teachers trained, visitors to interpretative centres	* Increased public awareness and education will lead to greater support for biodiversity conservation.
Output 3.1: Sanctuary management, monitoring and enforcement resources assessed and strengthened as required.	1. Resource shortages no longer hamper management, monitoring or enforcement activities.	1. Feedback from Sanctuary managers and field staff.	* Increased resources will lead to more effective management and enforcement.
Output 3.2: Comprehensive management plans developed	1. Management plans developed 2. Management plans implemented	1. Copies of management plans.	* Improved management planning will lead to more effective monitoring and enforcement

Objectives	Indicators	Means of Verification	Assumptions & Risks
and implemented		2. Progress reports	
Output 3.3: Training needs assessed, and training plans developed and implemented.	1. Training plan developed 2. Training plan implemented	1. Copies of training plan. 2. Progress reports on training activities undertaken.	* Better-trained staff will be more effective site managers.
Output 3.4: Local community consultation and involvement strategies developed and implemented.	1. Stakeholder involvement/ participatory management strategy and action plan developed and implemented	1. Feedback received via the monitoring and feedback programme	* Improved community-Forestry Department relations will assist in effective site management.
Output 4.1: SWOT review of State and Central Government policies and legislation undertaken, and critical barriers identified and addressed	1. Policy barriers identified, and workable solutions defined.	1. Feedback from policy-makers and Forestry Department leaders during briefings and workshops.	* Policy and legislative changes being recommended will be accepted and implemented by decision-makers.
Output 4.2: Land rights settlement process completed, and accurate boundary demarcations agreed.	1. Land title documents issued and boundary surveys completed. 2. Boundary and ownership disputes between FD and local land-owners resolved	1. Agreed, accurate site boundary maps and land title documents.	* Clear land rights and site boundaries will reduce encroachment, improve management and monitoring and reduce FD-community conflicts.
Output 4.3: Existing inter-sectoral coordination mechanisms reviewed, and an effective inter-sectoral coordination mechanism developed and implemented.	1. Comprehensive inter-sectoral coordination mechanism developed and accepted by institutional stakeholders.	1. Minutes of briefings and workshops indicating stakeholders' acceptance of coordination mechanism	* Improved coordination between institutional stakeholders will improve the management and conservation of the Sanctuaries.
Output 4.4: Watershed-level land and water resource management plan developed and implemented.	1. Watershed management strategy developed 2. Steering committee endorses strategy	1. Copies of management strategy document. 2. Minutes of steering committee meeting endorsing strategy.	* Watershed-level management strategies will improve coordination between institutional stakeholders and enhance the sustainable management of the Sanctuaries.

Annex III: STAP Review of GEF Project Proposal

Project Title: India: Conservation and Sustainable Management of Dryland Biodiversity

Reviewer: Wim Giesen

Date: 4 March 2001

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i) Global priority in the area of biodiversity.

"The state of Gujarat, India falls within the broad Ethiopian bio-geographical realm, and has three bio-geographic sub-regions. These are the Indian Desert, Semi-Arid Deccan-North Gujarat, and Semi-Arid Gujarat-Rajwara. These three sub-regions contain several unique ecosystems, including two types of dry open forest. The dry thorn scrub forest with a predominance of *Acacia nilotica* and *Capparis deciduas*; and the dry deciduous forest with a predominance of *Tectona grandis* and *Anogeissus latifolia.*

"Although these two dryland forest types are now significantly reduced throughout the State, they form the dominant ecosystem of the contiguous Jessore Sloth Bear and Balaram-Ambaji Wildlife sanctuaries at the southern tip of the Aravallis mountain range. As such the sanctuaries continue to harbour unique assemblages of endemic and endangered fauna and flora, wild native crop varieties and endemic medicinal plants. Sixteen rare and endangered plant species are recorded, including the near-extinct tree species *Commiphora mukul*, and it is believed that the potential of many of the species of economically important / medicinal plants remain unknown. These forests also support rare fauna such as the sloth bear (*Melursus ursinus*) and Indian pangolin (*Manis crassicaudata*) as well as many migrant birds using the West Asian – Indian migration flyway."

Comment: However, the arguments presented for the importance of these two sanctuaries for globally significant biodiversity are not very convincing.

- The proposal says that Gujarat State has 19,178 km2 of remaining forest of which 17,992 km2 is protected in some form and that the project is focused on two Wildlife Sanctuaries in Banaskantha district (Jessore Sloth Bear and Balaram-Ambaji Wildlife Sanctuaries). However these two Sanctuaries comprise of only 723 km2 or less that 3.77% of the remaining forest in Gujarat State.

- When discussing biodiversity justification (paragraphs 5-7) the proposal includes species found throughout the State, and it is unclear what proportion of these species (and the globally significant ones in particular) are found in the "project area" – presumably the two Wildlife Sanctuaries and an unspecified buffer zone. *Tectona grandis* forests predominate (para 5), but para. 52 suggests that at least some of these are simply teak plantations. *Gloriosa superba* is mentioned as being globally significant and threatened – it is common in much of sub-Sahara Africa, and is a striking, albeit common ornamental. In paragraphs 6 & 7 the proposal refers to certain species as being 'threatened' – this should be linked to IUCN Red Data Book categories or "Birds to Watch" categories.

- Information about Gujarat's importance as *"a crucial link and wintering ground in the flyways of millions of waterfowl that migrate…..*" (paragraph 2) is superfluous to the project document as it refers to the Rann of Kutch, not the dryland forests of Banaskantha District.

- It is unclear what the geographical scope of the project is – the proposal should at least include summary descriptions of the two sanctuaries, and place this is a broader context. Some comparative data /

information to inform the GEF Sec about the relative importance of the two focal project areas for biodiversity in relation to the other dryland forest areas in Gujarat would be beneficial.

- The two areas appear very highly disturbed: 50,000+ cattle, 40+ quarries, teak plantations, 114 villages, 87,000+ people, a major road passing through. With no clear indication of the remaining areas of natural habitat, it is hard to conceive that the area is worth investing in.

- The "identification of critically endangered target species requiring immediate protection from extinction" will be a primary output under Immediate Objective 1 – it is clear that the project proponents believe that new and / or rare species will be found during the implementation phase. This should be elaborated and included in the overall justification.

- In summary, the reviewer is not convinced that the increased protection of these two remnant dry forest patches will have significant global benefits. Clearer and more convincing arguments will be required.

ii) Cost-effectiveness in achieving focal area objective(s).

The reviewer is concerned about the cost effectiveness of this project for conserving dryland forest biodiversity in Gujarat State:

- The targeted forests form less than 4% (ca. 723 km^2) of the remaining forest area (19,178 km^2) of Gujarat State;
- The proposal also indicates that a considerable amount of donor funds / Loans (?) have already been spent on forestry related issues in Gujarat State. Whilst neither are directly related to biodiversity conservation – they indicate the high level of support necessary to implement forest conservation in the State:
  - A WB-aided reforestation project (amount spent undisclosed) has afforested 246,279 ha of marginal lands, and
  - part of a US$ 30.6 million Japanese Government Assistance project for integrated watershed development has already been spent in Banaskantha district.
- As mentioned under i), the two sanctuaries appear very highly disturbed: 50,000+ cattle, 40+ quarries, teak plantations, 114 villages, 87,000+ people, a major road passing through. With such a high level of disturbance, it is hard to conceive that investing in the area will be cost effective.
- However, the areas are reportedly highly diverse:
  - harbouring at least 16 known rare and endangered species (no IUCN categories or assessment of rarity and endangerment given in the proposal), including the wild relatives of many important crops species (e.g., cumin, bitter gourd, egg plant, capsicum, etc) as well as many medicinally important species;
  - Supporting viable populations of rare and endangered mammals, such as the Sloth Bear (IUCN RDB species??); and
  - Providing an important gene pool for future scientific discovery in the medicinal plant and agro-botany sectors.

This needs to be elaborated by the project proponents.

iii) Adequacy of project design.

The seven-year project duration over two phases is well rationalised and appears sound. Phase 1 removes policy barriers and implements alternative livelihoods to demand pressure on core area resources. This is coupled with awareness and environmental education programmes to build support for the project. Phase 2 will then focus on primary biodiversity conservation activities such a PA management, demarcation of zones, enforcement and capacity development.

However:

- Development of project objectives should be based on sound root cause analysis of the threats, and the proposal is weak in this respect.

- The reviewer has doubts about the global significance of the project area, and this needs to be addressed by the proponents.

iv) Feasibility of implementation, and operation and maintenance.

The project objectives and activities appear to be well designed and have built-in guarantees for continuation beyond the life of the project (7 years). On the whole, implementation seems feasible. The reviewer has doubts about some activities:

- Activity 1.1.6 Strengthen field gene banks. Does this mean establishing farms in the sanctuaries, or reintroducing species ?
- Activity 1.2.2 Train local farmers and tribal communities in monitoring techniques and processes. How does monitoring feed into sanctuary management and interventions ?
- Activities 2.1.19-2.1.21 concerning enforcing ban on quarrying in the sanctuary. What is the root cause for this, and is this being addressed ?
- Activity 2.4.3 Train herders in modern rest and rotation techniques. This is not the issue. Lands outside the sanctuaries are described as being highly degraded, and now herders have converged on the PAs. Can the buffer zone provide enough grazing ground ? what is the carrying capacity, and which % is this of the total herd (50,000+).
- Activity 2.4.7 Design and develop a sanctuary-wide grazing strategy. Grazing appears to be highly detrimental to the PAs, and is probably illegal.
- Activity 2.5.8 = missing.

I. Key Issues:

i) Scientific and technical soundness of the Project

Generally sound on the whole. But some concerns about the large suite of mostly un-tested community co-management ideas being promoted to remove threats to biodiversity.

The proposal also tends to justify the "shrinkage" of protected areas from their original extent to smaller well-enforced and exclusive core zones. These areas are at present undefined in size and exact location. Buffer zones are defined as part of the original PAs – but proposed activities suggest that there are few limits on human and livestock usage of these areas.

There is no mention of how small dryland forest patches in Gujarat State could be linked through community co-management and restoration of wildlife corridors between patches.

ii) Identification of the global environmental benefits and/or drawbacks of the Project

As mentioned under 1), the global benefits to biodiversity are not well articulated and need to be elaborated.

Discoveries from exploitation of newly discovered plant species and traditional knowledge may yield future global benefits.

iii) How the Project fits within the context of the goals of the GEF, as well as its operational strategies, programme priorities, Council guidance and the provisions of the relevant Conventions;

The project is eligible for GEF assistance under Operational Programme #1: Arid and Semi-Arid Ecosystems, and Operational Programme #3: Forests. India, a recipient of UNDP technical assistance and a participant in the restructured GEF as of May 12, 1994, is eligible according to the article 9(b) of the GEF instrument.

iv) Regional Context

Dryland forests of the broad Ethiopian bio-geographical realm are under heavy anthropomorphic and livestock pressures throughout their ranges.

The project focal area is a relatively small part of the remaining extent in Gujarat (<4%).

v) Replicability of the project

Many of the problems and issues highlighted are relevant to other protected areas in India and the sub-Continent in general. The proposal mentions transfer of experiences gained at the two target areas to adjacent forested locations, but mechanisms for replication are not detailed.

vi) Sustainability of the project

As the most important interventions are institutional or consist of capacity building, training and awareness, the project has a relatively high degree of sustainability.

II. Secondary Issues:

i) Linkages to other focal areas

Of the three other focal areas (climate change, international waters, ozone depletion), the Project has a tentative link with the "climate change" focal area, by way of combating deforestation (carbon sequestration in growing forests).

ii) Linkages to other programs and action plans at regional or sub-regional level

Proposal mentions linkages to integrated forestry and watershed management projects underway in the State but no clear definition of how such linkages would take place are proposed.

iii) Other beneficial or damaging environmental effects

Reforestation and watershed protection will enhance water availability, and improve water quantities and quality in downstream areas. Phasing out of mines and quarries may simply lead to relocation of the problem, and increased problems elsewhere.

iv) Degree of involvement of stakeholders in the project

The Gujarat Forest Department appears to be the dominant stakeholder in the project. Some involvement of the Department of Revenue and the Gujarat State Forest Development Corporation (GSFDC) are mentioned.

Local users and stakeholders have been consulted widely during project development. A survey of 72 villages was undertaken, involving Participatory Patient Learning Interaction (PPLI) surveys of over 500 individuals. Local NGOs and the Gujarat Institute of Development research (GIDR) were involved in this work.

Involvement of local communities in forest protection and maintenance of biodiversity is potentially possible through Joint Forest Management (JFM) initiatives. These enable decision-making and responsibility for control over Forest Department lands and usufruct rights being shared between Forest Departments and local user groups. In response to pressure on protected areas, the Government has adopted a participatory approach called eco-development, which aims to conserve biodiversity by addressing the impact of local people on the protected areas and *vice a versa.* It is unclear however how such a JFM mechanism will operate during the project implementation. In Section 8: Implementation and Execution Arrangements, no mention of local Non-Government stakeholder involvement is made.

v) Capacity building aspects

The proposal acknowledges that many of the issues undermining the sustainability of the ecosystems are either institutional in nature or have an institutional element in them. Therefore, improvement of management capacity within the Forest Department is one of the main components of the Project. The capacity of local communities to sustainably manage their natural resources will also be enhanced by the Project.

vi) Innovativeness of the project

No major innovations in biodiversity management are envisaged. The proposal focuses primarily on the issues pertaining to "protected area" management and adopts a zoned approach to this. A core protected zone, non-core protected zone and buffer zone are envisaged – each with differing levels of human activity permitted.

One of the more unique features of the project is the strategic emphasis on documenting, promoting and supporting indigenous knowledge systems and traditional conservation ethics. Many of the alternative livelihood activities proposed are based upon traditional local remedies and grassroots solutions to agricultural problems. Traditional medicines and herbal pesticides and herbicides are being promoted as a means of enhancing revenues generated from local NTBPs. Traditional conservation practices, including the maintenance of "Sacred Groves" around religious sites, are being promoted as the basis for protecting core zones and in developing awareness of the benefits of biodiversity conservation.

Suggestions for Improvement of the Project Proposal

- Para.1: "India has 130,000 species of plants and animals." This needs to be qualified, as the number of higher plants is probably in the order of 10-15,000, and vertebrates probably total about 2,000-3,000.

- Para. 2: lists 2,720 animal species in Gujarat: specify
- Para 5: *Tectona grandis* = teak; are these natural, or plantations, as para. 52 suggests ?
- Para. 12: what is the scientific name of 'Gugal' ? $46 is not 'in contrast' to the $255 poverty line, but a significant proportion of the basic local income.
- Para 19: Honeycomb nature of the PAs. What is the relative area of various habitat/lab use types. How does this relate to the IUCN PA categories ? Shouldn't buffer zones be identified outside the original PAs ?
- Para 23: State departments active in the PAs include State Revenue Dept., Agriculture Dept., Animal Husbandry Dept. and Irrigation Dept. How appropriate is their involvement in the two sanctuaries ?
- Para 27: What are the main problems associated with overgrazing ? Habitat destruction, erosion, competition with wildlife, disturbance, spreading of exotic weeds, etc...
- Para 28: 4,320 tonnes of fuelwood – how many ha of forest does this translate into ?
- Para 29: What kind of mining and quarrying ? pollution ? Do fires form a threat ? burning and clearing of habitats ?
- Para 34: food crops ? which varieties ? use of agrochemicals ? Introduction of inappropriate farming techniques is not a local community root cause, but more likely an institutional capacity problem (of State Agric. Dept.).
- Para 35: Burning of forest as a form of sacrifice. Which area per year ?
- Para 39: what is the size of these core areas ? capacity for preserving wildlife ? habitats included ? habitat condition ?
- Para 42: removal of unwanted vegetative biomass? what is this? logging? weed removal? Demarcation carried out by IFDP – what was demarcated? para. 44 says that core areas were not yet identified.
- Para 44: plan components include settlement? what does this mean? settlement in PA? resettlement? What is meant by development of watersheds? reforestation? or urban development?
- Para 42 (#2, between 45 and 46): what is a knowledge forest ?
- Para 46: elaborate 'sacred groves' – what species are protected ? natural forest, or holy fig trees ? Importance for wildlife ? size ? distribution in PAs.
- Para 44: (#2) Livelihood promotion. Livelihood options are limited within the sanctuary. They should be. Options should be promoted outside the PAs, not inside.
- Para 47: GLDC watershed development. What are they actually doing ?

Spelling corrections:

- Para. 6: *Heleotropium* should be *Heliotropium; Capparis cartiaginea* should read *Capparis cartilagineus*
- Para. 7: change pangoline to pangolin, and *Mycturia* to *Mycteria*
- Para 31: *Prosopis Juliflora* should read *Prosopis juliflora.*

Annex IIIa: Response to STAP reviewer

(Responses underlined)

i) Global priority in the area of biodiversity.

The concerns expressed about the justification of global significance are valid in that the version of the brief reviewed by the STAP reviewer did not describe the global significance of the sanctuaries sufficiently well. The description has been amended to emphasize the uniqueness of the forest ecosystems, representing a mix of the Ethiopian and Indo-Malayan realms, and their significance in terms of medicinal plants and wild relatives of cultivated plants.

Further points:

- Forest areas in Gujarat versus the sanctuaries.

Indeed, the forest area of Gujarat is much larger than the forest areas represented in the two sanctuaries. The figures formerly provided in the brief were mis-leading. Two sources of information have been used in correcting these figures, namely:
1. The Gujarat Forest Department web-site: http://www.gujaratforests.com/main.htm
2. The Forest Survey of India web-site: http://envfor.delhi.nic.in/fsi/sfr99/chap3/gujarat/gujarat.html

Despite slight discrepancies in figures between these two sites, the following information is of relevance:

- Total forest area: approx. 18,000 sq km.; "mostly distributed in the southern part of the state"
- Protected forest area: "20% of the total forest area" = approx. 3,600 sq.km
- Total forest area of the three northern districts (Banaskantha, Mehsana and Sabarkantha) classified as "dense" or "open" = 1,451 sq km
- Total forest area of the three northern districts that is protected = 747 sq km.

Thus, it can be seen that the two sanctuaries represent the only good quality forest containing the "northern tropical thorn forest" ecosystems that enjoys a protected status.

- Gujarat's importance as "a crucial link and wintering ground in the flyways of millions of waterfowl that migrate….." (paragraph 2) is superfluous

The wording has been amended, as the importance of the two sanctuaries was previously overstated. However, the project site is an important link, not least because although the Rann of Kutch is the most important wintering ground in the state, it is by no means the only one. For example, Nalsarovar, in the eastern part of the state, is the largest water bird sanctuary in the country. The sanctuaries are a significant site in flyways that split, to the west and east, at this location.

- It is unclear what the geographical scope of the project is

The wording has been improved, but the STAP reviewer was also hindered by lacking the maps which are included in the supplementary Annexes.

- The two areas appear very highly disturbed

"Disturbance" is a relative term! However, the fact that the State Forest Survey of India classifies 433 sq km of the two sanctuaries as "dense" forest indicates that much high quality forest remains. In fact, much of the disturbance is concentrated in specific areas, which is the basis for the whole project strategy of recognising different use zones.

- The "identification of critically endangered target species requiring immediate protection from extinction" will be a primary output under Immediate Objective 1 – it is clear that the project proponents believe that new and / or rare species will be found during the implementation phase.

The wording was slightly confusing and has been amended. The intent was to identify those endangered species for which specific conservation actions are required, not to survey or identify new species.

ii) Cost-effectiveness in achieving focal area objective(s).

The reviewer is concerned about the cost effectiveness of this project for conserving dryland forest biodiversity in Gujarat State

The reviewer's comments in relation to cost effectiveness largely mirror his comments under the heading of global significance, and have been addressed as described above. As the reviewer notes, the large amounts of foreign donor aid are not specifically related to conservation – most of these amounts have been used in support of reforestation projects.

iii) Adequacy of project design.

The seven-year project duration over two phases is well rationalised and appears sound. However:

- Development of project objectives should be based on sound root cause analysis of the threats, and the proposal is weak in this respect.

The reviewer was lacking the Threats and Root Causes Analysis Annex (Annex VII). This provides the basis for the project design.

iv) Feasibility of implementation, and operation and maintenance.

The project objectives and activities appear to be well designed and have built-in guarantees for continuation beyond the life of the project (7 years). On the whole, implementation seems feasible. The reviewer has doubts about some activities:

- Strengthen field gene banks. Does this mean establishing farms in the sanctuaries, or reintroducing species ?
- Train local farmers and tribal communities in monitoring techniques and processes. How does monitoring feed into sanctuary management and interventions ?
- concerning enforcing ban on quarrying in the sanctuary. What is the root cause for this, and is this being addressed ?
- Train herders in modern rest and rotation techniques. This is not the issue. Lands outside the sanctuaries are described as being highly degraded, and now herders have converged on the PAs. Can the buffer zone provide enough grazing ground ? what is the carrying capacity, and which % is this of the total herd (50,000+).
- Design and develop a sanctuary-wide grazing strategy. Grazing appears to be highly detrimental to the PAs, and is probably illegal.

Some of these activities have been deleted, and others re-worded. Note that the brief has been re-structured since the STAP review, so that there are no longer numbered activities, as these conveyed the impression of being prescriptive. The concerns with grazing pressure will be addressed through user agreements to reduce herd sizes in return for a package including improved livestock quality and alternative livelihoods.

I. Key Issues:

i) Scientific and technical soundness of the Project
Generally sound on the whole. But some concerns about the large suite of mostly un-tested community co-management ideas being promoted to remove threats to biodiversity.

Most if not all of the community co-management concepts have been successfully implemented in other parts of India, including in Gujarat.

The proposal also tends to justify the "shrinkage" of protected areas from their original extent to smaller well-enforced and exclusive core zones. These areas are at present undefined in size and exact location. Buffer zones are defined as part of the original PAs – but proposed activities suggest that there are few limits on human and livestock usage of these areas.

The project does not promote shrinkage of protected areas, but rather recognizes the reality of protected area management in India, namely that human use in protected areas is inevitable, but that this does not necessarily mean that biodiversity conservation is not possible.

ii) Identification of the global environmental benefits and/or drawbacks of the Project
As mentioned under 1), the global benefits to biodiversity are not well articulated and need to be elaborated.

Discussed above.

iv) Regional Context
The project focal area is a relatively small part of the remaining extent in Gujarat (<4%).

Not true, as explained above.

v) Replicability of the project
Many of the problems and issues highlighted are relevant to other protected areas in India and the sub-Continent in general. The proposal mentions transfer of experiences gained at the two target areas to adjacent forested locations, but mechanisms for replication are not detailed.

The project proposes a participatory approach to co-management of natural resources – an approach which is inherently replicable.

II. Secondary Issues:

i) Linkages to other focal areas
Of the three other focal areas (climate change, international waters, ozone depletion), the Project has a tentative link with the "climate change" focal area, by way of combating deforestation (carbon sequestration in growing forests).

While there are links to the CC focal area, these are largely incidental, and are therefore not emphasised. Reforestation of key degraded areas will contribute to C-sequestration, but the justification of reforestation is related to biodiversity conservation.

ii) Linkages to other programs and action plans at regional or sub-regional level

Proposal mentions linkages to integrated forestry and watershed management projects underway in the State but no clear definition of how such linkages would take place are proposed.

It is not clear to what sections of the text the reviewer is referring. The project will seek to learn from lessons generated by other projects such as the IFDP and other projects through the involvement of the Forest Department.

iii) Other beneficial or damaging environmental effects
Phasing out of mines and quarries may simply lead to relocation of the problem, and increased problems elsewhere.

The intent is to relocate mines and quarries to areas where their negative impacts are less significant – i.e. already degraded areas.

iv) Degree of involvement of stakeholders in the project
In Section 8: Implementation and Execution Arrangements, no mention of local Non-Government stakeholder involvement is made.

This has been amended, and a reference added.

Suggestions for Improvement of the Project Proposal

Note: Paragraph numbers have changed. Where appropriate, the text has been amended as described in the responses given below:
- Para.1: "India has 130,000 species of plants and animals." This needs to be qualified, as the number of higher plants is probably in the order of 10-15,000, and vertebrates probably total about 2,000-3,000.

Reference deleted.
Para. 2: lists 2,720 animal species in Gujarat: specify
Reference deleted.
Para 5: *Tectona grandis* = teak; are these natural, or plantations, as para. 52 suggests ?
Para. 12: what is the scientific name of 'Gugal' ?
Commiphora mukul – name added
$46 is not 'in contrast' to the $255 poverty line, but a significant proportion of the basic local income.
True – this has been deleted.
- Para 19: Honeycomb nature of the PAs. What is the relative area of various habitat/lab use types. How does this relate to the IUCN PA categories ? Shouldn't buffer zones be identified outside the original PAs ?

Relative or absolute areas can be provide on request. The term "buffer zone" is applied to non-Forest Department land, which is within the boundaries of the protected area, but outside the jurisdiction of the Forest Department.
Para 23: State departments active in the PAs include State Revenue Dept., Agriculture Dept., Animal Husbandry Dept. and Irrigation Dept. How appropriate is their involvement in the two sanctuaries ?
Their involvement is associated with the administration of government in India and is not subject to discussion!
Para 27: What are the main problems associated with overgrazing ?
Mainly habitat destruction
Para 28: 4,320 tonnes of fuelwood – how many ha of forest does this translate into ?
This is not a simple calculation since fuelwood collection is so widely distributed.
Para 29: What kind of mining and quarrying ? pollution ? Do fires form a threat ? burning and clearing of habitats ?
Mainly small-scale limestone quarrying; pollution and fires are insignificant.
Para 34: food crops ? which varieties ? use of agrochemicals ? Introduction of inappropriate farming techniques is not a local community root cause, but more likely an institutional capacity problem (of State Agric. Dept.).

Indeed, the introduction of inappropriate farming techniques is to a large degree and institutional problem – however, SRISTI has already enjoyed considerable success in overcoming these problems, and it is not foreseen that solution of the problem will be any more difficult in the project site.
Para 35: Burning of forest as a form of sacrifice. Which area per year ?
No exact figures – very small areas.
Para 39: what is the size of these core areas ? capacity for preserving wildlife ? habitats included ? habitat condition ?
The exact size of the core areas will be the subject of stakeholder agreements under Output 1.1; however, as stated, they will be designed on the basis of conservation biological principles, and will likely constitute a large proportion of the total area.
Para 42: removal of unwanted vegetative biomass ? what is this ? logging ? weed removal ? Demarcation carried out by IFDP – what was demarcated ? para. 44 says that core areas were not yet identified.
"Unwanted vegetative biomass" is non-native species – wording amended. Core areas have been identified, subject to stakeholder agreement – wording amended.
Para 44: plan components include settlement? what does this mean ? settlement in PA? resettlement ? What is meant by development of watersheds ? reforestation ? or urban development ?
"Settlement" = demarcation of settlement and sanctuary boundaries; "development of watersheds" = improved watershed management = wording amended.
Para 42 (#2, between 45 and 46): what is a knowledge forest ?
"Knowledge forest" is a term used to described a locally developed concept of natural resource management that incorporates traditional knowledge. There is a working example of this in the Balaram Sanctuary, and opportunities to develop and replicate this example will be sought.
Para 46: elaborate 'sacred groves' – what species are protected ? natural forest, or holy fig trees ? Importance for wildlife ? size ? distribution in PAs.
Information being sought from project proponent

- Para 44: (#2) Livelihood promotion. Livelihood options are limited within the sanctuary. They should be. Options should be promoted outside the PAs, not inside.

True – however, it is impractical to envisage no livelihood options inside the PA's
Para 47: GLDC watershed development. What are they actually doing ?
Information being sought from project proponent

Annex IV: Letter of Endorsement

सत्यमेव जयते

ARCHANA JOSHI
DEPUTY SECRETARY
(TELE FAX. 4362612)

तार :
Telegram : PARYAVARAN,
NEW DELHI
दूरभाष :
Telephone :
E-Mail Address :

भारत सरकार
पर्यावरण एवं वन मंत्रालय
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
पर्यावरण भवन, सी. जी. ओ. कॉम्पलेक्स
PARYAVARAN BHAVAN, C.G.O. COMPLEX
लोदी रोड, नई दिल्ली-110003
LODHI ROAD, NEW DELHI-110003

D.O. No.4(2)/11/98-IC-I

Dated 7th March, 2001

Dear Smt. Acharya,

Subject : GEF/UNDP Project on "Conservation and Sustainable Management of Dryland Biodiversity".

The Ministry of Environment & Forests hereby accords its in principle agreement to the above mentioned Project for funding under GEF subject to :

i) The State Government being nominated as the executing agency. The project will be implemented with the support of Government and Non-Governmental Organizations including SRISTI and Gir foundation.

ii) The State Government would not recommend SRISTI as the principal co-implementor but would like to take them along in project implementation for specific identified areas which are considered as their strength. Similarly services of other Government/NGOs would be utilized.

The above mentioned issues are expected to be sorted out when the detailed work plans for the Project are drawn out. You may kindly like to take further action for necessary endorsement of this proposal in time for the GEF Council meeting.

With regards,

Yours sincerely,

(ARCHANA JOSHI) 7/3/01

Ms. Rita Acharya,
Deputy Secretary,
Department of Economic Affairs,
North Block, NEW DELHI – 110 001.
(FAX NO. 3013133)

Encl : As above

Copy to : 1) Dr. P. Venkata Ramana, Assistant Resident Representative, UNDP, 55, Lodi Estate, NEW DELHI – 110 003.
2) Dr. Sarat Babu, JD (CS), MOEF.

Ramon Prudencio C. de Mesa

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April 5, 2001 4:56 PM

Cover Note

Project Title: "India: Conservation and Sustainable Management of Dryland Biodiversity"
Date: March 5th, 2001

	Work Program Inclusion	Reference/Note:
1. Country Ownership		
• Country Eligibility		Cover page
• Country Drivenness	Clear description of project's fit within: • National reports/communications to Conventions • National or sector development plans • Recommendations of appropriate regional intergovernmental meetings or agreements.	Paragraph #s: 13, 88, 89
• Endorsement	• Endorsement by national operational focal point.	Annex IV
2. Program & Policy Conformity		
• Program Designation & Conformity	Describe how project objectives are consistent with Operational Program objectives or operational criteria.	Paragraph #101, 102
• Project Design	Describe: • sector issues, root causes, threats, barriers, etc, affecting global environment. • Project logical framework, including a consistent strategy, goals, objectives, outputs, inputs/activities, measurable performance indicators, risks and assumptions. • Detailed description of goals, objectives, outputs, and related assumptions, risks and performance indicators. • Brief description of proposed project activities, including an explanation how the activities would result in project outputs (in no more than 2 pages). [1] • Global environmental benefits of project. • Incremental Cost Estimation based on the project logical	§ Paragraph #s: 26-41 § Annex II § Paragraph #s: 56-91 § Cover Page summary § Paragraph #: 56, 92 § Annex I

[1] A project/program could undertake detailed design (specification of project outputs) during the first phase of implementation, with clear benchmarks for approval of the subsequent phase. A project could also be an adaptable program loan with several phases, where achievement of the clear benchmarks at the end of each phase is a necessary condition for approval of the next phase. In such projects, describe in detail the project output for the first phase and describe briefly the project activities for that phase.

	Work Program Inclusion	Reference/Note:
	framework. • Describe project outputs(and related activities and costs) that result in *global* environmental benefits • Describe project outputs (and related activities and costs) that result in joint *global and national* environmental benefits. • Describe project outputs (and related activities and costs) that result in *national* environmental benefits. • Describe the process used to jointly estimate incremental cost with in-country project partner. • Present the incremental cost estimate. If presented as a range, then a brief explanation of challenges and constraints and how these would be addressed by the time of CEO endorsement.	§ Annex I, column 5 § NA § Annex I, column 4 § Paragraph # 111 § Paragraph # 111
• Sustainability (including financial sustainability)	Describe proposed approach to address factors influencing sustainability, within and/or outside the project to deal with these factors.	§ Paragraph #: 116
• Replicability	Describe the proposed approach to replication,(for e.g., dissemination of lessons, training workshops, information exchange, national and regional forum, etc) (could be within project description).	• Paragraph #: 71, 73, 76-83
• Stakeholder Involvement	• Describe how stakeholders have been involved in project development. • Describe the approach for stakeholder involvement in further project development and implementation.	• Paragraph #: 94-98 • Annex V
• Monitoring & Evaluation	• Describe how the project design has incorporated lessons from similar projects in the past. • Describe approach for project M&E system, based on the project logical framework, including the following elements: • Specification of indicators for objectives and outputs, including intermediate benchmarks, and means of measurement. • Outline organizational arrangement for implementing M&E. • Indicative total cost of M&E (maybe reflected in total project cost).	• Paragraph #: 119-121 • Paragraph #s: 117-118, Annex II
3. Financing		
• Financing Plan	• Estimate total project cost • Estimate contribution by financing partners. • Propose type of financing instrument	• Cover page; • Cover page; • Cover page

	Work Program Inclusion	Reference/Note:
• Implementing Agency Fees	Propose IA fee	NA
• Cost-effectiveness	• Estimate cost effectiveness, if feasible. • Describe alternate project approaches considered and discarded.	NA NA
4. Institutional Coordination & Support		
IA Coordination and Support • Core commitments & Linkages	Describe how the proposed project is located within the IA's: • Country/regional/global/sector programs. • GEF activities with potential influence on the proposed project (design and implementation).	• NA • NA
• Consultation, Coordination and Collaboration between IAs, and IAs and EAs, if appropriate.	• Describe how the proposed project relates to activities of other IAs (and 4 RDBs) in the country/region. • Describe planned/agreed coordination, collaboration between IAs in project implementation.	• Paragraph #: 51-52 • NA
5. Response to Reviews		
Council	Respond to Council Comments at pipeline entry.	NA
Convention Secretariat	Respond to comments from Convention Secretariats .	NA
GEF Secretariat	Respond to comments from GEFSEC on draft project brief.	NA
Other IAs and 4 RDBs	Respond to comments from other IAs, 4RDBss on draft project brief.	NA
STAP	Respond to comments by STAP at work program inclusion	
Review by expert from STAP Roster	Respond to review by expert from STAP roster.[2]	

[2] STAP Roster Review, and IA response, is a required annex of the project brief.

Annex V: Project Implementation Arrangements/Stakeholder Participation Summary

The NPD (National Project Director) will be appointed by MoEF (Ministry of Environment and Forest), GoI, preferably from Gujarat Forest Department. Steering Committee (SC) will be set up to assist the implementation strategy of the main project. NPD will separately enter into MoU with other institutions/NGO that will provide specific support to local communities, Forest Department, or other developmental agencies as a part of the main project.

IIM-A

IIM-A will be primarily involved in concurrent policy analysis, capacity building, and training in (a) participatory biodiversity conservation (b) development of sustainable livelihoods.

SRISTI

It will primarily be responsible for creating Knowledge Network among communities by documenting, validating, and value adding in local knowledge, research to develop new herbal products based on biodiversity in and around revenue lands or from agricultural areas as per the policy and procedures of PA authorities. It will also develop multimedia database, CDs and other communication and educational materials that can help foster positive attitude towards conservation of globally significant biodiversity. It will also co-ordinate with GAU, NBPGR, various Vidyapiths and other private and/or public research institutions in Gujarat in inventorising biodiversity, development of enterprises through value addition in agrobiodiversity and permitted forest products (in collaboration with GIAN). It will also undertake monitoring of eco-system health through soil microbial diversity analysis.

GEER foundation

Long-term monitoring of eco-system health, technical support to the forest department in preparing and finalizing the management plans for both the sanctuaries and protecting and managing ecosystems and habitats.

WII

Wildlife Institute of India (WII), Dehradun has agreed to help in formulating strategies for eco-tourism and in some of the research activities of the GEF project. A few research proposals have already been developed entitled as follows:

- Large mammalian prey-predator relationships in the semi-arid habitats of Northern Gujarat with special reference to population dynamics of Nilgai (*Boselaphus tragocamelus*) and common Leopard (*Panthera pardus*) and their influence on wildlife-human conflicts.
- Status and conservation of some lesser known mammals of dry zone of North Gujarat.
- Developing a Wildlife Monitoring Programme for dry zone of North Gujarat.

- Conservation and management of Wetlands in the dry zone of North Gujarat with special reference to avifaunal diversity and human use.
- Livestock grazing practices and their impact on the conservation on biodiversity and the ecology of the dryland zones of North Gujarat.
- Survey of herpatofauna in the dry zones of North Gujarat.
- Habitat evaluation of Sloth bear (*Melursus ursinus*) and corridor development in the semi arid habitats of North Gujarat using indigenous knowledge systems and their validation by ecological studies.

ISRO

Indian Space Research Organisation (ISRO)/Space Application Centre (SAC) would be helping in mapping and monitoring of vegetation and associated landuse/landcover of the project sites which would indicate the potential areas of region-specific research. Besides these, they will integrate, digitize and analyse both spatial and non-spatial data for carrying out criterion based information generation with the help of Geographic Information System (GIS).

Other NGOs

The community involvement, awareness and stake building in conservation of biodiversity in and around protected areas require close involvement of local NGOs and Vidyapiths . They will be assigned specific responsibility for generating conservation ethic. In addition, local NGOs will coordinate with tribal development agency, District Rural Development Agency, primary education committee of Jilla Parishad and other development agency to ensure that livelihood needs of local communities are met properly so that non-sustainable use of forest based resources can be checked and ultimately eliminated

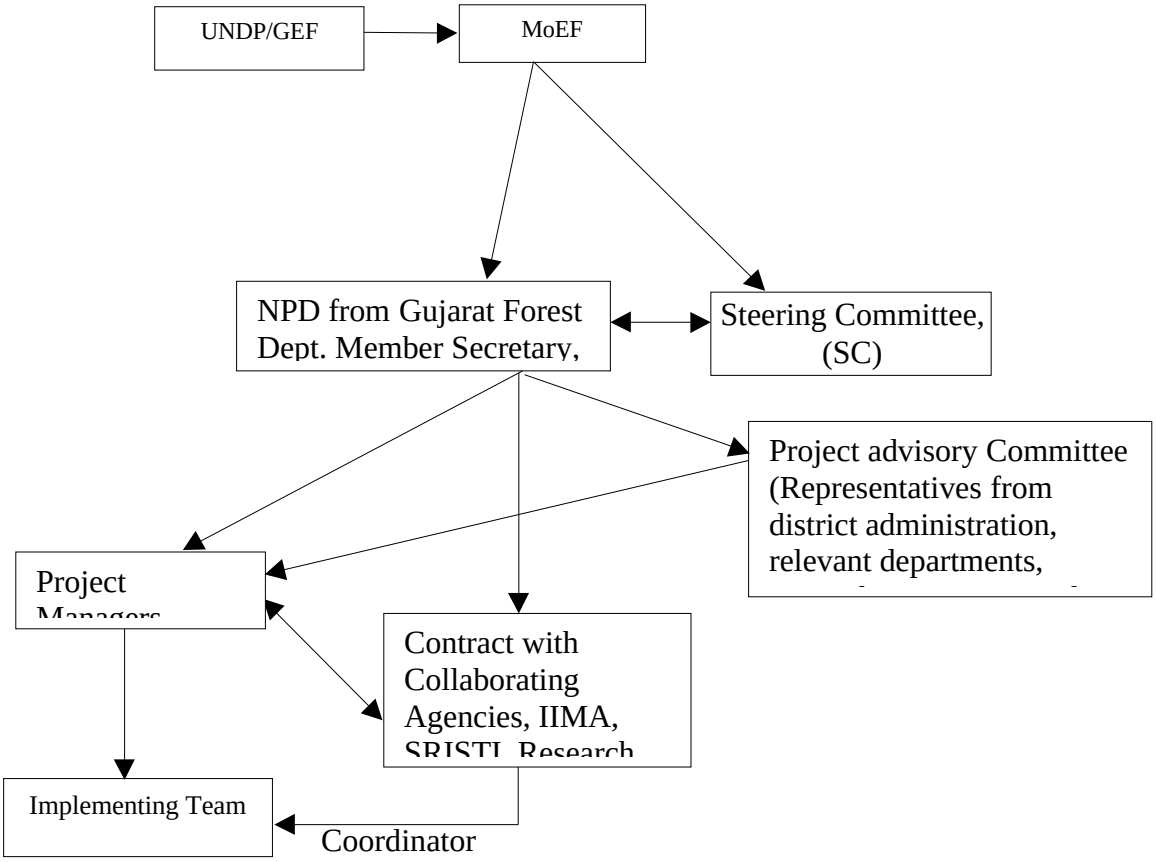
Other Research and Development Institutions

Various research institutions such as MSU, GU, Vallabh Vidyanagar, Saurashtra University, South and North Gujarat University, GIDR, etc., may be contracted for specific responsibility for biodiversity inventorising, developing conservation strategies, developing techniques for difficult to reproduce species under threat, developing technologies for local level value addition, etc.

Finalization of institutional framework for the major project:

The Forest Department, Government of Gujarat, will assume overall responsibility for the execution of the major project, and the achievement of its objectives (Please refer the draft Project Brief).

Project Implementation Arrangements



Ministry of Environmnet and Forests (MoEF) will appoint National Project Director (NPD) in consultation with Gujarat State Forest Department. NPD will help MoEF in constituting the Steering Committee in consultation with UNDP for efficient implementation of the project. The Steering Committee will comprise representatives of the MoEF, cross-sectoral Ministries including the Department of Economic Affairs, State Government nodal agencies, NGOs, prominent experts, SRISTI, IIMA and UNDP. The tasks of the Steering Committee will be:

- To meet at least twice a year to provide overall direction and monitor the implementation of the project
- To approve annual work plan and budget proposed by the NPD
- To promote inter-departmental co-operation and co-ordination at the State and National level.

The NPD will act as a member-secretary of the Steering Committee that will catalyze inter-departmental co-ordination through Project Managers. Project Co-ordination cell will be set up under NPD at the Gujarat Forest Department which will be assisted by Project Management Cell and coordinated by Project Managers.

In the recent Steering Committee meeting held at IIMA on 23rd July 1999, members agreed that the Forest Department, Government of Gujarat is the most appropriate entity to become the local implementing agency of the full project. The Principal secretary, Department of Forests and Environment agreed to explore with the government the possibility of taking over the responsibility for the major project.

Project Management Cell (PMC):

- The PMC will be set up to carry out the day-to-day working of the project. The project team comprising technical and support staff will assist the PMC, headed by a Project Manager. The PMCs will assume the responsibility for overall co-ordination and management of activities, administration, and finances.

The Project Manager will report to the NPD. She/he will maintain close interaction with the institutions associated with the line departments and UNDP. She/he will also facilitate the work of the collaborating institutions and consultants in implementation of project components. UNDP/India will advise the MoEF and the local implementing agency on National execution procedures as necessary.

Project Advisory Committee:

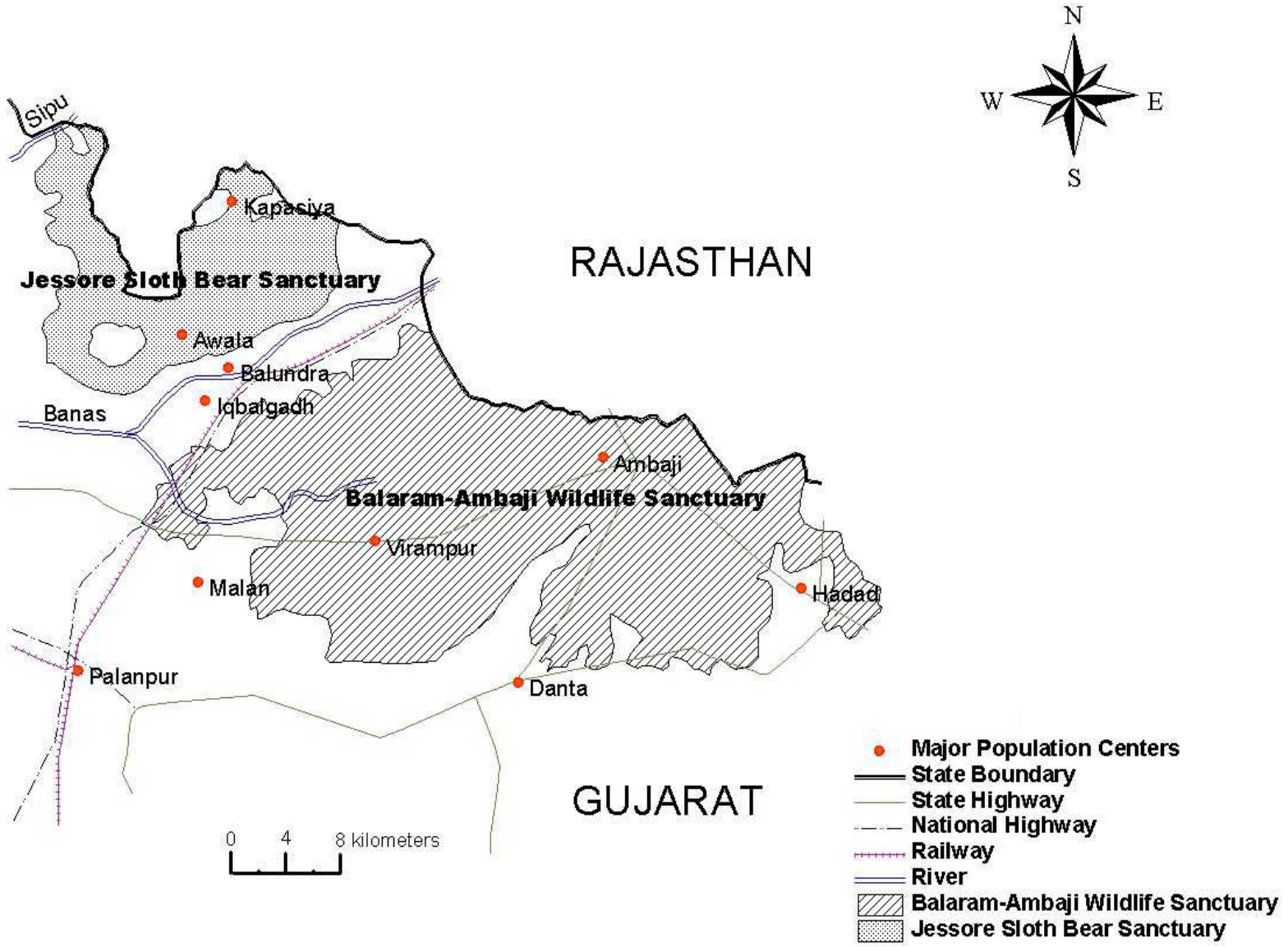
A Project Advisory Committee will be constituted by the NPD to support the execution of the project at the Banaskantha District level. The Advisory Committee will have representatives from the District Administration, relevant departments and nodal agencies, lead bank, financial institutions, NGOs, prominent experts, and community representatives. The tasks of the Project Advisory Committee will be:

- to meet at least quarterly to receive reports on the project implementation and offer appropriate advice
- promote inter-departmental co-operation and co-ordination at District and State level.

The Project Manager will act as member-secretary of the Project Advisory Committee. The Project Advisory Committee will appoint its own Chairperson to conduct its meetings.

The main GEF/UNDP project should have a specific District Forest Officer (DFO) appointed to work exclusively in these sanctuaries for the project with a team of Range Forest Officers (RFOs). They should directly report to the Chief Wildlife Warden or Conservator of Forests(CF), Wildlife. The DFO may also work as an Associate Project manager in the field.

ANNEX VI: MAP OF PROJECT AREA



Annex VII: Threats/Root Causes/Proposed Actions Matrix

Identification of important threats:

Several field level consultations were organized to assess the perception of various stakeholders' such as Lbhocal communities, Forest functionaries, NGOs, industry representatives etc. about conservation of biodiversity in the sanctuary areas.

Methodology:

About two-third (seventy-five) villages within both the sanctuaries were selected so as to represent different ecological regions and subregions in the sanctuaries. Focus group discussions were held [1] with (a) opinion leaders (seven to nine on an average per group) representing different local communities and (b) Range Forest officers, Foresters and Forest guards from all the eight ranges within the two sanctuaries. Thirteen major threats were identified based on various study reports and local consultations. The threats were prioritized (ranked) depending upon their significance as perceived by local communities and the forest officials.

The suggestions of the local communities have been sought during the village survey of 72 villages carried out earlier as part of the indigenous knowledge study. The local consultations organized earlier by GIDR (Gujarat Institute of Development Research) had also taken care of this aspect. Hence, the suggestions were only sought from the Forest Department officials from all the eight ranges of Balaram-Ambaji and Jessore sanctuaries.

Table: 1: Ranking of threats by local communities and Forest officials

Threats	Ranking by local village communities			Ranking by Range forest functionaries from both the sanctuaries		
	Mean Rank Value	Rank	No. of village	Mean Rank Value	Rank	No. Of Persons
Frequent droughts	2.48	I	52	3.95	II	85
Increase in human and cattle population	2.52	II	61	3.40	I	88
Indiscriminate lopping and cutting	2.79	III	48	5.21	IV	88
Forest fire	3.33	IV	27	6.75	VI	88
Encroachment of forest land for agriculture	3.50	V	26	8.25	IX	71
Pressure on Gauchar/ Common lands	4.28	VI	36	5.14	III	68

[1] The initial round of consultation with local communities was organized during June-August 1999. The second round of consultation with the forest officials was organized during August-September 1999.

Lack of efforts by forest department	4.93	VII	30	9.38	XII	72
Decline in forest eco-system health	5.40	VIII	28	6.10	V	88
Invasive species like prosopis	5.52	IX	25	7.70	VIII	88
Poaching	5.92	X	12	9.73	XIII	84
Discounting local people's knowledge	6.39	XI	18	6.87	VII	79
Over-extraction of NWFPs	6.42	XII	24	8.52	X	88
Industrialization (quarrying and mining)	6.67	XIII	3	8.97	XI	78

Notes:

i) These consultations were organized in all the eight ranges of both the sanctuaries and attended by the Range Forest Officers, the Foresters and the Beat Forest Guards.

ii) The numbers representing ranks for each threat will vary depending upon the individual perceptions and extent of threats for that particular village/ range.

Some of important threats that deserve discussion and may have policy implications for the major project are detailed below:

A) Over-grazing on forest land:

Government of Gujarat (Forest Department) has given **special privileges for grazing.** In addition to ten general privileges[2], for Banaskantha district such as, (a) free grazing may be allowed except in worked coupes for five years; (b) goats should be allowed to graze only in areas especially set aside in each village (please refer article 78 (b) of general privileges and special privileges to the residents of Banaskantha); (c) collection and removal of head-loads of grass free of charge for domestic use and for sale (please see article 78 (e) of general privileges and special privileges to the residents of Banaskantha, vide GRA and FDNo. 5898, dated 21/9/53 and 7/5/54, The Gujarat Forest Manual, vol. III. p. 33).

At present, there is no proper control or regulation of grazing activity. Large number of less productive cattle around and/or managed by dwellers in and around sanctuary areas (besides the migrants from Rajasthan) pose a serious threat to some of the habitats. In one of the consultation[3] with local communities including livestock rearers, many participants suggested that they would be willing to restrict the grazing into forest if their rights of residence and grazing outside the existing boundaries of the sanctuaries are secured. They were quite apprehensive about the proposed larger boundaries and were understandably concerned on this account. Some of them even went to the extent of suggesting that they were willing to participate in creating a boundary wall around the sanctuary in lieu of legitimization of their existing rights. A high demand of cultivable land due to increasing human population, non-availability of irrigation water for fodder/pasture cultivation in summer and winter, encroachment on common village lands (including wastelands and

[2] The list of general privileges is attached at the end of this note.

[3] Various local consultations were held in both the sanctuaries. For details, please see, draft project brief and study reports, July 1999.

gauchars) have increased the dependency of tribals /villagers on forest for grazing their animals. The land reserved for common grazing is insufficient for the cattle population of the villages in the sanctuaries, and the condition has deteriorated manifold in last few years. The neighboring state of Rajasthan lies in arid zone from where the migratory graziers enter into these sanctuary areas with their sheep, goats and cattle and take temporary refuge ranging from a few days to a few months. This is the time when the extensive grazing is experienced by the PAs. A drastic decrease in the grass cover not only due to grazing but also due to trampling takes place during this part of the year. In view of lack of institution building efforts by various public and voluntary agencies, the consciousness about rotational grazing or managing pasture has not been generated. The local institutions, rare as they are, prohibit grazing in certain pockets (such as the one near Guda and Karmdi villages in Balaram-Ambaji sanctuary) but they have to be recognized, maintained and replicated.

Following table summarizes the number of offences registered and cattle arrested in last five years

Table 2: Number of offences registered and cattle rounded up during last five years in both the sanctuaries

Year	No. of Offences registered	No. of Cattle rounded up
94-95	51	354
95-96	52	445
96-97	34	337
97-98	36	417
98-99	48	361

Source: Data provided by DFO, Palanpur

It can be seen from the above table that number of offences registered during last five year ranges from 36 to 52 with more than 300 cattle rounded up in various years. Though the average number of cattle per offence rounded up till 1997-98 has increased from seven to eleven it has again come down to slightly above seven in the year 98-99. The forest range-wise pattern indicates that ranges of Palanpur, Ambaji south and Iqbalgadh have the highest number of cases of grazing by cattle. It is obvious that the number of offenses registered does not fully capture the seriousness of the situation.

Some of the policy issues:

- Whether grazing will be permitted in specific blocks/year or seasonally in a regulated manner and if so, what will be the norms for permitting the same?
- If it is stopped, what alternative arrangements have to be made to make fodder available in villages instead of allowing them to collect grass from the wild? Also, what will be the ecological implications of total restriction of grazing in certain areas?
- How and in what way common-grazing lands will be re-opened, increased or rejuvenated?

- What is the policy for restricting or regularizing the encroachments by local people on forest land for cultivation? How should alternative means of livelihood be provided so as to reduce pressure on the forest areas?
- What are the policies for the development of pastures within and outside the sanctuary areas?
- Since the migratory graziers from Rajasthan cannot be stopped due to the orders of Supreme Court about their "unfettered rights to move across the state for grazing or other purposes", what arrangements are proposed to be made to provide corridors, or regulate their movement?
- What kind of initiatives can be taken to improve livestock productivity, improve water source and pasture etc.?
- What will be the measures taken to create awareness among villagers for experimenting with rotational grazing practices and other such resource conservation practices?

B) Deforestation by indiscriminate lopping and cutting:

Tribals as well as local residents within the sanctuaries are allowed to collect dry fallen wood and headloads only, but due to improper monitoring (and lack of alternative livelihood option), extensive lopping and cutting of important timber species as well as non-timber species like *Butea* (Khakkharo), *Anoegeissus* (Dhav) etc., is being carried out for fuelwood and fodder purposes. On the other hand, almost negligible afforestation activity has taken place outside the sanctuaries to meet the local needs of fuel and fodder.

- What measures would be taken for the proper monitoring of lopping and cutting of trees? Is it possible to do so with existing policing arrangements? How should local communities be involved in not only monitoring, lopping and cutting but also in the conservation processes?
- What kind of arrangements are necessary to decrease the dependency of local communities on forest for fuelwood (by providing ample quantity of alternative fuels at subsidized rate) and also avoiding lopping for the sale of wood to earn livelihood?

C) Population pressures:

1. Given the honeycomb structure of the two sanctuaries, there is a widespread human pressure on forest through 114 villages situated within the sanctuaries. In addition, communities living around the sanctuaries also put pressure on the forest resources to meet their needs. The Gujarat Government seems to have decided not to relocate the villages present inside the sanctuary boundaries though it does want to restrict and regulate the eco-destructive practices.

- What kind of co-management strategy needs to be evolved which involves local communities as partners in conservation?
- Suggestions have been made by some of the local communities to allow them to be responsible for protection of earmarked areas. Some of the community leaders have

even suggested that they be authorized to collect fines if they apprehend the culprits. Will Forest Department like to experiment with such a policy?

- If the relocation is not planned, can the local community be made aware of this so that apparent tensions on this account be defused?
- Whether any kind of rationalization of boundaries of sanctuaries is planned? If yes, how will the consensus created around the new boundaries ensure fullest co-operation of people within and outside the sanctuaries.

D) Over-extraction and destructive modes of NTFP Collection:

Both the sanctuaries possess a variety of non timber forest products. NTFPs like *Safed Musali, Dhav and Kadaya gum, Khair* etc., are almost threatened now though they were actually in a great abundance in the past. Non-sustainable methods of collection, lack of alternative sources of income generation, exploitation by the traders, less remuneration paid by the GSFDC, restriction of selling nationalized NTFPs to government body (GSFDC) only, are few of the important factors playing a key role in the excessive collection of NTFPs from forest which is a major threat to biodiversity. We are yet to develop norms of sustainable levels of extraction of various NTFPs. In the absence of such norms, it is difficult to fully fathom the magnitude of conflict between the needs of wild life and that of local communities (for self consumption or for sale). In case the extraction of NTFP has to be reduced, without causing decline in the income obtained by local communities from collection and sale of the same, value addition may have to be attempted. To reduce pressure on forest and to totally stop the wood cutting and lopping practices, alternative means of livelihood will have to be strengthened.

- Can a suitable variant of Joint Forest Management (JFM) scheme be suggested for the sanctuary area in which, there can be a provision to collect NTFP. Should the harvest of timber or wood be totally stopped since the area is declared as sanctuary and conservation of biodiversity is necessary?
- What steps should be planned to increase the payment rates of NTFP by GSFDC?
- There are many weeds occurring commonly in the cultivated fields in sanctuary areas, which are of economic importance. Whether there is any policy to make their collection commercially viable and if any action regarding the same is suggested?
- Salt or some other stuff is given in exchange of few biological products (eg. *Cassia tora* seeds) which are in plenty in these areas, instead of hard cash. It discourages the local collection of the same. Local people tend to collect other NTFPs to make their ends meet since income for sale of products like *Cassia tora* seeds is meager. If proper rates or remuneration in form of cash is paid for such abundantly available biological products, they may not go for other NTFP collection. What can be done in this matter?
- Can the rights of direct trading of some Nationalized NTFPs be given to tribals or villagers residing in sanctuaries?
- If no trading of NTFP as such is permitted, can the value addition be permitted? If so, How? Will the local villagers be allowed to trade such value added products?

- Will processed (value added) NTFP be sold by people in open market without any intermediation of any government agency (like GSFDC)? What supportive role can GSFDC play?
- If yes, what kind of enterprises are permitted?
- What can be done for increasing regeneration rates of native species like *Boswellia serata* (Salai), gum of which has a great market value and demand too?
- Whether any special relaxation/incentives sought to be provided in future for tribals for the collection and trading of NTFP with or without value addition?

E) Invasive species:

- Several invasive species like *Lantana camara* , *Prosopis juliflora* and *Parthenium hysterophorus* (Congress grass)have started encroaching upon the otherwise good forested area. In some degraded areas, these species have restricted the emergence of native species.
- What measures are intended to control the spread of invasive species and to ensure their elimination in due course?

F) Industrialization:

According to the Central Government laws mining activities can not be carried out within the sanctuary areas, but it has been noticed that there are a number of marble mines in and around the sanctuary especially around Ambaji. In addition to these mining industries, there are a number of quarrying sites. The data collected from District cottage Industry Centre, Palanpur indicates the presence of a total of 114 small and large scale industries located in both the sanctuaries including 22 mines, 31 quarrying sites, lime stone and marble polishing units.

- What actions should be proposed to control the industrial activities, which cause destruction to the wildlife, their habitats and biodiversity?

G) Other issues:

2. Balaram-Ambaji sanctuary experiences a heavy traffic due to the presence of State Highway No. 54 cutting across the width of the sanctuary from West to East. Like wise State Highway No.56 connecting Danta and Ambaji, and State Highway No.9 is running parallel to the North-East contribute equally to the hectic traffic. These roads are used to transport bulky quarry products within and outside the Gujarat state. The fast moving traffic not only causes sound pollution but is also a major cause of animal road kills. Animals such as dogs, foxes, mongoose, snakes, and birds are easy prey to this traffic and have been spotted dead on the roads after being hit and run by them.
3. The temples of Ambjai, Balaram and some other places in and around sanctuaries have cultural and religious fairs frequently organized. Large masses gather on such occasions, some of these places have regular visitors through out the year. Besides cultural and religious values, the scenic beauty and rich heritage of wildlife in some areas qualify some of these places as potential eco-tourism centres. The systematic

efforts of eco-tourism will help promote positive environmental ethics and generate revenue without exploiting and degrading natural resources.[4]

- How do we plan to diffuse tensions among village communities particularly Maldharis and tribal regarding their possible relocation?
- How can the involvement of communities in conservation plans be enhanced and institutionalized?
- What efforts are proposed to support the research on documentation of local biodiversity and associated knowledge systems?

[4] Experts from the Wildlife Institute of India have made a quick survey in these two sanctuaries and outlined a draft proposal on eco-tourism for the major project

Annex VIII: Site Descriptions and Globally significant plants and animal

JESSORE WILDLIFE SANCTUARY

COUNTRY: India—Gujarat
IUCN MANAGEMENT CATEGORY: IV

BIOGEOGRAPHICAL PROVINCE: The Indian Desert Province 3A-KUTCH

LEGAL PROTECTION: Under Wildlife Protection Act, 1972.

DATE ESTABLISHED: The sanctuary was notified in 1978 (GHKH-65-78-WLP-2077-62041-P Dt. 6.5.1978). The settlement works are yet to be completed but is deemed to be sanctuary as per the Act.

GEOGRAPHICAL LOCATION: The sanctuary is a part of Aravalli range where Mt. Abu hills connect with Jessore hills. The Jessore hills form northern edge of Thar Desert. The National Highway No. 8 from Palanpur to Abu Road constitutes its eastern physical boundary.

LATITUDE: 24^{o} 20'-24^{o} 31'N

LONGITUDE: 72^{o} 23'-72^{o}37' E

AREA: It covers an area of 180.66 sq. km. of Banaskantha district.

LAND TENURE: State

PHYSICAL FEATURES: Agricultural fields in Gujarat and agricultural fields and wastelands in Rajasthan surround it. The entire area of the sanctuary is hilly except about 3000 ha of Kapasia. It has an altitude of 167-1090 meters above mean sea level. The minimum temperature recorded is 9^{o} celsius and the maximum 40^{o} celsius.

FOREST TYPES: The forests, which are found inside the sanctuary boundaries, are of the following types: -
Southern dry mixed deciduous forest ($5A/C_3$), *Zizyphus* scrub ($6B/DS_1$), Anogeissus forest ($6/E_1$), Butea forest ($5/E_5$), Dry deciduous scrub- *Acacia catechu* forest ($5/DS_1$), Secondary dry deciduous ($5/2S_2$), *Prosopis juliflora* forest ($6/E_3$).

FLORA: The sanctuary has dry deciduous type of forest. It is also rich in medicinal plants. Some of the tree species found here are Khair (*Acacia catechu*), izarael baval (*A. tortalis*), desi baval (*A. nilotica*), dhavado (*A. pendula*), ber (*Zizyphus* sp.), dhav (*Anogeissus latifolia*), dudhalo (*Wrightia tinctoria*), sissoo (*Dalbergia sisoo*), saladi (*Boswellia serrata),* kadaya *(Sterculia urens*), siras *(Albizia lebbeck),* vad *(Ficus sp.),* golar *(F. glomerata*), gando baval (*Prosopis juliflora*), khakhra (*Butea monosperma*), monad (*Launea coromandelica*), salai (*Boswillia serrata*), timru (*Drospyros melanoxylon*), umbho (*Miluisa tomentosa*), amla (*Emblica officinalis*), baheda

(*Terminalia bellerica*), semal (*Bombax ceiba*), kalam (*Mitragyna parviflora*), bili (*Aegle marmelos*), garmalo (*Cassia fistula*), karanj (*Pongamia pinnata*), umero (*Fiscus racemosa*), vad (*Ficus bengalensis*), tamarind (*Tamarindus indica*).

The undergrowth comprises of lodri (*Flacourtia indica*), indrajav (*Holarrhena antidysenterica*), regorea (*Balanities aegyptica*), ankol (*Alangium salvifolium*), kanther (*Cappus sapieria*) and aiti (*Helicteres isora*). The grass species include doop (*Cynodon dactylon*), dhaman (*Cenchrus setigerus*), dharo (*Cynodon barberi*), jejvo (*Andropogon pertusus*), chido (*Cyperus compressus*), chakali-chokha (*Sorghum* sp.), saraki-chokha, taradu (*Digitaria adscendens*), vans (*Dendrocalamus strictus*), bantiya (*Echinochloa frumentacea*), chinna (*Panicum* sp.), Kauni (*Echinochloa* sp.), sukhli (*Heteroppogon contortus*), Fulkani/baru (*Sorghum halepense*).

ENDANGERED AND THREATENED FLORA: *Anogeissus sericea, Cassia holosericea, Indigofera cutchicum, Commiphora wightii, Sterculia urena, Tecomella undulata, Solanum albicaule, Phoenix sylvestris.*

FAUNA: The main species in the sanctuary are the sloth bear (*Melursus ursinus*) estimated between 24-50, leopard (*Panthera pardus*), jungle cat (*Felis chaus*), civet cat, caracal (*Felis car*acal), wildboar, bluebull (*Boselaphus magocamelus*), wolf (*Canis lupus*), hyena (*Hyaena hyaena*), jackal (*Canis aureus*), Indian fox (*Vulpes bengalensis*), Indian langur, macaques, common mongoose (*Herpestes edwardsi*), pangolin (*Manis crassicaudata*), Indian hare (*Lepus nigricollis*), squirrel (*Funambusus* sp.), rats, wild boar, hedgehog and porcupine (*Hystrise indica*). The reptile fauna includes python (*Python molurus*), cobra (*Naja naja*), krait (*Bungarus caeruleus*), viper (*Echis carinata*), Russel's viper (*Vipera russelli*), bamboo pit viper (*Trimeresurus gramineus*), flapshell Turtle (*Lissemus pinctatea*), star tortoise (*Geochaloue elegans*), Indian chameleon (*Champacleon zeylanicus*), common Indian monitor (*Varanus bengalensis*), desert monitor and common snake, jungle fowl and spur fowl.

ENDANGERED FAUNA: wolf (*Canis lupus*), hyena (*Hyaena hyaena*), sloth bear (*Melursus ursinus*)**,** caracal (*Felis caracal*), jungle fowl and red spurfowl (*Galloperdix spadicea*).

VULNERABLE FAUNA: pangolin.

NWFP: Fruits of Amla (*Embilica officinalis*), Aritha (*Sapindus laurifolius*), Baheda (*Termelaria bellirica*), Jambu (*Eugenia jambu*), Musli (*Chlorophytum* sp.), Falsa, Timru (*Diopspyros melanoxylon*), Karamda (*Carissa carandas*), Bor (*Zizyphus* sp.), as well as bamboo*(Dendrocalamus strictus)* grass, honey, wax, gum and resin are utilised. Incidences of illegal gum tapping from Salai and Kadaya also has been reported.

MEDICINAL PLANTS: At the foothills the species found are *Angoeissus latifolia* Wall.*, Butea frondosa* Koen, Andarakh, *Anthocephalus cadamba* Nig, *Pongamia glabra* Vent.*, Vitex negundo* Linn., Prasarini, Nagwala, and *Clematis tribola heync (*Madhurasa is made out of it). Also found are medicinal plants *Cissamplelos parieira* Linn.*, Ipomoea*

digitata, Urinea indica Kunth, Jaypal *and* Mahabla. 9 different kinds of jujuba trees are found here: a) Matun (Jalapump), Jatrani, Sahranpuri, Champeli, *Zizyphus rotundifolia lamk*, Khareki (Ajmeri), Rayan Bor, Gir Bor and Surti (Randeri Bor). Fruits of jujuba trees are utilised in preparing starch while the lac of the same tree can be utilised as a means of birth control (Rajyagor 1981:44). Leaves of Jivanti (Sizroti) and flowers of Tylophora are locally used. Among creepers found are *Byronia scabrella and Bryonia lacinoiosa. Metha pulegium or Anacyclus pyrethrum* ('Karwi jori' in Gujarati or 'Vishnumushti' in Sanskrit) is a rare plant.

CULTURAL HERITAGE: There are two temples inside the sanctuary area – Kedarnath and Munim Ashram, which attract large crowds during religious festivities in the month of Kartik (October –November). Dharmata sacred grove (2500 sq. ft) is well preserved and acts as a refugia for birds.

CONSERVATION MANAGEMENT: A draft management plan has been prepared by the Forest Department but not finalized.

STAFF: The Banaskantha Forest division has 1 Deputy Conservator of Forest, 3 Assistant Conservators of Forest, 13 Range Forest Officers, 45 Foresters and 159 guards And the sanctuary is managed by a RFO, Jessore sanctuary under Deputy Conservator of Forests, Banaskantha.

BUDGET: The funds are provided by the Government of Gujarat and supported by Integrated Forestry Development Project, OECF, Japan.

VISITOR FACILITIES: A guesthouse and a Nature Interpretation Center.

SCIENTIFIC RESEARCH AND FACILITIES:

LOCAL POPULATION: Approximately 17 199 persons (1991)

DISTURBANCES, DEFICIENCIES AND MANAGEMENT PROBLEMS:

- The forests of this sanctuary were ones well connected with the forests of Mt. Abu and Ambaji which facilitated the free migration of the sloth bears and other animals but now they exists in patches. Kapasia village constituted a pivotal home for sloth bear.
- The area is a dense forest of *Prosopis*, which is suppressing the growth of local vegetation. Sheep and goats are playing a vital role in spreading this shrub.
- Grazing of the area by local and migratory livestock from neighboring villages.
- Pressure of fuelwood, and fodder collection.
- The area is frequented by periodic droughts.
- The management standard is good but habitat protection of the animals needs special attention. Forest fire, grazing and invasion of *Prosopis* need to be checked.

REFERENCE:

Singh,H.S. (1998). *Wildlife of Gujarat*. GEER Foundation, Gandhinagar, pp 47-49.

Rajyagor, Dr. S.B. (1981). *Gujarat State Gazetteers - Banaskantha District*. Government of Gujarat, Ahmedabad.

DATE: Revised on 18th May 1999.

ANNEXURE 1 CONTINUED

BALARAM-AMBAJI SANCTUARY

COUNTRY: India –Gujarat

IUCN MANAGEMENT CATEGORY: IV

BIOGEOGRAPHICALPROVINCE: The Indian Desert Province 3A-KUTCH

LEGAL PROTECTION: Under Wildlife Protection Act, 1972.

DATE ESTABLISHED: Sanctuary was notified in 1989 (GVN-27/WLP-1288/850/V.2 Dt. 7.8.1989). The settlement work of the sanctuary is yet to be completed.

GEOGRAPHICAL LOCATION: It is in the northern part of Banaskantha District in north Gujarat bordering Rajasthan.

LATITUDE: $21^{o}10'$-$20^{o}30'$ N.

LONGITUDE: $72^{o}20'$-$73^{o}0'$E.

AREA: 542.08 sq. km. It covers forest of 38 villages of Palanpur taluka, 56 villages of Danta taluka and one village of Vadgam taluka. The National Highway No. 8 from Palanpur to Abu Road constitutes its north-western physical boundary.

LAND TENURE: State

PHYSICAL FEATURES: Area of the sanctuary constitutes extreme western part of Aravalli, which extends from this area to N. Delhi. It constitutes northern end of the eastern tribal belt, which starts from Valsad and ends in Banaskantha. The height of the sanctuary is 170-900 meters above mean sea level. The minimum temperature recorded is 9^{o} celsius and the maximum 43^{o} celsius.

FOREST TYPES: This sanctuary has classified into two major forest types Saline ($5/E_8$) and Prosopis shrubland ($6/E_3$)

FLORA: The sanctuary has dry mixed deciduous type of forest and tropical thorn forests. It is also rich in medicinal plants. Some of the species found here are monad (*Launea coromandelica*) (16.2%), gugal (12.9%), khakhra (*Butea monosperma*) (10.9%), timru (*Diopspyros melanoxylon*) (9.9%), dhavado (*A. pendula)* (5.2%), bor (*Zizyphus* sp.), (4.2%) Khair (*Acacia catechu*) (3.3%). Other species include bili (*Aegle marmelos*), izarael baval (*A. tortalis*), desi baval (*A. nilotica*), dudhi (*Wrightia tinctoria*), saladi (*Boswellia serrata)*, golar *(F. glomerata*), kanji (*Holoptelia integrifolia*), karanj (P*ongamia pinnata*), arjun sadad (*Terminalia arjuna*), jamun (*Sizygium cuminii*), and baheda (*T. belerica*).

ENDANGERED FLORA: *Anogeissus sericea, Cassia holosericea.*

FAUNA: The main species in the sanctuary are the sloth bear (*Melursus ursinus*), leopard (*Panthera pardus*), jungle cat (*Felis chaus*), civet cat, hyena (*Hyaena hyaena*), jackal (*canis aureus*), wolf (*Canis lupus*), Indian fox (*Vulpes bengalensis*), bluebull (*Boselaphus magocamelus*), porcupine (*Hysterise indica*). The area is also rich in several species of rodents and bats. The area is also rich in python (*Python molurus*), and other varieties of snakes, lizards, tortoise and birds.

ENDANGERED FAUNA: wolf, hyena (*Hyena hyena*), and sloth bear (*Melursus ursinus*)**.**

NWFP: Fruits of Amla (*Embilica officinalis*), Aritha (*Sapindus laurifolius*), baheda, (*Termelaria bellirica*), Jambu (*Eugenia jambu*), Musli (Chlorophytum sp.), timru(*Diopspyros melanoxylon*), bor (*Zizyphus* sp.), bamboo*(Dendrocalamus strictus)* grasses, honey, wax, gum and resin.

MEDICINAL PLANTS: Danta hills, which are 1 000 to 1 500 feet high are part of the ancient Aravalli ranges. This physiological feature together with other factors has made Danta a treasure house from the point of view of Ayurveda. The forests of Danta are valued for trees such as *Embelica myrobalan, Terminalia bellirica* Roxb., *Sapindus trifoliatus, Pinus logifolia, Acacia catechu* Willd., *alngium lamarchi, Angoeissus latifolia* Wall., *Holarrhena antidysentirica* Wall., *Aegle marmelos* Corr., *Gmelina arborea* Roxb., *Withnia somnifera Dunal, Anthocephalus cadamba* Nig, *Wrightia tinctoria* R. Br., *Feronia elephantum* Corr., *Butea frondosa* Koen, *Reuvolfaia serpentina* Benth., *Bombay malbaricum* DC. and *Terminalia arjuna* Wt. & A. *Hemidesmus indicus* are also found in relative abundance.

The region near Balaram river is abundant in 'Jeevak' and 'Roosabhak'. Besides, *Anthocephallus indicus Rich* also found in plenty. Its flowers are locally used for birth control purposes.

CULTURAL HERITAGE: The Balaram forests have two temples inside the sanctuary area – Balaram temple and Ambaji temple. There is a sacred grove adjacent to the Balaram temple.

CONSERVATION MANAGEMENT: The draft Management Plan is under preparation.

STAFF: The Balaram Forest division has 1 Deputy Conservator of Forest, 3 Assistant Conservator of Forest, 13 range Forest Officer, 45 Foresters and 159 guards and the sanctuary is managed by a RFO, Jessore sanctuary under DCF, Banaskantha.

BUDGET: The funds are provided by the Government of Gujarat and supported by Integrated Forestry Project, OECF, Japan.

VISITOR FACILITIES: A guesthouse (class A) and a Nature Interpretation Center.

SCIENTIFIC RESEARCH AND FACILITIES:

LOCAL POULATION: Approximately 80 703 persons (1991).

DISTURBANCE, DEFICIENCIES AND MANAGEMENT PROBLEM:

- Fragmentation of the sanctuary by settlements, encroachments and other activities.
- Local and migratory livestock from neighboring villages and Rajasthan is grazing the area.
- The area has rich source of marble and is being exploited by mining and industry.
- It is also experiencing the colonization of the area by *Lantana camera, Acacia tortalis, and Prosopis juliflora* species.
- Railway lines and roads interrupt the area.
- Level of protection is poor because of the prevailing illegal cultivation, grazing, forest fire, fuelwood collection and delay in settlement works. Plantation of *A. tortalis* has improved the vegetation cover but the habitat improvement for the endangered species is still lacking.
- Other problems faced by the sanctuary are the forest fire, droughts and water scarcity.

REFERENCE:

Singh,H.S. (1998).**Wildlife of Gujarat**.GEER Foundation, Ahmedabad. pp 42-43.
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DATE: Revised on 18th May 99.