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FOR

COASTAL BASED ACTIVITIES

IN

ORISSA

(BIODIVERSITY CONSERVATION: CONSERVATION OF FLORA AND FAUNA)

GOVERNMENT OF ORISSA

PRINCIPAL CHIEF CONSERVATOR OF FORESTS (Wildlife)
PRAKRUTI BHAWAN, 5TH FLOOR, NILAKANTHA NAGAR,
BHUBANESWAR-12.

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SECTION 1-Project context

A. State of (State) - A Brief Profile

The coastline in Orissa stretches over a length of 480 kms. from Subarnrekha river mouth near Orissa-West Bengal border to Ichhapuram bordering with Andhra Pradesh (Map-1). The coast is important not only to fishermen but also to people located near the coast. The mangrove provides a natural shelterbelt against the cyclones, super cyclones and tidal surges. The coasts as well as coastal waters are also important due to presence of a large number of ecosystems such as coastal, marine and estuarine which is extremely rich with bio-diversity. In Orissa, the coast along the mainland and islands also provides nesting ground to large number of Olive Ridley turtles. The coast is also quite important from tourism point of view. The Coastal belt in the state is under severe pressure. The unscientific use of coast along with natural factors is also leading to coastal erosion. To protect the vast coastal and marine biodiversity along with the interest of people living on and near the coast, protection and proper management of coastal areas are essential.

The coastal areas in Orissa State are spread over six districts, namely Balesore, Bhadrakh, Kendrapara, Jagatsinghpur, Puri and Ganjam. These come under the jurisdiction of Balesore, Bhadrakh, Rajnagar, Puri and Chilika Wildlife Divisions under the Principal Chief Conservator of Forests (Wildlife) & Berhampur Division under the Principal Chief Conservator of Forests Orissa.

The project areas included in the present World Bank Assistance Scheme for coast based activities in Orissa includes two important stretches of the state's coast line which includes (i) Dhamara - Paradeep Stretch and (ii) the Gopalpur Chilika stretch (Map-2).

Statement of significance:

(a) Dhamara - Paradip stretch (SITE 1)

It includes Bramhani, Baitarani and Mahanadi deltaic region of Kendrapara district in northeastern part of the coastal state of Orissa.

State, Province or Region

ORISSA, KENDRAPARA DISTRICT

Protected Area Network within SITE 1

2107 sq. km (It includes 672 sq. km of Bhitarkanika Wildlife sanctuary/NP + 1435 sq. km of Gahirmatha (marine) Wildlife sanctuary).

Geographical coordinates of the PAN to the nearest second

20⁰ 17' 32"N to 20⁰ 48' N latitude

86⁰ 45' E to 87⁰ 17' 36'E longitude

Dhamara - Paradip stretch of the coastal Orissa includes Bhitarkanika, which is both a sanctuary, and National Park (Map-3). It is good representative of mangrove wetland ecosystem having high genetic and ecological diversity. The floral diversity of Bhitarkanika is known to be the largest in India and second largest after Papua New Guinea. It is one of the best reptile refuge in the entire country as well as in the whole of South East Asia region. The coastal waters adjoining Bhitarkanika is a marine sanctuary known as the Gahirmatha marine wildlife sanctuary (Map-4).

This site epitomises the merging of four different eco-systems namely terrestrial, fresh water, estuarine and marine ecosystems, and shows all variations in genetic, specific and ecological diversity of both plant and animal communities. The peripheral areas in the buffer zone are dotted with numerous ornithologically important wetlands.

The site contains the most important and significant natural habitats for in-situ conservation of biological diversity containing 5 Amphibian species, 42

threatened species of outstanding universal value from the academic and conservation point of view. It includes Schedule-I animals of different categories namely Mammals (8 species), Birds (3 species) and Reptiles (16 species). As such the area is a treasure trove for botanical and zoological studies and research.

The site contains 300 plant species including both mangroves and non-mangroves. The wetland supports one of the largest mangrove plant diversity in India, and comprises of 82 species of mangroves and its associates. It harbours three varieties of Sundari trees (*Heritiera* sps.) including *Heritiera kanikensis*, which is an endemic species.

Table-1: Status of Mangrove covers in different districts of Orissa (Sq.km)

	1997	1999	2001	2003	2005
India	4827	4871	4482	4461	4445
Orissa	211	215	219	207	203
Balasore	3	3	3	4	4
Bhadrak	17	18	19	20	20
Jagatsinghpur	10	10	5	3	4
Kendrapara	181	184	192	180	175

The site contains one of the world's largest nesting and breeding ground of the endangered Olive ridley sea turtles. This seasonal phenomenon is considered as one of the greatest extravaganza of nature. It also holds areas of exceptional natural beauty and aesthetic importance. Gahirmatha sea beach along the coast being world's largest rookery attracts over half a million female olive ridley sea turtles for mass nesting/ egg lying.

MASS NESTING OF OLIVE RIDLEY SEA TURTLES IN ORISSA COAST:

The total numbers of Olive ridleys mass nested during the last five years are as follows:

Table-2: Number of nesting turtles at Gahirmatha and Rushikulya rookery in different years

Season	No. of nesting turtles (in lakhs)		Total (in lakhs)
	Gahirmatha	Rushikulya	
2003-2004	2.43	2.01	4.44
2004-2005	2.34	0.89	3.23
2005-2006	2.67	1.98	4.65
2006-2007	1.46	-	1.46
2007-2008	-	1.80	1.80
2008-2009	1.67	2.61	4.28

TABLE-3: OLIVE RIDLEY SEA TURTLE CASUALTIES ALONG ORISSA COAST IN DIFFERENT YEARS

<u>Year</u>	<u>Number of turtle casualties</u>
2001-2002	12,977
2002-2003	10,086
2003-2004	04,981
2004-2005	03,227
2005-2006	03,242
2006-2007	04,046
2007-2008	05,763
2008-2009	05,680

It is home to the largest population of the endangered estuarine crocodiles (*C. porosus*) in the Indian Sub-continent. The largest living crocodile in the world (23'+) is a denizen of this site (Guinness Book of World Record, 1994, 2006).

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Table-4: Population status of estuarine crocodiles in Bhitarkanika as per census results conducted in different years (2000 to 2009)

Size class	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Hatchlings	319	341	441	484	525	681	657	503	538	538
Yearlings	181	277	340	370	303	290	283	368	343	375
Juveniles	123	237	187	180	210	169	197	259	231	264
Sub-adults	145	36	145	82	100	107	122	135	143	148
Adults	146	107	217	192	220	207	203	232	261	271
Total	914	1098	1330	1308	1358	1454	1462	1497	1516	1596

Bhitarkanika also contains a high density of the India's largest water monitor lizard (*Varanus salvator*).

Species diversity of birds at this site is 269 including more than 60 species of migratory waterfowl (about 0.2 million birds). It has a site for community nesting of aquatic birds (heronry), where 12 wetland bird species nest and roost together annually (June to October) and rears the fledglings. It is also home to eight varieties of kingfishers including a sizeable population of endangered Brown-winged kingfishers.

The mangrove ecosystem in the Bramhani- Baitarani- Mahanadi deltaic complex is the nursery and spawning ground of several species of fish, prawn and crabs as well as other invertebrates. It is also the breeding ground of several rare and endangered species of wildlife.

The entire project area is an outstanding example of dynamic land developmental processes including both accretion and erosion.

(b) Gopalpur Chilika stretch:

Gopalpur Chilika stretch of the coastal Orissa includes Chilika, which is the largest brackish water lagoon of the country as well as the whole of Asia (Map-5).

Sq. km during summer, and extends over Puri, Khurda and Ganjam districts. The lagoon itself can be broadly divided in to four natural sectors based on salinity and depth such as the southern zone, central zone, northern zone, and the outer channel. Numerous islands are present in the lagoon, prominent among which are Kalijai Island, Honeymoon Island, Barakuda Island, Breakfast Island, Birds Island, etc. The ecosystem features of Chilika comprises of tidal ingress from the sea, which mixes with the fresh water brought by rivers like Daya, Bhargabi, Luna, and large number of rivulets.

One of the submerged (potential) islands covering, an area of 15.53 Sq. km has been notified as Chilika (Nalaban) Wildlife Sanctuary on 17th December 1987. The whole area of the Chilika lagoon, excluding the area notified as Sanctuary has been declared as a 'Closed Area' with effect from 16th December 2002.

There are 546 species of angiospermic plants belonging to 379 genera and 107 families, above 100 phytoplankton genera, 20 species of weed and 7 pteridophytic species documented so far in the lagoon and the islands.

Chilika is very rich in both invertebrate and vertebrate fauna. This Ramsar site is the habitat for the largest congregation of waterfowls in India. Over a million birds congregate in this water body for feeding and roosting. Migration commences in late September and the birds remain up to April, but the peak congregation period is mid-December to middle of January. Birds belonging to over 230 species including 14 birds of prey species (32% aquatic, 22% waders, and 46% terrestrial birds) are seen in this lake, of which 95 species are intercontinental and local migrants. Flocks of migratory waterfowl arrive from as far as the Caspian Sea, Lake Baikal, and remote parts of Russia, central and south East Asia, Ladakh and the Himalayas for feeding and roosting. 15 species of ducks and two species of geese (Order: Anseriformes), cover over 70% of the migratory birds which visit this lagoon annually. The ducks and geese are followed by coots, rails and cranes (Gruiformes) 15%; waders/shore birds (Charadriiformes) 12%; pelicans (Pelecaniformes) 1.5%; grebes (Podicipediformes) 1%; kites, eagles etc. (Falconiformes) and kingfishers (Coraciiformes) 0.5%.

In Chilika during the current bird migration season, maximum congregation of waterfowl (migratory and local) was observed in peripheral marshy areas of the lagoon such as: Kalupada ghatt, Manglajodi, Soran, etc.

The other vertebrate fauna includes:

- 321 species of fish (fresh water, estuarine and marine species),
- 7 species of amphibians,
- 30 species of reptiles (12 species of lizards and 18 species of snakes) and
- 18 species of mammals.

Two major crabs species (*Scylla serreta* and *Neptunus pelagicus*), available in Chilika are of commercial importance.

The population of Irrawaddy or Snubfin dolphins, *Orcaella brevirostris* (locally known as “Bhuasuni Magar”) is threatened due to intensive fishing and plying of mechanised boats in the lagoon. To prevent the above massive awareness campaign has been taken up by the Chilika wildlife division and Chilika Development Authority. At present there are 135 Irrawaddy dolphins in the entire lagoon. A small population of Bottle nosed dolphin, *Sousa chinensis* also migrates in to the lagoon from the sea.

The mass nesting beach (rookery) of the endangered Olive ridley sea turtles along the Chilika coast is at Rushikulya which is located at the southern Orissa coast. It spreads over six km. stretching from the coastline in front of village Purunabandha (one Km north of Rushikulya river mouth) to the beach in front of Kantiagada village of Ganjam District. The nesting beach is much wide, more or less flat with scattered sand dunes of 1 – 2 m high. The average beach width is about 100 m from near the high tide line, though at some places the width of the beach is more than 100 m. An estimated number of about 2,00,000 turtles are nesting in this rookery each season.

Most notable and endangered species also included in the Schedule-1 of the

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- *Barkudia insularis*, a limbless lizard/skink (this skink is named after the “Barukuda” island of the lake);
- an aquatic mammal i.e., Irrawaddy dolphin, *Orcaella brevirostris*,
- Fishing cat (*Felis viverrina*),
- White bellied sea eagle (*Haliaeetus leucogaster*), White spoon bill (*Platalea leucorodia*), Osprey (*Pandion haliaetus*), and
- Spoon billed sandpiper (*Eurynorhynchus pygmeus*).
- Olive ridley sea turtle (*Lepidochelys olivacea*)

The changing profile of the lake has led to new challenges. The bird congregation, which was largely confined to Nalaban and other four to five areas, has now dispersed to peripheral areas such as Kalupada, Mangalajodi, and Bhusandpur, etc. This has posed a problem of protection of birds due to difficulty in accessibility of the area and constraint of resources. Increase in tourism inside Chilika has given rise to death of Irrawaddy dolphins, which may at a later stage be detrimental to the overall population of these endangered dolphins. This, however, has also offered opportunities to work hand in hand with other stakeholders working in the area for overall conservation of the lagoon.

B. Physiography of the State:

The terrain of the landscape bordering of the Bay of Bengal comprises sandy sea beach backed by wetlands with natural mangrove forest and interrupted by a network of tidal rivers, creeks and crick lets of the major river systems of the state of Orissa namely, Bramhani, Baitarani, Dhamara, Mahanadi, Rushikulya, Bahuda, etc.

The monsoon prevails from middle of June and continues till September with occasional rains during October. The tides are of semi-diurnal type.

C. Coastal Resources / Marine Areas of the State

C.1 The coastal areas in Orissa state are spread over six revenue districts, namely Balesore, Bhadrakh, Kendrapara, Jagatsinghpur, Puri and Ganjam. These come under the jurisdiction of Balesore, Bhadrakh, Rajnagar, Puri and Chilika

Berhampur (Territorial) forest Division under the Principal Chief Conservator of Forests Orissa.

As per the State of Forest Report 2005, mangroves in Orissa are spread over an area of 203 km² of the coast. Kendrapara district has maximum of mangrove cover in the state (175 km²), followed by Bhadrakh district (20 km²), Jagatsinghpur district (4 km²) and Balesore District (4 km²).

The major river deltas are Subarnarekha, Budhabalanga, Baitarani, Bramhani, Dhamara, Mahanadi, Devi, Keluni, Rushikulya and Bahuda, which have mangroves (Map-6). Besides, Chilika lagoon has also some mangroves.

The river systems draining into the Bay of Bengal forms extensive deltas, which support mangrove forests. The mangrove forests though extends over six major river deltas such as Subarnarekha, Budhabalanga, Bramhani-Baitarani, Mahanadi and Devi covering a total area of 203 sq. km. The Bhitarkanika Wildlife Sanctuary/ National Park in Bramhani-Baitarani deltaic area, the largest (150 sq. km approx.) among the available patches in Orissa harbor India's richest mangrove forests in terms of species diversity. Mangroves in other areas are mostly degraded by a variety of factors, the most significant of which has been conversion to brackish water fishponds.

The diverse climatic conditions of Bhitarkanika mangrove wetland provide ideal habitat to a varieties of invertebrate and vertebrate fauna (lizards, snakes, saltwater crocodiles, varieties of waterfowl, mammalian species etc.). It is one of the best reptile refuges in the world. Besides, it provides an ideal habitat to the largest population of saltwater crocodiles, *Crocodylus porosus* including the partial white crocodiles in India. Bhitarkanika mangrove wetland has been declared as one of the Ramsar sites i.e. wetland of international importance on 19th Aug, 2002. It is the second wetland to be declared as Ramsar site in the state and one of the 19th in the entire country. The other designated Ramsar site in the state is Chilika, which is important for the migratory birds, Irrawaddy dolphins and other estuarine and marine fauna including sea turtles.

C.2 The identified project sites of the coastal belt of Orissa for protection of its rich biodiversity has a network of Protected Areas (PAs) notified under the Wildlife (Protection), Act, 1972 (Maps-3, 4 and 5), which are as follows:

- (1) Bhitarkanika Wildlife Sanctuary
- (2) Bhitarkanika National Park
- (3) Gahirmatha Marine Wildlife Sanctuary
- (4) Chilika (Nalabana) Wildlife Sanctuary

The identified project sites of the coastal belt of Orissa for protection of its rich biodiversity has also a net work of Marine Protected Areas (MPAs) notified under the Orissa Marine Fisheries Regulation (OMFR), Act 1981 (Map-7) which are as follows:

- (1) 20 km seaward radius of Gahirmatha area
- (2) 20 km seaward radius of Rushikulya river area

D. Coastal Zone Management-status

D.1 Laws & Policies-CRZ, CMZ

- (1) Wildlife (Protection) Act, 1972 amended 2006.
- (2) Forest Conservation Act 1980.
- (3) Environmental (Protection) Act 1986 including CRZ rules.
- (4) Orissa Marine Fisheries Regulation (OMFR) Act 1981.
- (5) Orissa Prevention of Land Encroachment (OPLE) Act

D.2 Institutions / Authorities (roles and responsibilities):

i. Government of Orissa, Forest and Environment Department: The Administrative Department in the Government responsible for implementation of various Policies relating to forest, wildlife and environment laws.

ii. Principal CCF (Wildlife) & Chief Wildlife Warden, Orissa, Bhubaneswar: The authority to implement policies and programmes of Government relating to wildlife, its habitat and related issues and to enforce the various laws relating to Wildlife and its habitat through its

a) Supervisory Officers:

- i. Conservator of Forests, Bhubaneswar Circle
- ii. Conservator of Forests, Berhampur Circle
- iii. Conservator of Forests & Field Director, STR, Baripada

b) Executing Officers:

- i. DFO, Mangrove Forest Division (Wildlife), Rajnagar
- ii. DFO Chilika (Wildlife) Division Balugaon
- iii. DFO Berhampur Division (Territorial) Berhampur
- iv. DFO Bhadrakh (Wildlife) Division
- v. DFO Balesore (Wildlife) Division

D.3 Status of implementation so far

Conservation and protection of flagship species like wetland birds, sea turtles, cetaceans like the dolphins and whales, crocodiles other wildlife and mangroves in the project sites have been attempted with limited financial resources from Govt. of India and Govt. of Orissa.

Specific details

Following projects for protection and conservation of flagship species in the coastal zone of Orissa have been undertaken in the state.

1. Launching of the GOI/ FAO/ UNDP supported Integrated Crocodile and Sea turtle conservation project in the mid 1970s: the population of the endangered crocodilian species has been considerably increased in the river systems of Bhitarkanika through the grow-rear and release programme. The programme is very successful in Bhitarkanika.
2. Under the APO of Gahirmatha marine wildlife sanctuary, funding support is provided for protection and conservation of flagship species like the endangered sea turtles, cetaceans and other aquatic wildlife.
3. Under the APO of Bhitarkanika Wildlife Sanctuary/ National Park, funding support is provided for protection and conservation of flagship species like the endangered estuarine crocodiles, cetaceans, other aquatic as well as terrestrial wildlife species.
4. Under the APO of Chilika (Nalabana) Wildlife Sanctuary funding support is provided for protection and conservation of flagship species like the wetland birds, cetaceans as well as other aquatic species.
5. Under the APO of Konark – Balukhand Wildlife Sanctuary funding

like the endangered blackbucks as well as other terrestrial and aquatic species.

The following Management Action Plans (MAPs) for conservation and management of mangroves/ schemes of government of India are now being implemented in the state under conservation and management of mangroves under 100% central assistance (Map-8):

1. **MAP on Bhitarkanika Mangroves** (implemented by Mangrove forest Division, Wildlife, Rajnagar)
2. **MAP on Mahanadi delta Mangroves** (implemented by Mangrove forest Division, Wildlife, Rajnagar)
3. **MAP on Dhamara Mangroves** (implemented initially by Mangrove forest Division, Wildlife, Rajnagar was subsequently transferred to Bhadrakh Wildlife Division)
4. **MAP on Devi-Kadua Mangroves** (implemented by Puri Territorial Forest Division,
5. **MAP on Subarnarekha Mangroves** (implemented by Baripada Forest Division.
6. **MAP on Chilika Mangroves** (implemented by Chilika Wildlife Division, Balugaon)

Besides, Kalibhanjdia island in Bhitarkanika has been designated as the **National Mangrove Genetic Resources and Conservation Center (NMGRCC)** of the country.

D.4 Current capacity building programs-achievements and limitations:

Within the Division capacity building programmes/ training is being organized for specific programme and activities for the field staff. With these training the staffs have been discharging their job. But as job of staff is transferable so training is required regularly.

Capacity building is required to upgrade the skills for identification of flora and fauna, specific training for updating the skill to take up census for birds, Crocodiles, sea turtles, dolphins, etc. Capacity building for raising nursery and taking up Mangrove plantation through different models, upgrading the skill to do

approaches and standard procedures adopted in other States and countries for staff at all levels are highly required to ensure greater success in programme implementation and achieving success.

Achievements:

- i. Best possible protection is being provided to mangroves, coastal casuarinas, crocodiles, sea turtles, dolphins, lizards, avifauna etc. with limited resources.
- ii. Awareness, motivation and education has been provided to nature lovers through eco-tourism about necessity of conservation and protection of bio-diversity.
- iii. Research activities: Specific research schemes have been undertaken relating to status survey of flag ship species like the crocodiles, sea turtles, dolphins, blackbucks, avifauna, etc.

Limitations:

- i) Shortage of staff
- ii) Aging of most of the existing staff
- iii) Lack of adequate communication and transport facilities
- iv) Inadequacy of amenities for staff
- v) Non-availability of sea worthy vessels for complete protection of sea turtles, dolphins and other marine life forms is not possible in their mating and breeding grounds.
- vi) It is not possible to check infiltration of intruders from neighboring states and country for illegal sea fishing activities.
- vii) Lack of adequate facilities and amenities for tourists
- viii) Lack of adequate fund to maintain the degraded mangrove forest

D.5 Overall budget/ resources spent in CZM in (State)

- (i) Expenditure on Management Action Plan (MAP) on Mangroves:

(From 2002-03 to 2006-07 for sites such as Bhitarkanika, Mahanadi Delta,

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- (ii) Expenditure on Annual Plan of Operation (APO) of Sanctuaries/ National Parks:

(From 2002-03 to 2006-07 under APO of Bhitarkanika N.P., Bhitarkanika Sanctuary, Gahirmatha Sanctuary, Balukhand-Konark sanctuary and Chilika – Nalabana sanctuary) (Rs. 465.4155 or 465. 16 lakhs)

Under MAP	147. 66 lakhs
Under APO	465.16 lakhs
Total:	612.82 lakhs

D.6 Key Issues in coastal zone management (entire [state])

- i. Inadequate natural cyclone shelter belt (Environment of the mangrove area)

(Degradation of natural barrier to cyclones such as mangrove forests)

- ii. Encroachment of coastal land and land put to improper use causing environmental degradation.
- iii. Disturbances to the habitats of sea turtles and other aquatic wildlife.
- iv. Illegal fishing in marine protected areas/ No Fishing Zones. (Protection of Olive Ridley turtles and their hatchlings as well as other marine wildlife on the coast and coastal waters.)
- iv. Un-regulated mass tourism in the coast.

(a) Institutional coordination issues-sub-state set up? Decision-making structures?

- i. For multi disciplinary activity relating to Protection of Olive Ridley Turtles and mangroves, there are State level committees (High Power Committee on protection of sea turtle under the chairmanship of Chief Secretary of State Govt. involving departments such as Forest, Fishery, Home, and Govt. of India agencies like the Coast Guard, DRDO, etc.
- ii. For other routine work, co-ordination among all district level officers exists.

(b) Pollution? Sewage? Marine life & resources? Salinity ingress? Livelihood issues-fisheries? Oil spill risk management?

- (i) Infiltration of people from Bangladesh causing illegal encroachment in mangrove, fishing and devastation of coastal and natural resources.

(ii) There is pollution problem due to presence of large number of

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Oswal Oil Refinery, Fertiliser Industry etc. In addition large number of tourists in Bhitarkanika and other areas also cause certain pollution.

- (iii) Sewage at present is a localized problem.
- (iv) There is over exploitation of marine life, mangrove forests and Casuarinas Plantation.
- (v) Salinity ingress is a problem in habitations specially affecting cultivation etc. unlike its usefulness in Mangrove areas.
- (vi) Livelihood issues are a concern in the area. Dependence of local population on forest and fisheries resources leads to over exploitation. Agriculture is not well developed. During lean season and during calamities there is problem for sustenance.
- (vii) No major problem relating to Oil spill has been faced. However due to presence of Oil Refinery close by and use of large number of Trawlers etc, are cause of concern. No arrangement to tackle this problem exists in case if any mishap takes place due to oil spill.

E. Key learning from CMZ activities

E.1 Important activities implemented in last 10 years

- (i) Protection to important fragile ecosystem and keystone species.
- (ii) Consolidation of forest blocks through forest settlement Proceedings.
- (iii) Conducive environment provided to Olive Ridley Turtles for mass breeding and mass nesting.
- (iv) Participation of local people ensured in conservation and protection of Bio-diversity by creating Eco-development committees and V.S.S.
- (v) Eco tourism developed.
- (vi) Census techniques for birds, Crocodiles, turtles, dolphins etc. standardized.

E.2 Success and failures:

Success:

- (i) Eviction of encroached areas to a large extent.
- (ii) Plantation along evicted areas
- (iii) Awareness creation to conserve and protect bio-diversity.
- (iv) Potential of eco tourism recognized.
- (v) Local people involved in conservation efforts.

Failure:

- i) Re-encroachment of plantation areas.
- ii) Unable to provide full protection to the mangrove areas and coastal seas which is the mating and breeding ground of Sea turtle, Whale and Dolphin, etc.
- iii) Dependence of people on marine and forest resources could not be reduced significantly as alternate livelihood options to sustain people could not be ensured.

F. Justification for the Project (SWOT):

Although awareness has been created among masses for protection and conservation of bio-diversity, still due to increased human population and their requirement pressure on bio diversity continues. For want of adequate resources, it is not possible to check biotic pressure and to compensate for the losses of individuals if they do not use and harvest the bio-diversity.

There is trained manpower, capacity of local people has been enhanced, problems are well defined and solutions are also known provided adequate resources are provided.

Thus this project will ensure strengthening the efforts already going on

SECTION II-THE PROJECT

A. [STATE]'s Vision and Strategy for ICZM:

- (i) Long-term scientific management of the coastal zone and its resources in an integrated manner through multi-disciplinary approaches and adopting the success stories and standard procedures from other areas.
- (ii) Protection of coastal and marine biodiversity of dynamic ecosystems.
- (iii) Providing ecological security to the species and eco-systems.

B. Project Objectives and Key Indicators:

The main objective of the Project is conservation of Bio-diversity on and along the coast and coastal waters.

The important species and eco-systems, which need immediate attention and the process to achieve these objectives, are:

- (i) Preservation and propagation of mangroves and mangrove associates both banks of all tidal influenced rivers, creeks and mud flats through massive plantation and protection through community participation.
- (ii) Protection to Olive ridley sea turtles, Dolphins, Whales and other marine life forms.

Key Indicators:

- (i) Density of vegetation assessment through satellite imagery will be a key indicator for the state of conservation of mangroves.
- (ii) The estuarine crocodiles being at the apex of the food chain in tidal rivers are the keystone species/ indicator species. Assessment of their population and sighting success of different size class of individuals from time to time will be a key indicator for the state of conservation of estuarine crocodiles.

Similarly Olive Ridley sea turtles are also keystone species/ indicator species in the coastal ecosystem. Continuance of mass nesting and reduction of mortality of adult sea turtles due to sea fishing related activities will be a key indicator for the state of conservation of Olive Ridley sea turtles.

Sighting trends of cetacean species such as Dolphins and Whales and reduction of mortality of these species due to sea fishing related activities will be the key indicator for the state of conservation of cetaceans.

Protection to other marine life forms can be known from the status of the population of the above keystone species/ indicator species in the tidal rivers/ estuaries as well as coastal ecosystem.

C. Project's Guiding Principles and Key Design Features

The guiding principles of the project are as follows:

- (i) Identification of the mangrove forest areas which has been degraded or evicted from encroachment and to restore such areas by taking up plantation of appropriate species and providing protection.
- (ii) Addressing the issue of protection of certain keystone species/ indicator species and their habitat along coastal stretches.
- (iii) Seeking co-operation of people for protection of environment by creating awareness among masses and motivating them for the cause of protection of bio-diversity.

D. Project Area Description:

The project area is basically part of Coastal areas of Orissa extending from Dhamara to Patisonapur (border with Andhra Pradesh) which includes land mass and parts of territorial waters extending up to 12 nautical miles into the sea from the high tide line (Map-2).

These coastal areas fall within the jurisdiction of DFO, Mangrove Forest Division, Rajnagar, DFO Chilika (WL) Division and DFO Berhampur (Territorial) Division.

Dhamara-Paradeep stretch to be implemented by Mangrove Forest Division

implemented by Chilika Division (Wildlife), Balugan and Berhampur (T) Forest Division.

The entire area is very rich in bio-diversity. There are coastal shelter belt of Casuarina, natural shelterbelt of mangroves, estuary of large rivers like Mahanadi, Baitarani, Bramhani, Daya, Devi, Kadua, Rushikulya, Bahuda, etc. (Maps-6 and 8).

There are important protected areas in the Project sites namely Bhitarkanika sanctuary/ National Park, Gahirmatha marine sanctuary, Balukhand-Konark and Chilika- Nalabana sanctuaries (Maps-3, 4 and 5).

The project site includes three mass nesting sites of Olive Ridley sea turtles at Nasi, Devi and Rushikulya river mouth forming largest rookery in the world including the coastal waters which are the mating and breeding ground of the species (Map-9).

The coastal waters also form the habitat for the marine mammals like whales, dolphins, porpoises, horse shoe crab, sea horses, coral reef, sea grass beds, etc.

The project site also include important tourist destination of state like Bhitarkanika sanctuary, Puri Beach, Chilika lagoon, Nalabana sanctuary, etc.

The populations in the vicinity of these coasts are basically dependent on the forest and marine products for their livelihood.

E. Project Description & Scope:

Project Description:

- Protection of breeding ground of sea turtles, dolphins, wet land birds and other terrestrial as well as aquatic wildlife.
- River bank mangrove plantation
- Restocking of existing degraded mangrove forest
- Protection of existing mangrove forests and casuarina plantation
- Eco tourism development.
- Resource generation and livelihood opportunity

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Scope:

- Safe guarding Olive ridley breeding and spawning ground of aquatic life forms.
- Protection to endangered species and increase of population of marine life forms.
- Helping a sustainable and responsible fishing.
- Complete protection to designated marine protected area
- Maintaining ecological balance in marine ecosystem.
- Appreciation of rich natural coastal biodiversity for long-term scientific management.
- Restoring natural mangrove forests and taking up casuarina plantation for shelter belt
- Development of awareness among national and international community with more employment generation scope.

F. Project Components and Component Description

Dhamara-Paradeep stretch of the project area to be implemented by Mangrove Forest Division (Wildlife) Rajnagar. The Gopalpur-Chilika stretch of the project area to be implemented by Chilika Division (Wildlife), Balugan and Berhampur (T) Forest Division, Berhampur.

**A: MAJOR ISSUE: BIODIVERSITY CONSERVATION:
SUB-ISSUE: CONSERVATION OF FLORA AND FAUNA**

F.1 Component A:

Restoration of Mangroves:

Plantation of mangroves/ mangrove associates and other suitable species:

Adjoining to the Gahirmatha marine sanctuary, an area extending over 672 sq. km has been declared as a Sanctuary in 1975. Part of the area is a National Park declared in 1998 over an area of 145 sq. km. of pristine mangrove forests under Wildlife (Protection) Act, 1972. Under the Annual Plan of Operation as well as Management Action Plan, all forest blocks, which are encroachment free, have been planted with mangroves. However, the areas along the many of the tidal rivers and creeks in the area, which are non-forest lands, are presently devoid of mangroves. It is, therefore, proposed to take up plantation of mangroves/ mangrove associates in the above areas, which in the long run will act as a natural cyclone shelterbelt (Map-10). The above will also help in stabilization of tidal riverbanks, prevent soil erosion and act as a buffer zone. Besides, some plantation shall also be taken up in the village areas through community participation through distribution of seedlings of suitable species.

Besides Bhitarkanika region, there also exists a scope of re-vegetating the deltaic regions of Rushikulya and Bahuda river mouth areas with mangroves and mangrove associates, etc. (Map-11).

**Table-5: MANGROVE FOREST COVER IN ORISSA IN DIFFERENT YEARS:
(as per Remote Sensing information of various National/State agencies)**

Year	Estimated area in Sq. km.
1975	234
1980	227
1985	217.12
1987	199
1989	192
1991	195
1993	195
1995	195
1997	211
1999	215
2001	219
2003	207
2005	203

Source: NRSA: 1975

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Thus about 2 Sq.km. of mangrove forests were being lost per year in Orissa and this trend continued from 1975 till 1989. This deterioration had resulted in severe imbalance in the meteorological, climatic and ecological conditions of the coastal belt. There is already alarming reports about coastal erosion north of Paradeep, which about few decades ago maintaining a perfect balance. Repeated occurrences of severe cyclones along the coastal tracts and the recent super-cyclone of 29th October, 1999 have demonstrated the ecological importance of the mangroves as wind barriers for shore line protection and coastal erosion control. Since 1989, due to the stringent actions as well as management interventions of Wildlife Wing of the Department of Environment and Forests of government of Orissa supported by Ministry of Environment and forests of Government of India, rapid depletion of mangrove cover has been arrested. Massive plantation programmes along with rigid and religious protection of the natural mangrove forests have resulted in net increase of about 27 km² of mangroves in the state during the last 15 years period from 1989 to 2003.

Table-6: Status of Mangrove covers in different districts of Orissa (Sq. km)

	1997	1999	2001	2003	2005
India	4827	4871	4482	4461	4445
Orissa	211	215	219	207	203
Balasore	3	3	3	4	4
Bhadrak	17	18	19	20	20
Jagatsinghpur	10	10	5	3	4
Kendrapara	181	184	192	180	175

Source: State Forest Report, F.S.I

CONSERVATION AND RESTORATION OF MANGROVES:

Mangrove wetlands are the major contributors to global biodiversity. They contribute more than 20% of the world's taxa and genetic resources although occupying only about 6% of the world's surface.

Mangrove wetlands are described as “the kidneys of the landscapes”

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function as the downstream receivers of wastes from both natural and human sources. These ecosystems have also been called “**biological supermarkets**” for the extensive food chain and rich biodiversity they support. They play major roles in the land scope by providing unique habitats for a wide variety of flora and fauna including thousands of migratory waterfowl.

The most significant benefits of mangroves are: nutrient export to adjacent areas; breeding and nursery area for a wide range of fish, mollusks, crustaceans, many of which are of economic importance; wintering ground of thousands of migratory water fowl; feeding and breeding site of a number of resident birds; coastal protection (prevention of erosion); source of food, fuel, building materials and other commodities for local communities.

The Bhitarkanika Wildlife Sanctuary / National Park in Bramhani-Baitarani deltaic area, the largest (150 sq. km approx.) among the available patches in Orissa harbor India’s richest mangrove forests in terms of species diversity. Mangroves in other areas are mostly degraded by a variety of factors, the most significant of which has been conversion to brackish water fishponds. The diverse climatic conditions of Bhitarkanika mangrove wetland provide ideal habitat to a varieties of invertebrate and vertebrate fauna (lizards, snakes, saltwater crocodiles, varieties of waterfowl, mammalian species etc.). It is one of the best reptile refuges in the world. Besides, it provides an ideal habitat to the largest population of saltwater crocodiles, *Crocodylus porosus* including the partial white crocodiles in India. Bhitarkanika mangrove wetland has been declared as one of the Ramsar sites i.e. wetland of international importance on 19th Aug.2002. It is the second wetland to be declared as Ramsar site in the state after Chilika and one of the 19th in the entire country.

Some of the important functions of the mangrove wetlands are:

- Protection of shorelines and hinterlands from the fury of Cyclones, super cyclones, tidal surges, tsunami and such other natural disasters.
- Flood control.
- Floral and faunal habitats
- Commercial value
- Economic sustenance to the people

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Socio-economic aspects and significance of the mangrove ecosystem:

The significance of mangrove forest and its role in conserving the ecology and socio economic life of human beings are multifold:

- Mangroves act as land builders. They stabilize newly formed islands with mud and silt deposits in the river mouth areas.
- Mangrove forest belt along the coast plays a key role in protecting the area/ human habitation from devastating cyclones, super cyclones, tsunami and tidal bores. It also saves the human lives and their properties.
- It is source of leaf detritus, which supports aquatic productivity such as phytoplankton and zooplankton. In turn planktons provide nutrition for higher form of life like fish, crabs, prawns and other aquatic life. Thus, it plays a key habitat role in the detritus food chain.
- Mangrove vegetation restricts and slows down the erosion process. The trees are well equipped with branched root systems (Hentala plants), pneumatophores or breathing roots (Sundari, *Heritiera* sp. etc.), stilt root systems (*Rhizophora* sp. *Kandelia* sp.) and Grasses (*Nalia*) *Myriostachya* sp. reduce tidal current action.
- Collection of minor forest produce like honey, bee wax, thatching materials, natural fibers from plants, grasses and climbers for basketry provide economic benefit to the poor people living in and around such ecosystems.

The survival of several species of rare, endangered flora and fauna is highly dependant on the continued existence of this ecosystem. The mangroves in the coast are important not only for conservation of wildlife but also for protection of human beings in the hinterland from the fury of severe cyclonic wind and tidal surges, which is very common in this coastal part of the state. This ecosystem should be preserved at all costs from various biotic and abiotic interferences.

Protection of ecologically sensitive and important coastal as well as marine areas always safeguards the long term livelihoods of fishing communities on a

and habitats bear a direct relation to the ecosystem services they provide (such as fisheries production); mangroves and coral reefs are breeding grounds for a variety of fish, prawns and crabs.

DETAILS OF THE PLANTATION SCHEME

2.1. The total area available for plantation of mangroves/ mangrove associates and other suitable species and re-generation will be around 133 ha. entirely outside the designated forest areas in the bank of tidal influenced rivers and creeks (Map-12). Besides, Plantation of mangroves/ mangrove associates and other suitable species in village forest Areas (30 Ha) shall be done by way of raising of nurseries and distribution of seedlings, etc. to the villagers of EDC villages (Map-13).

2.2. The division-wise break-up (on approximate basis) of proposed plantation area for Mangroves will be as follows:

Table-7: Division wise mangrove plantation

Sl. No.	Name of Division	Area for mangrove plantation (Area in ha.)
1.	Rajnagar (WL) Division	163
2.	Berhampur Division	05
	Total	168

In Mangrove Forest Division, plantation in the bank of rivers and creeks (133 Ha along approximately 100 km of the banks of tidal rivers and creeks) with mangroves/ mangrove associates and other suitable species shall be done. Although a detailed survey is required about the exact location availability of land for taking up mangrove plantation, the following sites shall be preferred (Map-12).

Table-8: Proposed Plantation area of mangroves and mangrove associates along banks of tidal rivers and creeks in Bhitarkanika

1.	Both banks of river Patasala (Baunsajodi) Gupti to Hansina	= 33 Ha.
2.	Both banks of river Papuli, Jagatjora, Panikhia	= 40 Ha.
3.	Both banks of river Bramhani from Kholra to Nalitapatia	= 10 Ha.
4.	Both banks of river Baunsajodi (Jaudia)	= 40 Ha.
5.	Banks of river Dhamara (Nalitapatia to Talachua)	= 10 Ha
Total		=133 Ha.

(A) 1. The rights on the plantations on these lands shall remain with the concerned departments of the state government. However, these would provide benefits to local communities, as they will help in promoting eco tourism in such areas. The restoration of mangroves shall also act as a barrier for protecting the villages from natural disasters since the areas are prone to frequent cyclones, super cyclones, etc.

(A) 2. Plantation of mangroves and mangrove associates and other suitable species through distribution of seedlings/ hypocotyls to local villagers shall also be done in village forest areas (30 Ha) in revenue and forestland as a pilot experimental study. In this case 1 to 2 ha. of plantation shall be done in villages where EDCs have been formed (Map-13).

Plantation in degraded areas (Govt. Revenue land, village forestland) along the Rushikulya and Bahuda river mouth areas (5 Ha.) shall also be done which will be implemented by the DFO, Berhampur (T) Division (Map-11). The end benefits for conservation, and for community point of view shall be governed as per the principles and guidelines for the two types of land – forest and community land as described above.

The mangrove restoration activities, if not planned properly, may cause loss of local species present in the area. In view of the above whenever there will be any invasion of any unwanted species, steps will be taken for removal and spreading of such species. This will be done by regular monitoring of the selected mangrove plantation sites and adjoining areas by monitoring personnel through movement in tidal rivers and creeks.

2.3. The mangrove plantation will be taken up in different modules. This is because in some of the refractory hyper saline areas and areas devoid of periodic inundation by tidal water, it is first necessary to prepare the ground and restore the salinity level by allowing free flow of inter-tidal water into the area through digging of channels in fishbone type design. This is an essential intervention to ensure that the mangrove plantation has good chance of success at these sites. Further, the plantation may be raised by putting hypocotyls of mangrove species, or by planting nursery raised seedlings.

END BENEFITS FOR CONSERVATION, AND FOR COMMUNITY POINT OF VIEW:

The list of such villages having EDCs is enclosed in the Table-11 and Map-13. Here the end benefits of conservation from community point of view shall be with the local community. Already public consultations in this regard have been initiated, which is enclosed as **Annexure-1**. In lands outside the Protected Area Network, the management shall be with the communities as per Govt. of Orissa Forest and Environment department Resolution No. 1F-Affn. 17/2008 – 17454/ F & E/ dated 22.10.2008 copy of which has been circulated to all Divisional Forest Officers from the Office of PCCF (Wildlife) and Chief Wildlife Warden, Orissa on the subject of Joint Forest Management Resolution, 2008 vide Memo No. 7002/ 1WL (C) – 458/2008 dated 15.11.2008 (**Annexure-2**). In the Joint Forest Management Resolution there are provisions for making MOUs. Plantations of mangroves and mangrove associates will help in increased fish, crab and other marine biodiversity as well check soil erosion in the banks of tidal rivers and creeks. It will improve the landscape, which will help in developing ecotourism activities where the benefits shall go to the local communities through their respective EDCs.

Table-9: The floral diversity of Bhitarkanika and its fringe areas: Mangroves and their associates.

Sl. No.	Scientific Name	Common Name	Habit	Family
1	<i>Acanthus ilicifolius</i>	Harakancha	Herb	Acanthaceae
2	<i>Acanthus volubilis</i>	Harakancha	Herb	Acanthaceae
3	<i>Acrostichum aureum</i>	Kharkhari	Fem	Polypodiaceae
4	<i>Aegialitis rotundifolia</i>	Banarua	Tree	Plumbaginaceae
5	<i>Aegiceras corniculatum</i> (<i>A. majus</i>)	Kharsi	Tree	Plumbaginaceae
6	<i>Amoora cucullata</i> (<i>Aglai cucullata</i>)	Ooanra	Tree	Meliaceae
7	<i>Avicennia alba</i>	Dhala bani	Tree	Avicenniaceae
8	<i>Avicennia marina</i>	Singala bani	Tree	Avicenniaceae
9	<i>Avicennia officinalis</i>	Bada bani	Tree	Avicenniaceae
10	<i>Brownlowia tersa</i>	Lati sundari	Herb	Tiliaceae
11	<i>Bruguera cylindrica</i>	Bandari	Tree	Rhizophoraceae
12	<i>Bruguiera gymnorhiza</i>	Bandari	Tree	Rhizophoraceae
13	<i>Bruguiera parviflora</i>	Khaliachua	Tree	Rhizophoraceae
14	<i>Bruguiera sexangula</i>	Bandari	Tree	Rhizophoraceae
15	<i>Caesalpinia cristata</i>	Nentei	Creeper	Caesalpiaceae
16	<i>Caesalpinia bonduc</i>	Nentei	Creeper	Caesalpiaceae
17	<i>Cerbera odollam</i>	Deni omba	Tree	Apocynaceae

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19	<i>Ceriops tagal</i>	Garani	Tree	Rhizophoraceae
20	<i>Clerodendron inerme</i>	Chiani	Creeper	Verbenaceae
21	<i>Crinum asiaticum</i>	Pani Kenduli	Herb	Amaryllidaceae
22	<i>Crinum defixum</i>	Pani Kenduli	Herb	Amaryllidaceae
23	<i>Cynometra ramiflora</i>	Singada	Tree	Leguminosae
24	<i>Cynometra iripa</i>	Singada	Tree	Leguminosae
25	<i>Cyperus compactus</i>	Tianshi ghasa	Grass	Cyperaceae
26	<i>Cyperus corymbosis</i>	Keutia ghasa	Grass	Cyperaceae
27	<i>Dalbergia spinosa</i>	Goera Kanta	Creeper	Papillionaceae
28	<i>Derris hetrophylla</i>	Katira nai	Creeper	Legurninosae
29	<i>Derris scandens</i>	Gosinga	Creeper	Legurninosae
30	<i>Dolichandrone spathacea</i>	Guan	Tree	Bignoniaceae
31	<i>Excoecaria agallocha</i>	Guan	Tree	Euphorbiaceae
32	<i>Fimbristylis ferruginea</i>	Luni ghasa	Grass	Cyperaceae
33	<i>Finlaysonia obovata</i>	Lata rai	Creeper	Peripocaceae
34	<i>Flageliaria indica</i>	Bahumruga	Creeper	Flagellariaceae
35	<i>Heritiera formes</i>	Bada Sundari	Tree	Sterculiaceae
36	<i>Heritiera kanikensis</i>	Kanika Sundari	Tree	Sterculiaceae
37	<i>Heritiera littoralis</i>	Dhala Sundari	Tree	Sterculiaceae
38	<i>Hibiscus tilliaceus</i>	Bania	Herb	Malvaceae
39	<i>Intsia bijuga</i>	Maasthia	Tree	Leguminosae
40	<i>Kandelia candel</i>	Sindhuguan	Tree	Rhizophoraceae
41	<i>Limnizera racemosa</i>	Churanda	Tree	Combretaceae
42	<i>Lummitzera littorea</i>	Churanda	Tree	Combretaceae
43	<i>Merope angulata</i>	Bana lembu	Herb	Rutaceae
44	<i>Myriostachya wightiana</i>	Nalia ghasa	Grass	Poaceae
45	<i>Nypa fruticans</i>	Nypa	Tree	Palmae
46	<i>Pandanus fascicularis</i>	Luni kia	Herb	Pandanaceae
47	<i>Phoenix paludosa</i>	Hetala	Tree	Palmae
48	<i>Phragmites karka</i>	Nala	Grass	Gramineae
49	<i>Porteresia coarctata</i>	Dhani dhana	Grass	Poaceae
50	<i>Rhizophora apiculata</i>	Rai	Tree	Rhizophoraceae
51	<i>Rhizophora mucronata</i>	Rai	Tree	Rhizophoraceae
52	<i>Rhizophora stylosa</i>	Rai	Tree	Rhizophoraceae
53	<i>Salacia prinoides</i>	Batra lata	Creeper	Hippocrateaceae
54	<i>Salicornia brachiata</i>	-	Herb	Chenopodiaceae
55	<i>Salvadora persica</i>	Miriga	Herb	Salvadoraceae
56	<i>Sapium indicum</i>	Batula	Shrub	Euphorbiaceae
57	<i>Sarcolobus carinatus</i>	Raigidi	Shrub	Asciepiadaceae
58	<i>Sesuvium portulacastrum</i>	-	Herb	Aizoaceae
59	<i>Sonneratia apetala</i>	Keruan	Tree	Sonneratiaceae
60	<i>Sonneratia caseolaris</i>	Orua	Tree	Sonneratiaceae
61	<i>Sonneratia griffithii</i>	Orua / Chakada	Tree	Sonneratiaceae
62	<i>Suaeda maritima</i>	Giria saga	Herb	Chenopodiaceae
63	<i>Suaeda monoeca</i>	Giria saga	Herb	Chenopodiaceae
64	<i>Suaeda nudiflora</i>	Giria saga	Herb	Chenopodiaceae

67	<i>Tamarix troupii</i>	Jagula	Herb	Tamaricaceae
68	<i>Thespesia populnea</i>	Habali	Tree	Malvaceae
69	<i>Xylocarpus granatum</i>	Shishumar	Tree	Meliaceae
70	<i>Xylocarpus mekongensis</i>	Pitakorua	Tree	Meliaceae
71	<i>Xylocarpus molluccensis</i>	Pitamari	Tree	Meliaceae

. (Source: Chadha and Kar, 1999).

Under mangrove plantation, the above species of mangroves and mangrove associates shall be considered which shall be site specific depending upon the soil conditions, availability of seeds and hypocotyls in the nearby areas, etc.

SPACING: 1.5 meter spacing for hypocotyls shall be preferred.

Drought and flood are recurrent phenomena in the State of Orissa and Bhitarkanika is not an exception in this regard. The occurrence of drought and flood are presented in the table-10.

Table-10: Details of recurrence of drought and flood in last 50 years in Orissa

1955	Flood	1977	Flood
1956	Flood	1978	Hailstorm, whirl wind
1961	Flood	1979	Severe drought
1965	Severe drought	1980	Flood
1966	Drought	1981	Tornado, whirlwind, flood and drought.
1967	Cyclone, flood	1982	Severe flood, drought, cyclone.
1968	Cyclone, flood	1984	Drought
1969	Flood	1985	Flood
1970	Flood	1986	Drought & cyclone.
1971	Severe cyclone, flood	1987	Drought & cyclone
1972	Flood & drought	1988	Drought
1973	Flood	1989	Drought
1974	Severe drought, flood	1990	Flood
1975	Flood	1999	Super Cyclone
1976	Severe drought		

Table-11: Details of Eco-Development Committees (EDCs) of Mangrove Forest Division (Wildlife) Rajnagar where mangrove plantations shall be carried out in Govt. Revenue/ forest land (map-13).

Sl.No.	Name of the E.D.C
1	Rajrajeswarpur
2	Debendra Narayanpur
	Gartagandia
4	Okilapal
5	Satabhaya
6	Kanpur
7	Magarkanda
8	Gupti
9	Banabiharipur
10	Kanafulia
11	Narangada
12	Gopalpur
13	Bagapatia
14	Praharajpur
15	Dangmal
16	Badaadia
17	Latiapatia
18	Krushna Nagar
19	Kanakanagar
20	Righagarh
21	Iswarpur
22	Balabhadrapur
23	Sailendra Nagar
24	Rajendranagar
25	Bhanjaprasad
26	Khasmunda
27	Sikarpahi
28	Bhekta
29	Sailendra Sarai
30	Ahirajpur
31	Pravati
32	Banipal

F.2 Component B

CONSERVATION OF FLAGSHIP SPECIES SUCH AS THE CROCODILES AND SEA TURTLES, ETC:

In Wildlife we often talk about the flagship approach of conservation, which means by protecting a species, which is at the apex of the ecosystem population, or all other species or communities living in that particular ecosystem can be protected. In other words if the population of a species at the apex of the ecosystem is in a healthy state it means that the population of all other species of that particular ecosystem is in a healthy state. In terrestrial environment in the last half century 'Project Tiger' and 'Project Elephant' have been launched as part of national as well as international programmes, which is widely known. In aquatic environment the estuarine crocodiles are at the apex of the ecosystem in the tidal rivers and creeks. Similarly in the coastal waters as well as in the high seas, the sea turtles and cetaceans are at the apex of the coastal/marine ecosystems. Therefore, by protecting the estuarine crocodiles and sea turtles, it can be ensured that the populations of all other species in these ecosystems are well protected and it can be ensured that they are in a healthy state.

The Bhitarkanika site (Map-10, 12 and 13) is also home to the largest population of estuarine crocodiles (*C. porosus*) in the Indian Sub-continent. The largest living crocodile in the world (23'+) is a denizen of this site (Guinness Book of World Record, 1994).

The site also contains one of the world's largest nesting and breeding ground of the endangered Olive ridley sea turtles (Map-9). The seasonal phenomenon of mass migration, mass mating, mass nesting as well as mass emergence of hatchlings is considered as one of the greatest extravaganza of nature. The site also holds areas of exceptional natural beauty and aesthetic importance. Gahirmatha sea beach along the coast being world's largest rookery attracts over half a million female olive ridley sea turtles for mass nesting/ egg laying.

Protection of ecologically sensitive and important coastal as well as marine areas always safeguards the long term livelihoods of local sea fishing communities on

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habitats bear a direct relationship to the ecosystem services they provide (such as fisheries production); mangroves and coral reefs are breeding grounds for a variety of fish, prawns and crabs. Protection of ecologically sensitive and important coastal as well as marine areas always safeguards the long-term livelihoods of fishing communities on a sustainable basis in the surrounding areas

The fisheries sector in Orissa while taking steps for maximizing capture fisheries from the wild, has also framed guidelines for protection of aquatic wildlife and important aquatic wildlife habitats for species such as fresh water/brackish water terrapins, horse shoe crabs, endangered fish, sharks, sea turtles, sea snakes, cetaceans (marine mammals like the dolphins, whales, porpoises), sea grasses, coral reefs, etc.

The Marine protected areas like “No Fishing Zones”, Marine Sanctuaries, Marine National Parks and Marine Biosphere Reserves are necessary in order to have a RESPONSIBLE FISHERY & SUSTAINABLE FISHERY which is very much required in the long term interest of human beings for the present and future generations as well as to ensure that no over-exploitation of the resources take place. The marine protected areas serve as nursery and breeding ground of numerous varieties of fish, prawns and crabs including commercially important species. There is a worldwide belief that no form of life is useless and Mother Nature always maintains balance in the natural ecosystems. Every form of life is necessary for maintenance of its peculiar ecosystems. More over this helps to maintain the food chain and food web in the coastal estuarine mangrove ecosystem.

If some species get exterminated or even their population is declined, population of so many other species sharing and living in the same ecosystem would get exterminated too. If Orissa can protect the species at the apex of the ecosystem, the marine ecosystem shall be kept intact. Marine Protected Areas are, therefore, necessary to provide some undisturbed areas for safe nursery and breeding ground of fishes, prawns and crabs. These areas are necessary not only for the survival and continued existence of marine wildlife but also to have a long term responsible and sustainable fishery for all times to come.

The estuarine crocodiles are not voracious eaters. They often do not migrate long distance in search of food and are opportunistic feeders. They also feed on carcasses and are scavengers of these ecosystems who help to clean the

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environment. Further, by consuming the big carnivorous fishes such as the catfish, etc. they also help the commercially important fishes to grow.

The Olive Ridley sea turtles come to Orissa Coastal waters in October and stay till April/May i.e., for more than half a year in their mass breeding grounds. During this period the adult turtles consume and control the jellyfish population to a large extent. The mass hatchling emergence period also coincides with the breeding season of the jellyfishes so that the hatchlings consume the small jellyfishes. The jellyfishes are carnivorous as well as voracious eaters and if the jellyfish population will grow it is highly detrimental to the commercial fisheries. Thus the Olive Ridley sea turtles are maintaining the ecological balance and helping the commercial sea fisheries to a great extent.

Protection of Olive Ridley Sea turtles, cetaceans, estuarine crocodiles and other aquatic wildlife.

The site contains the most important and significant natural habitats for in-situ conservation of biological diversity containing several threatened species of outstanding universal value from the conservation point of view such as the Olive Ridley Sea turtles, the cetaceans, the estuarine crocodiles and other aquatic wildlife. While estuarine crocodiles are at the apex of the aquatic ecosystem in the tidal rivers and creeks, sea turtles and cetaceans (marine mammals such as the dolphins, porpoises and whales) are at the apex of the aquatic ecosystem in the coastal waters. Therefore, protection and conservation of these flagship species shall ensure conservation of aquatic biodiversity of this region, which is a globally important biodiversity hot spot area containing globally important population of sea turtles and crocodiles.

The Gahirmatha area contains one of the world's largest nesting and breeding ground of the endangered Olive Ridley sea turtles, which is a globally significant population. This seasonal phenomenon is considered as one of the greatest extravaganza of nature. It also holds areas of exceptional natural beauty and aesthetic importance. Gahirmatha sea beach along the coast being one of world's largest rookery attracts over half a million female Olive Ridley sea turtles for mass nesting/egg laying. The coastal waters form the mating and breeding ground of the endangered olive ridley sea turtles. The State and Central Govt. have accorded highest level of protection status to the area (1435 sq. km.) as a

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infrastructural facilities such as sea going speed boats are not there to protect the mating and breeding ground as a result of which large number of turtles and some cetaceans are reportedly being killed each year due to illegal sea fishing activities. Since sea turtles and cetaceans are at the apex of ecological pyramid, their conservation shall ensure conservation of aquatic bio-diversity of this coastal marine ecosystem.

The Hon'ble High court of Orissa as well as Central Empowered Committee (CEC) of Supreme court of Orissa have given directions to the Govt. of Orissa for having sea worthy vessels, speed boats and support patrol vessels for protection of sea turtles in their congregated mating and breeding grounds. For this purpose, the Fisheries department has acquired two sea worthy vessels. However, funds are required for manning, running and maintenance of these vessels, which have been proposed in this proposal. The Forest and Fisheries department shall use these vessels for joint patrolling of the coastal waters. Besides, speedboats and trawlers are also required for negotiating between the base camps, berthing stations and the sea worthy vessels. Monitoring camps are required to be set up each season in different beaches for monitoring of mortality as well as nesting activities of sea turtles. One of the major monitoring centre shall be establishes at Babubali with provision of solar lights, water supply and a jetty. For protection and patrolling purpose equipments such as DGPS, GPS, Night viewing binoculars, Binoculars with distance measurement facility, Eco-sounder, radar, VHF main sets, VHF hand sets with electric and solar chargers, life jackets, life buoys, etc. shall be procured for use in the sea worthy vessels, speed boats and support patrol vessels for protection of sea turtles.

The Rushikulya river mouth area along the Chilika coast is also a mass nesting area of the endangered Olive ridley sea turtles. The coastal waters, which is the mating and breeding ground of the species has been designated as a 'No Fishing Zone' under the Fisheries Act. and the area has been proposed to be designated as a **marine sanctuary**. It is proposed to have a research and monitoring center at this site for facilitating long-term research and monitoring.

MASS NESTING:

The mass nesting which ceased in Gahirmatha coast during 2001 and 2002 took place in the subsequent years. The total numbers of Olive Ridley mass nested during the last four years are as follows:

Table-2: Number of nesting turtles at Gahirmatha and Rushikulya rookery in different years

Season	No. of nesting turtles (in lakhs)		Total (in lakhs)
	Gahirmatha	Rushikulya	
2003-2004	2.43	2.01	4.44
2004-2005	2.34	0.89	3.23
2005-2006	2.67	1.98	4.65
2006-2007	1.46	-	1.46
2007-2008	-	1.80	1.80
2008-2009	1.67	2.61	4.28

Around mid-1970s population of salt water crocodiles had drastically dwindled through out its range including in Orissa. After launching of the integrated GOI/ FAO/ UNDP project, the population of this endangered species has considerably increased in the river systems of Bhitarkanika through the grow-rear and release programme. The programme is very successful in Bhitarkanika, where the released crocodiles have started laying eggs in the nature. In recent years nests of released crocodiles have been noticed in the mangrove forest blocks of Jumbo area but these nests are being destroyed in the wild by predators such as the monitor lizards, wild pigs, etc. Therefore, there is a need for improving the existing hatchery as well as rearing complex in Dangmal area and/ or having a separate hatchery as well as rearing complex in Jamboo/ Kalibhanjadia island for successful conservation of the endangered estuarine crocodiles through the grow-rear and release programme which have been standardized in Bhitarkanika.

Table-4: Population status of estuarine crocodiles in Bhitarkanika as per census results conducted in different years (2000 to 2009).

Size class	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Hatchlings	319	341	441	484	525	681	657	503	538	538
Yearlings	181	277	340	370	303	290	283	368	343	375
Juveniles	123	237	187	180	210	169	197	259	231	264
Sub-adults	145	36	145	82	100	107	122	135	143	148
Adults	146	107	217	192	220	207	203	232	261	271
Total	914	1098	1330	1308	1358	1454	1462	1497	1516	1596

PROTECTION STRATEGY OF OLIVE RIDLEY SEA TURTLES:

The Olive Ridley Sea Turtles are expected to congregate from mid-October in the coastal sea near mass nesting beaches of (a) Gahirmatha (Dhamara mouth to Mahanadi mouth), (b) Devi mouth area and (c) Rushikulya mouth area. Turtle congregation and sporadic nesting may also occur at sea close to other river mouth areas as well as other beaches along the entire Orissa coast. The location of the congregation areas in the sea may shift from year to year, and during the season. The undisturbed and clean sandy beaches near river mouths devoid of background vegetation (like Casuarina plantation) with moderate size sand grains and where beach profile is such that there is a gentle slope from seafront and than a wide flat strip sloping gentle opposite to sea are usually preferred for nesting / mass nesting.

Hundreds of dead turtles are, however, seen on the beaches each year; and these casualties have been ascribed to 'incidental kill' due to:

- (i) Suffocation of turtles on account of being entangled in the trawl-nets and gill-nets operating on congregation / migration areas, or
- (ii) Injury by propellers of trawlers.

The number of such casualties along the entire Orissa coast was counted to be 5,680 in 2008-09 in comparison to 5,642 during 2007-08, 4,046 during 2006-07, 2,242 during 2005-06, 2,227 during 2004-05 and 1,081 during 2003-04. Maximum

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Kushabhadra mouth. An obvious strategy for preventing the casualties is to enforce prohibition on fishing by mechanised / motorised vessels and use of gill nets / trawl nets in the turtle congregation zones in the coastal sea during the period of their congregation. Such prohibition is enforced under the Wildlife (Protection) Act, and Government notifications imposing ban in specified areas on trawl net and gill-net fishing under the Orissa Marine Fisheries Regulation Act (OMFRA). (Map No.7)

Enforcement of the law and regulations is constrained by two factors; namely:

(a) Lack of infrastructure such as sea going patrol boats, communication network, camps for sustained sea patrolling, man-power, equipments and capability for night patrolling, etc.

(b) Lack of coordination between Fisheries and Forest officials and inadequate Police and magisterial support for proper enforcement of legal provisions.

The strategy of protection of sea turtles will be as follows:

- (i) Effective patrolling and vigorous enforcement of the wildlife law and OMFRA regulations against illegal fishing activities in the marine sanctuary area as well as in other turtle congregation zones with the aim of bringing 'casualty of the turtles to minimum;
- (ii) Continuous monitoring of all nesting and mass nesting beaches through observation posts and patrolling camps.
- (iii) Prevention of disturbance to the mass nesting beaches through day-night watch and ward;
- (iv) Ensuring proper coordination between law enforcement agencies like Fisheries and Forest department officials and the Coast Guard with adequate Police support.
- (v) Monitoring, patrolling, surveillance and enforcement activities in the breeding/ nesting areas (including counting of nesting turtles and turtle casualties) through various observation posts / patrolling camps and by the Central Operation and Database preparation Unit set up in the head quarters of Wildlife organization of Forest & Environment Department on day to day basis. These activities will be carried out on the basis of a detailed advance planning.

The operation is usually launched from October of a calendar year and

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should naturally expect to better its own record of achievements of the previous years.

The legal framework (Map-14):

(a) Any fishing within the marine sanctuary would invite section 50 (c) and section 29; and unauthorised movement of fishing boats and trawlers would invite section 27 of the Wildlife (Protection) Act, 1972 (WPA). Section 9 of the WPA would be attracted in known turtle congregation areas outside any sanctuary.

(b) As per Orissa Marine Fishing Regulation Act and Rules made there-under, the 5 km stretch of Orissa coastal waters covering the entire stretch of Orissa coastline is exclusively reserve for operation of traditional fishing crafts and in the above area no fishing of any kind is allowed involving mechanized crafts and mechanized gears.

(c) The Fisheries Department has issued notification, prohibiting fishing within a seaward radius of 20 Kms from Gahirmatha area of Bhitarkanika Wildlife sanctuary.

(d) The Fisheries Department has also issued notification, prohibiting fishing by trawlers within a seaward radius of 20 Kms from the high tide line of Orissa Coast from Jatadhar river mouth to Devi river mouth and from Chilika mouth (Magarmukha) to Rushikulya river mouth for a period of 5 months from January to May of every calendar year.

(e) By notification, Fisheries Department have prohibited movement / operation of motorised vessels, trawlers and those using mechanised fishing techniques in the sea turtle congregation areas comprising a zone of 10 Kms into the sea from three specified coasts:

(1) Dhamara mouth between Shorts' island and Udabali north

(2) Devi mouth between Keluni muhan (mouth) and new Devi Nasi island north

(3) Rushikulya mouth between south of Prayagi to north of Aryapalli.

This prohibition would apply for a period of 7 months from 1st November to 31st May.

(f) By notification, the Fisheries Department have imposed regulation on fishing by gill-nets within a belt of 10 Km of seaward distance near the aforementioned three river mouth areas during the period 1st November to 31st May. The regulation comprises of prohibition of fishing by motorised vessels and mechanised fishing crafts, and prohibition of use of multi-filament gill-nets of length more than 300 meters with mesh size below 140 mm and twine diameter of 0.7 mm, and monofilament gill-net of above dimension with twine diameter of 0.5 mm. The distance between two pieces of net should have a gap of 200 meters. The use of fishing gear made by seine net (ring net) has been prohibited along the entire coast throughout the year.

(g) Further, by notification, the Fisheries Department have made it mandatory to use Turtle Excluder Device (TEDs) in all trawl nets.

(h) By notification, the Fisheries Department have authorized the Range Officers of coastal forest divisions having jurisdiction over the coastline of Orissa, namely the Range Officers in charge of Jaleswar, Chandipur, Chandbali, Rajnagar, Mahakalpada, Kujanga, Astaranga, Konark, Balukhanda, Bramhagiri, Chilika, Rambha, Khalikote and Berhampur Ranges to exercise the powers and to discharge the duties cast on them under the OMFR Act. This has been circulated to the concerned DFOs for necessary action during the forthcoming sea turtle breeding seasons. Copies of the said notification have been sent to respective CFs from the office of Chief Wildlife Warden, Orissa.

5. Administrative measures: Patrolling and monitoring camps.

Temporary camps will be set up along the coast to start monitoring from October, each season. The campsites in Mangrove Forest Division are shown in the map (Map-15). A Forest field staff and also two daily wageworkers shall be drawn from the local communities for each camp.

A few camps like the ones at Babubali, Agarnasi, new Devi Nasi Island, Purunabandha are the bases for going into the sea on patrol. Personnel of these camps shall ensure that movement of boats through the congregation zones does not disturb turtles, particularly the mating pairs. The other camps will be primarily for monitoring the nesting beach area and for keeping count of the dead turtle carcasses. Each camp will have VHF communication facilities, solar lantern, first-aid-box with medicines, provision for drinking water, kitchen utensils, folding cots,

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The concerned DFOs are required to intimate the names of the campsites and names of the personnel in each camp and the facilities provided in each camp by the 1st week of November. The fisheries Directorate are required to intimate the names of the personnel of Fisheries department in the beginning of each season who will be associated in the sea patrolling operations.

6. Infrastructure.

A number of VHF stations, VHF hand sets, jetties and berthing stations have already been provided in the previous years. All these are kept fully functional and in proper working conditions prior to the commencement of the nesting season. The main berthing places for seized fishing vessels are Barunei, Gupti and Krishnapriyapur. Besides, the berthing facility of Paradip Port will also be availed. The VHF network of a particular year with respect to each forest division is being intimated to the Wildlife Organisation Hqrs. by 1st week of November of a calendar year for proper inter and intra departmental coordination.

Police parties are required to:

- (i) Go into the sea along with the Forest staff
- (ii) Remain in the patrolling camps on the shore and also at berthing yards of seized vessels for:
 - (a) Maintaining law and order; and for
 - (b) Enforcement of relevant regulations as well as for
 - (c) Rescue operation during emergency situations.

With Government of India funding, the Fisheries department has acquired two seaworthy fast moving patrolling vessels and these have been stationed at the fishing harbour, Paradip. The Fisheries Department shall take steps so that these two patrolling vessels are engaged into service during the marine turtle congregation-nesting season. For use of these two vessels, two engineers and one master have not yet been sanctioned. In the High Power Committee meeting on protection of olive ridley sea turtles held on 19.11.2007 under the Chairmanship of Chief Secretary, it has been decided that prompt / action should be taken to post these staff on contractual basis. Regarding modalities of use of these vessels specific operational plan, deployment and patrolling schedule are worked out each year in consultation with DFO, Mangrove Forest Division (Wildlife), Rajnagar.

General modalities are, however, as follows:

Prior to the commencement of each nesting season, which starts from mid-October, these vessels will complete annual repair/ maintenance, etc. and will be available with the DFO, Mangrove Forest Division (Wildlife), Rajnagar with crews and will remain with him till end of the turtle season i.e., end of May. Then during the month of June, these vessels will be sent for annual repair/ maintenance, etc., which will take 2-3 months and the vessels, will be back to the site in September for test trial and will be ready for the next season. Each of these sea going vessels will be supported by supporting speed boats/ trawlers for the purpose of monitoring by officials, transportation of staff and accused, for supply of ration/ drinking water, etc. on a regular basis.

These two seaworthy vessels shall also be used periodically for eco-tourism purpose so that these can generate some revenue, simultaneously while serving the purpose of monitoring and sea patrolling. The fisheries department has agreed in principle that if the cost of manning, running (cost of POL) as well as annual repair/ maintenance, etc. will be borne by the World Bank funded ICZM project, then these vessels can be spared for the cause of protection of biodiversity in general and that of sea turtles in particular in the coastal waters off Orissa.

PROTECTION STRATEGY OF ESTUARINE CROCODILES AND OTHER AQUATIC BIO-DIVERSITY:

Bhitarkanika and the adjoining Mahanadi delta area is a strong hold of estuarine crocodiles as it supports the largest population of this species in the state as well as in the country. The area also is an ideal habitat for the fresh water/ brackish water terrapins and marine mammals like the dolphins, etc.

Strategy for preventing the disturbances/ casualties is to enforce prohibition on fishing by mechanised / motorised vessels and use of gill nets / trawl nets in the crocodile congregation zones in the tidal rivers and creeks/ creek lets round the year. Such prohibition is enforced under the Wildlife (Protection) Act, 1972 and restrictions in fishing activities in the sanctuary and the adjoining crocodile habitats.

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This can be achieved by strengthening river patrolling by network of river patrolling squads by engaging a minimum number of (10 nos. of rowing boats+ 4 speed boats) in Bhitarkanika/Mahanadi delta area. The boats will be spacious enough to accommodate staying of the two crew members and a crocodile guard who will be required to stay permanently in the boats besides there will be cocking facilities. The boats will have provision of cocking facilities and VHF handsets and or mobile phone. The patrolling should be at regular basis covering both day and night patrolling and the modalities of the patrolling will be in such a manner that each day the starting time will be uniform. Besides, each patrolling boat will meet the patrolling boat during their activities each day. These boats will located in strategic locations such as Khola, Thanapati, Dangmal, Mahisamada, Suhajore, Gokhani confluence, Pataparia, Agargarpatia, Gupti, Hansina mouth, Baunsagarh mouth, Satabhaya ghat, Krushnapriyapur, Barunei mouth, Rajnagar, Sapua, Kalibhanjadia, Dhamara, Mantei, Babar Galia, etc.

Justification of selecting the particular subject of protection of Olive ridley sea turtles, Cetaceans, Estuarine crocodiles and other aquatic wildlife along with its associated habitat- the mangrove ecosystem

The most important service rendered by the Bhitarkanika wetland is by way of maintaining the productivity of the coastal estuarine ecosystem. The wetland is also a repository for the rich biological diversity. It is globally significant due to unique mangrove eco-system and rich biological diversity. In fact, this protected area is the last refuge of endangered estuarine crocodile. Besides, King Cobra, Python, Water Monitor Lizard are other important reptiles of the Park. The sanctuary harbours mammals like Spotted Deer, Sambar, Wild Boar, Porcupine, Fishing Cat, Hyena, and Mongoose etc. The area is rich in avifauna as more than 200 species of birds have been identified within the Sanctuary. The Bagagahan heronry, which is extending over an area of 4 ha. witnesses nesting of a large number of water birds (eleven species) on four species of mangrove host plants during monsoon every year. The winter migrants like Cotton Teal, Pintail, Shoveller, Brahminy Duck, Bar Headed Geese, Pied Avocet, Indian Skimmer and a host of waders are found in large numbers in open meadows, accreted islands and water bodies. Pelicans and Spoonbills also visit the area during monsoon and occasionally by Flamingoes during winter. Five species of Amphibians and varieties of Crabs including Hairy Crab, Crab and a large variety of fish and commercially

It has got a great potential for serving the purpose of wetland education. Apart from its rich fishery resources and diversity, it is also the lifeline for all the fishers of the surrounding areas who depend on the wetland for their livelihood. Considering the significant socio-ecological and economic values of the wetland, it is imperative to start a holistic management of this important natural wetland ecosystem. This will be possible through flagship approach of wildlife conservation and extending this internationally proven and accepted guiding principle from terrestrial ecosystem to aquatic ecosystem. Therefore, this pilot activity is needed and there is no other alternative.

G.2 Project's Finance and Fund Flow Arrangements:

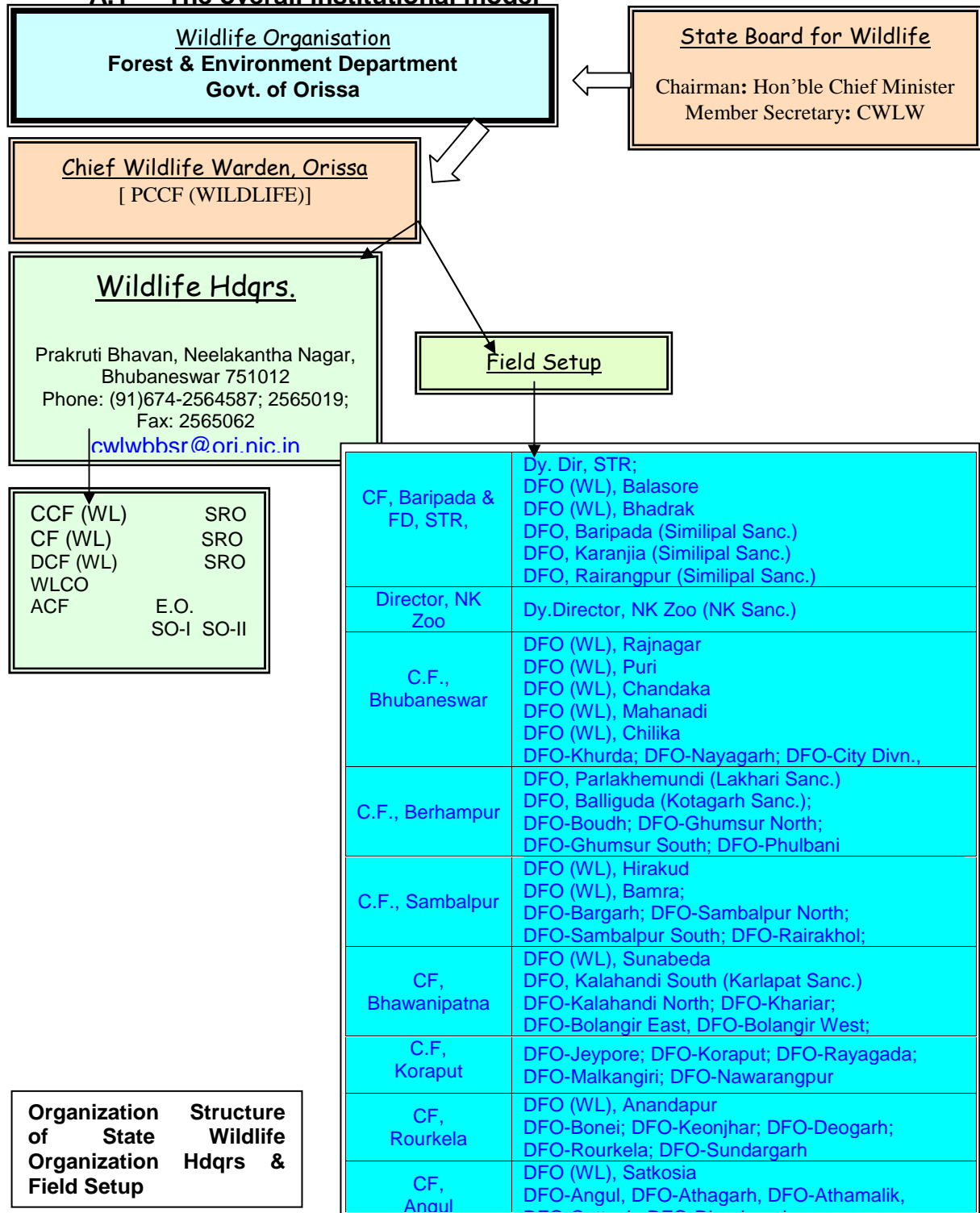
The funding of the total Project will be from the World Bank /Ministry of Environment & Forests, Govt. of India through the Department of Forest & Environment of Govt. of Orissa.

The funds from the World Bank / MoEF, Govt. of India will come to the Department of Forest & Environment, Govt. of Orissa who will transfer the fund to State Project Management Unit (SPMU) who in turn will deposit the fund with the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Orissa. The nodal officer of the ICZM Project Management Cell (PMC) functioning in the office of Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Orissa shall sanction and release the allotted funds to the field Forest Divisions such as the Mangrove Forest Division (Wildlife), Rajnagar, Chilika Wildlife Division and Berhampur (T) Division who are implementing agencies in the field.

SECTION-III: PROJECT IMPLEMENTATION ARRANGEMENT

A. Institutional Arrangement:

A.1 The overall institutional model



Key:

ACF: Assistant Conservator of Forests; BKanika: Bhitarkanika; CF: Conservator of Forests; DCF: Deputy Conservator of Forests; DFO: Divisional Forest Officer; NK: Nandankanan; NP: National Park; PCCF: Principal Chief Conservator of Forests; Sanc.: Sanctuary; SO: Section Officer; SRO: Senior Research Officer; STR: Similipal Tiger Reserve; WL: Wildlife; WLCO: Wildlife Conservation

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The Overall Institutional Model and rationale

The World Bank funded ICZM Project will be implemented by Wildlife wing of the Department of Forest and Environment, Government of Orissa. Following three coastal forest divisions extending along two stretches of ICZM Project (Dhamara-Paradip and Gopalpur-Chilika) will implement the project.

1. (Mangrove Forest Division (Wildlife), Rajnagar
2. Chilika (Wildlife) Division, Balugan
3. Berhampur (Territorial) Forest Division, Berhampur)

The activities will be carried out by the DFO Mangrove Forest Division (Wildlife), Rajnagar, DFO Chilika (Wildlife) Division, Balugan and DFO Berhampur (Territorial) Forest Division, Berhampur.

The Conservator of Forests, Bhubaneswar Circle will supervise the work of first two forest divisions i.e. the Mangrove Forest Division (Wildlife), Rajnagar and Chilika (Wildlife) Division, Balugan. The Conservator of Forests, Berhampur Circle will supervise the work of Berhampur (Territorial) Forest Division, Berhampur.

The work will be further monitored and supervised by Principal Chief Conservator of Forests (Wildlife), Orissa and other officers in his office. All the above authorities will be working under over all control of Government of Orissa Forest and Environment Department.

A.2 Implementing Agency: Roles & Responsibilities:

The Wildlife Organization of the State Forest Department is the overall implementing agency of this World Bank funded ICZM Project namely, Biodiversity Conservation (Conservation of Flora and Fauna). However, the project will be implemented by three field forest divisions who are the implementing field officials for execution of the various activities in the field.

Role of Implementing Agency:

- (i) To receive the fund and to execute the work as per the approved scheme observing due formalities under various rules and procedure of State Govt.
- (ii) To render the accounts of expenditure, reports and returns to all concerned as per the existing Government procedure as well as arrangements made in the Project.
- (iii) To facilitate proper inspection and monitoring & evaluation by the authorities as and when required.
- (iv) To carryout EIA/ SIA as well as Public Consultation with regard to the ICZM Project and prepare Environment Management Plan (EMP) including mitigation strategy during implementation of the project.

Responsibility of the Implementing Agency:

1. Plantation of Mangroves and Mangrove Associates:

(a) Shall be done by the Department (133 Ha) along banks of tidal rivers and creeks in Bhitarkanika as per the details below:

- | | | |
|----|--|----------|
| 2. | Both banks of river Patasala (Baunsajodi) Gupti to Hansina | = 33 Ha. |
| 3. | Both banks of river Papuli, Jagatjora, Panikhia | = 40 Ha. |
| 4. | Both banks of river Bramhani from Khola to Nalitapatia | = 10 Ha. |
| 5. | Both banks of river Baunsajodi (Jaudia) | = 40 Ha. |
| 6. | Banks of river Dhamara (Nalitapatia to Talachua) | = 10 Ha |

Total =133 Ha.

(b) Shall be done by DFO Berhampur (T) Division:

Plantation in degraded areas (Govt. Revenue land, village forestland) along the Rushikulya and Bahuda river mouth areas (5 Ha.) shall also be done which will be implemented by the DFO, Berhampur (T) Division (Map-11).

(c) Shall be done by the EDCs (30 Ha.):

Plantation of mangroves and mangrove associates and other suitable species through distribution of seedlings/ hypocotyls to local villagers shall also be done in village forest areas (30 Ha) in revenue and forestland as a pilot experimental study. In this case 1 to 2 ha. of plantation shall be done in villages where EDCs have been formed (Map-13).

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Details of Eco-Development Committees (EDCs) of Mangrove Forest Division (Wildlife) Rajnagar where mangrove plantations shall be carried out in Govt. Revenue/ forest land (map-13).

Sl.No.	Name of the E.D.C
1	Rajrajeswarpur
2	Debendra Narayanpur
	Gartagandia
4	Okilapal
5	Satabhaya
6	Kanpur
7	Magarkanda
8	Gupti
9	Banabiharipur
10	Kanafulia
11	Narangada
12	Gopalpur
13	Bagapatia
14	Praharajpur
15	Dangmal
16	Badaadia
17	Latiapatia
18	Krushna Nagar
19	Kanakanagar
20	Righagarh
21	Iswarpur
22	Balabhadrapur
23	Sailendra Nagar
24	Rajendranagar
25	Bhanjaprasad
26	Khasmunda
27	Sikarpahi
28	Bhekta
29	Sailendra Sarai
30	Ahirajpur
31	Pravati
32	Banipal

The mangrove plantation will be taken up in different modules. This is because in some of the refractory hyper saline areas and areas devoid of periodic inundation by tidal water, it is first necessary to prepare the ground and restore the salinity level by allowing free flow of inter-tidal water into the area through digging of channels in fishbone type design. This is an essential intervention to ensure that the mangrove plantation has good chance of success at these sites. Further, the plantation may be raised by putting hypocotyls of mangrove species, or by planting

The mangrove restoration activities, if not planned properly, may cause loss of local species present in the area. In view of the above whenever there will be any invasion of any unwanted species, steps will be taken for removal and spreading of such species. This will be done by regular monitoring of the selected mangrove plantation sites and adjoining areas by monitoring personnel through movement in tidal rivers and creeks.

3. (a) Protection of sea turtles, cetaceans as well as marine biodiversity:

The Forest and Fisheries department shall use the two Fisheries Department vessels for joint patrolling of the coastal waters following a standard protocol. Besides, speedboats and hired trawlers are also required for negotiating between the base camps, berthing stations and the sea worthy vessels. Linkages shall be established between Fisheries directorate and the Wildlife Organisation hqrs. For detailed patrolling strategy in the high seas and routine sea patrol operations ons.

The concerned DFOs are required to intimate the names of the campsites and names of the personnel in each camp and the facilities provided in each camp by the 1st week of November. The fisheries Directorate are also required to intimate the names of the personnel of Fisheries department in the beginning of each season who will be associated in the sea patrolling operations.

The departmental staff shall be responsible for effective patrolling and vigorous enforcement of the wildlife law and OMFRA regulations against illegal fishing activities in the marine sanctuary area as well as in other turtle congregation zones with the aim of bringing 'casualty of the turtles to minimum'; prevention of disturbance to the mass breeding areas through day-night watch and ward; ensuring proper coordination between law enforcement agencies like Fisheries and Forest department officials and the Coast Guard with adequate Police support.

Monitoring, patrolling, surveillance and enforcement activities in the breeding/ nesting areas (including counting of nesting turtles and turtle casualties) through various observation posts / patrolling camps and by the Central Operation and Database preparation Unit set up in the head quarters of Wildlife organization of Forest & Environment Department on day to day basis. These activities will be

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Monitoring camps (33 +2 = total 35 nos) shall be set up in each season in different beaches for monitoring of mortality as well as nesting activities of sea turtles. One of the major monitoring centre shall be established at Babubali with provision of solar lights, water supply and a jetty. It will be supported by two permanent camps at strategic locations such as Chinchiri and Dobandhi and 33 numbers of temporary camps.

Temporary camps will be set up along the coast to start monitoring from October, each season. A Forest field staff and also two daily wageworkers shall be drawn from the local communities for each camp.

A few camps like the ones at Babubali, Agarnasi, and Purunabandha are the bases for going into the sea for sea patrol operation. Personnel of these camps shall ensure that movement of boats through the congregation zones does not disturb turtles, particularly the mating pairs. The other camps will be primarily for monitoring the nesting beach area and for keeping count of the dead turtle carcasses. Each camp will have VHF communication facilities, solar lantern, first-aid-box with medicines, provision for drinking water, kitchen utensils, folding cots, life jackets, and canvas sheets for floor as mat.

The sea operation is usually launched from October of a calendar year and continues till May of the next calendar year, while the beach monitoring works shall continue till July since the hatchlings from high density sporadic nests laid during the month of May shall emerge till end of July.

(b) Protection of crocodiles, wetland birds and other aquatic biodiversity in tidal rivers, creeks and estuaries:

The four speed boats after completion of the sea turtles breeding season shall be withdrawn from the sea and shall be engaged in river patrolling works in big rivers such as the Dhamara, Bramhani, Baitarani, etc.

4. Procurement of Equipments:

For protection and patrolling purpose equipments such as DGPS, GPS, Night viewing binoculars, Binoculars with distance measurement facility, Eco-sounder, radar, VHF main sets, VHF hand sets with electric and solar chargers, life jackets, life buoys, etc. shall be procured for use in the sea worthy vessels, speed

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5. Infrastructure Development:

The infrastructural development such as construction of buildings for interpretation center at Gupti, construction of buildings for monitoring center at Chichiri and Dobandhi, Digging of Deep Tube Wells at temporary camp sheds, construction of buildings for monitoring center at Babubali, strengthening of hatchery and rearing complex of crocodiles at Dangmal, etc. shall be outsourced to competent / qualified bidders/ organizations/ agencies.

A.3 Staffing Plan:

The staffing pattern of the field Forest Divisions:

The staffing pattern of the field Forest Divisions such as the Divisional Forest Officer, Mangrove Forest Division, Rajnagar; Chilika (Wildlife) Division and Berhampur (T) Division are as follows:

Details of the staffing pattern of field forest divisions who shall be implementing the project are as follows:

Table-14: The existing staffing pattern of the Rajnagar, Chilika and Berhampur field Forest Division.

Sl. No.	Name of the Division	Staffing pattern (Position as on 31.03.2009)			
		DFO		ACF	
		Sanction strength	In position	Sanction strength	In position
1	Rajnagar	1	1	2	1
2	Chilika	1	1	1	1
3	Berhampur	1	1	2	1

Sl. No.	Name of the Division	R.O		Fr.		F.G.		Peon	
		R.O	Fr.	F.G.	Peon	R.O	Fr.	F.G.	Peon
		Sanct. Strength	In position	Sanct. Strength	In position	Sanct. Strength	In position	Sanct. Strength	In position
1	Rajnagar	7	5	22	21	53	32	1	0
2	Chilika	6	2	21	19	53	30	1	1
3	Berhampur	8	7	24	23	87	48	1	1

Each existing staff is occupied with the ongoing projects of Government of India and State Government as well as daily/ monthly routine activities. These staff will also contribute some of their time for the proposed activities in their respective jurisdiction of various Forest Divisions. Although these permanent staff of the Wildlife Organization will continue to give a percentage of their timing for implementation of the ICZM Project, the main execution of work will be by outsourcing and by hiring of specialized persons for each specific item of work as the Organization presently is not having the expertise for these specialized jobs to be executed in remote areas and difficult terrains. Further engagement of architect and consultants shall also be required for execution of technical work like preparation of plan, estimate and supervision of various works including construction works. These persons have to be brought from the open market observing due formality.

State Government will meet the cost of salary etc. of all its permanent employees engaged in supervision and executor of the project work.

Under the biodiversity conservation component the ICZM Project, following staffs will be recruited on contractual basis:

Manpower requirement for Operation and Database Preparation Unit at Wildlife Organization Head quarters:

- | | |
|---|---|
| a. GIS specialist-cum-research associate- | 1 |
| b. Accountant - | 1 |
| c. Technical assistant - | 1 |
| d. Data entry operator - | 1 |

Manpower requirement for Field Operation Unit

- | | |
|--|----|
| a. Scientist-cum-curator (for Interpretation Centre)- | 1 |
| b. Project research fellow (for 3 Forest Divisions)- | 5 |
| c. Speed Boat driver (one each for 4 speed boats) - | 4 |
| d. Speed Boat navigator (one each for 4 speed boats) - | 4 |
| e. Speed Boat helper (one each for 4 speed boats)- | 4 |
| f. Boatman (3 each for 10 country boat)- | 30 |

Under the biodiversity conservation project there will be a separate cell for Project operation and database preparation at the Wildlife Organization headquarters (Dept. of Forest & Environment, Govt. of Orissa) at Bhubaneswar. The cell will be comprised of GIS specialist-cum-research associate, Accountant, Technical assistant, Data entry operator and office support staff, who will be recruited on contractual basis. At present the expertise of this nature and magnitude is not available in the department and is absolutely necessary exclusively for database creation and the research-based information on a daily basis to provide inputs to guide the management actions. The cell will compile the day-to-day progress of the project. Besides, compilation, analysis and interpretation of the data collected from the field shall also be made in the GIS domain. The GIS specialist cum research associate will be the key person for compilation of temporal and spatial data, its analysis, interpretation and reporting.

At the project implementing site the scientist-cum-curator shall be responsible for running, manning and management of the interpretation center. The project research fellows stationed at different project implementation sites shall collect day to day information relating to species availability, dominance, diversity, threat perceptions and action required to mitigate the threats. The species research, documentation and monitoring of the biodiversity component shall focus on flagship species like sea turtles and cetaceans in coastal waters as well as species like estuarine crocodiles, cetaceans and wetland birds that are at the apex of these ecosystems. The information will also include the ecology, biology, lifecycle as well as habitats of the species including socio-ecological and economic aspects. They will also collect information relating to suitability of mangroves

plantation techniques and survival of mangroves in different extreme terrain conditions for successful mangrove aforestation programme. Based on this information the protection and monitoring squads will develop the strategy of protection and management on regular day-to-day basis.

These field staffs will also be actively involved in public consultation along with the forest department permanent staff involved in project implementation. They will help in assessing in socio-economic condition, modality in adopting alternate livelihood, their dependence on the natural recourses etc in different project sites.

Under the ICZM Project sea worthy vessels and speed boats as well as country boats will be procured. For protection and monitoring of sea turtles and cetaceans in the coastal waters there is a provision of 4 speedboats to be stationed at Babubali and Agarnasi 2 -2 each. 10 country boats will be stationed in different strategic locations in tidal rivers. Each speedboat will be manned by 1 navigator, 1 boat driver and 1 boat helper. Each country boat will be manned by three boat man. One will hold the steering and 2 boat mans will row the boat.

Steps will be taken so that after the project period is over the technical personnel shall be absorbed or will be allowed to continue for the protection of the biodiversity and its habitats in this region through other projects of Govt. of India or the State Government and other sources.

B. Financial Management arrangement:

B.1 Financial Management Framework:

It will be same as applicable in Orissa Forest Department.

B.2 Fund Flow and Disbursement arrangement:

The funding of the total Project will be from the World Bank /Ministry of Environment & Forests, Govt. of India through the Department of Forest & Environment of Govt. of Orissa.

The funds from the World Bank / MoEF, Govt. of India will come to the

fund to State Project Management Unit (SPMU) who in turn will deposit the fund with the Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Orissa. The nodal officer of the ICZM Project Management Cell (PMC) functioning in the office of Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Orissa shall sanction and release the allotted funds to the field Forest Divisions such as the Mangrove Forest Division (Wildlife), Rajnagar, Chilika Wildlife Division and Berhampur (T) Division who are implementing agencies in the field.

The fund will be allotted to the field forest divisions by the nodal officer in the office of Principal Chief Conservator of forests (Wildlife) and Chief Wildlife warden, Orissa, Bhubaneswar.

B.3 Accounting Policies and Procedures:

The implementing agencies will be rendering the Accounts of expenditure to Regional Chief Conservator of Forests and Principal Chief Conservator of Forests (Wildlife), Orissa or as per the project guidelines. The State Government procedures will be followed.

B.4 Staffing and Capacity Building:

The accounting staff of the Division office like Accountant, Dealing Assisants as well as in the Circle office and in the office of Principal CCF (Wildlife), Orissa will be given exposure in the ICZM accounting procedure from time to time.

B.5 Financial Reporting:

At the end of each month the implementing agencies will be submitting the monthly financial accounts, reports and returns to higher authorities as well as to the Accountant General, Orissa.

B.6 Internal Control Mechanism:

Divisional Forest Officers of concerned Divisions in the field will be implementing Authority. He will be responsible for all expenditure under the Project as per detailed procedure laid in Orissa Forest Department Code-1979. Further he will be rendering monthly accounts and returns to his immediate controlling officer, i.e.

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concerned Regional CCFs as well as to Principal CCF (WL) and Accountant General, Orissa.

B.7 Audit Arrangements:

This will be audited by Accountant General, Orissa and internal Audit by Forest & Environment Department, Govt. of Orissa.

B.8 Retroactive Financing:

Retroactive financing practices not prevailing.

B.9 User Cost Sharing Principles:

At present no such practice is prevailing

C. Procurement Arrangements:

C.1 Procurement Arrangements:

(i) For routine work it will be done as per the Policy of Government of Orissa.

(ii) Certain store items will be purchased from Government approved rate contract suppliers or from authorized suppliers at DGS&D approved rates. In such cases no quotation or tenders required.

(ii) Certain items like solar equipments to be purchased from autonomous agency under Science and Technology department of Government of Orissa like Orissa Renewable Energy Development Agency (OREDA). This Agency unlike private vendors have got a team of dedicated technical professionals for repair and maintenance of solar equipments. Their technical Staff is also posted in each District H.Q. to attend to any complaint. OREDA supplies all solar items. They procure through National bidding process.

(iii) Similarly items like DGPS and GPS are purchased from Orissa Remote sensing Application Centre an autonomous agency under Science and Technology Department of Government of Orissa. This is a technical organization with expertise in Survey and mapping. They use sophisticated instruments like DGPS of different specification. They purchase for different departments through open bidding calling quotation from National and international bidders.

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training for day today use as well as its maintenance and repair. Wooden or iron boats or construction material for building etc. quotation or tender may be required.

C.2 Procurement Methods:

As per government rules procurement will be made through quotation/tender process as the case may be.

C.3 Procurement Thresholds:

As per Annexure

C.4 Overall Procurement Plan:

Following items are required to be procured during the implementation:

- (i) For Plantation Activity: Barbed wire for fencing in the nursery, soil, manures, fertilizers, pesticide, water cans, nursery tools, kerosene, polythene bags POL, etc.
- (ii) For purpose of protection, boats. live jackets, life buoys, POL etc.
- (iii) For purpose of Ecotourism: building materials, boats, kerosene/ POL, Live jacket, etc.
- (iv) For entry point activities:

C.5 Procurement Manual:

As provided in Orissa Plantation Manual for Plantation and various Govt. circulars for purchase of store items.

C.6 Annual Procurement Plan:

All procurements are projected in advance in the budget.

C.7 Procurement of Works:

Most of the construction works will be executed Departmentally. However construction work costing above Rs.5.00 lakhs is proposed to be constructed through tender process.

C.8 Procurement at Community level:

It will be done for entry point activity as per the resolution passed by the community.

C.9 Key Procurement Guidelines:

Orissa Forest Department Code-1979 and Orissa Government Financial Rules (OGFR).

D. **Environmental and Social Safeguards:**

(For detail Refer Annexure-1 & 2)

D.1 Current Regulatory Framework:

The regulatory mechanism is already in position like various environmental laws such as the Environment Protection Act, 1986, Air and water (Prevention & control of Pollution) Act 1974 1981, The coastal Regulation Zone (CRZ) Notification, 1991 and Amended 2002, Wildlife Protection Act and Rules made there under, Orissa Marine Fisheries Regulation (OMFR) Act, 1982 and Rules made there under. To implement these laws, a group of designated field functionaries are available in the department.

D.2 Baseline Environment Management Situation:

The environmental management is being ensured by the Director Environment, Government of Orison; Chairman Pollution Control Board; District Collector; Regional Chief Conservator of Forests and Divisional Forest Officers.

Detailed environmental baseline data for the two stretches coming under ICZM Project of the coasts of Orissa have been provided in the DPR and Annexure-1 & 2. However, for the present project, the implementing agency will screen and prepare an environmental baseline report for the sites chosen for implementation of the Biodiversity conservation at different Protected Areas (PAs) as these are very much necessary for EIA and post project evaluation process.

Besides, the field functionaries of the project implementing sites will have to carry out public consultation with the local community during the initial implementation of the project. It is also necessary to carry a socio-economic study of the local people at the initial phase of the project implementation, as it will be helpful for monitoring and evaluation during the project operation as well as post- project evaluation.

D.3 Environment Management Framework:

The department of Forest and Environment, Government of Orissa and State Pollution Control Board have the overall responsibility for enforcement of the Environmental laws. However, the State project Management unit (SPMU) will be responsible for environmental screening of project sites during ICZM Project implementation. The Operation Unit at the Wildlife Head Quarters will assess the impact on the ambient environment during project implementation and will formulate mitigation plan. The Environmental Experts from the State Project Preparation Unit (SPMU) will provide technical support during the project period. Whenever necessary, OSPCB and other competent agencies/organizations may be asked for necessary clarifications and technical support. The field functionaries of all coastal Forest Divisions implementing the world Bank funded ICZM Project will provide regular reports in this regard to the Operation Unit of the Wildlife Head Quarters, which in turn will be responsible for preparing consolidated Environmental Monitoring report for the Department of the Forest and Environment as part of the regular project monitoring and will submit to the same to the SPMU of ICZM Project. The Operation Unit of the Wildlife Head quarters will also undertake the annual Project Evaluation in collaboration with the SPMU.

D.4 Environmental Monitoring Plan:

With the progress of the Project, the field functionaries will communicate **monthly** environmental report to the Divisional Head

water, salinity and other environmental parameters as well as activities of the EDC villages and V.S.S. In turn, the Operation Unit at Divisional Head Quarters will send consolidated monthly report to the Head Quarters of Wildlife Wing and the same shall be transmitted to the SPMU.

The Project Monitoring Unit (PMU) to be set up which is the Operation Unit of the Wildlife Head Quarters (the details of composition of which is mentioned in the staffing pattern) will carry out **quarterly** environmental monitoring. The monitoring team will be comprised of Divisional Forest Officers, concerned Circle Conservator of Forest and Department Experts from the Wildlife Head Quarters. They may also include experts from other line departments in the monitoring team. The Environment Specialists from the SPMU will provide technical support during the environmental monitoring. Whenever necessary, specialist experts may also be hired for outside. All quarterly environmental monitoring report will be submitted to the SPMU for preparation of the consolidated report of the ICZM Project.

Project Management Unit of the Wildlife Head Quarters will also carry out **annual** environmental Evaluation Programme. The evaluation team will be comprised of the departmental specialists, Senior Research Officers, managers and specialist experts from other line departments. Specialist experts from outside may be hired, whenever necessary. The environmental specialists from within the SPMU and outside organizations will provide technical support during the evaluation of the project.

At the end of the project, the operation Unit of the Wildlife Head Quarters (PMU) will carry out **a post-project evaluation** of the project and will submit the detailed report by updating checklist of flora and fauna along with flag ship species in the areas, health of the ecosystem with reference to the status of the habitat as well as stakeholders benefit of the project.

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D.5 Institutional Arrangement for Environmental Management:

The Institution implementing the project shall arrange to have a Environmental Monitoring and Review Committee (EMRC). It will be comprised of PCCF (Wildlife) and CWLW, Orissa, CCF and Senior Research Officer in the office of PCCF (Wildlife). The Project Coordinator of the PMU functioning in the Wildlife Headquarters will be the convener and member Secretary of the Environmental Monitoring and Review Committee (EMRC).

This committee shall over see the monthly field report along with quarterly monitoring reports, annual evaluation and post- project evaluation reports after its detailed scrutinisation by the PMU functioning at the Wildlife Head Quarters. The EMRC Committee will suggest remedial mitigation measures for the problems arising during the implementation process to the field functionaries through the PMU as well as seek the help of the SPMU and Government through the PMU. The PMU will be authorized to make all such correspondences and will carry out the day to day works.

The Environmental Monitoring and Evaluation Team (EMET) will be comprised of Divisional Forest Officers, concerned Regional Chief Conservator of Forests at circle level and Department Experts from the Wildlife Organisation Head Quarters; experts from the SPMU as well as outside experts.

The respective Divisional Forest Offices shall facilitate the **quarterly** Environmental Monitoring and Evaluation to be made as above. These offices will also facilitate the **annual** as well as **post-project evaluation** of the project. These programmes shall be initiated at the PMU functioning in the Wildlife Organisation Head quarters.

As it is a difficult terrain, it is necessary to have safety kits for the workers as well as monitoring and evaluation personnel.

D.6 Capacity Building:

Capacity building is required for all staff in order to execute the project successfully. This is because there are gaps between the capacity of the present staff and requirement of the project in environmental monitoring. The Staff are required to be given exposure of all new trends and methods of national/ international standard being followed within and outside the country along with success stories of different areas to provide successful solutions to issues relating to 'Integrated Coastal Zone Management' in fragile and vibrant ecosystems of coastal Orissa. In this regard the proposals have been submitted to the SPPC Orissa.

Success of the project can not be assured without the involvement of the local community. Huge populations in and around the project implementation sites are directly or indirectly depending on the coastal resources, which are extending along two stretches of the ICZM Project. Therefore, it is necessary to bring these people into the PPP mode and educate them regarding the sustainable management of the coastal ecosystem. This can be done through capacity building by exposure visit, meeting and training about flagship coastal flora and fauna.

(i) Bio-diversity conservation:

(a) Purchase of supporting speed boats, establishment of on shore and off shore camps, strengthening patrolling activities, publicity and awareness, etc.

Marine Protection squad: Provision of Speedboats (4 Nos.): these boats will be stationed 2 each at Babubali Island and Agarnasi at both ends of the marine sanctuary. After the breeding season of sea turtles, the speedboats will also be utilized for monitoring the mangroves as well as crocodiles and other biodiversity of the tidal rivers. Two speed boats will be required to work during night and two will be required to work during day time. They will be required to patrol about 1400 km² of the coastal waters (approximately 20km width x 70 km length) extending from Dhamra river mouth to Mahanadi river mouth.

Once the illegally operating fishing vessels coming from within the state as well as neighboring states such as West Bengal and Andhra Pradesh and neighboring countries such as Bangladesh, Thailand, Srilanka, Myanmar, etc. are detected entering into the sea turtle congregation zones / restricted fishing zones, they will handover the seized vessels along with accused persons (there may be about ten crews in each vessel depending on the size of vessel) to the officials present in the hired trawlers to take them to nearest Range Office or berthing stations for further follow of legal action. For this purpose these hired trawlers have to move through the river mouth / back waters /tidal rivers and creeks up to the berthing stations. The role of support boats will be to provide drinking water, medicine, ration, etc. to the staffs of speed boats and other vessels engaged in the sea turtle operation at sea. They will also be helpful in transport of staffs on a rotational basis working in various vessels. Thus a fleet of vessels of various shapes and sizes will be involved and engaged which is a need for this type of operation involving different types of water wage starting from tidal rivers, creeks, back waters, estuaries, near shore and offshore coastal waters as well as the high seas. There will be a provision of daily wage labourers to assist forest staff.

There will be 35 camps along the coast spread over three forest Divisions viz., Rajangar (18), Chilika (8) and Berhampur (9) Forest Divisions. These camps will function from mid October to June. In each camp there will be two persons on

Forest Guard, Forester, etc. Personnel of these camps shall monitor day-to-day nesting as well as arrival of carcasses of turtles and shall provide feedbacks to the protection squad engaged in the sea operation.

Out of these camps two camps at strategic locations such as Chinchiri and Dobandhi will have permanent infrastructure. All the camps however, will be provided with basic minimum facility and drinking water by way of sinking of a bore well. There will be a monitoring center at Babubali who will be coordinating all the above activities. For creating awareness and extended education about the need to protect the biodiversity (to name a few flagship species such as Sea turtles and marine mammals in the coastal waters and Saltwater crocodiles, wetland birds, etc. in the tidal rivers) and mangroves, there will be an Interpretation Center at Gupti which is centrally located.

Equipments such as DGPS (1), GPS (6), Night viewing binoculars (6), Binoculars with distance measurement facility (6), Eco-sounder (1), radar (1), VHF Main sets (6), VHF hand sets (12) with electric and solar chargers, life jackets (20), life buoys (20), etc. shall be procured which will be used in boats and vessels in the sea turtle operation at sea and other works in tidal and creeks.

(b) Survey, demarcation, fencing channel digging, raising nursery and taking up mangrove plantation along river banks over 100 km. length, mangrove and other associates plantation in villages over 35 ha.

Fencing of about 100 km. of the riverbank will be required for which the areas have been identified. However, the exact dimension of the area available for planting at various sub sites have to be determined after proper survey. Accordingly depending on the dimension of the areas available for plantation at different sub sites (square or rectangle or polygonal, etc.), the perimeter of the areas will differ which will influence the amount of fencing material which have to be procured and area to be fenced at each site.

For the purpose of fencing, RCC pillars of 5ft. height will be fixed at 3mt. intervals with PVC coated chain link mesh nets or strong plastic nets. Since the area is influenced by salinity such fencing will be required to prevent damage and will be useful to check cattle trees, etc.

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- (i) Bio-diversity conservation:
- (a) Purchase of speed boats/ supporting boats, establishment of on shore and off shore camps, strengthening patrolling activities, publicity and awareness.

After the breeding season of sea turtles, the speed boats operating at sea shall be withdrawn and these will be utilized for monitoring the mangroves as well as crocodiles and other biodiversity of the tidal rivers.

- (b) Casualty replacement of plantations, protection and monitoring.

(c) in 4th and 5th year Casualty replacement of plantations, protection and monitoring, etc. shall be done.

Under the biodiversity conservation project there will be a separate cell for Project operation and database preparation at the Wild Life organization headquarters at Bhubaneswar. The cell will be comprised of GIS specialist-cum-research associate, Accountant, Technical assistant, Data entry operator and Driver who will be recruited on contractual basis. At present the expertise of this nature and magnitude is not available in the Department and is absolutely necessary for database creation and the research based information on a daily basis will provide inputs to guide the management actions. The cell will compile the day-to-day progress of the project. Besides, compilation, analysis and interpretation of the data collected from the field shall also be made in the GIS domain. The GIS specialist cum research associate will be the key person for compilation of temporal and spatial data, its analysis, interpretation and reporting.

At the project implementing site the scientist cum curator shall be responsible for running, manning and management of the interpretation center. He will also supervise the work of the project research fellows. The project research fellows stationed at different project implementation sites shall collect day to day information relating to species availability, dominance, diversity, threat perceptions and action required to mitigate the threats. The species monitoring shall include flagship species like sea turtles and cetaceans in coastal waters as well as species like estuarine crocodiles, cetaceans and wetland birds which are at the apex of these ecosystems. They will also collect information relating to suitability of mangroves species for plantation in different habitat conditions including nursery

conditions for successful mangrove afforestation programme. Based on this information the protection and monitoring squads will develop the strategy of protection and management on regular day-to-day basis.

Under the ICZM Project sea-worthy vessels and speedboats as well as country boats will be procured. For protection and monitoring of sea turtles and cetaceans in the coastal waters there is a provision of 4 speed boats to be stationed at Babubali and Agarnasi 2 -2 each. 10 country boats will be stationed in different strategic locations in tidal rivers. Each speed boat will be manned by 1 navigator, boat driver 1 and boat helper 1. Each country boat will be manned by 3 boat man. One will hold the steering and 2 boat mans will row the boat.

Steps will be taken so that after the project period is over the technical personnel shall be absorbed or will be allowed to continue protection of the biodiversity and its habitats in this region through other projects of Govt. of India or the State Government and other sources.

SECTION-V MONITORING AND EVALUATION

The Wildlife Wing of the Forest and Environment Department, Government of Orissa will constitute an ICZM Project Monitoring and Evaluation Committee (PMEC) in the Project Management Cell (PMC) for monitoring and Evaluation of the project, which will be composed of officials, technical experts of the department. If necessary, experts from other allied departments will also be included in the Committee. Besides, technical experts may also be hired from external sources to meet the specific requirements as and when needed. The specialist experts from the SPMU will provide the technical support during monitoring and evaluation.

A. Objectives:

The objectives of monitoring and evaluation shall be as follows:

1. To ensure proper steps for conservation of ecosystem.
2. To ensure quality output in protection of endangered species and their habitats.
3. To detect problems and seek solution/ method for proper implementation of conservation strategy with proper involvement of local people.
4. To ensure timely completion of the project with proper utilization of resources and to ensure quality output.
5. Proper utilization of funds.

B. Components of Monitoring:

The following components will include the monitoring programme:

1. **Reporting:** - The implementing officials will report the progress of the work both physical and financial at regular interval (monthly basis) to the head quarters for the preparation of consolidated report by the PMC to be submitted to the SPMU.

2. **Documentation:** - The progress and quality of work will be done through video and still photography at regular interval through experienced staff from the hqrs as well as by the project personnel appointed in the project. The

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Management Cell (PMC) for monitoring and Evaluation of the project shall review the reports for acceptance.

3. Monitoring through field visit: - A team of competent and experienced staff from the head quarters and department along with others will visit all project sites at regular intervals (Quarterly) and monitor the activity and provide the report in the specific format. The involvement and support of the SPMU experts may be sought for in this process.

4. Departmental Review: Basing on the data available through reporting, documentation and monitoring, the Project Management Cell (PMC) of the Head quarters will prepare the consolidated report. Monitoring & Evaluation Committee of the department will review the consolidated report to be send to the SPMU. They will review the progress of the work and will suggest solutions for the problems. If necessary, experts from outside will also be called for the monitoring.

5. Evaluation: A team of experts from the Project Monitoring Committee (PMC) of the department and specialists from SPMU of ICZMP, Orissa will evaluate the progress of the project annually. If necessary, experts from outside will also be called to carry out the evaluation. Feed back from the public consultations will also be considered during the process of evaluation.

All documents will be communicated to SPMU.

C. Results Framework:

It will be under following aspects:

- a) Plantation of Mangrove and associate species along riverbanks and creeks: -
 - i. Area covered for fencing, plantation, etc.
 - ii. Number of EDCs involved; area covered under plantation, species planted, etc.

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- iv. Progress of pre-planting, plantation and post-plantation activities
 - v. Quality of planting material, growth of the plant
 - vi. Survival rate/ death of different mangrove plant species and replacement.
- b) Activities under taken for Construction works:
 - i) timely completion of construction works
 - ii) Quality out put
 - c) Activities under taken for protection of aquatic fauna:
 - i. Timely arrangement of sea-going vessels from allied department
 - ii. Timely commissioning and quality activity of speed boats for sea monitoring and country boats for monitoring of tidal rivers and creeks.
 - iii. Frequency of patrolling in the sea, details of seizures, and mortality record of Olive Ridley sea turtles, dolphins and crocodile etc.
 - iv. Involvement of Eco-Development Committees and their contribution.

D. Implementation Arrangements:

D.1 Arrangement for Results Monitoring:

The monitoring and evaluation schedule for biodiversity conservation project will be as follows:

Monitoring:

- i. The field functionaries will submit Monthly Monitoring report to the Wildlife Head Quarter every month. It will include both physical and financial aspect of the project activities.
- ii. The Project Monitoring Team will quarterly visit all sites and will prepare a detailed Monitoring result, which they will submit to the Project Management Cell (PMC). A consolidated report prepared by the PMC will be reviewed by the Committee constituted for the purpose at the Head quarters for onward transmission to the SPMU.
- iii. The SPMU will provide the necessary checklist for the purpose

Evaluation:

- i The Project Evaluation team formed at the Wildlife Head Quarters will carry out annual evaluation of the project activity. The Monitoring and Evaluation Committee (PMEC) of the Wildlife Head Quarters will review the annual evaluation of the project activity for onward transmission to the SPMU.
- ii The SPMU will provide necessary matrix (criteria) for the evaluation of the project.
- iii The SPMU environment expert will provide technical support during the evaluation process.

All reports will be submitted to the SPMU. For the success of the project, necessary steps will be taken basing on the suggestions and recommendations of the SPMU.

D.2 Programme Management Reports:

Quarterly monitoring results submitted by Project Monitoring and Evaluation Team will be reviewed by the PMU at Wildlife Head Quarters. These shall be submitted quarterly by the PMU to SPMU giving details of progress made in the project during preceding quarter. The suggestions given by the SPMU for execution, modifications, improvements, etc. shall be communicated to field functionaries by the Project Management Unit (PMU) and the compliances from field levels shall also be communicate to the SPMU by the PMU.

D.3 Programme Operations Management Information System:

This facility will be set up in the offices of the concerned Field implementing Forest Divisions, Regional Chief Conservator of Forests concerned and in the office of the Principal Chief Conservator of Forests (Wildlife) and Chief Wildlife Warden, Orissa.

The monitoring and evaluation data will be compiled by the PMU

ICZM Project Monitoring and Evaluation Committee (PMEC) will be submitted to the SPMU by the Unit. It will then be ready for public consultation and reference.

D.4 Data Collection Tools:

All the data collected will be stored in digital form. For this purpose digital, still and video cameras will be used. Various data collection tools like field visit, report collection (physical and financial), photographic documentation, feedback from the stakeholders and public consultation etc will be used during monitoring. PCs and laptops and GIS Unit will be used for data collection, processing and demonstration.

DETAILED PROJECT REPORT

Annex V

Outline Table of Content for Detailed Project Reports For State Level Local Pilots

[Note that the scope and coverage of the detailed project reports will vary depending on the nature and complexity of the individual state level local pilots]

Executive Summary:

Reflects the concepts, phasing and costing as detailed in the sections below
Description of Project Area (support all with maps)

The coast and coastal waters of Orissa are important due to presence of a large number of coastal, marine and estuarine bio-diversity. To protect the vast coastal and marine biodiversity along with the interest of people living on and near the coast, protection and proper management of coastal areas are essential. Effective protection of the hinterland from periodic cyclones, super cyclones and tsunami, etc. by taking up mangrove plantations which will help in reduction of wind velocity as well as tidal surges.

The project area is basically part of Coastal areas of Orissa extending from Dhamra to Patisonapur (border with Andhra Pradesh) which includes land mass and parts of territorial waters extending up to 12 nautical miles into the sea from the high tide line. These areas fall within the jurisdiction of DFO, Mangrove Forest Division, Rajnagar, DFO Puri (WL) Division, DFO Chilika (WL) Division and DFO Berhampur (Territorial) Division who will be the implementing agencies in the field for works relating to Wildlife organisation of Forest department, Govt. of Orissa.

The entire area is very rich in bio-diversity. There are coastal shelterbelt of Casuarina, natural shelterbelt of mangroves, estuary of large number rivers like Mahanadi, Baitarani, Bramhani, Daya, Devi, Kadua, Rushikulya and Bahuda etc. There are three important protected areas in the Project site namely Bhitarkanika, Gahirmatha, Balukhand-Konark and Chilika- Nalabana Sanctuaries.

The project site includes three mass nesting sites of Olive Ridley Turtles at

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including the coastal waters which are the mating and breeding ground of the species. The coastal waters also form the habitat for the marine mammals like whales, dolphins, porpoises, horse shoe crab, sea horses, coral reef, sea grass beds, etc. The mangrove ecosystem of Bhitarkanika and adjoining Mahanadi delta is the best habitat of the estuarine crocodiles (*Crocodylus porosus*).

The project site also include important tourist destination of State like Bhitarkanika Sanctuary, Mahanadi delta, Gahirmatha marine sanctuary, Chilika lake, Nalabana Sanctuary, etc. The populations in the vicinity of this coast are basically dependent on the forest and marine products for their livelihood.

The main objective of the Project is conservation of Bio-diversity on and along the coast and coastal waters.

The important species and eco-systems, which need immediate attention and the process to achieve these objectives are:

- (i) Protection to Olive Ridley sea turtle, Dolphins and Whales and other Marine life forms in the coastal waters and along the coast along with protection of avi - fauna of coastal wetlands.
- (i) Preservation and propagation of mangroves and mangrove associates both banks of all tidal influenced rivers, creeks and mud flats through massive plantation and protection through community participation.

PART I- FEASIBILITY REPORT

A. Physical (Hydrological) features:

The terrain of the landscape bordering of the Bay of Bengal comprises sandy sea beach backed by wetlands with natural mangrove forest and interrupted by a network of tidal rivers, creeks and crick lets of the major river systems of the state of Orissa namely, Bramhani, Baitarani, Dhamara, Mahanadi, Rushikulya, Bahuda, etc.

The monsoon prevails from middle of June and continues till September with occasional rains during October. The tides are of semi-diurnal type.

B. Economic features:

Economic valuation of mangrove species and other biodiversity forms including the ecosystem services are of immense importance. Appropriate studies will be conducted during the project period for economic evaluation of the above mentioned items.

C. Existing services status:

The project site is very rich in biodiversity. As a result the one of the Sea turtle species i.e. Olive Ridley Sea turtle come in large number for breeding and nesting and remain in the areas for more than six months. The Olive ridley population of the project area represents above 50% of the global population of the species and about 90% of the total Indian population of the species. The rich mangrove diversity provides valuable ecosystem services and sustain the livelihood of local community. The rich fishery resources are of immense importance for the local fishers. The mangrove system also protect the people in the hinterland from the fury of natural calamities. It also protect the shoreline and river banks from erosion.

D. Planning aspects (give due justifications for all):

- Feasible Alternative Plans

The coastal environment needs to be maintained in harmony with the

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biodiversity as it is. To fulfill this objective, there are few following alternatives, however the proposed activities are chosen because of their eco-friendly output and long term acceptable benefits.

Mangrove serve as a natural cyclone shelterbelt but in many areas, mangroves have been clear felled, thus these areas are now devoid of mangroves. Alternatives to mangrove plantation are erection of stonewall and such other engineering structure. However, engineering alternatives to mangrove planting are prohibitively expensive and don't provide a suitable habitat for important fisheries and wildlife. Engineering structures are also not environmental friendly and is not a long term solution to the problem to minimize shoreline erosion, protecting the hinterland from the affects of the cyclone as well as to provide habitats for fisheries and wildlife.

Alternative to Olive ridley sea turtle protection is to provide money to the Fisherman and businessman, who are commercially exploiting the fishery resources. These are however not the practical solution and not desirable also.

- Broad economic analysis and financial impact-capital, O&M

Non-maintenance of mangrove forests may cost the life of human being, cattle and other biodiversity. Living condition of people will deteriorate. Villages will submerge in the sea and govt. have to incur huge expenditure to mitigate the hardship of the people.

- Social Screening outcome, R&R requirement, Need for land acquisition

No land is being acquired from private sources. All activities will be undertaken in the Govt. land.

- Environmental Screening outcome, likely environmental impacts, need for detailed environmental assessments

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Social and environmental screening as per the World Bank format was done for each proposed site. CRZ mapping along with field verification has been done to ascertain if any of the project sites is coming under CRZ restrictions. Environmental and social issues will be identified through the screening process and if any potential issue is identified, the same will be suitably addressed in site specific Environmental Management Plans (EMPs) and Social Management Plans (SMP).

Implementation of the project will not have any bearing on ecology and environment of the locality. Since the structures will be constructed in vacant government lands it will not involve any displacement of people or disruption of any economic activity. The project area is not included in any proposed developed area. The design and constructions will be consistent with the surrounding landscape. The construction activity will involve only minor building foundation excavation which will be filled up with sand after the construction. The project will not also influence the flora and fauna of the locality in any way. It will not involve any hazardous activities, storage or use of any harmful substances or any waste emission. The detail of environment impact assessment study.

- Overview of institutional issues and capacity building required

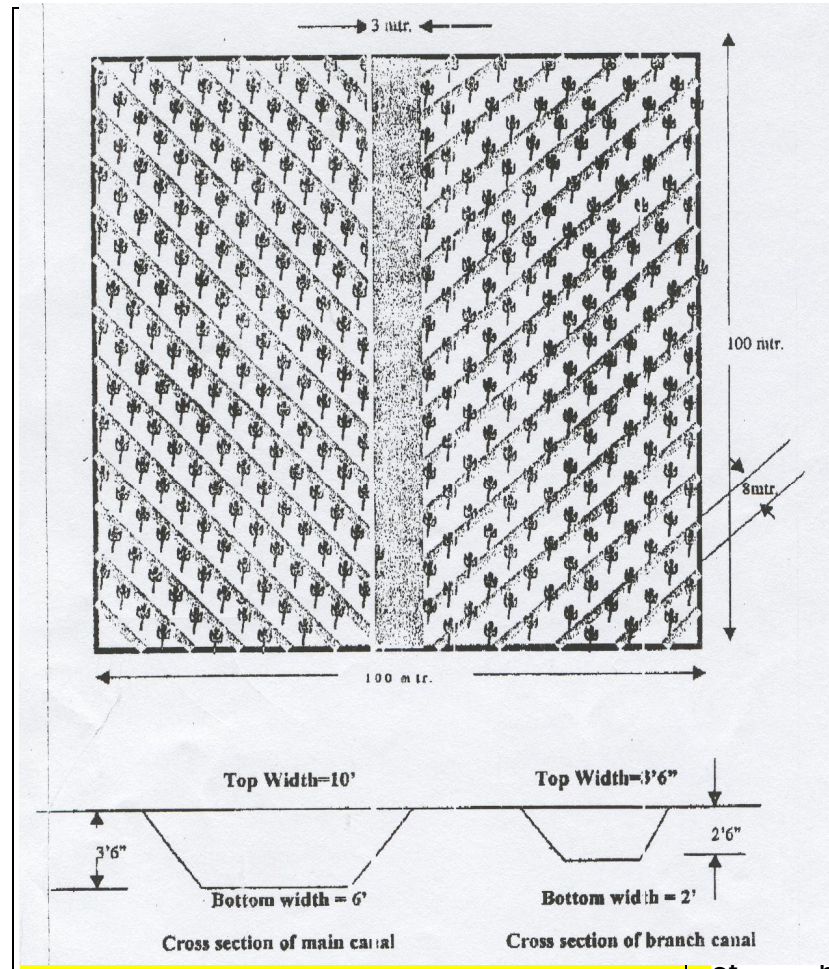
The project activities will be additional job at the level of DFO, RCCF and PCCF (Wildlife), Orissa. The existing staff are already too meager and over burdened whether in the office or in the field. Hence additional man power will be required in all the offices. Further infrastructure available is also not adequate like vehicle, building, equipments, etc. These need to be added.

Since ICZM work will be of new type funded by World Bank and supported by MoEF, Govt. of India for which the present set up is not tuned to their discipline and working whether it is implementing, accounting and monitoring procedures. So capacity building is required in these areas.

Part II- Detailed Project Report

A. Designs

A.1 Typical layout of fish bone channel in one h.a. area



Spacing of hypocotyls

1.5mX 1.5m = 4445 hypocotyls per hectare

Spacing for seedlings 2mX 2m = 2500 seedlings per hectare

D. Environmental & Social Assessments:

- **Environmental Assessments, Environmental Management Plans:**

Biodiversity conservation measures are basically to improve the degraded environment. For ensuring a balanced ecosystem the area has been notified as Sanctuary and National Park. For the purpose of conservation of biodiversity and plantation etc. management plans for each of the protected areas is existing within the project site are under scrutiny for approval.

- **Social Assessments, R&R Plans, Land acquisition plans and**

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For protection of Protected area, Eco-Development Committees have been formed to reduce the negative impact of human being on such areas. In lieu, number of entry point activities is being undertaken through Micro Plans prepared through social assessment.

R&R is not required in this project.

Land acquisition will be required for plantation as the land is not forest land. This is a routine work for the DFOs to get the land by approaching the Collector.

- **Details community consultations and agreements:**

During course of execution of works such as plantation and eco-tourism, etc., community consultation and their willingness will be taken into consideration.

MONITORING MECHANISM

1. maintenance of plantation journal (monthly)
2. Photo documentation
3. Satellite imagery interpretation by competent Organisation /Department
4. Regular inventory both internal and external

Concerned staff of the executive Department will execute the above mechanism. This will be governed by Orissa Forest Department code.

Public Consultation in annexure-1 & 2

E. Implementation Arrangements and Schedules:

- **Proposed Implementation Management Process (responsibilities in ULB, need for establishing additional capacities/ systems).**

The existing field staff will execute most of the fieldwork. However, a number of people are required to assist the field staff and also for data management in the field offices and in headquarters of the wildlife organisation. These additional staff will be hired on contractual basis.

- **Quality control procedures, third party checking requirements, need for hiring consultants.**

Quality checking will be done by departmental Officers as well as experts in relevant fields have to be hired to ensure quality control in a better and professional way.

- **Procurement and implementation plans**

F. Operation & Management Planning:

- **Operational plans for assets designed (how the system operates), Maintenance requirement and estimates of O&M costs.**

After creation of the mangrove plantation it will be protected by concerned EDCs or VSS as the case may be.

- **Plans for Operation and Management (O&M):**

Once the assets like plantation, boats and building, etc. has been created, it will be maintained by the EDC and VSS as well as from the Departmental fund as the case may be.

- **Equipments, Tools and Plants, logistics required for O&M:**

No specific support is required for O & M.

- **Skills to be built up, manpower to be hired, outsourcing contractors to be hired, systems to be established (MIS, accounting, asset management, etc.)**

For specialized works like design of boats and interpretation centres, services of experts are required on hiring and contractual basis.

- **Cost of O&M, revenue recovery plans, proposed tariffs, subsidy levels.**

It will be borne from the existing resources.

G. Service level monitoring:

- **Projected Service level achievements**

It will protect and enrich the biodiversity, capacity of local people will be enhanced for wise use of mangrove and marine resources. Life of the people will be secured and their living condition will be improved.

- **Monitoring requirements**

Two types of monitoring i.e. project and environmental are proposed. It will be carried out in a specific time schedule by the PMU. A particular

LIST OF MAPS

Map-1	Map of Orissa showing the coastline.
Map-2	Two coastal stretches of ICZM Project.
Map-3	Map of Dhamra-Paradip stretch showing location of Bhitarkanika Wildlife Sanctuary / National Park.
Map-4	Map of Dhamra-Paradip stretch showing location of Gahirmatha Marine (Wildlife) Sanctuary.
Map-5	Map of Gopalpur-Chilika stretch showing location of Chilika coastline, Chilika lagoon and Chilika (Nalaban) Wildlife Sanctuary.
Map-6	Map of major river deltas of Orissa showing mangrove areas.
Map-7	Map of Marine Protected Areas (MPAs) notified under State Fisheries Act (OMFR Act, 1981).
Map-8	Map of Management Action Plans (MAPs) for conservation and management of mangroves (being implemented under Centrally sponsored schemes).
Map-9	Map of Orissa coast showing mass nesting areas of Olive ridley sea turtles.
Map-10	Map of proposed plantation sites of mangroves and mangrove associates in Bhitarkanika
Map-11	Map of proposed plantation sites of mangroves and mangrove associates in Rushikulya and Bahuda river mouth areas.
Map-12	Map of plantation sites along tidal riverbanks in Mangrove Forest Division (Wildlife), Rajnagar.
Map-13	Map of location of Eco Development Committees of Mangrove Forest Division where plantation will be taken up.
Map-14	Map of zonation of sea for regulating fishing activities.
Map-15	Map of Gahirmatha Marine Sanctuary area of Mangrove Forest Division showing location of Olive ridley sea turtle camping sites.

LIST OF ANNEXURES

Annexure-1- EIA & SA (including Public consultation proceedings for Bhitarkanika & Gahirmatha

- (A) Public consultation proceedings for Badapadia EDC
- (B) Public consultation proceedings for Chakamohanpur EDC
- (C) Public consultation proceedings for Kaitha EDC
- (D) Public consultation proceedings for Kalatunga VSS
- (E) Public consultation proceedings for Kankanagar EDC
- (F) Public consultation proceedings for Nalitapatia EDC
- (G) Public consultation proceedings for Okilapada EDC
- (H) Public consultation proceedings for Paramanandapur EDC
- (I) Public consultation proceedings for Rajendranarayanpur EDC
- (J) Public consultation proceedings for Sailendranagar EDC
- (K) Public consultation proceedings for Krushnanagar EDC

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Annexure-2: EIA & SA (including Public consultation proceedings for Berhampur (Rushikulya mouth)

(A) Public consultation proceedings for Purunabandha village (Rushikulya mouth)

Annexure-3: Joint Forest Management Resolution 2008

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Annexure-1:**EIA & SA (including Public consultation proceedings for Bhitarkanika & Gahirmatha****1.0 INTRODUCTION****1.1 Project description**

Integrated Coastal Zone Management Programme (ICZMP) has been formulated by the Ministry of Environment and Forests, Government of India and funded by World Bank is concerned with sustainable long-term anthropocentric perspective area development plan in the coastal stretches of India. The project attempts to harmonize conservation and development with specific thrust on the conservation of resources along with welfare of local and indigenous communities, the traditional custodian of the coastal resources.

The objective of the project is “protection and sustainable development of coastal stretches and the marine environment through sustainable coastal zone management practices based on sound scientific principles taking into account the vulnerability of the coast to natural hazards, sustainable livelihood security for local communities and conservation of ecologically and culturally significant coastal resources”. The following environmental management related activities are envisaged while implementing ICZMP:

- Contingency plan for restoration of degradation due to human activities
- Conservation and restoration of critical wildlife habitats through:
 - (ii) Protection to important fragile ecosystems and keystone species.
 - (ii) Consolidation of degraded mangrove forest blocks and strategic estuarine river banks through mangrove plantation.
 - (iv) Conducive as well as protective environment to Olive Ridley Turtles for mass breeding and mass nesting.
 - (v) Eco-friendly sustainable conditions to other aquatic wildlife such as dolphins, crocodiles as well as avifauna.
 - (vii) Participation of local people shall be ensured in conservation and protection of Bio-diversity by creating Eco-development committees and Vana Sanrakhyana Samiti (V.S.S.).
 - (viii) Integration of biodiversity conservation with participatory

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dependence on coastal forest and fisheries resources, which leads to overexploitation.

Paradeep-Dhamra coastal stretch covers about 80 Km. of the total 480 km. coastal stretch of the state Orissa. It includes Bhitarkanika, which is both a sanctuary, and National Park. It is good representative of mangrove wetland ecosystem having high genetic and ecological diversity. The floral diversity of Bhitarkanika (mangrove) is known to be the largest in India and second largest after Papua New Guinea. It is one of the best reptile refuges in the entire country as well as in the whole of South East Asia region. The coastal waters adjoining Bhitarkanika is a marine sanctuary known as the Gahirmatha marine wildlife sanctuary.

This site epitomises the merging of four different eco-systems namely terrestrial, fresh water, estuarine and marine ecosystems, and shows all variations in genetic, specific and ecological diversity of both plant and animal communities. The peripheral areas in the buffer zone are dotted with numerous ornithologically important wetlands.

The state's vision and strategy for ICZM is perceived as:

- (iv) Long-term scientific management of the coastal zone and its resources in an integrated manner through multi-disciplinary approaches and adopting the success stories and standard procedures from other areas.
- (v) Protection of coastal and marine biodiversity of dynamic ecosystems.
- (vi) Providing ecological security to the species and eco-systems.

The main objective of the Project is conservation of Bio-diversity along the coast and coastal waters. The important species and eco-systems, which need immediate attention and the process to achieve these objectives, are:

- (v) Preservation and propagation of mangroves and mangrove associates both banks of all tidal influenced rivers, creeks and mud flats through massive plantation and protection through community participation.
- (vi) Protection to Olive ridley sea turtles and Cetaceans (Dolphins, Whales, Porpoises) and other marine life forms.

- (i) Survey, demarcation, mapping and fencing of the areas along the banks of tidal rivers and creeks for restoration of mangroves and mangrove associates
- (ii) Movement in rivers, creeks and creek lets for collection of planting materials such as seeds and hypocotyls.
- (iii) Involvement of skilled local people and EDC members for mangrove restoration.
- (iv) Purchase of speedboats and hiring of trawlers and support boats for protection of sea turtles at sea.
- (v) Construction of county boats for protection of estuarine crocodiles, wetland birds and other aquatic wildlife as well as control of illegal fishing activities in the tidal rivers and creeks.
- (vi) Construction of permanent camp shed at Chinchiri and Dobandhi and digging of deep tube well at all camp sites for beach monitoring and protection of sea turtles.
- (vii) Construction of Interpretation Centre at Gupti for education spread of awareness relating to biodiversity conservation and utility of coastal resources.
- (viii) Construction of hatchery and rearing complex of Saltwater crocodiles at Dangmal for supplementing activities relating to rehabilitation of this endangered species.
- (ix) Purchase of equipments for strengthening of patrolling activities at sea and in mangrove areas for collection of data for facilitating biodiversity conservation and database preparation.
- (x) Establishment of a GIS Cell for strengthening monitoring activity and database development in a GIS domain.

1.2 Baseline data:

The Mangrove Forest Division (Wildlife), Rajnagar includes Bramhani, Baitarani and Mahanadi deltaic region of Kendrapara district in northeastern part of the coastal state of Orissa. The protected area within this coastal Forest Division is about 2107 sq. km., which includes 672 sq. km of Bhitarkanika Wildlife Sanctuary/NP + 1435 sq. km of Gahirmatha (Marine) Wildlife sanctuary).

1.2.1 Physical settings

The geological setting of the Mangrove Forest Division (Wildlife), Rajnagar lies:

20⁰ 17' 32"N to 20⁰ 48' N latitude

86⁰ 45' E to 87⁰ 17' 36'E longitude

Bhitarkanika mangrove wetland has been declared as one of the Ramsar sites i.e. wetland of international importance on 19th Aug.2002. It is the second wetland to be declared as Ramsar site in the state after Chilika lagoon and one of the 19th in the entire country.

The project site will cover the entire forest division including the territorial waters of the coast. It includes Bramhani, Baitarani and Dhamara deltaic region of the coastal district of Kendrapara in the state of Orissa. The identified Project sites for protection of its rich biodiversity has a network of protected areas notified under Wildlife (Protection), Act 1972 are as follows:

Bhittarkanika Wildlife Sanctuary

Bhittarkanika National Park

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For the protection of rich biodiversity along this stretch of coastal waters, the project sites have also identified a network of Marine Protected Areas notified under the Orissa Marine Fisheries Regulation (OMFR) Act, 1982 which is:

20 km. seaward radius of Gahirmatha area.

20 km. sea ward radius of Rushikulya river mouth area

1.2.2 Biological settings

The mangrove ecosystem in the Bramhani- Baitarani-Dhamara deltaic complex is the nursery and spawning ground of several species of fish, prawn and crabs as well as other invertebrates. It is also the breeding ground of several rare and endangered species of wildlife. The entire project area is an outstanding example of dynamic land developmental processes including both accretion and erosion.

The site contains 300 plant species including both mangroves and non-mangroves. This coastal wetland supports one of the largest mangrove plant diversity in India, and comprises of 82 species of mangroves and its associates. It harbours three varieties of Sundari trees (*Heritiera* sps.) including *Heritiera kanikensis*, which is an endemic species. The details of mangroves and mangroves associates is given in Table-9.

The site contains the most important and significant natural habitats for in-situ conservation of biological diversity containing 5 Amphibian species, 42 Reptilian species, 217 Bird species and 30 Mammalian species. Five species of Amphibians and varieties of Crabs including Horse Shoe Crab and a large variety of edible and commercially important fish are also found in the waters of the sanctuary. It includes 27 threatened species of outstanding universal value from the academic and conservation point of view. It includes Schedule-I animals of different categories namely Mammals (8 species), Birds (3 species) and Reptiles (16 species) and also contains a high density of the India's largest water monitor lizard (*Varanus salvator*).

Species diversity of birds at this site includes more than 60 species of migratory waterfowl (about 0.2 million birds). It has a site for community nesting of aquatic birds, the Bagagahan

nesting of a large number of water birds (eleven species) on four species of mangrove host plants during monsoon every year. The winter migrants like Cotton Teal, Pintail, Shoveller, Brahminy Duck, Bar Headed Geese, Pied Avocet, Indian Skimmer and a host of waders are found in large numbers in open meadows, accreted islands and water bodies. Pelicans and Spoonbills also visit the area during monsoon and occasionally by Flamingoes during winter. It is also home to eight varieties of kingfishers including a sizeable population of endangered Brown-winged kingfishers.

The site contains one of the world's largest nesting and breeding ground of the endangered Olive ridley sea turtles. This seasonal phenomenon is considered as one of the greatest extravaganza of nature (2,67,000 during 2005-2006). It also holds areas of exceptional natural beauty and aesthetic importance. Gahirmatha sea beach along the coast being world's largest rookery attracts over half a million female olive ridley sea turtles for mass nesting/ egg lying.

It is home to the largest population of the endangered estuarine crocodiles (*C. porosus*) in the Indian Sub-continent (1596 during 2009 census). The largest living crocodile in the world (23'+) is a denizen of this site (Guinness Book of World Record, 1994, 2006).

1.2.3 Socioeconomic Settings

(The socio-economic parameters viz. demography, population growth, density, sex ratio, health, work force participation, occupational structure, literacy etc, play an important role in determining the impacts of a proposed activity on the socio-economic status of the study area).

Bhitarkanika wetland has two Protected Areas (PAs):

Bhitarkanika Wildlife Sanctuary extends over 672 sq. km and Bhitarkanika National Park extending over 145 sq. km. forms the core. As per the 2001 census, there are 410 villages in the sanctuary area, which includes population more than 2 lakhs as well as 75,000 cattle heads. There is no human habitation within the National Park but about 100 villages close to its periphery exerting pressure on the core zone.

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Three villages namely Satbhaya, Kanhupur and Barahipur remain outside the National Park but being landlocked, the people come through the PA for reaching the outside world.

Agriculture is the prime profession of the people. Due to tidal ingression and hyper salinity of the soil, only monsoon dependent one crop, i.e. paddy is cultivated in these villages. Fishing is the next means of livelihood. People from other professions are entering to fishing because of the increase in interest in brackish water prawn aquaculture. Even people taking fishing when there is no agriculture. Other professions adopted by the people are basket making, honey collection, duckery, poultry and diary etc. Many migrate to other urban areas of the state and even to other states during off seasons (December to May).

There is heavy anthropogenic pressure on the wetland. In general, people depend on it for firewood, house building materials, honey and various fruits and fish for their daily utility. They also mostly depend on forest for fodder for their cattle. Fisherman communities heavily depend on the rivers and creeks for their livelihood. After declaration of the protected area it is decreasing but still then illegal fishing to some extent is being reported.

The health and sanitary condition is not at all satisfactory. Because of low-lying area and networks of rivers and creeks, water borne diseases and other diseases are rampant. To provide health facility is also very difficult in this extreme terrain. Now-a-days man and wildlife conflict is also creating management problem. However, through Eco-Development Committees (EDCs), the Forest Department is trying to improve the condition of the people and trying to develop management strategy to reduce anthropogenic pressure on the sanctuary and simultaneously implement biodiversity conservation activities.

1.3 Policy, legal, and administrative framework

The purpose of Environmental Assessment (EA) is to assist in the decision making process and to ensure that the project is environmentally sound and sustainable and necessary management plans are included wherever necessary to minimize/ mitigate the environmentally adverse impacts, if, any. It is the responsibility of the Project Implementing Agency (PIA) i.e. the Wildlife Wing of Forest Department,

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existing regulatory/ legal framework, whether National, State, Municipal or local.

The environmental regulations, which have significance on the implementation of the Project, are highlighted below.

The Environment (Protection) Act, 1986

This is a central Act of Government of India, which is an umbrella legislation that focuses on the protection of the environment. It includes water, air and land and the interrelationship among them. The Act provides power to the authority declared under the Act to take necessary measures for the purpose of protecting and improving the quality of environment. Environmental Impact Assessment Notification, 2006 forms a part of the regulation under this legislation.

Relevance to the project:

- (1) The conservation of coastal natural resources and augmentation of conservation strategy for protection of flora, fauna in general and endangered and economic important ones in specific.
- (2) For regeneration of degraded coastal mangrove forest, rearing and support through effective mass nesting for estuarine crocodile, Olive Ridley sea turtle and avifauna.
- (3) To provide safeguard to the biotic community of the coastal ecosystem to sustain a local fishing population.

Water (Prevention & Control of Pollution) Act, 1974

This Act has been enacted to implement measures devised for effective prevention and control of water pollution. It empowers the State Pollution Control Board (OSPCB) to take necessary regulatory measures for disposal of sewage and trade effluents and information dissemination for maintaining or restoring wholesomeness of the water bodies, prosecuting offenders and issuing licenses for construction and operation of certain facilities.

Air (Prevention & Control of Pollution) Act, 1981

This Act has been enacted to implement measures devised for effective prevention and control of air pollution. It empowers the State Pollution Control Board to take necessary regulatory measures for discharge of emissions and information dissemination for maintaining or ambient air quality, prosecuting offenders and issuing licenses for construction and operation of certain facilities.

Relevance to the project.

All construction contractors need to obtain the consent to establish and consent-to-operate for the various plants – concrete batching, stone crushing and other plants – that they may erect for the purpose of housing construction. This should be obtained from the nearest regional offices of the SPCB. If existing plants are to be used, then the units should have the valid consent orders.

Under the Coastal Regulation Zone (CRZ) Notification, 1991 issued under the Environment (Protection) Act, 1986, coastal stretches have been defined as Coastal Regulation Zones (CRZ-I, CRZ-II, CRZ-III and CRZ-IV). Restrictions have been imposed on industries, operations and processes within the CRZs. For regulating development activities, the coastal stretches within 500 metres of High Tide Line on the landward side are classified into four categories, namely:

- CRZ-I: (i) Areas that are ecologically sensitive and important, such as national parks/ marine parks, sanctuaries, reserve forests, wildlife habitats, mangroves, corals/ coral reefs, areas close to breeding and spawning grounds of fish and other marine life, areas of outstanding natural beauty/ historically/ heritage areas, areas rich in genetic diversity, areas likely to be inundated due to rise in sea level consequent upon global warming and such other areas, and (ii) Area between Low Tide Line and the high Tide Line.
- CRZ-II: The areas that have already been developed upto or close to the shoreline. For this purpose, “developed area” is referred to as that area within the municipal limits or in other legally designated urban areas which are already substantially built up and which have been provided with drainage and approach roads and other infrastructural facilities, such as water supply and sewerage mains.
- CRZ-III: Areas that are relatively undisturbed and those, which do not belong to either CRZ-I or CRZ-II. These will include coastal zone in the rural areas (developed and undeveloped) and also areas within Municipal limits or in other legally designated urban areas, which are not substantially built up.
- CRZ-IV: Coastal stretches in the Andaman & Nicobar, Lakshadweep and small islands, except those designated as CRZ-I, CRZ-II or CRZ-III.

The development or construction activities in different categories of CRZ area shall be regulated by the concerned authorities at the State/ Union Territory level, in accordance with norms stipulated in the CRZ regulation and in the state/ UT coastal zone management plan.

Relevance to the project.

- No new construction is permitted in CRZ-I areas that are ecologically sensitive.
- In CRZ-II areas, new buildings are permitted only on the landward side of the existing (or approved) road or authorized structures.
- In CRZ-III areas, no new construction shall be permitted within 200m from the High Tide Line.
- In CRZ-III areas, construction or reconstruction of dwelling units between 200m and 500m is permitted only if it pertains to traditional/ customary rights.
- Construction of public rain shelters, community toilets, bridges, roads and jetties are permitted in CRZ-I areas that are not ecologically sensitive and fall

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UT Coastal Zone Management Authority.

Orissa Marine Fishing Regulation Act (OMFRA), 1982:

This is a State Fisheries Act. It regulates the fishing in fishing zones along the coast. It also aims at sustainable fishing through numerical restriction of mechanized fishing vessels in the landing centres and protecting the economic interests of traditional fishers operating in the marine sector. Under this act no mechanized fishing vessels are allowed to fish within 5 km from the coast to protect the interest of traditional fishermen. No outside (neighbouring states) fishing vessels, not registered under OMFRA are allowed to fish in the territorial waters of Orissa. To conserve the fish stock and biodiversity, uniform ban of fishing from 15th April up to 31st May every year is meticulously followed in the state. Orissa coast, being famous for the nesting sites of rare Olive Ridley sea turtles, several conservative measures are being taken under the OMFRA. Fishing has been prohibited in specified turtle congregation areas including Dhamara river mouth of this project site. All mechanized vessels within 20 km seaward radius from the coast. Use of Turtle Excluder Devises (TEDs) has been made mandatory in all the operating trawlers. Several officers of Fisheries Department and other line departments such as Forest Dept. and Coast Guard have been declared as Authorised Officers for strict implementation of the Act.

2.0 ENVIRONMENTAL AND SOCIAL IMPACTS

Environmental and Social Impacts

This section lists the potential environmental impacts, both positive and negative, during the construction as well as operational phase of the project. The environmental impacts identified in following pages are only preliminary in nature. Any further impact that may arise in due course of time will be assessed for its significance and necessary mitigative measures will be included in the Environmental Management Plan. The project is expected to yield significant environmental benefits in terms of coastal biodiversity conservation, increase in fisheries production, ensuring better livelihood, protection against cyclones, super cyclones, tidal surges, tsunami and such other natural disasters.

Checklist for Environmental and Social Assessment of the project is given in Table-1.

Table-1 Environmental and Social Assessment Checklist

Features likely to be affected	Positive impact		Negative Impact		No Impact	Mitigation measures required or not
	Yes	Likely	Yes	Likely		
Forestry/ Vegetation	✓					
Birds	✓					
Fisheries	✓					
Other wildlife/animals	✓					

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Noise environment			✓			✓
Water quality				✓		✓
Water availability					✓	
Soil quality					✓	
Land use and topography					✓	
Drainage patterns					✓	
Sedimentation/erosion		✓				
Agriculture					✓	
Food production		✓				
Climate		✓				
Groundwater table		✓				
Industrialization					✓	
Housing (involuntary resettlement)					✓	
Employment/training		✓				
Income and livelihood		✓				
Other socio-economic activities		✓				
Health and safety		✓				
Communications		✓				
Historical/cultural monuments					✓	
Scenic views and vistas		✓				
Tourism		✓				

Impact identification matrix for the construction phase as well as the operation phase of the proposed project is given in Table-2.

Table-2 Impact Identification Matrix

	Air	Noise	Surface Water	Ground water	Climate	Land & soil	Ecology	Health	Socio economic
Land Acquisition	Govt. land will be used in restricted areas, where there is neither habitation nor vegetation								
Construction Phase									
Transportation of construction materials	✓	✓				✓		✓	✓
Construction	✓	✓	✓			✓		✓	✓
Operational Phase									
Generation of Liquid waste			✓			✓		✓	
Generation of Solid waste						✓		✓	
Release of oil from the vessels / boats			✓					✓	
Release of noise from the vessels/ boats	✓	✓						✓	

Impact prediction matrix for various activities involved in the construction phase and

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Table-3 Impact Prediction Matrix

Activity	Environmental Attributes	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Significance
Construction Phase						
Transportation of construction materials	Air	Transportation of construction materials in trucks / boats & Exhaust emission from vehicles	Direct Negative	Short term	Reversible	Low
	Noise	Noise generation from vehicles	Direct Negative	Short term	Reversible	Low
	Land & soil	Dumping of materials & excavated earth	Direct Negative	Short term	Reversible	Low
	Health	Inhalation	Direct Negative	Short term	Reversible	Low
	Socioeconomic	Employment	Direct Positive	Short term	Irreversible	Medium
	Risk	Risk of accidents during transit	Direct Negative	Long term	Irreversible	Low, if safety measures are taken to prevent accidents
Construction activity	Air	Operation of construction machinery	Direct Negative	Short term	Reversible	Low
	Noise	Noise generation from vehicles and machinery	Direct Negative	Short term	Reversible	Low
	Health	Inhalation	Direct Negative	Short term	Reversible	Low
	Socioeconomic	Employment	Direct Positive	Short term	Irreversible	Medium

Activity	Environmental Attributes	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Significance
	Risk	Risk of accidents during transit	Direct Negative	Long term	Irreversible	Low, if safety measures are taken to prevent accidents
Operational Phase						
Mangrove Plantation and Coastal, Marine	Water Quality	Generation of waste waters	Direct Negative	Long Term	Reversible	Low
	Air Quality	Vessel/boat	Direct Negative	Short term	Reversible	Low

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conservation and protection	Noise levels	Noise generation from vessels/ boats	Direct Negative	Short term	Reversible	Low, with installation of acoustic enclosures, periodic maintenance of boats and vessels
	Oil	Release form oil spill / leak/ accident	Direct Negative	Short term	Reversible	Low, with proper safety measures and mitigation plan
	Socioeconomic	Employment generation	Direct Positive	Long term	Irreversible	High, new opportunities for income generation
	Overall Quality of Life of local community	Protection from cyclone/ saline water ingress/ high localised fish population	Direct Positive	Long term	Irreversible	High
	Risk	Risk of accidents during coastal plantation and protection of aquatic wildlife	Direct negative	Long term	Irreversible	Low, if safety measures are taken to prevent accident and safety step during calamities and disasters

Legal Framework

The legislative tools for coastal environmental management are outlined in the Coastal Regulation Zone Notification, 1991, Environment (Protection) Act, 1986, Water (PCP) Act, 1974 and Air (PCP) Act, 1981, and Coastal Management Zone Notification, 2008 (Draft). Despite the obvious strengths of these regulations, there still exists a gap in the institutional coordination, which needs to be addressed.

Institutional Framework

The Project Coordinator (PC) in the Project Management Cell (PMC) functioning in the Wildlife Organisation Hqrs. will have the overall responsibility for implementation of the Project in coordination with the State Project Management Unit (SPMU). PC will be assisted by adequate and qualified technical and managerial staffs and will be provided with necessary equipment/ instruments and other infrastructural facilities as well as vehicles and

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reports as part of the regular Project monitoring in consultation with the SPMU.

2.1 Positive impacts due to the project activities –
Summarized in Table-2s & 3

2.2 Negative impacts due to the project activities –
Summarized in Table-2 & 3

2.3 Mitigation measures:
Discussed in Section 5 (Table-4)

3.0 PUBLIC CONSULTATION

The above public consultations with different stakeholders (Annexure –I (a-e) & Annexure-2 (a)) reveal that the implementation of the project is not expected to lead any adverse social concerns. As the activities will be carried out mostly in Govt. land in restricted areas, there will be no loss of public land and therefore no rehabilitation programme is necessary. During construction phase, the activities are only small civil works, which will have minor, localized impacts, and these can be readily managed. Necessary environmental management programmes have been included in the project to mitigate/ minimise the limited adverse impacts of operation phase.

The local inhabitants of the Bhitarkanika area have been consulted for their opinion on the plantation of mangroves both by the Department and EDC which they have agreed, will be beneficial to them with regard to availability of resources and protection during disasters. Initially the villagers were sceptical but after the discussion they were convinced about the long-term benefit of this conservation programme. People from different sectors of the society were present in this consultation process. They were briefed about the impacts of the programme, details of which are enclosed in Annexure-I.

4.0 ANALYSIS OF ALTERNATIVES

The coastal environment needs to be maintained in harmony with the development plans. It is therefore necessary to protect and conserve the biodiversity as it is. To fulfil this objective, there are few following alternatives, however the proposed activities are chosen because of their eco-friendly output and long term acceptable benefits.

Mangrove serve as a natural cyclone shelterbelt but in many areas, mangroves have been clear failed and thus these areas are now devoid of mangroves. Alternatives to mangrove plantation are erection of stonewall and such other engineering structure. However, engineering alternatives to mangrove planting are prohibitively expensive

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structures are also not environmental friendly and is not a long term solution to the problem to minimize shoreline erosion, protecting the hinterland from the affects of the cyclone as well as to provide habitats for fisheries and wildlife.

Alternative to Olive ridley sea turtle protection is to provide money to the Fisherman and businessman, who are commercially exploiting the fishery resources. These are however not the practical solution and not desirable also.

5.0 ENVIRONMENTAL MANAGEMENT PLAN

5.1 Mitigation

The primary objective of this proposed environmental management plan and monitoring programme is to control environmental impacts, if any, to levels within acceptable standards, and to minimise possible impacts on the community and the workforce of foreseeable risks during the construction and subsequent operation phases of the project. Such environmental mitigation measures shall be used in conjunction with good management practices and good engineering design, construction and various operation practices.

Mitigation Measures during Construction

Activity	Impacts	Mitigative measures to be taken
Initiation of Construction activity	Legal non-compliance	All clearance/ approvals required for Environmental aspects during construction phases shall be ensured and made available before initiation of the work.
(a) Construction Phase		
The following section contains instructions to the Contractors/ Field implementing Officer, which should be adhered to while carrying out the construction activity. This section will be appended into the relevant bid document.		
Site development	Tree felling	<ul style="list-style-type: none"> Any tree felling should be minimised. Compensatory plantation through landscaping
Construction	<ul style="list-style-type: none"> Top soil erosion 	<ul style="list-style-type: none"> In slopes and suitable places along the roadside, bush grass should be planted and retaining walls, water-intercepting ditches will be built to prevent soil erosion. Deploy silt fences to avoid/ reduce soil erosion and run-off. Temporary and permanent drainage systems will be designed to minimize soil erosion. Topography of the sand dunes along the coast shall not be altered as practicable as possible.
	<ul style="list-style-type: none"> Air pollution due to Dust during Construction 	<ul style="list-style-type: none"> Locally available materials should be used as much as possible so as to avoid long distance transportation, especially that of sand and stone.

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		<p>materials like sand and fine aggregates shall be covered to reduce spills on roads.</p> <ul style="list-style-type: none"> • All dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet. • Stockpiles of aggregate or spoil shall be covered and water applied. • The height from which excavated materials are dropped shall be controlled to a minimum practical height to limit fugitive dust generation from unloading. • All vehicles, equipment and machinery used for construction shall be regularly maintained to ensure that the pollution emission levels conform to the SPCB norms. • Mixing equipment should be well sealed, and vibrating equipment should be equipped with dust removal device. Residence should be 500 meters from downwind direction of asphalt mixing sites. • The random ambient air quality monitoring shall be done to ensure that the significant impacts are being mitigated adequately.
	<ul style="list-style-type: none"> • Noise pollution 	<ul style="list-style-type: none"> • Noise emission level from all construction equipment shall strictly conform to the MoEF/ SPCB noise standards. • On-site power gensets shall be covered with an acoustic enclosure and fitted with muffler and shall conform to the noise emission standards. • Ambient noise level monitoring shall be conducted at suitable locations at periodic intervals during construction phase to conform to the stipulated standards both during day and night time.
	<ul style="list-style-type: none"> • Water logging and creation of mosquito breeding site 	<ul style="list-style-type: none"> • Avoid developing new quarries. Use existing quarries. • Careful attention to be given on design and maintenance of earthworks and drainage systems during construction to avoid creation of significant habitat areas for mosquito larvae. • Spray larvicide in silt traps to prevent the mosquito breeding.
	<ul style="list-style-type: none"> • Surface Water pollution 	<ul style="list-style-type: none"> • Use water resources without conflict. • Solid/ liquid/ construction/ domestic wastes should not be disposed in surface water bodies. • Surface water quality monitoring shall be conducted at suitable locations at periodic intervals during construction phase to conform to the stipulated standards for Inland surface water bodies.

	pollution	<p>tanker supply and ground water.</p> <ul style="list-style-type: none"> • Necessary precautions will be taken to minimize the wastage of water in the construction process. • Ground water quality monitoring shall be done during construction phase, if large quantity of water is used. •
	<ul style="list-style-type: none"> • Land pollution 	<ul style="list-style-type: none"> • The project will take prior permission from the competent authority for disposal of construction waste on landfill site in suitable area. It will be ensured that no construction spoils of any unsuitable material are disposed off on roadside or any other place in the project area. • Construction debris will be collected and suitably used on site as per construction waste management plan.
Labour camps	<ul style="list-style-type: none"> • Soil contamination • Pollution of drinking water sources • Surface water contamination due to washing, bathing and waste disposal • Tree felling for fire wood and tents • Unhygienic work environment • Air pollution from burning of tyres and plastic materials 	<ul style="list-style-type: none"> • All relevant provisions of the factories Act, 1948 and the Building and the other Construction Workers (regulation of Employment and Conditions of Service) Act, 1996 shall be followed for construction and maintenance of labour camps. • Labour camps will be constructed within the project area • The Contractor/ Implementing agency shall also guarantee for the following. <ul style="list-style-type: none"> ➤ Availability of uncontaminated water for drinking, cooking and daily uses. ➤ Supply of potable water at easily accessible places. ➤ The sewage system for the camp will be designed, built and operated in such a way that no health hazard as well as no pollution to the air, ground water or adjacent surface water bodies should occur. ➤ Latrines and urinals shall be maintained in a clean sanitary condition at all times with adequate water supply. ➤ Toxic materials like tyres and plastic materials should not be burnt by the labours for any purpose. ➤ Trees will not be cut for firewood or tent.
Working Condition	<ul style="list-style-type: none"> • Impact on workers health • Impact on Public safety 	<ul style="list-style-type: none"> • The Contractor/ Implementing Agency shall comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organisation (ILO) Convention No. 62 as far as those are applicable to this contract. • All machines to be used in the construction will conform to the relevant Indian Standards (IS) Codes, will be free from patent defect, will be kept in good working condition, will be regularly

		<ul style="list-style-type: none"> • Where loose soil is met with, shoring and strutting shall be provided to prevent the collapse of soil. • The project will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations and safe means of entry and exit. • The Contractor/ Implementing Agency shall arrange for <ul style="list-style-type: none"> ➤ A readily available first aid kit including adequate supply of sterilized dressing materials and appliances. Suitable transport to take injured or sick person to the nearest hospital will be immediately provided. ➤ Personal protective equipment such as safety goggles, helmets, safety belts, earplugs, mask etc. to workers and staff. • The project will take adequate precautions to prevent danger from electrical equipments. • No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights will be provided to protect the public. • Work spots will be maintained clean, and provided with optimum lighting. • Fire fighting arrangement: <ul style="list-style-type: none"> ➤ Demarcation of area susceptible to fires should be provided along with cautionary signage ➤ Portable fire extinguishers/ sand baskets shall be provided at easily accessible locations in the event of fire. ➤ The workers should be educated on the usage of the equipments in the need of emergency. • The contractor/ Implementing Agency shall not engage any person below the age of 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form.
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Operation Phase

The following section contains activities to be undertaken by the respective persons entrusted with the operation and maintenance of the project activity to ensure long-term sustainability with respect to

Maintenance

- | | |
|---|--|
| <ul style="list-style-type: none"> • Poor drainage or Flooding | <ul style="list-style-type: none"> • Regular inspection and periodic maintenance for cleaning of drains to remove any debris or plant growth that may interrupt the flow. |
| <ul style="list-style-type: none"> • Soil erosion | <ul style="list-style-type: none"> • Construct silt fences to avoid soil erosion. |

	<ul style="list-style-type: none"> Control of Invasion Species in mangrove plantation 	<ul style="list-style-type: none"> Regular monitoring will be done to check any invasion species occupied the plantation species. In case of invasion, such species will be removed. Only local dominant and adaptable species will be permitted to grow in the selected plantation sites. All other species will be removed. Impact of the mangrove plantation species on the local species will be keenly observed. If irreversible negative impact will be noticed, steps shall be taken to control it.
Waste disposal and site restoration	<ul style="list-style-type: none"> Soil contamination Water contamination 	<ul style="list-style-type: none"> All the construction camps and facilities shall be dismantled and removed from the site. Oil and fuel contaminated soil shall be removed, transported and buried in properly identified waste disposal areas. Sapling of plants similar to that of cut trees, if any shall be planted. Soak pits and septic tanks should be covered and effectively sealed off. Construction debris shall be disposed separately and properly. Follow safety measures while disposing wastes.
Environment	Air Quality	<ul style="list-style-type: none"> Use of ultra low sulphur diesel in the DG sets. Green belt development with specific species will reduce SPM levels. Steps will be taken to minimise the harmful boat exhaust by using various available devises.
	Noise	<ul style="list-style-type: none"> All noise generating sources in the complex will be equipped with appropriate noise control measures. Noise levels will be consistent with prescribed standards for Industrial areas. Ambient noise levels will be periodically monitored to determine compliance with the norms. Noise levels will also be monitored at point sources for occupational noise exposure and ensuring health risk. Steps will be taken to reduce noise generated from the boats and other vessels by adopting available devises.
	Waste water	<ul style="list-style-type: none"> The liquid wastes generated will be properly remove from the infrastructure and will dump in a confined pit, which will not contaminate the surrounding.

	Ground Water Quality	<ul style="list-style-type: none"> • Rainwater harvesting for optimum utilization of rainwater to recharge the ground water level/ bore well area to be adopted. • Ground water quality shall be periodically monitored. • The domestic sewage generated from the building will be linked to the soak pit within the project area.
	Solid waste	<ul style="list-style-type: none"> • Solid waste may comprise of broken glasses, packaged materials, broken plastic containers, soil/ solid samples, expired chemicals etc. These will be segregated, labelled, stored and disposed off as per the Rules. Hazardous wastes will be stored in a lined pit constructed as per the Rule.
	Traffic Pattern	<ul style="list-style-type: none"> • Vehicle movement will be regulated inside the site with adequate management and regulatory practices.
	Landscaping and Green Belt Development	<ul style="list-style-type: none"> • Landscape and green area in approx. 20% of total plot area will be developed wherever possible. • The species to be grown on the site will be fast growing native species having broad leaf base so that a permanent green belt is created in a short period. The effective plantation will also stabilize the soil and reduce any nuisance during windstorm.

5.2 Monitoring

The monitoring program will be a continuing program of data gathering and analysis to ensure the effectiveness of the mitigation measures for potentially adverse environmental impacts arising from construction and operation of Project facilities and to suggest for any additional mitigation measures in case of significant deterioration of environmental quality. It is proposed to monitor essential parameters for ambient air quality, ambient noise quality, ground water quality, and waste water quality both during the construction and operation phases of the project.

Ambient Air Quality

The frequency of ambient air quality monitoring shall be twice every month at least three locations within 500 m radius of the proposed site. The parameters to be monitored are Respirable Particulate Matter (RPM), Suspended Particulate Matter (SPM), Sulphur Dioxide (SO₂), and Nitrogen Oxide (NO_x).

Ambient Noise Quality

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equipments shall be monitored during construction phase. The frequency of monitoring for day and night time noise level shall be once in every month at all important locations within 500 meter radius of the proposed site

During operation phase, ambient noise level within the plot area will be monitored for once in three months.

Wastewater Quality

During project operation phase, an effluent treatment plant (ETP) has been proposed to treat the wastewater generated from the laboratory processes. It is proposed to analyze the quality of Inlet and outlet of ETP monthly for the following parameters.

pH, BOD, COD, oil and grease, total suspended solids, total dissolved solids, Nitrate, Phosphate, Sulphate, Chloride, and Metals

Ground Water Quality

During Construction Phase, Ground water (if any) used for the construction and human consumption shall be monitored for the desired parameters as per BIS standards once in every month.

During Operation Phase, the ground water will be tested once in every month to ascertain any contamination due to laboratory operation and regular usage.

5.3 Capacity Development and Training

The project Coordinator will be responsible for the implementation of environmental Monitoring Plan. The annual monitoring report will be submitted to the State Pollution Control Board, Orissa as a statutory obligation.

As the project staffs associated with the Project Coordinator will be involved in the environmental monitoring program in addition to the Coastal environmental monitoring, no further manpower is required. Further, the same laboratory facilities will also be utilised for sampling and analysis of environmental parameters. However manpower training in the field of environment management, environmental audit, waste management etc. are required.

5.4 Implementation Schedule and Cost Estimates

The Environmental Management Plan and Monitoring Plan shall be synchronised with the construction and operational phases of the project. For implementation schedule and cost estimates for the Environmental monitoring and Environmental Management Plan (EMP) of the project refer DPR at page (D. Environmental and Social Safeguards under Section- III. Project Implementation Arrangement)

Annexure-2

EIA & SA (including Public consultation proceedings for Berhampur (Rushikulya mouth))

1.0 INTRODUCTION

1.1 Project description

Integrated Coastal Zone Management Programme (ICZMP) has been formulated by the Ministry of Environment and Forests, Government of India and funded by World Bank is concerned with sustainable long-term anthropocentric perspective area development plan in the coastal stretches of India. The project attempts to harmonize conservation and development with specific thrust on the conservation of resources along with welfare of local and indigenous communities, the traditional custodian of the coastal resources.

The objective of the project is “protection and sustainable development of coastal stretches and the marine environment through sustainable coastal zone management practices based on sound scientific principles taking into account the vulnerability of the coast to natural hazards, sustainable livelihood security for local communities and conservation of ecologically and culturally significant coastal resources”. The following environmental management related activities are envisaged while implementing ICZMP:

- Contingency plan for restoration of degradation due to human activities
- Conservation and restoration of critical wildlife habitats through:
 - (iii) Protection to important fragile ecosystems and keystone species.
 - (ii) Consolidation of degraded mangrove forest blocks and strategic estuarine river banks through mangrove plantation.
 - (vi) Conducive as well as protective environment to Olive Ridley Turtles for mass breeding and mass nesting.
 - (vii) Eco-friendly sustainable conditions to other aquatic wildlife such as dolphins, crocodiles as well as avifauna.
 - (ix) Participation of local people shall be ensured in conservation and protection of Bio-diversity.
 - (x) Integration of biodiversity conservation with participatory livelihood activities of the local people to decrease dependence on coastal forest and fisheries resources, which leads to overexploitation.

Gopalpur-Chilika coastal stretch covers about 100 Km. of the total 480 km. coastal stretch of the state Orissa. It includes Chilika Lagoon, which is a Ramsar site. Part of the Chilika lagoon has also been designated as a Wildlife Sanctuary known as Chilika (Nalaban) Wildlife Sanctuary. It is good representative of wetland ecosystem having high genetic and ecological diversity. The floral diversity of Chilika is as follows:

Chilika is very rich in both invertebrate and vertebrate fauna. This Ramsar site is the habitat for the largest congregation of waterfowls in India. Over a million birds congregate in this water body for feeding and

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up to April, but the peak congregation period is mid-December to middle of January. Flocks of migratory waterfowl arrive from as far as the Caspian Sea, Lake Baikal, and remote parts of Russia, central and south East Asia, Ladakh and the Himalayas for feeding and roosting. 15 species of ducks and two species of geese (Order: Anseriformes), cover over 70% of the migratory birds which visit this lagoon annually. The ducks and geese are followed by coots, rails and cranes (Gruiformes) 15%; waders/shore birds (Charadriiformes) 12%; pelicans (Pelecaniformes) 1.5%; grebes (Podicipediformes) 1%; kites, eagles etc. (Falconiformes) and kingfishers (Coraciformes) 0.5%.

At present there are 135 Irrawaddy dolphins in the entire lagoon. A small population of Bottle nosed dolphin, *Sousa chinensis* also migrates in to the lagoon from the sea.

The peripheral areas in the buffer zone are also dotted with numerous ornithologically important wetlands of various shapes and sizes.

The state's vision and strategy for ICZM is perceived as:

- (vii) Long-term scientific management of the coastal zone and its resources in an integrated manner through multi-disciplinary approaches and adopting the success stories and standard procedures from other areas.
- (viii) Protection of coastal and marine biodiversity of dynamic ecosystems.
- (ix) Providing ecological security to the species and ecosystems.

The main objective of the Project is conservation of Biodiversity along the coast and coastal waters. The important species and eco-systems, which need immediate attention and the process to achieve these objectives, are:

- (vii) Preservation and propagation of mangroves and mangrove associates both banks of all tidal influenced rivers, creeks and mud flats through massive plantation and protection through community participation.
- (viii) Protection to Olive ridley sea turtles and Cetaceans (Dolphins, Whales, Porpoises) and other marine life forms.

The major activities to be carried out by the Wildlife wings of the Forest Department of the State of Orissa is to achieve these objectives are as follows:

- (a) Survey, demarcation, mapping and fencing of the areas along the Rushikulya and Bahuda river mouth for the plantation of mangroves and mangrove associates.

sites for beach monitoring and protection of sea turtles.

(c) Purchase of equipments for strengthening of patrolling activities at sea and in mangrove areas for collection of data for facilitating biodiversity conservation and database preparation.

(d) Establishment of a GIS Cell for strengthening monitoring activity and database development in a GIS domain.

1. Baseline data:

- 2 Gopalpur-Chilika stretch includes largest brackish water lagoon of Asia i.e. Chilika and coastal stretch of Ganjam district.

1.2. Physical settings

1

Gopalpur-Chilika stretch along Orissa is one of the important and rich area of flora and fauna which include Chilika lagoon and coastal stretches of Ganjam district. Chilika wetland has been declared as one of the Ramsar sites i.e. wetland of international importance in 1981. It is the first wetland to be declared as Ramsar site in the state. For the protection of rich biodiversity along this stretch of coastal waters, the project sites have also identified the Rushikulya area notified under the Orissa Marine Fisheries Regulation (OMFRA) Act, 1982 which lies along Gopalpur- Chilika stretch.

1.2.2 Biological settings

In Chilika there are 546 species of angiospermic plants belonging to 379 genera and 107 families, above 100 phytoplankton genera, 20 species of weed and 7 pteridophytic species documented so far in the lagoon and the islands.

Birds belonging to over 230 species including 14 birds of prey species (32% aquatic, 22% waders, and 46% terrestrial birds) are seen in this lake, of which 95 species are intercontinental and local migrants.

The other vertebrate fauna includes:

- 321 species of fish (fresh water, estuarine and marine species),
- 7 species of amphibians,
- 30 species of reptiles (12 species of lizards and 18 species of snakes) and
- 18 species of mammals.

The mass nesting beach (rookery) of the endangered Olive ridley sea turtles along the Chilika coast is at Rushikulya which is located at the southern Orissa coast. It spreads over six km. stretching from the coastline in front of village Purunabandha (one Km north of Rushikulya river mouth) to the beach in front of

The average beach width is about 100 m from near the high tide line, though at some places the width of the beach is more than 100 m. An estimated number of about 2,00,000 turtles are nesting in this rookery each season.

1.2.3 Socioeconomic Settings

(The socio-economic parameters viz. demography, population growth, density, sex ratio, health, work force participation, occupational structure, literacy etc, play an important role in determining the impacts of a proposed activity on the socio-economic status of the study area).

Agriculture is the prime profession of the people. Due to tidal ingression and hyper salinity of the soil, only monsoon dependent one crop, i.e. paddy is cultivated in these villages. Fishing is the next means of livelihood. People from other professions are entering to fishing because of the increase in interest in brackish water prawn aquaculture. Even people taking fishing when there is no agriculture. Other professions adopted by the people are basket making, honey collection, duckery, poultry and diary etc. Many migrate to other urban areas of the state and even to other states during off seasons (December to May).

The health and sanitary condition is not at all satisfactory. Because of low lying area and networks of rivers and creeks, water borne diseases and other diseases are rampant. To provide health facility is also very difficult in this extreme terrain.

1.3 Policy, legal, and administrative framework

The purpose of Environmental Assessment (EA) is to assist in the decision making process and to ensure that the project is environmentally sound and sustainable and necessary management plans are included wherever necessary to minimize/ mitigate the environmentally adverse impacts, if, any. It is the responsibility of the Project Implementing Agency (PIA) i.e. the Wildlife Wing of Forest Department, Government of Orissa to ensure that the project activities are in consistent with the existing regulatory/ legal framework, whether National, State, Municipal or local.

The environmental regulations, which have significance on the implementation of the Project, are highlighted below.

The Environment (Protection) Act, 1986

This is a central Act of Government of India which is an umbrella legislation that focuses on the protection of the environment. It includes water, air and land and the interrelationship among them. The Act provides power to the authority declared under the Act to take necessary measures for the purpose of protecting and improving the quality of environment. Environmental Impact Assessment Notification, 2006 forms a part of the regulation under this legislation.

Relevance to the project:

- (1) The conservation of coastal natural recourses and augmentation of conservation strategy for protection of flora, fauna in general and endangered and economic important ones in specific.
- (2) For regeneration of degraded coastal mangrove forest, rearing and support through effective mass nesting for estuarine crocodile, Olive Ridley sea turtle and avifauna.
- (3) To provide safeguard to the biotic community of the coastal ecosystem to sustain a local fishing population.

prevention and control of water pollution. It empowers the State Pollution Control Board (OSPCB) to take necessary regulatory measures for disposal of sewage and trade effluents and information dissemination for maintaining or restoring wholesomeness of the water bodies, prosecuting offenders and issuing licenses for construction and operation of certain facilities.

Air (Prevention & Control of Pollution) Act, 1981

This Act has been enacted to implement measures devised for effective prevention and control of air pollution. It empowers the State Pollution Control Board to take necessary regulatory measures for discharge of emissions and information dissemination for maintaining or ambient air quality, prosecuting offenders and issuing licenses for construction and operation of certain facilities.

Relevance to the project.

All construction contractors need to obtain the consent to establish and consent-to-operate for the various plants – concrete batching, stone crushing and other plants – that they may erect for the purpose of housing construction. This should be obtained from the nearest regional offices of the SPCB. If existing plants are to be used, then the units should have the valid consent orders.

The Coastal Regulation Zone (CRZ) Notification, 1991 (amended, 2002)

Under the Coastal Regulation Zone (CRZ) Notification, 1991 issued under the Environment (Protection) Act, 1986, coastal stretches have been defined as Coastal Regulation Zones (CRZ-I, CRZ-II, CRZ-III and CRZ-IV). Restrictions have been imposed on industries, operations and processes within the CRZs. For regulating development activities, the coastal stretches within 500 metres of High Tide Line on the landward side are classified into four categories, namely:

- CRZ-I: (i) Areas that are ecologically sensitive and important, such as national parks/ marine parks, sanctuaries, reserve forests, wildlife habitats, mangroves, corals/ coral reefs, areas close to breeding and spawning grounds of fish and other marine life, areas of outstanding natural beauty/ historically/ heritage areas, areas rich in genetic diversity, areas likely to be inundated due to rise in sea level consequent upon global warming and such other areas, and (ii) Area between Low Tide Line and the high Tide Line.
- CRZ-II: The areas that have already been developed upto or close to the shoreline. For this purpose, “developed area” is referred to as that area within the municipal limits or in other legally designated urban areas which are already substantially built up and which have been provided with drainage and approach roads and other infrastructural facilities, such as water supply and sewerage mains.
- CRZ-III: Areas that are relatively undisturbed and those, which do not belong to either CRZ-I or CRZ-II. These will include coastal zone in the rural areas (developed and undeveloped) and also areas within Municipal limits or in other legally designated urban areas, which are not substantially built up.
- CRZ-IV: Coastal stretches in the Andaman & Nicobar, Lakshadweep and small islands, except those designated as CRZ-I, CRZ-II or CRZ-III.

The development or construction activities in different categories of CRZ area shall be regulated by the concerned authorities at the State/ Union Territory level, in accordance with norms stipulated in the CRZ regulation and in the state/ UT coastal zone management plan.

Relevance to the project.

- No new construction is permitted in CRZ-I areas that are ecologically sensitive.
- In CRZ-II areas, new buildings are permitted only on the landward side of the existing (or approved) road or authorized structures.
- In CRZ-III areas, no new construction shall be permitted within 200m from the High Tide Line.
- In CRZ-III areas, construction or reconstruction of dwelling units between 200m and 500m is permitted only if it pertains to traditional/ customary rights.
- Construction of public rain shelters, community toilets, bridges, roads and

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UT Coastal Zone Management Authority.

Orissa Marine Fishing Regulation Act (OMFRA), 1982:

This is a State Fisheries Act. It regulates the fishing in fishing zones along the coast. It also aims at sustainable fishing through numerical restriction of mechanized fishing vessels in the landing centres and protecting the economic interests of traditional fishers operating in the marine sector. Under this act no mechanized fishing vessels are allowed to fish within 5 km from the coast to protect the interest of traditional fishermen. No outside (neighbouring states) fishing vessels, not registered under OMFRA are allowed to fish in the territorial waters of Orissa. To conserve the fish stock and biodiversity, uniform ban of fishing from 15th April up to 31st May every year is meticulously followed in the state. Orissa coast, being famous for the nesting sites of rare Olive Ridley sea turtles, several conservative measures are being taken under the OMFRA. Fishing have been prohibited in specified turtle congregation areas including Dhamara river mouth of this project site. All mechanized vessels within 20 km sea ward radius from the coast. Use of Turtle Excluder Devises (TEDs) have been made mandatory in all the operating trawlers. Several officers of Fisheries Department and other line departments such as Forest Dept. and Coast Guard have been declared as Authorised Officers for strict implementation of the Act.

2.0 ENVIRONMENTAL AND SOCIAL IMPACTS

Environmental and Social Impacts

This section lists the potential environmental impacts, both positive and negative, during the construction as well as operational phase of the project. The environmental impacts identified in following pages are only preliminary in nature. Any further impact that may arise in due course of time will be assessed for its significance and necessary mitigative measures will be included in the Environmental Management Plan. The project is expected to yield significant environmental benefits in terms of coastal biodiversity conservation, increase in fisheries production, ensuring better livelihood, protection against cyclones, super cyclones, tidal surges, tsunami and such other natural disasters.

Checklist for Environmental and Social Assessment of the project is given in Table-1.

Table-1 Environmental and Social Assessment Checklist

Features likely to be affected	Positive impact		Negative Impact		No Impact	Mitigation measures required or not
	Yes	Likely	Yes	Likely		
Forestry/ Vegetation	✓					
Birds	✓					
Fisheries	✓					
Other wildlife/animals	✓					
Air quality			✓			✓
Noise environment			✓			✓
Water quality				✓		✓
Water availability					✓	
Soil quality					✓	
Land use and topography					✓	
Drainage patterns					✓	
Sedimentation/erosion		✓				
Agriculture					✓	
Food production		✓				
Climate		✓				
Groundwater table		✓				
Industrialization					✓	

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Employment/training		✓				
Income and livelihood		✓				
Other socio-economic activities		✓				
Health and safety		✓				
Communications		✓				
Historical/cultural monuments					✓	
Scenic views and vistas		✓				
Tourism		✓				

Impact identification matrix for the construction phase as well as the operation phase of the proposed project is given in Table-2.

Table-2 Impact Identification Matrix

	Air	Noise	Surface Water	Ground water	Climate	Land & soil	Ecology	Health	Socio economic
Land Acquisition	Govt. land will be used in restricted areas, where there is neither habitation nor vegetation								
Construction Phase									
Transportation of construction materials	✓	✓				✓		✓	✓
Construction	✓	✓	✓			✓		✓	✓
Operational Phase									
Generation of Liquid waste			✓			✓		✓	
Generation of Solid waste						✓		✓	
Release of oil from the vessels / boats			✓					✓	
Release of noise from the vessels/ boats	✓	✓						✓	

Impact prediction matrix for various activities involved in the construction phase and operation phase and the impact characteristics are given in Table-3.

Table-3 Impact Prediction Matrix

Activity	Environmental Attributes	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Significance
Construction Phase						

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Transportation of construction materials	Air	Transportation of construction materials in trucks / boats & Exhaust emission from vehicles	Direct Negative	Short term	Reversible	Low
	Noise	Noise generation from vehicles	Direct Negative	Short term	Reversible	Low
	Land & soil	Dumping of materials & excavated earth	Direct Negative	Short term	Reversible	Low
	Health	Inhalation	Direct Negative	Short term	Reversible	Low
	Socioeconomic	Employment	Direct Positive	Short term	Irreversible	Medium
	Risk	Risk of accidents during transit	Direct Negative	Long term	Irreversible	Low, if safety measures are taken to prevent accidents
Construction activity	Air	Operation of construction machinery	Direct Negative	Short term	Reversible	Low
	Noise	Noise generation from vehicles and machinery	Direct Negative	Short term	Reversible	Low
	Health	Inhalation	Direct Negative	Short term	Reversible	Low
	Socioeconomic	Employment	Direct Positive	Short term	Irreversible	Medium

Activity	Environmental Attributes	Cause	Impact Characteristics			
			Nature	Duration	Reversibility	Significance
	Risk	Risk of accidents during transit	Direct Negative	Long term	Irreversible	Low, if safety measures are taken to prevent accidents
Operational Phase						
Mangrove Plantation and Coastal, Marine Aquatic life conservation and protection	Water Quality	Generation of waste waters	Direct Negative	Long Term	Reversible	Low
	Air Quality	Vessel/boat exhaust	Direct Negative	Short term	Reversible	Low
	Noise levels	Noise generation from vessels/boats	Direct Negative	Short term	Reversible	Low, with installation of acoustic enclosures, periodic maintenance

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	Oil	Release form oil spill / leak/ accident	Direct Negative	Short term	Reversible	Low, with proper safety measures and mitigation plan
	Socioeconomic	Employment generation	Direct Positive	Long term	Irreversible	High, new opportunities for income generation
	Overall Quality of Life of local community	Protection from cyclone/ saline water ingress/ high localised fish population	Direct Positive	Long term	Irreversible	High
	Life risk of operating personnel					

Legal Framework

The legislative tools for coastal environmental management are outlined in the Coastal Regulation Zone Notification, 1991, Environment (Protection) Act, 1986, Water (PCP) Act, 1974 and Air (PCP) Act, 1981, and Coastal Management Zone Notification, 2008 (Draft). Despite the obvious strengths of these regulations, there still exists a gap in the institutional coordination, which needs to be addressed.

Institutional Framework

The Project Coordinator (PC) in the Project Management Cell (PMC) functioning in the Wildlife Organisation Hqrs. will have the overall responsibility for implementation of the Project in coordination with the State Project Management Unit (SPMU). PC will be assisted by adequate and qualified technical and managerial staffs and will be provided with necessary equipment/ instruments and other infrastructural facilities as well as vehicles and vessels. PC will also be responsible for preparing consolidated environmental monitoring reports as part of the regular Project monitoring in consultation with the SPMU.

2.1 Positive impacts due to the project activities –

Summarized in Table-2s & 3

2.2 Negative impacts due to the project activities –

Summarized in Table-2 & 3

2.3 Mitigation measures:

Discussed in Section 5 (Table-4)

3.0 PUBLIC CONSULTATION

The above public consultations (Annexure –2 (A)) reveal that the implementation of the project is not expected to lead any adverse social concerns. As the activities will be carried out mostly in Govt. land in restricted areas, there will be no loss of public land and therefore no rehabilitation programme is necessary. During construction phase, the activities are only small civil works which will have minor, localized impacts and these can be readily managed. Necessary environmental management programmes have been included in the project to mitigate/ minimise the limited adverse impacts of operation phase.

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their opinion on the plantation of mangroves by the Department, which they have agreed, will be beneficial to them with regard to availability of resources and protection during disasters. Initially the villagers were sceptical but after the discussion they were convinced about the long term benefit of this conservation programme. People from different sectors of the society were present in this consultation process conducted at Purunabandha. They were briefed about the impacts of the programme, details of which is enclosed in Annexure-2(A).

4.0 ANALYSIS OF ALTERNATIVES

The coastal environment needs to be maintained in harmony with the development plans. It is therefore necessary to protect and conserve the biodiversity as it is. To fulfil this objective, there are few following alternatives, however the proposed activities are chosen because of their eco-friendly output and long term acceptable benefits.

Mangrove serve as a natural cyclone shelter belt but in many areas, mangroves have been clear failed and thus these areas are now devoid of mangroves. Alternatives to mangrove plantation are erection of stone wall and such other engineering structure. However, engineering alternatives to mangrove planting are prohibitively expensive and don't provide a suitable habitat for important fisheries and wildlife. Engineering structures are also not environmental friendly and is not a long term solution to the problem to minimize shoreline erosion, protecting the hinterland from the affects of the cyclone as well as to provide habitats for fisheries and wildlife.

Alternative to Olive ridley sea turtle protection is to provide money to the Fisherman and business man, who are commercially exploiting the fishery resources. These are however not the practical solution and not desirable also.

5.0 ENVIRONMENTAL MANAGEMENT PLAN

5.1 Mitigation

The primary objective of this proposed environmental management plan and monitoring programme is to control environmental impacts, if any, to levels within acceptable standards, and to minimise possible impacts on the community and the workforce of foreseeable risks during the construction and subsequent operation phases of the project. Such environmental mitigation measures shall be used in conjunction with good management practices and good engineering design, construction and various operation practices.

Mitigation Measures during Construction

Activity	Impacts	Mitigative measures to be taken
Initiation of Construction activity	Legal non-compliance	All clearance/ approvals required for Environmental aspects during construction phases shall be ensured and made available before initiation of the work.
(a) Mangrove Plantation Phase		
The following section contains instructions to the Contractors/ Field implementing Officer, which should be adhered to while carrying out the construction activity. This section will be appended into the relevant bid document.		
Site development	Tree felling	<ul style="list-style-type: none"> Any tree felling should be minimised. Compensatory plantation through landscaping
	<ul style="list-style-type: none"> Mangrove plantation 	<ul style="list-style-type: none"> In slopes and suitable places along the roadside, bush grass should be planted and retaining walls water-intercenting

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		<ul style="list-style-type: none"> • Temporary and permanent drainage systems will be designed to minimize soil erosion. • Topography of the sand dunes along the coast shall not be altered as practicable as possible. • Invasion of species to be avoided by regular checking and eradicating them.
	<ul style="list-style-type: none"> • Noise pollution 	<ul style="list-style-type: none"> • Noise emission level from all equipment and vehicles shall strictly conform to the MoEF/ SPCB noise standards. • On-site power gensets shall be covered with an acoustic enclosure and fitted with muffler and shall conform to the noise emission standards. • Ambient noise level monitoring shall be conducted at suitable locations at periodic intervals during construction phase to conform to the stipulated standards both during day and night time.
	<ul style="list-style-type: none"> • Water logging and creation of mosquito breeding site 	<ul style="list-style-type: none"> • Careful attention to be given on design and maintenance of earthworks and drainage systems during plantation to avoid creation of significant habitat areas for mosquito larvae. • Spray larvicide in silt traps to prevent the mosquito breeding.
	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Use water resources without conflict. • Solid/ liquid/ wastes should not be disposed in surface water bodies. • Surface water quality monitoring shall be conducted at suitable locations at periodic intervals during construction phase to conform to the stipulated standards for Inland surface water bodies.
	<ul style="list-style-type: none"> • Land pollution 	<ul style="list-style-type: none"> • The project will take prior permission from the competent authority for disposal waste on landfill site in suitable area. • Debris will be collected and suitably used on site as per construction waste management plan.
Labour camps	<ul style="list-style-type: none"> • Soil contamination • Pollution of drinking water sources • Surface water contamination due to washing, bathing and waste disposal • Tree felling for fire wood and tents 	<ul style="list-style-type: none"> • All relevant provisions of the factories Act, 1948 and the Building and the other Construction Workers (regulation of Employment and Conditions of Service) Act, 1996 shall be followed for construction and maintenance of labour camps. • Labour camps will be constructed within the project area • The Contractor/ Implementing agency shall also guarantee for the following. <ul style="list-style-type: none"> ➤ Availability of uncontaminated water for drinking, cooking and daily uses. ➤ Supply of potable water at easily accessible places. ➤ The sewage system for the camp will be designed, built and operated in

	<p>environment</p> <ul style="list-style-type: none"> • Air pollution from burning of tyres and plastic materials 	<p>water or adjacent surface water bodies should occur.</p> <ul style="list-style-type: none"> ➤ Latrines and urinals shall be maintained in a clean sanitary condition at all times with adequate water supply. ➤ Toxic materials like tyres and plastic materials should not be burnt by the labours for any purpose. ➤ Trees will not be cut for firewood or tent.
Working Condition	<ul style="list-style-type: none"> • Impact on workers health • Impact on Public safety 	<ul style="list-style-type: none"> • The Contractor/ Implementing Agency shall comply with all the precautions as required for ensuring the safety of the workmen as per the International labour Organisation (ILO) Convention No. 62 as far as those are applicable to this contract. • All machines to be used in the construction will conform to the relevant Indian Standards (IS) Codes, will be free from patent defect, will be kept in good working condition, will be regularly inspected and maintained. • Where loose soil is met with, shoring and strutting shall be provided to prevent the collapse of soil. • The Contractor/ Implementing Agency shall arrange for <ul style="list-style-type: none"> ➤ A readily available first aid kit including adequate supply of sterilized dressing materials and appliances. Suitable transport to take injured or sick person to the nearest hospital will be immediately provided. ➤ Personal protective equipment such as safety goggles, helmets, safety belts, earplugs, mask etc. to workers and staff. • No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights will be provided to protect the public. • Work spots will be maintained clean, and provided with optimum lighting. • Fire fighting arrangement: <ul style="list-style-type: none"> ➤ Demarcation of area susceptible to fires should be provided along with cautionary signage ➤ Portable fire extinguishers/ sand baskets shall be provided at easily accessible locations in the event of fire. ➤ The workers should be educated on the usage of the equipments in the need of emergency. • The contractor/ Implementing Agency shall not engage any person below the age of 14 years for any work and no

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		in any form.
Operation Phase		
The following section contains activities to be undertaken by the respective persons entrusted with the operation and maintenance of the project activity to ensure long-term sustainability with respect to		
(b) Olive Ridley / Other Aquatic Life Protection		
Maintenance	<ul style="list-style-type: none"> • Sand dune alteration • Soil erosion 	<ul style="list-style-type: none"> • Regular inspection and periodic maintenance for cleaning sand dunes to maintain conducive condition. • To adopt means to avoid soil erosion.
	<ul style="list-style-type: none"> • Removal of dead turtles 	<ul style="list-style-type: none"> • Dead bodies of the turtles shall be removed and buried at the appropriate site,
Camp site restoration	<ul style="list-style-type: none"> • Soil contamination • Water contamination 	<ul style="list-style-type: none"> • All the camp sites shall maintain contamination free from solid waste and all obstructions shall be removed during nesting. • Oil and fuel contaminated soil shall be removed, transported and buried in properly identified waste disposal areas. • Sapling of plants similar to that of cut trees, if any shall be planted. • Soak pits and septic tanks should be covered and effectively sealed off. • Debris shall be disposed separately and properly. • Follow safety measures while disposing wastes.
Environment	Air pollution	<ul style="list-style-type: none"> • Use of ultra low sulphur diesel in the DG sets. • Vessels and boats shall use devices to reduce harmful exhaust and maintain acceptable SPM levels.
	Noise	<ul style="list-style-type: none"> • All noise generating sources, i. e. boats and protecting squad vessels during nesting shall be equipped with appropriate noise control measures. Noise levels will be consistent with prescribed standards for Industrial areas. • Ambient noise levels will be periodically monitored to determine compliance with the norms. • Noise levels will also be monitored at point sources for occupational noise exposure and ensuring health risk.
	Waste water	<ul style="list-style-type: none"> • The liquid wastes generated will be properly remove from the infrastructure and will dump in a confined pit which will not contaminate the surrounding. • Steps will be taken for control of oil spills during turtle nesting

	Ground Water Quality	<ul style="list-style-type: none"> Rainwater harvesting for optimum utilization of rainwater to recharge the ground water level/ borewell area to be adopted.
	Solid waste	<ul style="list-style-type: none"> Solid waste may stored and disposed off as per the Rules. Hazardous wastes will be stored in a lined pit constructed as per the Rule.
Working condition	Traffic Pattern	<ul style="list-style-type: none"> Vehicle movement will be regulated near the nesting sites.
	Personal safety	<ul style="list-style-type: none"> Persons engaged in protection squad shall be provided with all protection regarding personal safety. Persons engaged in protection squad shall be provided with safety kits to work along the coast and high sea. Hygiene and health of the persons engaged in turtle protection shall be maintained to work in this hostile environment,

5.2 Capacity Development and Training

The project Coordinator will be responsible for the implementation of environmental Monitoring Plan. The annual monitoring report will be submitted to the State Pollution Control Board, Orissa as a statutory obligation.

As the project staffs associated with the Project Coordinator will be involved in the environmental monitoring program in addition to the Coastal environmental monitoring, no further manpower is required. Further, the same laboratory facilities will also be utilised for sampling and analysis of environmental parameters. However manpower training in the field of environment management, environmental audit, waste management etc. are required.

5.3 Implementation Schedule and Cost Estimates

The Environmental Management Plan and Monitoring Plan shall be synchronised with the construction and operational phases of the project. The treatment system for fume and waste water will be installed during the construction phases.

The total cost estimate for implementation of the Environmental Management Plan and Monitoring Plan for the entire project is mentioned in the DPR (Environmental and Social Screening)

Annexure-3**Joint Forest Management Resolution 2008**

**Government of Orissa
Forest & Environment Department**

**RESOLUTION
No.IF-Affin.17/2008-17454/F&E
Dated, Bhubaneswar the 22nd October, 2008**

Sub: Joint Forest Management Resolution, 2008.

1. Introduction

Forests are one of the complex ecosystems. The role of forest in conservation of environment and economic prosperity of mankind is well established. Economic growth and environment protection are inextricably linked. For surviving on the earth we ought to live in harmony with Nature. Conservation of environment and protection of forest and wildlife have already been enshrined in our Constitution. Orissa has 58136 sq.kms of forest area 31.07% of its geographical area is under forest cover. Forests play a very significant role in the socio-economic and cultural life of the people of the state. However, over the past few decades, the forests of Orissa are under heavy biotic pressure. The rich biodiversity of the State is at risk. Man-animal conflict is on the rise. Hence, presentation and development of the rich sylvan heritage of the State is a priority of the State Government.

The National Forest Policy, 1988 envisages cooperation of the people in conservation and development of forest. The Government of Orissa have already adopted the policy of Joint Forest Management (JFM) and sought community participation for protection, regeneration and management of the forest wealth. Joint Forest Management is not only a tool for forest regeneration but also a means of employment generation and social empowerment of the forest-fringe dwellers.

The State Government enacted the Orissa Village Forest Rules, 1985 that prescribed for a Management Plan for every village forest and sought cooperation of the community in protection of these forests. In 1988, the State Government had passed a resolution of formally introduce a scheme of protection of peripheral Reserve Forest areas with participation of the adjoining villagers by forming a Village Level Forest Protection Committee. The scope of this resolution was enlarged in 1990 to include the Protected Forests. To make the forest people interface more effective and transparent, the Government of Orissa in Forest & Environment Department issued a resolution dated 3.7.1993. This resolution dealt in a fairly exhaustive manner the involvement all local communities in protection of adjoining forests, formation of Van Sarankhyana Samiti (V.S.S), duties and responsibilities of the V.S.S and their Executive Committees and the role of Forest Department and Gram Panchayats, preparation of Joint Forest Management plan, usufructory benefits for the V.S.S and provisions of MOU and **related issues**. Subsequently another Government resolution dated 30.09.1996 tried to confer specific rights in favour of the Village Committees in respect of various **products**.

However, these Resolutions in the past did not cover the National Parks and Sanctuaries. The Mangrove Wetlands and the Protected Areas (PA) of the State though need the participatory mode of management, require a different approach. In past all attempts to protect the PA from human interventions by coercion has resulted in hostile attitude of the people towards wildlife and forest staff. It has been realized that people living near the PA, while deriving little benefit from conservation, have paid enormous costs in terms of lost access to their life support systems. Further, there is restriction on harvesting of forest produce in the National Parks and Sanctuaries as per the orders of Hon'ble **Supreme Court**. It has therefore become essential to have a site specific, culturally sensitive and participatory approach, which would ultimately provide economic incentives to increase the net local benefit from conservation and sustainable resource use. Eco-development is a strategy for securing support of the local communities and other stakeholders for the protected area management. The activities to be taken up under eco-development should have a strong Conservation-Development (C-D) linkage and may include Ecotourism and **Off-farm** activities as well as providing specific alternatives to local biomass dependencies on the PA.

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The biodiversity rich Mangroves on the long coastal tract of Orissa are of immense value which provides ecological, livelihood and food security. Sustainable management of these vital and Life sustaining resources involving all the stakeholders by introduction of site-specific participatory management practices is essential. Mangrove forests are fragile inter tidal ecosystem with characteristic salt tolerant vegetation. Sharing of forest produce with the participant user communities is an important ingredient of JFM. But the slow growing mangroves offer a very limited scope of providing wood and NTFP that may serve as an incentive for ensuring participation of people. Hence eco-development approach is essential which will focus on development of alternate resources and alternate livelihood security options.

Joint Forest Management is an evolving concept encompassing socio-cultural and economic dimensions. With the changing scenario of Forest Management, increasing awareness among people and experiences gained from the past management practices, it is now felt necessary that the State Government resolution on Joint Forest Management needs revision to make it more effective.

2. Selection of Area

- (i) The forests of the State shall be grouped into the following two categories:
 - (a) **Forest Area** (Reserve Forest, Protected forests, Village forest and Revenue forests)
 - (b) Protected Area (National Park and Sanctuaries) excluding Core are and Mangrove Wetland.
- (ii) Only such forest area shall be brought under the Joint Forest Management (JFM) where villagers of the adjacent villages or cluster of villages are willing and / or can be motivated to offer active cooperation, in management, protection and regeneration of the forests.
- (iii) For the first category, **villages located adjacent to such forest boundary** should be considered as far as possible. For the second category, the villages located within the National Park/Sanctuaries as well as adjacent to the same will be involved in protection and management of the wildlife and habitat.
- (iv) The Reserve Forest and Protected forests, village forests and Revenue forests having crown density of less than 40% will be treated as degraded forestland and brought under JFM.
- v. **A committee consisting of the DFO, ACF, and concerned RO and Forester, here in after referred to as Divisional Level Committee (DLC) will decide the extent of area that may be assigned to any Joint Forest Management Committee (JFMC). While deciding the extent of area to be assigned, the committee shall take in to account the extent and density of forest area available at the site, the number of adjacent villages decide to constitute one JFMC jointly, then a large area can be assigned according to their capacity to protect.**

3. Constitution of Joint Forest Management Committee

- (i) Ordinarily there will be one Joint Forest Management Committee (JFMC) for a single village or a group of villages. **However, depending upon the population and number of hamlets / Sahi and community composition more than one JFMC can be constituted in a village to have harmonious coexistence.** The Committee constituted for the first category of forest will be known as **Van Samrakshyana Samiti (VSS)** while the Committee constituted for the second category will be known as **Eco-Development Committee (EDC).**
- (ii) a. Any forest officer not below the rank of a **Forester** shall request the **Gram Panchayat (GP)** to convene a meeting of all the adult members of all households residing in the hamlet/village/cluster of villages located **as specified in Para I (ii) above.**
- b. The concept of Joint Forest Management including all rights and responsibilities of JFMC members and the Forest Department will be explained in this meeting.

- c. If a minimum of 60% of the adult members of the **hamlet/village/cluster of villages** agree to constitute a JFMC then a resolution to this effect shall be passed and adopted in the meeting in the prescribed format (Form-I).
- d. The Forester / Forest Ranger will send the resolution of the **meeting** along with his recommendation in Form-2 to the DFO for his consideration and constitution of the **JFMC**.
- e. **The proposal shall be discussed in the meeting of DLC. After evaluating the motivation level of the villagers and taking in to account other relevant factors the committee may recommend the constitute of JFMC along with extent of forest area to be assigned. The proceedings of the meeting shall be recorded, signed by all participants and made available in the concerned file. There after the DFO shall issue an office order constituting the JFMC mentioning therein a registration number and the extent of area to be assigned.**
- (iii) All adults of the **hamlet /villages(s)** are eligible to become members of the **JFMC on payment of enrolment fee of Rs.1/- per person. The JFMC shall be considered functional if at least 60% adults enroll themselves as members.**
- (iv) The concerned Forester **or VFW as may be assigned by the Divisional Forest Officer** shall be the ex-officio Secretary of the **JFMC**. The elected Chairperson and Vice-Chairperson of the Executive Committee will also be the Chairperson, and Vice-Chairperson of the **JFMC**.

4. Constitution of the Executive Committee (EC)

- (i) On receipt of DFOs **office order in regard to constitution of JFMC, the Member Secretary** will contact the Sarpanch/**Ward Member(s) and other important persons of the hamlet/villages(s)** for calling a General Body (GB) meeting of the Gram Sabha to elect the EC.
- (ii) The **GB shall elect** the Chairperson, the Vice-Chairperson and the Treasurer and another 8 (eight) members (Total-11 members) (representatives) to constitute Executive Committee. Of this at least 5 shall be women members. The number of SC & ST members in the Executive Body shall be in proportion **to their membership in JFMC**.
- (iii) Either the Chairperson or Vice-Chairperson shall be a woman.
- (iv) The composition of the EC shall be as follows:
- | | | | |
|----|-----------------------------------|---|----------------------|
| 1. | Chairperson | 1 | Elected Member |
| 2. | vice-Chairperson | 1 | Elected Member |
| 3. | Treasurer | 1 | Elected Member |
| 4. | Ward Member (s) | | x-officio Member (s) |
| 5. | Members | 7 | Elected Member |
| 6. | Forester / VFW (Member Secretary) | | Ex-officio Member |
| 7. | Concerned Forest Guard | | Ex-officio Member |
| 8. | Village opinion leader | 1 | Elected member |
- (v) The Range Officer concerned will act as the Returning Officer for conducting the election of the EC. **It shall be the responsibility of the Returning Officer to ensure that the representation in the EC is strictly in accordance with reservation specified in para-ii above.**
- (vi) The EC will have tenure of 3 years at a time.

5. Meeting

- (i) General Body (GB)
- (a) The GB meeting of the JFMC shall be held at least once in every six months. It can

- (b) The Chairperson with an advance notice of one week will convene the GB.
 - (c) The Chairperson or Vice-Chairperson, if former is absent, shall preside over all the meetings of JFMC (GB).
 - (d) 50% of the members of the JFMC will constitute the quorum for the GB, out of which at least 40% should be women,
 - (e) Under special circumstances, special meeting of the JFMC can be convened provided at least one third of the members agree to convene such a meeting and make such a request to the Chairperson in writing. Where the Chairperson does not convene the meeting, the concerned Member Secretary shall convene the GB meeting with the approval of the Range Officer. In all such cases, a 3 days notice indicating the purpose of the said meeting shall be circulated to all the members of the JFMC.
 - (f) The proceedings of the meeting shall be recorded in a register in Oriya language and shall be maintained by the Member Secretary. All decisions taken in such meetings shall be recorded in shape of resolution, which shall be duly signed, by the Chairperson, Vice-Chairperson and the Member Secretary. A copy of the resolution will be forwarded to the Range Officer as well as to the DFO.
 - (g) The next Executive Committee shall be elected by GB at least one month before the tenure of the current EC expires. It shall be binding on the part of the Chairperson to convene this meeting.
- (ii) Executive Committee (EC)
- (a) The Member Secretary with the consent of the Chairperson shall call the meeting of the EC at least once in 2 months.
 - (b) The meeting will be presided over by the Chairperson or by the Vice-Chairperson, if former is absent.
 - (c) The quorum for any meeting of the EC shall be 50% of its membership, out of which at least 2 shall be women.
 - (d) The Member Secretary or in his absence the Treasurer / Forest Guard shall record the proceedings of the meeting in Oriya in a register to be duly signed by all the participating members. A copy of the proceedings will be forwarded to the Range Officer as well as to the DFO.

6. Duties and responsibilities of JFMC.

- (i) The members of the JFMC shall individually and collectively ensure protection of the forests against fire, grazing, illicit felling, theft of forest produce, poaching of wildlife and encroachment of the forestland. They should also ensure protection of Wildlife staying outside their assigned forests.
- (ii) The JFMC may adopt its own patrolling system and regulate entry to the forest by the people and domestic cattle.
- (iii) It shall be the duty of all members of the JFMC to prevent forest and wildlife offence and pass on relevant information and intelligence in this regard to the forest officials.
- (iv) The members of the JFMC shall actively help the forest officials in apprehending any person committing forest offence and in giving proper evidence against any such person in the court of law.
- (v) The JFMC members shall help the forest department officials in protection and maintenance of the forest boundary pillars.

- (vi) The JFMC shall prepare the micro plan and annual work plan for integrated development of the village(s) and for the conservation, development and sustainable management of the assigned forests and its wildlife. Summary of the micro-plan should be available in Oriya.
- (vii) The members of the JFMC shall try to ensure gradual reduction in the dependence of the villagers on forests for their sustenance.
- (viii) The JFMC shall have the powers to remove and / or substitute any elected (non-official) member of the EC by a simple majority of the members present and voting if the concerned member does not discharge his/her duties satisfactorily. The members of the JFMC shall also have the power to remove and replace the Chairperson of the JFMC by simple majority of members of the JFMC present and voting if the concerned Chairperson does not discharge his or her duties properly. In such cases a GB meeting will be convened as per procedure laid down in para 5(i)(e). The concerned Range Officer shall act as Returning Officer on all such occasions.
- (ix) In case of a forest diversion proposal under Forest Conservation Act, 1980 covering a portion of the forest assigned to a JFMC the Range Officer shall inform the EC in writing and ask for its opinion. The EC should discuss all aspects of the proposal in a special GB of the JFMC and forward its opinion on the said proposal to the concerned Range Officer who in turn would send the same to the DFO. The concerned DFO while forwarding the proposal onwards shall attach the comments of the VSS with it consideration of the State Government / Govt. of India.

7. Duties and responsibilities of the Executive Committee (EC)

- (i) The EC shall carry out the day-to-day business of the JFMC as per provisions of the Resolution. It shall be responsible for managing and implementing Micro-Plan and annual plan and other decisions of the JFMC.
- (ii) The EC shall be responsible for protection of the forests assigned to the JFMC and for apprehending the offenders. If the members of the VSS/EDC play a significant role in detection of forest offence and seizure of the forest produce within their village limits, they will be entitled for a fixed percentage of the value of the forest produce (except in case of WL Tophies) so seized as per procedure laid down in para-11 (iii) and (iv).
- (iii) The EC in consultation with the GB shall evolve methodology on all issues relating to membership, conflict resolution, encroachment, customary rights and benefit sharing.
- (iii) The EC of the VSS shall execute / carry out various silvi-cultural operations, intermediate and final felling as and when so advised by the Range Officer in accordance with the provisions of the management plan/micro plan.
- (v) The EC shall be responsible to account for and manage the funds and other resources received from the Government, other agencies and funds internally generated, if any. For this purpose a joint account called VSS account /EDC account shall be opened in any commercial, rural or co-operative Bank recognized by the RBI or in any post office, which shall be operated, jointly by the Chairperson and the Member Secretary of the JFMC. Utilization Certificate relating to the expenditure incurred shall also be jointly signed by the Chairperson and the Member-Secretary and submitted to the concerned authorities whenever required.
- (vi) The EC shall be responsible for managing funds received by JFMC by maintaining and operating VSS /EDC account as per the procedure detailed in Annexure-A.
- (vii) The EC shall establish marketing linkage to various NTFP items and other micro-enterprise products for securing better returns to the beneficiaries.

8. Role of the Forest Department.

- (i) To assign and demarcate the forest area in favour of VSS/EDC.

- (iii) To ensure that the activities of the JFMC are in accordance with the JFM resolution and all other Act and Rules of the State Government and Government of India in force.
- (iv) To take subsequent legal action as per rule in cases where JFMC members have handed over the offenders and forest produce involved in offence.
- (v) To ensure capacity building of VSS members on different aspects of forest management, planning, silvi-culture, nursery technology, forest laws accounting and book keeping etc. in a transparent manner.
- (vi) To provide technical help to the JFMC member in preparation and implementation of the Micro-plan /annual work programme and approval of the same.
- (vii) To sign Memorandum of Understanding with the JFMC and ensure sharing of benefit amongst all members in case of VSS only.
- (viii) To motivate villagers to become active partner in the JFM programme of the State and organize village level meetings for this purpose.
- (ix) To conduct election of office bearers and ensure appropriate participation of the weaker sections including women in all benefit sharing and decision making process of the JFMC.
- (x) To establish coordination with other department/agencies for successful implementation of micro plan and related area development programme.
- (xi) To guide the EC in discharge of their duties and resolving disputes.

9. Dissolution, reconstitution and suppression of JFMC.

- (i) Based on the report of the Range Officer or otherwise the DFO may dissolve, reconstitute or supersede any JFMC within his jurisdiction if in his opinion the activities of the VSS is detrimental to forest protection and management. He may then order for restoration of management of the assigned forest with the forest department. The appeal against such order shall lie with the Conservator of Forests whose decision shall be final.
- (ii) If the work of the EC of any VSS is found to be against the principals of regeneration and proper management of forest, the DFO may dissolve and reconstitute the EC after due enquiry and recording his finding to this effect. The appeal against such order shall lie with the Conservator of Forests whose decision shall be final.
- (iii) On receipt of a report from the concerned Range Officer regarding irregularities by any member(s) of the EC or member(s) of the subcommittee appointed by the EC, the DFO may divest the said member(s) of their powers temporarily pending finalization of enquiry to this effect.

10. Joint Forest Management Plan (Micro Plan)

- (i) After constitution of the EC, as soon as possible, a micro-plan shall be prepared by the members of the committee through a participatory process involving VSS Members and with the field officers of the Forest Department.
- (ii) The Micro-plan shall be drafted in a prescribed format in Oriya language for the integrated development of the village/villagers constituting the JFMC as well as for conservation, sustainable management of the assigned forests based on local circumstances, priorities and assessed annual returns, with participation and involvement of line departments.
- (iii) The Micro Plan shall prescribe various, soil and moisture conservation measures, silvi-cultural operations, afforestation measures and steps to be taken for livelihood support of the forest dependent communities. It shall also incorporate formation of SHGs and micro-enterprise that may be feasibly undertaken based on locally available resources by them. In case of EDC, the Eco-development Plan may include activities such as: ecotourism, farm forestry, agro forestry, silvi-pasture development, promotion of fuel-efficient device,

mushroom cultivation, tassar cultivation, micro-credit facility and mobile health care facility, etc.

- (iv) The micro plan shall indicate the choice of species in different plantation models subject to forest laws in vogue. It shall contain a detailed regeneration and harvesting plan, which shall be consistent with the overall prescription of the working plan covering the area or the Wildlife Management Plan of the Protected area.
- (v) The micro plan shall also detail out the various NTFP items that can be collected. This shall be done with due regard to the carrying capacity, productivity and biodiversity of the local ecosystem.
- (vi) The draft Micro-plan prepared by the EC shall be agreed upon the GB after deliberation.
- (vii) the draft Micro-plan as approved by the VSS and signed by the Chairperson shall be submitted by the Member Secretary to the Range Officer concerned who shall examine the micro-plan from technical, social, financial and legal angle. The RO may refer back to the EC any suggested modifications for consideration and necessary amendment of the draft micro-plan. The EC will discuss the suggested changes, incorporate the same in the draft Micro-plan and resubmit the same to the RO.
- (viii) After evaluating the Micro-plan on technical, legal, social and financial considerations, the RO shall accord his approval on the Micro-plan. A copy of the approved Micro-plan shall be kept for reference and record in each of the offices of the DFO, Range Officer, VSS and Member-Secretary.
- (ix) For implementation of the approved Micro-plan, an annual work plan (April-March) with estimates of cost and returns shall be prepared by the EC. The annual work plan for the coming financial year shall be submitted latest by the end of December each year by the Member Secretary to the Range Officer. The annual work plan will be approved by the competent authority depending upon its financial outlay.
- (x) The finance required for implementation of micro plan/annual work plan may be borne by the State Government through the Forest Department or may be received from Government of India or may be incurred from VSS account. Contributions from other Departments of the Government, DRDA, ITDA can also be accepted for this purpose. However, contributions from National/International donor agencies can be accepted with approval of Government.
- (xi) Micro-plan shall normally be for a period of 10 years with provision of mid-term reviews.

11. Usufruct benefits for the VSS

- (i) The VSS shall be entitled to the un-sufructuary benefits from the assigned forests as under.
 - (a) Unsufructs like fallen leaves, fodder grasses, thatch grass, broom grass, thorny fencing materials, brushwood, fallen tops and twigs to be used as fuel shall be available to the members free of cost.
 - (b) All intermediate yield in the shape of small wood, poles, firewood etc as may be obtained as a result of silvi-culture operations shall be made available to the VSS members in a manner as may be decided by EC may sell the surplus material under intimation to the DFO concerned.
 - (c) In case of Kendu leaves and specified fore produce, leased items of NTFP, if any, the VSS members will have the right to collect the same from the assigned forest but these items shall have to be delivered to the departmental agencies or lessee on payment of prescribed rates for the collection of such items.
 - (d) In case of a major harvest or final felling in the assigned forest, the same shall be taken up by the forest department strictly as per the prescription of the working plan/duly approved micro-plan. In case of natural calamities, harvesting of wind-fallen trees shall be treated as

after deduction of proportionate harvesting cost and this will be deposited in their "VSS account". Provided that the VSS may also opt for 50% of the forest produce so harvested if it is for their bonafide domestic use and they agree to pay the proportionate cost of harvesting. In respect of the village woodlots raised under the SIDA Social Forestry Project on land notified as Village Forest and brought under JFM, the VSS shall be entitled to 100% of the usufructs in the final harvest of the plantation while they will be entitled for 50% of the share as usual during subsequent rotations.

- (ii) The EC shall be responsible for the distribution of the usufructuary benefits equally or equitably among the members of the VSS as may be decided by it.
- (iii) In cases where member/ a group of members of the JFMC play a major role in the collection of intelligence, detection and seizure of illegal forest produce in transit the concerned JFMC shall be entitled to the prescribed percentage of the sale price of the forest produce as per Rule 4(3) of the Orissa Rewards for Detection of Forest Offences Rules, 2004. Such amount shall be deposited by the DFO to the "VSS account/EDC account" after disposal of the seized produce following due procedure of law.
- (iv) Collection of money by any member or members of the VSS in relation to forest produce except as pre provision of para-II (iii) as mentioned above will be illegal and would be dealt as per law.

12. Transit of harvested forest product

All forest produce requiring permits for transit as per provisions of Orissa Timber and Other Produce Transit Rules, 1980 shall be removed from the assigned forest area in accordance with a permit to be issued jointly by any authorized member of the EC and the Member Secretary of the area in the prescribed format (Form-4). The permit shall be valid only within the limits of the area to which the VSS members belong and no second permit shall be issued in lieu thereof.

13. Conflict Resolution:

In case of intra village conflict in matters of implementation of Joint Forest Management, the Executive Committee of the VSS/EDC shall endeavor to amicably resolve the conflict. If it is felt to resolve the conflict, it shall bring the same to the notice of the Forest Range Officer with its recommendation of action to be taken. In case of inter village conflict; the same would be referred to the Panchayat Samiti for resolving the conflict. In case of a dispute amongst the villages of different Panchayats, the same should be referred to the Divisional Level Steering Committee and their decisions would be final.

14. Memorandum of Understanding (MOU)

- (i) To ensure smooth working relationship between the Forest Department and the JFM committees and also to bring in a sense of ownership, empowerment and accountability a MoU shall be signed between the FD and JFMC.
- (ii) The VSS/EDC through its EC shall execute a MoU with the Forest department for active participation in the task of protection, regeneration and management of the assigned forest area and for implementation of the programme as per the Joint management Plan (Micro-Plan).
- (iii) The Chairperson of the VSS will sign the MoU on behalf of the VSS while the Range Officer concerned will sign the same on behalf of forest department. Other members at the EC will also be signatory to the MoU as witness while the concerned local forest officials such as: the Forester/VFW and Forest Guard will also sign MoU as witness.
- (iv) The MoU shall be in the prescribed form (Form-5).

15. Steering Committee

(ii) Forest Division Level Steering Committee: This committee shall comprise of the following members:

- | | | | |
|-----|---|---|------------------|
| (a) | Conservators of Forests | : | Chairperson |
| (b) | Divisional Forest Officer (Territorial or Wildlife) | : | Member Secretary |
| (c) | Representative of Collector, preferably ADM dealing with land matters | : | Member |
| (d) | Deputy Director (Agriculture) | : | Member |
| (e) | Chief District Veterinary Officer | : | Member |
| (f) | PO, DRDA | : | Member |
| (g) | PA, ITDA | : | Member |
| (h) | Deputy Director (Horticulture) | : | Member |
| (i) | Soil Conservation Officer | : | Member |
| (j) | Executive Engineer (RWSS/PHED) | : | Member |
| (k) | District Inspector of Schools | : | Member |
| (l) | 2 NGOs (to be nominated by the DFO) | : | Member |
| (m) | 5 VSS (Chairperson/Vice-Chairperson (at least 2 women) (to be nominated by DFO) | : | Member |
| (n) | Chairperson of two Panchayat Samities to be nominated by Collector in rotation. | | |
| (o) | Prakruti Mitra and Prkruti Bandhu Awardees: | | Member |

(iii) The tenure of the non-official members will be three years

(iv) The Divisional Level Steering Committee will meet at least once in six months and shall monitor functioning of the VSS, implementation of micro-plans and suggest measures of improvement.

(v) The Committee shall ensure co-ordination of all concerned departments/agencies at the district /sub-divisional levels for proper implementation of the JFM programme.

(vi) State Level Steering Committee: The constitution of the State Level Steering Committee shall be as under:

- | | | | |
|-----|---|---|------------------|
| 1. | Minister (Forest) | : | Chairperson |
| 2. | C.S./Addl. Chief Secretary (Supervising Forest): | | Vice Chairperson |
| 3. | Principal Secretary, F &E Department | : | Member |
| 4. | Principal CCF | : | Member |
| 5. | Principal CCF (WL) | : | Member |
| 6. | 2 C.Fs from field to be nominated by PCCF | : | Member |
| 7. | Secretary, Revenue Department | : | Member |
| 8. | Secretary, Home Department | : | Member |
| 9. | Secretary, RD Department | : | Member |
| 10. | Secretary, PR Department | : | Member |
| 11. | Secretary, SC & ST Department | : | Member |
| 12. | Two non-official experts to be nominated by Govt. | | Member |
| 13. | Special Secretary, F & E Department | : | Member |
| 14. | Chairpersons of two JFMC selected by PCCF | : | Member |
| 15. | CCF (Affn and SF), Office of PCCF, Orissa | : | Member |

(vii) The non-official members of the State Level Steering Committee will have tenure of three years.

(viii) The Committee shall meet once in a year to review the programme of Joint Forest Management in the State. They may hold extensive deliberations on specific problems faced in implementation of the programme and may guide and direct the operation of JFM programme in the State. They may recommend amendment of JFM provisions whenever required to steer the course of events in a positive direction.

16. Repeal and Savings:

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Department Resolution No.16700-10F (Pron)-29/93-F&E dt.3.7.1993 will be recognized and treated as formed under this Resolution.

ORDER

Ordered that the Resolution be published in the Extraordinary issue of the Orissa Gazette.

By order of Governor

H S Chakar

Principal Secretary to Government
Forest & Environment Department

22.X.08

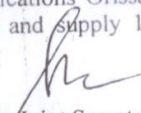
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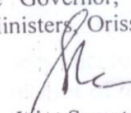
Memo No. 17455 /F&E. Date: 22.10.08

Copy forwarded to the Director, Printing, Stationery and Publications Orissa, Cuttack with a request to publish the resolution in the next issue of Orissa Gazette and supply 100 copies to the Department.


Joint Secretary to Government

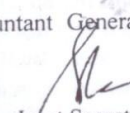
Memo No. 17456 /F&E. Date: 22.10.08

Copy forwarded to the Commissioner-cum-Secretary to the Governor, Orissa/ Principal Secretary to Chief Minister, Orissa/Private Secretaries to all Hon'ble Ministers, Orissa for information and necessary action.


Joint Secretary to Government

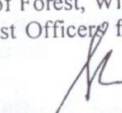
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Copy forwarded to all Departments of Government/ Accountant General (A&E), Orissa, Bhubaneswar for information and necessary action.


Joint Secretary to Government

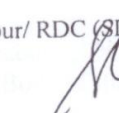
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Copy forwarded to the Principal Chief Conservator of Forests, Orissa/ Principal Chief Conservator of Forests (WL) and Chief Wildlife Warden, Orissa/ Addl. Principal Chief Conservator of Forests (KL)/ Project Director, OFSDP, Bhubaneswar/ Managing Director, OFDC Ltd., Bhubaneswar/ M.D., TDCC, Bhubaneswar/ Project Director, OTELP, Bhubaneswar/ Project Director, Western Orissa Livelihood Project/ Director, Orissa Watershed Development Mission, Bhubaneswar/ All Chief Conservators of Forests, Office of the PCCF, Orissa/ Chief Conservator of Forest, Wildlife, Office of the PCCF (WL), Orissa/ All Conservators of Forests/ All Divisional Forest Officers for information and necessary action.


Joint Secretary to Government

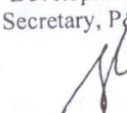
Memo No. 17459 /F&E. Date: 22.10.08

Copy forwarded to the RDC (CD), Cuttack/ RDC (ND), Sambalpur/ RDC (SD), Berhampur / All Collectors for information and necessary action.


Joint Secretary to Government

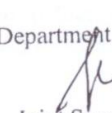
Memo No. 17460 /F&E. Date: 22.10.08

Copy forwarded to the Private Secretaries to Hon'ble Chief Minister / Chief Secretary/ Development Commissioner-cum-ACS/ Agriculture Production Commissioner/ Secretaries, Home Department./ Agriculture Deptt. / Revenue & Disaster Management Deptt. / Rural Development Deptt./ ST & SC Development Department/ Special Secretary, F&E Department/ Special Secretary, P&C Department for favour of information of Hon'ble Chief Minister /Chief Secretary/ Development Commissioner-cum-ACS/ Agriculture Production Commissioner/ Secretaries, Home Department./ Agriculture Deptt. / Revenue & Disaster Management Deptt. / Rural Development Deptt./ ST & SC Development Department/ Special Secretary, F&E Department/ Special Secretary, P&C Department


Joint Secretary to Government

Memo No. 17461 /F&E. Date: 22.10.08

Copy to Guard File, Plantation & Regeneration Section of F&E Department.


Joint Secretary to Government

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ANNEXURE-A
ACCOUNTING PROCEDURE, DUTIES OF OFFICIALS AND NON-OFFICIALS

A. JFMC Account and Procedure of Accounting

- (i) There shall be a Development Fund in each JFMC wherein money received by the JFMC will be deposited before it is used for any purpose. On receipt of resolution of the EC for opening of a bank account, the DFO shall recommend the same for opening savings bank account in any Nationalised Bank, Cooperative Bank, Rural Bank (recognized by RBI) or in Post Office, which will be called the "JFMC Account". The Chairperson and the Member Secretary of the JFMC will operate this account jointly. (The JFMC shall open a savings bank account in any nationalized bank, cooperative bank, rural bank and post office proximate to the village. The account will be opened in the style of "(village name) JFMC Account". All money received by the JFMC either in cash or instrument shall be deposited into the account before it is used for any purpose. The Chairperson and Member Secretary will jointly operate the account).
- (ii) Any withdrawal from the JFMC account can be done only after a specific resolution of the EC in this regard and after one week of such resolution. A copy of the said resolution shall be endorsed to the concerned Range Officer who may communicate his opinion within a week if he differs with the resolution. In such a situation the EC will have to reconsider its proposal and accordingly take a decision.
- (iii) The funds deposited into the JFMC account shall be utilized towards the conservation and development of forest, development of the village or for any other purpose ancillary to the implementation of the Micro-plan.
- (iv) In case the EC decides to spend the money from the "JFMC account / EDC account" for any other purpose it shall seek the approval of the General Body of the JFMC and then written permission from the DFO.
- (v) The PCCF/Govt. may issue executive instruction for operation of the JFMC account, which shall be binding on the EC. In case of detection of any financial irregularity the condensed DFO may freeze the JFMC account for a specific period and conduct necessary enquiry and may take required legal action.
- (vi) The Member Secretary shall be fully responsible for the submission of the Monthly account and maintenance of the Cash Book of the JFMC. The account shall be maintained in the same form as maintained by the Forest Department.
- (vii) A monthly work programme shall be drawn up by the Forester concerned in consultation with the EC and will be implemented with the approval of the RO subject to availability of funds for the purpose. Funds will be withdrawn accordingly from the JFMC account.
- (viii) All vouchers will be passed by the EC and signed by the Member Secretary as well as the Chairperson/Treasurer and shall be retained at the JFMC level. The Member Secretary will submit an abstract of receipt and expenditure to the concerned Range Officer by the 10th of the following month. RO will prepare a consolidated abstract of receipt and expenditure of all JFMC in his range and submit a monthly report to the DFO by 15th of the same month.
- (ix) On receipt of the monthly Cash Account of the JFMC the Range Officer will scrutinize make field verification if any and countersign the same. He will then send consolidated abstract of receipt and expenditure of all the JFMC in his Range along with his comments on each account to the DFO concerned. In all cases "where the Range Officer raised objection on the expenditure incurred by any JFMC he should communicate the menu of objection to the concerned EC for compliance while also informing the same to the DFO. The decision of the DFO on this issue shall be final.
- (x) Annual receipt and expenditure of the JFMC shall be audited by an auditor to be appointed by the Conservator of Forests. The annual statement of receipt and expenditure of the JFMC account shall be placed before the GB for its approval. The audited and approved

B. Duties of the Chairperson

- (i) To request the Member Secretary of the JFMC to convene meeting of EC and GB as per the provisions of the resolution and as and when necessitated.
- (ii) To preside over meetings of the GB and EC.
- (iii) To sign the MoU on behalf of the JFMC as per provision of Para 14 (iii).
- (iv) To jointly operate with the Member Secretary the JFMC account /EDC account.
- (v) To countersign all vouchers of payment and expenses, muster rolls and utilization measurement books and utilization certificates along with the Member Secretary. (The Chairperson may also authorize the Treasure in do the same on his behalf).
- (vi) To ensure implementation of the Micro Plan, annual and monthly work plan.
- (vii) The conduct all other functions that may be authorized by the GB or EC.

C. Duties of the Vice Chairperson

- (i) To perform all functions of the Chairperson in his absence or on being instructed by the Chairperson.
- (ii) Any other function as authorized or instructed by the GB or the EC.

D. Duties of the Treasurer

- (i) To assist the Member Secretary in the maintenance of the JFMC account and submission of return thereof.
- (ii) To countersign all vouchers, muster rolls and measurement books, If authorized by the Chairperson.
- (iii) The JFMC Treasurer should maintain a detailed record of the cost and benefit shared by the JFMC and FD in case of intermediate and final felling as per provisions of the micro plan. In case of the EDC, the Treasurer should maintain a detailed record of the benefits accrued to different members of the EDC through various development programmes.

E. Duties of the Conservator of Forests

- (i) Evaluation of the performance of the JFMC. Approval and administrative sanction of the annual work plan depending upon its financial outlay as per delegation of financial powers by Government.
- (ii) To appoint a registered auditor for the audit of annual accounts of the JFMC, which shall be completed by May of following financial year?
- (iii) To dispose of appeals against the decision of the DFO on disbanding any JFMC and order for recovery of any amount after giving both sides reasonable opportunity of being heard.

F. Duties of Divisional Forest Officer

- (i) To register the JFMC and assign Registration No.
- (ii) Monitoring and evaluation of the performance of the JFMC.
- (iii) Approval and administrative sanction of the annual work plan depending upon its financial outlay.

- (iv) To ensure opening and operation of the joint savings bank account of the JFMC account/EDC account in Nationalized Cooperative Bank (as recognized by RBI) in a Post Office by the Chairperson and Member Secretary of the JFMC.
- (v) To impart training and lend assistance to the member of the JFMC for preparation and implementation of Micro-plan.
- (vi) To coordinate with other agencies for execution of the work programme adopted under the micro plan and make the financial resources available.
- (vii) To ensure harvesting and marketing of forest procedure whenever required as envisaged in the approved micro plan / annual work plan with the participation of JFMC members.
- (ix) To maintain a ledger of the abstract of accounts of all the JFMC within the Division, make field enquiries if any and to submit their consolidated account report to the Conservator or Forests /Appropriate authority / Donor agency.
- (x) The DFO may either himself or through the ACF at any point of time hold an enquiry into the accounts or any other activities of a JFMC and take appropriate action if any misappropriation of funds or irregularity is noticed.
- (xi) To disband the EC and JFMC under para 9 (i) and (ii) or divest its powers under para 9(iii).
- (xii) In special circumstances as a provisional alternative arrangement and with prior permission of the Conservator of Forests, DFO shall have the power to authorize the concerned Range Officer to perform all the functions and exercise all the powers of the Member Secretary of a JFMC.

G. Duties of Assistant Conservator of Forests

- (i) Monitoring and evaluation of the performance of the JFMC.
- (ii) To guide the members of JFMC and offer required technical assistance to the JFMC member in preparation of micro plan / annual action plan.
- (iii) To make site inspection and conduct field enquiry to make an assessment of forest area to be assigned to a JFMC as member of DLC.
- (iv) To conduct any other function as directed by the DFO for implementation of the JFMC programme.

H. Duties of Forest Range Officer

- (i) To guide the forester in initially organizing a meeting of the Gram Sabha for constituting the JFMC.
- (ii) To oversee the constitution of the Executive Committee and to act as Returning Officer during the election of elected member of the EC.
- (iii) To assist and train the members of the JFMC in preparation of the micro plan and annual work plan.
- (iv) To assist the JFMC member in resolution of internal conflicts and in discharge of their functions.
- (v) The RO shall attend all the special / emergency meeting of any JFMC and will have the freedom to attend other meetings of any EC or JFMC.
- (vi) To issue authenticated serial numbered and page certified account books, muster rolls and measurement books to a JFMC and to maintain an account of this.

- (viii) On being authorized by the DFO as per para F(xii) to perform all functions of the member secretary under any JFMC under special circumstances.
- (ix) To take follow up action as per rules after the detection of forest offence by the JFMC and to ensure that the JFMC gets its due share after disposal of the forest produce so seized.
- (x) To demarcate the forest area to be assigned in favour of any JFMC.
- (xi) He shall submit the consolidated abstract of receipt and expenditures of all JFMCs of his range within prescribed time period.

I. Duties of FEO

- (i) He will be instrumental in spreading the message of JFMC within the Range.
- (ii) He will interact with villages /PRI and collect socio-economic profile of village.
- (iii) He will assist the JFMC in PRA exercise and formulation of micro-plan.
- (iv) He will assist the RO in monitoring and periodic evaluation of all JFM programme in the range.

J. Duties of Forester / VFW

- (i) He will be the ex-officio Member Secretary of the JFMC as well as that of the EC.
- (ii) He shall maintain the proceedings of the GB and EC meetings.
- (iii) He shall maintain the monthly receipt, expenditure account of the JFMC. He shall be the custodian of all books and vouchers of all JFMC under his responsibilities. He shall submit a monthly abstract of receipts and expenditure to the Range Officer by 10th of following month.
- (iv) He shall operate the JFMC account jointly with the Chairperson of the JFMC.
- (v) He shall assist the members of the JFMC in preparation and implementation of the Micro Plan.
- (vi) He shall keep the Range Officer continuously informed about functioning of all the JFMC under his control.
- (vii) Under special circumstances where the Chairperson does not convene the meeting of the GB even after receiving written request from at least one third member of the GB the Member Secretary shall convene the GB meeting with the approval of the concerned Range Officers.
- (viii) To discharge all other functions of the Member Secretary as prescribed in the JFM Resolution.
- (ix) To take follow up action as per rules after the detection of forest offence by the JFMC and to ensure that the JFMC gets its due share after disposal of the forest produce so seized.

K. Duties of Forest Guard

- (i) To assist the Member Secretary to organize all meetings in the village.
- (ii) To assist the villagers in preparation and in the implementation of the Micro plan / annual work plan.
- (iii) To oversee harvesting and distribution of the forest produce among the JFMC members as per approved Micro Plan.

- (v) To assist the Member Secretary in maintenance of Proceedings of all meetings of the JFMC and EC and records thereof.
- (vi) To keep the Member Secretary continuously informed about the day-to-day activities of the JFMC and the daily progress of work.
- (vii) To discharge any other function as insured by Range Officer or Forester.

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ANNEXURE-B**Form-1****RESOLUTION**

We the following villages of _____ village(s), hereby resolve to form a JFMC (Vana Samrakshyan Samiti) (VSS/Eco Development Committee (EDC) for the protection and management of the part /whole of _____ forest in accordance with the provision of the Orissa Joint Forest Management Resolution, 2008. We also undertake not to contravene any provision of the Orissa Forest Act, 1972 and Forest Conservation Act, 1980 and any Acts and Rules in force.

In case of failure to comply with any of the conditions laid down in the above said Resolution by any of the members of the JFMC, the membership of such member may be cancelled.

NAME OF VILLAGERS**SIGNATURE**

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20

Form-2
RECOMMENDATION FOR FORMATION OF
JOINT FOREST MANAGEMENT COMMITTEE

To

The Divisional Forest Officer _____ Division
 (Through Forest Range Officer _____ Range)

As per the provision of para 3 ii (a) of the Orissa Joint Forest Management Resolution, 2008, a meeting of the Gram Sabha of _____ village(s) was organized. The concept of Joint Forest Management including all rights, responsibility and benefits that might accrue to the JFMC members was explained in the said meeting. On being satisfied that 60% of adult members of the village are willing and interested to form a JFMC, I Shri _____ Forester of the _____ section in pursuance to the Vana Samrakshana Samiti (VSS) /Eco Development Committee (EDC) in this village(s). The details of the area is as follows:

1. Name of Committee:
2. Village:
3. Gram Panchayat:
4. C.D. Block
5. Police Station:
6. Forest Beat:
7. Forest Station:
8. Forest Range:
9. Total Members (list of members enclosed):

10. Forest areas proposed to be protected and managed _____ ha.
11. Name of the Forest Block _____
12. Comp. No. _____

The Resolution of the Gram Sabha of the village of _____ village(s) is attached herewith.

Signature of the Forester

OFFICE OF THE FOREST RANGE OFFICER _____ RANGE

Memo No. _____ /Date _____

I forward herewith the Resolution of the villagers of _____ village along with the views of the Forester of _____ section. I recommend for formation of the JFMC _____ village for the protection and management of _____ ha. of the forest area in _____ forest block.

Signature of Forest Range Officer

Form: 3

OFFICE OF THE DIVISIONAL FOREST OFFICER _____ DIVISION

OFFICE ORDER NO. _____ DATE _____

After due consideration of the proposal submitted vide Memo No. _____ Office Forest Range Officer, _____ Range, and the recommendation of the DLC, I, in exercise powers vested under 3 ii(e) of the Orissa Joint Forest Management Resolution, 2008 accord my approval for constitution of VSS/EDC and order that the _____ Vana Samrakshyana Samiti/Eco Development Committee for the _____ villagers(s) is hereby constituted for protection and management of part / whole of _____ forests.

The _____ Vana Samrakshyana Samiti/Eco Development Committee is registered in this office vide Registration No. _____.

Forest Area Schedule:

Extent of Forest Area: ha.

Description of Location:

DIVISIONAL FOREST OFFICER
_____ **FOREST DIVISION**

OFFICE OF THE DIVISIONAL FOREST OFFICER _____ DIVISION

Memo No. _____/Date _____

Copy forwarded to Forest Range Officer _____ Range for information and necessary action. He is instructed to demarcate the forest area as per above schedule and depict the area in the topo sheet (1: 50000 scale). A copy of the map should be available with the VSS, Member Secretary, Beat Guard and in the Range Office. Another copy of the map should be submitted to this office for record.

Copy forward to Sarpanch, _____ Gram Panchayat for information and necessary action.

DIVISIONAL FOREST OFFICER
_____ **FOREST DIVISION**

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Form-4
**PERMIT UNDER THE ORISSA JOINT FOREST MANAGEMENT
RESOLUTION-2008**

- Name of the assigned Forests _____
- Description of Forest produce Quantity
- Source of Procurement of the forest produce _____
- Name of the JFMC Member _____

Date of issue:

Designation

Valid up to:

(Signature of the Authorised Member
of the Executive Committee,
_____ JFMC)

Signature of the
Member Secretary

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Form-5
MEMORANDUM OF UNDERTAKING

1. We the members of the Executive Committee of the Vana Samrakshyana Samiti /Eco Development Committee of _____ village do hereby undertake individually and collectively to perform the duties and shoulder the responsibilities as detailed in the Orissa Joint Forest Management Resolution, 2008, for proper protection, regeneration and management of the forest areas as per the schedule given hereunder.

- i. Name of the JFMC
- ii. District _____
- iii. Forest Division _____
- iv. Forest Range:
- v. Section:
- vi. Beat:
- vii. Police Station:
- viii. Village:
- ix. Name of the assigned Forest Block
- x. Legal status of the Forest area:
- xi. Area (Ha) of the assigned forest:
- xii. Boundaries of the area:

North	East
South	West

1. We, understand that the usufructuary benefits as detailed in the aforesaid Resolution shall be allowed only upon satisfactory observance of the duties, responsibilities and functions by this executive Committee and by the members of the Vana Samrakshyana Samiti as per the aforesaid resolution. We undertake not to contravene any provision of any Act or Rules in force. In case of failure to comply with any provision of this Resolution by any member of the JFMC, the membership of such member may be cancelled and such member may not be allowed any usufructuary benefits from the date of termination of his/her membership.

2. A copy of the aforesaid Resolution is annexed herewith duly signed by us on every page in proof /evidence of our having read /understood the same in letter and spirit. It is hereby agreed that this MOU will come into effect from_____.

Signature of the Chairperson
 _____ JFMC

Signature of R.O.
 Range: Division:

Witnesses:
 1.
 2.
 3.

Witnesses:
 1.
 2.
 3.



WORLD BANK

ASSISTANCE SCHEME

FOR

COASTAL BASED ACTIVITIES

IN

ORISSA

(LIVELIHOOD SECURITY: ECOTOURISM)

GOVERNMENT OF ORISSA

PRINCIPAL CHIEF CONSERVATOR OF FORESTS (Wildlife)
PRAKRUTI BHAWAN, 5TH FLOOR, NILAKANTHA NAGAR,
BHUBANESWAR-12.

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SECTION 1-Project context

A. State of (State) - A Brief Profile

The coastline in Orissa stretches over a length of 480 kms. from Subarnrekha river mouth near Orissa - West Bengal border to Ichhapuram bordering with Andhra Pradesh. The coast is important not only to fishermen but also to people located near the coast. The mangrove provides a natural shelter belt against the cyclones, super cyclones and tidal surges. The coasts as well as coastal waters are also important due to presence of a large number of ecosystems such as coastal, marine and estuarine which is extremely rich with bio-diversity. In Orissa, the coast along the mainland and islands also provides nesting ground to large number of Olive Ridley turtles. The coastal belt is very important from tourism point of view.

The coastal areas in Orissa State are spread over six districts, namely Balesore, Bhadrakh, Kendrapara, Jagatsinghpur, Puri and Ganjam. These come under the jurisdiction of Balesore, Bhadrakh, Rajnagar, Puri and Chilika Wildlife Divisions under the Principal Chief Conservator of Forests (Wildlife) & Berhampur Division under the Principal Chief Conservator of Forests Orissa.

The project areas included in the present World Bank Assistance Scheme for coast based activities in Orissa includes two important stretches of the states coast line which includes (i) Dhamara - Paradeep Stretch and (ii) the Gopalpur Chilika stretch.

Statement of significance:

(a) Dhamara - Paradip stretch (SITE 1)

It includes Bramhani, Baitarani and Mahanadi deltaic region of Kendrapara district in north-eastern part of the coastal state of Orissa.

State, Province or Region

ORISSA, KENDRAPARA DISTRICT

Protected Area Network within SITE 1

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2107 sq. km (It includes 672 sq. km of Bhitarkanika Wildlife sanctuary/NP + 1435 sq. km of Gahirmatha (marine) Wildlife sanctuary).

Geographical coordinates of the PAN to the nearest second

20⁰ 17' 32''N to 20⁰ 48' N latitude

86⁰ 45' E to 87⁰ 17' 36'E longitude

Dhamara - Paradip stretch of the coastal Orissa includes Bhitarkanika which is both a sanctuary and National Park. It is good representative of mangrove wetland ecosystem having high genetic and ecological diversity. The floral diversity of Bhitarkanika is known to be the largest in India and second largest after Papua New Guinea. It is one of the best reptile refuge in the entire country as well as in the whole of South East Asia region. The coastal waters adjoining Bhitarkanika is a marine sanctuary known as the Gahirmatha marine wildlife sanctuary.

This site epitomises the merging of four different eco-systems namely terrestrial, fresh water, estuarine and marine ecosystems, and shows all variations in genetic, specific and ecological diversity of both plant and animal communities. The peripheral areas in the buffer zone are dotted with numerous ornithologically important wetlands.

The site contains the most important and significant natural habitats for in-situ conservation of biological diversity containing 5 Amphibian species, 42 Reptilian species, 217 Bird species and 30 Mammalian species. It includes 27 threatened species of outstanding universal value from the academic and conservation point of view. It includes Schedule-I animals of different categories namely Mammals (8 species), Birds (3 species) and Reptiles (16 species). As such the area is a treasure trove for botanical and zoological studies and research.

The site contains 300 plant species including both mangroves and non-mangroves. The wetland supports one of the largest mangrove plant diversity in India, and comprises of 82 species of mangroves and its associates. It harbours three varieties

of Sundari trees (*Heritiera* spp.) including *Heritiera kanikensis*, which is an endemic species.

The site contains one of the world's largest nesting and breeding ground of the endangered Olive ridley sea turtles. This seasonal phenomenon is considered as one of the greatest extravaganza of nature. It also holds areas of exceptional natural beauty and aesthetic importance. Gahirmatha sea beach along the coast being world's largest rookery attracts over half a million female olive ridley sea turtles for mass nesting/egg laying.

It is home to the largest population of the endangered estuarine crocodiles (*Crocodylus porosus*) in the Indian Sub-continent. The largest living crocodile in the world (23'+) is a denizen of this site (Guinness Book of World Record, 1994). Bhitarkanika also contains a high density of the India's largest water monitor lizard (*Varanus salvator*).

Species diversity of birds at this site is 269 including more than 60 species of migratory waterfowl (about 0.2 million birds). It has a site for community nesting of aquatic birds (heronry), where 12 wetland bird species nest and roost together annually (June to October) and rears the fledglings. It is also home to eight varieties of kingfishers including a sizeable population of endangered Brown-winged kingfishers.

The mangrove ecosystem in the Bramhani- Baitarani- Mahanadi deltaic complex is the nursery and spawning ground of several species of fish, prawn and crabs as well as other invertebrates. It is also the breeding ground of several rare and endangered species of wildlife.

The area is also home to a primitive tribe locally known as '**Daleis**' who are living in harmony with the ecosystem.

The entire project area is an outstanding example of dynamic land developmental processes including both accretion and erosion.

(b) Gopalpur-Chilika stretch:

Gopalpur-Chilika stretch of the coastal Orissa includes Chilika which is the largest brackish water lagoon of the country as well as the whole of Asia. The water spread of

the lagoon varies between 1165 Sq. km in monsoon to 906 Sq. km during summer, and extends over Puri, Khurda and Ganjam districts. The lagoon itself can be broadly divided into four natural sectors based on salinity and depth such as the southern zone, central zone, northern zone, and the outer channel. Numerous islands are present in the lagoon, prominent among which are Kalijai Island, Honeymoon Island, Barakuda Island, Breakfast Island, Birds Island, etc. The ecosystem features of Chilika comprises of tidal ingress from the sea, which mixes with the fresh water brought by rivers like Daya, Bhargabi, Luna and large number of rivulets.

One of the submerged (potential) islands covering an area of 15.53 Sq. km has been notified as Chilika (Nalaban) Wildlife Sanctuary on 17th December 1987. The whole area of the Chilika lagoon, excluding the area notified as sanctuary has been declared as a 'Closed Area' with effect from 16th December 2002.

There are 546 species of angiospermic plants belonging to 379 genera and 107 families, above 100 phytoplankton genera, 20 species of weed and 7 pteridophytic species documented so far in the lagoon and the islands.

Chilika is very rich in both invertebrate and vertebrate fauna. This Ramsar site is the habitat for the largest congregation of waterfowls in India. Over a million birds congregate in this water body for feeding and roosting. Migration commences in late September and the birds remain up to April, but the peak congregation period is mid-December to middle of January. Birds belonging to over 230 species including 14 birds of prey species (32% aquatic, 22% waders, and 46% terrestrial birds) are seen in this lake, of which 95 species are intercontinental and local migrants. Flocks of migratory waterfowl arrive from as far as the Caspian Sea, Lake Baikal, remote parts of Russia, central and south East Asia, Ladakh and the Himalayas for feeding and roosting. 15 species of ducks and two species of geese (Order: **Anseriformes**), cover over 70% of the migratory birds which visit this lagoon annually. The ducks and geese are followed by coots, rails and cranes (**Gruiformes**) 15%; waders/ shore birds (**Charadriiformes**) 12%; pelicans (**Pelecaniformes**) 1.5%; grebes (**Podicipediformes**) 1%; kites, eagles etc. (**Falconiformes**) and kingfishers (**Coraciformes**) 0.5%.

In Chilika during the current bird migration season, maximum congregation of waterfowl (migratory and local) was observed in peripheral marshy areas of the lagoon such as: Kalupada ghatt, Manglajodi, Sorana, etc.

The other vertebrate fauna includes:

- 321 species of fish (fresh water, estuarine and marine species),
- 7 species of amphibians,
- 30 species of reptiles (12 species of lizards and 18 species of snakes) and
- 18 species of mammals.

Two major crabs species (*Scylla serreta* and *Neptunus pelagicus*), available in Chilika are of commercial importance.

The population of Irrawaddy or Snubfin dolphins, *Orcaella brevirostris* (locally known as “Bhuasuni Magar”) is threatened due to intensive fishing and plying of mechanised boats in the lagoon. To prevent the above massive awareness campaign has been taken up by the Chilika wildlife division and Chilika Development Authority. At present there are 135 Irrawaddy dolphins in the entire lagoon. A small population of Bottle nosed dolphin, *Sousa chinensis* also migrates in to the lagoon from the sea.

The mass nesting beach (rookery) of the endangered Olive ridley sea turtles along the Chilika coast is at Rushikulya which is located at the southern Orissa coast. It spreads over six km. stretching from the coastline in front of village Purunabandha (one Km north of Rushikulya river mouth) to the beach in front of Kantiagada village of Ganjam District. The nesting beach is much wide, more or less flat with scattered sand dunes of 1 – 2 m high. The average beach width is about 100 m from near the high tide line, though at some places the width of the beach is more than 100 m. An estimated number of about 2,00,000 turtles are nesting in this rookery each season.

Most notable and endangered species also included in the Schedule-1 of the Wildlife (Protection) Act available in the Chilika lagoon are as follows:

- *Barkudia insularis*, a limbless lizard/skink (this skink is named after the “Barukuda” island of the lake);

- an aquatic mammal i.e., Irrawaddy dolphin, *Orcaella brevirostris*,
- Fishing cat (*Felis viverrina*),
- White bellied sea eagle (*Haliaeetus leucogaster*), White spoon bill (*Platalea leucorodia*), Osprey (*Pandion haliaetus*), and
- Spoon billed sandpiper (*Eurynorhynchus pygmeus*).
- Olive ridley sea turtle (*Lepidochelys olivacea*)

The changing profile of the lagoon has led to new challenges. The bird congregation, which was largely confined to Nalaban and other four to five areas, has now dispersed to peripheral areas such as Kalupada, Mangalajodi, and Bhusandpur, etc. This has posed a problem of protection of birds due to difficulty in accessibility of the area and constraint of resources. Increase in tourism inside Chilika has given rise to death of Irrawaddy dolphins, which may at a later stage be detrimental to the overall population of these endangered dolphins. This, however, has also offered opportunities to work hand in hand with other stakeholders working in the area for overall conservation of the lagoon.

B. Physiography of the State:

The terrain of the landscape bordering of the Bay of Bengal comprises sandy sea beach backed by wetlands with natural mangrove forest and interrupted by a network of tidal rivers, creeks and crick lets of the major river systems of the state of Orissa namely, Bramhani, Baitarani, Dhamara, Mahanadi, Rushikulya, Bahuda, etc.

The monsoon prevails from middle of June and continues till September with occasional rains during October. The tides are of semi-diurnal type.

C. Coastal Resources / Marine Areas of the State

C.1 The coastal areas in Orissa state are spread over six revenue districts, namely Balesore, Bhadrakh, Kendrapara, Jagatsinghpur, Puri and Ganjam. These come under the jurisdiction of Balesore, Bhadrakh, Rajnagar, Puri and Chilika Wildlife Divisions under the Principal Chief Conservator of Forests (Wildlife) and Berhampur (Territorial) forest Division under the Principal Chief Conservator of Forests Orissa.

As per the State of Forest Report 2005, mangroves in Orissa are spread over an area of 203 km² of the coast. Kendrapara district has maximum of mangrove cover in the state (175 km²), followed by Bhadrakh district (20 km²), Jagatsinghpur district (4 km²) and Balesore district (4 km²).

The major river deltas are: Subarnarekha, Budhabalanga, Baitarani, Bramhani, Dhamara, Mahanadi, Devi, Keluni, Rushikulya and Bahuda which have mangroves. Besides, Chilika lagoon has also some mangroves.

The river systems draining into the Bay of Bengal forms extensive deltas which support mangrove forests. The mangrove forests though extends over six major river deltas such as Subarnarekha, Budhabalanga, Bramhani-Baitarani, Mahanadi and Devi covering a total area of 203 sq. km. The Bhitarkanika Wildlife Sanctuary/National Park in Bramhani-Baitarani deltaic area, the largest (150 sq. km approx.) among the available patches in Orissa harbor India's richest mangrove forests in terms of species diversity. Mangroves in other areas are mostly degraded by a variety of factors, the most significant of which has been conversion to brackish water fishponds.

The diverse climatic conditions of Bhitarkanika mangrove wetland provide ideal habitat to a varieties of invertebrate and vertebrate fauna (lizards, snakes, saltwater crocodiles, varieties of waterfowl, mammalian species etc.). It is one of the best reptile refuges in the world. Besides, it provides an ideal habitat to the largest population of saltwater crocodiles, *Crocodylus porosus* including the partial white crocodiles in India. Bhitarkanika mangrove wetland has been declared as one of the Ramsar sites i.e. wetland of international importance on 19th Aug.2002. It is the second wetland to be declared as Ramsar site in the state and one of the 19th in the entire country. The other designated Ramsar site in the state is Chilika, which is important for the migratory birds, Irrawaddy dolphins and other estuarine and marine fauna including sea turtles.

C.2 The identified project sites of the coastal belt of Orissa for protection of its rich biodiversity has a network of Protected Areas (PAs) notified under the Wildlife (Protection), Act, 1972 are as follows:

- (1) Bhitarkanika Wildlife Sanctuary
- (2) Bhitarkanika National Park

- (3) Gahirmatha Marine Wildlife Sanctuary
- (4) Chilika (Nalabana) Wildlife Sanctuary

The identified project sites of the coastal belt of Orissa for protection of its rich biodiversity has also a net work of Marine Protected Areas (MPAs) notified under the Orissa Marine Fisheries Regulation (OMFR), Act which are as follows:

- (1) 20 km seaward radius of Gahirmatha area [\(Reference Map\)](#)
- (2) 20 km seaward radius of Rushikulya river area [\(Reference Map\)](#)

D. Coastal Zone Management-status

D.1 Laws & Policies-CRZ, CMZ

- (1) Wildlife (Protection) Act, 1972 amended 2006.
- (2) Forest Conservation Act 1980.
- (3) Environmental (Protection) Act 1986 including CRZ rules.
- (4) Orissa Marine Fisheries Regulation (OMFR) Act 1981.
- (5) Orissa Prevention of Land Encroachment (OPLE) Act

D.2 Institutions / Authorities (roles and responsibilities)

i. Government of Orissa, Forest and Environment Department: The Administrative Department in the Government responsible for implementation of various Policies relating to forest, wildlife and environment laws.

ii. Principal CCF (Wildlife) & Chief Wildlife Warden, Orissa, Bhubaneswar : The authority to implement policies and programmes of Government relating to wildlife, its habitat and related issues and to enforce the various laws relating to Wildlife and its habitat through its field functionaries like

a) Supervisory Officers:

- i. Conservator of Forests, Bhubaneswar Circle
- ii. Conservator of Forests, Berhampur Circle
- iii. Conservator of Forests & Field Director, STR, Baripada

b) Executing Officers:

- i. DFO, Mangrove Forest Division (Wildlife), Rajnagar
- ii. DFO Chilika (Wildlife) Division Balugaon
- iii. DFO Berhampur Division(Territorial) Berhampur
- iv. DFO Bhadrakh (Wildlife) Division
- v. DFO Balesore (Wildlife) Division

D.3 Status of implementation so far

Awareness generation through ecotourism for conservation and protection of flagship species like wetland birds, sea turtles, cetaceans like the dolphins and whales, crocodiles other wildlife and mangroves in the project sites have been attempted with limited financial resources from Govt. of India and Govt. of Orissa.

Specific details:

Following projects for protection and conservation of flagship species in the coastal zone of Orissa have been undertaken in the state.

1. Launching of the GOI/FAO/UNDP supported Integrated Crocodile and Sea turtle conservation project in the mid 1970s: the population of the endangered crocodilian species has been considerably increased in the river systems of Bhitarkanika through the grow-rear and release programme. The programme is very successful in Bhitarkanika.
2. Under the APO of Gahirmatha marine wildlife sanctuary, funding support is provided for protection and conservation of flagship species like the endangered sea turtles, cetaceans and other aquatic wildlife.
3. Under the APO of Bhitarkanika Wildlife Sanctuary/ National Park, funding support is provided for protection and conservation of flagship species like the endangered estuarine crocodiles, cetaceans, other aquatic as well as terrestrial wildlife species.
4. Under the APO of Chilika (Nalabana) Wildlife Sanctuary funding support is provided for protection and conservation of flagship species like the wetland birds, cetaceans as well as other aquatic species.

D.4 Current capacity building programs-achievements and limitations

Within the Division capacity building programmes/ training is being organized for specific programme and activities for the field staff. With these training the staffs have

been discharging their job. But as job of staff is transferable so training is required regularly.

Capacity building is required to upgrade the skills for identification of flora and fauna, specific training for updating the skill to take up census for birds,. Crocodiles, sea turtles, dolphins, etc. Capacity building for raising nursery and taking up Mangrove plantation through different models, upgrading the skill to do patrolling in deep sea, conducting eco-tourism etc. Capacity for multi disciplinary approaches and standard procedures adopted in other States and countries for staff at all levels are highly required to ensure greater success in programme implementation and achieving success.

Achievements:

- i. Best possible protection is being provided to mangroves, coastal casuarinas, crocodiles, sea turtles, dolphins, lizards, avifauna etc. with limited resources.
- ii. Awareness, motivation and education has been provided to nature lovers through eco-tourism about necessity of conservation and protection of bio-diversity.
- iii. Research activities: Specific research schemes have been undertaken relating to status survey of flag ship species like the crocodiles, sea turtles, dolphins, blackbucks, avifauna, etc.

Limitations:

- i) Inadequate Database
- ii) Shortage of staff
- iii) Aging of most of the existing staff
- iv) Lack of adequate communication and transport facilities
- v) Inadequacy of amenities for staff
- vi) Non-availability of sea worthy vessels for complete protection of sea turtles, dolphins and other marine life forms is not possible in their mating and breeding grounds.
- vii) It is not possible to check infiltration of intruders from neighboring states and country for illegal sea fishing activities

- viii) Lack of adequate facilities and amenities for tourists
- ix) Lack of adequate fund to maintain the degraded mangrove forest

D.5 Overall budget/ resources spent in CZM in (State)

- (i) Expenditure on Management Action Plan (MAP) on Mangroves:

(From 2002-03 to 2006-07 for sites such as Bhitarkanika, Mahanadi Delta, Devi-Kadua and Chilika) (Rs. 147.6545 or 147.66akhs)

- (ii) Expenditure on Annual Plan of Operation (APO) of Sanctuaries/ National Parks:

(From 2002-03 to 2006-07 under APO of Bhitarkanika N.P., Bhitarkanika Sanctuary, Gahirmatha Sanctuary, Balukhand-Konark sanctuary and Chilika – Nalabana sanctuary) (Rs. 465.4155 or 465. 16 lakhs)

Under MAP	147. 66 lakhs
<u>Under APO</u>	<u>465.16 lakhs</u>
Total:	612.82 lakhs

D.6 Key Issues in coastal zone management entire (state)

- a. Inadequate natural cyclone shelter belt (Environment of the mangrove area) (degradation of natural barrier to cyclones such as mangrove forests)
- b. Encroachment of coastal land and land put to improper use causing
 - i. environmental degradation.
 - ii. Disturbances to the habitats of sea turtles and other aquatic wildlife.
- c. Illegal fishing in marine protected areas / No Fishing Zones. (Protection of Olive Ridley turtles and their hatchlings as well as other marine wildlife on the coast and coastal waters.)
- d. Un-regulated mass tourism in the coast.

(a) Institutional coordination issues-sub-state set up? Decision-making structures?

- i. For multi disciplinary activity relating to Protection of Olive Ridley Turtles and mangroves, there are State level committees (High Power Committee on protection of sea turtle under the chairmanship of Chief Secretary of State Govt. involving departments such as Forest, Fishery, Home, and Govt. of India agencies like the Coast Guard, DRDO, etc..)

- ii. For other routine work, co-ordination among all district level officers exists.
- (b) Pollution? Sewage? Marine life & resources? Salinity ingress? Livelihood issues-fisheries? Oil spill risk management?**
 - (i) Infiltration of people from Bangladesh causing illegal encroachment in mangrove, fishing and devastation of coastal and natural resources.
 - (ii) There is pollution problem due to presence of large number of industries in the project site under consideration like, Paradeep Port, Oswal Oil Refinery, Fertiliser Industry etc. In addition large number of tourists in Bhitarkanika and other areas also cause certain pollution.
 - (iii) Sewage at present is a localized problem.
 - (iv) There is over exploitation of marine life, mangrove forests and Casuarinas Plantation.
 - (v) Salinity ingress is a problem in habitations specially affecting cultivation etc. unlike its usefulness in Mangrove areas.
 - (vi) Livelihood issues are a concern in the area. Dependence of local population on forest and fisheries resources leads to over exploitation. Agriculture is not well developed. During lean season and during calamities there is problem for sustenance.
 - (vii) No major problem relating to Oil spill has been faced. However due to presence of Oil Refinery close by and use of large number of Trawlers etc , are cause of concern . No arrangement to tackle this problem exists in case if any mishap takes place due to oil spill.

E. Key learning from CMZ activities

E.1 Important activities implemented in last 10 years

- (i) Protection to important fragile ecosystem and keystone species.

- (ii) Consolidation of forest blocks through forest settlement Proceedings.
- (iii) Conducive environment provided to Olive ridley sea turtles for mass breeding and mass nesting.
- (iv) Participation of local people ensured in conservation and protection of Bio-diversity by creating Eco-development committees and V.S.S.
- (v) Ecotourism development.
- (vi) Census techniques for birds, Crocodiles, turtles, dolphins etc. standardised.

E.2 Success and failures:

Success:

- (i) Eviction of encroached areas to a large extent.
- (ii) Plantation along evicted areas
- (iii) Awareness creation to conserve and protect bio-diversity.
- (iv) Potential of eco tourism recognized.
- (v) Local people involved in conservation efforts.

Failure:

- (i) Re-encroachment of plantation areas.
- (ii) Unable to provide full protection to the mangrove areas and coastal seas which is the mating and breeding ground of Sea turtle, Whale and Dolphin, etc.
- (ii) Dependence of people on marine and forest resources could not be reduced significantly as alternate livelihood options to sustain people could not be ensured.

F. Justification for the Project (SWOT):

Although awareness has been created among masses for protection and conservation of bio-diversity, still due to increased human population and their requirement, pressure on bio diversity continues. For want of adequate resources, it is not possible to check biotic pressure and to compensate for the losses of individuals if they do not use and harvest the bio-diversity.

Livelihood issues are a concern in the area. Dependence of local population on forest and fisheries resources leads to over exploitation. Agriculture is not well developed. During lean season and during calamities there is problem for sustenance.

There are trained manpower, capacity of local people has been enhanced, problems are well defined and solutions are also known provided adequate resources are provided.

Thus this project will ensure strengthening the efforts already going on in the state.

Section II- The Project

A. [STATE]'s Vision and Strategy for ICZM:

- (i) To address the livelihood issues through eco tourism for long term conservation of biodiversity along the coast/ coastal waters of Orissa.
- (ii) Long term scientific management of the coastal zone and its resources in an integrated manner through multi-disciplinary approaches and adopting the success stories and standard procedures from other areas.
- (iii) Protection of coastal and marine biodiversity of different ecosystems.
- (iv) Providing ecological security to the species and eco-systems.

B. Project Objectives and Key Indicators:

The main objective of the Project is conservation of Bio-diversity on and along the coast and coastal waters through promotion of ecotourism and livelihood security.

The important species and ecosystems, which need immediate attention and the process to achieve these objectives are:

- (i) Development of ecotourism to provide livelihood support to the affected fishermen in the restricted area.
- (ii) Ensuring people's participation in all conservation and developmental activities along the coast particularly Protection to Olive ridley sea turtle, Dolphins and Whales, Avi-fauna of coastal wetlands and other marine life forms; Preservation and propagation of mangroves and mangrove associates both banks of all tidal influenced rivers, creeks and mud flats through ecotourism and through community participation.
- (iii) Reduction of pressure on coastal natural resources.
- (iv) Development of strategy for better management of the coastal region through reduction of conflict between affected fishermen and management.

Key Indicators

- (i) Density of vegetation assessment through satellite imagery will be a key indicator for the state of conservation of mangroves.
- (ii) The estuarine crocodiles being at the apex of the food chain in tidal rivers are the keystone species/ indicator species. Assessment of their population and sighting success of different size class of individuals from time to time will be a key indicator for the state of conservation of estuarine crocodiles.

Similarly, Olive Ridley sea turtles are also keystone species/ indicator species in the coastal ecosystem. Continuance of mass nesting and

reduction of mortality of adult sea turtles due to sea fishing related activities will be a key indicator for the state of conservation of Olive Ridley sea turtles.

Sighting trends of cetacean species such as Dolphins and Whales and reduction of mortality of these species due to sea fishing related activities will be the key indicator for the state of conservation of cetaceans.

Protection to other marine life forms can be known from the status of the population of the above keystone species/ indicator species in the tidal rivers/ estuaries as well as coastal ecosystem.

- (iii) Reduction of migration of affected fishermen during fishing ban period.
- (iv) Development of socio-economic condition of coastal stakeholders.

C. Project's Guiding Principles and Key Design Features

The guiding principles of the Project are as follows:

Ecotourism is a form of tourism that involves traveling to relatively undisturbed natural areas with specific objective of studying and enjoying nature, its wild plants and animals, and any cultural aspects of the area. It is different from mass tourism and luxury tourism since eco-tourists do not seek the comforts of city life when they go to a natural area. The essential attributes of ecotourism are:

- It has little impact of the visitors on the area visited.
- It provides not merely enjoyment, but educational experience on nature.
- It involves the local communities who provide the various services and add to income opportunities for them, which in turn sustains their motivation to conserve the natural values.
- The ecotourism will be educative enough for both tourist and local community that it will help for the protection and preservation of wildlife and other natural resources along coastal stretch.

- It will help to reduce conflict between man and wildlife.

The elements of ecotourism thus include:

- A natural environment as its prime attraction.
- The number of visitors consistent with carrying capacity of the area.
- Activities, which do not have any kind of adverse impact on the ecosystem.
- Ample opportunity for nature appreciation that is both educative and enjoyable.
- Gainful involvement of the local communities.

THE ORISSA SCENARIO

The potential for nature and wildlife based tourism in Orissa and particularly in the coastal tract is very high, since the State is endowed with rich mangrove forests, wilderness areas and rich diversity of wildlife. The demand for organized eco-tourism has been growing most notably in respect of Bhitarkanika, Chilika (Nalaban sanctuary). Community participation in managing eco-tourism activities is in very early stage of development in Orissa, but the potential of the above areas as sites of eco-tourism destination is quite high in the State.

Certain norms are to be observed in regulation of tourism in protected areas and potential wildlife habitats. The number of tourists and tourist vehicles to be allowed inside protected area is to be limited within the carrying capacity of the area. Tourism is not allowed in the core zone of the PAs. The other regulations are in regard to the type of vehicles to be used, the minimum distance to be kept between two vehicles or vessels plying on the same tract, the minimum distance to be maintained while spotting any wild animal, and proper training of guides. Eco-tourism should be fostered in the right perspective and there can be no comparison or trade off in wildlife interest.

There are existing Forest Rest Houses/ Forest Rest Sheds and tourist cottages and/ or barracks in the sanctuaries and National parks at various locations, some of which are important eco-tourism destinations. These could provide the nucleus of

present and future eco-tourist camps, and with necessary remodeling, renovation and refurbishing of this existing infrastructure a good deal of facilitation can be provided to the cause of ecotourism. There is also some eminently suitable tourism bases just outside the boundaries of the sanctuaries, where facilities can be further developed. People from Kolkata in large numbers usually pay visit to Puri and Konark. Opportunities exist for providing more fulfilling experience to sections of these visitors who may be serious nature lovers, if the right kind of facilities for such persons can be developed in our wildlife rich areas.

TASKS AT HAND:

For promoting an area as an ecotourism destination, the following are some of the major tasks at hand:

- **Accord priority to the interpretation of Nature and culture:**

Need for good local guides and good naturalists who know their subject and know how to put it across cannot be over emphasized.

- **Address quality, authenticity and security.**

Quality means attention to detail and understanding of visitor's need. Authenticity in regard to an area will mean meeting the visitor aspiration of seeing the tiger, crocodiles or the rare birds. Security connotes visitors' safety and reliability of the services offered.

- **Management has to be proactive.**

The design of the accommodation units, catering, opportunities for activities such as trekking and hill climbing, boating, fishing, bird watching, elephant ride, etc. enterprise and employment opportunities for local people, value retained in the local economy through use of local products, local dishes, and quality of visitor experience, environment impact, etc. are all relevant in the planning, design and management of the services being offered.

The challenge and the opportunity here is to attract the high-end tourists which alone could result in visible gains to the local economy, minimize environmental impact and increase support for conservation.

Development of eco-tourism would seek co-operation of people for protection of environment by creating awareness among masses and motivating them for the cause of protection of bio-diversity.

D. Project Area Description:

The project area is basically part of Coastal areas of Orissa extending from Dhamra to Pati Sonapur (border with Andhra Pradesh) which includes land mass and parts of territorial waters extending up to 12 nautical miles into the sea from the high tide line.

These areas fall within the jurisdiction of DFO, Mangrove Forest Division, Rajnagar, DFO Chilika (WL) Division and DFO Berhampur (Territorial) Division.

Dhamara - Paradeep Stretch to be implemented by Mangrove Forest Division (Wildlife) Rajnagar. The Gopalpur Chilika stretch of the project area to be implemented by Chilika Division (Wildlife) and Berhampur (T) Forest Division.

The entire area is very rich in bio-diversity. There are coastal shelterbelt of Casuarina, natural shelterbelt of mangroves, estuary of large number rivers like Mahanadi, Baitarani, Bramhani, Daya, Devi, Kadua, Rushikulya and Bahuda etc.

There are three important protected areas in the Project site namely Bhitarkanika, Gahirmatha and Chilika- Nalabana Sanctuaries.

The project site includes three mass nesting sites of Olive Ridley Turtles at Nasi, and Rushikulya river mouth forming largest rookery in the world including the coastal waters which are the mating and breeding ground of the species. The coastal waters also form the habitat for the marine mammals like whales, dolphins, porpoises, horse shoe crab, sea horses, coral reef, sea grass beds, etc.

The project site also include important tourist destination of State like Bhitarkanika Sanctuary, Chilika lagoon, Nalabana Sanctuary, etc.

The populations in the vicinity of these coasts are basically dependent on the forest and marine products for their livelihood.

E. Project Description & Scope:

Project Description:

- Eco tourism development.
- Resource generation and livelihood opportunity through ecotourism for biodiversity conservation.

Scope:

- Appreciation of rich natural coastal biodiversity for long term scientific management.
- Development of awareness among national and international community with more employment generation scope for local communities.
- Protection to endangered species and increase of population of marine life forms.
- Helping a sustainable and responsible fishing.
- Complete protection to designated marine protected area
- Maintaining ecological balance in coastal ecosystem.

F. Project Components and Component Description

Dhamara-Paradeep Stretch to be implemented by Mangrove Forest Division (Wildlife) Rajnagar. The Gopalpur Chilika stretch of the project area is being managed by Chilika Division (Wildlife) and Berhampur (T) Forest Division.

MAJOR ISSUE: LIVELIHOOD SECURITY: SUB ISSUE: ECOTOURISM

F.1 Component A:

Ecotourism accommodates and entertains visitors in a way that is minimally intrusive or destructive to the environment and sustains as well as supports the native cultures in the location it is operating. Ecotourism or tourism in areas known for forest, wildlife and wilderness can help the environment in many ways, especially by providing economic incentives to the local communities to protect the resources that have little other financial value.

Ecotourism is different from mass tourism and luxury tourism. Essentially, it is tourism for nature appreciation, and tourism with low visitor-impact on the area visited. Eco-tourists do not seek the comforts of the city life when they go to a sanctuary or a wilderness. What is more, ecotourism is sensitive to the environmental, cultural attributes of the area; and is tourism that provides benefits to local people instead of tour operators from far away places. It accommodates and entertains visitors in a way that does not degrade the qualities and amenities of nature and environment, and sustains the native culture of the people of the locality.

Protected Areas (PAs) are repositories of varied wildlife, biodiversity and gene pool; and are constituted as representative ecosystems. Wildlife (Protection) Act, 1972 as amended in 2002 has laid down four categories of PAs namely: (i) Sanctuary; (ii) National Park; (iii) Conservation Reserve; and (iv) Community Reserve. In Orissa at present there are 18 notified sanctuaries including a marine sanctuary. Of these, part of Bhitarkanika sanctuary has been constituted as a National Park and part of Similipal sanctuary is a proposed National Park. Satkosha George sanctuary is also a Tiger Reserve already recognized by the Govt. of India. The state of Orissa with its rich bounties of nature has immense potential to occupy a place of pride in the eco-tourism map of the country.

The Wildlife Sanctuaries and National Parks in Orissa as elsewhere in the country are under tremendous pressure for biomass drawl and other anthropogenic

activities with the gradual growth of the population in and around the PAs. The consumptive biomass based livelihood of poor villagers is to be replaced with the benign eco-tourism as a management intervention. Their traditional knowledge of plants, wild animals and animal behaviour has to be harnessed. Side by side, it is thought to build up a cadre of conservationists in the peripheral belt of the protected areas with initiation from the local people. Conceptually, this nature tour with well structured educational content is believed to create greater publicity and drawing public support for conservation of biodiversity in the sanctuaries, national parks and other potential wildlife habitats.

Eco-tourism seeks out authentic experience of Nature and wildlife through sustained camping, trekking, observation and exploration. Eco-tourists are not casual visitors, picnickers or plain amusement seekers. They are primarily serious Nature lovers who go to an area for exploration and appreciation of the flora, fauna and other values of Nature as well as for a learning experience.

In development of eco-tourism, the emphasis is on provision of quality service. While, from the point of view of the eco-tourist, luxuries and comforts are not important, the desirable services would comprise of the following:

- (a) Clean and hygienic accommodation.
- (b) Standard arrangement of food and water.
- (c) Services of Naturalists and Eco-guides; Interpretation centre including appropriate signages.
- (d) Efficient management of booking, reception, watchtowers, camp maintenance, boating, trekking expeditions, etc.

Eco-tourism will create income opportunities for members of the local communities who may become Cooks, Attendants, Water carriers, Guides, Caretakers, Receptionists, Animal trackers, Boatmen, etc. Local delicacies and handicrafts may be peddled to the campers. This will create the much-needed stake holding of the local

communities in conservation of forests, wildlife and the natural values. If eco-tourism thrives, conservation as an objective stands to gain a lot.

The law governing Protected Areas (PAs) prohibits construction of commercial tourist lodges, hotels, etc. inside a sanctuary/ national park. The National Wildlife Action Plan treats eco-tourism as a permissible activity in sanctuaries, provided it is regulated to remain within the physical and ecological carrying capacity of the area, and is confined to designated tourism zones, and not spread out into the core zones, sensitive wildlife habitats and corridors, natal areas of species like the tiger, and provided that it serves the overall objective of wildlife conservation.

This scheme seeks to create facilities for camping and trekking in Bhitarkanika sanctuary, Gahirmatha Marine sanctuary, Chilika (Nanabana) sanctuary and on the extensive sand-bar adjoining the Bay of Bengal. These places hold immense attraction for serious nature lovers.

The coast holds a lot of places of historical importance. In Mahanadi delta, the historical building 'Hukitola' of British era with unique architecture, constructed during 1860's as a Port of the British people has deteriorated over the years and needs immediate restoration. Provisions of drinking water facilities, jetty, VHF sets, and tourist boats, etc. are the immediate requirements to enhance the ecotourism activities.

Besides, eco-tourism at four other sites in Bhitarkanika as well as in Chilika can be taken up in many forms, ranging from watching the animals, birds and trees in the forest and marine life on the sea by boat. Tourist complex has been proposed at strategic points with provision of luxury house boats in big tidal rivers such as Bramhani and Dhamara rivers.

The present schemes comprises of the items of works as indicated in the tables, with tentative cost estimates indicated against each.

LINKAGES WITH THE SANCTUARY MANAGEMENT PLANS:

The project will be implemented covering three Protected Areas (PAs) namely Bhitarkanika Wildlife Sanctuary and National Park, Gahirmatha (Marine) Wildlife Sanctuary and Chilika Wildlife Sanctuary. The Management Plans of these Protected Areas are currently under preparation and due care is being given by the managers of the respective Protected Areas (PAs) as well as by the state Wildlife Organisation headquarters so that these Management Plans will encompass all the activities being proposed in the ecotourism component of the ICZM World Bank funded project. The National Wildlife Action Plan treats eco-tourism as a permissible activity in sanctuaries, provided that it is regulated to remain within the physical and ecological carrying capacity of the area, and is confined to designated tourism zones, and not spread out into the core zones, sensitive wildlife habitats and corridors, natal areas of species like the tiger, and provided that it serves the overall objective of the wildlife conservation.

Ecotourism has already emerged as an important component of the country. The significant growth in nature tourism bears adequate testimony to this. Though the term “eco-tourism” is popular, it is rather loosely used by many. Hence, it is imperative to distinguish this from the general mass tourism/casual tourism.

First of all it is necessary to understand, what is the difference between the Casual tourists and Eco-tourists? Basically casual tourists are those visitors, who come to an area for a short duration, i.e., for a day or two. The major aim of the casual visitors is to just pay a visit and understand what ever they see and perceive within few hours. These visitors do not pay much time to understand the essence of the area; neither they appreciate the serenity and beauty of the area. These visitors do not have any definite plan, programme or sensitivity of the environment. On the other hand, the Eco-tourists are those visitors who plan properly their objective of the visit to an area; they plan their time schedule, activities and their stay in the areas. They basically demand for a resource person, eco-guides, and literatures regarding the area to guide them properly during their visit and stay. Eco-tourists are very sensitive to the environment; and care much about the integrity of the environment. They come here to spend maximum time in

the nature and appreciate the serenity, beauty and every thing of the nature and contribute for the cause of the environment. They really exchange a very good culture of nature caring and also help much to enhance the economy of the local inhabitants. Eco-tourists also sponsor and fund for varying degrees for maintaining wilderness of specified areas. So, keeping the above in view, there is no free mass tourism or casual tourism in Protected Areas (PAs). Since eco-tourism is always guided by well defined rules and regulations, it is necessary to promote eco-tourism in such areas.

Eco-tourism is a travel to natural areas that conserves the environment and sustains the well being of local people. It is a part of general growth in tourism and reflects increased environmental awareness and the desire for more authentic natural and cultural experience. During 2000 Ecotourism in Protected Areas and in territorial forest divisions was recognized as one of the thrust areas of the Ministry of Environment and Forests of Government of India.

IMPLEMENTING ARRANGEMENTS – CONCEPTUAL FRAMEWORK OF ECOTOURISM:

At present with permission of Forest and Environment department of the Govt. of Orissa, Bhitarkanika Eco-Tourism and Eco-Development Society has been duly constituted under the Societies Registration Act (NO. XXI of 1860) since 14.8.2007 with its headquarters at Rajnagar in Kendrapara district. In due course, as per the above guiding principle which has already been initiated in some of the PAs of the state viz., Bhitarkanika and Satakosia, Similipal, etc., it is proposed to ground a separate eco-tourism society for each Protected Area in the State which would be a Special Purpose Vehicle (SPV) and a dedicated outfit to manage the eco-tourism enterprise in such Protected Areas. The society on principle would be headed by a senior Forest Officer who has jurisdiction over the Protected Area, and would have a few officials, conservationists, eco-tourists, local service providers, and eminent public persons of the locality as members. The Society would be authorized to take the receipts accruing from entry fees and other charges and to plough it back towards running the services and

maintenance of the facilities. The Society might engage Naturalists, Guides, Caterers and other management partners depending on the volume of business it is able to generate. Based on the above guiding principles separate Eco-Tourism and Eco-Development Society can also be duly constituted under the Societies Registration Act in areas outside PAs such as Rushikulya mouth so that local communities can share the benefits of various activities under the ecotourism component.

In view of the above it is clear that promotion of ecotourism is a mandate of the concerned ministry (MoEF) of the central Government and Forest and Environment Department of the State government based on a clear conceptual framework. Extensive work has also been initiated and continuing in some of the designated PAs of the state.

Wilderness of the PAs covered in this ICZM project attracts about 30,000 to 40,000 eco-tourists annually. Bengalis are predominant outsiders who visit the areas besides the usual Oriya visitors. Visitors prefer winter and early summer season. A rush is there in getting reservation in Forest Rest Houses during that period. NGOs and Ecotourism and Eco Development Societies are there to provide services to the visitors. But infrastructural facilities, interpretive services presently available with them or even with the concerned PA management are not sufficient. There are lot many thrust areas which need intensive attention.

Ecotourism has been considered here as a sustainable, equitable, community based endeavor for maintaining wilderness of the PAs, for protection and conservation of the biodiversity as well as their habitats and at the same time for improving the living standards of indigenous local communities living in and around the Protected Areas of the state. Apart from these stake holders; there is also a dire need to forge partnership with the strategic partners at each site (PAs).

Opportunities for children

The interpretation centers have been proposed which can cater to the need. Further in each site where there will be tourist complexes, for children, eco-parks are to be developed for awareness of the children visiting the sanctuary.

Attended Interpretation:

Information centre:

Two information/ interpretation centers will be created where one receptionist will be posted to provide necessary information to the visitors about important places, features, admission charges, facilities, etc.

Eco-guides:

The literate youths of villagers close to all entry points will act as Edo-guides. They will accompany the group of visitors either on vehicle or on Nature camp or in trekking and explain about significance of PAs or about the potential wildlife habitats and its elements. Payment to eco-guides will be made through the registered societies already formed or to be formed.

Audiovisual show:

Film shows on wildlife will be displayed on Amphitheater, which will be created. One LCD Projector with large screen will be purchased for display to larger group of visitors. Documentary film on specific themes of the PAs or about the potential wildlife habitats and its elements will be prepared by reputed Filmmakers / Video Photographers. CDs of the films will be sold to the visitors. Generator sets will be purchased for all the tourist complexes, Interpretation centers. Video film shows will be displayed in night where the visitors stay.

Non attended Interpretation

Sinages:

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Outside the Sanctuary:

Sinages of large hoardings say 8' x 4' or 10' x 8' will be erected at Bus stand, Railway station and N.H. road side of the concerned areas.

Inside the sanctuary:

On the sides of main PWD / Forest Roads within the sanctuary, sinages of 5'x3' or 4,x 3' size will be displayed narrating various features of the sanctuary and administrative instructions or traffic regulations and Relief map of the sanctuary.

At tourist sub-zones:

Administrative instructions, details of available facilities with direction, map of sub-zone will be displayed with sinages of 3' x 2, or 2 x 1'-6" size.

Publications:

Colourful, attractive and informative newsletter, leaflet, handbill, brochures will be printed and circulated to all the visitors, hotel owners, tourism offices of the concerned districts. These publications will be made available at Divisional office, Range Office and information/ interpretation centres. Every year there shall be a publication.

Nature trail

There shall be at least two nature trails in each tourism sub-zone. The length of a trail will be 1.5-2.0 kms. Sinages near the important features will make the trail lively. A parking space will be made at the entrance of the trail.

Conservation Plots:

In each tourism sub-zone there will be two conservation plots each of 3-5 ha. of area for in-situ conservation of Medicinal plants. The local Vaidya Community (group)

will identify such plots; identify the important Medicinal plants available there. The plot will be demarcated, fenced, labeled. Fire lines will be traced around the plot. All silvicultural operations like cleaning, tending, soil working will be undertaken for in-situ conservation. Plants will be labeled indicating their usefulness.

One Herbal Medicine Centre to be opened in the sub-zone will be managed by local Vaidyas, who will give herbal treatment to the visitors and explain on medicinal values of plants.

Improvement in Animal sighting:

It is one of the most important aspects to be looked into. Unless the chances of animal sighting are increased, the inflow of visitors cannot be increased. Better chances of animal sighting can be achieved by adopting the following procedures.

- (a) Development of visitor paths and view lines.
- (b) Development of transit sheds for eco-tourists to take rest
- (c) Creation of water holes, salt licks near road or visitor path.
- (d) Construction of watch towers near water holes / water reservoir at a safer distance.
- (e) Grass land development near tourist complex.
- (f) Development of Jetty near tourist complex, which are close to rivers.

Wild animals are rich in the identified tourist sub-zones. Forest road or extraction path or foot pat in each of such sub-zones can be repaired. 10 mtr on either side of the visitor road is to be cleared leaving poles and tree growth. The clearance of shrubs, weeds, herbs will improve sighting chances. Some view lines perpendicular to the visitor road are to be created at width of 20-30 mtr, where only under growth canopy needs to be removed. Fodder trees may be pollarded at 1.5 mtr height to attract browsers. The gap between 2 view lines will be 200-300 mtrs. The length of view line is to be maximum 200 mtr. Some artificial water holes and saltlicks can be provided along the roadside to

be used by wild animals. These are to be created in the tourism zone only so that the tourists can sight the wild animals

It is proposed to construct watch towers in every tourist complex zone. The watch towers should be made up of RCC, well protected and camouflaged. Grey cement colour can be put on them instead of bright colours. It is proposed to construct 4 such more watch towers in the tourism complex zones.

Herbivores like spotted deer, wild pig, peafowl use to come closer to human habitation to get rid of predators. It is seen in many parks that herbivores spend whole night near rest houses used by tourists. In the project areas meadows in small patches can be developed near Forest Rest Houses, tourist complexes and transit sheds wherever possible. These meadows can be developed by removing weeds and by planting slips of palatable grasses. After establishment of meadows, subsequently controlled burning may help in sprouting of grass shoots, which attract more herbivores. About 1 acre of such land depending upon land availability can be developed in each of the eco-tourism sub-zones.

Problems from tourists in the PAs:

At present there is no facility for sustained eco-tourism. Presently in some places what is being done may be treated as mass tourism consisting of picnickers, and night camping by officials and amusement seekers. Problems from tourism include:

1. Accumulation of plastic and polythene garbage, use of sound boxes and non-veg items.
2. Disturbance to wildlife by picnic parties.
3. Increase of illegal activities and violence during peak periods.
4. Lack of compatible attitude towards wild animals and forests.
5. Inadequate prior knowledge base and awareness level amongst most of the visitors as well as local people.

6. Unchecked tourism resulting in forest fires, poaching of wildlife, poisoning, killing, wildlife crime and degradation of forests in a rampant scale.

The Strategies:

The strategies have been made to overcome the above problems. There is a lot of opportunities to explore tourism in PAs with proper regulation. At present in some areas tourist complexes are developed to some extent and much preferred by tourists and picnickers. This needs to be properly guided and controlled. Therefore, it has been planned to take additional new areas and the existing areas shall be improved. Following two-point major strategies will be undertaken in order to promote ecotourism in and around the PAs and other potential wildlife habitats.

1. Identification of buffer zone suitable for creating eco-tourism infrastructure.
2. Rebuilding institutional capacity for running ecotourism enterprise preferably in a society mode.

Basic facilities:

Provision of basic facilities like food, drinking water, toilet, canteen, shade, sitting places is essential for the tourists. These basic needs can be supplied to the tourists through the volunteers of the NGOs, Ecotourism Society, local communities. Infrastructural supports are to be provided by the Park authority. All these facilities are to be extended in the identified eco-zones.

STRENGTHENING THE LIVELIHOOD ISSUES:

Eco-tourism will create income opportunities for members of the local communities who may become Cooks, Attendants, Water carriers, Guides, Caretakers, Receptionists, Animal trackers, Boatmen, etc. Local delicacies and handicrafts may be peddled to the campers. This will create the much-needed stake holding of the local communities in conservation of forests, wildlife and the natural values. If eco-tourism thrives and continues, **conservation as an objective stands to gain a lot in all the**

Protected Areas of the state as well as other biodiversity rich areas outside the PA network. Areas coming in the periphery of the PAs/ the buffer zones of the PAs shall also be immense benefited through development of such activities. The thrust of such Ecotourism Societies shall be strengthening the livelihood issues of the local communities.

In order to strengthen and development of policy guidelines as well as implementing mechanisms to achieve the perceived objectives, It is proposed that institutional strengthening and capacity building at all levels is required which shall be possible by visiting various areas to learn and adopt the success stories from across the globe particularly from the areas having a coastline and where some activities have been taken up and are currently being practiced relating to coastal biodiversity and communities are participating in promoting ecotourism. The lessons, which may be learned from modus operandi of all successful projects in various continents, can be incorporated in the implementing mechanism covering all phases of this pilot ICZM project funded by the World Bank.

G. PROJECT FINANCE AND FUND FLOW ARRANGEMENTS

The finance for the project will be from World Bank / Ministry of Environment & Forests, Govt. of India.

The fund will be allotted to the field forest divisions by the nodal officer in the office of Principal Chief Conservator of forests (Wildlife) and Chief Wildlife warden, Orissa, Bhubaneswar.

SECTION III
PROJECT IMPLEMENTATION ARRANGEMENT

A. Institutional Arrangement:

A.1 The Overall Institutional Model (and rationale)

There will be three implementing agencies namely DFO Mangrove Forest Division (Wildlife), DFO Chilika (Wildlife) Division and DFO Berhampur (Territorial) Forest Division.

Most of the action programmes will be executed through field functionaries of Forest department as well as credible agencies and Organisations operating in the field under the supervision of and guidance of the concerned wildlife wardens and the Chief Wildlife Warden, Orissa.

The work will be supervised by Conservator of Forests Bhubaneswar Circle and Conservator of Forests Berhampur Circle.

The work will be further monitored and supervised by Principal Chief Conservator of Forests (Wildlife), Orissa.

All the above authorities will be working under over all control of Government of Orissa Forest and Environment Department.

A.2 Implementing Agencies-roles & responsibilities:

Role of Implementing Agencies:

- (i) To receive the fund and to execute the work as per the approved scheme.

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- (ii) To render the accounts of expenditure, reports and returns to all concerned as per the arrangement made.
- (iii) He will facilitate proper inspection and monitoring by the authorities as and when required

A.3 Staffing Plan:

The state wild life organization headquarters located at Bhubaneswar is functioning with handful of staffs. The organization is over burden with various types of work therefore for overall supervision of the ICZM Project (both the components relating to biodiversity and ecotourism) one project coordinator will be recruited on contractual basis whose responsibility will be to coordinate the office work as well as the field work. There are lot of civil construction works in both components of biodiversity and ecotourism, to supervise the work one project engineer will be recruited on contractual basis.

One **Project Coordinator** will be appointed in the Project Management Unit (PMU) functioning in the office of the Principal CCF (Wildlife) and Chief Wildlife warden, Orissa on contractual basis for over all day to day management of the project, for reporting on all matters to the SPMU and also for coordinating with the field forest divisions.

One **Scientist-cum curator** will be appointed on contractual basis to supervise and management of the interpretation center at Rushikulya river mouth under Berhampur territorial Forest Division.

On the project implementation site 3 **project research fellow** will be recruited on contractual basis and shall be stationed at different locations for collection and interpretation of data for facilitating and improving the ecotourism activities.

There is a provision of 2 tourist boats in Gahirmatha marine sanctuary area, 4 luxury houseboats in Bhitarkanika wild life sanctuary area and 2 speed boats in Berhampur division which will operate in the sea, in sea turtle conservation areas. Each of these mechanized vessels (8) shall be manned by 1 navigator, 1 boat driver and 1 boat helper. In Chilika lagoon coming under Chilika wild life Division 7 mechnised boats

will be procured to be stationed at Satpada (2), Berhampura (2), Balugaon (2) and Rambha (1), which are the entry points to the Chilika lagoon. Each of these 7 mechanised boats shall be manned by boat driver 1, boat helper 1.

B. Financial Management arrangement:

B.1 Financial Management Framework:

It will be same as applicable in Orissa Forest Department.

B.2 Fund Flow and Disbursement arrangement:

The finance for the project will be from World Bank / Ministry of Environment & Forests, Govt. of India.

The fund will be allotted to the field forest divisions by the nodal officer in the office of Principal Chief Conservator of forests (Wildlife) and Chief Wildlife warden, Orissa, Bhubaneswar.

B.3 Accounting Policies and Procedures:

The implementing agencies will be rendering the Accounts of expenditure to Conservator of Forests and Principal Chief Conservator of Forests or as per the project guidelines.

B.4 Staffing and Capacity Building:

Capacity building of staff at all levels is required. Suggestions have been

B.5 Financial Reporting:

At the end of each month the implementing agencies will be submitting the monthly financial reports to higher authorities

B.6 Internal Control Mechanism:

The work of the Mangrove wildlife Division, Rajnagar and Chilika Wildlife Division, Balugaon will be supervised by Conservator of Forests Bhubaneswar

Circle and the work of Berhampur Territorial Forest Division by the Conservator of Forests Berhampur Circle.

The work will be further monitored and supervised by Principal Chief Conservator of Forests (Wildlife), Orissa.

All the above authorities will be working under the over all control of the Forest and Environment Department, Government of Orissa.

B.7 Audit Arrangements:

This will be audited by inspecting team from the office of the Conservator of Forests, Principal Chief Conservator of Forests, Government of Orissa and also by Accountant General Orissa.

B.8 Retroactive Financing

Retroactive financing practices not prevailing in the department.

B.9 User Cost Sharing Principles:

The tourist will bear the schedule cost of the tourist programme which will be the prime source of income for sustenance in subsequent post project period.

However, salary etc. of permanent staff will be borne by the implementing agency.

C. Procurement Arrangements:

C.1 Procurement Arrangements

For routine work it will be done as per the Policy of Government of Orissa.

However items like Sea worthy vessels, speed boat, etc. it is expected that donor organization will procure and supply to implementing agencies.

C.2 Procurement Methods:

As per government rules procurement will be made through quotation/ tender process as the case may be.

C.3 Procurement Thresholds:

As per the Scheme.

C.4 Overall Procurement Plan:

Following items are required to be procured during the implementation:

- (i) For Plantation Activity: Barbed wire for fencing in the nursery, soil, manures, fertilizers, pesticide, water cans, nursery tools, kerosene POL, etc.
- (ii) For purpose of protection, boats. Live jackets, POL etc.
- (iii) For purpose of Ecotourism: building materials, boats, kerosene/POL, Live jacket, etc.
- (iv) For entry point activities:

C.5 Procurement Manual:

As provided in Orissa Plantation Manual for Plantation and various Govt. circulars for purchase of store items.

C.6 Annual Procurement Plan:

As per the Scheme of the Project.

C.7 Procurement of Works:

C.8 Procurement at Community level:

It will be done for entry point activity as per the resolution passed by the community.

C.9 Key Procurement Guidelines:

Government of Orissa's Circulars.

D. Environmental and Social Safeguards

D.1 Current Regulatory Framework:

The regulatory mechanism is already in position like various environmental laws, Wildlife Protection Act and Rules made there under, Orissa Marine Fisheries Act and Rules made there under. To implement these laws, large no. of field functionary are available.

D.2 Baseline Environment Management Situation:

The environmental management is being ensured by the Director Environment, Government of Orissa; Chairman Pollution Control Board and District Collectors and Conservator of Forests and Divisional Forest Officers.

D.3 Environment Management Framework:

The Environmental management framework exists. There are field functionaries from Forest Department, District administration Pollution Control Board and Director Environment.

D.4 Environmental Monitoring Plan:

With the progress of Project, it will be monitored periodically. It will be done by updating check list of flora and fauna, ensuring quality of water, salinity, silt etc.

D.5 Institutional Arrangement for Environmental Management As described in foregoing para the Institutional arrangement exists.

D.6 Capacity Building:

Capacity building of all the staff is required to execute the project successfully. The Staff are required to be given exposure off all new trends being followed within and outside the country to provide successful solutions to issues relating to 'Integrated Coastal Zone Management'.

D.7 Budget

Budget of EIA and SIA

SECTION-IV PROGRAMME AND IMPLEMENTATION SCHEDULE

A. Overall Programme Phasing:

The programme will be carried out in five years:

B. First Year Implementation Plan:

Details as per provisions as spelt out in the cost of Project

Eco-tourism:

Creation of tourist complex at four sites in Bhitarkanika, besides renovation of Hukitola building, interpretation centers, publicity and awareness, purchase of boats for tourism, deepening of creeks at Chilika.

C. Second Year and Third Year Plan:

Maintenance of tourist complex, Hukitola building, interpretation centers, creating publicity and awareness, purchase of boats for tourism ,deepening of creeks at Chilika.

SECTION-V MONITORING AND EVALUATION

A. Objective:

Monitoring and evaluation are essential to ensure timely completion of the project with proper utilisation of resources and to ensure quality output.

B. Components of Monitoring:

Eco-tourism: Number of visitors visiting the project areas, frequency of their visit to different sites, review of camping facilities, etc.

C. Results Framework:

- (i) Activities under taken for development of eco-tourism.
- (ii) Formation of eco-development committees and their contribution.

D. Implementation Arrangements:

D.1 Arrangement for Results Monitoring:

- (i) Result will be monitored by the concerned DFOs, Conservator of Forests and Principal Chief Conservator of Forests(Wildlife) or his representatives as well as by Government of Orissa, and also by the nodal and donor agency.

D.2 Programme Management Reports:

It may be provided quarterly giving details of progress made in the project during preceding quarter.

D.3 Programme Operations Management Information System:

This facility will be provided in the office of concerned implementing agencies, Conservator of Forests concerned and in the office of the Principal Chief Conservator of Forests (Wildlife) and Chief Wildlife Warden, Orissa.

D.4 Data Collection Tools:

All the data collected will be stored in digital form. For this purpose digital still and video cameras, PCs and lap tops will be used in various offices.

SUCCESS INDICATORS FOR ALL THE PROJECTS AND FUND RELEASE PRINCIPLES:

(A) Success Indicators:

The Project envisages following activities:

- (i) Plantation of Mangrove and Casuarinas in degraded and blank patches:

The important success indicator is survival of plants. The Plantation manual of Govt. of Orissa have prescribed the minimum no. of plants to survive for claiming to be successful plantation.

- (ii) Bio-diversity conservation: This activity is basically for conservation of flora and fauna of the various ecosystem present in the area. It is difficult to assess the vast biodiversity and impact of conservation in their growth. But indirect way of success indicator would be to assess how effectively biotic interference has been checked. This can be judged by seizure of various resources like timber, firewood and other marine resources, number of cases booked and people arrested.

- (iii) Eco –tourism: Success of this activity will be judged from the number of tourists visiting the area. If their number is decreasing indicates poor success and if it is increasing means it is a success.

B) Fund Release Principle:

The executing agency in the field is the Divisional Forest Officer. He is also the DDO. Hence entire fund has to be placed with him in advance.

Annex V

Outline Table of Content for Detailed Project Reports for State Level Local Pilots

[Note that the scope and coverage of the detailed project reports will vary depending on the nature and complexity of the individual state level local pilots]

Executive Summary:

Reflects the concepts, phasing and costing as detailed in the sections below
Description of Project Area (support all with maps)

Eco-tourism is required to appreciate the nature and its environment as well as to generate funds for economic upliftment of the local people. The main objective of the project is livelihood security through ecotourism with the over all aim of conservation of Bio-diversity on and along the coast and coastal waters.

The coast and coastal waters of Orissa are important due to presence of a large number of coastal, marine and estuarine bio-diversity. To protect the vast coastal and marine biodiversity along with the interest of people living on and near the coast, protection and proper management of coastal areas are essential This is possible by addressing the issue of livelihood security through ecotourism with the over all aim of conservation of Bio-diversity on and along the coast and coastal waters. Effective protection of the hinterland from periodic cyclones, super cyclones and tsunami, etc. can be achieved by protecting the mangroves which will help in reduction of wind velocity as well as tidal surges.

The project area is basically part of Coastal areas of Orissa extending from Dhamara to Pati Sonapur (border with Andhra Pradesh) which includes land mass and parts of territorial waters extending up to 12 nautical miles into the sea from the high tide line. These areas fall within the jurisdiction of DFO, Mangrove Forest Division, Raj Nagar, DFO Puri (WL) Division, DFO Chilika (WL) Division and DFO Berhampur (Territorial) Division who will be the implementing agencies in the field for works relating to Wildlife organisation of Forest department, Govt. of Orissa.

The entire area is very rich in bio-diversity. There are coastal shelter belt of Casuarina, natural shelterbelt of mangroves, estuary of large number rivers like Mahanadi, Baitarani, Bramhani, Daya, Devi, Kadua, Rushikulya and Bahuda etc. There are three important protected areas in the Project site namely Bhitarkanika, Gahirmatha, Balukhand-Konark and Chilika- Nalabana Sanctuaries.

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The project site includes three mass nesting sites of Olive Ridley Turtles at Nasi, Devi and Rushikulya river mouth forming largest rookery in the world including the coastal waters which are the mating and breeding ground of the species. The coastal waters also form the habitat for the marine mammals like whales, dolphins, porpoises, horse shoe crab, sea horses, coral reef, sea grass beds, etc.

The project site also include important tourist destination of State like Bhitarkanika Sanctuary, Mahanadi delta, Gahirmatha marine sanctuary, Chilika lake, Nalabana Sanctuary, etc. The population in the vicinity of these coast are basically dependent on the forest and marine products for their livelihood.

The important species and eco-systems which need immediate attention are:

- (i) Protection to Olive Ridley sea turtle, Dolphins and Whales and other Marine life forms in the coastal waters and along the coast along with protection of avi - fauna of coastal wetlands.
- (ii) Preservation and propagation of mangroves and mangrove associates both banks of all tidal influenced rivers, creeks and mud flats through massive plantation and protection through community participation.

The process to achieve these objectives are:

- (i) Development of ecotourism at strategic locations in two identified sites.
- (ii) Ensuring people's participation in all conservation and developmental activities along the coast.

PART I- FEASIBILITY REPORT

A. Physical (Hydrological) features:

The terrain of the landscape bordering of the Bay of Bengal comprises sandy sea beach backed by wetlands with natural mangrove forest and interrupted by a network of tidal rivers, creeks and crick lets of the major river systems of the state of Orissa namely, Bramhani, Baitarani, Dhamara, Mahanadi, Rushikulya, Bahuda, etc.

The monsoon prevails from middle of June and continues till September with occasional rains during October. The tides are of semi-diurnal type

B. Economic features:

Economic valuation of mangrove species and other biodiversity forms including the ecosystem services have not been attempted. Appropriate studies will be conducted during this project period for economic evaluation of the above mentioned items.

C. Existing services status:

D. Planning aspects (give due justifications for all):

- Feasible Alternative Plans
- Broad economic analysis and financial impact-capital, O&M
- Social Screening outcome, R&R requirement, Need for land acquisition
- Environmental Screening outcome, likely environmental impacts, need for detailed environmental assessments
- Overview of institutional issues and capacity building required

C. Environmental & Social Assessments:

- **Environmental Assessments, Environmental Management Plans:**

For the purpose of conservation of bio-diversity and plantation etc. management plans for each of the protected areas existing within the project site are under preparation.

- **Social Assessments, R&R Plans, Land acquisition plans and schedules:**

R&R is not required in this project.

- **Details community consultations and agreements :**

During course of execution of works such as plantation and eco-tourism, etc., community consultation and their willingness will be taken into consideration

ANNEXURE –

ENVIRONMENTAL AND SOCIAL ASSESSMENT OF ICZM PROJECT**ENVIRONMENTAL AND SOCIAL ASSESSMENT CHECKLIST****LIVELIHOOD SECURITY: ECOTOURISM- SITE-I- BHITARKANIKA WILDLIFE
SANCTUARY****IMPLEMENTED****BY MANGROVE FOREST DIVISION (WILDLIFE), RAJNAGAR**

Features likely to be affected	Positive impact		Negative Impact		No Impact	Mitigation measures required or not
	Yes	Likely	Yes	Likely		
Forestry/Vegetation				√		
Birds						
Fisheries	√					
Other wildlife/animals	√					
Air quality					√	
Noise environment					√	
Water quality	√					
Water availability	√					
Soil quality					√	
Landuse and topography	√					
Drainage patterns	√					
Sedimentation/erosion				√		
Agriculture	√					
Food production	√					
Climate					√	
Groundwater table	√					
Industrialization					√	
Housing (involuntary	√					

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resettlement)						
Employment/training	√					
Income and livelihood	√					
Other socio-economic activities	√					
Health and safety	√					
Communications	√					
Historical/cultural monuments					√	
Scenic views and vistas	√					
Tourism	√				√	

√ in appropriate column

MONITORING MECHANISM

1. Maintenance of journals (monthly)
2. Photo documentation
3. Regular inventory both internal and external

The above mechanism will be executed by concerned staff of the executive Department. This will be governed by Orissa Forest Department code.

ANNEXURE –

ENVIRONMENTAL AND SOCIAL ASSESSMENT OF ICZM PROJECT**ENVIRONMENTAL AND SOCIAL ASSESSMENT CHECKLIST****ECOTOURISM: SITE-II- GAHIRMATHA (MARINE)****WILDLIFE SANCTUARY****IMPLEMENTED****BY MANGROVE FOREST DIVISION (WILDLIFE), RAJNAGAR**

Features likely to be affected	Positive impact		Negative Impact		No Impact	Mitigation measures required or not
	Yes	Likely	Yes	Likely		
Forestry/Vegetation	-	-	-	-	√	
Birds	-	-	-	-	√	
Fisheries	-	-	-	-	√	
Other wildlife/animals	-	-	-	-	√	
Air quality	-	-	-	-	√	
Noise environment	-	-	-	-	√	Restricted area may create some impact
Water quality					√	
Water availability	√					Rain water harvesting structure shall be created
Soil quality					√	
Landuse and topography					√	
Drainage patterns					√	
Sedimentation/erosion					√	
Agriculture					√	
Food production					√	

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Climate					√	
Groundwater table					√	
Industrialization					√	
Housing (involuntary resettlement)					√	
Employment/training	√					
Income and livelihood	√					
Other socio-economic activities	√					
Health and safety	√					
Communications	√					
Historical/cultural monuments						
Scenic views and vistas	√					
Tourism	√					

√ in appropriate column

MONITORING MECHANISM

1. Maintenance of journals (monthly)
2. Photo documentation
3. Regular inventory both internal and external

The above mechanism will be executed by concerned staff of the executive Department. This will be governed by Orissa Forest Department code.

ANNEXURE –

ENVIRONMENTAL AND SOCIAL ASSESSMENT OF ICZM PROJECT**ENVIRONMENTAL AND SOCIAL ASSESSMENT CHECKLIST
LIVELIHOOD SECURITY: ECOTOURISM- SITE-III- CHILIKA COAST
IMPLEMENTED****BY CHILIKA WILDLIFE DIVISION**

Features likely to be affected	Positive impact		Negative Impact		No Impact	Mitigation measures required or not
	Yes	Likely	Yes	Likely		
Forestry/Vegetation				√		
Birds						
Fisheries	√					
Other wildlife/animals	√					
Air quality					√	
Noise environment					√	
Water quality	√					
Water availability	√					
Soil quality					√	
Land use and topography	√					
Drainage patterns	√					
Sedimentation/erosion				√		
Agriculture	√					
Food production	√					
Climate					√	
Groundwater table	√					
Industrialization					√	
Housing (involuntary resettlement)	√					
Employment/training	√					

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Income and livelihood	√					
Other socio-economic activities	√					
Health and safety	√					
Communications	√					
Historical/cultural monuments					√	
Scenic views and vistas	√					
Tourism	√					

√ in appropriate column

MONITORING MECHANISM

1. Maintenance of journals (monthly)
2. Photo documentation
3. Regular inventory both internal and external

The above mechanism will be executed by concerned staff of the executive Department. This will be governed by Orissa Forest Department code.

ANNEXURE –

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ENVIRONMENTAL AND SOCIAL ASSESSMENT OF ICZM PROJECT

**ENVIRONMENTAL AND SOCIAL ASSESSMENT CHECKLIST
LIVELIHOOD SECURITY: ECOTOURISM- SITE-IV- CHILIKA – GOPALPUR COAST
IMPLEMENTED**

BY BERHAMPUR (T) DIVISION

Features likely to be affected	Positive impact		Negative Impact		No Impact	Mitigation measures required or not
	Yes	Likely	Yes	Likely		
Forestry/Vegetation				√		
Birds						
Fisheries	√					
Other wildlife/animals	√					
Air quality					√	
Noise environment					√	
Water quality	√					
Water availability	√					
Soil quality					√	
Landuse and topography	√					
Drainage patterns	√					
Sedimentation/erosion				√		
Agriculture	√					
Food production	√					
Climate					√	
Groundwater table	√					
Industrialization					√	
Housing (involuntary resettlement)	√					
Employment/training	√					
Income and livelihood	√					

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Other socio-economic activities	√					
Health and safety	√					
Communications	√					
Historical/cultural monuments					√	
Scenic views and vistas	√					
Tourism	√					

√ in appropriate column

MONITORING MECHANISM

1. Maintenance of journals (monthly)
2. Photo documentation
3. Regular inventory both internal and external

The above mechanism will be executed by concerned staff of the executive Department. This will be governed by Orissa Forest Department code.

E. Implementation Arrangements and Schedules:

- **Proposed Implementation Management Process (responsibilities in ULB, need for establishing additional capacities/ systems).**

Most of the field work will be executed by the existing field staff. However, a number of people are required to assist the field staff and also for data management in the field offices and in headquarters of the wildlife organisation. These additional staff will be hired on contractual basis.

- **Quality control procedures, third party checking requirements, need for hiring consultants.**
- **Procurement and implementation plans**

F. Operation & Management Planning:

- **Operational plans for assets designed (how the system operates), Maintenance requirement and estimates of O&M costs.**
- **Plans for Operation and Management (O&M):**
- **Equipments, Tools and Plants, logistics required for O&M:**

Equipments such as DGPS (1), GPS (6), Night viewing binoculars (6), Binoculars with distance measurement facility (6), Eco-sounder (1), radar (1), VHF Main sets (6), VHF hand sets (12) with electric and solar chargers, life jackets (20), life buoys (20), etc. have been proposed to be procured for proper implementation of the project.

- **Skills to be built up, manpower to be hired, outsourcing contractors to be hired, systems to be established (MIS, accounting, asset management, etc.)**
- **Cost of O&M, revenue recovery plans, proposed tariffs, subsidy levels.**

G. Service level monitoring:

Organisation Structure of State Wildlife Organisation Hdqrs & Field Setup



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Key:

ACF: Assistant Conservator of Forests; BKanika: Bhitarkanika; CF: Conservator of Forests; DCF: Deputy Conservator of Forests; DFO: Divisional Forest Officer; NK: Nandankanan; NP: National Park; PCCF: Principal Chief Conservator of Forests; Sanc.: Sanctuary; SO: Section Officer; SRO: Senior Research Officer; STR: Similipal Tiger Reserve; WL: Wildlife; WLCO: Wildlife Conservation Officer

Joint Forest Management Resolution 2008**Annexure**

Government of Orissa
Forest & Environment Department

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RESOLUTION
No.IF-Affin.17/2008-17454/F&E
Dated, Bhubaneswar the 22nd October, 2008

Sub: Joint Forest Management Resolution, 2008.

1. Introduction

Forests are one of the complex ecosystems. The role of forest in conservation of environment and economic prosperity of mankind is well established. Economic growth and environment protection are inextricably linked. For surviving on the earth we ought to live in harmony with Nature. Conservation of environment and protection of forest and wildlife have already been enshrined in our Constitution. Orissa has 58136 sq.kms of forest area 31.07% of its geographical area is under forest cover Forests play a very significant role in the socio-economic and cultural life of the people of the state. However, over the past few decades, the forests of Orissa are under heavy biotic pressure. The rich biodiversity of the State is at risk. Man-animal conflict is on the rise. Hence, presentation and development of the rich sylvan heritage of the State is a priority of the State Government.

The National Forest Policy, 1988 envisages cooperation of the people in conservation and development of forest. The Government of Orissa have already adopted the policy of Joint Forest Management (JFM) and sought community participation for protection, regeneration and management of the forest wealth. Joint Forest Management is not only a tool for forest regeneration but also a means of employment generation and social empowerment of the forest-fringe dwellers.

The State Government enacted the Orissa Village Forest Rules, 1985 which prescribed for a Management Plan for every village forest and sought cooperation of the community in protection of these forests. In 1988, the State Government had passed a resolution of formally introduce a scheme of protection of peripheral Reserve Forest areas with participation of the adjoining villagers by forming a Village Level Forest Protection Committee. The scope of this resolution was enlarged in 1990 to include t he Protected Forests. To make the forest people interface more effective and transparent, the Government of Orissa in Forest & Environment Department issued a resolution dated 3.7.1993. This resolution dealt in a fairly exhaustive manner the involvement all local communities in protection of adjoining forests, formation of Van Sarankhyana Samiti (V.S.S), duties and responsibilities of the V.S.S and their Executive Committees and the role of Forest Department and Gram Panchayats, preparation of Joint Forest Management plan, usufructory benefits for the V.S.S and provisions of MOU and *related issues*. Subsequently another Government resolution dated 30.09.1996 tried to confer specific rights in favour of the Village Committees in respect of various *products*.

However, these Resolutions in the past did not cover the National Parks and Sanctuaries. The Mangrove Wetlands and the Protected Areas (PA) of the State though need the participatory mode of management, require a different approach. In past all attempts to protect the PA from human interventions by coercion has resulted in hostile attitude of the people towards wildlife and forest staff. It has been realized that people living near the PA, while deriving little benefit from conservation, have paid enormous costs in terms of lost access to their life support systems. Further, there is restriction on harvesting of forest produce in the National Parks and Sanctuaries as per the orders of Hon'ble *Supreme Court*. It has therefore become essential to have a site specific, culturally sensitive and participatory approach, which would ultimately provide economic incentives to increase the net local benefit from conservation and sustainable resource use. Eco-development is a strategy for securing support of the local communities and other stakeholders for the protected area management. The activities to be taken up under eco-development should have a strong Conservation-Development (C-D) linkage and may include Ecotourism and *Off-farm* activities as well as providing specific alternatives to local biomass dependencies on the PA.

The biodiversity rich Mangroves on the long coastal tract of Orissa are of immense value which provides ecological, livelihood and food security. Sustainable management of these vital and

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Life sustaining resources involving all the stake holders by introduction of site specific participatory management practices is essential. Mangrove forests are fragile inter tidal ecosystem with characteristic salt tolerant vegetation. Sharing of forest produce with the participant user communities is an important ingredient of JFM. But the slow growing mangroves offer a very limited scope of providing wood and NTFP that may serve as an incentive for ensuring participation of people. Hence eco-development approach is essential which will focus on development of alternate resources and alternate livelihood security options.

Joint Forest Management is an evolving concept encompassing socio-cultural and economic dimensions. With the changing scenario of Forest Management, increasing awareness among people and experiences gained from the past management practices, it is now felt necessary that the State Government resolution on Joint Forest Management needs revision to make it more effective.

2. Selection of Area

- (i) The forests of the State shall be grouped into the following two categories:
 - (a) **Forest Area** (Reserve Forest, Protected forests, Village forest and Revenue forests)
 - (b) Protected Area (National Park and Sanctuaries) excluding Core are and Mangrove Wetland.
- (ii) Only such forest area shall be brought under the Joint Forest Management (JFM) where villagers of the adjacent villages or cluster of villages are willing and / or can be motivated to offer active cooperation, in management, protection and regeneration of the forests.
- (iii) For the first category, **villages located adjacent to such forest boundary** should be considered as far as possible. For the second category, the villages located within the National Park/Sanctuaries as well as adjacent to the same will be involved in protection and management of the wildlife and habitat.
- (iv) The Reserve Forest and Protected forests, village forests and Revenue forests having crown density of less than 40% will be treated as degraded forest land and brought under JFM.
- v. ***A committee consisting of the DFO, ACF, and concerned RO and Forester, here in after referred to as Divisional Level Committee (DLC) will decide the extent of area that may be assigned to any Joint Forest Management Committee (JFMC). While deciding the extent of area to be assigned, the committee shall take in to account the extent and density of forest area available at the site, the number of adjacent villages decide to constitute one JFMC jointly, then a large area can be assigned according to their capacity to protect.***

3. Constitution of Joint Forest Management Committee

- (i) Ordinarily there will be one Joint Forest Management Committee (JFMC) for a single village or a group of villages. ***However, depending upon the population and number of hamlets / Sahi and community composition more than one JFMC can be constituted in a village to have harmonious coexistence.*** The Committee constituted for the first category of forest will be known as ***Van Samrakshyana Samiti (VSS)*** while the Committee constituted for the second category will be known as ***Eco-Development Committee (EDC)***.
- (ii) a. Any forest officer not below the rank of a ***Forester*** shall request the ***Gram Panchayat (GP)*** to convene a meeting of all the adult members of all households residing in the hamlet/village/cluster of villages located ***as specified in Para I (ii) above.***
- b. The concept of Joint Forest Management including all rights and responsibilities of JFMC members and the Forest Department will be explained in this meeting.

- c. If a minimum of 60% of the adult members of the *hamlet/village/cluster of villages* agree to constitute a JFMC then a resolution to this effect shall be passed and adopted in the meeting in the prescribed format (Form-I).
- d. The Forester / Forest Ranger will send the resolution of the *meeting* along with his recommendation in Form-2 to the DFO for his consideration and constitution of the *JFMC*.
- e. *The proposal shall be discussed in the meeting of DLC. After evaluating the motivation level of the villagers and taking in to account other relevant factors the committee may recommend the constitute of JFMC along with extent of forest area to be assigned. The proceedings of the meeting shall be recorded, signed by all participants and made available in the concerned file. There after the DFO shall issue an office order constituting the JFMC mentioning therein a registration number and the extent of area to be assigned.*
- (iii) All adults of the *hamlet /villages(s)* are eligible to become members of the *JFMC on payment of enrolment fee of Rs.1/- per person. The JFMC shall be considered functional if at least 60% adults enroll themselves as members.*
- (iv) The concerned Forester *or VFW as may be assigned by the Divisional Forest Officer* shall be the ex-officio Secretary of the *JFMC*. The elected Chairperson and Vice-Chairperson of the Executive Committee will also be the Chairperson, and Vice-Chairperson of the *JFMC*.

4. Constitution of the Executive Committee (EC)

- (i) On receipt of DFOs *office order in regard to constitution of JFMC, the Member Secretary* will contact the Sarpanch/*Ward Member(s) and other important persons of the hamlet/villages(s)* for calling a General Body (GB) meeting of the Gram Sabha to elect the EC.
- (ii) The *GB shall elect* the Chairperson, the Vice-Chairperson and the Treasurer and another 8 (eight) members (Total-11 members) (representatives) to constitute Executive Committee. Of this at least 5 shall be women members. The number of SC & ST members in the Executive Body shall be in proportion to their membership in *JFMC*.
- (iii) Either the Chairperson or Vice-Chairperson shall be a woman.
- (iv) The composition of the EC shall be as follows:

1.	Chairperson	1	Elected Member
2.	vice-Chairperson	1	Elected Member
3.	Treasurer	1	Elected Member
4.	Ward Member (s)		x-officio Member (s)
5.	Members	7	Elected Member
6.	Forester / VFW (Member Secretary)		Ex-officio Member
7.	Concerned Forest Guard		Ex-officio Member
8.	Village opinion leader	1	Elected member
- (v) The Range Officer concerned will act as the Returning Officer for conducting the election of the EC. *It shall be the responsibility of the Returning Officer to ensure that the representation in the EC is strictly in accordance with reservation specified in para-ii above.*
- (vi) The EC will have tenure of 3 years at a time.

5. Meeting

- (i) General Body (GB)

- (a) The GB meeting of the JFMC shall be held at least once in every six months. It can also be called as and when required.
 - (b) The Chairperson with an advance notice of one week will convene the GB.
 - (c) The Chairperson or Vice-Chairperson, if former is absent, shall preside over all the meetings of JFMC (GB).
 - (d) 50% of the members of the JFMC will constitute the quorum for the GB, out of which at least 40% should be women,
 - (e) Under special circumstances, special meeting of the JFMC can be convened provided at least one third of the members agree to convene such a meeting and make such a request to the Chairperson in writing. Where the Chairperson does not convene the meeting, the concerned Member Secretary shall convene the GB meeting with the approval of the Range Officer. In all such cases, a 3 days notice indicating the purpose of the said meeting shall be circulated to all the members of the JFMC.
 - (f) The proceedings of the meeting shall be recorded in a register in Oriya language and shall be maintained by the Member Secretary. All decisions taken in such meetings shall be recorded in shape of resolution which shall be duly signed by the Chairperson, Vice-Chairperson and the Member Secretary. A copy of the resolution will be forwarded to the Range Officer as well as to the DFO.
 - (g) The next Executive Committee shall be elected by GB at least one month before the tenure of the current EC expires. It shall be binding on the part of the Chairperson to convene this meeting.
- (ii) Executive Committee (EC)
- (a) The Member Secretary with the consent of the Chairperson shall call the meeting of the EC at least once in 2 months.
 - (b) The meeting will be presided over by the Chairperson or by the Vice-Chairperson, if former is absent.
 - (c) The quorum for any meeting of the EC shall be 50% of its membership, out of which at least 2 shall be women.
 - (d) The Member Secretary or in his absence the Treasurer / Forest Guard shall record the proceedings of the meeting in Oriya in a register to be duly signed by all the participating members. A copy of the proceedings will be forwarded to the Range Officer as well as to the DFO.

6. Duties and responsibilities of JFMC.

- (i) The members of the JFMC shall individually and collectively ensure protection of the forests against fire, grazing, illicit felling, theft of forest produce, poaching of wildlife and encroachment of the forest land. They should also ensure protection of Wildlife staying outside their assigned forests.
- (ii) The JFMC may adopt its own patrolling system and regulate entry to the forest by the people and domestic cattle.
- (iii) It shall be the duty of all members of the JFMC to prevent forest and wildlife offence and pass on relevant information and intelligence in this regard to the forest officials.

- (iv) The members of the JFMC shall actively help the forest officials in apprehending any person committing forest offence and in giving proper evidence against any such person in the court of law.
- (v) The JFMC members shall help the forest department officials in protection and maintenance of the forest boundary pillars.
- (vi) The JFMC shall prepare the micro plan and annual work plan for integrated development of the village(s) and for the conservation, development and sustainable management of the assigned forests and its wildlife. Summary of the micro-plan should be available in Oriya.
- (vii) The members of the JFMC shall try to ensure gradual reduction in the dependence of the villagers on forests for their sustenance.
- (viii) The JFMC shall have the powers to remove and / or substitute any elected (non-official) member of the EC by a simple majority of the members present and voting if the concerned member does not discharge his/her duties satisfactorily. The members of the JFMC shall also have the power to remove and replace the Chairperson of the JFMC by simple majority of members of the JFMC present and voting if the concerned Chairperson does not discharge his or her duties properly. In such cases a GB meeting will be convened as per procedure laid down in para 5(i)(e). The concerned Range Officer shall act as Returning Officer on all such occasions.
- (ix) In case of a forest diversion proposal under Forest Conservation Act, 1980 covering a portion of the forest assigned to a JFMC the Range Officer shall inform the EC in writing and ask for its opinion. The EC should discuss all aspects of the proposal in a special GB of the JFMC and forward its opinion on the said proposal to the concerned Range Officer who in turn would send the same to the DFO. The concerned DFO while forwarding the proposal onwards shall attach the comments of the VSS with it consideration of the State Government / Govt. of India.

7. Duties and responsibilities of the Executive Committee (EC)

- (i) The EC shall carry out the day-to-day business of the JFMC as per provisions of the Resolution. It shall be responsible for managing and implementing Micro-Plan and annual plan and other decisions of the JFMC.
- (ii) The EC shall be responsible for protection of the forests assigned to the JFMC and for apprehending the offenders. If the members of the VSS/EDC play a significant role in detection of forest offence and seizure of the forest produce within their village limits, they will be entitled for a fixed percentage of the value of the forest produce (except in case of WL Tophies) so seized as per procedure laid down in para-11 (iii) and (iv).
- (iii) The EC in consultation with the GB shall evolve methodology on all issues relating to membership, conflict resolution, encroachment, customary rights and benefit sharing.
- (iii) The EC of the VSS shall execute / carry out various silvi-cultural operations, intermediate and final felling as and when so advised by the Range Officer in accordance with the provisions of the management plan/micro plan.
- (v) The EC shall be responsible to account for and manage the funds and other resources received from the Government, other agencies and funds internally generated, if any. For this purpose a joint account called VSS account /EDC account shall be opened in any commercial, rural or co-operative Bank recognized by the RBI or in any post office, which shall be operated, jointly by the Chairperson and the Member Secretary of the JFMC. Utilization Certificate relating to the expenditure incurred shall also be jointly signed by the Chairperson and the Member-Secretary and submitted to the concerned authorities whenever required.

- (vi) The EC shall be responsible for managing funds received by JFMC by maintaining and operating VSS /EDC account as per the procedure detailed in Annexure-A.
- (vii) The EC shall establish marketing linkage to various NTFP items and other micro-enterprise products for securing better returns to the beneficiaries.

8. Role of the Forest Department.

- (i) To assign and demarcate the forest area in favour of VSS/EDC.
- (ii) To register the JFMC and maintain close liaison with them.
- (iii) To ensure that the activities of the JFMC are in accordance with the JFM resolution and all other Act and Rules of the State Government and Government of India in force.
- (iv) To take subsequent legal action as per rule in cases where JFMC members have handed over the offenders and forest produce involved in offence.
- (v) To ensure capacity building of VSS members on different aspects of forest management, planning, silvi-culture, nursery technology, forest laws accounting and book keeping etc. in a transparent manner.
- (vi) To provide technical help to the JFMC member in preparation and implementation of the Micro-plan /annual work programme and approval of the same.
- (vii) To sign Memorandum of Understanding with the JFMC and ensure sharing of benefit amongst all members in case of VSS only.
- (viii) To motivate villagers to become active partner in the JFM programme of the State and organize village level meetings for this purpose.
- (ix) To conduct election of office bearers and ensure appropriate participation of the weaker sections including women in all benefit sharing and decision making process of the JFMC.
- (x) To establish coordination with other department/agencies for successful implementation of micro plan and related area development programme.
- (xi) To guide the EC in discharge of their duties and resolving disputes.

9. Dissolution, reconstitution and suppression of JFMC.

- (i) Based on the report of the Range Officer or otherwise the DFO may dissolve, reconstitute or supersede any JFMC within his jurisdiction if in his opinion the activities of the VSS is detrimental to forest protection and management. He may then order for restoration of management of the assigned forest with the forest department. The appeal against such order shall lie with the Conservator of Forests whose decision shall be final.
- (ii) If the work of the EC of any VSS is found to be against the principals of regeneration and proper management of forest, the DFO may dissolve and reconstitute the EC after due enquiry and recording his finding to this effect. The appeal against such order shall lie with the Conservator of Forests whose decision shall be final.
- (iii) On receipt of a report from the concerned Range Officer regarding irregularities by any member(s) of the EC or member(s) of the subcommittee appointed by the EC, the DFO may divest the said member(s) of their powers temporarily pending finalization of enquiry to this effect.

10. Joint Forest Management Plan (Micro Plan)

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- (i) After constitution of the EC, as soon as possible, a micro-plan shall be prepared by the members of the committee through a participatory process involving VSS Members and with the field officers of the Forest Department.
- (ii) The Micro-plan shall be drafted in a prescribed format in Oriya language for the integrated development of the village/villagers constituting the JFMC as well as for conservation, sustainable management of the assigned forests based on local circumstances, priorities and assessed annual returns, with participation and involvement of line departments.
- (iii) The Micro Plan shall prescribe various, soil and moisture conservation measures, silvi-cultural operations, afforestation measures and steps to be taken for livelihood support of the forest dependent communities. It shall also incorporate formation of SHGs and micro-enterprise that may be feasibly undertaken based on locally available resources by them. In case of EDC, the Eco-development Plan may include activities such as: ecotourism, farm forestry, agro forestry, silvi-pasture development, promotion of fuel-efficient device, veterinary care to the village cattle population, development of pisci-culture, poultry etc. mushroom cultivation, tassar cultivation, micro-credit facility and mobile health care facility, etc.
- (iv) The micro plan shall indicate the choice of species in different plantation models subject to forest laws in vogue. It shall contain a detailed regeneration and harvesting plan, which shall be consistent with the overall prescription of the working plan covering the area or the Wildlife Management Plan of the Protected area.
- (v) The micro plan shall also detail out the various NTFP items that can be collected. This shall be done with due regard to the carrying capacity, productivity and biodiversity of the local ecosystem.
- (vi) The draft Micro-plan prepared by the EC shall be agreed upon the GB after deliberation.
- (vii) the draft Micro-plan as approved by the VSS and signed by the Chairperson shall be submitted by the Member Secretary to the Range Officer concerned who shall examine the micro-plan from technical, social, financial and legal angle. The RO may refer back to the EC any suggested modifications for consideration and necessary amendment of the draft micro-plan. The EC will discuss the suggested changes, incorporate the same in the draft Micro-plan and resubmit the same to the RO.
- (viii) After evaluating the Micro-plan on technical, legal, social and financial considerations, the RO shall accord his approval on the Micro-plan. A copy of the approved Micro-plan shall be kept for reference and record in each of the offices of the DFO, Range Officer, VSS and Member-Secretary.
- (ix) For implementation of the approved Micro-plan, an annual work plan (April-March) with estimates of cost and returns shall be prepared by the EC. The annual work plan for the coming financial year shall be submitted latest by the end of December each year by the Member Secretary to the Range Officer. The annual work plan will be approved by the competent authority depending upon its financial outlay.
- (x) The finance required for implementation of micro plan/annual work plan may be borne by the State Government through the Forest Department or may be received from Government of India or may be incurred from VSS account. Contributions from other Departments of the Government, DRDA, ITDA can also be accepted for this purpose. However, contributions from National/International donor agencies can be accepted with approval of Government.
- (xi) Micro-plan shall normally be for a period of 10 years with provision of mid-term reviews.

11. Usufruct benefits for the VSS

- (i) The VSS shall be entitled to the un-sufructuary benefits from the assigned forests as under.

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- (a) Unsufructs like fallen leaves, fodder grasses, thatch grass, broom grass, thorny fencing materials, brushwood, fallen tops and twigs to be used as fuel shall be available to the members free of cost.
- (b) All intermediate yield in the shape of small wood, poles, firewood etc as may be obtained as a result of silvi-culture operations shall be made available to the VSS members in a manner as may be decided by EC may sell the surplus material under intimation to the DFO concerned.
- (c) In case of Kendu leaves and specified fore produce, leased items of NTFP, if any, the VSS members will have the right to collect the same from the assigned forest but these items shall have to be delivered to the departmental agencies or lessee on payment of prescribed rates for the collection of such items.
- (d) In case of a major harvest or final felling in the assigned forest, the same shall be taken up by the forest department strictly as per the prescription of the working plan/duly approved micro-plan. In case of natural calamities, harvesting of wind-fallen trees shall be treated as final harvest. The produce so obtained shall be sold/disposed off by the forest department or by agents of the forest department. The VSS will be entitled to 50% share of the sale price after deduction of proportionate harvesting cost and this will be deposited in their "VSS account". Provided that the VSS may also opt for 50% of the forest produce so harvested if it is for their bonafide domestic use and they agree to pay the proportionate cost of harvesting. In respect of the village woodlots raised under the SIDA Social Forestry Project on land notified as Village Forest and brought under JFM, the VSS shall be entitled to 100% of the unsufructs in the final harvest of the plantation while they will entitled for 50% of the share as usual during subsequent rotations.
- (ii) The EC shall be responsible for the distribution of the usufructuary benefits equally or equitably among the members of the VSS as may be decided by it.
- (iii) In cases where member/ a group of members of the JFMC play a major role in the collection of intelligence, detection and seizure of illegal forest produce in transit the concerned JFMC shall be entitled to the prescribed percentage of the sale price of the forest produce as per Rule 4(3) of the Orissa Rewards for Detection of Forest Offences Rules, 2004. Such amount shall be deposited by the DFO to the "VSS account/EDC account" after disposal of the seized produce following due procedure of law.
- (iv) Collection of money by any member or members of the VSS in relation to forest produce except as pre provision of para-II (iii) as mentioned above will be illegal and would be dealt as per law.

12. Transit of harvested forest product

All forest produce requiring permits for transit as per provisions of Orissa Timber and Other Produce Transit Rules, 1980 shall be removed from the assigned forest area in accordance with a permit to be issued jointly by any authorized member of the EC and the Member Secretary of the area in the prescribed format (Form-4). The permit shall be valid only within the limits of the area to which the VSS members belong and no second permit shall be issued in lieu thereof.

13. Conflict Resolution:

In case of intra village conflict in matters of implementation of Joint Forest Management, the Executive Committee of the VSS/EDC shall endeavor to amicably resolve the conflict. If it is felt to resolve the conflict, it shall bring the same to the notice of the Forest Range Officer with its recommendation of action to be taken. In case of inter village conflict, the same would be referred to the Panchayat Samiti for resolving the conflict. In case of a dispute

amongst the villages of different Panchayats, the same should be referred to the Divisional Level Steering Committee and their decisions would be final.

14. Memorandum of Understanding (MOU)

- (i) To ensure smooth working relationship between the Forest Department and the JFM committees and also to bring in a sense of ownership, empowerment and accountability a MoU shall be signed between the FD and JFMC.
- (ii) The VSS/EDC through its EC shall execute a MoU with the Forest department for active participation in the task of protection, regeneration and management of the assigned forest area and for implementation of the programme as per the Joint management Plan (Micro-Plan).
- (iii) The Chairperson of the VSS will sign the MoU on behalf of the VSS while the Range Officer concerned will sign the same on behalf of forest department. Other members at the EC will also be signatory to the MoU as witness while the concerned local forest officials such as: the Forester/VFW and Forest Guard will also sign MoU as witness.
- (iv) The MoU shall be in the prescribed form (Form-5).

15. Steering Committee

- (i) There shall be a Steering Committee at the Forest Division level and another at the State Level.
- (ii) Forest Division Level Steering Committee: This committee shall comprise of the following members:

(a) Conservators of Forests	:	Chairperson
(b) Divisional Forest Officer (Territorial or Wildlife)	:	Member Secretary
(c) Representative of Collector, preferably ADM dealing with land matters	:	Member
(d) Deputy Director (Agriculture)	:	Member
(e) Chief District Veterinary Officer	:	Member
(f) PO, DRDA	:	Member
(g) PA, ITDA	:	Member
(h) Deputy Director (Horticulture)	:	Member
(i) Soil Conservation Officer	:	Member
(j) Executive Engineer (RWSS/PHED)	:	Member
(k) District Inspector of Schools	:	Member
(l) 2 NGOs (to be nominated by the DFO)	:	Member
(m) 5 VSS (Chairperson/Vice-Chairperson (at least 2 women) (to be nominated by DFO)	:	Member
(n) Chairperson of two Panchayat Samities to be nominated by Collector in rotation.		
(o) Prakruti Mitra and Prkruti Bandhu Awardees:		Member
- (iii) The tenure of the non-official members will be three years
- (iv) The Divisional Level Steering Committee will meet at least once in six months and shall monitor functioning of the VSS, implementation of micro-plans and suggest measures of improvement.
- (v) The Committee shall ensure co-ordination of all concerned departments/agencies at the district /sub-divisional levels for proper implementation of the JFM programme.
- (vi) State Level Steering Committee: The constitution of the State Level Steering Committee shall be as under:

- | | | | |
|-----|---|---|------------------|
| 1. | Minister (Forest) | : | Chairperson |
| 2. | C.S./Addl. Chief Secretary (Supervising Forest): | | Vice Chairperson |
| 3. | Principal Secretary, F & E Department | : | Member |
| 4. | Principal CCF | : | Member |
| 5. | Principal CCF (WL) | : | Member |
| 6. | 2 C.Fs from field to be nominated by PCCF | : | Member |
| 7. | Secretary, Revenue Department | : | Member |
| 8. | Secretary, Home Department | : | Member |
| 9. | Secretary, RD Department | : | Member |
| 10. | Secretary, PR Department | : | Member |
| 11. | Secretary, SC & ST Department | : | Member |
| 12. | Two non-official experts to be nominated by Govt. | | Member |
| 13. | Special Secretary, F & E Department | : | Member |
| 14. | Chairpersons of two JFMC selected by PCCF | : | Member |
| 15. | CCF (Affn and SF), Office of PCCF, Orissa | : | Member |

(vii) The non-official members of the State Level Steering Committee will have tenure of three years.

(viii) The Committee shall meet once in a year to review the programme of Joint Forest Management in the State. They may hold extensive deliberations on specific problems faced in implementation of the programme and may guide and direct the operation of JFM programme in the State. They may recommend amendment of JFM provisions whenever required to steer the course of events in a positive direction.

16. Repeal and Savings:

This supersedes Forest & Environment Department Resolution No.16700-10F(Peon)-30/93-F&E dt.3.7.1993. However, all VSSs already formed under provisions of Forest & Environment Department Resolution No.16700-10F(Pron)-29/93-F&E dt.3.7.1993 will be recognized and treated as formed under this Resolution.

ORDER

Ordered that the Resolution be published in the Extraordinary issue of the Orissa Gazette.

By order of Governor

J.S. Chakar
Principal Secretary to Government 22.X.08
Forest & Environment Department

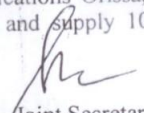
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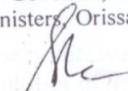
Memo No. 17455/F&E. Date: 22.10.08

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Joint Secretary to Government

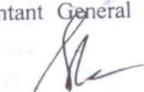
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Joint Secretary to Government

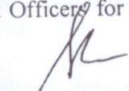
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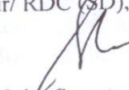
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Joint Secretary to Government

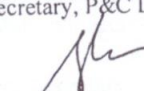
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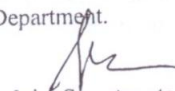
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Joint Secretary to Government

ANNEXURE-A

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ACCOUNTING PROCEDURE, DUTIES OF OFFICIALS AND NON-OFFICIALS

A. JFMC Account and Procedure of Accounting

- (i) There shall be a Development Fund in each JFMC wherein money received by the JFMC will be deposited before it is used for any purpose. On receipt of resolution of the EC for opening of a bank account, the DFO shall recommend the same for opening savings bank account in any Nationalised Bank, Cooperative Bank, Rural Bank (recognized by RBI) or in Post Office which will be called the "JFMC Account". This account will be operated jointly by the Chairperson and the Member Secretary of the JFMC. (The JFMC shall open a savings bank account in any nationalized bank, cooperative bank, rural bank, post office proximate to the village. The account will be opened in the style of "(village name) JFMC Account". All money received by the JFMC either in cash or instrument shall be deposited into the account before it is used for any purpose. The account will be jointly operated by the Chairperson and Member Secretary).
- (ii) Any withdrawal from the JFMC account can be done only after a specific resolution of the EC in this regard and after one week of such resolution. A copy of the said resolution shall be endorsed to the concerned Range Officer who may communicate his opinion within a week if he differs with the resolution. In such a situation the EC will have to reconsider its proposal and accordingly take a decision.
- (iii) The funds deposited into the JFMC account shall be utilized towards the conservation and development of forest, development of the village or for any other purpose ancillary to the implementation of the Micro-plan.
- (iv) In case the EC decides to spend the money from the "JFMC account / EDC account" for any other purpose it shall seek the approval of the General Body of the JFMC and then written permission from the DFO.
- (v) The PCCF/Govt. may issue executive instruction for operation of the JFMC account, which shall be binding on the EC. In case of detection of any financial irregularity the concerned DFO may freeze the JFMC account for a specific period and conduct necessary enquiry and may take required legal action.
- (vi) The Member Secretary shall be fully responsible for the submission of the Monthly account and maintenance of the Cash Book of the JFMC. The account shall be maintained in the same form as maintained by the Forest Department.
- (vii) A monthly work programme shall be drawn up by the Forester concerned in consultation with the EC and will be implemented with the approval of the RO subject to availability of funds for the purpose. Funds will be withdrawn accordingly from the JFMC account.
- (viii) All vouchers will be passed by the EC and signed by the Member Secretary as well as the Chairperson/Treasurer and shall be retained at the JFMC level. The Member Secretary will submit an abstract of receipt and expenditure to the concerned Range Officer by the 10th of the following month. RO will prepare a consolidated abstract of receipt and expenditure of all JFMC in his range and submit a monthly report to the DFO by 15th of the same month.
- (ix) On receipt of the monthly Cash Account of the JFMC the Range Officer will scrutinize make field verification if any and countersign the same. He will then send consolidated abstract of receipt and expenditure of all the JFMC in his Range along with his comments on each account to the DFO concerned. In all cases "where the Range Officer raised objection on the expenditure incurred by any JFMC he should communicate the menu of objection to the concerned EC for compliance while also informing the same to the DFO. The decision of the DFO on this issue shall be final.
- (x) Annual receipt and expenditure of the JFMC shall be audited by an auditor to be appointed by the Conservator of Forests. The annual statement of receipt and expenditure of the JFMC

account shall be placed before the GB for its approval. The audited and approved abstract of annual receipt and expenditure shall be communicated by the EC to the concerned RO and DFO.

B. Duties of the Chairperson

- (i) To request the Member Secretary of the JFMC to convene meeting of EC and GB as per the provisions of the resolution and as and when necessitated.
- (ii) To preside over meetings of the GB and EC.
- (iii) To sign the MoU on behalf of the JFMC as per provision of Para 14 (iii).
- (iv) To jointly operate with the Member Secretary the JFMC account /EDC account.
- (v) To countersign all vouchers of payment and expenses, muster rolls and utilization measurement books and utilization certificates along with the Member Secretary. (The Chairperson may also authorize the Treasure in do the same on his behalf).
- (vi) To ensure implementation of the Micro Plan, annual and monthly work plan.
- (vii) The conduct all other functions that may be authorized by the GB or EC.

C. Duties of the Vice Chairperson

- (i) To perform all functions of the Chairperson in his absence or on being instructed by the Chairperson.
- (ii) Any other function as authorized or instructed by the GB or the EC.

D. Duties of the Treasurer

- (i) To assist the Member Secretary in the maintenance of the JFMC account and submission of return thereof.
- (ii) To countersign all vouchers, muster rolls and measurement books, If authorized by the Chairperson.
- (iii) The JFMC Treasurer should maintain a detailed record of the cost and benefit shared by the JFMC and FD in case of intermediate and final felling as per provisions of the micro plan. In case of the EDC, the Treasurer should maintain a detailed record of the benefits accrued to different members of the EDC through various development programmes.

E. Duties of the Conservator of Forests

- (i) Evaluation of the performance of the JFMC. Approval and administrative sanction of the annual work plan depending upon its financial outlay as per delegation of financial powers by Government.
- (ii) To appoint a registered auditor for the audit of annual accounts of the JFMC, which shall be completed by May of following financial year.
- (iii) To dispose of appeals against the decision of the DFO on disbanding any JFMC and order for recovery of any amount after giving both sides reasonable opportunity of being heard.

F. Duties of Divisional Forest Officer

- (i) To register the JFMC and assign Registration No.

- (ii) Monitoring and evaluation of the performance of the JFMC.
- (iii) Approval and administrative sanction of the annual work plan depending upon its financial outlay.
- (iv) To ensure opening and operation of the joint savings bank account of the JFMC account/EDC account in Nationalized Cooperative Bank (as recognized by RBI) in a Post Office by the Chairperson and Member Secretary of the JFMC.
- (v) To impart training and lend assistance to the member of the JFMC for preparation and implementation of Micro-plan.
- (vi) To coordinate with other agencies for execution of the work programme adopted under the micro plan and make the financial resources available.
- (vii) To ensure harvesting and marketing of forest procedure whenever required as envisaged in the approved micro plan / annual work plan with the participation of JFMC members.
- (ix) To maintain a ledger of the abstract of accounts of all the JFMC within the Division, make field enquiries if any and to submit their consolidated account report to the Conservator or Forests /Appropriate authority / Donor agency.
- (x) The DFO may either himself or through the ACF at any point of time hold an enquiry into the accounts or any other activities of a JFMC and take appropriate action if any misappropriation of funds or irregularity is noticed.
- (xi) To disband the EC and JFMC under para 9 (i) and (ii) or divest its powers under para 9(iii).
- (xii) In special circumstances as a provisional alternative arrangement and with prior permission of the Conservator of Forests, DFO shall have the power to authorize the concerned Range Officer to perform all the functions and exercise all the powers of the Member Secretary of a JFMC.

G. Duties of Assistant Conservator of Forests

- (i) Monitoring and evaluation of the performance of the JFMC.
- (ii) To guide the members of JFMC and offer required technical assistance to the JFMC member in preparation of micro plan / annual action plan.
- (iii) To make site inspection and conduct field enquiry to make an assessment of forest area to be assigned to a JFMC as member of DLC.
- (iv) To conduct any other function as directed by the DFO for implementation of the JFMC programme.

H. Duties of Forest Range Officer

- (i) To guide the forester in initially organizing a meeting of the Gram Sabha for constituting the JFMC.
- (ii) To oversee the constitution of the Executive Committee and to act as Returning Officer during the election of elected member of the EC.
- (iii) To assist and train the members of the JFMC in preparation of the micro plan and annual work plan.

- (iv) To assist the JFMC member in resolution of internal conflicts and in discharge of their functions.
- (v) The RO shall attend all the special / emergency meeting of any JFMC and will have the freedom to attend other meetings of any EC or JFMC.
- (vi) To issue authenticated serial numbered and page certified account books, muster rolls and measurement books to a JFMC and to maintain an account of this.
- (vii) To make field inspection of works executed by JFMC and communicate his comments or opinion to the EC for rectification of any defects.
- (viii) On being authorized by the DFO as per para F(xii) to perform all functions of the member secretary under any JFMC under special circumstances.
- (ix) To take follow up action as per rules after the detection of forest offence by the JFMC and to ensure that the JFMC gets its due share after disposal of the forest produce so seized.
- (x) To demarcate the forest area to be assigned in favour of any JFMC.
- (xi) He shall submit the consolidated abstract of receipt and expenditures of all JFMCs of his range within prescribed time period.

I. Duties of FEO

- (i) He will be instrumental in spreading the message of JFMC within the Range.
- (ii) He will interact with villages /PRI and collect socio-economic profile of village.
- (iii) He will assist the JFMC in PRA exercise and formulation of micro-plan.
- (iv) He will assist the RO in monitoring and periodic evaluation of all JFM programme in the range.

J. Duties of Forester / VFW

- (i) He will be the ex-officio Member Secretary of the JFMC as well as that of the EC.
- (ii) He shall maintain the proceedings of the GB and EC meetings.
- (iii) He shall maintain the monthly receipt, expenditure account of the JFMC. He shall be the custodian of all books and vouchers of all JFMC under his responsibilities. He shall submit a monthly abstract of receipts and expenditure to the Range Officer by 10th of following month.
- (iv) He shall operate the JFMC account jointly with the Chairperson of the JFMC.
- (v) He shall assist the members of the JFMC in preparation and implementation of the Micro Plan.
- (vi) He shall keep the Range Officer continuously informed about functioning of all the JFMC under his control.
- (vii) Under special circumstances where the Chairperson does not convene the meeting of the GB even after receiving written request from at least one third member of the GB the Member Secretary shall convene the GB meeting with the approval of the concerned Range Officers.
- (viii) To discharge all other functions of the Member Secretary as prescribed in the JFM Resolution.

- (ix) To take follow up action as per rules after the detection of forest offence by the JFMC and to ensure that the JFMC gets its due share after disposal of the forest produce so seized.

K. Duties of Forest Guard

- (i) To assist the Member Secretary to organize all meetings in the village.
- (ii) To assist the villagers in preparation and in the implementation of the Micro plan / annual work plan.
- (iii) To oversee harvesting and distribution of the forest produce among the JFMC members as per approved Micro Plan.
- (iv) To take follow up action as per rules after the detection of forest offence by the JFMC.
- (v) To assist the Member Secretary in maintenance of Proceedings of all meetings of the JFMC and EC and records thereof.
- (vi) To keep the Member Secretary continuously informed about the day-to-day activities of the JFMC and the daily progress of work.
- (vii) To discharge any other function as insured by Range Officer or Forester.

ANNEXURE-B

Form-1

RESOLUTION

We the following villages of _____ village(s), hereby resolve to form a JFMC (Vana Samrakshyan Samiti) (VSS/Eco Development Committee (EDC) for the protection and management of the part /whole of _____ forest in accordance with the provision of the Orissa Joint Forest Management Resolution, 2008. We also undertake not to contravene any provision of the Orissa Forest Act, 1972 and Forest Conservation Act, 1980 and any Acts and Rules in force.

In case of failure to comply with any of the conditions laid down in the above said Resolution by any of the members of the JFMC, the membership of such member may be cancelled.

NAME OF VILLAGERS

SIGNATURE

1
2
3
4
5
6
7
8
9
10
11
12
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20

Form-2

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**RECOMMENDATION FOR FORMATION OF
JOINT FOREST MANAGEMENT COMMITTEE**

To

The Divisional Forest Officer _____ Division
(Through Forest Range Officer _____ Range)

As per the provision of para 3 ii(a) of the Orissa Joint Forest Management Resolution, 2008, a meeting of the Gram Sabha of _____ village(s) was organized. The concept of Joint Forest Management including all rights, responsibility and benefits that might accrue to the JFMC members was explained in the said meeting. On being satisfied that 60% of adult members of the village are willing and interested to form a JFMC, I Shri _____ Forester of the _____ section in pursuance to the Vana Samrakshana Samiti/Eco Development Committee (EDC) in this village(s). The details of the area is as follows:

1. Name of Committee:
2. Village:
3. Gram Panchayat:
4. C.D. Block
5. Police Station:
6. Forest Beat:
7. Forest Station:
8. Forest Range:
9. Total Members (list of members enclosed):

10. Forest areas proposed to be protected and managed _____ ha.
11. Name of the Forest Block _____
12. Comp. No. _____

The Resolution of the Gram Sabha of the village of _____ village(s) is attached herewith.

Signature of the Forester

OFFICE OF THE FOREST RANGE OFFICER _____ RANGE

Memo No. _____/Date _____

I forward herewith the Resolution of the villagers of _____ village along with the views of the Forester of _____ section. I recommend for formation of the JFMC _____ village for the protection and management of _____ ha. of the forest area in _____ forest block.

Signature of Forest Range Officer

Form: 3

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OFFICE OF THE DIVISIONAL FOREST OFFICER _____ DIVISION

OFFICE ORDER NO. _____ DATE _____

After due consideration of the proposal submitted vide Memo No. _____ Office Forest Range Officer, _____ Range, and the recommendation of the DLC, I, in exercise powers vested under 3 ii(e) of the Orissa Joint Forest Management Resolution, 2008 accord my approval for constitution of VSS/EDC and order that the _____ Vana Samrakshyana Samiti/Eco Development Committee for the _____ villagers(s) is hereby constituted for protection and management of part / whole of _____ forests.

The _____ Vana Samrakshyana Samiti/Eco Development Committee is registered in this office vide Registration No. _____.

Forest Area Schedule:

Extent of Forest Area: ha.

Description of Location:

DIVISIONAL FOREST OFFICER
_____ **FOREST DIVISION**

OFFICE OF THE DIVISIONAL FOREST OFFICER _____ DIVISION

Memo No. _____ /Date _____

Copy forwarded to Forest Range Officer _____ Range for information and necessary action. He is instructed to demarcate the forest area as per above schedule and depict the area in the topo sheet (1: 50000 scale). A copy of the map should be available with the VSS, Member Secretary, Beat Guard and in the Range Office. Another copy of the map should be submitted to this office for record.

Copy forward to Sarpanch, _____ Gram Panchayat for information and necessary action.

DIVISIONAL FOREST OFFICER
_____ **FOREST DIVISION**

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Form-4
**PERMIT UNDER THE ORISSA JOINT FOREST MANAGEMENT
 RESOLUTION-2008**

- Name of the assigned Forests _____
- Description of Forest produce Quantity
- Source of Procurement of the forest produce _____
- Name of the JFMC Member _____

Date of issue:

Designation

Valid up to:

(Signature of the Authorised Member
 of the Executive Committee,
 _____ JFMC)

Signature of the
 Member Secretary

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Form-5
MEMORANDUM OF UNDERTAKING

1. We the members of the Executive Committee of the Vana Samrakshyana Samiti /Eco Development Committee of _____ village do hereby undertake individually and collectively to perform the duties and shoulder the responsibilities as detailed in the Orissa Joint Forest Management Resolution, 2008, for proper protection, regeneration and management of the forest areas as per the schedule given hereunder.

- i. Name of the JFMC
- ii. District _____
- iii. Forest Division _____
- iv. Forest Range:
- v. Section:
- vi. Beat:
- vii. Police Station:
- viii. Village:
- ix. Name of the assigned Forest Block
- x. Legal status of the Forest area:
- xi. Area (Ha) of the assigned forest:
- xii. Boundaries of the area:

North
South

East
West

1. We, understand that the usufructuary benefits as detailed in the aforesaid Resolution shall be allowed only upon satisfactory observance of the duties, responsibilities and functions by this executive Committee and by the members of the Vana Samrakshyana Samiti as per the aforesaid resolution. We undertake not to contravene any provision of any Act or Rules in force. In case of failure to comply with any provision of this Resolution by any member of the JFMC, the membership of such member may be cancelled and such member may not be allowed any usufructuary benefits from the date of termination of his/her membership.

2. A copy of the aforesaid Resolution is annexed herewith duly signed by us on every page in proof /evidence of our having read /understood the same in letter and spirit. It is hereby agreed that this MOU will come into effect from_____.

Signature of the Chairperson
_____ JFMC

Signature of R.O.
Range: Division:

Witnesses:

- 1.
- 2.
- 3.

Witnesses:

- 1.
- 2.
- 3.

PART III-Bid documents

- A. WB Condition of contracts
- B. Qualification criteria
- C. Technical specifications.
- D. Standard specification drawings.
- E. Milestones.
- F. Terms of payments.