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55

Implementation Strategies for Maharashtra

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Indo-German Biodiversity Programme
Conservation and Sustainable Management of Coastal and Marine Protected Areas

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Authors
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Conservation and Sustainable Management of Coastal and Marine Protected Areas

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List of Acronyms

BARC	Bhabha Atomic Research Centre
BNHS	Bombay Natural History Society
BPCL	Bharat Petroleum Corporation Limited
CBD	Convention on Biological Diversity
CIFE	Central Institute of Fisheries Education
CMFRI	Central Marine Fisheries Research Institute
CMPA	Coastal and Marine Protected Area
COP	Conference of Parties
CRZ	Coastal Regulation Zone
CSM	Conservation and Sustainable Management
CSR	Corporate Social Responsibility
EEZ	Exclusive Economic Zone
GIZ	Gesellschaft für Internationale Zusammenarbeit
HPCL	Hindustan Petroleum Corporation Limited
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
MbPT	Mumbai Port Trust
MCGM	Municipal Corporation of Greater Mumbai
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MIDC	Maharashtra Industrial Development Corporation
MMRDA	Mumbai Metropolitan Region Development Authority
MoEFCC	Ministry of Environment, Forests and Climate Change
MPA	Marine Protected Area
MPCB	Maharashtra Pollution Control Board
MSEB	Maharashtra State Electricity Board
MSRDC	Maharashtra State Road Development Corporation
MTDC	Maharashtra Tourism Development Corporation
NABARD	National Bank for Agriculture and Rural Development
NGO	Non Government Organisation
NHAI	National Highway Authority of India
NIO	National Institute of Oceanography
NMMC	Navi Mumbai Municipal Corporation
NPCIL	Nuclear Power Corporation of India Limited
TMC	Thane Municipal Corporation
SNM	Sahyadri Nisarga Mitra
UNDP	United Nations Development Programme

Executive Summary

The Implementation Strategy Report explores conservation and sustainable management of Coastal and Marine Protected Areas (CMPAs) at selected coastal sites in the Konkan region of Maharashtra, India. It focuses on the capacity gaps as identified in the stakeholder matrix of the region during the rapid survey and recommends interventions by way of capacity building to enable effective community participation in conservation. The document also elaborates on the ecological and socio-economic issues of the region, along with the state of its natural environment and biodiversity. The involvement of various stakeholders and their interaction with the natural environment has also been assessed. Possible interventions in the context of the threats faced by the coastal sites in the Konkan region have been suggested.

Based on the rapid survey of the selected sites- Thane Creek, Velas-Dabhol coastal stretch, Ansure Creek and Angria Bank - and the previous institutional knowledge of the area, following is a gist of the capacity gaps observed among stakeholders in the region:

- Dwindling belief in age-old and time-tested holistic living practices
- Adoption of unsustainable and uncontrolled consumerist practices; tendency towards favouring urban lifestyle among the new generation
- Destruction of natural habitat and biodiversity due to promotion of ill designed industrial and development policies
- Destruction of natural habitat by locals, knowingly or unknowingly, due to an eroding belief system and lure of short term monetary benefits
- Lacuna in the education system in promoting sustainable lifestyle choices amongst the student community

- Inadequate focus by media in promoting sustainable lifestyle choices
- Lack or gaps in existing laws for meaningful participatory conservation regimes, especially in the realm of marine ecology
- Inadequate focus and priority on coastal and marine biodiversity at both local and state level.

Post a further detailed study of the ecology of the three areas, the conservation issues, stakeholder mapping and existing roles being played by various stakeholders, it will be possible to chart out interventions and action plans that would be required to create an effective Community Conservation Model, through enhanced participation of all stakeholders. This will involve blending traditional knowledge with best modern practices, based on field research, GIS mapping, comprehensive socio-economic analysis, higher standards of on site community interventions and capacity building in such a manner that the local community benefits without harming the environment.

Based on the recently undertaken rapid survey of the Konkan region, initial advocacy interventions with various local stakeholders using diverse capacity building techniques, as well as acquiring relevant information from traditional knowledge for better community-based conservation through the following measureshave been suggested:

- Workshops and Seminars
- Focus Group Discussions and training programmes on issues of marine biodiversity; various laws governing biodiversity and legal regimes that allow participatory conservation
- One-on-one meetings with major stakeholders
- Community awareness exercises such as exhibitions, volunteer training, nature trails, brochures, leaflets, etc.
- Focused group meeting with locally elected representatives of Gram panchayat and other relevant government agencies
- Creating a common platform for various government agencies and local community representatives to discuss best practices on community managed MPAs
- Interventions through public media for better dissemination of sustainable growth models through appropriate coverage
- Interventions for better management of protected areas through active involvement of various government departments, including Forest and Revenue, as well as constructive interactions with local, state-level and national policy makers

Chapter 1

Introduction

Without doubt, the ecological integrity of the coastal and marine areas of Maharashtra and other parts of India are increasingly under threat due to diverse reasons, primarily attributed to unsustainable developmental activities over the past couple of decades. Despite being a part of the United Nations World Heritage Site of the Western Ghats, the Konkan region of Maharashtra is fast losing its myriad and biologically rich habitats. The entire area harbours abundant marine, freshwater and terrestrial biodiversity along with a wide array of habitats that include numerous creeks, mangroves, sand dunes, mudflats, seagrass beds, rocky and sandy shores, coastal plateaus, orchards, fishing and farming villages, paddy fields, moist deciduous forests, rivers and foothills of the Western Ghats that branch out towards the sea.

The holistic and eco-friendly lifestyles previously followed by the people of the Konkan region are being rapidly replaced by unsustainable practices. With more people migrating to coastal areas from the hinterland, uncontrolled urbanization is beginning to show its impact on formerly untouched rural areas. Rampant sand mining and destruction of most habitats due to increased commercial activities has further exacerbated the degradation of the coast of Maharashtra. Added to this are factors such as discharge of effluents, dumping of sewage, industrial pollution, oil spills, infrastructure and power projects and other biotic interferences.

Conservation efforts based on research, public awareness, advocacy and community participation, coupled with sustainable development policies, are vital for the long term survival of coastal and marine habitats. The Convention on Biological Diversity (CBD), a UN initiative which meets every two years at the Conference of Parties (COP), has included marine biodiversity as an important issue. The AICHI targets of CBD and the priority areas selected at COP-11 last year in Hyderabad, also underpin the protection of coastal and marine ecosystems. In this context, the report aims to discuss the ecological and socio-economic issues observed in the Konkan region. It further details interventions and approaches required to

conserve these ecosystems through community participation.

The four sites selected under the GIZ-MoEFCC initiative in the state of Maharashtra include the Thane Creek, Velas-Dabhol coastal stretch, Ansure Creek and Angria Bank. These sites represent multiple ecosystem subsets as well as diverse stakeholders. The Thane Creek lies in an urban area near Mumbai and is dominated by mudflats and mangroves. Velas-Dabhol coast lies in Ratnagiri district and has good quality sandy shores with sea turtle nestings as well as mangroves. Ansure on the other hand also lies in Ratnagiri district and has excellent quality mangroves while Angria Bank is an offshore underwater reef. The ecological and social setting of the selected sites are discussed in the following pages:

Thane Creek

Ecological Setting: The Thane Creek opens towards the south west approach to Mumbai Harbour bay and is connected at its northern extremity to the Ulhas River, covering a total distance of 26km. The creek lies at the northern extremity on the east coast of Mumbai, starting from Thane. It narrows down near the city and has a northward slope gradient. The basin is so shallow that during low tide, depending upon the tidal flow, the creek gets divided into 3-4 branches. The current slows down considerably and mudflats with mangroves become common in the area.

The creek harbours Asia's biggest industrial belt and the Thane-Mumbai urban complex along its banks. As a result, large quantities of industrial and sewage effluents enter the creek. Treated and untreated domestic waste along with waste from chemical, petrochemical, fertilizer and atomic plants situated around the coast also contaminate the creek.

Despite serious environmental threats, the Thane Creek is home to rich floral and faunal diversity. Mangroves create a unique habitat that is capable of hosting a wide variety of species such as *Avicennia marina* (White Mangrove), *Rhizophora mucronata*, *Ceriops tagal* (Yellow mangrove), *Sonneratia apetela* (Mangrove Apple), *Aegiceras corniculatum* (River Mangrove),*Excoecaria agallocha* (Milky Mangrove), *Bruguiera gymnorrhiza* (Orange Mangrove), *Salvadora persica* (Toothbrush plant), *Acanthus ilisifolius* (Holy mangrove). Of these, *Avicennia marina* is the most abundant due to its high pollution tolerance capacity. Invertebrates include marine annelids, polychaetes worms, mollusc groups like gastropoda, bivalvia, pulmonata and crustaceans like barnacles, crabs, shrimps and prawns. Insects abundantly found in the creek include butterflies, moths, beetles, bugs, flies, wasps, grasshoppers and dragonflies. Vertebrates such as a variety of fishes, reptiles like snakes, lizards and skinks are also common in the creek area.

A large number of migratory birds from the Arctic Circle visit the area every winter. The area is also home to approximately 15,000 near-threatened Lesser Flamingoes. Both large and small mammals such as jackal, wild boar, common mongoose, small Indian mongoose and bat species are commonly found in the area.

Social Setting: Local communities mainly consist of fishermen who depend upon the creek for catching crabs and shells, especially bivalve; salt pan workers and factory workers also live here.

Velas-Dabhol

Ecological Setting: Vasishthi River,flowing from Chiplun, merges with the Arabian Sea at Dabhol and is called theDabhol creek. The creek and its adjacent areas are extremely rich in fishery resources, mangrove ecosystems and related biota. The scattered mangrove patches, range in sizes from as small as 579 sq.m to as large as 5,10,787 sq.m. These mangrove patches are not only heterogeneous in size but also show a wide range in terms of stature, composition, and community structure.

Avicennia marina and *Avicennia officinalis* are dominant species on the southern bank whereas, *Sonneratia alba* are more visible

on the northern bank. Most of the patches have *Sonneratia apetala, Excocaria agallocha, Aegiceras corniculatum* along with associate species towards the landside, while *Avicennia spp., Brugiera gymnorhiza, Kandelia candel*, and *Rhizophora spp*. are found more towards the interiors. The patches are invariably lined by *Rhizophora spp*. or in some cases *Kandelia candel* on the creek side. Sites with disturbance showed abundance of *Acanthus ilicifolius* and *Acrosticum aureum*. Bhopan and its settlement, Buddhawadi, are situated on a branch of the Dabhol Creek that runs north-south on the northern bank before joining the main creek. They are characterized by tall *Excocaria agallocha* trees towards land and very old A. *officinalis* individuals in the interiors. At Peve and Panderi Inamdar, large individuals of A. *officinalis* with girth > 600 cm were encountered. This is one of the most species rich and healthy patch.

Velas is a small coastal village in Mandangad Taluka of Ratnagiri district. This is the northernmost Taluka in the district and together with the neighbouring Dapoli Taluka, consists of an undulating mountainous region. These mountains, which run westward, perpendicular to the main Western Ghats crestline, extend up to the Arabian Sea. Thus, the region is an integral part of the Western Ghats eco-region. The coastal part of Mandangad taluka lies between the Bankot Creek in the north and the creek separates it from the Dapoli Taluka on the south. Over the years, Velas has gained popularity due to sea turtle nesting sites on the beach. Apart from sandy beaches, other habitats in the region include rocky shores, creeks, coastal plateaus and moist deciduous forests on the hillsides.

Social Setting: The local communities inhabiting along the patches of mangroves in this region depend on mangroves for their daily needs. Collection of fish, bivalves and firewood are the regular activities. Recently, large patches of mangroves have been affected by the cutting of trees for fuelwood and clearing of space to install aquaculture units.

In Dabhol, *Sonneratia alba* plantation was observed. A bund breaks tidal supply to the mangroves and signs of large scale cutting of trees could be seen. Large stumps of *Avicennia* sp. suggest that it might have been a dominant specie in the recent past. At Unavare, the construction of a bund/road along the circumference of the mangrove patch blocks supply from tidal water. This has led to the forest having a dense undergrowth of saplings of species such as *Acrostichum aureum* and *Acanthus ilicifolius*.

People living in Velas and surrounding villages, have retained the typical rural rustic ambience of the Konkan region. They are primarily engaged in eco-tourism, agro-tourism, paddy farming, horticulture, fishing, local trade, local transport and government jobs. Although many members of the young generation have migrated to cities, a sizeable number remains back, engaged in the above mentioned occupations. The increasingly popular annual Velas Turtle Festival has become a landmark event that also promotes eco-tourism. Not only has this ensured the safety of the turtle nesting sites, it has provided a viable livelihood opportunity to the local residents.

Ansure

Ecological Setting: The Ansure creek is approximately 6.5 km long and about 250-300 meter wide and unites with the Vijaydurg creek on the northern side of Vijaydurg Fort. The creek is one among those harboring wide mudflat areas and dense, diverse standing mangrove vegetation of the coastal region of Ratnagiri. The northern bank of the creek harbors larger mudflats and mangrove forested areas as compared to the southern bank. Northern bank mangrove patches are primarily found distributed along two villages: upstream Ansure-Dande wadi and downstream Ansure khalchi waki.

About 100 to 200 meter wide open flat areas are occupied by varying types of marine invertebrates. Many species of molluscs and crustacean were accounted for in the last few studies conducted by the Bombay Natural

History Society (BNHS). Certain protected species such as *Placuna placenta* (Schedule–IV WPA, 1972), *seagrass Halophila beccarii* (IUCN Red List-Vulnerable) are known to exist in this mudflat area. Small mammals such as Fishing cat (*Prionailurus viverrinus*) and Otters (*Lutrogale perspicillata* - IUCN Red List-Vulnerable) inhabit this region. Commercial as well as local fishing activities are carried out within the Ansure creek system and adjacent areas of the sea. The mid-littoral region supports one of the two populations of seagrass *Halophila beccarii* in Ratnagiri and is listed as vulnerable globally. Mangroves and seagrass are known as nursery habitat for several species of fishes and crustaceans. Thus, the mentioned area is of ecological as well as economical high importance. Further, mangrove-mudflat habitat is among the significant contributors to coastal carbon sequestration.

Social Setting: Gravel mixed substratum and upstream dense mature strands of mangrove are peculiar to this area. Soft brown-black mud can be seen in the interior region of this patch and it supports dense patches of washed-off litter and dead mangrove tree stumps. Local women are seen fishing for oysters and Telescopium telescopium (gastropod). Meat of this specie is known to be part of the preferred diet in the region. Fishermen and women collect oysters and Striarca symmetrica (pelecypod) by using traditional methods. Both these are easily sold in the local markets. Fishing occurs in surrounding areas and during low tide, many boats are found anchored along the bank. For collection of crabs, local fishing gear such as nets and hooks are used.

Angria Bank

Ecological Setting: Angria Bank is a shallow sunken atoll on the continental shelf off the west coast of India. It is located 105 km west of Vijaydurg, Maharashtra. The bank is at a depth of 20m and its dimensions are 40 km from north to south and 15 km from east to west. It is a coral habitat with a bed consisting of sand, shells, and coral. The bank is steep on all sides, with great depths surrounding it. The reef are rich in fish and shellfish along with with many flagship species such as Whale Shark, Humpback Whale, Indian Humpback Dolphin, Hawksbill Sea Turtle, Olive Ridley Turtle and Giant Grouper.

Social Setting: It is an offshore submerged reef which falls within an Exclusive Economic Zone (EEZ) of India. Fisherman from the states of Maharashtra and Goa use this reef for fishing.

Chapter 2

Current Status of Coastal and Marine Biodiversity in Maharashtra

With the Arabian Sea to its west, the state of Maharashtra has a 720 km long coastline that comprises of five districts viz. Thane, Greater Mumbai, Raigad, Ratnagiri and Sindhudurg. All five are part of the Konkan region and distinct in their physical features, biota and marine resources. The State of Maharashtra stretches from the coast along the Western Ghats to the Deccan Plateau. The coast is characterized by crescent-shaped beaches flanked by rocky cliffs of Deccan basalt, estuaries, mangroves, mudflats, rocky shores, sandy shores, sand dunes, islands, coastal plateaus and Sacred Groves. Sand dune vegetation comprises of *Casuarina equisetifolia* and *Cocus nucifera*, primarily developed as shelterbelt plantation.

The coastal wetland ecosystem of Maharashtra was studied for the first time by Blatter in 1905. Subsequently, other scientists such as Navalkar (1951), Qureshi (1959), Shah (1962), Sidhu (1963), Bhosale and Joshni (1973), Blasco (1975) and Gole studied the various aspects of coastal wetland habitats, especially mangrove vegetation.

Of the total length of the coast, about 15 rivers, 5 major creeks and 30 backwater regions have been reported (Jagtap et al., 1994). All creeks and estuaries together form the drainage in east-west direction and flow into the Arabian Sea in the west. The major upstream freshwater flowing rivers or estuaries are absent, except for a few small rivers like Kundalika, Savitri, Vasishthi, Shastri, and a few creeks like Vaitrana, Ulhas-Thane complex, Karanja-Dharmatar complex, Purnagad, Devgad, Achra and Karli creeks (Naskar and Mandal, 1999). Mouths of these rivers and creeks are wide-open and funnel shaped.

Coastal and marine habitat loss is attributed to a range of factors including clearing of mangroves for intensive aquaculture (shrimp farming), development for housing, recreation, industry, transportation, dredging, land filling,and disruption of currents, sediment flow and discharge through construction of jetties and other physical barriers. Chemical pollution, solid waste disposal, sand mining, etc also pose serious threats.The issues however are at times site

Table 1
The Total Coastal Wetland Area Along Maharashtra Coast has been Estimated to be 1567 Km^2

Coastal area	Area km2
Estuarine	738.13
Mud flat	471.44
Beach/spit	119.65
Shoals	1.20
Mangroves	146.40
Marsh	12.10
Mudflat with vegetation	8.20
Lagoon	8.60
Dunes	42.40
Salt pans	19.50

(Jagtap et al. 2001)

specific. For example, in the case of the Thane creek, multi-functional industries contribute to high pollutants along with enormous volume of untreated sewage as well as solid waste and oil spills. The creek also has issues such as salt pans, cutting of mangroves for housing purposes, sand mining and coastal armour.

In recent times, the coastal Konkan region has received attention for development in the form of tourism infrastructure, power plants, ports, sand mining and ship yards. Combined with changes in land use pattern, such as growth of mango orchards, plateau mining, housing expansion etc, the coastal Konkan area is slated for a facelift which in turn will impact the already fragile coastal habitats.

The **key socio-economic issues** for the region include:

- **Urbanization:** Population of the towns and Taluka headquarters is increasingly becoming urban in its lifestyle. Economic activities are increasingly getting centred around manufacturing, trading, transportation and other services.
- **Local economies:** Population of the villages continues to live a largely rural lifestyle. Their occupations include fishing, farming, horticulture, agro-tourism, eco-tourism, local transport, etc. However, some issues prevail such as selling of agricultural and privately owned forest lands, including mangroves.
- **Changing aspirations:** With the increasing influence of media and the internet, the belief systems and priorities of the younger generation is changing fast. Many are weaning away from fishing and agriculture and steering towards jobs in big or small cities.

To understand the key drivers and pressures responsible for the loss of coastal and marine biodiversity in the region, including the selected sites, a systematic assessment coupled with cumulative impact assessment studies is required. But the following can be concluded:

- **Pollution:** Large scale pollution of land and water in the Dabhol Creek area due to existing and upcoming industries, infrastructure projects and utility projects; urbanization and unplanned tourism is also on the rise in many areas.
- **Mining:** The recent revocation of the earlier stay order on mining in the coastal talukas of Ratnagiri district poses a major threat. Earlier, illegal uncontrolled mining of minor produce such as sand and lateritic rock was going on. Now with the revocation, legal mining of minor as well as major produce such as bauxite and iron is likely to destroy the already

fragile ecosystem.

- **Deforestation:** The destruction of natural forest areas for reasons such as urbanization, uncontrolled tourism infrastructure, uncontrolled expansion of monoculture (mango and cashewnut) and to a lesser extent, felling for timber and firewood.
- **Habitat Destruction:** Other habitats such as coastal plateaus, sandy shores, rocky shores and mangroves are also being destroyed due to uncontrolled industrial, urban and infrastructural growth. Kharland bunds, are constructed to prevent ingress of seawater (usually an intervention to increase soil aerability for agriculture). However, this is detrimental to mangroves and in many areas shown as a major cause for the loss of mangrove cover.

Chapter 3

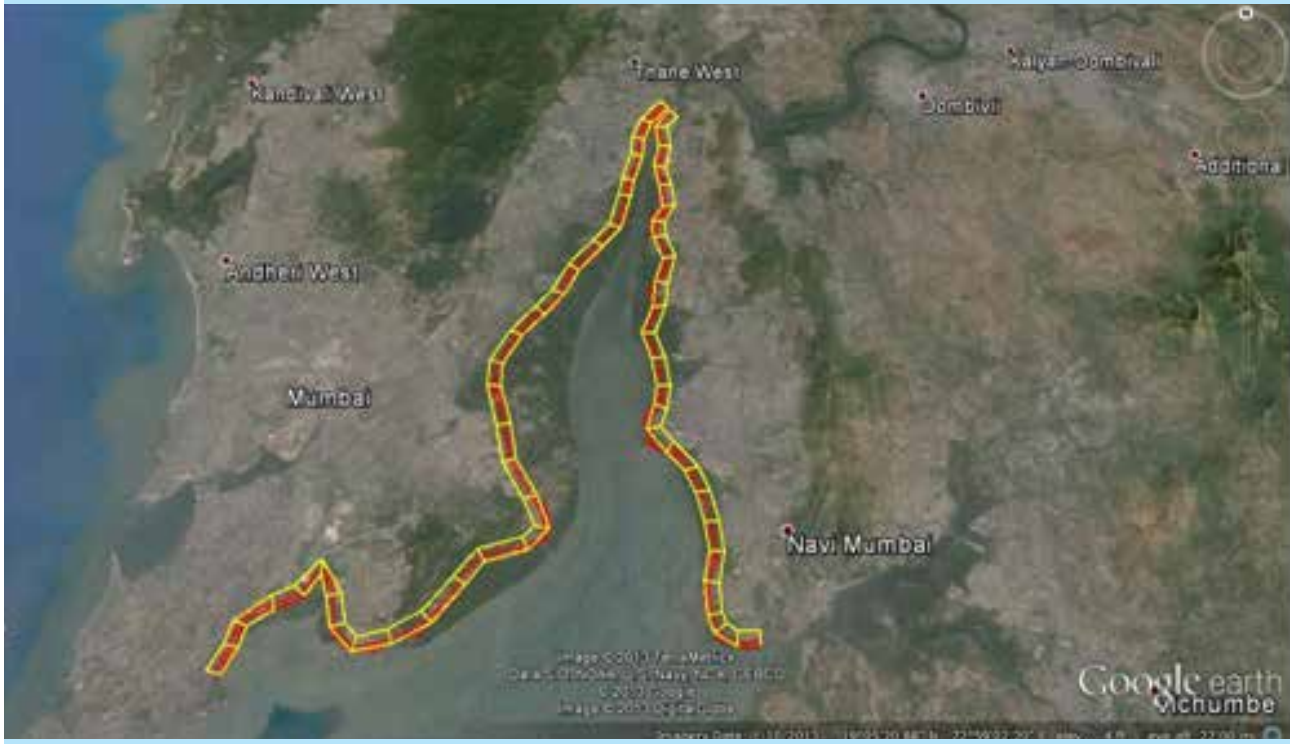
Stakeholder Analysis

In order to understand their role in the proposed initiative, an extensive study of all stakeholders is required. This will help assess the gaps that prevail and the interventions that can be carried out at a later stage. It is important to examine existing livelihoods and dependency of locals on natural resources and assess their sustainability. The stakeholder landscape needs to be studied in relation to various habitats including forests, mangroves, sandy shores, rocky shores, creeks, plateaus, rivers and marine habitat.

Stakeholder mapping for all the four selected sites, and the surrounding regions within the immediate perimeter of one, two and five kilometres is an important step (Maps 1 to 4). In the case of Thane creek, it would be 200 to 500m. This allowsfor an understanding of the target population and helps assess priority areas for subsequent stages of intervention and monitoring. Stakeholders will broadly include urban populations and rural communities such as fishermen, horticulturists, farmers, food processing and cottage industries, homestay facilities, local traders and self employed skilled and unskilled people, transporters, NGOs, tour operators, parents, teachers and spiritual leaders. This will also include the industry, government machinery including all concerned departments and policy makers, media and other external stakeholders. Mapping of stakeholders will begin with the latest available population census data and relevant secondary details such as the socio-economic standards, literacy, occupational/employment status, male-female ratio, use of local, natural and other supplied resources, urbanization trends and population shifts.

Following is a gist of the various locations around the four selected sites that need to be studied for an elaborate stakeholder analysis. The area of intervention however needs to be decided based on several considerations such as natural resource use and direct dependency on the ecosystem services and demography. (Annexure 1, Tables 1-4 identify the total number of villages and the population within 1, 2 and 5km lateral distance from the high tide mark for Dabhol-Velas and Ansure sites and 500m and 200m for

Map 1
Thane Creek

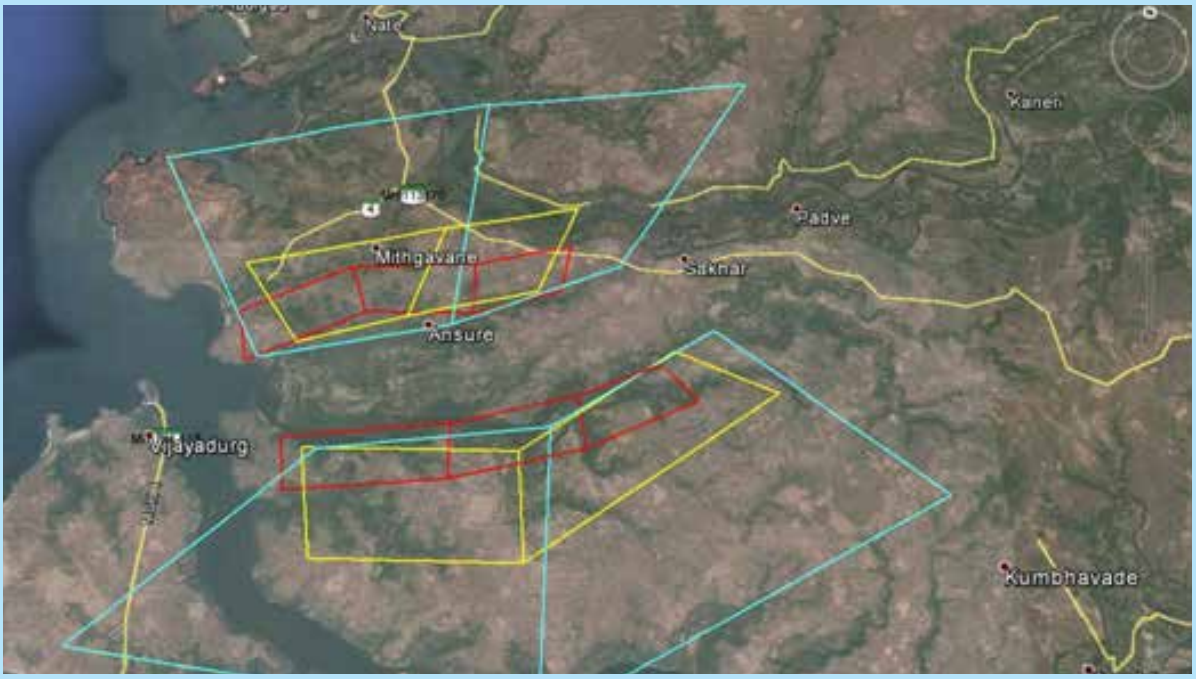


Red Line: 200 mts on each side of the high tide line; Yellow Line: 500 mts on each side of the high tide line

Thane Creek).

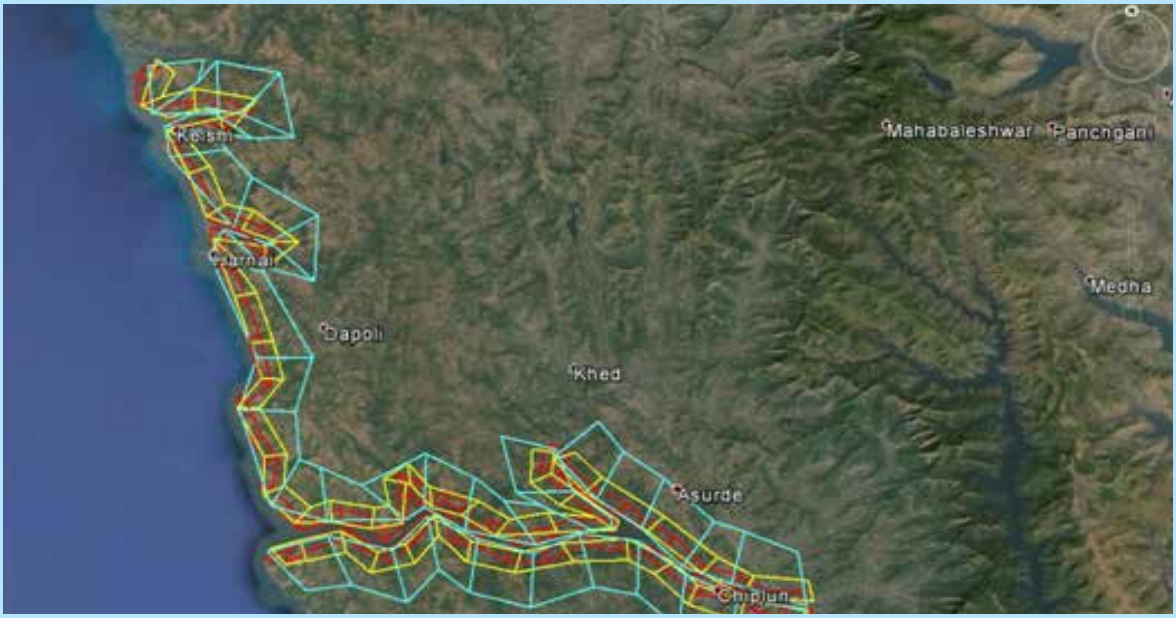
- **For Thane Creek site**, the area of stakeholder mapping will include Mumbai City, Mumbai Suburban, Thane City, Navi Mumbai and other locations from the talukas of Thane, Panvel and Uran, covering the urban, semi-urban and industrial areas.
- **For Velas-Dabhol**, the area will include the talukas of Mandangad, Dapoli, Guhagar, Khed and Chiplun, covering the towns and villages on the coast, along the Dabhol Creek and Vasishthi River and the hinterland that forms the catchment area. This will cover villages and towns such as Velas, Kelshi, Aade, Anjarle, Harne, Murud, Dapoli, Mandangad, Ladghar, Burondi, Kudavale, Kolthare, Dabhol, Dhopave, Gudage, Chikhalgaon, Panhale Kaji, Guhagar, Anjanvel, Modkagar, Songaon, Chiplun, Parshuram, Lote, Pophali and Marg Tamhane.
- **For Ansure site**, the area will include the talukas of Rajapur and Ratnagiri, covering towns and villages on the coast, along the Ansure, Jaitapur and Vaghothan Creeks and the catchment area in the hinterland. This will cover the villages and towns such as Ansure, Purnagad, Kasheli, Rajapur, Vilye, Adivare, Upale and Gothne.
- **For Angria Bank site**, coastal villages and towns in the region such as Malvan, Tarkarli and Vaingani, Ratnagiri and parts of Goa will have to be studied.

Map 2
Ansure Creek



Red Line: 1km on each side of the high tide line; Yellow Line: 2km on each side of the high tide line;
Blue Line: 5km on each side of the high tide line

Map 3
Velas-Dabhol



Red Line: 1km on each side of the high tide line; Yellow Line: 2km on each side of the high tide line;
Blue Line: 5km on each side of the high tide line

Map 4
Angria Bank

Chapter 4

Demographic Data

The following table gives the demographic data (Census Information 2001) in terms of thetotal number of households and total population for Dabhol, Velas and Ansure. A detailed demographic break up for each area is available in Annexure 1.

Table 2
Demographic Data

Area	No. of Households	Population
Dabhol creek	29889	135887
Velas	8178	35932
Ansure	5672	24106
Total	43739	195925

Chapter 5

Natural Resource Dependency

Dependency of various local stakeholders engaged in different economic activities based on the natural environment of the selected sites can be summarized as below:

Table 3
Dependency of Various Local Stakeholders Engaged in Different Economic Activities

Ansure	Dabhol-Velas	Thane	Angria Bank
Fishing community depends upon the creek for fish, shellfish, crab, etc.	Fishing community depends upon the creek for fish, shell-fish, crab, etc.	Fishing community depends upon the creek for fish, shell-fish, crab, etc.	Use of large fishing trawlers
Locals (non fishermen) also depend on the creek for crabs, oysters, other bivalves etc. for substance use	Locals (non fishermen) also depend on the creeks for crabs, oysters, other bivalves etc for substance use	Salt pan holders	-
A small percentage of agrarian community resides in close proxim-ity to the creek	A small percentage of agrar-ian community resides in close proximity to the creek, and control of sea water ingress due to mangroves is important	Aquaculture ponds (Prawn & fish)	-
Horticulture community depends upon insects, birds and bats from surrounding forests for pollination to a certain extent and on birds and animals for pest control	Horticulture community de-pends upon insects, birds and bats from surrounding forests for pollination to a certain ex-tent and on birds and animals for pest control	depend upon the creek water	-

Ansure	Dabhol-Velas	Thane	Angria Bank
Sea turtle based tourism	Eco tourism and agro tourism	People from nearby residential colonies depend upon the eco-system for a clean and green ambience	-
Sporadic use of mangroves for fuel	Sporadic use of mangroves for fuel	Bird watching for flamingos and waders	-
Sand mining	-	Large scale mangroves clearing for housing, development and industrial purpose	-

Possible roles of various local stakeholdersfor playing a further constructive role in conservation:

- Enhance the role of local communities in managing selected sites through a combination of traditional knowledge and scientific intervention
- Involve schools, colleges and other educational institutions in disseminating the holistic and sustainable growth model through community participation, and in reviving traditional knowledge that will compliment this model
- Involve Forest/Revenue and other department officials and local self governments/Gram Panchayats/Gram Sabhas in implementation of existing laws for conservation of habitat, promotion of government schemes such as those under NABARD/MGNREGA for balanced regional growth and resolving legal issues
- Media (national and local) in scientifically accurate reporting and useful information, and promoting/advocating sustainable policies
- Industries and infrastructure companies operating in the region in enabling a localised holistic growth model through empowerment of people and implementation of conservation measures, under their CSR policy
- Enhance the role of researchers and NGOs in safeguarding various habitats and studying the possible conservation options
- Involve small scale and large scale tourism service providers operating in the areas to help implement community conservation
- Enhance the involvement of Navy and Indian Coast Guard in ensuring conservation in case of Angria Bank

Table 4
Stakeholder Mapping

For Dabhol-Velas

NGO	Government Agencies	Corporates	Other
BNHS	State Forest Department	Ratnagiri Gas & Power Limited	Schools and colleges in the region
Sahyadri Nisarga Mitra	Dept of Revenue	Ashapura Minerals	Regional cultural and social institutions
Lokmanya Education Trust	Dept of Ports	Gharda Chemicals	
	CMFRI	Vasishthi Detergents	
	Konkan Krushi Vidyapeeth	Bharati Shipyard	
	Gram Panchayats		
	MTDC		
	MIDC		
	State Biodiversity Board		

For Ansure

NGO	Government Agencies	Corporates	Other
BNHS	State Forest Department	NPCIL	Schools and colleges in the region
	Dept of Revenue		Regional cultural and social institutions
	College of Fisheries		
	Dept of Port		
	CMFRI		
	Konkan Krishi Vidyapeeth		
	Gram Panchayat		
	State Biodiversity Board		

For Angria Bank

NGO	Government Agencies	Corporates	Other
Science and Technology Park, University of Pune	State Forest Department	-	
BNHS	Ministry of Shipping		
	Indian Coast Guard		
	Indian Navy		

For Thane Creek

NGO	Government Agencies	Corporates	Other
BNHS	Forest Department and forest training institutes	BPCL	Schools and colleges in the region
AWAAZ Foundation	Municipal Corporation of Greater Mumbai		Regional cultural and social institutions
Conservation Action Trust	Thane Municipal Corporation	Hindustan Petroleum Corporation Limited	Saltpan holders
Mangrove Society of India	Navi Mumbai Municipal Corporation	Indian Oil	Media houses
Clean Mumbai Foundation	Revenue Department	TATA Power	Aquacultures
Greenpeace	Tourism Department	Godrej & Boyce	Fishing Community
Srushtidnyan		Aegis Logistics Limited	
	Mumbai Metropolitan Region Development Authority		
	Maharashtra Pollution Control Board		
	Maharashtra Industrial Development Corporation		

NGO	Government Agencies	Corporates	Other
	Maharashtra State Road Development Corporation		
	Maharashtra State Electricity Board		
	State CRZ authority		
	State Disaster Management Authority		
	CMFRI		
	Central Institute of Fisheries Education		
	National Institute of Oceanography		
	National Biodiversity Authority		
	Coast Guard and Indian Navy		
	Coastal Police		
	Mumbai Port Trust		
	NPCI		
	Bhabha Atomic Research Centre		
	State Biodiversity Board		

Direct Users (Primary Stakeholders)

Ansure	Dabhol-Velas	Thane Creek	Angria Bank
Fishermen	Fishermen	Fishermen	Fishermen
Farmers	Horticulturists	Saltpan holders	Indian Navy
Horticulturists	Farmers	Industries	Indian Coast Guard
Administrative bodies	Eco tourism & Agro tourism	Developers	
	Administrative bodies	Administrative bodies	

Direct Users (Primary Stakeholders)

Ansure	Dabhol-Velas	Thane Creek	Angria Bank
Government employees	Government employees	Government employees	-
Local traders, teachers, food processing units etc	Local traders, teachers, food processing units etc	Local traders, teachers, food processing units etc	-

Users by Habitat, purpose, seasonality, gender

Direct Users (Primary Stakeholders)

Criteria	Ansure	Dabhol-Velas	Thane	Angria Bank
Habitat	Mangrove	Mangrove and sandy shores	Mangrove and mudflats	Coral reef
Purpose	Substance fishing, commercial harvesting of shellfish and bivalves, mangrove for fuel in few locations, aquaculture	Substance fishing, commercial fishing, harvesting of shellfish and bivalves, mangrove for fuel, sea turtle tourism, sand mining, industry use, aquaculture	Substance fishing, commercial harvesting of shellfish and crabs, bird watching, saltpans,	Fishery
Seasonality	Mostly from October - June	All these activities are seasonal	Year round	October-May
Gender	Both men and women	Both men and women	Both men and women	Men

Indirect Users (Secondary Stakeholders)

Criteria	Ansure	Dabhol-Velas	Thane	Angria Bank
Habitat	Large population indirectly uses creek for navigation, recreation, ground water recharge of wells etc	Large population indirectly uses creek for navigation, recreation, ground water recharge of wells etc	Large population indirectly uses creek for navigation, recreation, ground water recharge of wells, sand for construction, salt processing	Navy, Coast guards
Seasonality	Seasonal	Seasonal	Seasonal	Seasonal
Gender	Both men and women	Both men and women	Both men and women	Men

Chapter 5

Ecological and Social Status of Selected Sites

It is important to assess the social and ecological status of the selected sites, and in particular the role of the local communities in biodiversity conservation. At present, Maharashtra state has only one marine protected area. Various issues surrounding marine and coastal biodiversity offer a perfect opportunity for participatory conservation regimes.

- Mangroves are severely threatened in and around Mumbai, Thane and Raigad, whereas they are in a better state in Ratnagiri and Sindhudurg districts. However, even in the latter areas, unsustainable developmental work and urbanization pose potential threats.
- Terrestrial forests on mountain slopes and plateau slopes have been degraded to secondary forest in some areas, whereas, good quality forest patches exist in some areas, especially in the relatively 'under developed' talukas. Many places have a seamless mosaic of forests and horticulture. But this balance faces the danger of excessive monoculture if unsustainable land-use conversion takes place.
- Coastal plateaus are severely threatened in areas where industrial, utility and infrastructure activities are taking place. In other areas they are comparatively in a better state.
- Marine ecosystems such as sandy shores, sand dunes, rocky shores, reefs and creeks face issues related to coastal development, urbanization, unregulated tourism and industrial pollution. In the relatively undisturbed areas, especially in Ratnagiri and Sindhudurg, these habitats are in a better state.

The rural ambiance, especially at Dabhol and Ansure, provides a conducive social environment for participatory conservation.

- Most rural communities still lead a largely agrarian and fishing lifestyle, with much less use of natural resources as compared to their urban counterparts. Such communities thus play a vital role in conserving the biodiversity

and habitats of the area.

- Role of traditional belief systems of holistic lifestyles is still evident in rural areas, which naturally translates into maintenance of a richer biodiversity.
- Local customs derived from the belief systems still largely ensure conservation of fisheries stocks, forests and other habitats along with local wildlife, although the same is gradually dwindling.
- The small towns and districts/Taluka headquarters are fast facing urbanization and lifestyle changes at various levels. However, if proper interventions are made in time for a sustainable growth model, these areas can be saved from the fate of today's megacities.
- Role of educators, community leaders. Gram Sabhas and cultural organizations can be vital in effective advocacy at the intervention stage.

Legal Instruments

It is important to study the various laws and legal instruments applicable for better protection of habitats and for the implementation of these laws at the grassroot level. Following is an indicative list of the **applicable laws, regulations and policies:**

- Indian Forest Act, 1927 (including subsequent amendments)
- Wildlife Protection Act, 1972 (amended in 2003 and 2011)
- Environment Protection Act, 1986
- Panchayati Raj Act, 1996
- Biological Diversity Act, 2002
- Forest Rights Act, 2006
- CRZ Regulations
- National Forest Policy, 1988
- Horticulture policy (state level)
- Aquaculture policy (state level)
- Industrial policy (state level)
- National Wildlife Action Plan, 2002-16
- Relevant five-year plan under progress

The most relevant laws that may provide legal instrument for the protection of the sites are appended separately (Annexure 2).

Gap Analysis

Capacity Gap Analysis: The rapid surveys done upto now reflect some gaps in the existing capacities of the various stakeholders which need to be addressed through relevant interventions. At the same time, it has been observed that since conservation of habitats and biodiversity is inherently embedded in the lifestyles and belief systems of the local communities, conservation efforts need to focus on further strengthening the existing capacities.

In light of this, the capacity gaps mentioned in the summary can be detailed as given below. This provides an overview of the level of awarenessamongstindividualsandorganizations, and the extent of cross-stakeholder cooperation.

Knowledge Gaps

1. Lack of integration of modern science and traditional knowledge in natural resource management
2. Dwindling belief in age-old and time-tested holistic living practices. This has created several gaps between the priorities of the older and the younger generation which is easily influenced by the global forces of 'development'
3. Lack of knowledge in terms of benefits of having MPAs vs no MPAs
4. Ignorance or lack of understanding of laws governing natural resources
5. A general lack of knowledge at management level about marine biodiversity

Governance Gaps

1. Top down approach towards conservation
2. Gaps or lack of clarity in existing policies such as Conservation Reserves and Community reserves within Wildlife (Protection) Act 1972
3. Self defeating mandates of various ministries ex. Fisheries and Forests and Environment; Tourism and Forest and Environment; Forest dept and Revenue Dept
4. Revenue lands of mangroves in Ratnagiri district are yet to be transferred to Forest Dept. Large tracts of mangroves are still

privately owned.

The Thane Creek being an industrial belt, the major stakeholders are the industries themselves. Their capacity building about issues such as mangrove conservation, biodiversity conservation, sustainable use of natural resources, pollution control and solid waste management is needed. However, capacity building of the locals cannot be neglected as they are dependent on the creek for their day to day routine.

Table 5
Problem Analysis and Capacity Gap Analysis for the Selected Sites

Ansure	Dabhol-Velas	Thane Creek	Angria Bank
Proposed industrial and utility projects pose threat to biodiversity and social set up	Proposed industrial and utility projects pose threat to biodiversity and social set up	Sand Mining in some areas	Lies in EEZ of India thus required to follow international water treaties
Gradual destruction of terrestrial natural vegetation by monocultures	Upcoming tourism and second home projects pose threat to biodiversity	Large scale mangroves clearing for housing, development and industrial purpose	
Gradual erosion of existing belief systems and sustainable lifestyles	Urbanization at taluka headquarters	Dumping of solid waste, sewage water	
	Gradual erosion of existing belief systems and sustainable lifestyles	Water pollution through industries	
	Mining in some areas	Saltpans and aquaculture	
	Increasing tendency towards a consumerist lifestyle	Encroachment of people from slums	
	Gradual destruction of terrestrial natural vegetation by monocultures		

Recommendations for Possible HCD Interventions

This is the penultimate stage of the project wherein interventions are recommended for filling in capacity gaps among stakeholders. Following is a summary of the initial suggested interventions:

Advocacy
Advocacy interventions with local stakeholders using various capacity building techniques as well as deriving relevant information from traditional knowledge for better community-based conservation – Capacity building can be conducted through the following measures:

- Workshops and Seminars
- Group Discussions
- One-on-one meetings
- Training programmes
- Exhibitions
- Volunteer grooming events
- Nature Trails
- Brochures, leaflets and questionnaires

Communication for Conservation
Interventions pertaining to media for better dissemination of sustainable growth models through appropriate coverage. This can be achieved in the following manner:

- Media training workshops
- Green reporting training programmes
- Field visits for media persons to various ecologically sensitive areas
- Field visits for media persons to successful community conservation initiatives

Good Governance

- Interventions for better management of protected areas through active involvement of various government departments, including Forest and Revenue. Constructive interactions with local, state-level and national policy makers. Here again training programmes, workshops and field visits will be the way forward for heightened awareness
- Value-added economy: Training on improved livelihoods and establishing links between protection and livelihoods

Habitat Assessment & Monitoring

To enumerate the benefits of conservation measures, it is essential to develop robust baselines of biological diversity. Along with this, selected indicator species need to be identified and long term population monitoring done with priority.A detailed Action Plan based on these recommendations will ensure that the requisite training and capacity building exercises are effectively conducted. This will facilitate the following desired goals:

- Improved conservation and management of coastal and marine resources
- Better participatory approaches and minimizing of conflicts between stakeholders and biodiversity
- Alleviation of negative consequences and establishment of synergies
- For Thane Creek site, recommendations include ecological surveys for creating baseline data, capacity building for ecologically sensitive and heritage sensitive sites for the following stakeholders: Tourism Department, Revenue Department, Corporates, Municipal Corporation of Greater Mumbai, Thane Municipal Corporation, Navi Mumbai Municipal Corporation, Bhabha Atomic Research Centre, National Institute of Oceanography, Central Marine Fisheries Research Institute, Fishermen community/ Local community, Salt pan holders, Bharat Petroleum Corporation Limited, Hindustan

Table 6
Recommendations for HCD Interventions

	Ansure	Dabhol-Velas	Thane Creek	Angria Bank
Recommendations	Creating enabling environment, creating organizational capabilities, facilitating cross cultural cooperation, individual participation	Creating enabling environment and organizational capabilities, facilitating cross cultural cooperation, individual participation	Capacity building	
Tools	Workshops, training programs, film screenings, illustrated talks, nature trails, information manuals	Workshops, training programs, film screenings, illustrated talks, nature trails, information manuals	Workshops, training programs, film screenings, illustrated talks, nature trails, information manuals	
Outcome	Better synergies, better transfer of scientific and traditional knowledge, replicability and better implementation	Better synergies, better transfer of scientific and traditional knowledge, replicability and better implementation	Increased interaction, exchange of ideas, replicability	

The following table lists those stakeholders, including organizations, networks and individuals, who are relevant from the viewpoint of partnering for various HCD interventions. By involving these organizations during the delivery of HCD, the sustainability of further training will be safeguarded and mainstreamed at the local level. The following aspects are of importance in this context:

- Social and scientific resources
- Effective resource material
- Capacity development using these material
- Facilitation for implementation of recommendations

Table 7
Resource organizations/networks/individuals (providers)

Ansure	Dabhol-Velas	Thane Creek	Angria Bank
BNHS	BNHS	BNHS	BNHS
Prashant Shinde, Srishtigyan	Sahyadri Nisarga Mitra	Dr. Athalye, B.N. Bandodkar College of Science, Thane	MoEFCC
Mangrove cell, Forest Department	Lokmanya Education Trust	Dr. Arun Joshi, Ex teacher, M.H. High School, Thane	
	Vinayak Mahajan	Mangrove cell, Forest Department	Science and Technology Park, University of Pune
	Dilip Kulkarni	Maharashtra Pollution Control Board	
	SP Mandali's English School, Parshuram	Mumbai University	
	Marathi school at Pedhe	MoEFCC	
	Amraban Resort		
	Krishi Varada		
	Konkan Krushi Vidyapeeth		
	Nisarga Sahavas Resort		
	Saitavadekar (Fisherman – Songaon)		
	Hemand Deodhar (Horticulturist)		

Annexures

Annexure 1
Demographic Data (Census Information 2001)
Dabhol creek
District: Ratnagiri

No	Name & details of village	No. of Households	Population	Male	Female	Literacy (M)	Literacy (F)
Within 1 km area							
1	Bhati (Taluka-Dapoli)	208	835	338	497	233	290
2	Navase (Taluka-Dapoli)	99	601	276	325	238	266
3	Onanvase (Taluka Dapoli)	255	1016	403	613	277	287
4	Gudaghe (Taluka-Dapoli)	186	754	306	448	175	156
5	Umbarghar (Taluka-Dapoli)	112	588	279	309	235	251
6	Panderi (Taluka-Dapoli)	186	785	355	430	253	293
7	Pangari Tarf Haveli (Taluka-Dapoli)	306	1426	597	829	366	423
8	Pharare (Taluka-Dapoli)	239	1099	441	658	304	383
9	Panhalaje Kh. (Taluka-Khed)	108	574	288	286	217	190
10	Panhalaje (Taluka-Khed)	295	1424	607	817	368	330
11	Hodkhad Kh. (Taluka-Khed)	129	627	275	352	188	162
12	Hodarpad (Taluka-Khed)	84	391	158	233	90	98
13	Chougale Mohalla (Taluka- Khed)	83	357	122	235	102	167
14	Bahiravali (Taluka Khed)	313	1395	572	823	350	385
15	Mulgaon (Taluka- Khed)	114	456	201	255	150	154
16	Ashti Bk. (Taluka- Khed)	30	186	82	104	62	82
17	Amshet (Taluka- Khed)	83	462	217	245	177	195
18	Navanagar (Taluka-Guhagar)	283	1339	639	700	432	348
19	Dhopare (Taluka-Guhagar)	181	794	385	409	297	234
20	Tetale (Taluka-Guhagar)	15	71	30	41	16	14
21	Koliwadi Chalkewadi Tr.Dhopale (Taluka-Guhagar)	216	921	380	541	265	268
22	Pangari Tarf Haveli (Taluka-Guhagar)	270	1204	520	684	373	405
23	Bamnoli (Taluka-Chiplun)	292	1212	530	682	371	402
24	Ketki (Taluka-Chiplun)	154	738	353	385	237	207
25	Bhile (Taluka-Chiplun)	301	1433	668	765	523	431
26	Karjikar (Taluka-Chiplun)	268	1612	866	746	726	627
27	Chiplun (M Cl) (Taluka-Chiplun)	9973	46229	23343	22886	19093	17403
28	Pimpli Kh. (Taluka-Chiplun)	566	2492	1290	1202	970	768
29	Dalvatne (Taluka Chiplun)	342	1855	914	941	685	487
30	Kalambaste (Taluka-Chiplun)	555	2625	1372	1253	1148	882
31	Walope (Taluka-Chiplun)	543	2506	1249	1257	1008	853
32	Majarekashi (Taluka-Chiplun)	86	407	177	230	140	168
33	Pedhe (Taluka-Chiplun)	700	3261	1609	1652	1275	1082
34	Ghagwadi (Taluka- Khed)	107	447	222	225	182	146
35	Matwadi (Taluka- Khed)	187	876	400	476	281	259
36	Kotwali (Taluka- Khed)	285	1306	615	691	412	369
37	Shiv Bk. (Taluka- Khed)	57	297	142	155	93	92
38	Koregaon (Taluka- Khed)	194	754	336	418	232	197
39	Nilik (Taluka- Khed)	147	761	344	417	293	316
	TOTAL	**18552**	**86116**	**41901**	**44215**	**32837**	**30070**

Annexure 1 (*Cntd...*)
Demographic Data (Census Information 2001)

No	Name & details of village	No. of Households	Population	Male	Female	Literacy (M)	Literacy (F)
Within 2 km area							
1	Dabhil (Taluka- Dapoli)	316	1349	595	754	416	415
2	Waghivare (Taluka-Chiplun)	336	1547	635	912	448	563
3	Wavghar (Taluka-Dapoli)	234	943	364	579	187	235
4	Bhadavale (Taluka- Dapoli)	212	869	364	505	219	229
5	Tumbad (Taluka-Khed)	159	745	331	414	219	195
6	Savanas (Taluka- Khed)	184	904	358	546	204	201
7	Karjee (Taluka- Khed)	192	951	402	549	269	372
8	Koregaon (Taluka-Khedi)	194	754	336	418	232	197
9	Sakhari Trishul (Taluka-Guhagar)	123	483	213	270	146	148
10	Pardalewadi (Taluka-Guhagar)	179	668	236	432	166	236
11	Visapur (Taluka-Guhagar)	211	756	283	473	185	252
12	Parchuri Kh. (Taluka-Guhagar)	89	394	185	209	127	111
13	Gangrai (Taluka-Chiplun)	253	1260	531	729	375	435
14	Maldoli (Taluka-Chiplun)	407	1986	842	1144	655	841
15	Karambavane (Taluka-Chiplun)	265	1141	521	620	414	365
16	Uktad (Taluka-Chiplun)	13	69	35	34	28	19
17	Kherdi (Ct) (Taluka-Chiplun)	2503	10702	5659	5043	4467	3486
18	Khandat (Taluka-Chiplun)	286	1346	669	677	486	379
19	Dhamandevi Mohalla (Taluka-Chiplun)	88	490	203	287	178	238
20	Pedhe (Taluka- Khed)	307	1296	638	658	540	481
21	Mete (Taluka- Khed)	199	1026	485	541	346	285
22	Anjani (Taluka- Khed)	470	2106	926	1180	657	642
23	Ashti (Taluka- Khed)	63	338	160	178	133	133
24	Kondivali Kh. (Taluka-Khed)	103	559	246	313	161	194
	TOTAL	**7386**	**32682**	**15217**	**17465**	**11258**	**10652**
Within 5 km area							
1	Unhavare (Taluka Guhagar)	310	1284	586	698	376	315
2	Peth Anjanwel (Taluka Guhagar)	204	1159	526	633	394	380
3	Pere (Taluka Guhagar)	271	1185	532	653	390	404
4	Karul (Taluka Guhagar)	227	965	422	543	323	325
5	Daphalewadi (Taluka Guhagar)	78	270	98	172	57	61
6	Vadad (Taluka Guhagar)	360	1511	680	831	441	378
7	Lonari Chivali Bandar (Taluka- Chiplun)	201	978	402	576	276	330
8	Donavali (Taluka-Chiplun)	365	1550	634	916	444	555
9	Dhamanvane (Taluka-Chiplun)	337	1794	906	888	681	587
10	Dhamandevi (Taluka-Khed)	673	2760	1409	1351	1055	818
11	Lote (Taluka- Khed)	925	3633	2081	1552	1609	929
	TOTAL	**3951**	**17089**	**8276**	**8813**	**6046**	**5082**

Velas
District Ratnagiri

No	Name & details of village	No. of Households	Population	Male	Female	Literacy (M)	Literacy (F)
Within 1 km area							
1	Velas (Taluka-Mandangad)	161	707	359	348	272	242
2	Kelashi (Taluka-Dapoli)	773	3418	1599	1819	1277	1238
3	Padale (Taluka-Dapoli)	109	385	171	214	134	149
4	Ade (Taluka-Dapoli)	423	2189	995	1194	660	621
5	Anjarla (Taluka-Dapoli)	407	1654	776	878	642	624
6	Tadachakond (Taluka-Dapoli)	94	328	132	196	87	92
7	Juikar Mohalla (Taluka-Dapoli)	362	1885	1054	831	746	516
8	Kongle (Taluka-Dapoli)	136	468	179	289	108	157
9	Pandhari (Taluka-Dapoli)	971	5635	2693	2942	1549	910
10	Karde (Taluka-Dapoli)	349	1250	548	702	433	434
11	Murud (Taluka-Dapoli)	419	1645	750	895	602	651
12	Teleshwarnagar (Taluka-Dapoli)	97	494	173	321	122	166
13	Shital Nagar (Taluka-Dapoli)	125	407	139	268	75	107
14	Kolthare (Taluka-Dapoli)	270	1223	569	654	449	442
15	Aghari (Taluka-Dapoli)	177	654	240	414	155	173
16	Bhati (Taluka-Dapoli)	208	835	338	497	233	290
	TOTAL	5081	23177	10715	12462	7544	6812
Within 2 km area							
1	Tadil (Taluka-Dapoli)	375	1636	684	952	475	540
2	Bandhativare (Taluka-Dapoli)	186	656	268	388	161	192
3	Adkhal (Taluka-Dapoli)	179	688	299	389	217	212
4	Waghave (Taluka-Dapoli)	107	392	156	236	98	132
5	Kalambat (Taluka-Dapoli)	159	559	231	328	129	149
6	Sarang (Taluka-Dapoli)	203	918	376	542	275	332
7	Saldure (Taluka-Dapoli)	89	342	166	176	131	104
8	Chandranagar (Taluka-Dapoli)	270	1152	494	658	345	359
9	Ladghar (Taluka-Dapoli)	399	1604	746	858	570	554
10	Tamastirth (Taluka-Dapoli)	170	708	322	386	257	275
	TOTAL	**2137**	**8655**	**3742**	**4913**	**2658**	**2849**
Within 5 km area							
1	Ambavali Kh. (Taluka-Dapoli)	112	457	196	261	148	155
2	Panchanadi (Taluka-Dapoli)	363	1665	786	879	590	538
3	Vanoshi Tarf Panchanadi (Taluka-Dapoli)	485	1978	795	1183	527	549
	TOTAL	**960**	**4100**	**1777**	**2323**	**1265**	**1242**

Ansure

No	Name & details of village	No. of Households	Population	Male	Female	Literacy (M)	Literacy (F)
Within 1 km area							
1	Dandewadi (Taluka-Rajapur)	114	446	197	249	154	154
2	Ansure (Taluka-Rajapur)	536	2113	857	1256	607	661
3	Hurse (Taluka-Rajapur)	41	146	61	85	50	45
4	Gothivare (Taluka-Rajapur)	119	461	226	235	144	109
5	Shirse (Sagave) (Taluka-Rajapur)	86	341	159	182	121	106
	Total	**896**	**3507**	**1500**	**2007**	**1076**	**1075**
Within 2 km area							
1	Mithgavane (Taluka-Rajapur)	445	1816	829	987	604	599
2	Madban (Taluka-Rajapur)	130	437	196	241	165	152
3	Janshi (Taluka- Rajapur)	96	403	169	234	120	134
4	Karivane (Taluka-Rajapur)	209	926	424	502	305	251
5	Burbewadi (Taluka-Rajapur)	148	682	148	682	220	222
6	Palye (Taluka-Rajapur)	66	298	142	156	104	86
7	Bakale (Taluka-Rajapur)	65	268	119	149	91	80
8	Kuveshi (Taluka-Rajapur)	206	797	358	439	283	261
9	Tulsundewadi (Holi) (Taluka-Rajapur)	111	570	284	286	202	150
10	Niveli (Taluka-Rajapur)	61	233	106	127	78	58
11	Padave (Taluka-Rajapur)	106	528	241	287	175	152
	Total	**1643**	**6958**	**3016**	**4090**	**2347**	**2145**
Within 5 Km Area							
1	Tivarambi (Taluka-Rajapur)	3	15	9	6	7	6
2	Sakhar (Taluka-Rajapur)	333	1292	550	742	382	379
3	Varilwadi (Taluka-Rajapur)	101	414	182	232	149	135
4	Katradevi (Sagave) (Taluka-Rajapur)	151	809	383	426	279	215
5	Sagave (Taluka-Rajapur)	87	392	179	213	141	126
6	Jambhari Sagave (Taluka-Rajapur)	252	1230	564	666	424	430
7	Katali (Taluka-Rajapur)	303	1470	664	806	474	451
8	Doniwade (Taluka-Rajapur)	278	1283	566	717	387	351
9	Nate (Taluka- Rajapur, District- Ratnagiri)	426	1850	873	977	613	545
10	Holi (Taluka-Rajapur)	135	550	233	317	167	165
11	Chavhatawadi (Taluka-Rajapur)	49	204	96	108	83	75
12	Jaitapur (Taluka-Rajapur)	76	265	124	141	106	114
13	Dale (Taluka-Rajapur)	172	668	299	369	235	216
14	Sogamwadi (Taluka-Rajapur)	190	778	306	472	200	219
15	Rautwadi (Taluka-Rajapur)	286	1277	500	777	340	391
16	Devache Gothane (Taluka-Rajapur)	291	1144	442	702	312	363
	TOTAL	**3133**	**13641**	**5970**	**7671**	**4299**	**4181**

Annexure 2
Indian Laws and Policies relevant to Community Conserved Areas as Applicable for Identified Sites

Act	Provision/s	Strengths	Weaknesses	Application for selected sites
National Acts				
Indian Forest Act (IFA) 1927	• Conversion of RF into VF if the LC ask and fulfil certain requirements • LC is then vested the powers of the FD for management of VF	• Good provision for forest CCAs • One of the best legal supports as it leaves the institutional arrangements, rules and regulations largely to the local communities as long as the objective of effective management and protection is fulfilled.	• Not implemented anywhere in India in its true spirit • Where implemented provisions diluted • Government retains the power to grant or withdraw the status of VFs, with no clear provision on how and under what conditions such decisions should be taken.	May not be applicable
Wildlife Protection Amendment Acts, 1972 as amended in 2003 (WLPA) 2003	New categories - Community Reserves and Conservation Reserves. Community Reserves can be declared on privately owned or community lands (the definition of which is not clear). Conservation Reserves can be declared by the government on government owned lands in consultation with the local people.	Community Reserves can provide legal support to CCAs on private or community lands. (3 declared so far) Conservation Reserves for the first time in Indian wildlife conservation history provide a space for consultation with local people before declaration of the reserve and seeks their inputs in the management of the reserve. A Conservation Management Committee has to be constituted and represented (About 40 declared so far)	• State government can declare without the consent of the community (e.g. Kokare Bellure) • Most documented CCAs in India exist on government land, so may not be eligible to be declared Community Reserves. • Existing PAs cannot be converted to CRs without de-notifying them first. • The Act mandates a uniform management institution, with panchayat members and the local forest officer in the committee. • Conservation Reserves does not recognise existing systems of community management and the overall in-charge remains the Chief Wildlife Warden, with the community's role being largely advisory.	Conservation and Community ReservesCould be one of thepossibilities but points to remember would be: The overall decision making power rests with the FD. The management committee only has advisory role. The final decision about any recommendation by the committee in the management plan would rest with the CWLW Act is not clear on what activities are allowed. This could be good as then the management committee could decide based on actual impact of the activity but could be ineffective if FD interprets it in a way which means that no activities are allowed inside. The Act does not define how the rest of the community will be involved in the process of making the management. This should be clarified right in the beginning to ensure that the process does not remain restricted to just a few heads of panchayat and other government and non government functionaries only.

Annexure 2 (*Cntd...*)
Indian Laws and Policies relevant to Community Conserved Areas as Applicable for Identified Sites

Act	Provision/s	Strengths	Weaknesses	Application for selected sites
National Acts				
Environmental Protection Act, (EPA) 1986	• Ecosystems and landscapes can be notified Ecologically Sensitive Areas (ESA). • Restricts certain identified commercial, industrial and development activities.	Potentially a strong tool. Is extremely open in the way it is notified, the committee that would be set up and the manner it would be managed Anyone can initiate the proposal. The committee once formed is completely independent to manage itself, frame its own rules and regulations and monitor its activities	• Communities know little about this Act and how it can be used. • There are a number of ESA in the country, but none covering CCAs. • Its relevance for CCAs has not been really tested on ground yet.	One of the best options among the ones mentioned here. The panchayat members and NGO will have to play an important long term role. Panchayat members with support from State Government and NGO will have to initiate the proposal and send it to the MoEFCC justifying why it is important to declare this an ESA. MoEFCC will only accept it if the local government has no objection to its declaration (therefore lobbying with the local administration beforehand will be important) Once accepted members need to discuss who should be part of the ESA committee. This committee could include the panchayat members, leading NGOs, the local administrator, fisheries department, other relevant departments and individuals. Composition is extremely important as this committee will be responsible for all decisions related to the ESA Committee will be absolutely independent.
			State government can declare without the consent of the community (e.g. Kokare Bellure)	The management committee only has advisory role. The final decision about any recommendation by the committee in the management plan would rest with the CWLW

Annexure 2 (*Cntd...*)
Indian Laws and Policies relevant to Community Conserved Areas as Applicable for Identified Sites

Act	Provision/s	Strengths	Weaknesses	Application for selected sites
National Acts				
Panchayati Raj (Extension to Scheduled Areas) Act 1996 (PESA)	• Intends decentralisation of governance to rural bodies, like panchayats (village councils) and gram sabhas (village assemblies) in predominantly tribal ('scheduled' under constitution) areas. • Confers the ownership and decision-making rights over non-timber forest products (NTFP) to local institutions. • Mandates consultation with local communities regarding many developmental and other issues relevant for a site.	• Strong potential to integrate and enhance conservation and livelihoods needs • Could help communities to resist destructive forces	• In most states where implemented, its provisions have been diluted in the state adaptations of the Central Act. • Government forests and PAs have been excluded from the jurisdiction of the Act. • Slow or no implementation in most states	Need to see the applicability

Annexure 2 (*Cntd...*)
Indian Laws and Policies relevant to Community Conserved Areas as Applicable for Identified Sites

Act	Provision/s	Strengths	Weaknesses	Application for selected sites
National Acts				
Biological Diversity Act, (BDA) 2002	• Three tier structure • Mandates creation of Biodiversity Management Committees (BMC) at the village level. • BMCs are expected to manage, protect and record local biological diversity. • The National Biodiversity Authority and the State Biodiversity Boards established under the Act are required to consult the local BMCs while taking decisions related to the use of biological resources and knowledge associated with such resources. • Provides for the declaration of areas being conserved for agricultural or wildlife biodiversity as Biodiversity Heritage Sites (BHS).	• Biodiversity Heritage Sites could be used to provide legal backing to CCAs.	• The BD Rules 2004 fail to empower BMCs to manage, use and conserve natural ecosystems. Their primary function is limited to recording local knowledge, and to help the state and national level boards to grant permission for the use of biological resources and knowledge associated with it, in their areas. • Not clear whether they can deny the permission once it has been accepted by the NBA. No prior consent needed.	Biodiversity Heritage Site could be a good option Formation of Biodiversity Management Committee could also be an option. However it will have to be ensured right from the beginning that BMC will be managing the resources as per the management plan drafted by them.

Annexure 2 (*Cntd...*)
Indian Laws and Policies relevant to Community Conserved Areas as Applicable for Identified Sites

Act	Provision/s	Strengths	Weaknesses	Application for selected sites
National Acts				
Scheduled Tribes and Other Traditional Forest-Dwellers (Recognition of Forest Rights) Act (FRA) 2006	Provides the establishment of several rights to tribal and forest dependent communities, including to forest lands and resources. The Act also stresses coexistence in PAs. Empowers communities to declare any forest that they have been conserving and protecting as Community Forests.	• Allows for a greater role and empowerment of Gram Sabha (local governing bodies) in determining claims, managing forests it has traditionally conserved, checking processes destructive of forest-dwellers' habitats, and protecting traditional knowledge. • Allows for greater livelihood security for forest-dwellers who have been unjustly denied tenure, and mandates that any displacement and relocation can happen only by consent. • Provides greater possibility of community involvement in government managed PAs. • Provides for legal backing of forested CCAs in the form of 'Community Forest'. This is a category under which the local communities can legally protect and manage any forest that they have been traditionally protecting and can establish suitable institutions, rules and	• There is lack of clarity on how the CF provision will be operationalised. Much depends on the content of the rules that are currently being formulated. • The fact that 'encroachments' on forest lands upto December 2005 are eligible for regularization, gives rise to possibilities of misuse by vested interests who will incite fresh encroachments. In some parts of India there is a fear that CCAs could also be affected by this. • Certain development projects and activities (eg. construction of roads) for the purpose of village development have been excluded from clearances under the Forest Conservation Act. This opens up a potential for misuse at some sites to allow destructive projects in forest areas. • This Act has an unclear relationship with existing forest/wildlife laws. In particular, the institutional arrangement for enforcement of community rights and responsibilities is not clear.	Meant for forest areas. Can be applicable for Dabhol and Ansure, if the definition of a forest can be extended to mangroves

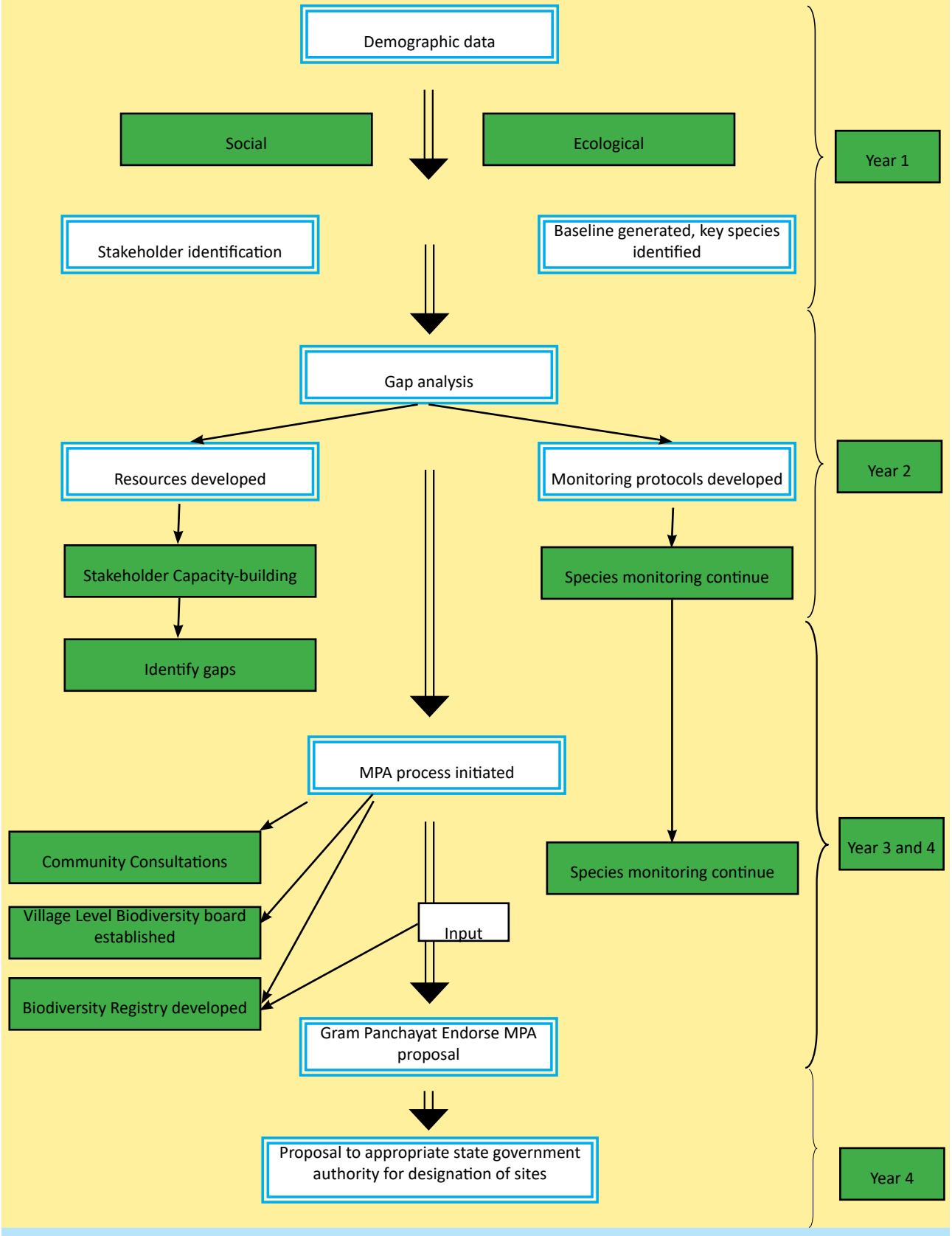
Annexure 2 (*Cntd...*)
Indian Laws and Policies relevant to Community Conserved Areas as Applicable for Identified Sites

State Acts				
There may be Acts more relevant for marine areas, which are not reflected in this table				
Policies and Action Plans	**Provisions**	**Strengths**	**Weaknesses**	**Applicability to selected sites**
National Forest Policy (NFA) 1988	• This policy deals with conservation and management of forests, afforestation with rules governing people's access to government owned forests and their products.	• This policy for the first time after Indian Independence placed greater importance on using local forest resources to meet local people's needs rather than industrial needs. • The policy stresses on the involvement of local people in the management of forests. Resulting into the Government Resolution on Joint Forest Management (JFM) in 1990.	• The policy has not been translated adequately into law as yet (the IFA 1927 remains in place even today). It is for this reason that many of its progressive provisions have remained unimplemented. • JFM still has no legal backing. • Success of JFM is mixed depending often on attitudes of the officers incharge, level of empowerment of the local community and availability of funds	The area could be jointly managed by the Panchayat members and the Forest Department but the following will have to be kept in mind: • Not sure whether the scheme can be extended to marine areas • The arrangement will have no legal status • Forest Department will have a major say on all matters including the management plan and activities to be allowed and not to be allowed. • FD can claim benefits from a part of the harvest from the area

Annexure 2 (*Cntd...*)
Indian Laws and Policies relevant to Community Conserved Areas as Applicable for Identified Sites

National Wildlife Action Plan, (NWAP) 2002-2016	This plan deals with policy imperatives and strategic actions to conserve wildlife in and outside PAs, to manage these PAs, to prevent illegal trade on endangered species, to ensure people's participation in the conservation of wildlife, to promote ecotourism in PAs, among others.	• The plan envisages the involvement of local communities residing in and around PAs in the management of natural resources. • According to this plan, local communities must participate in and benefit from ecotourism developments in wildlife areas. • Community initiatives in conservation are to be supported.	• NWAP is yet to make a difference, as implementation is seriously lagging. Despite having identified specific timelines for achieving its objectives no move has been made towards its implementation. Not clear who will implement it, how, and under what law? • It does not go the full distance in establishing tenurial security and a share in decision-making of PAs for local communities. • The legal environment needed to implement the NWAP is also not in place as the Wildlife Protection Act does not envisage participation of people in establishment and creation of PAs.	Good policy but no legal instrument to implement so will not be of much use.
11th Five year scheme, Integrated Development of Wildlife Habitats	• Provision for financial support to Community Reserves and Conservation Reserves • Financial support to CCAs under 'Protection of Wildlife outside PAs'.	• Intends to support CCAs irrespective of their legal status • Guidelines take into account the diversity of CCA situations.	• Has to be implemented by the wildlife wing of the forest department. Most CCAs are not in their jurisdiction so a lack of clarity about the implementation of the scheme.	The Panchayat in any case sends a proposal from the local wildlife office to receive some financial assistance under this scheme for some of the activities that they envisage for conservation and livelihoods. The scheme has to be implemented by the forest department.

Annexure 3
Implementation Strategy



Annexure 4
Resource Persons and Institutions

- Uday Joshi - Farmer / trader
- Dilip Kulkarni – Educator / writer
- Prasad Thatte – Agro tourism
- Vinayak Mahajan – Agro-based industry
- Vikrant Patil – Farmer / software engineer
- Digambar Joshi - Farmer
- Prakash Joshi – Farmer / eco tourism
- Dr Raja Dandekar – Educationist / teacher / horticulturist
- Abhijit Khulapkar – Fisherman / farmer
- Siddhi Khulapkar – Housewife / fisherwoman / farmer
- Dr. Athalye, B.N. Bandodkar College of Science, Thane
- Dr. Arun Joshi, Ex teacher, M.H. High School Thane
- Mr. Hemant Karkhanis, Officer- Mangrove centre, Godrej and Boyce Ltd, Mumbai

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Documentation of interviews

- All the above mentioned stakeholders were interviewed

Fact Sheet for each institution listed as resource organization in the report

Note: Organizations to be considered for activities under the project should be evaluated. This could be done by using the fact sheet as given below.

Annexure 5
Fact sheet for Resource Organizations

General Information:

1. Name of organization:
2. Status: Public, private, autonomous, informal
3. Geographical focus: National/ Name of particular State or district of the State
4. Type of capacity-strengthening programmes they are engaged in:
5. Target group:
6. What is their thematic focus?
7. Details on their training cycle/ calendar/ planning cycle
8. Information on the existing training/ capacity building networks they are part of (with reference to the 4 project states)

	Strength	**weakness**	**Opportunity**
Legitimacy • Institutional position and status • Mandate • Responsibilities • Governance / accountability • Political support			
Organisation ▪ • Organisational structure (departments, units) • Management structure • Number of staff involved in activities related to conservation and management of coastal and marine issues • Organisational culture / leadership			
Human resources ▪ Number of staff involved in matters of coastal and marine issues (management, administration, operational) • Human resources management structure • Staff turnover • Training possibilities • Motivation level of staff and management • Awareness • Knowledge • Technical skills • Soft skills (communication etc.) • Managerial skills • Key persons in the context of the project			

Annexure 5 (*Cntd...*)
Fact Sheet for Resource Organizations

	Strength	**weakness**	**Opportunity**
Financial and material resources▪ • Financial resources available for coastal and marine matters • Material resources available • Relevant equipment • Infrastructure relevant for the project (training facilities etc.) • Training courses relevant for the project available			
Networks / position in the system • Dependencies • Direct and indirect connections with other stakeholders • Cooperation with other stakeholders, associations or networks			

- Policy interventions and realignment with objectives: Bridging gaps in Policies
- Rigorous scientific (Ecological and Social) assessment of sites

About the Study

The study titled *Implementation Strategies for Maharashtra* explores conservation and sustainable management options for selected coastal and marine sites of the state of Maharashtra, India. This includes Thane Creek, Velas- Dabhol coastal stretch, Ansure Creek and Angria Bank. Based on the recently undertaken rapid survey of the Konkan region, the study suggests certain advocacy interventions, capacity building techniques etc. that could efficiently effect better and community-based conservation of the area.

The CMPA Project

The project 'Conservation and Sustainable Management of Coastal and Marine Protected Areas' (CMPA)is a project of the Indo-German technical cooperation. It is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and implemented by the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of BMUB.

Established to support the achievement of the Aichi targets of the Convention on Biological Diversity, the Project's overall goal is to contribute to conservation and sustainable use of biodiversity in selected areas along the coast of India. Taking into consideration the economic importance of the coastal zone for large segments of the population, the Project's approach is people-centered, thus ensuring the support for conservation by those depending on coastal ecosystems.

CMPA Technical Report Series

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Implementation Strategies for Maharashtra

October 2014

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of :
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
of the Federal Republic of Germany

Indo-German Biodiversity Programme
Conservation and Sustainable Management of Coastal and Marine Protected Areas