



## Report on Existing Beach Usage and Practices in Velas, Keslhi and Anjarle villages in coastal Maharashtra, for Conservation and Sustainable Management of Marine Areas (CMPA)

by  
Sahyadri Nisarga Mitra

February, 2016



**CMPA Technical Report Series No. 18**

Report on Existing Beach Usage and Practices in Velas, Keslhi and Anjarle vil-  
lages in coastal Maharashtra, for Conservation and Sustainable Management of  
Marine Areas (CMPA)

**Author**

Sahyadri Nisarga Mitra

**Published by**

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Indo-German Biodiversity Programme (IGBP),  
GIZ-India, A-2/18, Safdarjung Enclave,  
New Delhi - 110029, India  
E-mail: [biodiv.india@giz.de](mailto:biodiv.india@giz.de)  
Web: [www.giz.de](http://www.giz.de)

**February 2016****Responsible**

Dr. Konrad Uebelhör, Director, GIZ

**Photo Credit**

Supriya Jhunjunwala

**Design**

Commons Collective, Bangalore  
[shibipeter@gmail.com](mailto:shibipeter@gmail.com)

**Layout**

Raul Anaya  
[wanderingpencil@rediffmail.com](mailto:wanderingpencil@rediffmail.com)

**Disclaimer**

The views expressed in this document are solely those of the authors and may not in any circumstances be regarded as stating an official position of the Ministry of Environment, Forests and Climate Change (MoEFCC), Government of India, nor the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) or the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The designation of geographical entities and presentation of material in this document do not imply the expression or opinion whatsoever on the part of MoEFCC, BMUB, or GIZ concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Reference herein to any specific organization, consulting firm, service provider or process followed does not necessarily constitute or imply its endorsement, recommendation or favouring by MoEFCC, BMUB or GIZ.

# Report on Existing Beach Usage and Practices in Velas, Keslhi and Anjarle villages in coastal Maharashtra, for Conservation and Sustainable Management of Marine Areas (CMPA)

by  
Sahyadri Nisarga Mitra

February 2016

CMPA Technical Report Series

---

18



### **Disclaimer**

This study has been financed through a contract with the project on “Conservation and Sustainable Management of Coastal and Marine Protected Areas” (CMPA), of the Indo-German Biodiversity Programme. The Project is jointly implemented by the Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India, and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB).

The information presented and the views expressed in this report are those of the author(s) and do not necessarily reflect the views of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, nor of the Ministry of Environment, Forests and Climate Change, or the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH.

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of MoEF&CC, BMUB, or GIZ concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific organisations, companies or products of manufacturers, does not imply that these have been endorsed or recommended by MoEF&CC, BMUB, or GIZ in preference to others of a similar nature that are not mentioned.



This publication has been developed under the project, 'Conservation and Sustainable Management of Coastal and Marine Protected Areas (CMPA) of the Indo-German Biodiversity Programme (GIZ).

The CMPA Project has been commissioned by the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB), under the International Climate Initiative (IKI). It is implemented by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of BMUB. In Maharashtra, Mangrove Cell, Maharashtra Forest Department implemented the project in three sites: Thane creek, Velas-Dabhol coastal stretch and Ansure creek.

### **Sustainable Management of Coastal and Marine Protected Areas in Maharashtra (CMPA)**

#### **Project Team:**

#### **National Project Coordinator, CMPA Project**

Dr. J. R. Bhatt, Advisor, Ministry of Environment, Forest and Climate Change, Government of India

#### **Responsible**

Dr. Konrad Uebelhör, Director, Indo-German Biodiversity Programme, GIZ India

Mr Edgar Endrukaitis, Former Director, Indo-German Biodiversity Programme, GIZ India

Dr. J. Michael Vakily, Team Leader, CMPA Project, Indo-German Biodiversity Programme, GIZ India

#### **Nodal Officer for Maharashtra**

Mr. N. Vasudevan, Additional Principal Chief Conservator of Forests, Mangrove Cell

#### **Coordination for Maharashtra**

Ms. Supriya Jhunjhunwala, GIZ Adviser, Maharashtra, and Technical Expert, CMPA Project, Indo-German Biodiversity Programme, GIZ India

# Chapters

# Pages

<b>1</b>	<b>ACKNOWLEDGEMENT</b>	x
	<b>EXECUTIVE SUMMARY</b>	xi
	<b>BACKGROUND</b>	01
	1.1. Coastal ecosystem: Management challenges.....	02
	1.2. Study area details.....	02
<b>2</b>	<b>LITERATURE REVIEW</b>	04
	2.1. Olive Ridley sea turtle nesting.....	04
	2.2. Policy and legislation.....	05
	2.2.1. Wildlife (Protection) Act, 1972.....	05
	2.2.2. Coastal Regulation Zone Notification, 2011.....	05
	2.3. Turtle tourism and conservation.....	05
<b>3</b>	<b>OBJECTIVES OF THE REPORT</b>	07
<b>4</b>	<b>METHODOLOGY</b>	08
	4.1. Stakeholder identification.....	08
	4.2. Interaction with stakeholders in beach management.....	09
	4.3. Profiling litter and waste on the beach.....	09
<b>5</b>	<b>ANALYSIS AND DISCUSSION</b>	10
	5.1. Stakeholders in beach management.....	10
	5.1.1. Local.....	11
	5.1.2. External to study villages.....	11
	5.2. Beach use by villagers.....	12
	5.3. Tourism on the beach.....	12



	5.4. Litter and waste on the beach .....	12
	5.5. Volume of litter and waste on the beach .....	15
<b>6</b>	<b>DISCUSSION AND FOLLOW UP</b>	16
	6.1. Challenges for beach management in study villages.....	16
	6.2. Follow up .....	16
	References.....	18
	<b>LIST OF ANNEXURES</b>	23
	Annexure 1: List of resource persons .....	23
	Annexure 2: Research team .....	23
	Annexure 3: The questionnaire used to collect information on beach management .....	24

## LIST OF FIGURES

Figure 1	Geographical location of study villages .....	02
Figure 2	Velas beach usage .....	11
Figure 3	Kelshi beach usage .....	11
Figure 4	Anjarle beach usage .....	11
Figure 5	Velas beach litter profile.....	13
Figure 6	Kelshi beach litter profile .....	13
Figure 7	Anjarle beach litter profile.....	13
Figure 8	Percentage-wise breakup of toilet waste disposal methods in Velas .....	14
Figure 9	Percentage-wise breakup of toilet waste disposal methods in Kelshi .....	14
Figure 10	Percentage-wise breakup of toilet waste disposal methods in Anjarle .....	14

## LIST OF TABLES

Table 1	Biodiversity in study villages.....	01
Table 2	Stakeholders in beach management .....	08
Table 3	Beach use categories and their percentage.....	12
Table 4	Tourism peaks in study villages .....	12
Table 5	Beach litter profile in study villages .....	13
Table 6	Percentage of household toilet waste disposal types in study villages .....	14
Table 7	Beach litter weight before and after high tide.....	15

## LIST OF PHOTOS

Photo 1	Waste profiling .....	19
Photo 2	Weighing the waste .....	19
Photo 3	Display board on beach cleaning .....	20
Photo 4	Display board on beach cleaning .....	20
Photo 5	Faecal matter and syringe washed ashore in Velas .....	21
Photo 6	Medical waste at Velas beach .....	21
Photo 7	Plastic bottle washed ashore in Anjarle .....	22
Photo 8	Plastic bag washed ashore in Anjarle .....	22
Photo 9	Plastic sack washed ashore in Anjarle .....	22
Photo 10	Religious waste washed ashore in Anjarle .....	22

## LIST OF ACRONYMS

CMPA	Coastal and Marine Protected Area
GIZ	Gesellschaft für Internationale Zusammenarbeit
SNM	Sahyadri Nisarga Mitra
ToR	Terms of Reference
MoEFCC	Ministry of Environment, Forests and Climate Change
Gol	Government of India
SHG	Self Help Group
IUCN	International Union for Conservation of Nature
CRZ	Coastal Regulation Zone

# Acknowledgement

---

Sahyadri Nisarga Mitra would like to thank the organisations and individuals mentioned below for the information and insights they shared with us:

1. Villagers of Velas, Kelshi, and Anjarle who generously spared time to answer our queries while collecting data for this report.
2. Gram Panchayats of Velas, Kelshi, and Anjarle and their office-bearers.
3. All primary and middle schools in Velas, Kelshi, and Anjarle.
4. Joint Forest Management Committee and Kasav Mitra Mandal in Velas
5. Primary Health Centre, Kelshi and its office bearers
6. Maharashtra State Forest Department, in particular Mr. Vasudevan, IFS, Chief Conservator of Forests & Head of Mangrove Cell; Mr. Jagtap, IFS, DCF, Ratnagiri Division (Territorial) Chiplun; Mr. Patki; RFO, Dapoli and field staff in Velas, Kelshi, and Anjarle
7. GIZ team, in particular Mr. Edgar Endrukaitis, Director, Indo-German Biodiversity Programme; Dr. Jan Michael Vakily, Team Leader, Conservation of Coastal and Marine Areas (CMPA) Project; Ms. Supriya Jhunjunwala, Advisor & Coordinator for Maharashtra, CMPA Project and Dr. Aaron Savio Lobo, Advisor and Coordinator for Goa & Tamil Nadu.

# Executive Summary

---

This report describes and analyses current beach usage in the study villages; Velas, Kelshi, and Anjarle in the Konkan region. It is part of a larger exercise to develop guidelines for beach management in these villages.

This report provides an overview of management challenges and policy provisions to manage beaches in India. The legal framework to regulate undesirable activities on beaches includes Coastal Zone Regulation Notification of 2011 under the Environment Protection Act, 1986 and Wildlife (Protection) Act, 1972. In beach management, solid waste washed in by the tidal waves is a major challenge. Unchecked release of pollutants and sewage in the open sea is another major challenge for beach management as affects marine and inter-tidal biodiversity.

The study villages are situated on India's western coast along the Arabian Sea. The villages have a long, flat beach that stretches for an average of 2 kms in length. All the study villages are located along a creek where a river meets the sea. Thus, the villages also have mangroves. The study villages are popular tourist destinations and are famous for their proactive efforts to conserve Olive Ridley sea turtles.

We identified 20 stakeholders for beach management in the study villages. They are categorised as local, external to the village, individual and institutional stakeholders. The important stakeholders include Gram Panchayat (village council), Biodiversity Management Committee, State Forest Department and mining-dredging companies.

Current beach usage at the local level includes relaxation, shallow-water fishing, crab-hunting, occasional uses such as immersion of

Ganesh idols, and for defecation. There is no system for domestic sewage disposal in the study villages and it is generally released into the creek.

Tourists visit Kelshi and Anjarle throughout the year, while in Velas tourism is restricted to the two months of February and March around the turtle festival.

# Chapter 1

## Background

Coastal villages in the Konkan region are richer in biodiversity than inland ecosystems as they have terrestrial as well as estuarine, inter-tidal, and marine biodiversity. In 2014, a Rapid Biodiversity Assessment was conducted in the study villages (Patwardhan, 2014) to document species diversity in the area (Table 1).

The beaches are an important aspect of coastal villages. They serve as a habitat for numerous species, especially non-vertebrates like molluscs and crustaceans. Mega fauna such as marine

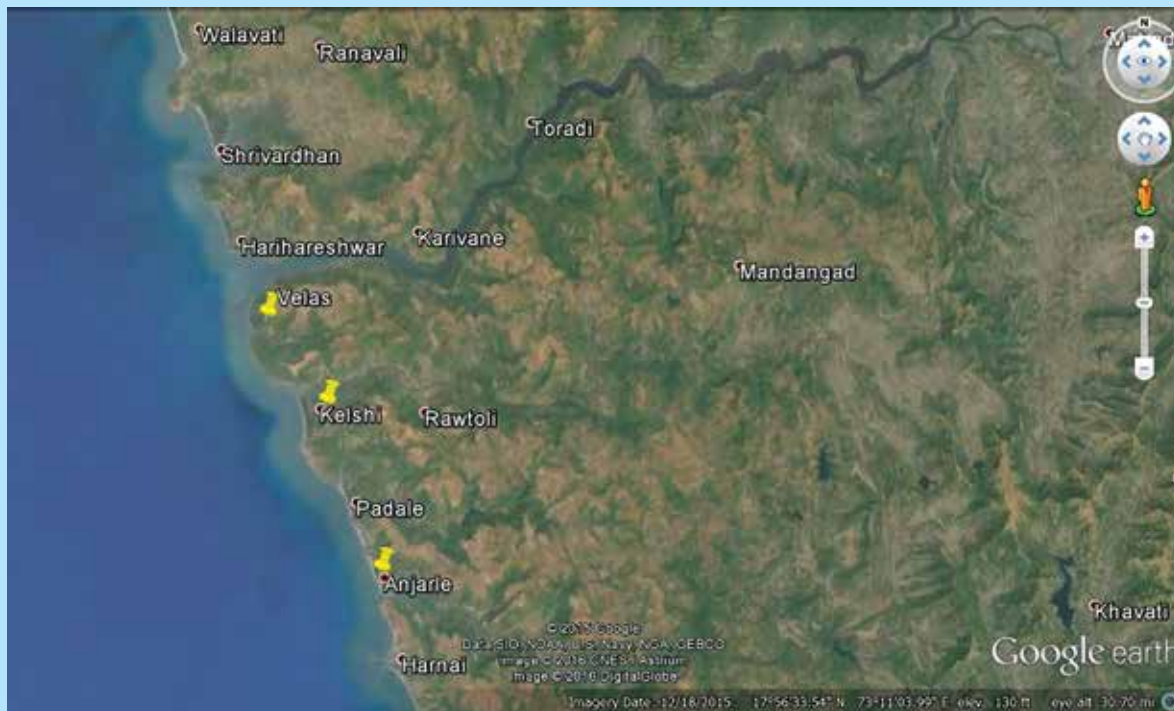
turtles use sandy beaches for mass nesting. Beaches are also very important from an economic perspective as they are an important site for tourism. Both biodiversity conservation and economic activities are important for beach management and need to be balanced to ensure that neither is negatively affected by management practices. Thus, destruction of biodiversity must be minimised, while ensuring that eco-friendly tourism practices are followed in coastal villages. The first step towards such a management regime is to identify stakeholders for beach management.

**Table 1**  
**Biodiversity in study villages**

SN	Organismic group	Number of species
1	Mangrove and mangrove associates	22
2	Wild flowers (herbs and shrubs)	27
3	Coastal invertebrates	17
4	Butterflies	30
5	Fishes	>25 <sup>1</sup>
6	Birds	49
7	Coastal and marine mammals	4

<sup>1</sup> Based on estimated reported from a study (Tike et al, 2009) carried out in a similar area in the Konkan region.

Figure 1: Study villages



2

Then, these stakeholders will need to be sensitised about the impact of existing practices on biodiversity. Finally, stakeholders will need to work together to ensure balance between biodiversity conservation and tourism on the beach. In this context, this report provides an overview of the current status of beach management in the study villages. This report is part of a large exercise of develop guidelines for beach management in these villages.

### 1.1. Coastal ecosystem: Management challenges

Coasts and beaches are rich in natural resources that sustain various stakeholders. A large part of global trade and commerce depends on sea transport. The fishing community relies on the inter-tidal zone and offshore areas for sustenance. The tourism industry is centred on the beaches with the sea being a key attraction. The sea is believed to have enormous remedial capacity and receives treated, partially-treated, and untreated sewage, industrial effluents, and solid waste from coastal settlements. The Hindu

practice of immersing idols in water has resulted in thousands of small and large Plaster of Paris and clay idols along with various offerings being introduced to these ecosystems twice a year: Ganpati and Durga puja. Coastlines are also important for national security. The species that live in coastal regions are one of the most important stakeholders.

Coastal ecosystems are amongst the most significant, sensitive, vulnerable, and threatened environments. It includes mangroves, coral reefs, estuarine areas, and inter-tidal zones. Also, sea and land interface on the coast and the ecological productivity and pollution levels of the sea depends on coastal management systems.

### 1.2. Study area

Velas is located in Mandangad *taluka* of Ratnagiri district, Maharashtra. It is situated at the northern boundary of the district, near the mouth of Savitri River (17°57'27.7" N and 73°01'55.0" E). The beach in Velas is 3 kms long



and has emerged as a popular tourist site since 2006 when it started hosting an annual turtle festival. There is an estuary to the north of the beach and the southern end has a rocky patch bordered by natural vegetation and a freshwater stream. Most of the beach is surrounded by Casuarina plantations and Ipomea biloba.

Kelshi is located in Dapoli *taluka* of Ratnagiri district (17°55'11.4" N and 73°03'16.5" E). The beach is 2 kms long and includes sandy and rocky sections. The beach is surrounded by Casuarina plantations. There is an estuary to the north of

the beach and a broad rocky patch dominated by Indian screw pine (*Pandanus* sp.) and *Ipomea biloba* to the south.

Anjarle is located in Dapoli *taluka* of Ratnagiri district (17°50'47.6" N and 073°05'20.5" E). The beach stretches for 1.2 kms and is broad but gradually narrows towards the southern end. There is an estuary to the south and a rocky patch to the north. It is flanked by coconut and betel-nut plantations, mango groves, Casuarina plantations, and wild Indian screw pines.

## Chapter 2

# Literature Review

4

### 2.1. Olive Ridley sea turtle nesting

The Olive Ridley sea turtle (*Lepidochelys olivacea*) is a medium-sized marine turtle that lives in the Pacific and Indian oceans. It is categorised as 'vulnerable' by the IUCN. It is included in Schedule 1 of India's Wildlife (Protection) Act, 1972. It is also protected under the Convention on the Conservation of Migratory Species of Wild Animals and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to which India is a signatory.

These turtles exhibit mass-nesting behaviour called arribada, which means 'arrival from sea' in Spanish. Beaches in Odisha state on India's east coast are famous for such mass nestings.

Turtle nesting grounds are sensitive ecosystems and are protected under the Coastal Regulation Zone Notification, 2011 in India. Nesting sites are generally on flat beaches, especially around the middle of the beach, and free of debris (Ocana 2010).

It is very important to protect beaches where turtles nest from littering and intense

#### Box 1: Olive Ridley sea turtle details

**Weight:** Adult: 100 pounds (45 kg); Hatchling: <1 ounce (28 g)

**Length:** Adult: 22-31 inches (55-80 cm); Hatchling: 1.5 inches (4 cm)

**Appearance:** Olive/grayish-green with a heart-shaped top shell

**Lifespan:** Unknown, but they reach sexual maturity around 15 years of age

**Diet:** Algae, lobster, crabs, tunicates, molluscs, shrimp, and fish

**Behaviour:** On India's east coast thousands of Olive Ridley sea turtles come ashore and nest in a phenomenon called arribada. Females nest every year, once or twice in a season and lay clutches of around 100 eggs

Source: <http://www.nmfs.noaa.gov/pr/species/turtles/oliveridley.htm>

anthropogenic activities. Female turtle remember the beach where they hatched and return to the same beach to lay their eggs (WWF, 2013).

In 2014, a Rapid Biodiversity Assessment was done in the study villages by SNM. This assessment was done during the planning phase of the CMPA project. In this exercise, important physical and biological parameters of the beaches were documented. The report also identified potential threats to turtle nesting sites and interventions required to address them. One of its key recommendations that emerged was the need to manage solid waste washed on the beach by the tide.

## 2.2. Policy and Legislation

### 2.2.1. Wildlife (Protection) Act, 1972

Wildlife (Protection) Act, 1972 is the primary legal instrument for conservation of biodiversity in India. It provides a legal framework to protect different species of flora and fauna that are listed in its schedules, and to establish protected areas. The act consists of eight chapters, 60 sections and six schedules. It empowers the central and state governments to declare an area as a protected area and impose a blanket ban on industrial activities in such areas. It also provides authority structures to administer and implement conservation measures; regulates hunting of wild animals, protects biodiversity and spaces, and restricts trade in wild animals and their body parts. The act prohibits hunting of wildlife without explicit permission from an authorised officer and is only given when an animal is deemed dangerous to human life or property, or is disabled or diseased beyond recovery.

Olive Ridley sea turtle is listed in Schedule 1 of this act, which prohibits hunting.

### 2.2.2. Coastal Regulation Zone Notification, 2011

India's coastal and marine environments are under increasing pressure from urban development, tourism, recreational activities and resource exploitation. A number of official reports were prepared on the subject and resulted in Government of India passing a notification in 1981 to ban all human activities till

500m from the highest tide line. In an effort to control, minimise, and protect sensitive coastal stretches from unplanned human interference, Government of India framed rules in 1991 to regulate various activities in coastal zones and notified them under the Environment Protection Act, 1986. This notification is called the Coastal Regulation Zone (CRZ) Notification, 1991. The rules were revised based on recommendations of an expert committee headed by Prof. M.S. Swaminathan and notified in 2011. According to CRZ notification 2011, the coastal areas are demarcated into four zones with varying levels of protection and regulation.

CRZ I includes "ecologically sensitive areas like mangroves (if the area exceeds 1,000 sq. m, then a buffer zone of 50m is provided), corals, sand-dunes, salt marshes, bird and turtle nesting sites, horseshoe crab habitats, sea grass beds, mudflats and inter-tidal zones. In addition to this, national parks, marine parks, sanctuaries, reserve forests, wildlife habitats and other protected areas are also declared in coastal areas under Wildlife (Protection) Act, 1972 (53 of 1972), the Forest (Conservation) Act, 1980 (69 of 1980) and Environment (Protection) Act, 1986 (29 of 1986); including biosphere reserves and sites of archaeological importance.

### 2.3. Turtle tourism and conservation

Olive Ridley sea turtle mass nesting events have been documented in Odisha since 1974 (Shanker et al. 2003). Gahirmatha beach near Bhitarkanika Wildlife Sanctuary is famous for turtle arribadas. Local communities reportedly avoid hunting turtles and protect them during nesting. The local community was involved in an experimental procedure to tag turtles and collect data during a study conducted by Wildlife Institute of India in 1995.

Martin (2013) describes the successful cleanup of the beaches on Jekyll Island, Georgia, USA for a one-year period by local citizens with 200 volunteers donating 460 man-hours. This started as a citizen science project by Georgia Sea Turtle Center (GSTC), which is a state-of-the-art facility dedicated to sea turtle rehabilitation, research,

and education. This exercise helped volunteers participate in a larger initiative to make a visible impact. Educating individuals and inspiring them to participate in such initiatives is an important strategy to remove marine debris from coastal areas, while education prevents further pollution. Debris in the marine environment poses a significant threat to marine life and its presence be reduced through the involvement of citizens. Marine debris includes manufactured items that enter the ocean regardless of their source and material, including plastic, metal, wood, glass, foam, cloth, and rubber. Citizen involvement is an effective way to engage volunteers for conservation initiatives, increase awareness and develop skills.

Campbell (1999) reports Olive Ridley sea turtle-based rural eco-tourism in the Costa Rican village of Ostional. In 1995, only four percent of households in Ostional identified tourism as a source of income; however, this was substantial in comparison to other economic activities. While most Ostional residents had positive attitudes toward tourism, they had limited awareness of employment or investment opportunities. Lack of awareness and increased activity by outside investors were identified as major challenges by the author. Campbell added that in the absence of formalised planning or intervention, the benefits of tourism to the community in Ostional would remain limited.

## Chapter 3

---

# Objectives of the report

This is a preparatory report to develop beach management guidelines in the study villages. The beach management guidelines are aimed at safe nesting of Olive Ridley sea turtles in these villages. The objectives of this report are;

- To identify stakeholders in beach management in study villages
- To interact with beach management stakeholders to document their usage of the beach
- To develop a profile of beach litter in the study villages

## Chapter 4

# Methodology

8

The activities under the beach management component included preparation of an assessment report of existing beach management in project villages. The major stakeholders in beach management were identified as part of the assessment. As a follow up of the report, beach management protocols for various stakeholder groups were prepared. The protocols were then shared with the Gram Panchayats of project villages.

### 4.1. Stakeholder identification

Stakeholders in beach management are individuals or institutions, private and public, with an interest or concern in the beach for livelihood, recreation, research, regulation, and commercial extraction. All stakeholders need to be identified for the development of beach management guidelines. In the guidelines, roles and responsibilities of each stakeholder must be identified. For the purpose of this report, the stakeholders in beach management

**Table 2**  
**Stakeholders in beach management**

Local		External to study villages	
Individual and private	Institutional and public	Individual and private	Institutional and public
Fishermen	Gram Panchayat	Tourists	Forest Department
Cattle owners	Biodiversity Management Committee	Tour operators	Mining and dredging company
Waste and rag pickers	Joint Forest Management Committee	SNM	NGOs
Home-stay operators		Researchers	Hospitals and dispensaries

were identified based on; (i) earlier SNM studies on biodiversity assessment and stakeholders in natural resource management in the study villages, (ii) discussions with SNM field personnel, and, (ii) field observations by the research team. The identified stakeholders are listed in Table 2 and described in the next section. The stakeholders were interviewed to document their interaction with, and use of, the beach.

#### **4.2. Interaction with stakeholders in beach management**

A set of questions were prepared for interactions with stakeholders. These questions guided conversations with respondents and covered cause or motive of interaction with the beach, frequency and periodicity of interactions, and general practices for littering on the beach. In each village, interviews were randomly conducted in 25 households. This number constituted more than 5% of the total households in each study village. According to Israel (1992), 5% to 10% of the population is sufficient to constitute a representative sample.

Due to time constraints, other stakeholders were identified and interviewed in person or over the phone.

#### **4.3. Profiling of litter and waste on the beach**

Litter and waste on the beach were documented through periodic observations and measurements. The sampling methodology suggested by Azira et al (2008) was followed to estimate volume of beach litter and waste on the beach. Following Schulz et al. (2015), litter was collected from 100m sections of each beach and then weighed. The waste was segregated into individual types and measured with a spring balance. The collection method adhered to the guidelines of the Convention for the Protection of the Marine Environment of the North-East Atlantic or OSPAR Convention (Annexure II). The collection and weighing on each beach was done before and after high-tide. These measurements protocols were also repeated before and after the peak tourism period. In total, four observations were made on each beach.

## Chapter 5

# Analysis and discussion

10

### 5.1. Stakeholders in beach management

We grouped stakeholders into local and external to study villages and further divided them into two subgroups, (i) individual and private and, (ii) institutional and public.

#### 5.1.1. Local

##### Individual and Private

- Fishermen - small boats: Small boat operators contribute to floating thermocol pieces that they use as floats for their fishing nets. Damaged fishing nets were also found among the debris on the beaches. Such fishermen are found in Anjarle and Kelshi have fishermen but not in Velas.

- Fishermen - trawlers: Fishing trawlers are vessels designed to operate fishing trawls. In trawling. One or more boats pull or drag a trawl through water behind them. The trawlers are mechanised vessels and often stay at sea for two or more days. Olive Ridley sea turtles often get caught and die in these nets.

- Small scale on-shore fishing: People from all study villages visit the beach to catch crabs.

- Cattle owners: Livestock in Velas are grazed on vegetation on the beach, while those in the other two villages use the beach to reach their grazing areas.

- Home-stay operators: They provide paid lodging and meals to tourists. It has become a significant source of income for around 30 households in each village.

- Waste and rag pickers: Only two rag-pickers were found in Kelshi in the study area.

##### Institutional and public

- Gram Panchayat: It is a local elected body at the village-level and the foundation of the Panchayat system. A Gram Panchayat exists in villages that have more than 500 people. A Gram Panchayat is shared by two or more villages, if the population of each village is less than 500. The Panchayat Act (of 1992) specifies the functions, powers, and duties of Gram



Panchayats, which are responsible for basic facilities and functions in the village, including health, sanitation; water, and education.

- **Joint Forest Management (JFM) Committee:** It is a village-level committee set up by the forest department for the protection, regeneration, and development of degraded forest lands. In the study site, JFM committee exists only in Velas.

- **Biodiversity Management Committee:** A BMC is set up by the Gram Panchayat by a special resolution under the Biological Diversity Act, 2002 to document, manage, and regulate the use of biodiversity. BMCs were set up in the villages recently but are not active.

**5.1.2. External to study villages  
Individual and Private**

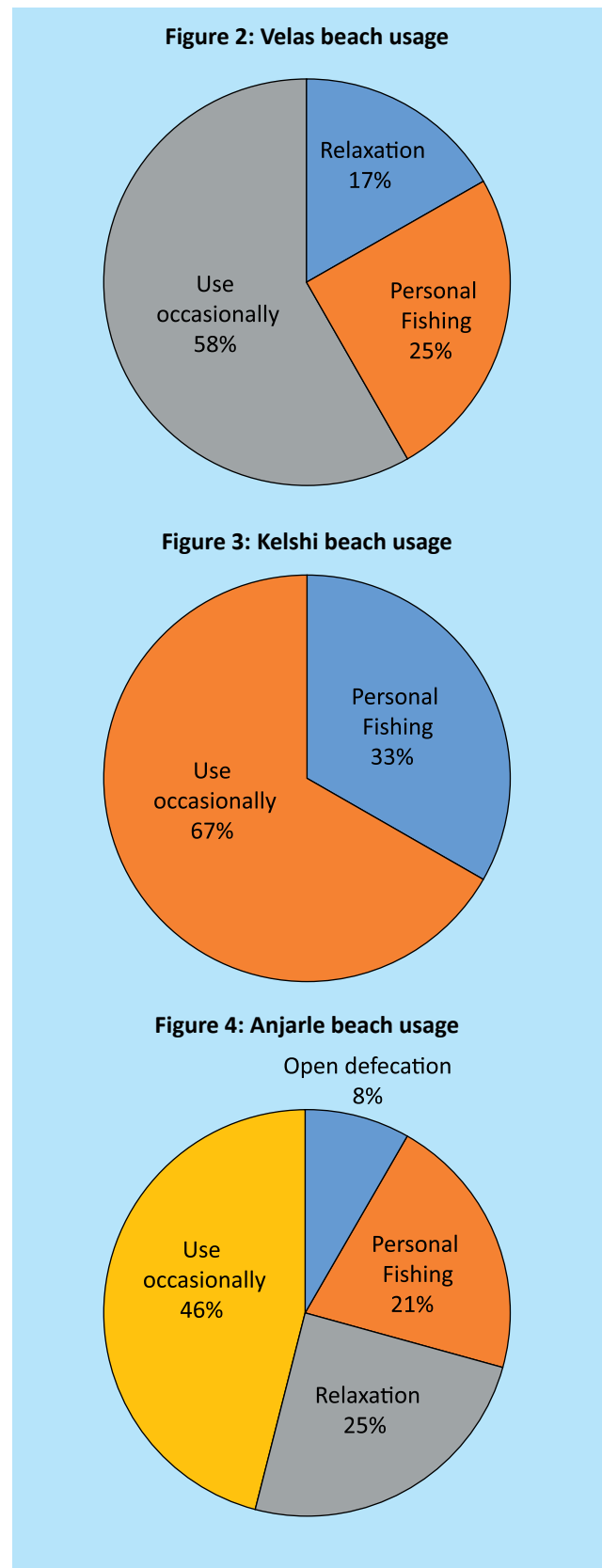
- **Tourists:** All study villages receive considerable number of tourists, mostly from Mumbai and Pune. Tourists who visit Anjarle are generally interested in recreation and relaxation, while Kelshi also receives people who are interested in visiting a local temple and a historical dargah. Nature tourists are rare in these two villages, while they comprise most visitors to Velas. However, tourism in Velas is limited to the annual turtle festival.

- **Researchers:** These villages receive numerous researchers studying various ecological and social aspects of the area, though they never share their findings with the villagers.

**Institutional and public**

- **Hospitals and dispensaries:** These generate harmful medical waste that needs to be disposed properly. The beach survey found that bio-medical waste such as syrup bottles, tablet strips, and syringes constituted a fifth of the measured solid waste.

- **Voluntary/Non-Government Organisations:** Sahyadri Nisarga Mitra (SNM) is one of the prominent NGOs active in the area. It initiated participatory biodiversity conservation in the Konkan region. Notable initiatives include



conservation of threatened species such as white-backed vulture, white-bellied sea eagle, edible-nest swiftlet, and Olive Ridley sea turtles. SNM has also worked with Gram Oanchayats to form village-level BMCs.

**Table 3**  
Beach use categories and their percentage

SN	Parameter	Velas		Kelshi		Anjarle	
		N	%	N	%	N	%
1	Relaxation	4	17	--	--	6	25
2	Small time fishing	6	25	8	33	5	21
3	Defecation		--	--	--	2	8
4	Occasional use	15	58	17	67	12	46

**Table 4**  
Tourism peaks in the study villages

Occasion	Time of the Year	Velas	Kelshi	Anjarle
New Year's Eve/New Year	December-January	N	Y	Y
Turtle Festival	February-March	Y	N	N
Annual village festival	April	N	Y	Y
Ganesh festival	August-September	N	Y	Y
Navratri	September-October	N	Y	Y
Deepawali	October-November	N	Y	Y
Weekends	All year round	N	Y	Y

N=No; Y=Yes

- **State Forest Department:** The forest department plays an important role in beach management through plantations along the coast to check soil erosion and limit wind speed. Casuarina plantations by the forest department are common in the villages. The forest department recently established a Mangrove Cell to conserve mangroves in the state.

- **Commercial entities responsible for mining and dredging:** Their activity is significant for beach management. Excavation and transportation of excavated material is a prominent activity in all the villages. There are more than 300 dumper trucks in Kelshi that transport excavated material to dredgers in the creek, which transport the material to large cargo ships anchored in the open sea. There is significant dredger movement in Velas and Kelshi.

- **Tour operators:** Tour operators from Mumbai and Pune facilitate tourist visits to the study area. There is no structured information on tour operators active in the study villages. There are some specialised nature tourism operators

such as Mumbai Travellers, Trek Mates India and Treks and Trails India that conduct tours for turtle tourism.

### 5.2. Beach use by the villagers

Major beach use categories for the local community are, (i) relaxation, (ii) small-scale fishing, (iii) open defecation, and (iv) occasional use for idol immersion during Ganapati etc. Among these categories, occasional use accounts for nearly 50% of use in all villages, followed by personal fishing (>25%) (Table 3 and figures 2, 3 and 4).

### 5.3. Tourism on the beach

There are annual peaks for tourism in the area (Table 4). The study villages receive more tourists on six occasions. Kelshi and Anjarle receive tourists round the year, especially during weekends. In Velas, tourism peaks during the turtle festival in February/March.

### 5.4. Litter and waste on the beach

The beach in Velas receives more waste than Kelshi and Anjarle (Table 5, figures 5,6, and 7), while Kelshi is the cleanest. Strips of tablets,

**Table 5**  
**Beach litter profile of the study villages**

SN	Type of waste	% of total waste measured during investigation		
		Velas	Kelshi	Anjarle
	Degradable			
1	Religious waste	1	10	6
2	Faecal matter	Not measured		
	Non degradable			
3	Glass	80	60	67
4	Plastic	14	10	17
5	Rubber	4	20	7
6	Medical waste	1	NA	3

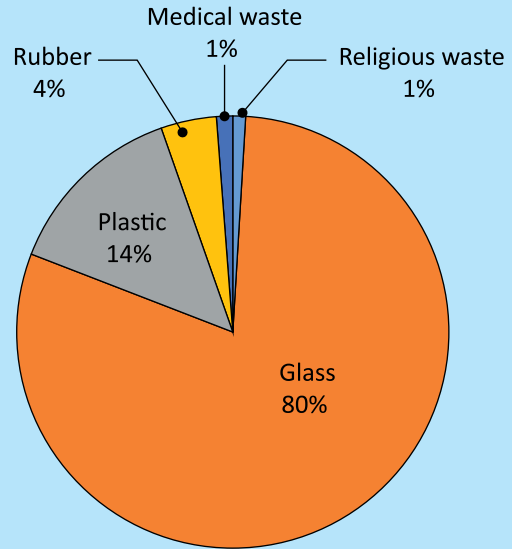
syrup bottles, and syringes are common on the beaches of all three villages. Other waste on the beach includes plastic waste, liquor bottles, and empty milk packets, thermocol used in packaging, footwear, and empty nylon gunny bags. Religious waste like flowers and coconuts is the most common waste found on the beach.

Importantly, human faecal matter is very common on the beach as sewage is released into the sea from coastal villages and then washes ashore during high tide. Most toilets in the study villages have lined septic tanks. However, around 30% toilets release their waste into the creek or seep into the soil (locally called *Jirta*) (Table 6).

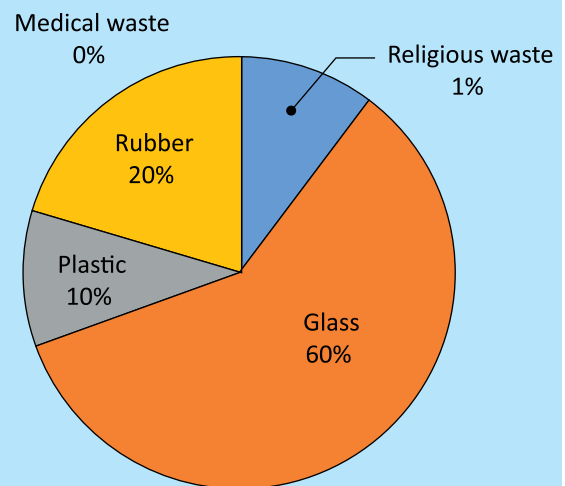
Human faecal matter was observed on all three beaches and can be divided into two categories. One category is human faecal matter in a broken line along the high tide line, while the second is the result of open defecation on the beach. People defecating inside toilets also contribute to faecal matter on the beach as the toilets empty into the creek, especially for houses situated along the creek: Kinara *mohalla* in Kelshi, Danda community in Velas and Bandarwada in Anjarle, and informal drain networks that empty into the creek.

The Gram Panchayat is responsible for cleaning of septic tanks at public toilets and roadside drains. In Velas, there are no public toilets, while those in Anjarle are *jirta*, as reported by the Gram

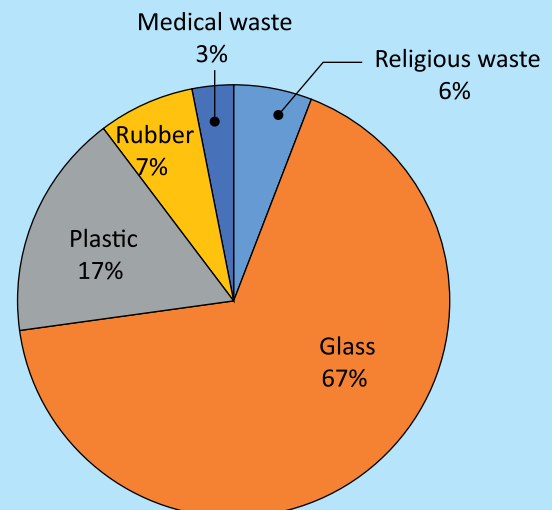
**Figure 5: Velas beach litter profile**



**Figure 6: Kelshi beach litter profile**



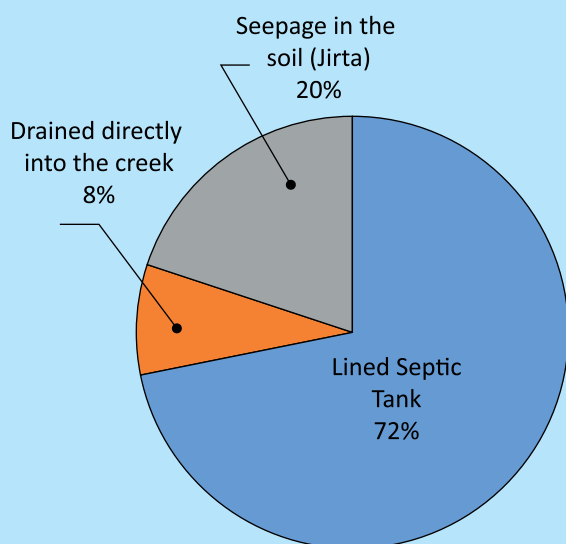
**Figure 7: Anjarle beach litter profile**



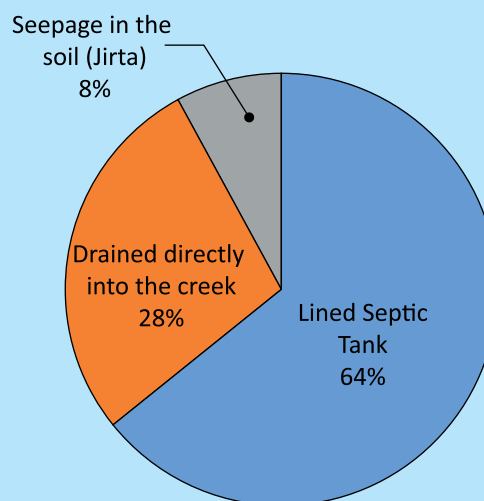
**Table 6**  
Percentage of toilet waste disposal types in the study villages

SN	Type of household toilet waste disposal	% of type of household toilet waste disposal system					
		Velas		Kelshi		Anjarle	
		N	%	N	%	N	%
1	Lined Septic Tank	18	72	16	64	17	68
2	Drained directly into the creek	2	8	7	28	2	8
3	Seepage in the soil ( <i>Jirta</i> )	5	20	2	8	6	24
	Total	25	100	25	100	25	100

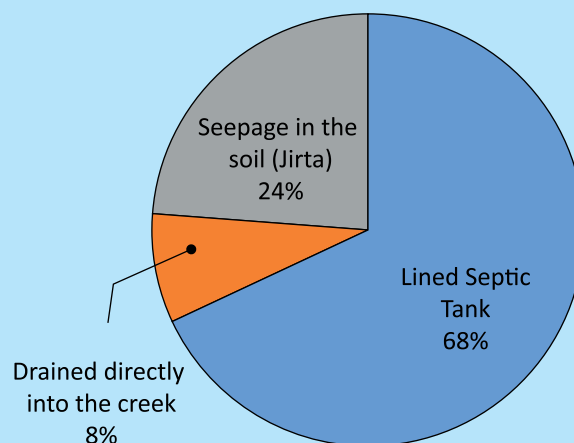
**Figure 8: Percentage-wise breakup of toilet waste disposal methods used in Velas**



**Figure 9: Percentage-wise breakup of toilet waste disposal methods used in Kelshi**



**Figure 10: Percentage-wise breakup of toilet waste disposal methods used in Anjarle**



Panchayat. A *jirta* toilet has an unlined septic tanks that allows sewage sludge to mix with soil. In Kelshi, there are public toilets but their cleanup schedule could not be ascertained. Roadside drains in Velas are cleaned once- before the monssons. In Kelshi, this was done thrice a year. There is no regular schedule in Anjarle. None of the Gram Panchayats shared a management plan for sludge removal from roadside ditches and sewage sludge at public toilets.

**Table 7**  
**Beach litter weight before and after high tide**

Data collection period	Weight of litter (kg) before and after high tide					
	Velas		Kelshi		Anjarle	
	Before	After	Before	After	Before	After
November, before tourism, Diwali	66 <sup>2</sup>	0.5	1	0.5	1.5	0.75
November, during tourism, Diwali	10	2	0.4	0.2	1.5	0.5
December, before tourism, year end	0 <sup>3</sup>	0.5	0.25	0.5	0.2	0.1
December, during tourism, year end	5	0.5	0.3	0.5	2	0.6

*Abnormally high; data may be an outlier*  
*Pre-turtle nesting voluntary cleaning was carried out prior to sampling*

### 5.5. Volume of litter and waste on the beach

The high tide is estimated to bring an average of 0.68 kg of waste to the three beaches. The average litter on Velas beach was higher than the other beaches (0.88 kg, as compared to 0.42 kg in Kelshi and 0.48 kg in Anjarle). One factor for this difference could be the bridge construction underway near Velas (Table 6).

The study also found that the amount of litter on the beach before high tide (as compare dto after) was actually lower during Diwali in Velas and Kelshi and equal in Anjarle. However, during New Year’s Eve, beach litter on Velas and Anjarle beaches were considerably higher (five to 10 times higher than pre-tourism readings), though pre-tourism and during-tourism readings were

nearly the same in Kelshi. This indicates that all three beaches have greater tourist pressure in terms of solid waste during New Years.

Villagers in Velas undertake voluntary beach cleanup drives. In addition, M/s Infrastructure Logistics Pvt. Ltd., Mandangad has committed to cleaningup of Velas beach. However, the schedule of these management activities could not be ascertained.

As part of their Corporate Social Responsibility (CSR) efforts, M/s Ashapura Minechem Pvt. Ltd. has undertaken cleanup drives on Kelshi beach. However, the schedule of their cleanup drives could not be determined. Coordination between peak tourism periods and beach cleanup drives is essential to keep the beach clean.

## Chapter 6

# Discussion and follow up

16

### 6.1. Challenges for beach management in study villages

- The CSR activity of M/s Ashapura Minechem Pvt. Ltd. and M/s Infrastructure Logistics Pvt. Ltd. appear to be unplanned and irregular. This is possibly due to the fact that local villagers do not know their time table for beach cleanup activities. This must be better managed and planned to ensure that beach cleanup activities coincide with high incidences of beach litter, e.g., Ganpati festival, prior to turtle nesting.
- Open defecation is sporadically practiced in Anjarle and 8% of survey respondents in the village admitted to it. In Kelshi, many migrant labourers working in the mines of M/s Ashapura Minechem Pvt Ltd. resort to open defecation due to lack of proper facilities to support the large inflow of migrants in Kelshi.
- Recreation activities such as riding motorbikes on the beach were observed in Kelshi. As of now this is almost negligible but may increase in the future. It may escalate into uncontrolled tourist

recreation activities like riding sand bikes and para-sailing in Harne, Murud, Ladghar, and other adjacent beaches. Such activities are very harmful for the beach ecosystem. Gram Panchayat, BMCs and other concerned authorities must remain vigilant to prevent such activities. The houses in the study villages adjacent to the creek (Danda area in Velas, Kinara *mohalla* in Kelshi and Bhandarwada in Anjarle) invariably dispose their solid waste directly into the creek—the waste probably makes its way back to nearby beaches during high tide. Effective waste segregation and management systems need to be established to curb environmentally-harmful disposal practices.

### 6.2. Follow up

This report focussed on existing beach usage and practices in the study villages. It has described all major stakeholders; local and external to the study villages and their use of the beach in the study villages. The report also provides details of measured volume of solid waste that washes up on the beach and other forms of litter

generation. SNM had earlier documented the sand and biodiversity profile of beaches in the study area.

This knowledge provides the require information to develop beach management guidelines with clear roles, responsibilities, and timeline for all major stakeholder groups. This report will help the development of these guidelines for the study villages and other coastal villages with marine turtle nesting sites.

## References

Campbell, L. M. (1999). Ecotourism in rural developing communities. *Annals of Tourism Research*, 26(3), 534-553.

Ocana, M. A. S. (2010). Arribada nesting of olive ridley sea turtles (*Lepidochelys olivacea*) at La Escobilla, Mexico.  
Shanker, K., Pandav, B., & Choudhury, B. C. (2004). An assessment of the olive ridley turtle (*Lepidochelys olivacea*) nesting population in Orissa, India. *Biological Conservation*, 115(1), 149-160.

Martin, J. M. (2013). Marine debris removal: one year of effort by the Georgia Sea Turtle-Center-Marine Debris Initiative. *Marine Pollution Bulletin*, 74(1), 165-169.

Schulz, M., Neumann, D., Fleet, D. M., & Matthies, M. (2013). A multi-criteria evaluation system for marine litter pollution based on statistical analyses of OSPAR beach litter monitoring time series. *Marine Environmental Research*, 92, 61-70.

Tike, M.J., Samant, J.S. and Mohite, S.A. (2009) Diversity status of minor fish and shellfish along Malvan coast, Maharashtra Indian Journal of Applied and Pure Biology Indian Journal of Applied and Pure Biology, India 24(2) 441-448 Available at - [http://nicmas.nio.org/eprints11/Indian\\_J\\_Appl\\_Pure\\_Biol\\_24\\_441.pdf](http://nicmas.nio.org/eprints11/Indian_J_Appl_Pure_Biol_24_441.pdf)

Patwardhan, A. (2014). Report on Rapid Biodiversity Assessment of Coastal Habitat for Implementation of a Start-up Phase in the Velas–Anjarle Coastal Stretch, Maharashtra, for Conservation and Sustainable Management of Existing and Potential Areas (CMPA). Sahyadri Nisarga Mitra, Chiplun, Maharashtra.

WWF India (2013). Marine turtles along the Indian coast: Distribution, threats and management implications. Available at [http://awsassets.wwfindia.org/downloads/turtle\\_report\\_web.pdf](http://awsassets.wwfindia.org/downloads/turtle_report_web.pdf)

### Websites

<http://www.ospar.org>

<http://mpcb.gov.in>

<http://www.eol.org>

<http://mangrovecell.org>



## Photos

Photo 1: Waste profiling



Photo 2: Weighing the waste



Photo 3: Display board on cleaning the beaches



Photo 4: Display board on cleaning the beaches





**Photo 5: Faecal matter and syringe washed ashore in Velas**



**Photo 6: Medical waste on Velas beach**



**Photo 7: Plastic bottle washed ashore in Anjarle**



**Photo 8: Plastic milk bag washed ashore in Anjarle**



**Photo 9: Plastic sack washed ashore in Anjarle**



**Photo 10: Religious waste washed ashore in Anjarle**



### Annexure 1: List of resource persons

Velas	Mr. Omkar Prakash Nijure	Home-stay operator
	Mr. Ravindra Dhondu Pawar	Cable operator as well as electronics repairing
	Mr. Mohan Upadhye	Farmer and project employee, GIZ-Maharashtra State Forest Department CMPA project
Kelshi	Dr. Shubhada Gawade	Private Doctor
	Mr. Ehsan Khan	Local scrap shop owner
	Mr. Bharat Kitabu Basphod	Local scrap shop owner
	Dr. Vinita Kangule	Medical officer on duty (Public Health Centre, Kelshi)
	Mr. Trushant Bhatkar	Home-stay operator and Vice Sarpanch
	Mr. Uday Joshi	Horticulturist and entrepreneur
Anjarle	Dr. Shripad Biwalkar	Private doctor
	Mr. Malgunkar	Chicken shop owner
	Mr. Abhinay Kelaskar	Farmer and project employee, GIZ-Maharashtra State Forest Department CMPA project

### Annexure 2: Research Team

1.	Ramashish Joshi, SNM, Chiplun.
2.	Raghunandan Velankar, SNM, Chiplun
3.	Dr. Poonam Hudar, Environmental Greenliness, Mumbai.
4.	Dr. Deepti Sharma, TerraNero Enterprises, Mumbai.
5.	Nitin Walmiki, TerraNero Enterprises, Mumbai.
6.	Adwait Jadhav, TerraNero Enterprises, Mumbai.
7.	Abhijeet Jagtap, TerraNero Enterprises, Mumbai.
8.	Aditi Srivastava, TerraNero Enterprises, Mumbai.

### Annexure 3: Proforma of questionnaire for information collection on beach management

#### Waste Profile Sheet Velas Village, Dapoli Taluka, Ratnagiri Dist., State Maharashtra

##### A) Waste Generator Information

Name (Optional): \_\_\_\_\_

1. Family Size: \_\_\_\_\_

2. Address: \_\_\_\_\_

3. Telephone: \_\_\_\_\_

##### B) Waste Stream Information

1. Waste segregation?  Yes  No

2. What types of containers/bags are used for waste collection?

Plastic bag  Cardboard  Metal  Cloth bag  None

3. Total quantity of waste generated \_\_\_\_\_ kg

4. Type of waste that does not enter the waste stream \_\_\_\_\_

5. Weight of type of waste:

<input type="checkbox"/> Kitchen _____ g	<input type="checkbox"/> Paper _____ g
<input type="checkbox"/> Cardboard _____ g	<input type="checkbox"/> Plastic _____ g
<input type="checkbox"/> Cloth/Net _____ g	<input type="checkbox"/> Metal _____ g
<input type="checkbox"/> Glass _____ g	<input type="checkbox"/> Wood _____ g
<input type="checkbox"/> Leather _____ g	<input type="checkbox"/> Garden & agricultural _____ g

##### C) Physical Characteristics of waste

1. Colour : \_\_\_\_\_ 2. Odor :  Strong  Mild

3. pH : \_\_\_\_\_

##### D) Household Hazardous Waste & Electronic Waste (Amount generated, Fate)

Type of Waste	Amount Generated	Fate
1. Pesticides/Herbicides/Weedicides	_____	_____
2. Personal care products	_____	_____
3. Lighting equipments	_____	_____
4. Cellular Phones	_____	_____
5. Battery cells	_____	_____
6. Household appliances	_____	_____

##### E) Waste Disposal

1. What is the final fate of the waste?  
 Open dumping  Burial  Incineration  Open burning

2. What types of containers/bags are used for waste collection?

Plastic bag  Cardboard  Metal  Cloth bag  None

3. How frequently do you clean the septic tank of your toilet? \_\_\_\_\_

4. What is done with the sludge removed from the toilet? \_\_\_\_\_

5. Any issues with current dumping practices: \_\_\_\_\_

6. What improvements you feel are required: \_\_\_\_\_

##### F) Sample Certification

1. Sample date: \_\_\_\_\_

2. Type of sampling:  Composite  Grab

3. Sample ID number: \_\_\_\_\_ 4. Sampler's name: \_\_\_\_\_

G) How do you use the beach?: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

H) Surveyor's notes (if any): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



CMPA Technical Report Series

18

Report on Existing Beach Usage  
and Practices in Velas, Keshi  
and Anjarle villages in coastal  
Maharashtra, for Conservation and  
Sustainable Management of Marine  
Areas (CMPA)

February 2016

