

# Long term monitoring & community based conservation of sea turtles in Maharashtra, India

## Final Report



Submitted by Dakshin Foundation to GIZ-CMPA Maharashtra Project

*March 2017*



**Date: 1<sup>st</sup> April, 2017**

Published by: Dakshin Foundation,  
Flat no. A-001,  
Samvridhhi Gardenia Apartments, 88/3,  
Byatarayanapura, Near Sahakar Nagar Block A,  
Bangalore- 560 092, India.

Submitted by:

Nupur Kale (Research Consultant)

Parth Bapat (Logistic Consultant)

Muralidharan M. (Program Officer, Marine Flagships, Biodiversity and Monitoring Program,  
Dakshin Foundation)

Chetan Rao (Research Assistant, Dakshin Foundation)

Kartik Shanker, Ph.D. (Founding trustee, Dakshin Foundation and Director, Ashoka Trust for  
Research in Ecology and the Environment)

Naveen Namboothri, Ph.D. (Director and Founding trustee, Dakshin Foundation)

This publication has been developed under the project titled '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 (MoEFCC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of BMUB. In Maharashtra, the Mangrove Cell, Maharashtra Forest Department is implementing the project in three sites i.e. Thane Creek, Velas-Dabhol Coastal Stretch and Ansure Creek.

**Copyright: Mangrove Cell, Maharashtra Forest Department**

**Photos: Nupur Kale**





## Indo-German Cooperation on Biodiversity

The Governments of India and Germany have fostered a partnership to enhance conservation of India's biodiversity in line with the objectives of the Convention on Biological Diversity (CBD). The partnership includes implementing projects in which protecting the environment takes center-stage in unison with the principle of sustainable development and enhancement of human well-being.

### **The CMPA Project**

The CMPA project is a flagship project of the Indo-German technical cooperation supporting the CBD's Aichi targets. The project is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). It is implemented by the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of BMUB.

The overall objective of the project is, "The conservation and sustainable use of biodiversity in the pilot protected areas are improved, taking into consideration the economic circumstances of the local population."

The project aims at conservation and management of potential marine protected areas in Maharashtra. The three main components of the CMPA project are participatory process, human capacity development, and communication and awareness. The Project intervenes at two levels in India: At the national level and at the level of selected federal states. It focuses on:

#### **I: Participatory management**

Participatory management processes are implemented in the pilot protected areas.

#### **II: Capacity development**

A capacity strengthening system for supporting participatory management of coastal and marine protected areas is developed for selected states and at national level.

#### **III: Information, education and communication**

Relevant stakeholders have information on and are aware of the importance of conserving biodiversity in marine and coastal areas.

## **CMPA sites in Maharashtra**

A series of national and state level stakeholder consultations involving government representatives, researchers and NGOs resulted in the identification of three CMPA sites in Maharashtra. These are Thane Creek, Velas to Dabhol Coastal Stretch and Ansure Creek.

1. **Thane Creek:** Thane Creek opens into Mumbai's harbour and extends over a distance of 26 km. Thane Creek supports a rich diversity of flora and fauna. It has been declared an Important Bird Area and a Wildlife Sanctuary.
2. **Velas to Dabhol coastal stretch: This 60 km coastal stretch is located in the Ratnagiri district of Maharashtra.** Habitats in the region include sandy beaches, rocky shores; mangroves, estuaries, coastal plateaus and moist deciduous forests on hill sides. Beaches along this coast have become popular due to sea turtle nesting sites and the efforts of local communities to conserve turtle nests.
3. **Ansure Creek:** Ansure creek is **located in the Ratnagiri district of Maharashtra.** It is approximately 6.5 km long and 250-300 m wide. The creek harbors large mud flats and mangrove forests.

## Executive Summary

On the west coast of India, the state of Maharashtra boasts of a 720km long coastline. This coastline witnesses nesting of olive ridley sea turtle (*Lepidochelys olivacea*) with occasional green turtle (*Chelonia mydas*) and hawksbill turtle (*Eretmochelys imbricata*) sightings. In order to conserve these globally important species, the Maharashtra Forest Department in collaboration with local NGOs and communities have been working for more than a decade. In continuation with these efforts, two capacity building workshops at Ratnagiri and Anjarle along with short term nest monitoring was conducted in the district of Ratnagiri. The workshops dealt with sharing of knowledge on sea turtle research techniques and problems associated with monitoring between the forest officials and local volunteers. Additionally, deployment of data loggers will provide nest incubation temperatures to assess the effects of rising temperatures on the hatchling sex ratio. With these preliminary efforts, we hope to establish a long term research initiative which would consequently aid in improving conservation measures that need to be applied.

## Introduction

Out of the seven sea turtle species, four species are known to nest on the Indian mainland as well as Andaman and Nicobar Islands and Lakshadweep islands. However, the olive ridley turtle is the only species that nests in all coastal states, including the state of Maharashtra (Giri & Chaturvedi, 2006). Although there are no confirmed green turtle or hawksbill turtles nesting records in Maharashtra, the two species have been sighted off shore (Andhare & Hatkar, 2015) or stranded on beaches (Sundaram & Mane, 2013). There is a take of both adults and eggs in the country. This poaching has reduced due to a stringent ban on consumption and conservation efforts by Governments and NGOs. Similarly in Maharashtra, the local Forest Department along with local NGOs and communities has established a network of hatcheries to conserve sea turtles.

According to local communities, the Maharashtra coast used to receive high olive ridley nesting numbers in the 1970s. Since the early 2000s, there has been constant monitoring of sea turtle nests in Ratnagiri. This monitoring was initiated by Sahyadri Nisarg Mitra, Chiplun (SNMC) in 2002. With the help of local volunteers and the Forest Department, beach and nest monitoring activities were started. However, the nesting has been noted to have reduced in recent years as compared to the early 2000s (Katdare pers comm. 2017). The nesting numbers for recent years in Ratnagiri have been given below:

**Table 1: Taluka-wise nesting records in Ratnagiri district from 2012-2016 (Divisional Forest Office-Chiplun)**

| Region    | 2012-13 | 2013-14 | 2014-15 | 2015-16 |
|-----------|---------|---------|---------|---------|
| Dapoli    | 41      | 46      | 41      | 54      |
| Chiplun   | 4       | 11      | 12      | 6       |
| Ratnagiri | 0       | 0       | 0       | 2       |
| Total     | 45      | 57      | 53      | 62      |

In order to understand nesting patterns and the effect of rising temperatures on nests, a series of workshops and short-term monitoring was conducted to build capacity for research and conservation in the region. The work was conducted in the district of Ratnagiri which is also synonymous for sea turtle based ecotourism in form of turtle festivals (Kale *et al.* 2017). These workshops and temperature data can serve as a preliminary step to establish a standardised protocol for a monitoring programme in the coming season.

## Objectives and Outcomes

The main objectives and results of this study were:

### 1) To initiate a locally managed monitoring programme

To achieve the first objective, capacity building workshops were conducted for forest department officials, local volunteers from various coastal villages and other interested individuals such as college students. The workshops were conducted in Anjarle for participants from Velas to Dabhol and near Bhatye beach for participants from Dabhol to Madban (Fig.1). The main aim of the workshops was to impart knowledge on sea turtle monitoring and provide a refresher session in monitoring techniques in addition to teaching new ones. The workshops served as a platform for forest officials and local volunteers to voice their doubts and concerns with regard to monitoring of the nesting beaches and other issues causing hindrance to their work. Some of the common problems faced were beach erosion, nest relocation and poaching of adult turtles. In addition, the workshop motivated some local students from Mumbai University, Ratnagiri sub-centre to join in during beach monitoring. The important outcomes of these workshops were networking between the various stakeholders in sea turtle conservation and an interest in research by the forest department and locals.



Figure 1: Workshop participation as Velas to Dabhol- North Ratnagiri, Dabhol to Madban-South Ratnagiri

**2) To monitor key aspects of a protected species**

Due to the uncertainty of encountering a nesting turtle, we were unable to tag any turtles this season. However, a total of six data loggers were deployed in relocated nests at Anjarle and Velas. As these nests are predicted to hatch in April, we currently have no nest temperature data.

**3) To create awareness about sea turtles and their habitat**

Workshops were open to enthusiastic local participants and professors and students from various colleges and universities. Additionally, content relevant to the Maharashtra coast was generated for circulation which includes a manual and posters on sea turtle biology and conservation.

## Workshops

### [A] Ratnagiri Workshop

The first capacity building workshop was conducted at the Regional Coconut Research Centre, Ratnagiri on 4<sup>th</sup> February, 2017. The total strength of the workshop was 29 participants and comprised forest department officials, locals working on monitoring the beaches south of Dabhol till Madban and local students from Fisheries College and Mumbai University Sub-Centre, Ratnagiri. The day commenced with a welcome note by Mr. Parth Bapat of Dakshin Foundation and Dr. Vaibhav Shinde, Officer In-charge of the Regional Coconut Research Centre. At 0945hrs, the workshop started with a general discussion on sea turtles and their role in the ecosystem. The discussion was followed by a refresher session on basic nest and hatchery monitoring techniques. In this session, information such as data to be collected, identification of tracks and detection of nests etc. were discussed. In continuation, hatchery management techniques were described. Here, it was emphasized that nest relocation must happen only in case of threats from poaching, predation or beach erosion. Participants raised a doubt whether it was alright to leave a nest in situ if it would get washed over two or three times during the incubation period. Everybody agreed that in case of continuous inundation, it was better to relocate such nests. Details on hatchery building, when and how to relocate nests, artificial nests etc. were given. At this point, participants discussed their problems while relocating nests that are too far from the hatcheries. Participants were then shown how hatchlings emerged should be released; nest excavation and calculation of hatching and emergence success was taught.

In the next session, participants were taught new beach monitoring techniques such as to conduct beach profiling and mapping, tagging turtles and using data loggers along with its application and importance. The workshop was concluded with an introduction to TAG-able, an online data repository that is being developed to simplify data entry. The highlight of the workshop was a strong endorsement of collaborative effort to carry out research in the area. The participants then spoke of their experiences and issues in the field. Forest department staff and local volunteers discussed the proper 'to do's in case of tourist presence. A local volunteer raised the problem of poaching of nesting turtles in his area near Pavas beach. Questions related to changes in nesting numbers, sea turtle biology, mortality etc. were raised and discussed amongst the participants and the workshop officially ended at 1300hrs.



Figure 2: Forest Department staff at the Ratnagiri workshop.

## [B] Anjarle Workshop

The second capacity building workshop was conducted on 9<sup>th</sup> February, 2017 in Jain Mandir Hall, Anjarle. The workshop was attended by 39 participants which included Forest Department officials, local volunteers of villages from Diveagar to Dabhol, and college students from Mumbai and Pune. The day started off with a welcome note from Mr. Parth Bapat along with words of encouragement from Mr. Suresh Varak, Range Forest Officer of Dapoli and Mr. Mohan Upadhyay, Project Associate of Mangrove Cell. The workshop started at 1030hrs with a discussion on various sea turtle species and their biology. The content of the workshop was similar to that of the Ratnagiri workshop.

At this workshop, volunteers complained about the lack of official identity cards to be causing problems because tourists questioned their intentions while relocating nests. Issues such as timings of release of hatchlings were discussed and it was decided that the most suitable times are 0630hrs and 1845hrs. These hours were observed to be optimal as the surroundings are dark but there is sufficient visibility for tourists. The other issue discussed at Anjarle was beach erosion. Many volunteers complained that erosion in the summer months makes it difficult to construct hatcheries. Some participants considered the option of constructing a permanent hatchery and its maintenance using the example of Madhavpur in Gujarat. It was also emphasized that hatchlings should not be retained at any of the nesting beaches for tourists, V.I.P. or otherwise. The participants requested Mr. Varak to convey to his seniors to officially change the hatchling release timings and discourage guests from asking that hatchlings be retained for them to view.



Figure 3: Parth Bapat of Dakshin Foundation gives welcome note at Anjarle workshop.

## Data collection

This season, we were unable to tag turtles due to the uncertainty of nesting at particular sites and the tagging team missed the nesting events at Velas and Anjarle.

However, total of 6 data loggers were deployed in nests at Velas and Anjarle as given below:

| Location | Data logger number | Nest no. |
|----------|--------------------|----------|
| Velas    | 10116443           | 7        |
| Velas    | 10116433           |          |
| Velas    | 10458367           |          |
| Anjarle  | 10458361           | 4        |
| Anjarle  | 10458362           | 6        |
| Anjarle  | 10458364           | 5        |

The relocated nests with the above mentioned data loggers are expected to hatch around mid-April after which we will acquire incubation temperatures for 2 different locations. These incubation temperatures will help us estimate the hatchling sex ratio of the nests. In addition, the knowledge of incubation temperature will help us understand if temperature reduction measures need to be employed.



**Figure 4: A tribal was found carrying this dead turtle for consumption near Anjarle**

## Outreach material

The material given below was created in the context of the Maharashtra coast. Some of the pre-existing material was translated to Marathi and will be provided to people working on sea turtles in Maharashtra.



Figure 5: Life History of Sea Turtles Poster in Marathi

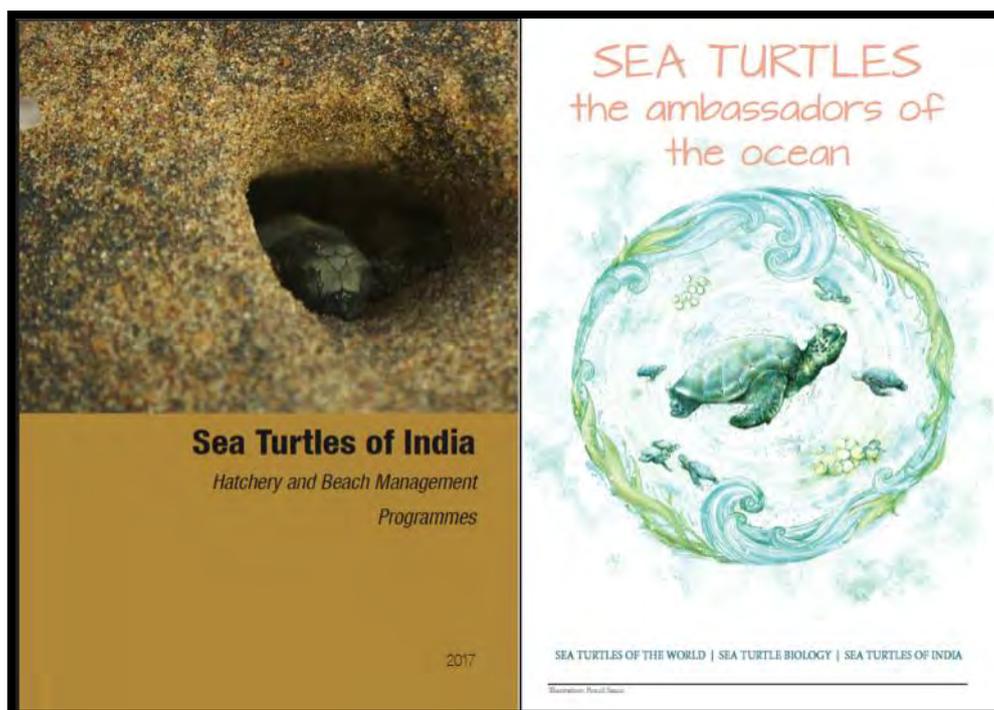


Figure 6: Cover pages of Sea Turtles of India Manual and Sea Turtles-the Ambassadors of the Ocean book

## Recommendations

Here, we provide additional recommendations with regard to sea turtle conservation on the Ratnagiri coast. In recent years, the turtle festival or *kasav mahotsav* of Velas has gained prominence in the country. Similarly, the beach town of Anjarle also hosts a turtle festival when it receives considerable nesting. Every year, these festivals attract tourists from all parts of Maharashtra and from various other states as well. However, as the tourist number increases, it will be imperative to safeguard the main intention of this festival- sea turtle conservation through community involvement.

The festival in Velas was included in our monitoring as it deals with important factors such as hatchling retention, release timings etc. In order to ensure proper running of the festival with compliance to scientific guidelines, the following recommendations were made. These recommendations ensure that the interests of local community hosting the village are maintained along with that of safety of the turtle hatchlings.

- 1) The time of release for hatchlings should be changed to 0630hrs and 1845hrs as mentioned in before. These timings must be maintained at all locations hosting the festivals whereas other non-festival beaches should release hatchlings as and when found.
- 2) During the release, the hosts need to make sure that tourists are not in the water or very close to the high tide line. Once the hatchlings enter water, sometimes they get washed up on the beach with the incoming wave. Tourists standing in the water could mistakenly step on the hatchlings.
- 3) As the number of tourists increase, there might be a need to restrict the intake of tourists at the festival sites. Moreover, it was observed that after the release activity, tourists stay back on the beach and litter it. There must be strict rules to ensure that the beach does not get strewn with garbage.
- 4) Once released the hatchlings should not be moved again or forced into the water.
- 5) Hatchlings should not be dug out of nests for the tourists or be retained if they have emerged the night before. They should be immediately released in case of late night emergence.
- 6) The homestay owners should inform tourists of the rules to be followed on the beach such as no usage of flash lights, no garbage etc. at the residence where it is easier to have the full attention of the guest.
- 7) The presence of a forest official during these release festivals will ensure that all the activities run properly during the release. Tourists will also conduct themselves properly in the presence of uniformed guard(s).

Not only will these recommendations help in proper release of hatchlings, they will also simplify and ease the work of the hosting village in terms of tourist management.

## References

Andhare, V.V. and P. Hatkar (2015) *A survey of sea turtle nesting beaches and their occurrence in the off shore waters off the coast of Sindhudurg district, Maharashtra*. ISBN: 978-81-930573-4-6.

Giri, V. and N. Chaturvedi (2006) *Sea turtles of Maharashtra and Goa*. In Marine Turtles of the Indian subcontinent, eds. K. Shanker and B.C. Choudhury. CRC Press. 145-147.

Kale, N., Muralidharan M., K. Shanker (2016) *The Olive Currency: A comparative account of Community based ecotourism ventures in western India*. Indian Ocean Turtle Newsletter 23:2-6

Sea turtle conservation and its success story (2017) Report by the Divisional Forest Officer, Chiplun Office

Sundaram, S. and S. Mane (2013) *Green turtle, Chelonia mydas stranded at Malvan, Maharashtra*. Marine Fisheries Information Service; Technical and Extension Series 215:39-40.

The CMPA Project has been commissioned by the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB), with funds provided under the International Climate Initiative (IKI). The Ministry of Environment, Forest and Climate Change, Government of India (MoEFCC) has entered into a technical cooperation agreement with BMUB for implementing the CMPA project. BMUB has commissioned GIZ to implement the Project jointly with MoEFCC and the state forest departments in selected states of India.

### **Responsible**

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

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

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

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

### **Nodal Officer for Maharashtra**

N. Vasudevan Chief Conservator of Forests, Mangrove Cell

### **Coordination for Maharashtra**

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

### **Mangrove Cell-CMPA Project Team**

Mr. Jayamegowda (Deputy Conservator of Forests, Mangrove Cell)

Dr. Manas P. Manjrekar (Project Co-ordinator)

Mr. Bhaskar J. Paul (Programme Officer)

Mr. Padmanabh V. Vaidya (Finance and Administrative Officer)

Mr. Siddhesh S. Surve (Senior Project Associate)

Mr. Mohan Upadhye (Project Associate, Dapoli)

Mr. Abhinay Kelaskar (Project Associate, Ratnagiri)



Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is a German government-owned not-for-profit enterprise supporting sustainable development.

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