



An Analysis of the Stakeholders in Dr. Salim Ali Bird Sanctuary Chorao, Goa

November 2014



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Geotechnical Institute
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Engineering (GIZ) GmbH

On behalf of:



Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany

CMPA Technical Report Series No. 05

An Analysis of the Stakeholders in
Dr. Salim Ali Bird Sanctuary, Chorao, Goa

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Published by

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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November 2014

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Citation

Da Silva, S., R K Alex, N N Naik, and S Parida. 2014. *An Analysis of the Stakeholders in Dr Salim Ali Bird Sanctuary, Chorao, Goa*. CMPA Technical Series No.5. Indo-German Biodiversity Programme, GIZ-India, New Delhi.

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Namrata Namdeo Naik, Sushobhan Parida

(BITS Pilani, K.K. Birla Goa Campus)

November 2014

CMPA Technical Report Series

05

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List of Acronyms

ACs	assembly constituencies
ADP	Annual Development Plan
BDO	Block Development Officer
BJP	Bharatiya Janata Party
BMC	Biodiversity Management Committees
BMCs	Biodiversity Management Committees
BMUB	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
CMPA	Conservation and Sustainable Management of Existing and Potential Coastal and Marine Protected Areas
CT	Census-Town
CTP	Chief Town Planner
DCF	Deputy Conservator of Forest
DPC	District Planning Committee
DRP	Draft Regional Plan
FARs	floor area ratios
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GSBB	Goa State Biodiversity Board
GSIDC	Goa State Infrastructure Development Corporation
INC	Indian National Congress
m	meters
MLA	member of the legislative assembly
MoEFCC	Ministry of Environment, Forest and Climate Change, Government of India
MoU	Memorandum of Understanding
N.O.C.	no-objection certificate
OBC	other backward classes
OG	urban outgrowth
PBR	People's Biodiversity Register
ppm	parts per million
RP	Regional Plan
SC	scheduled castes
SDO	Sub-Divisional Officer
SEZs	Special Economic Zones
ST	scheduled tribes
STP	Senior Town Planners
SUP	Surface Utilization Plan
TCP	Town & Country Planning
VP	village panchayat
WRD	Water Resource Department, Government of Goa
ZP	zilla panchayats

Acknowledgements

Any project is not a single-handed task but a collaborative one and we wish to place on record the various collaborators without whose kind assistance this research would not have been possible.

First, we express our gratitude to the GIZ body which gave us an opportunity to work in this project. We especially acknowledge Dr. Jan Michael Vakily, Team Leader, Conservation of Coastal and Marine Areas (CMPA) Project, and Mr. P.D. Francis, Coordinator—Administration & Finance for the support rendered in this project. If not for Dr. Aaron Lobo's advice, encouragement and timely guidance, this project would not have been shaped the way it has. We thank him for constantly being our pillar of support.

We render our heartfelt gratitude to our institution, BITS Pilani, K.K. Birla Goa Campus, for approving the consultancy project and giving us the space and time to engage in this interesting research. Without the approval from Prof. K.E. Raman, Director of BITS Pilani, K.K. Birla Goa Campus, this project would not have seen the light of day. Thank you Sir, for your belief and trust in us to accept and complete this project. Our team has been consistently encouraged and supported by the good wishes generously received from Prof. Meenakshi Raman, Head, Department of Humanities and Social Sciences, BITS Pilani, K.K. Birla Goa Campus.

Our team has immensely benefitted from Prof. Alito Sequeira's creative suggestions, support and help, especially in finding the best Research Assistant that we could have asked for. We graciously acknowledge his interest and assistance in this project, and if not for him, we would not have had the opportunity to work with Ms. Namrata N. Naik, the Research Assistant of this project.

We acknowledge with gratitude the timely help rendered by the Principal Chief Conservator of Forest, Dr. Anil Kumar for his support, sharing of information and permission to enter the forest area for our fieldwork.

Our team is grateful to our field informants, Mr. Mambre, Mr. Khandeparkar, Mr. Amey and Mr. Uday, for lending us their time, and energy and guiding us in the field and sharing their invaluable knowledge about the place and people. If not for them, our team wouldn't have managed to gather the rich information and minute details.

We wish to place on record the assistance and support given to us by the residents of Chorao. We are humbled by the intricacies of this island and cannot forget the time spent in the island researching for this project.

We express our immense gratitude to Dr. S. Susan Deborah for copy-editing the document at short notice.

We thank Siddhyog Graphics, Vasco-da-Gama, for enabling us to systematically collate, print and present the report.

Solano, Rayson
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Executive Summary

There were two broad sets of stakeholders that were encountered in the course of the fieldwork: (1) There were groups of persons involved in different kinds of livelihoods both in and around the sanctuary, and were labelled as livelihood stakeholders. (2) Then there were different institutions exercising authority over the sanctuary and its surroundings. These were labelled institutional or regulatory stakeholders.

When examining the major activities taking place within the sanctuary it was found that tourism is the most significant activity and one which has also been growing. The main service providers catering to the visitors are the Forest department and a few private boat operators. The Forest department exclusively manages the only walking path into the sanctuary and also manages the boat rides into the sanctuary along the Mandovi river. In the case of the private boat operators, while there have been four or five fishers taking tourists into the sanctuary, only Mr. Uday Mandrekar takes tourists regularly into the sanctuary and possesses a customized boat for these operations. There are indications that another private boat operator—Mr. Paresh Sawant—will soon commence boat trips. The other activity carried out in the sanctuary is fishing, and this is entirely carried out using stake-nets. This activity is not precisely within the sanctuary but on its outer periphery and only on the side facing the Mandovi river. There are four or five persons who set up stake-nets regularly around the sanctuary. There are approximately three persons who regularly enter the sanctuary on foot and catch crabs using iron rods or snare them using baited nets (coblem). To add to these, there are three or four persons who access the rivulets inside the sanctuary by boat and catch crabs using baited nets (coblem).

The fishers, crabbers and the private boat operators can be considered the main actors carrying out livelihood-related activities within the

sanctuary. It was noticed that these three sets of stakeholders comprise very few individuals. Further their activities do not conflict with one another. It was also found that the Forest department, which manages and regulates the entire sanctuary, has maintained a very good rapport with the above-mentioned livelihood stakeholders, and no major conflicts or discord between the two was noted in the course of the fieldwork.

The visitors or tourists coming to the sanctuary comprise a mix of avid bird watchers, casual tourists and curious passers-by. They are an important set of interests who—via their demand for the ‘services’ of the sanctuary—create the impetus for effective conservation of the sanctuary and are the main sources of revenue for the Forest department and the private boat operators. It was noted however that the visitors are rather critical of the facilities offered in the sanctuary and of the general upkeep of the sanctuary. Another major complaint has been the lack of bird sightings in the sanctuary. In contrast, however, visitors who access the boat rides offered by Mr. Uday Mandrekar usually have positive feedback about bird sightings. Since Mr. Mandrekar spans a much larger area compared to the sanctuary, he is able to ‘guarantee’ much more bird sightings compared to those using the walkway or the boat ride offered by the Forest department.

Shifting the gaze just outside the sanctuary, the major human presence comes from households bordering the sanctuary. These are mainly settlements in the wards of Madel and Orando of Chorao village. These residents have very little, if at all any, interaction with the sanctuary. A few persons have small shops near the Madel ferry point, but their business is not significantly connected with the tourists visiting the sanctuary. It was learnt that there are two issues affecting the people in the immediate settlements. The first is to do with the contamination of the wells bordering the sanctuary with salt water. Some residents relate the problem to the fish ponds constructed by the fisheries department, which have now been closed, while others relate the problem to the breakage of the bunds that existed on the periphery and inside the sanctuary, leading to the ingress of salt water. The second issue is connected to a proposal to have a 1 km buffer zone for the sanctuary which has led to fears about not getting construction and commercial licenses for those living within the buffer zone.

It was learnt that the government recently ‘mentioned’ that the buffer zone would be reduced to 100 m, and the Forest department has opined that the same would be contained within the precincts of the sanctuary (personal communication with DCF, Dr. Anil Kumar on 29 October 2014). The other significant activity taking place in the vicinity

of the sanctuary is agriculture. This is mainly undertaken in the khazan areas: namely in Patramon and Varona in the village of Chorao and in the khazans in Salvador-Do-Mundo which lies across the Mapuca river. While the khazan system of agriculture is an age-old practice, agriculture in general has experienced a slowdown. The only khazans where there is a fair amount of cultivation is in Varona in Chorao and some fields in the khazan in Salvador-Do-Mundo.

There is a cultivators' association in Chorao called the the Chorao Farmers Club which has been trying to revive cultivation and encourage organic farming and could be an important partner for the project. When listing the activities taking place in the estuarine surroundings of the sanctuary it was found that these mainly comprise fishing and river navigation. The fishing activities are mainly artisanal in nature. One aspect relating to river navigation which may be of concern for the project is the proliferation of boat jetties which has taken place along the Mapuca river side of the sanctuary in the village panchayat (VP) of Penha-De-Franca and which is governed by the Captain of Ports.

Coming to the institutional or regulatory stakeholders, the main regulator managing the conservation and upkeep of the sanctuary and controlling access to the sanctuary is the Forest department. Through the course of fieldwork, it was learnt that the Fisheries department owns a significant amount of land bordering the sanctuary. The fisheries department had previously constructed fish ponds to encourage pisciculture but these were subsequently discontinued, and the ponds have been dormant for almost two decades. It was also learnt that a recently formed island in the river Mandovi would be handed over by the Revenue Department to the Forest Department and may also form part of the sanctuary.

Shifting to the immediate surroundings of the sanctuary, the most important institution governing the surrounding is the Village Panchayat (VP) of Chodan-Madel (VP Chodan-Madel). The VP is the main institution issuing construction and commercial licences in the village and is responsible for the general upkeep and welfare of the village. The VP also comprises the assembly of all the voters in the village, which is known as the Gram Sabha. The Gram Sabha could potentially be used to communicate the objectives of the project and also solicit participation for the conservation of the sanctuary. Further, the Biodiversity Management Committee (BMC), which is formed under the aegis of the VP, is another panchayat body which the project should work closely with since it shares many of its objectives.

If in the course of the project it is felt that issues pertaining to land use need to be addressed, both in Chorao and in its surroundings, then the

project should consider bringing on board concerned officials from the Town and Country Planning (TCP) department.

With respect to upcoming projects around the sanctuary, it was learnt that there is a proposal to construct a bridge from Chorao to Salvador-Do-Mundo and the alignment of the bridge will be near the sanctuary. It may be important to assess the effect of the bridge on the sanctuary. It was also gathered that there has been a proposal to create a 'Ribandar Biodiversity Park' in the area across the Mandovi river, adjoining the Panaji–Ribandar causeway. It would be worthwhile finding out more about this plan and whether the proposal is under serious consideration. Finally it was learnt that the Water Resources Department (WRD) has recently initiated a study on the effects of climate change on the Mandovi and Zuari rivers. It would also undertake biodiversity studies of the estuaries. This project should track the findings of this study, which seem to be relevant to the project.

Chapter 1

Introduction

An Overview of the Project

The Ministry of Environment, Forest and Climate Change, Government of India (MoEFCC) has entered into a technical cooperation agreement with the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) for implementing the project 'Conservation and Sustainable Management of Existing and Potential Coastal and Marine Protected Areas (CMPA)'. The BMUB has commissioned the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH to jointly implement the project with the MoEFCC in selected states in India.

The overall objective of the CMPA project is 'to contribute to the improvement of the conservation and sustainable use of biodiversity in the pilot protected areas, while taking into consideration the economic circumstances of the local population'.

The CMPA Project intends to improve the protection of biodiversity by promoting participatory approaches to the conservation

and management of existing coastal and marine protected areas, and supporting the creation of new protected areas in the future. By involving stakeholders at local, state and national levels, it is expected to make a significant contribution to the conservation of areas rich in biodiversity. At the same time the project is concerned with identifying economic activities in protected coastal areas in concordance with agreed conservation strategies.

The project maintains pilot sites in four states of India, namely Gujarat, Goa, Maharashtra and Tamil Nadu. Many of these pilot sites feature extended mangrove areas for which the project is tasked to develop management plans for a better conservation of those areas, together with the Forest Department and the concerned stakeholders. Some of these measures will have an impact on people using these mangroves for their livelihood.

This specific project has identified a protected site, Dr. Salim Ali Bird Sanctuary, located on the island of Chorao, Goa, for understanding how

it can be sustainably conserved through the involvement of the people surrounding it and how the conservation of the site could have positive externalities for the population.

A Description of the Consultancy Project

The consultancy is essentially a social study which seeks to aid the overall objective of the project—to work out a sustainable and participatory management plan for the sanctuary by providing a mapping of the social actors who have a significant connection with the sanctuary.

This study is based on two premises: (1) That spaces of ecological interest, often understood as bio-physical spaces, are also social spaces, that is, the ways in which humans conduct their economic activities and the ways in which they seek to govern their societies have certain ecological consequences. It is therefore imperative for any conservation initiative to understand how the area of ecological interest is embedded socially in livelihood activities and in institutions of governance and control. (2) That any space is not only shaped by the economic processes taking place within its confines and the political powers exercising authority over it but is also shaped by similar social processes taking place in its surroundings. The consultancy builds on these premises by seeking to reveal the political and economic stakeholders in and around the sanctuary so that the project can first benefit from an understanding of the same and identify potentials for collaborative partnerships.

To do this the consultancy has first demarcated two basic spatial zones, the sanctuary and its surroundings, thereafter subjecting these two to political and economic analysis. The political lens is used to understand the respective authorities and institutions that exercise power and govern these two zones. The economic lens is used to understand the significant livelihood activities undertaken in these two zones.

Methodology

The first task that was undertaken was to devise a framework which would help orient the research.

Reviewing the literature on environmental conservation and stakeholders, it was noted that the study could expect to encounter two broad sets of stakeholders: individuals and groups involved in activities related to livelihoods and institutions involved in the regulation and governance of spaces and also of human activities. The literature also pointed out that spaces which are interest for environmental conservation are affected both by the activities and governance regimes that occur within that space and also by the activities and regulatory policies pursued in its vicinity.

The above theoretical insights led to the development of a research framework directed towards capturing and understanding the roles of two kinds of stakeholders: livelihood stakeholders and institutional stakeholders. This general focus was in turn delineated along a spatial axis: to look at the livelihood activities and governance institutions within the sanctuary and in its immediate periphery. With respect to the periphery of Dr. Salim Ali Bird Sanctuary the same was further sub-divided into the landmasses and the estuary bordering the sanctuary.

Oriented by the above research framework, the fieldwork was undertaken in two phases. The initial fieldwork limited itself to observing and enumerating the various human activities taking place within the sanctuary and in the immediate surroundings of the sanctuary. In a similar vein, a listing of the various institutions governing these two spaces and regulating the various human activities undertaken in them was also undertaken. As a result, four sets of inventories were created: livelihood activities within and in the surrounding areas of the sanctuary, institutions governing the sanctuary, and institutions governing its surroundings.

Following the creation of these itineraries, the subsequent phase of fieldwork was directed towards developing a more detailed understanding of both the livelihood activities and the institutions governing the respective spaces and human activities. In the case of

the livelihood stakeholders, the fieldwork was focused on gathering the identities of the various livelihood stakeholders, getting a sense of their numbers, understand their socio-economic profile, understanding the nature of their activities and their interaction with the sanctuary and noting down their relationship with the regulators. To do this, the fieldwork made use of semi-structured interview schedules which were customized to each group of livelihood actors. The individual actors were purposively sampled based on observations carried out in the first phase of fieldwork. Actors who were interviewed also directed the field-investigators to other actors. Through the investigation of livelihood actors the study hoped to flag potential livelihood partners and possibilities for the project and also warn of possible challenges. In the case of the institutional stakeholders, the second phase of fieldwork was directed towards understanding each respective institution's jurisdiction, its functions and internal structure. Here semi-structured schedules were used to interview specific individuals currently holding or who had held key positions of authority within the respective institutions. Through this the study aimed to place on record an itinerary of the various institutions which would be relevant for the project.

Finally, in the course of the fieldwork it was also learnt that there were some infrastructure projects and other conservation initiatives taking place in the surroundings of the sanctuary.

Since these would be of potential interest to the project, the same were also detailed in the report.

Outline of the Report

After this introductory Chapter, the report is divided into two parts. Part I of the report with Chapters 2 and 3 are largely a political analysis through which the significant institutions exercising authority over the sanctuary and its surroundings are presented. The second chapter explains the genesis of the sanctuary and in doing so traces the authorities exercising control over the sanctuary. The third chapter then shifts the focus to the surroundings of the sanctuary and divides the same into three geo-political zones in order to highlight the respective institutions exercising authority in these spaces.

Part II comprise Chapters 4 and 5 present an economic analysis to reveal the livelihoods carried out within the sanctuary and in its periphery. Chapter 5 looks into the precincts of the sanctuary to identify the various human activities that are carried out there and in doing so it proceeds to list the respective livelihood-stakeholders. Chapter 5 then shifts the economic lens to the surroundings of the sanctuary. It first demarcates the surroundings into two—the landmasses and the estuarine system—and identifies the human activities carried out in these. By doing this, the chapter explains the nature of these activities and highlights the respective stakeholders involved.

Chapter 2

The Sanctuary: Its Location, History and Governance

4

This chapter focuses on the location and the history of the sanctuary. It explains how the sanctuary came about and in doing so traces the emergence of the authorities and their jurisdiction over the sanctuary.

Location of the Sanctuary

Dr. Salim Ali Bird sanctuary is located in the western Indian state of Goa. It is located in North Goa on the island of Chorao as shown in Figure 1. The sanctuary falls within North Goa District and comes under the taluka of Tiswadi. The sanctuary is close to the state's capital, Panaji. It can be accessed either by road from Aldona, Assonora or Bicholim or by ferry from Ribandar or Pomburpa. Visiting the sanctuary from Panaji entails travelling 4 km on National Highway 4A to the Ribandar jetty and taking the ferry to Madel, Chorao.

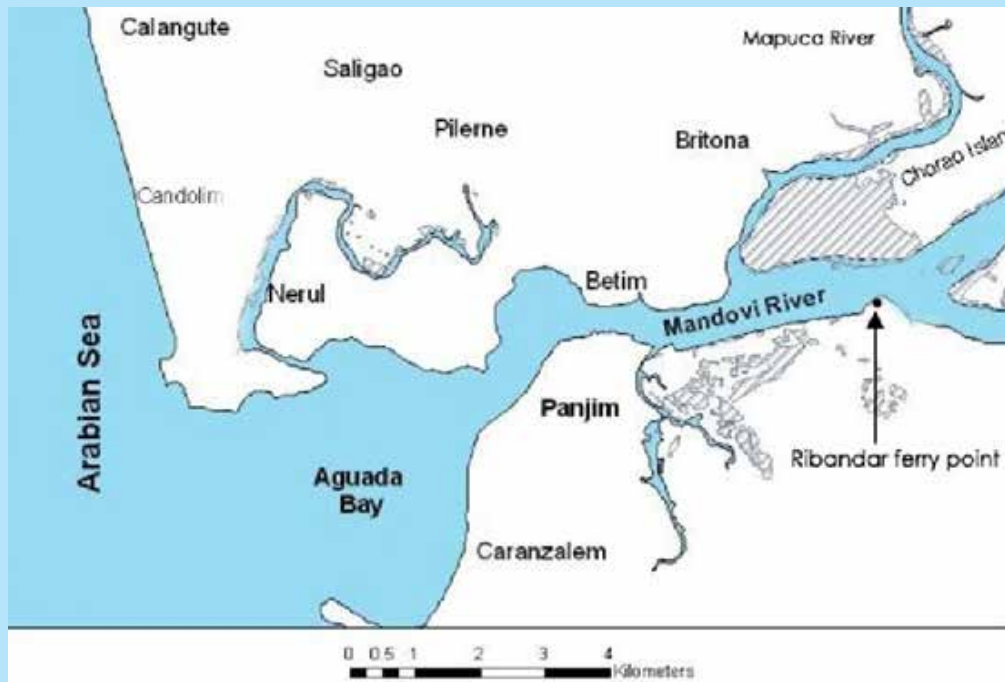
The island of Chorao is an inland island located in the Mandovi estuary. Within Goa, the estuary traverses inland up to a distance of about 50 km (Shetye et al, 1995, page 493), after which it continues into the State of Karnataka. The

estuary has an approximately 3 km wide bay, called Aguada Bay, where it joins the Arabian Sea. As the estuary moves upstream, it gets progressively narrower (Kessarkar et al, 2009, page 370). About 8 km upstream from Aguada Bay the estuary encounters the island of Chorao, where it divides into the Mapuca and the Mandovi rivers. The sanctuary, which is situated on the eastern corner of the island, is surrounded on three of its sides by the confluence of the Mapuca and the Mandovi rivers as shown in Figure 1.

The estuary has heavy run-off during the south-west monsoons with the influx of fresh water (Kessarkar et al, 2009, page 370). Apart from the monsoon months the flow into the estuarine area is mostly tidal and is experienced up to approximately 50 km from the bay (Sundar and Shetye, 2005, page 493).

The mean tidal heights at LT, MT and HT levels were calculated to be 0.25 m, 1.1 m and 1.98 m, respectively (Clemente and Ingole, 2011 page 154). As the sanctuary is a low-lying area (altitude

Figure 1
Map Showing the Estuarine Area Around Chorao Island



Source: Adapted from Nagi (2008), page 33

Figure 2
A View of the Ferry from the Madel Jetty



ranging from -0.5 m to +0.5 m), it is affected by the tidal action (Kumar, 2013, page 6).

The area, which is largely marshy, forms a transition zone between the firmer terrestrial dry land of Chorao towards the eastern side of the sanctuary and the aquatic estuarine systems comprising the rivers, Mandovi and Mapuca.

There are also a number of rivulets which criss-cross the sanctuary, adding to its marshy profile.

The tidal action on the sanctuary leads to high concentrations of dissolved salts in its water, and the water levels constantly change with the tide. The oxygen-deprived sediment makes it impossible for most plant species except

Figure 3
Fiddler Crab in the Sanctuary



mangroves, which have special adaptations to survive in such conditions (Kumar, 2013, page 9). The sanctuary is a typical mangrove swamp forest (wetland) occupying an area of approximately 270 ha (ISRO, 2009, page 46). The National Wetland Atlas classifies the area as a coastal natural mangrove wetland (ISRO, 2009, pages 46-47).

The mangrove flora of this island is represented by 12 genera and 15 species' of which the dominant plants include *Rhizophora mucronata*, *Avicennia marina*, *Sonneratia alba* and *Excoecaria allagocha* (Clemente and Ingole, 2011, page 154).

It hosts more than 100 species of bird, both native and migratory. It also has marine animals like crabs, shrimps, oysters and clams. The network of bunds existing in the sanctuary provides an ideal habitat for some of the mammals like rodents, fruit bats and jackals. The low-lying areas which are under tidal influence support diverse inter-tidal life forms, of which most prominent are mud skippers and fiddler crabs (Kumar, 2013, pages 14-24).

History of Dr. Salim Ali Bird Sanctuary, Chorao

As noted by Kumar (2013, page 2) the area in which the bird sanctuary is presently located was originally low-lying khazan land (for explanation, refer to the note on khazans on page number). The area was parcelled into a number of privately owned khazans in which paddy was cultivated. The same was sown during the monsoons and harvested in October. From the fieldwork it was found that many persons in Chorao still recall the area being cultivated. A couple of private parties owned separate khazans. Some of the prominent owners were Jack Sequeira¹, the Velho family and Baba Hiro Naik. The Comunidade also owned a khazan in the area which was located closer to the settlement areas. At the time, mangroves grew on the periphery of the entire khazan bordering the outer bunds of the khazans and the Mandovi estuary. To get a glimpse of the sanctuary when it comprised cultivated khazans see Figure 4, which shows the harvesting of the Velho khazan during the 1950s.

The owners of the khazans would hire agricultural workers to cultivate and harvest

Box 1 The Khazan System

Beginning from the time of the Bhojas (circa 200 BC), the Konkan Mauryas (500 AD), the Goa Shilaharas (900 AD), the Goa Kadambas (1000 AD), the Bahamanis (1300 AD) and the Portuguese (1510 AD) to the present, the larger part of Goan history was witnessed by the khazans (Alvares and Gadgil, 2001, page 99).

The khazans are saline flood plains in Goa's tidal estuaries which have been reclaimed over centuries with an intricate system of bunds (dykes) and sluice gates. These bunds are helpful in protecting the khazans against the ocean/river. One can speculate that 50 years ago, the bunds were constructed sourcing locally available, cheap, recyclable materials such as mud, chopped straw, mangrove litter and branches, laterite stones, bamboo and areca-nut logs and other such. These structures were made on the basis of the tidal cycles, water currents, wave energy, sediment load and anticipated increase in floodplains. Since the erosive effects were highest near the external embankments, such constructions employed locally quarried laterite stones. The outer embankments are linked to the second line of defence. The sluice gates (see Fig 2.5) are vital to the ecology of the khazans which is dependent on the dynamic variation in water salinity from near-zero ppm in the springs flowing from the hills to 35,000 ppm in the river water flowing in from the sluice gates. Strategically located, these gates depend on the contours and relief of the land, the elevation at the point of smooth inflow and outflow of saline water. Except when their life is reduced due to long periods of usage, the wooden shutters need infrequent supervision. Under normal circumstances, the wooden shutters operate with the pressure of the tidal flow. Depending upon the strength of the tidal flow, these shutters are installed in situ in naturally carved laterite wires or specially made laterite. A majority of the shutters are supported by gates built with laterite and mortar/cement. The sluice gates protect the fields from inundation and control the water flow in and out of the depressions or rivulets in most khazan lands. The water withdrawal mechanism in the khazan system helps in the growing of salt-tolerant varieties of paddy and the salinity of the salt in turn helps pisciculture. In any case, water is not retained for a long time, which could affect the land adversely. The khazan system is considered a reliable and low-cost saline water drainage system from the floodplains. It is necessary to maintain a harmonious balance between the mangrove forests and khazan lands. Today, the use of khazan systems is deteriorating, causing damage to the khazan land and ecology. Some of the reasons that directly/indirectly affect them are:

- Deforestation in upper river basins
- Uncontrolled urban growth
- Pollution of estuaries
- Barge traffic in Mandovi river
- Encroachments in wetlands
- Destruction/blockage of the natural drainage system
- Uncontrolled and illegal pisciculture
- Unauthorized extraction of mud, shells, etc.
- Mismanagement of bunds
- Stoppage of agriculture (Alvares and Gadgil, 2002, pages 99–102)

their fields. These workers were not from Chorao and would come by boat from areas that were further upstream in the Mandovi estuary such as: Madkaim, Kundaim, Marcel and Mardol. They would built huts and stay on the khazan until the paddy was harvested.

Interviews during the fieldwork showed that until the 1960s the area was cultivated, after which there was a slowdown and ultimate stoppage of paddy cultivation in the area. The reasons for the end of cultivation are varied. Some opine that it was because of new openings created by the Government of Goa following the state's liberation from Portuguese colonial rule

in 1961. Others opine that it was a result of the passing of the Agricultural Tenancy Act in 1964 and its subsequent amendments, giving tenants rights to purchase the land they cultivated at nominal rates. While the act was intended to provide security for the agricultural tenants, it dis-incentivized the owners of agricultural land from maintaining the bunds which used to prevent salt water from entering the fields. The decline in bund maintenance, along with the increase in barge traffic with the opening of iron-ore mines, led to continual waves hitting the bunds, which also contributed to their erosion. The breaching of the bunds resulted in ingress of saline water into the khazans, and

Figure 4
A 1950 File Photograph of the Sanctuary



Photographer: Rui Antão (The photograph is currently in the possession of Velho family, Panaji)

the mangroves which used to border the khazan then began to progressively take root inside the khazans, leading ultimately to their colonization of the entire low-lying area. Currently forms I and IV for Survey No. 468 for the village of Chorao show the owner is Jack Sequeira.

The Two Authorities of the Sanctuary

The area admeasuring approximately 260 ha was initially acquired around 1986 (The Hindu, 2005) by the Agriculture Department for agricultural and pisciculture purposes. Due to the overgrowth of mangroves and the visits of migratory birds, an area of 178 ha of the total land that was acquired was subsequently handed over to the forest department (Kumar, 2013, page 2) and 83 ha was transferred to the Department of Fisheries to set up pisciculture farms. Figure 6 shows the extent of the land in the possession of the respective authorities.

In 1988 the Forest Department went on to declare the land in its possession a Reserve Forest under Section 20 of the Indian Forest Act, 1927. Subsequently, in 1998 it was conferred

the status of a sanctuary under the Wildlife Protection Act of 1972 (Kumar, 2013, page 2; ELDF and WWF India, 2009, page 74).

In the case of the land in the possession of the Fisheries Department, of the total 83 ha, the department allocated 10 ha to construct seven aquaculture ponds. These ponds were leased to private parties who used it to farm tiger shrimp. Of the seven ponds, about three were reserved for locals. Subsequently, the ponds were shut down. There were different reasons given for the closure of the ponds. Some people mentioned that the ponds were responsible for damaging the well water in the surrounding areas as the wells became saline. Others opine that the contamination of the wells was the result of the breakage of the bunds and the resultant ingress of salt water into the sanctuary right up to the settlement areas. Some of the lessees of the ponds mentioned that the Department of Fisheries increased the annual rents which proved to be unprofitable to the lessees, some of whom refused to pay the revised rates, leading to a shutting down of the ponds.

Figure 5
Sluice Gates (Manos) in Chorao

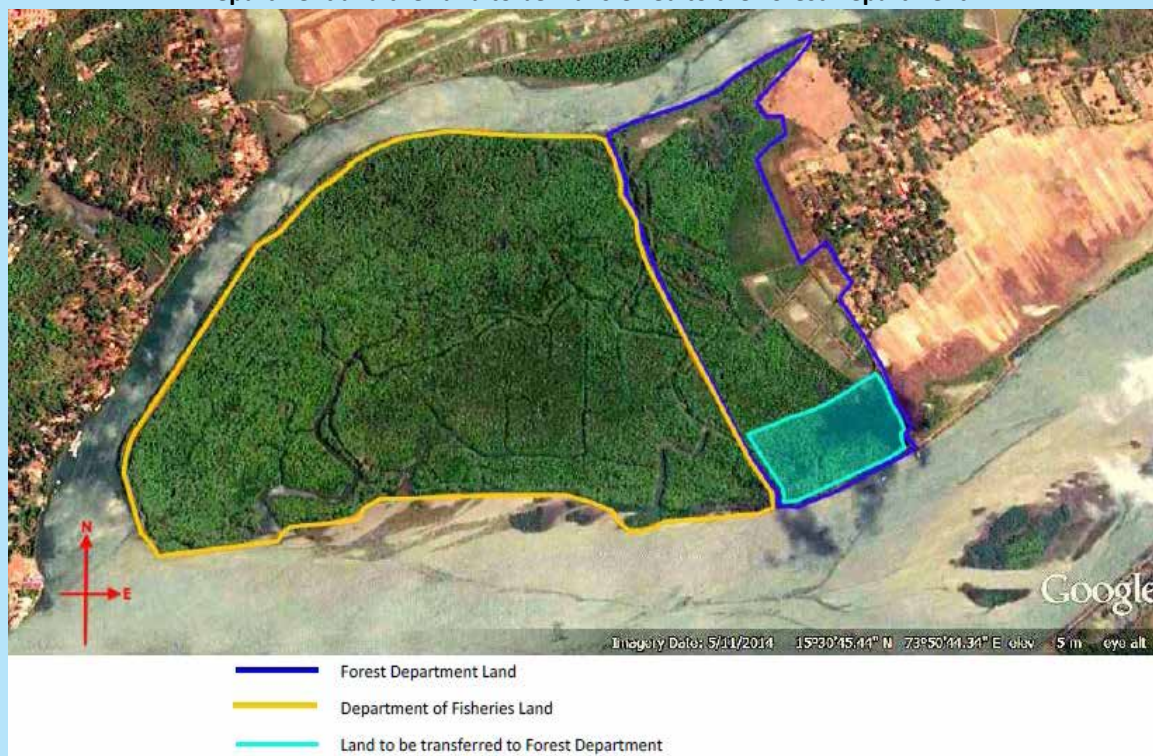


Figure 6
Map Illustrating Demarcation of Land Owned by the Forest Department and the Fisheries Department



Overlay source: (1) For forest department jurisdiction: Kumar (2013) page 5 and
(2) Dr. Sharmila Monteiro, Director, Fisheries Department, Govt.
Base map source: Google Earth

Figure 7
Map Showing the Two Jurisdiction of Forest Department and the Fisheries Department and the Land to be Transferred to the Forest Department



Overlay source: (1) For forest department jurisdiction: Kumar (2013) page 5 and (2) Dr. Sharmila Monteiro, Director, Fisheries Department, Govt.
 Base map source: Google Earth

Shutting down of the aquaculture ponds resulted in the Fisheries Department closing down their operations in the area eventually resulting in mangroves colonizing even that area, including the fish ponds. This is evident from the satellite imagery given in Figure 7. Though the Fisheries Department is in de jure possession of 83 ha of the area, the Forest Department became the de facto authority managing the area. The Fisheries Department has decided to transfer 27 ha to the Forest Department via the Revenue Department. See Figure 7. to get an idea of the area proposed to be transferred to the Forest Department.

The Sanctuary's Buffer Zone

Over the last few years controversies have emerged in the village of Chorao because of a proposal to have a 1 km buffer zone for the sanctuary.

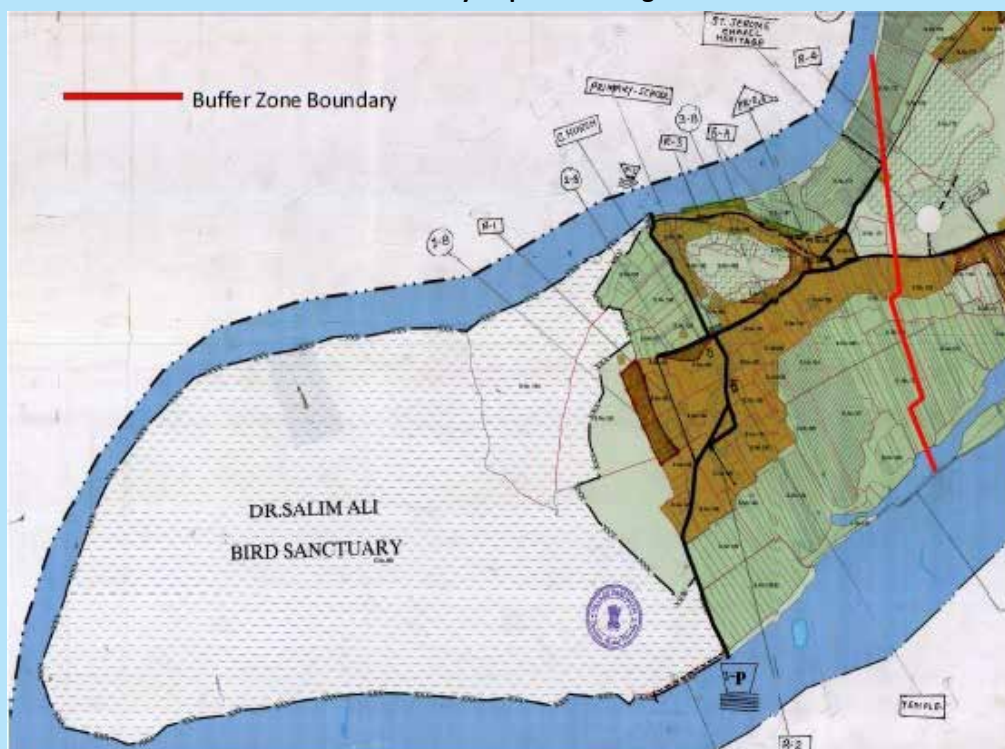
This first emerged when the Draft Regional Plan for Goa—2021 (DRP-2021) was finalized in October 2007 and was sent to Chorao's village panchayat (VP Chodan-Madel). The same buffer zone was mentioned in the final Regional Plan for Goa—2021 (RP-2021), prepared in October 2011². Refer to Figures 8 and 9 for details.

The proposal to have a buffer zone created a lot of discontentment among the locals, especially those who are living within the purview of the sanctuary (Fernandes, 2011). They felt that they would henceforth not be issued permissions to construct new houses and repair or modify old houses (Times of India, 2011a). Similarly, no small-scale workshops and manufacturing would be allowed. The Forest Department tried to hold a number of meetings with the people to assure them that the buffer zone will not affect their constructions, etc. (Times of India,

Box 2 Mankule Island

Over the last 15–20 years an island has emerged in the Mandovi river. It is in the vicinity of the sanctuary, located between the Madel ferry jetty and the tip of the neighbouring island of Divar (see figure 10). From the fieldwork it was learnt that a number of people opine that the island was formed as a result of the continual run-off of silt from the mining pits further upstream. The island first formed as a small sand bank and grew wider with the collection of silt, and it subsequently came to be populated with mangroves. The island has a wide low-lying area that becomes exposed during low tides and is used by some fishers to place stake-nets along the low-tide line. Farmers in the adjoining khazan in Chorao—Patramon khazan—complain that the island has resulted in changing the flow of the current in the river, leading to increased flows along the outer bund of the Patramon khazan, causing its deterioration. Details about the same have been discussed in Chapter 4. From a meeting with the Deputy Conservator of Forests (North) it was learnt that the previous Chief Minister of Goa, Mr. Manohar Parrikar, has named the island Mankule Island and it was decided to hand over the same to the Forest Department.

Figure 8
1 Km Buffer Zone of the Sanctuary as per Draft Regional Plan for Goa—2021



2011b) but were unable to convince the villagers about the purpose of the buffer zone and the exact nature of the restrictions that would be imposed on those falling within its domain. Some of those arguing against the buffer zone said that the sanctuary was not a perennially existing forest but one which has emerged only recently. They argued that when the 'man-made' mangrove forest—created as a result of government negligence through the breakage

of bunds—was designated a protected area they did not protest and have lived alongside the same without interfering with the sanctuary and therefore failed to see why a buffer zone has subsequently come to be proposed. Further, fears have arisen among the villagers who have learnt about the fate of other villages in parts of Goa and India who have either been evicted or have had numerous restrictions imposed on them when buffer zones were around protected

Figure 9
1 Km Buffer Zone of the Sanctuary as per Final Regional Plan for Goa—2021

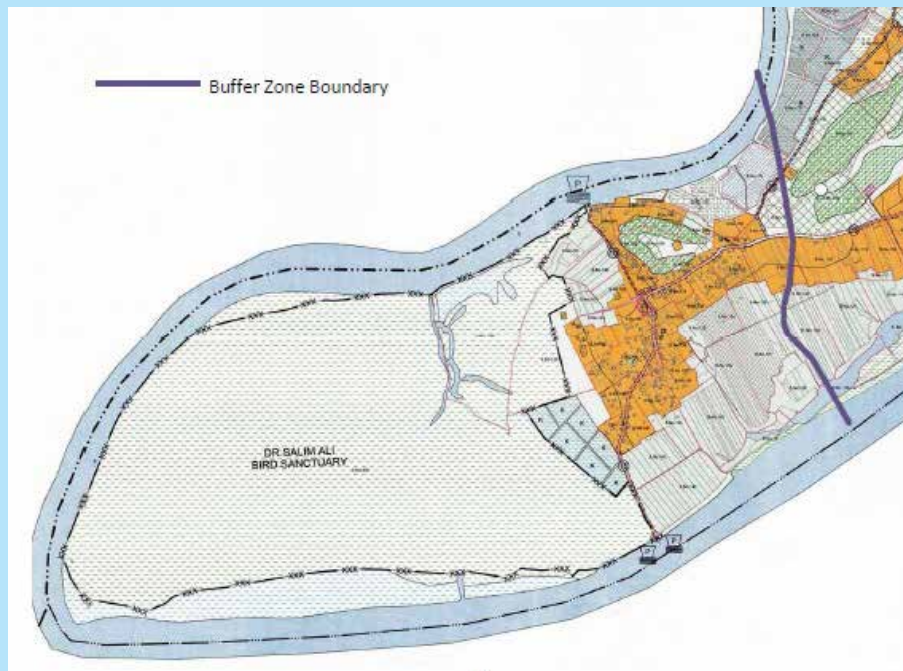


Figure 10
Map Showing Mankule Island



Source: Google Earth

areas. Some persons also cited a case where a person applying for a construction licence was asked by the Town & Country Planning (TCP) Department to get a clearance from the Forest Department as the proposed construction fell within the 1 km buffer zone.

The issue of the buffer zone was taken up by the state government with the MoEFCC. In November 2014 the then Chief Minister of Goa, Mr. Manohar Parrikar issued a statement saying that the Goa State Government has argued with the MoEFCC to reduce the proposed 1 km buffer zone to just 100 m (Times of India, 2014).

When speaking to the Deputy Conservator of Forests (North) about the same issue it was learnt that the 100 m buffer zone would be incorporated within the existing boundaries of the sanctuary since, as already explained above, the area presently in de jure possession of the Forest Department falls inside the mangrove forest and the 100 m buffer zone would fall into the area possessed by the Department of Fisheries and therefore be incorporated within the land which is currently de facto being managed by the Forest Department. In this way, the proposed 100 m buffer zone would not affect any of the settlements and commercial activities in the vicinity of the sanctuary.

Conclusion

By exploring the history of the sanctuary and explaining how it came about the chapter has shown how the sanctuary came in the possession of the Forest Department. The chapter has also shown how the area immediately surrounding the sanctuary came under the possession of the Department of Fisheries. These two departments therefore become institutional stakeholders. Although the operations of the Department of Fisheries have altogether been suspended and the entire area is presently being managed by the Forest Department, it may be important to consider formally handing over the entire remaining portions to the Forest Department which can help the Department effectively plan and implement future plans for the area. The chapter has also highlighted the issue of the proposed buffer zone around the sanctuary, which can be understood as an extension of the domain of the sanctuary, under the jurisdiction of the Forest Department. This has however proved to be controversial with the villagers of Chorao, especially those in the sanctuary's immediate surroundings, who have suffered from the contamination of their wells as a result of the breakage of the bunds and the continual ingress of salt water into the sanctuary. While the state government has proposed to reduce the buffer zone, the same should be effectively communicated to the people of Chorao.

Notes

1. Currently form I&IV for Survey No. 468 for village of Chorao shows owners as Jack Sequeira.
2. State Level Committee for Regional Plan for Goa - 2021(2011) Final Report Regional Plan for Goa – 2021: Release Three, Panaji, Goa: Govt. Printing Press.

Chapter 3

The Governance of the Surroundings of the Sanctuary

14

This chapter shifts its gaze to the surroundings of the sanctuary and categorizes the same in terms of three geo-political zones, i.e., spatially distinct areas falling under the jurisdiction of different authorities as shown in Figure 11. The three zones include the eastern surroundings of the sanctuary, comprising the village of Chorao; the northern, western and southern riverine surroundings, comprising the Mandovi estuary; and, finally, the wider social environs, comprising the rural and urban areas that surround the sanctuary and the island of Chorao. The aim of this chapter is to highlight the various political authorities who govern the areas surrounding the sanctuary. The reason for highlighting these institutional stakeholders is that they are key decision-makers in the vicinity of the sanctuary whose policies and actions can potentially affect the health of the sanctuary and vice-versa. They are also potentially affected by the plans and policies implemented in the sanctuary. More details have been provided about the first two zones—Chorao and the Mandovi estuary—because of the proximity of these two areas to the sanctuary compared with the wider surroundings.

Governance of the Island of Chorao

The sanctuary is physically attached to the island of Chorao and therefore the island becomes the most socially embedded area to the sanctuary. In terms of governance while the sanctuary falls predominantly under the purview of the Forest Department, the rest of the island falls under a different set of political and government authorities. Each of these authorities has a different composition, roles and functions and different superior and subordinate offices. While there are a number of government authorities who exercise their jurisdiction and undertake different activities in Chorao, this section will focus on the governance of four authorities since their impact is significant and relevant to the aims of the project. The four that are discussed below include the village panchayat (VP), the district administration, the member of the legislative assembly (MLA) and the TCP department.

Local Governance

The institution of the panchayats was established with the objective of decentralizing governance. Through the creation of this third

Figure 11
Map Showing the Three Zones Under Consideration



Source: Google Maps

tier of government—below the Federal and State tiers—it was intended to bring responsive governance to the grassroots and encourage people to participate in the management of their local areas and have greater oversight over local administration. The panchayats are supposed to be the most proximate and responsive government authority to take up local issues.

The functioning of the VP has two aspects: (1) The panchayat: for electoral and developmental purposes, the VP is divided into wards. One-third of the seats are reserved for women¹ and some seats are reserved for persons from the scheduled castes (SC), scheduled tribes (ST) and other backward classes (OBC). The electorate in the village elects ward representatives, known as panchas, who serve a 4-year term. The elected panchas in turn nominate a Sarpanch who heads the VP. Together these representatives are supposed to ensure the functioning of the VP. (2) The Gram Sabha: This is an assembly of the people who fall under the VP's jurisdiction. The assemblies are held four times in a year.² The GS enjoys powers to determine the priorities of the VP and oversee its functioning.

Functions of the Village Panchayat and the Gram Sabha

The following responsibilities and powers have been devolved to the VPs in order to perform their role of local governance: Their overall objective is to 'promote the health, safety, education, comfort, convenience or social or economic or cultural well-being' of the inhabitants in their jurisdiction. As a result, the VP is responsible for building roads and bridges and carrying out repairs on them. It also has the responsibility to ensure proper sanitation, which includes garbage collection and disposal and effective drainage in the village. The VP is empowered to act against certain violations such as illegal constructions, encroachments in public and open spaces and has powers to impound stray cattle.

The VP is also an important licensing body in the village. It is the main authority issuing permissions for the construction of houses, building and running hotels, shops and eateries, construction of factories within its jurisdiction and undertaking any repairs of the above-mentioned structures. Other technical agencies

of the government assist the VP to assess and approve applications for the above licences.

Finally, the VP also issues important certificates to the inhabitants of its area. These include income, occupancy, birth and death, residence, poverty, occupation and bonafide fisherman certificates. These are important for the villagers to avail themselves of different services and schemes offered by other government departments (Directorate of Panchayats, 2008, pages 19–30).

The assembly of the people, the Gram Sabha, has powers to oversee the budget and the administration of the VP. The assembly is supposed to ‘determine the priorities of the panchayat’. It can also organize people for specific work in the village. Importantly, the decisions taken by the assembly are binding on the VP as long as they are not contrary to the provisions of law.

The assembly has powers to appoint various committees. These include (1) Supervisory Committees to oversee the work of the VP, (2) Ward Development Committees which can help prepare ward plans which can thereafter be integrated into a village development plan and (3) Vigilance Committees which can oversee the quality of work carried out by the VP (Directorate of Panchayats, 2008, pages 10–12).

Organizational Structure of Panchayat Institutions

There are three levels in which the panchayat system is organized comprising a mixture of elected and government appointees:

At the village level; As mentioned above, each VP is divided into wards and the people belonging to each ward elect a ward representative known as a pancha who then nominate a Sarpanch who heads the VP. The VP is assisted by a Panchayat Secretary who is appointed by the state government. The responsibilities and powers of the VP have already been discussed in the section above.

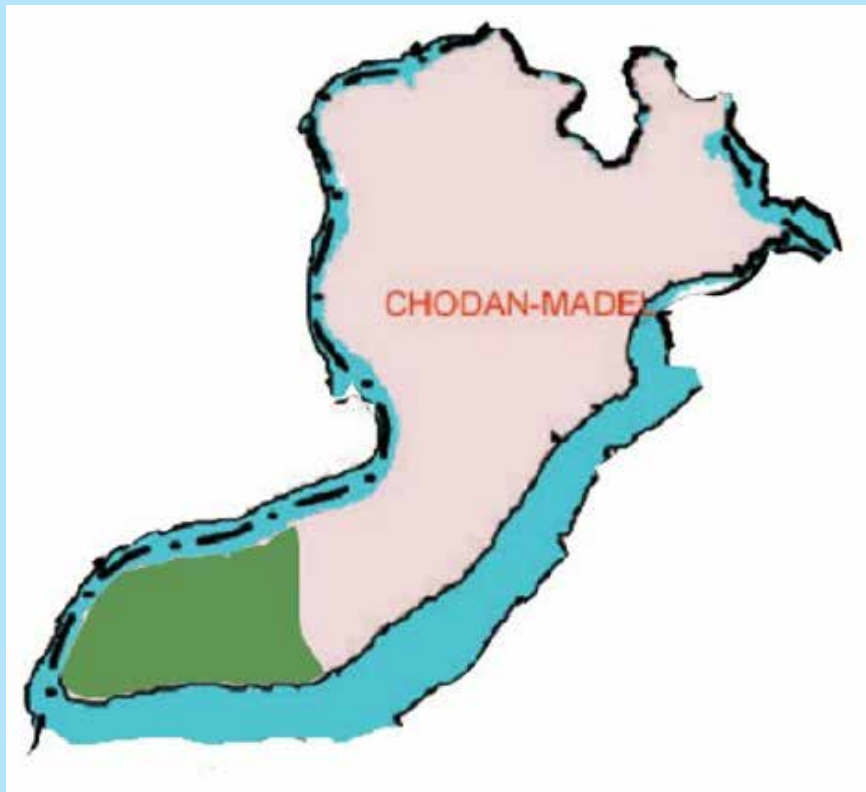
At the district level. The state of Goa is divided into two zilla panchayats (ZP) coterminous with the two districts, North Goa Zilla Panchayat and South Goa Zilla Panchayat. The ZPs in turn have zilla constituencies: North and South Goa ZPs have 30 and 20 zilla constituencies, respectively. The people in each zilla constituency elect zilla representatives for a term of 5 years.

The zilla representatives in turn nominate an Adhaykasha who heads the ZP. Each ZP is assisted by a Chief Executive Officer who is a state government appointee and who performs secretarial duties for the ZP. The role of the ZP is mainly to ‘incur expenditure for various works pertaining to the health, safety, education, comfort and social, economic and cultural wellbeing of people in its jurisdiction’. Further powers are specified in Schedule II of the act (Sections 238–239 of Panchayat Raj Act).

At the state level; All the VPs within a taluka fall under the purview of a Block Development Officer (BDO), whose duty is to supervise and assist the VPs. The BDO has to ensure the proper utilization of funds given to each VP and also ensure their compliance with government orders and instructions. The BDO is also entrusted with the task of formulating development plans for the block. Administratively, the BDO is answerable to the Deputy Director of Panchayats, whose jurisdiction includes all the VPs and BDOs within a district. The Deputy Director acts as the coordinating agency at the district level and oversees the administration of VPs in the district. He or she supervises the functioning of BDOs, VPs and VP Secretaries in the district and is empowered to act against illegal constructions. The Deputy Directors is in turn answerable to the Director of Panchayats who is answerable to the legislature via the Secretary of Panchayats and the Minister of Panchayats.

Importantly, every VP is expected to prepare an Annual Development Plan for the village which is thereafter supposed to be forwarded to the respective ZP. The ZP is in turn supposed to prepare a development plan for the entire

Figure 12
Map Showing Jurisdiction of VP Chodan



Source: Adapted from Task Force for RP—2021 (2007), page 7

Figure 13
Map Showing the Wards of VP Chodan-Madel



Source: Based on interview with Mr. Krishna Haldankar, Sarpanch of VP Chodan-Madel

Table 1
Ward Representatives of VP Chodan-Madel

Ward No.	Ward Name	Category of the Ward	Name of Representative
I	Madel	General	Pandhari Kanta Vernekar (Dy. Sarpanch)
II	Kerem	Women	Arati Narendra Bandodkar
III	Karabhat	General	Salvador Alex Cruz
IV	Saude	OBC Women	Divya Devendra Usapkar (Sarpanch)
V	Pandavada	OBC	Vishal Ashok Acharya
VI	Malevadda	General	Shamba Shankar Kalangutkar
VII	Sodetim	Women	Pooja Prasad Chodankar
VIII	Devгим	General	Vasudev Vasant Dhuri
IX	Orando	General	Rama Maddu Kubal

Source: Government of Goa (2012)

Table 2
Office bearers of ZP

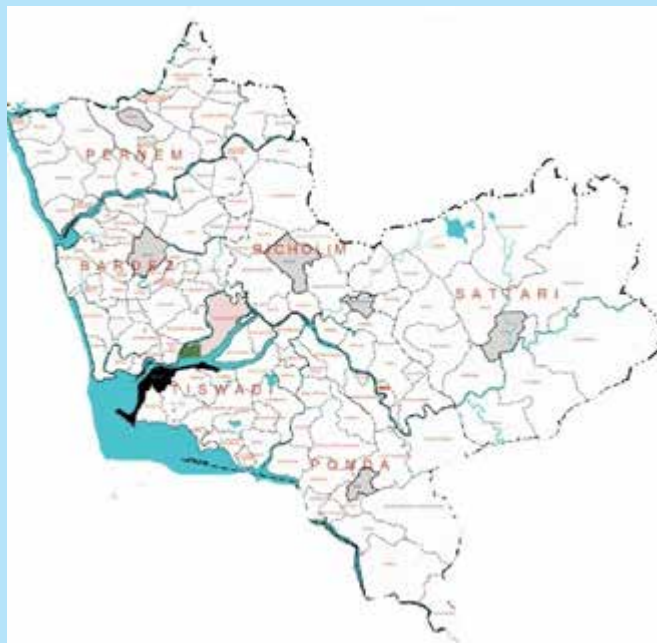
Jurisdiction	Office	Name
North Goa Zilla Panchayat	Adhaykasha	Ms. Amol Morajkar
Chorao	Zilla Representative (Chodan)	Vrunda Naik

Figure 14
Map Showing Tiswadi Taluka, the Jurisdiction of the BDO of Tiswadi



Source: Adapted from Task Force for RP—2021 (2007) pg. page 7

Figure 15
Map Showing North Goa District, the Jurisdiction of the Director of Panchayats



Source: Adapted from Task Force for RP—2021 (2007), page 7.

Table 3
Office Bearers of Panchayat Administration

Jurisdiction	Office	Name	Contact
Entire state of Goa	Minister of Panchayats	Mr. Dayanand Mandrekar	-
Entire state of Goa	Secretary of Panchayats	Mathew Samuel (IAS)	mathew.samuel@nic.in
Entire state of Goa	Karabhat	General	Salvador Alex Cruz
North Goa District	Director of Panchayats	Mr. Narayan S. Navti	(0832) 2432826 / 2222586
Tiswadi Taluka	Deputy Director of Panchayats (North)	Mr. Dashrath Redkar	(0832) 2222586 / 2432550
Chorao	BDO-Tiswadi	Mr. Bhiku. L. Gawas	(0832) 2426481
Chorao	VP Chodan-Madel	Mr. Rupesh Halarnkar	8888694462 / 9326125977

district and submit the same to a District Planning Committee (DPC). The DPC's role is to consolidate the VP and ZP plans along with those prepared by the Municipal Councils governing the urban areas in the district.

In 2002 the union government passes the Biological Diversity Act. To implement the

objectives of the act, in 2004 the Goa State Biodiversity Board (GSBB)³ was formed in 2001 (Shetye, 2012). Under the mandate of the Biological Diversity Act, 2002—as per Section 41—every locality should form Biodiversity Management Committees (BMCs) which would be created at the level of the panchayats. A BMC's main task is to maintain a People's Biodiversity

Register (PBR) which shall contain comprehensive information on the availability and knowledge of local biological resources, their medicinal or any other uses or any other traditional knowledge associated with them.

Specific Information Pertaining to VP Chodan-Madel

In the village of Chorao, local governance is carried out by the village panchayat of Chodan-Madel (VP Chodan-Madel). To get a sense of the jurisdiction of the VP, see Figure 12. The VP is divided into nine wards. For an approximate idea of the layout of the wards, see Figure 13. There are three seats reserved for women, and two seats are reserved for persons from the other backward classes (OBC). The last election was held in 2012, and the names of the elected representatives are shown in Table 1. The VP is presently headed by Mrs. Divya Devendra Usapkar. One can see from Figure 13 that the wards closest to the sanctuary are Ward I and IX, represented by Mr. Pandhari Vernekar and Mr. Rama Kubal, respectively.

District Administration

The District Administration is the branch of the executive at the district level assigned with the 'role of implementing the laws and policies of the government on the ground' (Collectorate of North Goa, n.d., page 4).

The administration is organized in the following manner: Heading the administration is the District Collector who is also known as the District Magistrate; each district is divided into subdivisions and talukas/tehsils which are headed by Deputy Collectors/Sub-Divisional Officer (SDO) and Taluka Mamlatdars, respectively. Talukas/tehsils are in turn divided into Revenue Circles which are headed by a Circle Inspector and the revenue circles are subsequently divided into Revenue Sazas which consist of compact revenue villages. The Revenue Saza is managed by the Talathi. The Revenue Saza and the Revenue Village are the smallest units of the District Administration and the Talathi is the representative of the district administration at the grassroots.

Functions of the Authorities in the District Administration

The District Collector's main duties include the collection of revenue through land taxes, income taxes, excise duties, etc. The Collector also carries out land assessment and land acquisition. The Collector also performs magisterial functions which include the maintenance of law and order, disaster management in cases of natural calamities, crisis management in cases of riots and law and order situations. He or she is also the responsible official for overseeing the functioning of the Comunidades and is the District Election Officer.

The office of the Deputy Collector and the SDO are the authorities responsible for settling matters pertaining to the Land Revenue Code, Tenancy Act, Mundkar Act, CRPC and elections. This is also the authority issuing conversion sanads, certificates for partitioning of land and issuing sound permissions.

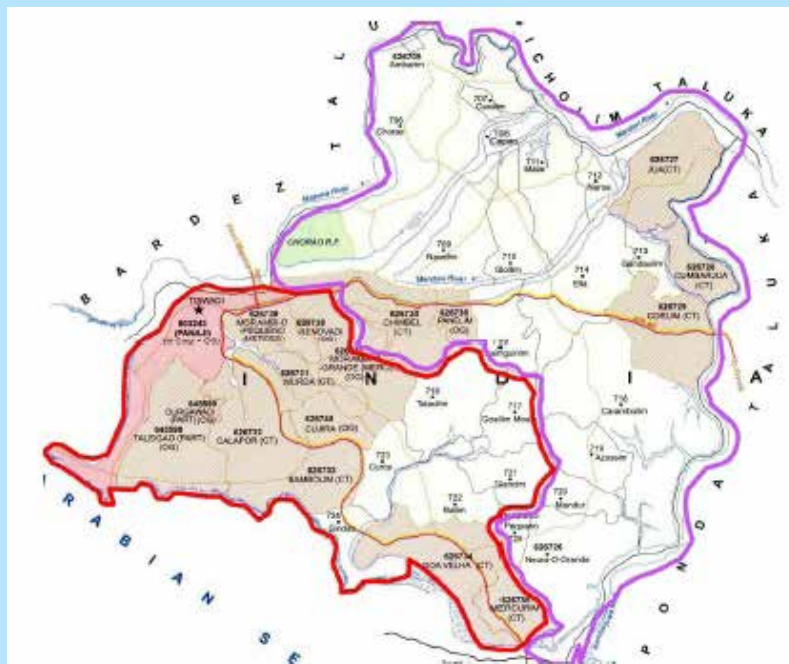
Taluka Mamlatdars are executive magistrates in their respective talukas. They also handle services such as granting of residence certificates, solvency certificates, caste certificates, ration cards, allocation of plots under the 20-point programme and inclusion of names in the electoral roll. The Talathi is responsible for providing information pertaining to local land records and carries out field inspection to prepare a cultivation report for the Revenue Saza.

Specific Information Pertaining to the Village of Chorao

Goa comprises just two administrative districts: North and South Goa. The sanctuary and the village of Chorao fall within the purview of North Goa District and therefore come under the jurisdiction of the North Goa District Collectorate.

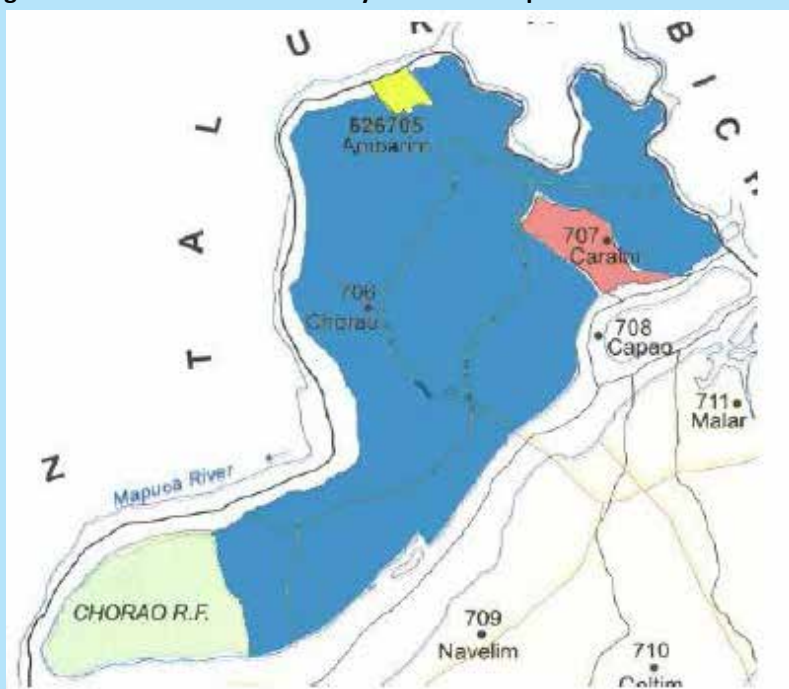
From the ground up, Chorao together with two other revenue villages, Ambaraim and Caraim, comprises one Revenue Saza called the Chorao Revenue Saza, which is managed by a Talathi. The

Figure 16
Map Showing the Two Revenue Circles of Tiswadi Taluka



Source: Adapted from Directorate of Census, Goa (2012), page 15

Figure 17
Map Illustrating Demarcation of Land Owned by the Forest Department and the Fisheries Department



Source: Adapted from Directorate of Census, Goa (2012), page 15

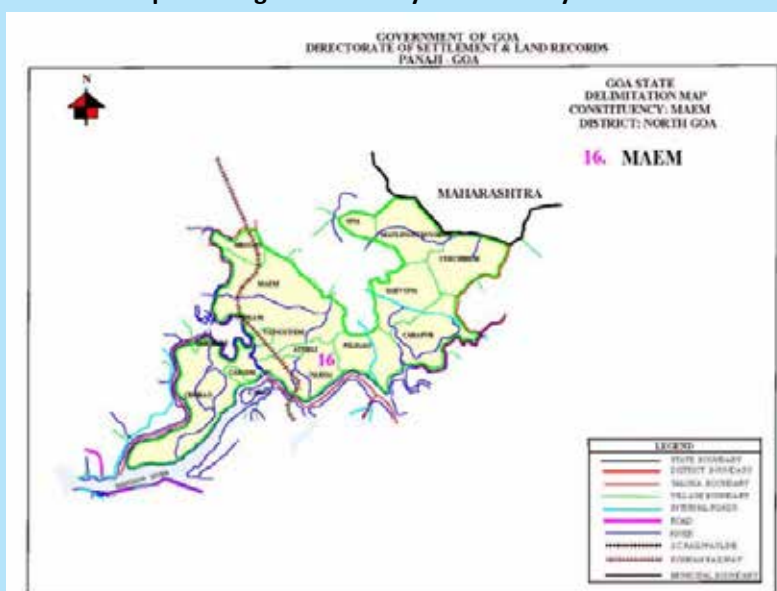
revenue saza in turn falls under the Carambolim Revenue Circle, managed by a Circle Inspector. The revenue circle falls under the jurisdiction of the Tiswadi Taluka, headed by the Mamlatdar of Tiswadi. This in turn comes under the Sub-

division of Panaji, headed by the SDO (Panaji); this in turn comes directly under the North Goa District Collector, who is the seniormost officer of the District Administration. To get an idea of the respective jurisdiction of each of the layers

Table 4
Office Bearers of District Administration

Jurisdiction	Office	Name	Contact
North Goa District	North Goa District Collector	Mrs. Nila Mohanan (I.A.S.)	0832-2223612, 2225383, 222508,
Sub-division	Dy. Collector/ SDO (Panaji)	Mr. Navin L.S.	—
Tiswadi Taluka	Taluka Mamlatdar (Tiswadi)	Mr. Madhu Narvekar	0832-2425533
	Circle Inspector	—	—
Chorao Revenue Saza	Talathi	Hemant Naik	7350966003

Figure 18
Map Showing the Assembly Constituency of Maem



Source: Chief Electoral Officer, Goa State (n.d.)

of the district's administration, see Figures 16 and 17. Table 4 lists the office bearers in the district administration.

Member of the Legislative Assembly

Goa's State legislature comprises 40 assembly constituencies and thereby 40 elected representatives.

Chorao is part of the Maem Assembly Constituency, whose jurisdiction is shown in Figure 18. Mr. Anant Shet, who is a member

of the ruling BJP party, has represented the constituency since 2007, when he first won the seat. He was re-elected in the last round of the assembly elections held in 2012.

Land Use

Land planning and the regulation of land use are handled by the TCP department. The department is organized as follows. The Chief Town Planner (CTP) heads the entire department and is answerable to the Cabinet Minister of Town and Country Planning through the Secretary of Town

Table 5
Organizational Chart of the TCP Department

Designation	Name	Contact
Minister for Town & Country Planning	Mr. Francis D'Souza	—
Secretary of Town & Country Planning	Mr. Prashant Goyal (IAS)	—
Chief Town Planner	Dr. S.T. Puttaraju	(0832) 2437352, 2437353,
Senior Town Planner (North Goa)	Mr. S.M. Byakod	9890361751
Town Planner/Deputy Town Planner (Tiswadi)	Mr. S.P. Surlakar	9822482308

and Country Planning. Reporting to the CTP are two Senior Town Planners (STP) designated to North and South Goa districts, respectively. Reporting to each STP are Town Planners or Deputy Town Planners who are the taluka-level in-charges. Since Chorao falls in Tiswadi Taluka, matters pertaining to its land use are primarily handled by the office of the Deputy Town Planner (Tiswadi). The names and contact details of the respective TCP officials relevant for Chorao are shown in Table 5.

The manner in which the TCP manages land use is through the formulation and implementation of a Regional Plan (RP) or a Surface Utilization Plan (SUP) which charts different types of land-uses or zones and specifies the kinds of development which can take place in each zone. Relevant details about the same pertaining to the sanctuary and Chorao will be discussed in Chapter 4.

Governance of the Estuarine System

As mentioned earlier, Chorao Island is situated at the confluence of the Mandovi and Mapuca rivers. The inshore activities in the estuarine area around Chorao mainly comprise navigating (various kinds of boats) and fishing. These activities are regulated by three departments: the River Navigation Department, the Captain of Ports Department and the Department of Fisheries.

Boat Traffic

The River Navigation Department is instrumental in providing ferry services. In the case of Chorao, it handles two ferry crossings: Ribandar to Madel;

Chorao ferry service; and Pomburpa to Chorao. The first service in a day is at 06.00 a.m. and closes at 02.00 a.m. next day. The ferry is used by the islanders to commute through vehicles and to transport goods. Four wheelers, heavy vehicles, public transport buses and other vehicles (maximum of 8 tonnes) are allowed to commute with charges, whereas the passengers are not charged (River Navigation Department, n.d.). The use of the inland waterways for transportation of iron ore, commercial purposes, tourism purposes and inland fishing is controlled by the Captain of Ports Department.

The departmental works include periodical hydrographic surveys, dredging of rivers, maintenance of lighthouses and beacons, providing necessary navigational aids, imparting training to those desiring to build careers on inland vessels and providing landing facilities for both passenger boats and cargo vessels. As part of its regular work, registering of mechanized and non-mechanized vessels such as inland cargo, inland fishing, inland passengers and tourist vessels is being done by the department as the registering authority at Panaji (Captain of Ports Department, n.d.). The River Navigation and the Captain of Ports departments are currently managed by the same director although the two come under two separate cabinet ministries, as can be seen from Table 6.

Fishing

The Department of Fisheries works for increasing fish production, welfare of the fishermen,

Table 6
Organizational Structure of River Navigation and Captain of Ports Departments

Designation	Name	Contact
Minister for Ports	Mr. Dilip Parulekar	—
Minister for River Navigation	Mr. Ramkrishna Dhavalikar	—
Secretary, Ports and River Navigation	Dr. Sharat Chauhan (IAS)	—
Captain of Ports & Director River Navigation	Capt. James Braganza	0832-2225070
Town Planner/Deputy Town Planner (Tiswadi)	Mr. S.P. Surlakar	9822482308

Table 7
Organizational Structure of Fisheries Department

Designation	Name	Contact
Minister for Fishing	Mr. Avertano Furtado	—
Secretary, Fishing	Mr. Amjad Tak (IAS)	—
Director, Fisheries	Dr. Shamila Monteiro	(0832) 2224838 or 2227780

Table 8
Fees Prescribed for Registration

Type of Vessel	Cost (Rs.)
Non-motorized canoes	200
Motorized canoes	500/
Mechanized fishing vessel	1000
fishing vessel above 50 BHP	500
above 50 BHP Fishing vessel below 50 BHP	200
Erecting fishing stakes	700

promotion of culture and inland fisheries. Any fishing activity in the estuarine area has to be carried out with the permission of the Department of Fisheries (Government of Goa n.d.). The Department of Fisheries promotes fresh water fish farming by giving a subsidy of 50% of the total cost. The organizational structure of the department is shown in Table 7.

Fishermen are expected to register their nets, non-motorized, motorized, mechanized vessels and canoes. Permission need to be taken from the department for erecting fish stakes in the inland waters, shrimp farming and fresh water fish farming. The application in the prescribed form for the fishing stakes is first submitted to the Department of Fisheries. The application is then

forwarded to the Captain of Ports Department for no-objection (N.O.C.).

After an N.O.C. is obtained from the Captain of Ports, a public notice is published in the local newspapers, inviting objections/objections from the public to the proposed erection. In case an N.O.C. is not granted by the Captain of Ports, the amount deposited by the applicant is refunded to the applicant (Registration Procedures of Fisheries Department, in Government of Goa, n.d.). The fee structure of the applications is shown in Table 8.

Governance of the Wider Surroundings of the Sanctuary

In terms of local governance, as seen in Figure 19, the two closest villages to the north of the

Figure 19
Map Showing the VPs Around Chorao



sanctuary, across the Mapuca river, are Salvador-Do-Mundo and Penha-De-Franca. They are governed by the VPs of Salvador-Do-Mundo and Penha-De-Franca. The areas to the south of the sanctuary, across the Mandovi, are the city of Panaji, Chimbél and Mercés, which are governed, respectively, by the Municipal Corporation of Panaji, VP of Chimbél and VP of Mercés. The VP of Chorao, i.e., VP Chodan-Madel, along with the VPs of Chimbél and Mercés, falls under the BDO of Tiswadi. The VPs of Salvador-Do-Mundo and Penha-De-Franca fall under the BDO of Bardez.⁴ Since Panaji comes under a municipal corporation, it does not come under any BDO's jurisdiction.

In terms of district administration, all the local bodies surrounding the VP of Chodan-Madel fall in North Goa District. However, Chorao, Chimbél, Mercés and Panaji fall in the taluka of Tiswadi and therefore come under the jurisdiction of the Mamlatdar of Tiswadi. Salvador-Do-Mundo and Penha-De-Franca fall in the taluka of Bardez and therefore come under the SDO of Mapuca⁵ and the Mamlatdar of Bardez.⁶

In terms of assembly constituencies (ACs) and their respective MLAs, to the north of the sanctuary lie the newly created ACs of Porvorim, whose MLA is Mr. Rohan Kaunte (independent candidate). To its south are the ACs of Panaji, Cumbarjua and Santa Cruz, whose respective MLAs are: Mr. Manohar Parrikar (BJP), Mr. Pandurang A. Madkaikar (INC) and Mr. Atanasio J. Monserrate (INC).

As mentioned in the section on land use planning in Chorao, the regulation of land use comes under the purview of the TCP department. While all these areas fall under the jurisdiction of the STP (North Goa), Chorao, Panaji, Mercés and Chimbél come under the Deputy Town Planner of Tiswadi, and Salvador-Do-Mundo and Penha-De-Franca come under the Deputy Town Planner of Bardez.

Proposed Study of the Mandovi Estuary

The Water Resources Department of the Government of Goa (WRD) has recently signed an MoU with DHI—a Danish Environmental Consultant—to conduct a study assessing the 'sustainability of Goa's waterways'. The study will mainly focus on the Mandovi and Zuari

estuaries and will look into the effects of climate change and also 'conduct biodiversity studies - to ascertain endemic species and aquatic ecology' in the two estuaries. The study would also prepare 2D and 3D models of the estuaries. The report is expected to be submitted in 16 weeks (Herald, 2014)

Conclusion

This chapter sought to chart the significant authorities who exercise power in the areas surrounding the sanctuary. When doing this, it listed the following offices as being significant: the village panchayat (VP), district administration, town and country planning (TCP) and the office of the member of the legislative assembly (MLA). Where applicable, when discussing these authorities the chapter has described their internal hierarchies and functions and in this way has tried to make known those levels of the respective offices that apply to the areas proximate to the sanctuary.

Of all the authorities it was learnt that the office of the VP Chodan-Madel is the one which is most proximate and relevant to the well-being of the sanctuary. The assembly of the people or the Gram Sabha—which is organized by the VP every 4 months—could be a very useful forum where information regarding the conservation of the

sanctuary can be disseminated to the community, and their involvement in the same can be solicited. To add to this, the recently initiated Biodiversity Management Committees (BMC)—again at the VP level—are another potential forum through which the local people can be brought in to participate in the conservation of the sanctuary and its surroundings. The Annual Development Plan (ADP), which is also supposed to be prepared at the VP but which is unfortunately not being done, also carries the potential for grassroots planning, which could achieve a balance between economic development and ecological conservation.

The other significant authority with whom it would be worthwhile to partner is the TCP department, whose role it is to specify land uses, lay down regulations for the different land uses and ensure their adherence. Issues concerning the zoning and regulations of activities in the sanctuary and the surrounding landmasses can potentially be taken up with the TCP.

Finally, when it comes to the estuarine surroundings of the sanctuary, the regulation of activities such as fishing and river navigation including mooring of boats falls under the fisheries department and the Captain of Ports, respectively.

Notes

1. Section 7(6) of The Goa Panchayat Raj Act and Rules, 1994.
2. On any Sunday of January, April, July and October. Source: Directorate of Panchayats (2008), page 7.
3. The Minister for Environment, Mrs. Alinha Saldanha, is the chairperson of the State Biodiversity Board. The Member Secretary of the board is Dr. Nitin Sawant - (9822483535).
4. BDO (Bardez), Mr. Deepak Vaigainkar. Contact no. 0832-2262206.
5. Dy. Collector and SDO (Mapuca) Mr. Sabaji Shetye. Contact no. (0832) 2262038 or 2250398
6. Mamlatdar (Bardez) Mr. Dasharath Gawas. Contact nos. (0832) 2262233 or 2262210

Chapter 4

The Sanctuary and Anthropogenic Activities

This chapter focuses on identifying and describing the various anthropogenic activities carried out within the domain of the sanctuary. In doing so, the chapter will detail the manner in which the respective activities are conducted and highlight the locations in the sanctuary where the same are carried out. Further, the chapter will also provide information about the persons involved in the respective activities. When doing this some of the significant narratives of the actors' experiences of conducting the activity in the location will also be presented.

There are mainly two types of activities which are conducted within the precincts of the sanctuary: tourism and fishing. The following sections will detail each of these two activities.

Tourism

The sanctuary has been progressively receiving a steady stream of visitors over the years and there are two service providers or tourist operators catering to the visitors: the main operator is the forest department—which is also the authority regulating the visitors to the sanctuary. The others comprise a few private operators who offer boat rides into the sanctuary.

Tour Operators

Forest Department

The forest department has an office at the entrance of the sanctuary located near the ferry jetty which serves as a reception area for people visiting the sanctuary. The department has constructed a walking path through the

Box 3 Collection of Firewood

Secondary informants reveal that a dormant activity taking place in the sanctuary is the collection of firewood. The firewood collected is for personal consumption like heating water, cooking and parboiling paddy. Though before the sanctuary was declared protected, people used to collect firewood without restrictions, now the collection has reduced considerably, owing to the restrictions made by the forest department and the reduced demand for firewood in the market.

Figure 20
The Entrance to the Sanctuary



Figure 21
Tourists in the Sanctuary



sanctuary and also operates boat rides into the sanctuary.

The boat is a 12-seater one, and the ride usually lasts about an hour. There are also two watchtowers in the sanctuary, one of which—Redshank Point—can only be accessed by boat.

The fees for accessing the sanctuary using the walking path and by boat are shown in Table 9.

Private Operators

There are also some private operators who offer

boat tours into the sanctuary to the visitors. The names of these operators are mentioned in Table 10. Of these, apart from Mr. Uday Mandrekar, most of the other operators are irregular in their services. Mr. Mandrekar has a 10-seater fibre boat customized for taking tourists into the sanctuary.

Mr. Mandrekar has very good visibility on the Internet, which attracts both Indian and foreign tourists. He also has a shop located near the ferry jetty where people disembark from Panaji/Ribandar, thus enabling him to solicit customers. He claims that his customers are mostly

Figure 22
The Walking Path in the Sanctuary



Figure 23
The Watchtower in the Sanctuary



birdwatchers, who include both foreigners and Indians. Mr. Mandrekar has been cited in Lonely Planet (1998) and Trip Advisor online services.

Mr. Mandrekar claims to have been in the business for around 25 years. He has two brochures, of which one is shown above.

Visitor Numbers and Spatial Distribution of the Tour Operators

Walkway within Sanctuary

One can see from Table 11. that the number of visitors to the sanctuary has increased exponentially over the years, with the sanctuary receiving more than 6400 visitors in 2013–2014.

Figure 24
Boat Operated by the Forest Department



Table 9
Forest Department Fee Structure

Particulars	Rate (Rs.)
Adult entry	20
Child entry	10
Department boat	75 per person/hour
Department boat (special hire)	900/trip

Figure 25
Mr. Uday Mandrekar's 10-Seater Boat



Figure 26
Mr. Mandrekar's Shop at the Jetty



Figure 27
Mr. Mandrekar with Two Tourists



Source: Mr. Mandrekar's photo album

Most of the visitors to the sanctuary use the walkway and access the sanctuary on foot. At the starting point of the walkway, there is a reception centre where visitors can get information about the sanctuary and pay

the required fees to enter the sanctuary. The walkway is made of concrete blocks, and there is an information centre which has pictures of some of the plants and animals found in the sanctuary. There is also one watchtower

Figure 28
Mr. Mandrekar's Brochure



Source: Mr. Mandrekar's photo album

Table 10
Private Tourist Operators Offering Boat Rides into the Sanctuary

Name	Details	Locality	Phone No.	Notes
Uday Mandrekar	Takes tourists in a 12-seater fibre boat	Orando, Chorao	0832-2239114 (R); 9822583127 (M)	Regular and is an expert on the local flora and fauna
Sandeep Sawant	eight-seater fibre boat	Orando, Chorao	9822814838	Used to take tourists in a canoe, has now procured an 8-seater boat and wants to restart
Mr. Paresh Sawant	Used to take tourists in a canoe, now does so only intermittently	Orando, Chorao	—	Contact from Mr. Amey
Umesh Chodhankar	Used to take tourists in a canoe, now does it sometimes	Orando, Chorao	—	Contact from Mr. Amey
Eusabio Da Silva	Licensed tourist guide	Chorao	—	Potentially useful person to meet when planning any eco-tourism related initiatives

overlooking the Mandovi river. The existing walking route can be seen on the map in Figure 31.

One can observe from the map that the existing walking route only covers a small part of the southern side of the sanctuary. The forest

department proposes to extend the walking route right up to Redshank Point—which at the moment can only be accessed by boat—by building two bridges which will create an uninterrupted walking path right up to Redshank point. This proposal can be referred to in the map in Figure 32.

Table 11
Visitors to Dr. Salim Ali Bird Sanctuary (2003–2014)

Year	No
2003–04	164
2004–05	827
2005–06	1014
2006–07	84
2007–08	1281
2008–09	1351
2009–10	1515
2010–11	1569
2011–12	3117
2012–13	4372
2013–14	6456

Figure 29
The Walkway Leading to The Entrance of the Sanctuary



Boat Rides

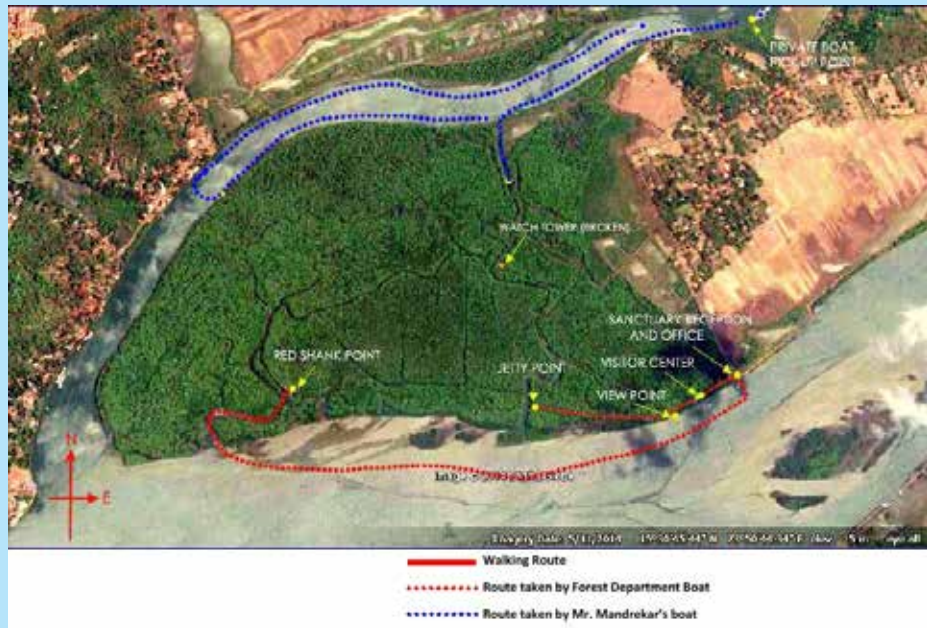
Boat services are provided by both the forest department and private operators like Mr. Uday Mandrekar. Since there were only data pertaining to the number of visitors using the forest department's boat services over the period from August 2012 to October 2013, of a total of 4943 visitors, approximately 20% availed themselves of the boat rides. If we were to add the number of visitors who also took the boat rides offered by the private operators, then the numbers would be much more. They are estimated to be around 30%.

Comparing the number of boat rides made by the two operators in a one-year period (August 2012 to October 2013), of a total of 424 boat rides, 53% were made by the private players and 47% by the forest department. During the same period, of the 223 boat trips made by private players, only 20 were by canoe. Apart from the slight dominance of the private operators in offering boat rides, one can also notice in the graph in Figure 33 that while the forest department's boat rides closely match the annual tourist cycle, i.e., they peak during the tourist season and peter out during the monsoons, the private operators

Figure 30
The Sanctuary's Reception and Office



Figure 31
Map Showing the Walkway in the Sanctuary and the Routes Taken by the Different Boat Operators



are on average able to solicit visitors throughout the year.

Analysing the boat operations spatially, it is seen that the forest department exclusively uses the boating route on the southern side of the sanctuary, i.e., along the Mandovi river, whereas Mr. Mandrekar exclusively uses the route from the northern side along the Mapuca river. The

two respective boating routes used by the forest department and by the private operator, i.e. Mr. Uday Mandrekar, have been indicated in Figure 31.

Visitors

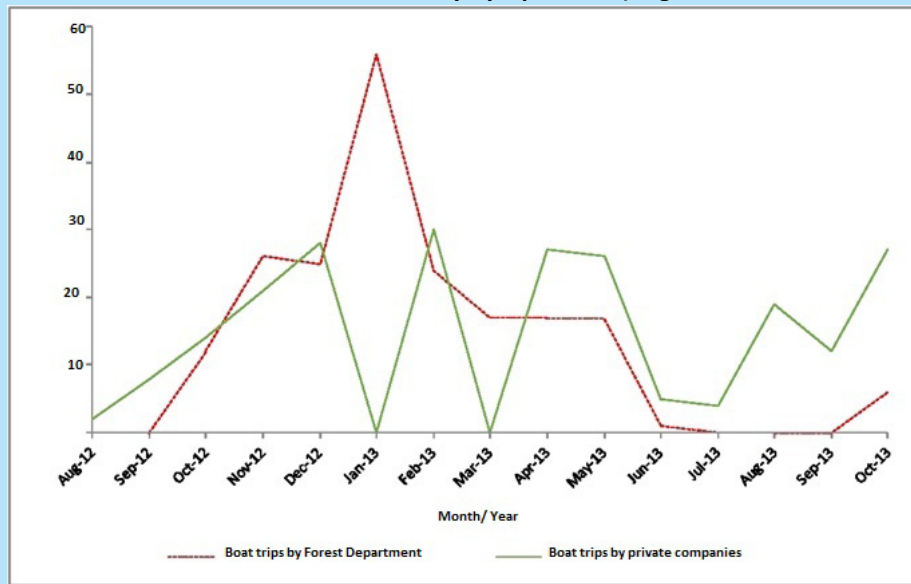
In order to get a better sense of the number of visitors to the sanctuary over a given year, the report has calculated the number of visitors per

Figure 32
Map Showing the Proposed Walking Route



Source: Kumar (2013) Appendix III

Figure 33
Number of Boat Rides Made in the Sanctuary by Operators (August 2011 To October 2013)



Source: Statistics from DCF's records

month for a period of 2 years (August 2011 to October 2013). The data are presented in Figure 34. From this it can be seen that the peak period is between December and February and the lean period is during the monsoon months (June–October). The peaks and troughs of the visits also coincide with the tourist season in Goa, i.e., from October to March, every year.

Tourist Profile

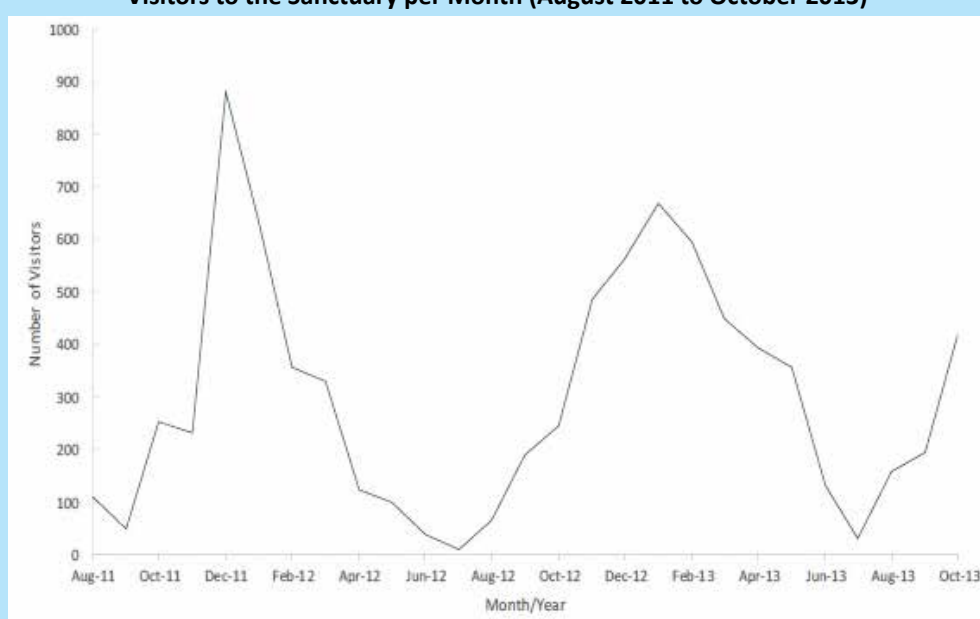
Segregating the number of visitors (from 2007 to 2013) into domestic and international as shown in Table 12, we find that while the percentage of domestic tourists has been steadily increasing, the number of foreign visitors to the sanctuary has been steadily going down. In order to get a sense of the profile of visitors over an annual cycle,

Table 12
Domestic and Foreign Visitors to Dr. Salim Ali Bird Sanctuary (2007–2014)

Year	Indian (%)	Foreign (%)	N
2007–08	34	66	1281
2008–09	43	57	1351
2009–10	53	47	1515
2010–11	54	46	1569
2011–12	75	25	3117
2012–13	80	20	4372
2013–14	82	18	6456

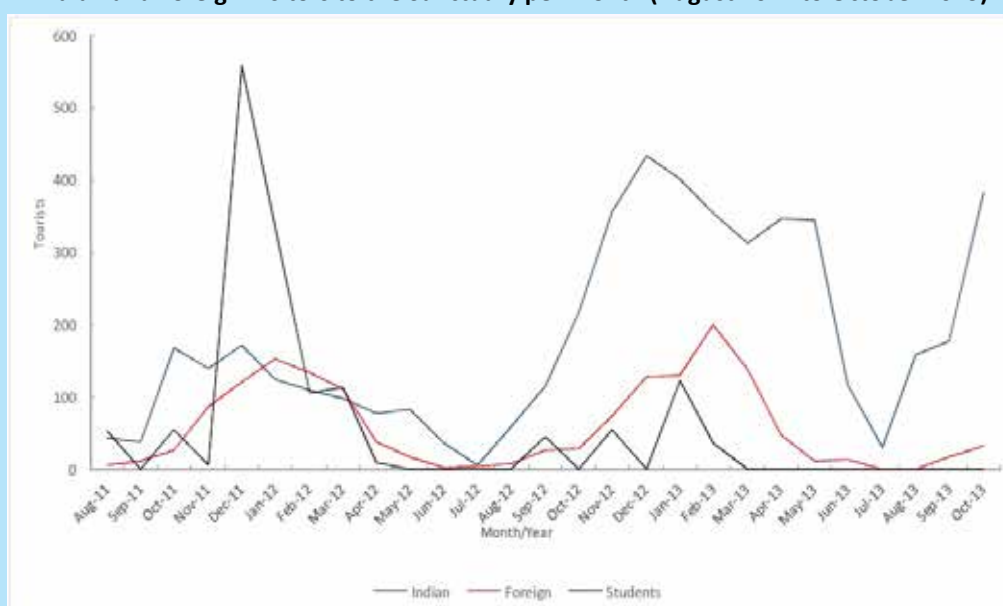
Source: Statistics from DCF's records

Figure 34
Visitors to the Sanctuary per Month (August 2011 to October 2013)



Source: Statistics from DCF's records

Figure 35
Indian and Foreign Visitors to the Sanctuary per Month (August 2011 to October 2013)



Source: Statistics from DCF's records

Figure 36
Tourists in Chorao



Source: Statistics from DCF's records

the graph (Figure 35) has looked at three kinds of visitors—domestic, international and student—over a 25 month period (August 2011 to October 2013). While we find that all the visitors follow the above-mentioned pattern—with most visiting between November and February—domestic visitors make visits over a longer period, i.e., November–April. International visitors follow a predictable pattern peaking in January–February and tapering off from April to October. In the case of students, apart from a sharp rise in their visits in December 2011, the number of their visits have since dropped.

Over an approximately 2 year period from August 2011 to October 2013, there were 570 visitors with still or video cameras. Of a total number of 7903 visitors over the same period, this works out to approximately 7% of the visitors carrying cameras when visiting the sanctuary. This figure could be used as a proxy indicator to get a sense of the approximate number of birding enthusiasts visiting the sanctuary.

When nine individuals and two groups of visitors

were interviewed about their experience of the sanctuary, they expressed the following concerns:

- Most often birds are not sighted during the visits.
- There is a lot of garbage which can be seen in the mangroves. According to the personnel of the forest department, the tidal movement causes the accumulation of garbage.
- There are no proper toilet facilities.
- The walkway, constructed using concrete blocks, is difficult to walk on, especially during the monsoons, as it can get quite slippery.
- The walkway allows access to only a small part of the sanctuary.
- Information about the boating facilities provided by forest department is not prominently displayed.
- There should be an information board about the sanctuary located on the Ribandar side of the Mandovi river so that tourists passing through can know that there is a bird sanctuary on the other side.
- Some tourists are not aware that they can

Figure 37
Bivalves Collected in the Sanctuary



use the ferry to get to the sanctuary and end up taking a long road route to get to the sanctuary via Mapuca and Bicholim.

Regulation

The Forest Department is the main authority regulating both the people visiting the sanctuary and the entry of the private boat operators. The Forest Department also imposes the following charges on private boat operators: apart from the above-mentioned regular entry fees charged per person and on cameras, there is a boat entry fee of Rs.100 each time a mechanized boat (boat with outboard motor) takes tourists into the sanctuary and Rs.50 each time a non-mechanized (canoe) takes tourists into the sanctuary.

Fishing

There are two broad categories of fishing activity that are undertaken within the sanctuary. They include catching fish using stake-nets and catching crabs, or crabbing. Occasionally there

are also some individuals who gather bivalves from the sanctuary.

Stake-Net Fishing

This is the most noticeable fishing technique on the border of the bird sanctuary. The technique, which is locally called *futauni*, involves the use of a series of bamboo stakes which are inserted into the ground along the low-tide line at intervals of 4–5 m. A net—with approximately half-inch gaps—is then placed on the bamboo stakes. The bamboo stakes are used to keep the nets upright. During the high tide, when the water rises, the net is raised on the stakes. The net has weights at the end which are placed in the water and has floaters made of thermocol or straw on the other end. Sometimes the nets are fixed much higher than the water level in order to prevent fish from jumping over the net. The length of the entire stake-net can range from 100 m to even 500 m. Most of the stake-net fishers keep their stakes permanently fixed, and around the time of spring tide—which is

Figure 38
View of the Tip of the Sanctuary where the Mandovi and Mapuca Rivers Meet



Figure 39
A Close-up of Stake-Nets During Low Tide



locally called zorgot—they place the nets on the stakes, but instead of keeping their nets upright they keep them gathered at the base of the stakes. After high tide the fisher uses a canoe and raises the net up like a curtain and fastens the net on the stakes. This usually requires two persons, one to navigate the canoe and another to fasten the net on the stakes. The technique works by snaring fish when the water recedes during the low tide. Therefore the net is erected during high tide and the fish are collected during the low tide. This is carried out once in 14 days during zorgot.

The stake-nets are almost exclusively placed along the southern or Mandovi river side of the

sanctuary. There are up to four series of stake-nets beginning from the ferry jetty. The stake-nets are licensed by the fisheries department to different fishers who have more or less fixed areas where they place their nets, starting with Mr. Ashok Madkaikar's net, which consists of 160 stakes, followed by Shankar Khandeparkar's 60–70 stakes. Thereafter, there are some other stake-nets, which are erected by some other fishers from Ribandar and Britona. Apparently, only one person, Mr. Gokuldas Khandeparkar, used to put a stake-net on the Mapuca river face near the Orando boat jetty. However, of late Mr. Gokuldas Khandeparkar has not been erecting stake-nets on the site. The reason for stake-nets not usually being erected along the

Figure 40
Map Showing the Locations of Stake-Net Fishing around the Sanctuary



Base map source: Google Earth | Overlay source: fieldwork

northern or Mapuca river side of the sanctuary is that that side does not have a long enough slope between the high and low tide lines, thus making it difficult to catch a sufficient amount of fish. The locations of the stake-nets can be seen in Figure 40.

As mentioned earlier, there are four regular fishers who use stake-nets in the sanctuary along the Mandovi river side of the sanctuary. The names of these persons are mentioned in Table 13. Of these, two are from the village of Chorao, and there are others from the villages of Ribandar and Britona. Another person, Mr. Gokuldas Khandeparkar, used to set up his stake-net on the Mapuca river side sometimes, but the fieldworkers did not find this happening. Mr. Ashok Madkaikar belongs to the OBC Bhandari community. Fifty percent of his income is from fishing, and 50% is from agriculture, i.e., from the sale of paddy, coconuts, mangos and vegetables. He is economically well-to-do as he lives in a farm house along with his wife and has property in which he has a plantation of coconuts

and mangos. Mr. Shankar Khandeparkar also belongs to the OBC Bhandari community. Most of the fish is sold in the market in Panaji to wholesale sellers. Some of the catch is also sold locally in Chorao, near the ferry jetty.

Crabbing

Crabbing is carried out in the sanctuary using two techniques. The first is carried out by using a hooked iron rod, which is locally called a kutchu, to remove crabs from their burrows. The iron rod is inserted into the holes made by crabs during high tide. The holes are approximately half a metre deep, and using some special techniques the habitant crabs are removed. This type of crab-fishing is done only four or five times a month. The second technique involves the use of a round net which is baited with meat—usually chicken skin and innards. The net is locally called a coblem. The coblem can either be placed along the banks of a river or placed some way from the banks in deeper water. When positioning the coblem in deeper water, a boat is used. The location where the net is placed is marked using a thermocol

Table 13
Names of Stake-Net Fishers in the Sanctuary

Name	Activity Sub-type	Village/ Locality	Contact No.	Notes
Ashok Madkaikar	Stake-net	Chorao	—	Closest to sanctuary entrance next to the ferry jetty
Shankar Khandeparkar (Babush)	Stake-net	Chorao	—	Located after Mr. Ashok Madkaikar's stake-net
Other persons who place futauni after Shankar's from Ribandar	Stake-net	Ribandar/ Britona	—	Located after Mr. Shankar Khandeparkar's stake-net
Gokuldas Khandeparkar	Stake-net	Chorao	—	Used to occasionally put a stake-net near the Orando jetty on the Mapuca river face

floater. Those who access the sanctuary using canoes to catch crabs carry an average of 15 coblems and leave them for about 20 minutes to attract the crabs, after which they are lifted and collected and the coblems placed in another location. The crabbers spend up to 8 hours doing the same and catch anywhere between 25 and 50 crabs. Usually two persons head out in the canoe. The best time for crabbing is during zorget.

During the fieldwork, it was observed that there were two crabbers who used the iron rod method to catch crabs from the sanctuary. These crabbers walk into the sanctuary using the pathways around the fish ponds. They head to the now derelict platform inside the sanctuary and hunt for crabs in the mangroves within the sanctuary. The route they take is marked on Figure 43. With respect to the crabbers who use coblems, there is only one crabber who uses the method of accessing the sanctuary on foot and placing a coblem by the side of the banks of the rivulets. This crabber carries out this activity along either side of the same walking path of the sanctuary, which has been constructed by the forest department. The route he takes is marked on Figure 43. The other persons who catch crabs in the sanctuary use boats to access the inner rivulets of the sanctuary and use coblems lowered from boats. They access the inner rivulets of the sanctuary by entering from either the southern side, i.e., from

the Mandovi river, or from a number of entry points from the northern side from the Mapuca river side. Their crabbing entry points and paths have been shown in Figure 43. Those who use the Mapuca river entrance are exclusively crabbers from Penha-De-Franca/Britona.

We found out that there are approximately 11 crabbers who access the sanctuary to catch crabs. Details of these crabbers are mentioned in Table 14. Two of them, Mr. Laximan Malvankar and Mr. Gajanan Kundaikar, use iron rods to catch crabs by accessing the sanctuary on foot. Another person, Mr. Simon, places coblems on the banks of the river by again accessing the sanctuary on foot, whereas there are eight other persons who place coblems inside the sanctuary using oared canoes. Of these eight persons, one of the crabbers is from Chorao, and the other seven are from Britona. The crabber from Chorao, Mr. Sudhakar Halarnakar, accesses the river system from the Mandovi side and those from Britona access the sanctuary either from the Mandovi river side or from the Mapuca river side. The frequencies of their visits, however, vary. It was learnt that about 12–15 years ago there were up to 20 persons from Britona who used to access the sanctuary for crabbing. This number has now fallen, the reason for the fall being that many crabbers are taking other jobs and also that catches have fallen.

Figure 41
Mr. Laximan Malvankar with the Iron Rod Used for Crabbing



Figure 42
Mr. Mandrekar Showing a Coblem to Tourists



Some of them who catch crabs sell them to Pandhari Vernekar's wife (Pandhari Vernekar is the Deputy Sarpanch of the Village Panchayat), who makes groups of six or seven crabs and sells them in turn to hotels in Panaji. It was also observed that Mr. Simon sells the crabs he catches directly at the ferry jetty. The crabbers from Britona sell almost all the crabs directly under the Mandovi bridge near Malim jetty.

They charge about Rs.100 for five crabs.

The crabbers who access the sanctuary using canoes say that usually the officials of the forest department are tolerant of them but sometimes disapprove of them when they are taking tourists birdwatching as they feel that the crabbers disturb the surrounding, causing the birds to get scared.

Figure 43
Map Showing the Various Routes Followed by Different Types of Crabbers



Table 14
Names of Crabbers in the Sanctuary

Name	Activity Sub-type	Village/ Locality	Contact No.	Notes
Simon	Iron rod crabbing	Chorao	—	Uses either side of the walkway in the sanctuary
Laximan Malvankar	Iron rod crabbing	Chorao, Madel		
Gajanan Kundaikar	Coblem using canoe	Chorao, Madel	—	Friend of Mr. Laxman Malvankar
Sudhakar Halarnakar	Coblem using canoe	Chorao	—	Accesses sanctuary from Mandovi river side
Gaurish Bhosle (Dhaklo)	Coblem using canoe	Britona		Accesses sanctuary from either Mapuca river or Mandovi river side
Vasudev Bhosle	Coblem using canoe	Britona	—	Accesses sanctuary from either Mapuca river or Mandovi river side
Prasad Chodankar	Coblem using canoe	Britona	—	Accesses sanctuary from either Mapuca river or Mandovi river side
Dileep	Coblem using canoe	Britona	—	Accesses sanctuary from either Mapuca river or Mandovi river side
Vasu	Coblem using canoe	Britona	—	Accesses sanctuary from either Mapuca river or Mandovi river side
Arvind Kubal	Coblem using canoe	Britona	—	Accesses sanctuary from either Mapuca river or Mandovi river side
Sandeep Bhosle	Coblem using canoe	Britona	—	Accesses sanctuary from either Mapuca river or Mandovi river side

Figure 44
Mr. Laxman Malvankar with His Catch



Regulation

The fishers who erect stakenets need to obtain licenses for fishing from the Department of Fisheries. On the receipt of applications, the Department conducts a site inspection and delimits the area where the fisher can setup his stakenets. In spite of crabbing being completely unregulated, the number of crabbers are few .

Conclusion

This chapter has highlighted the point that there are predominantly two kinds of human activities taking place within the sanctuary: tourism and fishing. When identifying and categorizing the persons involved in these two activities, one can note that there are different types of stakeholders: (1) There are persons whose livelihoods are closely connected to these two activities. In the case of fishing, it includes the stake-net fishers and the crabbers. In the case of tourism, it includes the private boat operators, who take tourists inside the sanctuary. (2) The forest department who monitors and regulates the activities in the sanctuary can be seen as an institutional or regulatory stakeholder. (3) Finally, the visitors and tourists who frequent the sanctuary become another set of stakeholders who access the services of the sanctuary and

whose visits are closely connected to the income of the forest department and to the livelihoods of the private tourist operators.

The fishers who erect stake-nets need to obtain licenses for fishing from the fisheries department. On receiving applications, the department conducts a site inspection and delimits the area where the fisher can set up his stake-nets. In spite of the crabbing being completely unregulated, the number of crabbers is small.

In the light of the conversations with the informants and the data collected, some implications/concerns/analyses are given below:

1. The visitors/tourists are highly critical of the facilities in the sanctuary and the maintenance of the sanctuary.
2. The private operators have more to offer in terms of services and information on the sanctuary and the island.
3. There are no restrictions imposed on the private operators on the frequency of boat rides that they can take but there is a fee for each ride. However, currently there is only one operator who is regular.

4. The forest department has maintained a very positive relationship with the fishers and the crabbers and has in doing so offset any potential conflicts. Having mentioned

this, the fishers and crabbers are few in number, and the nature of their operations is not particularly exploitative to impact the sanctuary in a negative manner.

Chapter 5

Human Activities and Livelihoods in the Surroundings of the Sanctuary

46

This chapter will shift its gaze to the areas surrounding the vicinity of Dr. Salim Ali Bird Sanctuary and highlight the various anthropogenic activities carried out in these areas. To do this, the research has delimited its scope to two geographic zones surrounding the sanctuary: the landmasses and the estuarine system within a radius of approximately 2 km around the sanctuary as shown in Figure 45. This has been done based on the assumption that the activities carried out in the relatively proximate regions are of greater consequence to the sanctuary.

The chapter will first describe the land uses in the surrounding areas. This will provide a broad overview of the human interactions with the bio-physical spaces around the sanctuary. The second section will focus on the landmasses surrounding the sanctuary and detail the most significant human activities and livelihoods carried out in them. The third section will follow with a mapping of the human activities in the estuary surrounding the sanctuary. When presenting all these details in the following

section, descriptions will begin with the relatively distant regions and move progressively closer towards the proximity of the sanctuary.

Land Use in the Surrounding Areas

Of these, the most important from a Goa was the first state in the Indian Union to prepare a regional plan to regulate land use that covered the entire state's landmass. The most recent Regional Plan (RP) prepared by the TCP department is the Goa Regional Plan 2021 (RP-2021). The RP-2021 incorporated some innovative zoning policies such as: classifying ecologically sensitive areas into different categories: ECO-1, where no development was allowed, and ECO-2, which permitted limited amounts of development. It also specified different floor area ratios (FARs) depending on the rural or urban character of the village or town.

Using the land use data specified in RP-2021, we can get a sense of the land uses in the VPs and towns which surround the sanctuary. From Table 15 it can be noticed that Chorao

Figure 45
Map Showing the Area Under Focus and Consideration



Source: Google Earth

and Salvador-Do-Mundo have relatively higher percentages of their landmass classified under ECO-1, with large tracts classified as paddy fields. The VPs with the most built-up areas are Penha-De-Franca and Chimbél.

To get an idea of the spatial distribution of the various land uses shown in Table 15, one can refer to Figure 46, which is a land use plan of the areas surrounding the sanctuary. Here one notices that the area to the north of the sanctuary across the Mapuca river in Salvador-Do-Mundo comprises largely paddy fields and khazans and is classified as ECO-1. However, on the same side, shifting towards Penha-De-Franca, one notices denser settlement areas overlooking the sanctuary. Moving to the southern side of the sanctuary, across the Mandovi river, one can notice that the Panaji-Ribandár causeway, which falls under the jurisdiction of Panaji Municipal Corporation, and its adjoining areas, which fall in the VP of Mercês and are classified as salt pans, are classified under ECO-2. There has been a proposal by the Goa State Infrastructure

Development Corporation (GSIDC) to develop the area across the Panaji-Ribandár causeway into the 'Ribandar Biodiversity Park' (GSIDC, 2013). See Figure 47 for the proposal. The denser settlements across the Mandovi are around the Ribandar ferry jetty. This area also falls under Panaji Municipal Corporation.

Land Use in Chorao and the Proximity of the Sanctuary

The RP for Chorao—specifically the RP for VP Chodan-Madel—was notified in October 2011 (SLC, 2011). One can refer to the first column in Table 15, which provides a breakup of the land use of the village. Here it can be noticed that more than 60% of the land surface has been classified under ECO-1 and another 15% has been classified as ECO-2. The same can be read together with Figure 48, which shows the spatial organization of the different land uses specified by RP-2021 for the village of Chorao. The settlements in the village have been subjected to a maximum FAR of 60% (SLC, 2011, page 66). When looking along the eastern border of the

Table 15
Land Use of Areas Surrounding the Sanctuary (In %)

	VP Chodan- Madel	VP Salvador- Do- Mundo	VP Penha- Da- Franca	Panaji Municipal Corporation	VP Chimbel	VP Merces
Total land (km2, N)	18.97	12.3	5.01	21.01	4.46	10.03
Eco-1						
Forest	0	0	0	0	0	0
Mangrove	16.84	3.85	0	0	0	14
Private forest	0	7.28	11.02	0	0	0
Water bodies	13.07	12.94	17.99	66.64	4.04	5.23
Paddy fields	32.11	19.85	2.06	1	1.97	25.11
Eco-2						
Orchard	8.57	0.91	2.61	6.31	18.45	13.16
Natural cover	5.16	30.87	5.04	0	21.53	14.46
Cultivable	0	0	0	0	0	0.43
salt pans	0	0.05	0	0	0.00p	4.53
Fish farm/ mudflats	1.91	0	0	0	0	0
Eco-3						
Settlement	20.23	21.37	50.28	18.55	48.06	20.84
Institutional	0.19	0.01	7.68	3.71	1.56	0.36
Industry	0	0.77	0.1	0	0.89	0.08
Micro Industrial	0	0.32	0	0	0	0
Zone	1.29	1.07	2.68	3.78	3.14	1.08
Transport	0	0	0	0	0	0
Miscellaneous	100	100	100	100	100	100

Source: SLC (2011), pages 19–35

sanctuary one can notice that the areas closer to the two rivers are low-lying areas, and since these are used as paddy fields, they have been classified as ECO-1. Between these two agricultural areas lies the settlement closest to the sanctuary, an area known locally in Chorao as Madel.

Human Activities in the Surrounding Landmasses

The most proximate landmass to the sanctuary is the island of Chorao, with which the sanctuary is physically connected. The second most proximate area is the landmass towards the north and north-west of the sanctuary across the Mapuca river. This comprises the villages of Salvador-Do-Mundo and Penha-Da-Franca. Towards the south of the sanctuary across the river Mandovi, and relatively distant to the sanctuary, lies Ribandar and south-west is the capital city of Panaji. The

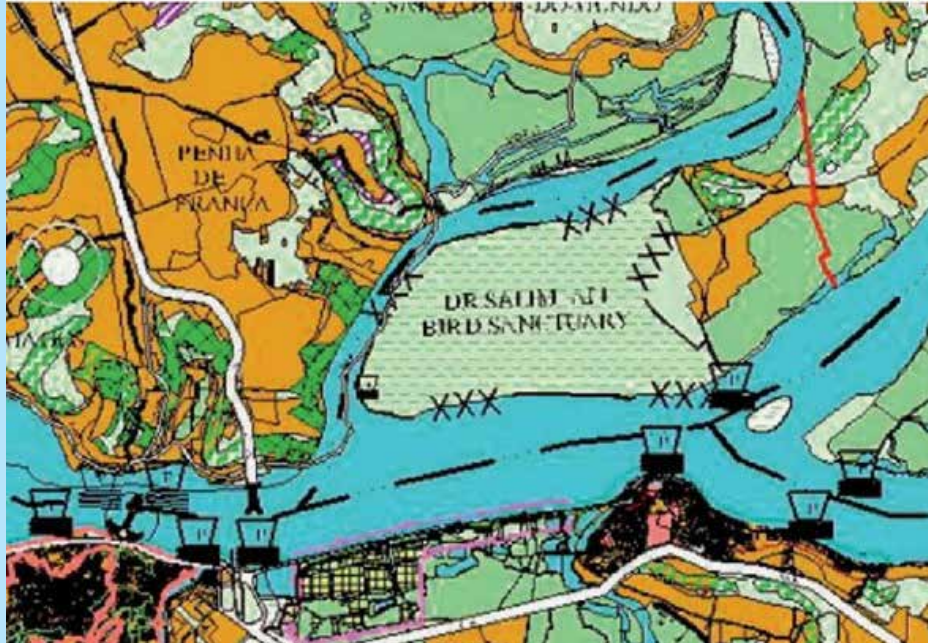
human activities having a significant imprint on the landmass delimited above are human settlements and agriculture. Other activities undertaken in close proximity to the sanctuary on the Chorao landmass include small commercial operations on the Orando jetty and transport..

Human Settlements

Table 16 describes the population of the areas surrounding the sanctuary—organized as VPs and towns. Chorao and the village of Salvador-Do-Mundo are relatively less populated compared to the urbanized areas of Panaji, Chimbel, Penha-Da-Franca and Merces. A similar pattern can also be discerned in terms of the respective numbers of households in these areas.

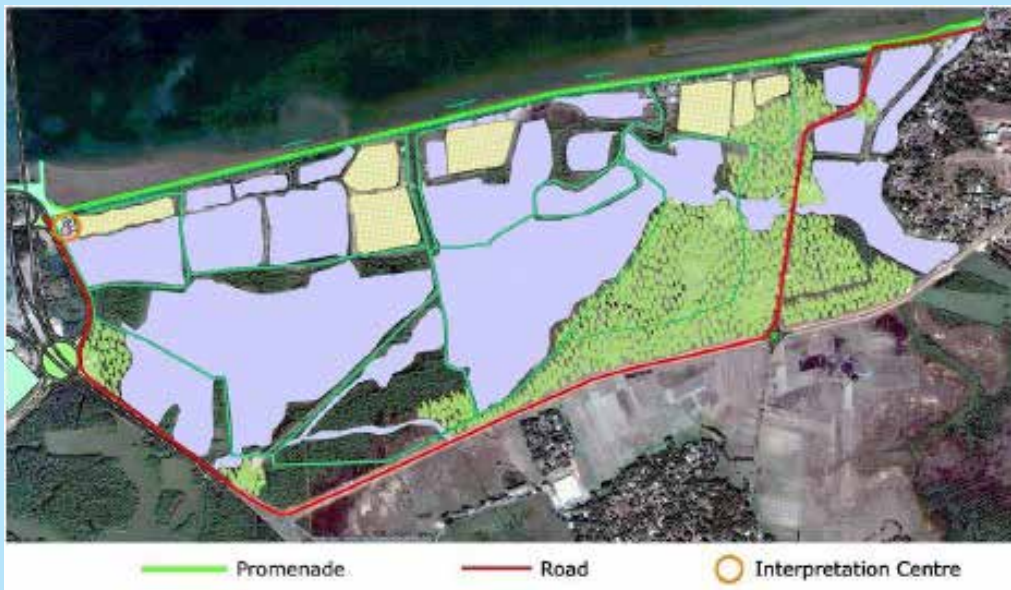
Table 16 read together with Figure 49 helps us obtain a visual idea of the population densities

Figure 46
Land Use Plan of Surrounding Areas of Chorao



Source: Task Force for RP—2021 (2007), page 133

Figure 47
Map Showing the Proposed Ribandar Biodiversity Park

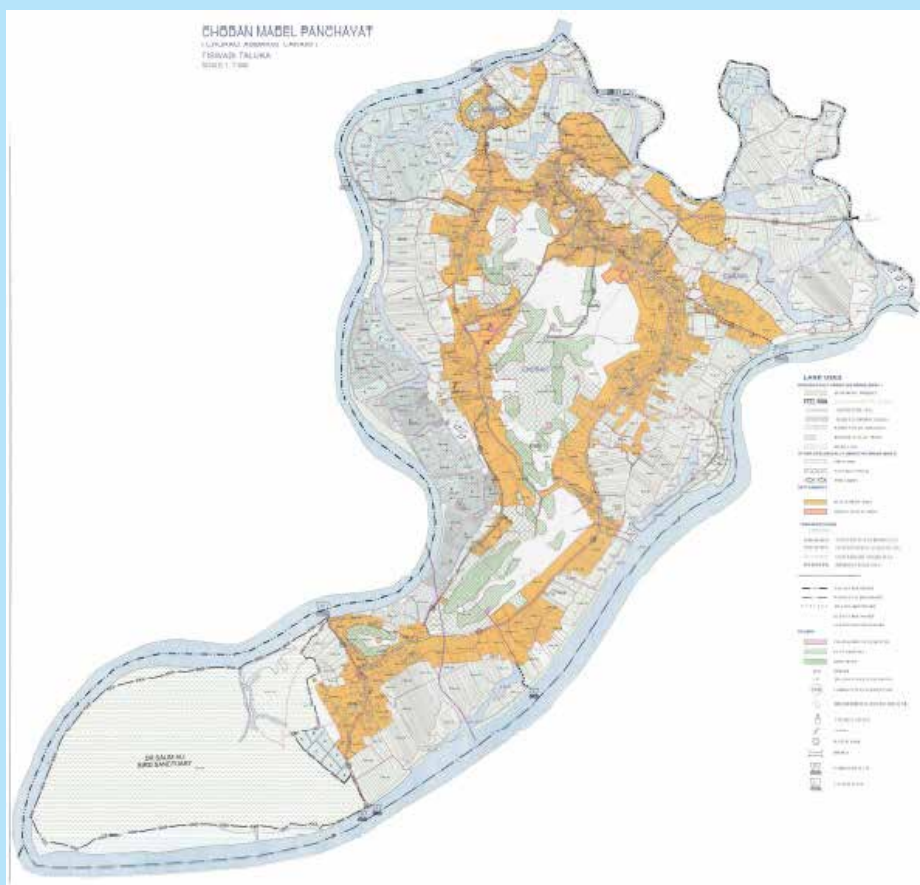


Source: GSIDC (2013), page 66

in the areas surrounding the sanctuary. It can be seen that Chorao and the VP of Golti-Naveli, which falls in the island of Divar, are the areas with the smallest population densities and have been classified by the Census Office as the only two rural areas in the surroundings of the sanctuary. Owing to their small sizes, Chimbel and Penha-De-Franca are the most dense areas surrounding the sanctuary. These are followed

by Mercedes and Panaji. While the heart of Panaji has a higher density, the area shown includes Panaji's urban outgrowth (OG), which falls to the south of the sanctuary across the Mandovi river, containing Ribandar. While the village of Salvador-Do-Mundo has been classified by the census as a Census-Town (CT), as can be seen in Table 16, it is the least dense of the urban areas surrounding the sanctuary.

Figure 48
Map Showing Land Use in Chorao Island



Source: SLC (2011)

History of the Settlement

The Island of Chorao was originally called Chudamani, meaning a chain made of precious stones. Some islanders are of the opinion that the island was formed from the diamonds that were thrown away by Lord Sri Krishna's mother, Yashoda (interview).

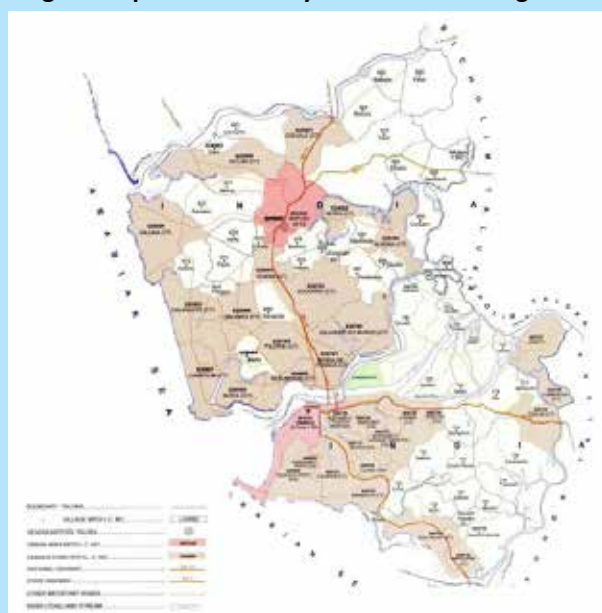
Though not much is known to us about the pre-Portuguese history of the island of Chorao (D'Silva, 1998, page 12), we have a detailed Portuguese history of Chorao. On 25 November 1510, Afonso de Albuquerque conquered the islands of Chorao, Vanxim, Divar and Zua from the Sultan of Bijaspur (ibid, page 13). By 1560 the island of Chorao had been completely Christianized. In the course of conversion, more than a dozen temples were destroyed by the Portuguese (ibid, page 16). In the 16th century the population of Chorao was approximately 8000 (ibid, page 13). There was a steady increase in the population in the 17th

and 18th centuries. Some of them immigrated to Chorao fearing the virulent fever that spread in Goa in 1570 and 1675 and the attack of the Marathas (ibid, page 13). In the 16th century and later, the Portuguese built churches and other religious institutions such as the Church of Bartolomeu (1569), a seminary called the Real Colegio de Educacao de Chorao (1761), Chapel of Sacra Familia-Panda-vaddo (1782), Chapel of Nossa Senhora de Livra-Febres, Belbatta (1786), Chapel of Nossa Senhora de Saude, Boctavaddo (1847), Chapel of Nossa Senhora do Rosario in Pandavaddo (1954) and small chapels, crosses and oratories (Catao, 1962, pages 63–64). Records say that Chorao had a population of 22,000 people in the 18th century (D'Silva, 1998, page 14). In 1759, the Jesuits, who were instrumental in converting the locals and establishing Catholic institutions in Chorao, were expelled from Goa as a consequence of a legal enactment in Portugal due to the anti-Jesuits, which had its repercussions across the

Table 16
Population, Households and Density In VPs Surrounding the Sanctuary

VP	Area (km ²)	Settlements(%)	Total Population	Households	Density(per km ²)
VP Chorao ¹	18.97	20.00	5,563.00	1,273.00	293.25
VP Salvador-Do-Mundo	12.30	21.00	6,373.00	1,516.00	518.13
VP Penha-De-Franca	5.04	58.00	15,342.00	3,850.00	3044.05
Panaji ²	21.01	22.00	17,807.00	70,991.00	847.55
VP Chimbel ³	4.46	49.00	16,269.00	3,335.00	3647.76
VP Mercês ⁴	10.03	10,471.00	2,523.00	1,043.97	2523.00
VP Golti-Naveli (Island of Divar) ⁵	10.580	11.00	2,767.00	703.00	261.53

Figure 49
Map Showing the Population Density of the Surrounding Areas of Chorao



Source: Directorate of Census Operations, Goa (2012), pages 14–15

world (ibid, page 32). In the year 1775, the island of Chorao was attacked by an epidemic which wiped out approximately 80% of the population of Chorao (Catao, 1962, page 7). While some of the families chose to stay back in their ancestral land, some of them fled the place. On 28 March 1808, the Government granted permission to the Comunidade of Chorao to construct new houses and invited outsiders to reside in the island (ibid, page 7). The comparatively peaceful Chorao in the second half of the 19th century and later saw the rise of educational and religious institutions such as St. Bartholomew's High School (founded in 1944), Dayanand High School (1970), Raghuvir and Parvatibhai Salkar Memorial Higher

Secondary School (1994), Temple of Shri Devika Krishna Bhoomika Mallinath Prassana (1924), Temple of Shri Vishnu Devalaya Prassana (1952) and Temple of Shri Vassudeo Devki Krishna Pisso Ravalnath Devasthan (1964) (D'Silva, 1998, pages 49–51).

Profile of Chorao Based on the 2011 Census

Chorao is inhabited by 5563 people, of whom 2812 (50.6%) are female and 2751 (49.4%) are male. The child population of the island (0–6 years) stood at 483 (8.6%), with 251 boys and 232 girls. The entire population comprises 1273 households.

A total of 87 persons (1.56%) are classified under the scheduled castes (SC) category, of whom 45 are males and 42 are females, while 444 inhabitants (7.9%) are categorized under the scheduled tribes (ST) category, of whom 235 are males and 209 are females.

Looking at the literacy rates, 4494 (80.7%) inhabitants out of the total population are literate. There is an almost equal distribution of literate males (2316) and females (2178). Of the 1069 illiterate people inhabiting the island, 40.6% (435) are males and 59.4% (634) are females.

To get a sense of the working population, the total working population of Chorao was 2116 (38%), out of which close to 74% (1565) were male and 26% (551) were female. 83.08% of the total working population (1758) are categorized as 'Main Workers', i.e., those who have regular work for more than 6 months in a year. The remaining 16.92% of the working population (344) are 'Marginal Workers', i.e., working for 6 months or less than 6 months in a year.

Profile of the Settlements in the Vicinity of the Sanctuary

The region connecting the sanctuary to Chorao comprising the wards of Madel and Orando has a number of households. From interviews with their respective VP ward representatives, it was learnt that Madel has approximately 80 households and Orando has approximately 20 households. The major problems faced by the people in this area which are connected to the sanctuary are the following.

Saline well-water. There are a number of wells in the settlement close to the sanctuary whose water has become saline and therefore unfit for consumption or for watering plants. The households depend entirely on piped water. This problem has existed for more than 20 years. People give mixed reasons for the same. Some associate this with the setting up of fish ponds by the fisheries department, which they claim were deep and led to the contamination of their wells with salt water. Others state that the main reason

for the problem was the destruction of the bunds in the khazans in the sanctuary which used to act like dykes, protecting the settlements from the ingress of salt water. The collapse of agriculture and the lack of maintenance of the bunds led to the ingress of salt water, resulting in many wells becoming saline.

Problem of buffer zone. As already detailed in Chapter 1, recently a controversy emerged in the settlement surrounding the sanctuary following the publication of the Draft RP—2021 and the Final RP—2021, which showed a 1 km buffer zone from the boundaries of the bird sanctuary. The main concern among the people living in the vicinity was that, as a result of the buffer zone, the villagers would not be issued construction permissions to build homes and undertake commercial ventures in the near future.

Agriculture

Location and Description: In the areas surrounding the sanctuary towards the eastern-side on Chorao Island, there are three areas which are demarcated as agricultural areas in the land uses indicated by Regional Plan—2021 (RP-2021). In Figure 50, these agricultural areas have been marked as A, B and C. On the northern side of the sanctuary across the Mapuca river in the village of Salvador-Do-Mundo, there are areas marked as agricultural zones (area D).

Of these four areas, A and C in Chorao and area D in Salvador-Do-Mundo are classified as fields. Area A is slightly elevated and is locally known as morod land. The remaining two—area C in Chorao and area D in Salvador-Do-Mundo—are classified as khazan agricultural land. Area B in Chorao is classified as orchard agricultural land. Area C, which is the largest agricultural area near the sanctuary in Chorao, comprises—albeit not exclusively—of two khazans: Patramon and Varona. In Figure 50, area C is further sub-divided into C1 and C2, which is a rough delineation of the two khazans.

Owners/Cultivators

Annexures 1, 2, 3, and 4 provide a listing of the

Figure 50
Map Showing the Demarcation of Agricultural Areas



Source: Base map: Google Earth | Overlay map: fieldwork

owners and the respective tenants of areas A, B, C1 and C2 in Chorao. The information for the same has been collated by scrutinizing forms I and IV for the respective survey numbers.

In the case of area A, Annexure 1 shows that in terms of ownership the overwhelming majority in the said area are private land owners. This area comprises six survey numbers and a total of 47 sub-divisions. In all, there are 31 tenants in the entire area.

Annexure 2 indicates the names of the owners of area B, who—based on the surnames—seem to be from the same family. As per forms I and IV, there are no tenants in the said property. Further, there is no cultivation or plantation undertaken in the area.

Area C is the largest agricultural area in the vicinity of the sanctuary. The same area has been sub-divided into two: areas, C1 and C2. Annexure 3 and Annexure 4 show the names of the owners and respective tenants in areas C1 and C2. Table 17 lists the owners in areas C1 and

C2, respectively. It can be noted that in the area C1 there are a total of 39 sub-divisions of which 35 are owned by the Comunidade and two are privately owned. In the case of area C2, which is larger than C1, when it comes to the owners of the sub-divisions there are a total of 178 sub-divisions, of which 124 are owned by the Comunidade and 54 are privately owned.

In the case of the tenants in C1 and C2, Table 18 shows that in C1 there are a total of 28 tenants, of which 26 are tenants of the Comunidade and two are tenants of the private owners. In the case of C2, the area has a total of 168 tenants, of which 137 are tenants of the Comunidade and 31 are tenants of the private owners.

Importantly, areas C1 and C2 comprise two khazans, Patramon and Varona, respectively, and the two khazans are jointly managed by an association of tenants called the Patramon–Varona Tenants Association. The tenants association comprises a total of 104 cultivators, of which 23 are tenants in Patramon khazan and 76 are tenants in Varona khazan and there are

Table 17
Subdivisions and Owners of Areas C1 (Patramon) and C2 (Varona)

No. of Sub-Divisions	Ownership	
	Comunidade	Private
Patramon		
39	36	2
Varona		
178	124	54

Table 18
Classification of Tenants in Areas C1 (Patramon) and C2 (Varona)

No. of Sub-Divisions	Ownership	
	Comunidade	Private
Patramon		
28	26	2
Varona		
168	137	31

five private land owners⁶—all of whom own land in the Varona area—who are also members of the tenants association.⁷

Cultivation

The ground visits to each of the above-mentioned areas indicated the following.

Area A in Chorao. There is only one paddy field that is regularly cultivated and is located near the Orando jetty. There are also two plots on either side of the road leading to the Orando jetty which have plantations of fruit trees and some vegetables. The cultivated areas have been marked in Annexure 1.

Area B in Chorao. This is marked as an orchard—the area has neither been cultivated nor has it had any plantation on it for many years. In fact, there are a number of mangroves growing in the plot.

Area C in Chorao. This comprises the two khazans of Patramon (C1) and Varona (C2); there are some fields which are cultivated in both the khazans, and these are mostly located along the upper areas of the khazan, i.e. closer to the settlement areas. Those owners of tenants who have been cultivating in areas C1 and C1 have

been colour coded in Annexure 3 and Annexure 4. This information is based on two sources—the chairperson of the Varona–Patramon khazan and the official cultivation report filed by the talathi in 2009. There appeared to be a considerable difference between the two sources, with the talathi’s report indicating a significantly lower number of persons cultivating in the two respective areas.

In Area D. located across the Mapuca river in Salvador-Do-Mundo. The khazankhazan just after the outer bund is largely un- cultivated and has mangroves growing in it. However it was noted that in the outer bund of the khazankhazan itself, bordering the Mapuca river, the same was used to cultivate vegetables. Beyond the uncultivated khazanskhazans and across the road, field visits indicated that many of the fields have been cultivated for paddy. From field visits it was also observed that very few fields were cultivated in Patramon khazankhazan whereas in Varona khazankhazan there were quite a few fields that were culti- vated.

Here it must be mentioned that there is an active cultivators association in Chorao called Tthe Chorao Farmers’ Club, comprising ofcomprising over 100 members, which has been actively

Figure 51
The Cultivated Outer Bund in Salvador-Do-Mundo



Figure 52
A View of the Stalls at the Entrance of the Island



encouraging a revival of agriculture in the village. It especially seeks to promote the use of traditional and organic cultivation practices (The Chorao Farmers; Club, n.d.).

Small Commercial Activities

There are a number of shops near the entrance

of the sanctuary in Madel where the commuters get on to the ferry or disembark from it. Figure 52 indicates the various stalls in the area. They range from tea and snacks stalls to hair-cutting saloons, mechanics' garages and vegetable vendors's shops. The owners of the shops pay an annual rent—known as *sopo*—to the VP.

Road Transport

There are four or five motorcycle pilots near the Madel ferry stand. Table 19 lists the names and phone numbers of four of the motorcycle pilots. They usually charge about Rs.20 for every 2 km. There is also sometimes one motorcycle pilot who positions himself at the ferry point where the Pomburpa ferry docks in Chorao. There are also usually two motorcycle pilots near Saude Church. Besides motorcycles there are also two or three rickshaws near the Saude Church.

There are mainly two bus routes on the island. One route runs from Madel ferry point to the town of Bicholim. This route is operated by three private buses. There also used to be a public Kadamba bus operating on this route which has now been discontinued. The second route is from the Madel ferry point to the Pomburpa ferry point. This is operated by two private buses and a public bus (Kadamba). The Kadamba plies from 7:00 to 9:30 hours and then from 14:00 to 20:00 hours.

Proposed Bridge

There has been a proposal to build a bridge connecting the island to the Salvador-Do-Mundo landmass. The proceedings to begin acquisition of land for the bridge have already begun. Figure 54 shows the proposed alignment of the bridge. From the figure one can see that the proposed bridge is close to the sanctuary and will result in the acquisition of parts of area A in Madel—as described in the previous section on agriculture—and cut across some of the wetland areas in Salvador-Do-Mundo.

Human Activities in the Surrounding Estuary

The two main activities carried out in the estuary which surrounds the sanctuary are different types of fishing and navigation and mooring boats in the river. The following will detail these two activities in the surrounding estuary.

Fishing

Stake-Nets (Futauni): A description of the method of using stake-nets has already

been provided in Chapter 3. In Chapter 3 it was explained how fishing using stake-nets comprises one of the primary human activities taking place within the sanctuary. However, the use of this technique of fishing can also be noticed in the river system surrounding the sanctuary. The two other locations, closest to the sanctuary, where stake-nets are set up are along the low-tide line around the newly formed Mankule island and along some portions of the opposite bank of the river Mandovi towards the Panaji–Ribandar area. Figure 55 provides a better indication of these two locations.

In the course of the fieldwork it was learnt that some parties from Ribandar have installed stake-nets around Mankule Island, but we were unable to ascertain the fishers setting up stake-nets on the opposite bank of the Mandovi river. From the fieldwork, it was also learnt that there are some fishers who install temporary stake-nets which are small in size and vary in their locations. A list of these persons is provided in Table 20.

Bagnets (Hari): This technique involves piercing the river bed with approximately six betel nut/areca nut trunks and attaching a long—usually 20 m—conical fishing net to the trunks with the use of iron rings. The trunks are approximately 15 feet long. This net is placed towards the middle of the river where the speed of the current is high. The net is usually fastened to the trunks during low tide and at night. Fish which are driven by the current into its conical net are caught. The net mesh size varies.

It is wider at the mouth of the conical aperture and becomes progressively smaller towards the net's end. The catch mostly consists of prawns and small fish. The trunks are replaced every year. The locations of the bagnets around the sanctuary are shown in Figure 56.

While there are about 10 bagnets, only two of the bagnet fishermen are from Chorao: Sanjay Sawant and Madhu Chodankar. Both belong to the Kharvi community, and the practice of using

Table 19
Names and Phone Numbers of Motorcycle Pilots at Madel Ferry Point

Name		Phone No.
Pundalik	2	9923966452
Ramakant	4	9767720954
Shekar	1	9764631841
Kushta	5	9637096875

bagnets has been passed down from generation to generation. Madhu remains unemployed for up to 4 months when bagnets are not deployed. But Sanjay Sawant also works on a barge. Madhu claims that his father had a field in the sanctuary but lost the same, but he does not have papers to prove it. The other bagnet fishers are from Britona, Pomburpa and Ribandar. When interviewing Sanjay Sawant and Madhu Chodankar, it was learnt that the women in their families are involved in selling the catch in the fish markets in Chora, Panaji and Mapuca.

Gillnet (Kantali): This technique involves drawing a gillnet across a section of the river. The net mesh size is approximately 1 inch. The net has a rope with floaters at the top end and weights at the other end. It is placed across a section of the river using a canoe. It can be used during either the high tide or the low tide. There is no fixed location where the kantali is placed as it varies continually. Another kind of kantali which has a smaller mesh size is used to catch fish near the manos. This is called manos zali.

Table 20 lists the kantali fishers who fish in the surroundings of the sanctuary. According to kantali fishers, night is the best time for catching fish, and hence those who are employed in other professions go fishing at night. Similarly, the monsoon is the best period as the fish catch is more. Fish are mostly sold to the market in Panjim through a wholesaler or locally, depending on the quantity. More goes to the market, whereas a smaller quantity is sold at Chora itself at the ferry point.

The fish caught using gillnets are similar to

those caught using stake-nets and include mullets (Shevtale), prawns (Sungata), butter fish (Saunale), pearl spot (Kalundar or Tipro), barramundi (Chonnak), river perch (Palu), lady fish (Muddoshi), cuttlefish (Mhanke), tiger prawns (Vaghi), crabs (Kurli), red snapper (Tamoshi), cat fish (Sangta) and sciaenoids (Dhadyaro). Prawns and mullets are the common fish. River perch, tiger prawns, lady fish, barramundi, pearl spot and red snapper fetch high prices in the market.

Vouli: This technique consists of attaching a series of baited fish hooks to a long rope using a nylon fishing line. The line is stretched across a section of the river. The hooks are usually baited using prawns. The baited line is left in the river for a couple of hours to attract fish. The names of those fishers who use this technique are provided in Table 20.

River Navigation

There are two ferries that connect Chora with its surroundings. The busiest ferry route is that of the Ribandar–Madel, Chora ferry. This is the main route through which the villagers of Chora access Panaji. During peak hours there are four ferries on this route. The less frequent ferry route is the ferry that connects Chora to Pomburpa. This has only one ferry. The ferries are managed by the River Navigation Department of the Government of Goa.

Both the Mapuca and Mandovi rivers are used by barges which until recently had stopped because of the Supreme Court-imposed mining ban.

There are a couple of jetties for mooring boats in the estuary surrounding the sanctuary. Figure 57 shows that there are three jetties officially

Figure 53
A Motorcycle Pilot Near the Jetty



Figure 54
Map Showing the Alignment of the Proposed Bridge Across the Island



Source: SLC (2011)

mentioned in the RP—2021 at Penha-De-Franca. While all are mentioned as passenger jetties as indicated on the RP map, one of these is used by fishing trawlers to dock their vessels. From the fieldwork it was, however, observed that there are another two privately owned jetties which allow private vessels to moor on the jetties for a fee.⁸ The locations of the same are shown in Figure 57. The regulation of the same is in the jurisdiction of the Captain of Ports.

Conclusion

This chapter divided the surroundings of the sanctuary into its terrestrial and its estuarine surroundings. Scrutinizing these two zones for the significant human activities showed that in the case of the terrestrial areas, the predominant activities comprise settlements and agriculture. In the case of settlements, the closest settlement to the sanctuary comprises some 100-odd households in the Madel area of

Figure 55
Map Showing the Placement of the Stake-Nets Near the Sanctuary



Base map: Google Earth | Overlay map: Fieldwork

Chorao. This settlement does not directly border the sanctuary but is separated from it by some agricultural land. Besides this, the interference of the inhabitants from the settlement with the sanctuary is minimal. On the contrary, the residents associate some problems stemming from the sanctuary: the contamination of their wells with salt water and the recent attempt to draw a 1 km buffer zone around the sanctuary. In the case of agriculture, it was found that while the sanctuary is surrounded on its eastern and northern sides by agricultural land, the agriculture has itself experienced a slowdown, with large portions of these areas lying fallow.

Currently, these agricultural lands are still protected from attempts to convert them for settlements through the zoning regime implemented by the RP—2021. In terms of the sanctuary's southern terrestrial surroundings, across the Mandovi, comprising the Panaji–Ribandar causeway and the salt pans of Mercês, they are already classified under ECO-2. With regards to this area, it was interesting to learn that the Goa State Infrastructure Development

Corporation (GSIDC) has a proposal to set up the Ribandar Biodiversity Park here. This may be an interesting project to follow up on. The human activities in the estuarine surroundings of the sanctuary are predominantly fishing and river navigation. Most of the fishing is artisanal in nature—stake-net, bagnet, kantali and vouli—and the interference and impact of the same on the sanctuary can be assumed to be minimal. The Mapuca river section of the estuary has witnessed an increase in the number of jetties which offer mooring space for a range of boats: fishing trawlers, tourist boats and private yachts. It may be prudent to work out regulations regarding the number of mooring points and boats that should be permitted in the vicinity of the sanctuary. In a similar vein, it may be important to also set and implement guidelines regarding the cleaning of boats and the disposal of their waste.

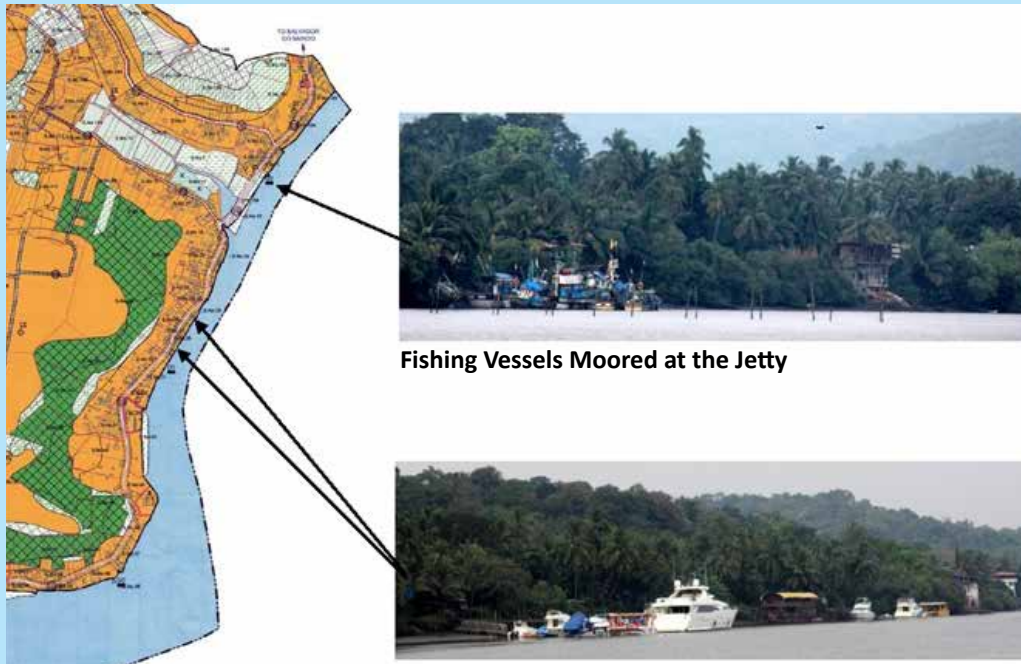
The other two activities, undertaken on a smaller scale, include small-scale commercial activities and transportation, at the entrance of the sanctuary. The persons involved in these

Figure 56
Map Showing the Locations of the Bagnets



Base map: Google Earth | Overlay map: fieldwork

Figure 57
Showing Jetties of VP Penha-De-Franca Based on Rp—2021



Fishing Vessels Moored at the Jetty

Private Jetties at the Penha-De-Franca Bank of the Mapuca River

activities are marginal earners, and it would be worthwhile to factor them into plans for the management of the sanctuary. Finally, it would

be important to look into the implications of the proposed bridge which would be aligned in the close proximity of the sanctuary.

Table 20
Names of the Fishers and Sub-types of Fishing Techniques in and Around the Sanctuary

Name	Activity Sub-types	Locality	Phone No.	Notes
PROXIMITY OF THE SANCTUARY				
Stake-nets				
Sudhakar Halarnkar (Tari)	Stake-net	Chorao	—	—
Pandhari Vernekar	Stake-net	Chorao	—	—
Shekar Halarnakar	Stake-net and gillnet; also crabbing using coblem	Chorao, Orando	9673400566	Brother of Navnath Halarnkar
Navnath Halarnakar	Stake-net, gillnet and coblem	Chorao, Orando	9673400566	Brother of Shekar Halarnkar
Bagnet				
Sanjay Sawant	Bagnet	Chorao, Orando	9850930254	Also works on barge
Madhu Chodankar	Bagnet	Chorao, Orando	9673274463	
Sagar Rivodkar	Bagnet	Britona	—	—
	Bagnet	Britona	—	—
Gajanan Halarnakar	Bagnet	Britona	—	—
Avesh Halarnakar	Bagnet	Britona	—	—
Pandurang Naik	Bagnet	Britona	—	—
Gill net				
Ashok Madkaikar	Gillnet	Chorao	—	Also stake-net
Shekar Halarnakar	Gillnet	Chorao	—	Also stake-net
Navnath Halarnakar	Gillnet	Chorao	—	Also stake-net
Dharmanand Malvankar	Gillnet	Chorao	—	—
Pramod Chodankar	Gillnet	Chorao	—	—
Gajanan Kundaikar	Gillnet	Chorao	—	Also kutcho (iron-rod) crabbing
Ulhas Chodankar	Gillnet	Chorao	—	—
Mukund Naik	Gillnet	Chorao	—	—
Paresh Sawant	Gillnet	Chorao	—	—
Laxman Malvankar	Gillnet	Chorao	—	—
Hanuman Kundaikar	Gillnet	Chorao	—	—

Table 20 (Cntd...)
Names of the Fishers and Sub-types of Fishing Techniques in and Around the Sanctuary

Name	Activity Sub-types	Locality	Phone No.	Notes
PROXIMITY OF THE SANCTUARY				
Stake-nets				
Dayanand Karapurkar	Gillnet	Chorao	—	—
Ramdas Kauthankar	Gillnet	Chorao	—	Also stake-net
Shivanand Karapurkar	Gillnet	Chorao	—	—
Santosh Malvankar	Gillnet	Chorao	—	—
Mandar Pilgaokar	Gillnet	Chorao	—	—
Satin brothers)			—	—
Uday Mandrekar	Gillnet	Chorao	—	Also tourism
Amrut Tari	Gillnet	Chorao	—	—
Kalidas Chodankar	Gillnet	Chorao	—	—
Bhiku Halarnkar	Gillnet	Chorao	—	—
Shekar Halarnakar	Gillnet, stake-net and crabbing using coblem	Chorao, Orando	9673400566	Brother of Navnath Halarnkar
Navnath Halarnakar	Gillnet, stake-net and crabbing using coblem	Chorao, Orando	9673400566	Brother of Shekar Halarnkar
Vouli				
Pandhari Vernekar	Vouli and stake-net	Chorao	—	—
Ashok Madkaikar	Vouli and stake-net	Chorao	—	—

Notes

1. Comprises census villages of Chorao, Ambaraim and Caraim.
2. Comprises Panaji Municipal Corporation and Panaji (OG).
3. Comprises census villages of Chimbel (CT) and Panelim (OG).
4. Comprises census villages of Morambi-O-Pequeno, Morambi-O-Grande (OG), Murda (CT) and Renovadi (OG).
5. Comprises census villages of Navelim and Goltim.
6. Chandrakant Gaonkar, Tukaram Goltekar, Ganesh N. Kautankar, Shiva Sawant and Vithal Manohar Kundaikar. Source: Mr. Mukund Khande- parkar.
7. Source: Mr. Mukund Khandeparkar, former office bearer of the Patramon-Varona Shetkar Committee.
8. One of the private jetties is owned by Mr. Cosme phone no. 9881267848.

Bibliography

- Alvares, C. and V. Gadgil (eds.) (2002) *Fish Curry and Rice: A Sourcebook on Goa, Its Ecology and Life-style* (4th edition). Mapusa: The Goa Foundation. 271 pages.
- Captain of Ports Department (n.d.) Aims and Objectives. Captain of Ports Department, Government of Goa. Accessed online on 10 November 2014 <<http://www.ports.goa.gov.in/aims-and-objectives>>
- Catao, Mons. F.X. Gomes (1962) *The Island of Chorao: A Historical Sketch*. Alwaye: Mar Louis Memorial Press.
- Chief Electoral Officer, Goa State (n.d.) Chief Electoral Officer, Goa. Accessed online on 10 November 2014 <www.cegoa.nic.in>
- Clemente, S. and B. Ingole (2011) Recruitment of mud clam *Polymesoda erosa* (Solander, 1876) in a mangrove habitat of Chorao Island, Goa. *Brazilian Journal of Oceanography* 59(2): 153–162.
- Collectorate of North Goa (n.d.) Citizens Charter for Collectorates of North and South Goa District Offices. Government of Goa. 46 pages. Available online <<http://northgoa.gov.in/charter.pdf>>
- Comptroller and Auditor General of India—CAG (2012) Annual Technical Inspection Report on the Urban Local Bodies and Panchayati Raj Institutions: For The Year Ended 31 March 2012. Government of Goa. Available online <http://www.saiindia.gov.in/english/home/Our_Products/Audit_Report/Government_Wise/local_bodies/Issued_State_Govt/Goa/2011_12.pdf>
- D'Silva, Rowena Grace (1998) *A Historical Sketch of the Island of Chorao*. Goa: Unpublished B.A. dissertation, Dempo College of Arts & Science.
- Directorate of Census Operation Goa (2012) *Administrative Atlas Goa*. New Delhi: Map Division, Office of the Registrar General & Census Commissioner, India.
- Directorate of Panchayats (2008) Citizen's Charter. Government of Goa, Directorate of Panchayats. 66 pages. Available online <http://www.panchayatgoa.gov.in/1227596995CITIZEN_CHARTER.pdf>
- ELDF and WWF India (2009) *Conserving Protected Areas and Wildlife: A Judicial Journey*. WWF New Delhi, 289 pages.
- Fernandes, Paul (2011) 'Chorao islanders objected to the marking of a buffer zone around Dr. Salim Ali Bird Sanctuary in RP2021 Chorao, stating that there is still confusion among residents about its definition and implications if it is enforced' *Times of India* (Goa Edition), 7 December 2011 viewed online on 15 October 2014 <<http://timesofindia.indiatimes.com/home/Chorao-islanders-objected-to-the-marking-of-a-buffer-zone-around-Dr-Salim-Ali-bird-sanctuary-in-RP-2021-Chorao-stating-that-there-is-still-confusion-among-residents-about-its-definition-and-implications-if-it-is-enforced-/articleshow/11023470.cms>>
- Government of Goa (2012) Official Gazette, Series II, No. 8, 13 July.
- Government of Goa (n.d.) About Department of Fisheries. Government of Goa. Accessed on 10 November 2014 <<https://www.goa.gov.in/departments/fisheries.html>>
- GSIDC (Goa State Industrial Development Corporation) (2013) *Draft Masterplan for the Holistic Development of Panaji City*, prepared by LKS, India. 153 pages.
- Herald (2014) Government Undertakes Study on Goan Waterways. *Herald*, 26 November, accessed online on 26 November 2014 <<http://www.heralddgoa.in/Goa/Govt-undertakes-study-on-Goan-waterways/81451.html>>
- ISRO (Space Application Centre and Centre for Studies in Resources Engineering (IIT-Mumbai)) (2009) *National Wetland Atlas: Goa*. SAC/RESA/AFEG/NWIA/ATLAS/01/2009. Ahmedabad, India: Space Applications Centre (ISRO). 72 pages.
- Kessarkar, P. M., V. P. Rao, R. Shynu, I.M. Ahmad, P. Mehra, G. S. Michael and D. Sundar, (2009) Wind-driven estuarine turbidity maxima in Mandovi Estuary. *J. Earth Syst. Sci.* 118(4): 369–377.
- Kumar, G. Trinadh (2013) *Management Plan for Dr. Salim Ali Bird Sanctuary, Chorao: 2013–14 to 2033–24*. Panaji: Government of Goa Printing Press.
- Nagi, H. M. H. (2008) *Environmental Studies on Mangrove Cover Changes in Goa, and Its Resident Crassostrea Population*. Ph.D. thesis, Goa University–National Institute of Oceanography, Goa viewed online on 14 November 2014 <<http://drs.nio.org/drs/handle/2264/2113>>
- River Navigation Department (n.d.) River Navigation Department, Government of Goa. Accessed online on 2 November 2014 <<http://www.rnd.goa.gov.in/>>
- Shetye, M. (2012) The Goa State Biodiversity Board Constituted. *The Times of India* (Goa edition). 3 September. Accessed online on 15 November 2014 <<http://timesofindia.indiatimes.com/city/goa/The-Goa-State-Biodiversity-Board-constituted/articleshow/16232144.cms>>
- Shetye S.R., A.D. Gouveia, S.Y. Singbal, C.G. Naik, D. Sundar, G.S. Michael and G. Nampoothiri. (1995) Propagation of tides in the Mandovi-Zuari estuarine network. *Proc. Indian Acad. Sci. (Earth Planet. Sci.)* 104(4): 667–682.
- SLC (State Level Committee for Regional Plan for Goa—2021) (2011) *Final Report Regional Plan for Goa—2021: Release Three*. Panaji, Goa: Government Printing Press.
- Sundar, D. and S.R. Shetye, (2005) Tides in the Mandovi and Zuari estuaries, Goa, west coast of India. *J. Earth Syst. Sci.* 114(5): 493–503.
- Task Force for Regional Plan—2021 (2007) *Draft Regional Plan for Goa—2021*. Department of Town and Country Planning, Government of Goa.
- The Chorao Farmers' Club (n.d.) About Us. The Chorao Farmers' Club. Accessed online on 4 October 2014 <<http://www.thechoraofarmers.com/about-2/>>

- The Hindu (2005) Sachivalaya: Notice Issued to Officer. The Hindu, 13 October 2005. Viewed online on 14 November 2014 <<http://www.thehindu.com/2005/10/13/stories/2005101303340300.htm>>
- Times of India (2011a) VP for Zero Buffer Zone around Chorao Sanctuary. Times of India (Goa Edition), 8 December. Viewed online on 2 October 2014 <<http://timesofindia.indiatimes.com/city/goa/VP-for-zero-buffer-zone-around-Chorao-sanctuary/articleshow/11026508.cms>>
- Times of India (2011b) Official Allays Fear on Chorao Buffer Zone. Times of India (Goa edition), 9 December. Viewed online 2 October 2014 <<http://timesofindia.indiatimes.com/city/goa/Official-allays-fear-on-Chorao-buffer-zone/articleshow/11038411.cms>>
- Times of India (2014) MoEF Nod for 1 km Buffer Zone: Parrikar. Times of India (Goa edition), 1 November 2014. Pages 1 and 3.
- ISRO (Space Application Centre and Centre for Studies in Resources Engineering (IIT-Mumbai)) (2009) National Wetland Atlas: Goa. SAC/RESA/AFEG/NWIA/ATLAS/01/2009. Ahmedabad, India: Space Applications Centre (ISRO). 72 pages.
- Kessarkar, P. M., V. P. Rao, R. Shynu, I. M. Ahmad, P. Mehra, G. S. Michael and D. Sundar, (2009) Wind-driven estuarine turbidity maxima in Mandovi Estuary. *J. Earth Syst. Sci.* 118(4): 369–377.
- Kumar, G. Trinadh (2013) Management Plan for Dr. Salim Ali Bird Sanctuary, Chorao: 2013–14 to 2033–24. Panaji: Government of Goa Printing Press.
- Nagi, H. M. H. (2008) Environmental Studies on Mangrove Cover Changes in Goa, and Its Resident *Crassostrea* Population. Ph.D. thesis, Goa University–National Institute of Oceanography, Goa viewed online on 14 November 2014 <<http://drs.nio.org/drs/handle/2264/2113>>
- River Navigation Department (n.d.) River Navigation Department, Government of Goa. Accessed online on 2 November 2014 <<http://www.rnd.goa.gov.in/>>
- Shetye, M. (2012) The Goa State Biodiversity Board Constituted. The Times of India (Goa edition). 3 September. Accessed online on 15 November 2014 <<http://timesofindia.indiatimes.com/city/goa/The-Goa-State-Biodiversity-Board-constituted/articleshow/16232144.cms>>
- Shetye S.R., A.D. Gouveia, S.Y. Singbal, C.G. Naik, D. Sundar, G.S. Michael and G. Nampoothiri. (1995) Propagation of tides in the Mandovi-Zuari estuarine network. *Proc. Indian Acad. Sci. (Earth Planet. Sci.)* 104(4): 667–682.
- SLC (State Level Committee for Regional Plan for Goa—2021) (2011) Final Report Regional Plan for Goa—2021: Release Three. Panaji, Goa: Government Printing Press.
- Sundar, D. and S.R. Shetye, (2005) Tides in the Mandovi and Zuari estuaries, Goa, west coast of India. *J. Earth Syst. Sci.* 114(5): 493–503.
- Task Force for Regional Plan—2021 (2007) Draft Regional Plan for Goa—2021. Department of Town and Country Planning, Government of Goa.
- The Chorao Farmers' Club (n.d.) About Us. The Chorao Farmers' Club. Accessed online on 4 October 2014 <<http://www.thechoraofarmers.com/about-2/>>
- The Hindu (2005) Sachivalaya: Notice Issued to Officer. The Hindu, 13 October 2005. Viewed online on 14 November 2014 <<http://www.thehindu.com/2005/10/13/stories/2005101303340300.htm>>
- Times of India (2011a) VP for Zero Buffer Zone around Chorao Sanctuary. Times of India (Goa Edition), 8 December. Viewed online on 2 October 2014 <<http://timesofindia.indiatimes.com/city/goa/VP-for-zero-buffer-zone-around-Chorao-sanctuary/articleshow/11026508.cms>>
- Times of India (2011b) Official Allays Fear on Chorao Buffer Zone. Times of India (Goa edition), 9 December. Viewed online on 2 October 2014 <<http://timesofindia.indiatimes.com/city/goa/Official-allays-fear-on-Chorao-buffer-zone/articleshow/11038411.cms>>
- Times of India (2014) MoEF Nod for 1 km Buffer Zone: Parrikar. Times of India (Goa edition), 1 November 2014. Pages 1 and 3.

Based on information provided by
Mr. Ganesh Govekar, Chairperson of the
Patramon-Varona Tenants' Association

Based on information provided by
the cultivation report 2009, prepared
by the Talathi, Chorao Saza

Annexure 1
Area A in Chorao: Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
155	1	Eliza Gaveia Bareto	Shiva Vithal Sawant	2375
	2	Luis Franciso Minguel deAbreu	NIL/NA	7050
	3	Ana Elisa Adelia deBatista de Gracias Goveia e Valerino Bareto	Shankar Ajun Mandrekar Jaivanti Jaideo Mandrekar	4250
	4	Anaclet Reismagos Fernades	Premavati Raghuvir Vaingankar	1300
	5	Casiano Almeida	NIL/NA	5050
		Philomena Almeida		
		Honrato Almeida		
		Germano Carcisto Almeida		
	6	Eliza Goveia Bareto	Shiva Vithal Sawant	5150
	7	Ermino F.C Perira	Waman Datta Vaingankar	2400
	8	Ditosa D'Souza e Gomes	Datram Arjun Mandrekar	5050
	9	Luis de Gove	Digambar Vasu Goltekar	675
156	10	Anaclet Reismagos Fernades	Premavati Raghuvir Vaingankar	1950
	11	Comunidade of Chorao	NIL/NA	10590
	1	Ermino F.E Peria	Tulshidas Datta Vaingankar	8825
	2	Luis Jose Gave	Tukaram Vassu Galtekar	5025
	3	Edward Abreu	Digambar Vasu Goltikar	3350
157	4	Julia Canlic Pinto	Carlit Mendes	5525
	5	Estacina Auralio Francis Gonsalves	Premavati Raghuvir Vaingankar	6075
	1	Aleixo Fernades Veloso	Ganesh Narayan Kauthankar	1400
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	2	Aleixo Fernades Veloso	Kashinath Sadashiv Wadyekar	1050
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso.		
		Annie Fernades Veloso		
	3	Aleixo Fernades Veloso	Hiravati Rama Khandeparkar.	1200
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	4	Aleixo Fernades Veloso	Nagush Ram Kauthankar	275
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		

Annexure 1 (Contd...)
Area A in Chora: Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
157	5	Aleixo Fernades Veloso	Kashinath Sadashiv Wadyekar	575
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	6	Aleixo Fernades Veloso	Radha Krishna Vaingankar	275
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	7	Aleixo Fernades Veloso	NIL/NA	275
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	8	Aleixo Fernades Veloso	Kashinath Sadashiv Wadyekar	1950
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	9	Aleixo Fernades Veloso	Hiravati Rama Khandeparkar.	2500
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso.		
		Annie Fernades Veloso		
	10	Aleixo Fernades Veloso	Nagush Ram Kauthankar	800
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	11	Aleixo Fernades Veloso	Kashinath Sadashiv Wadyekar	2500
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	12	Aleixo Fernades Veloso	Radha Krishna Vaingankar	1300
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	13	Aleixo Fernades Veloso	Nagush Ram Kauthankar	1675
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		

Annexure 1 (Contd...)
Area A in Chorao: Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
158	1		Chimno Mukund Khandeparkar	4325
	2		Jose Picado	6000
	3	Aleixo Fernades Veloso	Narayan Shanu Kundaikar	1525
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	4	Jose Antonio Andre Fernades	Jose Picado	1050
	5	Julia Canto ePinto	Hiravati Rama Khandeparkar	3475
	6	Estancio Antonio Fernades	NIL/NA	5750
	7	Comunidade of Chorao	NIL/NA	200
159	1	Conceiao Fernades, Directorate of Education	Chimno Mukund Khandeparkar	6675
	2	Pedro Nicolau Abreu	NIL/NA	875
	3	Vitorino Abreu	NIL/NA	100
	4	Jose Paul Fernades	NIL/NA	1050
	5	Josefina Almeida	NIL/NA	925
	6	Benjamin Fernades	NIL/NA	825
	7	Jose Paul Fernades	NIL/NA	125
	8	Comunidade of Chorao	NIL/NA	250
	9	Comunidade of Chorao	NIL/NA	425
	10	Government Primary School of Goa, Daman and Diu	NIL/NA	200

Annexure 2
Area B in Chorao: Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA B				
153	1	Aleixo Fernades Veloso	NIL/NA	69625
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		

Annexure 3
Area C1 in Chorao (Patramon): Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
142	1	Comunidade of Chorao	NIL/NA	11275
	10	Comunidade of Chorao	Madhu Topiyo Kundaikar	5100
	11	Comunidade of Chorao	Oitoso de Sequeira	5125
	12	Comunidade of Chorao	Krishna Pandurang Madkaikar	4900
	13	Comunidade of Chorao	Tukaram Narayan Kerkar	4825
	14	Comunidade of Chorao	Rukmini Duklo Madkaikar	4725
	15	Comunidade of Chorao	Lilavati Rohidas Chodankar	4800
	16	Comunidade of Chorao	Ganesh Narayan Kauthankar	5400
	2	Comunidade of Chorao	Raghuvir Shabi Karapurkar	5850
	3	Comunidade of Chorao	Raghunath Hari Naik	5175
	4	Comunidade of Chorao	Shivram Ramchandra Kundaikar.	5275
	5	Comunidade of Chorao	Anna Maria Silveira	5350
	6	Maria Merciana Colaco	Maria Merciana Colaco	5450
	7	Comunidade of Chorao	Amora Fernandes	5100
	8	Comunidade of Chorao	Kashinath Sadashiv Vadyekar	4775
	9	Comunidade of Chorao	Luis Pedro Mathias D'Souza	5150
143	1	Comunidade of Chorao	Pundalik Atmaram Vaigankar	7250
	10	Comunidade of Chorao	NIL/NA	25
	11	Lily De Mello	NIL/NA	2550
	12	Comunidade of Chorao	Celestina Cardoz	2500
	2	Comunidade of Chorao	Maria Antonio Fernandes	4550
	3	Comunidade of Chorao	Pundalik Atmaram Vaigankar	4750
	4	Comunidade of Chorao	Vasu Narayan Hoble	4700
	5	Comunidade of Chorao	Sidhu Shanu Kundaikar	6000
	6	Comunidade of Chorao	NIL/NA	50
	7	Comunidade of Chorao	Narcinha Khandeparkar	4800
	8	Comunidade of Chorao	NIL/NA	50
	9	Comunidade of Chorao	Datta Govind Shirodkar	4900
144	1	Comunidade of Chorao	Ganesh Naryan Kauthankar	2900
	10	Comunidade of Chorao	Ramrai Gopi Kesark	4900
	11	Comunidade of Chorao	NIL/NA	50
	2	Comunidade of Chorao	NIL/NA	25
	3	Comunidade of Chorao	Shiva Vithal Sawnt	1950
	4	Antonio Pereira	NIL/NA	25
	5	Comunidade of Chorao	Pedro Abreu	4600
	6	Comunidade of Chorao	NIL/NA	100
	7	Radha Govind Gaonkar	NIL/NA	2750
	8	Comunidade of Chorao	Radha Govind Gaonkar	5650
	9	Comunidade of Chorao	NIL/NA	50

Annexure 4
Area C2 in Chorao (Varona): Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
140	1	Comunidade of Chorao	Yeshwant Pundlik Gaonkar	795
	10	Comunidade of Chorao	Eliza Gonsalves	2675
	11	Comunidade of Chorao	Dattaram Kusta Haldankar	5225
	12	Comunidade of Chorao	Gurudas Vithu Naik	5300
	13	Comunidade of Chorao	Erminda Abreu	5425
	14	Comunidade of Chorao	Pedro Abreu	5400
	15	Maria J. Goveia e Pinto	Krishna Bhiku Vaigankar Pramod Yeshwant Salgaonkar	3875
	16	Maria J. Goveia e Pinto	NIL/NA	25
	2	Comunidade of Chorao	Govind Yeshwant Mayekar	7625
	3	Comunidade of Chorao	NIL/NA	400
	4	Nalini Vithal Khandeparkar	NIL/NA	6200
	5	Comunidade of Chorao	Marcelina Cardozo	5400
	6	Comunidade of Chorao	Sidhu Shanu Kundaikar	2675
	7	Comunidade of Chorao	Mahadeo Lumo Khandeparkar	2850
	8	Comunidade of Chorao	Shambu Rama Surlikar	5350
	9	Comunidade of Chorao	Paulina Almeida	2575
141	1	Comunidade of Chorao	NIL/NA	1050
	2	Cicilia Pinto	Yeshwant Govind Mayekar	6700
	3	Maria Francisco Pinto Mascarenhas	Ganesh Dulba Govenkar Shivram Dulba Govenkar	3475
	4	Narcisco S.Fernandes Maria M.Fernandes	NIL/NA	1600
	5	Comunidade of Chorao	Uttam Rama Surlikar	1275
	6	Narcisco S.Fernandes Maria M.Fernandes	NIL/NA	2450
139	2	Aleixo Fernades Veloso Alcina Fernades Veloso Manuel Alfredo Fernades Veloso Annie Fernades Veloso	Hiravati Rama Khandeparkar	3475
	4	Comunidade of Chorao	Matilda Fernades	250
	5	Aleixo Fernades Veloso Alcina Fernades Veloso Manuel Alfredo Fernades Veloso Annie Fernades Veloso	Hiravati Rama Khandeparkar	300
	6	Joaquim Rodrigues	Tipanna A.Belgaomkar	2600
	7	Aleixo Fernades Veloso Alcina Fernades Veloso Manuel Alfredo Fernades Veloso Annie Fernades Veloso	Hiravati Rama Khandeparkar	175

Annexure 4 (Cntd...)
Area C2 in Chorao (Varona): Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
139	8	Aleixo Fernades Veloso	Hiravati Rama Khandeparkar	50
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso		
	9	Comunidade of Chorao	Matilda Fernades	3850
	12	Comunidade of Chorao	Matilda Fernades	1800
	14	Comunidade of Chorao	Shabi Naryan Madkaikar	6250
	15	Comunidade of Chorao	Parvati Shankar Khandeparkar	3875
	16	Comunidade of Chorao	Nilkant Yeso Honkar	3025
	17	Comunidade of Chorao	Adelin Abreu	4275
	18	Comunidade of Chorao	Vitorin A. Abreu	5000
	19	Comunidade of Chorao	Filomena Vaz	4250
	20	Comunidade of Chorao	Vishnu Pundalik Gaonkar	6025
	21	Comunidade of Chorao	Pandurang Govind Mayekar	4050
	22	Comunidade of Chorao	Pramod Yeshwant Salgaonkar	3700
	23	Comunidade of Chorao	Vithal Dharma Kerkar	3500
135	1	Manuel Anto Conceiao Martin Pinto	NIL/NA	1900
	2	Comunidade of Chorao	Parvati Shankar Khandeparkar	1500
	3	Comunidade of Chorao	Shabi Naryan Madkaikar	1450
	4	Comunidade of Chorao	Vitorin A. Abreu	1500
	5	Julie D'Sa Nicolau Abreu	NIL/NA	2275
	6	Comunidade of Chorao	Shabi Naryan Madkaikar	5200
134	1	Comunidade of Chorao	Parvati Shankar Khandeparkar	1550
	10	Comunidade of Chorao	NIL/NA	25
	11	Comunidade of Chorao	Dropadi Shankar Khandeparkar	1575
	12	Comunidade of Chorao	Radha Govind Gaonkar	1525
	13	Comunidade of Chorao	NIL/NA	25
	14	Comunidade of Chorao	Naguesh Ram Kauthankar	1825
	15	Comunidade of Chorao	NIL/NA	25
	16	Comunidade of Chorao	Datta Rau Madkailkar	1550
	17	Comunidade of Chorao	Asociano Cardoz	1675
	18	Comunidade of Chorao	NIL/NA	25
	19	Comunidade of Chorao	Naguesh Ramchandra Kundaikar	1775
	2	Comunidade of Chorao	Filomena Vaz	1575
	20	Comunidade of Chorao	Laxmi Bhalchandra Kauthankar	1625
	21	Comunidade of Chorao	NIL/NA	25
	22	Comunidade of Chorao	Arjun Raghoba Kundaikar	1850
	23	Comunidade of Chorao	Jaivanti Jaideo Mandrekar	1775
	3	Comunidade of Chorao	NIL/NA	25

Annexure 4 (Cntd...)
Area C2 in Chorao (Varona): Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
134	4	Comunidade of Chorao	NIL/NA	25
	5	Comunidade of Chorao	Vishnu Pundalik Gaonkar	1525
	6	Comunidade of Chorao	Pandurang Govind Mayekar	1550
	7	Comunidade of Chorao	NIL/NA	25
	8	Comunidade of Chorao	Pramod Yeshwant Salgaonkar	1675
	9	Comunidade of Chorao	Vithal Dharma Kerkar	1600
133	10	Rama Datta Vaingankar	NIL/NA	375
	6	Rama Datta Vaingankar	NIL/NA	1900
131	9	Pascoal Fernandes	Yeshwant Pundalik Gaonkar	1400
		Antonio Fernandes		
		Meciana Fernandes		
	12	Rama Datta Vaingankar	NIL/NA	2900
130	3	Mari Emelda Expectao dePerpetuo Socro Pinto eD'Silva	Maria Deudita D'Sa eSilva	2600
129	3	Pascoal Jose Menezes	Arjun Shankar Gaonkar	1225
	4	Pascoal Jose Menezes	Sitabi Ram Sawnt	225
	5	Pascoal Jose Menezes	Pandurang Sajo Gaonkar	250
	6	Pascoal Jose Menezes	Narayan Damu Shet	250
	7	Sumitra Sadnad Gaonkar	NIL/NA	225
	8	Pascoal Jose Menezes	Anand Vinayak Gaonkar	450
	16	Pascoal Jose Menezes	Narayan Damu Shet	900
	17	Sumitra Sadnad Gaonkar	NIL/NA	1125
	18	Pascoal Jose Menezes	Anand Vinayak Gaonkar	500
	19	Pascoal Jose Menezes	Atmaram Rama Shet	650
	20	Pascoal Jose Menezes	Yeshwant Damu Shet	450
	21	Pascoal Jose Menezes	Atmaram Rama Shet	300
	22	Pascoal Jose Menezes	Narayan Damu Shet	750
128	1	Arjun Shankar Gaonkar	Arjun Shankar Gaonkar	2175
	3	Comunidade of Chorao	Yeshwant Pundalik Gaonkar	2550
	4	Comunidade of Chorao	Pandurang Krishna Madkair	2150
	6	Comunidade of Chorao	Mahdeo Pundalik Khandeparkar	2425
	8	Comunidade of Chorao	Pandurang Sajo Gaonkar	2200
	10	Comunidade of Chorao	Shri Mukund Chimno Khandeparkar	2550
			Sagun Chimno Khandeparkar	
			Ratnkar Chimno Khandeparkar	
			Krishnath C.Khandeparkar	
			Anadi C.Khandeparkar	
	11	Comunidade of Chorao	Datta Bicu Vaingankar	5025

Annexure 4 (Cntd...)
Area C2 in Chorao (Varona): Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
128	12	Comunidade of Chorao	Yeshwant Damu Shet	5225
			Krishnanath Yeshawant Shet	
			Gurudas Yashawant Shet	
	13	Comunidade of Chorao	Narayan Damu Shet	2325
	14	Comunidade of Chorao	Jagannath Kusta Haldenkar	5850
127	2	Comunidade of Chorao	Dropadi Shankar Khandeparkar	4025
	3	Comunidade of Chorao	Radha Govind Gaonkar	3775
	4	Comunidade of Chorao	Nagesh Ram Kauthankar	3725
	5	Comunidade of Chorao	Datta Rama Madkakair	3575
	6	Comunidade of Chorao	Asaciana Cardoz	3600
	7	Comunidade of Chorao	Nago Ramchandra Kundaikar	3150
	8	Comunidade of Chorao	Laxmi Bhalchandra Kauthankar	3250
	9	Comunidade of Chorao	Arjun Raghoba Kundaikar	3150
	10	Comunidade of Chorao	Jaivanti Jaideo Mandrekar	3125
	11	Arjun Shankar Gaonkar	Arjun Xhankar Gaonkar	3300
	12	Comunidade of Chorao	Yashwant Pundlik Gaonkar	3100
	13	Comunidade of Chorao	Pandurang Krishna Madkair	3225
	14	Comunidade of Chorao	Mahdeo Pundalik Khandeparkar	3250
	15	Comunidade of Chorao	Pandurang Sajo Gaonkar	2875
	16	Comunidade of Chorao	Mukund C.Khandeparkar	2725
	17	Comunidade of Chorao	Datta Bico Vaigankar	4775
126	1	Agnelo Vaz	Vasu Naryan Goltekar	16000
	2	Agnelo Vaz	Govind Yeshwant Mayekar	7025
	3	Comunidade of Chorao	Shivram Vithu Naik	600
	4	Comunidade of Chorao	Celstinha Cardoz	675
	5	Comunidade of Chorao	Celstinha Cardoz	775
	6	Comunidade of Chorao	Shivram Vithu Naik	550
	7	Comunidade of Chorao	Uttam Rama Surlikar	2725
	8	Comunidade of Chorao	Carmelina Rodrigues	4150
	9	Comunidade of Chorao	Shivram Vithu Naik	2775
	10	Comunidade of Chorao	Shabi Vithu Naik	6550
124	1	Comunidade of Chorao	Yeshwant Damu Shet	3400
	2	Comunidade of Chorao	Narayan Damu Shet	4200
	3	Comunidade of Chorao	Jagannath Kusta Haldenkar	7600
	4	Comunidade of Chorao	Pandurang Kusta Haldnkar	5150
	5	Comunidade of Chorao	Atmaram Rama Shet	9900
	6	Motibai Keshav Gaonkar	Keshao Pundlik Gaonkar	5025
	7	Comunidade of Chorao	Natlina D'Cunha	5050

Annexure 4 (Cntd...)
Area C2 in Chorao (Varona): Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
124	8	Comunidade of Chorao	Atmaram Babuso Harmalkar	4700
	9	Comunidade of Chorao	Shiva Vithal Sawnt	7875
	10	Comunidade of Chorao	Babuso Vithoba Chodankar	2325
	11	Comunidade of Chorao	Venkatesh Datram Madkair	4750
			Vasudeo Datram Madkair	
	12	Comunidade of Chorao	Yeshwant Muknd Khandepark	4750
123	13	Comunidade of Chorao	Jagannath Datta Vaigankar	4600
	1	Comunidade of Chorao	Pandurang Kusta Haldnkar	1075
	2	Comunidade of Chorao	Atmaram Rama Shet	2000
	4	Motibai Keshav Gaonkar	Keshao Pundlik Gaonkar	1075
		Rudreshwar Keshav Gaonkar		
	5	Comunidade of Chorao	Natlina P.Caido	1050
	6	Comunidade of Chorao	Atmaram Babuso Harmalkar	1150
	7	Comunidade of Chorao	Shiva Vithal Sawant	1750
	8	Comunidade of Chorao	Babuso Vithoba Chodankar	575
	9	Comunidade of Chorao	Venkatesh Datram Madkaikar	1150
			Vasudeo Datram Madkaikar	
	10	Comunidade of Chorao	Yeshwant Muknd Khandepark	1050
	11	Comunidade of Chorao	Jagannath Datta Vaigankar	950
	12	Comunidade of Chorao	Premavati Raghuvir Vaingankar	1425
	14	Comunidade of Chorao	Vithal Manohar Kundaikr	600
	15	Comunidade of Chorao	Vishnu Manohar Kundaikr	625
	17	Comunidade of Chorao	Vishnu Pundalik Gaonkar	550
	18	Comunidade of Chorao	Sitabai Ram Sawant	575
	19	Comunidade of Chorao	Ramnath Pandurang Madkair	175
	20	Arjun Shankar Gaonkar	Arjun Shankar Gaonkar	200
122	3	Balkrishna Arjun Mandrekar	Balkrishna Arjun Mandrekar	4925
	4	Guilhermina (Mina) Alvares	Balkrishna Arjun Mandrekar	4825
	6	Dr. Savlo Keny	Arjun Raghoba Kundaikar	1325
	7	Aleixo Fernades Veloso	Arjun Raghoba Kundaikar	3600
		Alcina Fernades Veloso		
		Manuel Alfredo Fernades Veloso		
		Annie Fernades Veloso.		
	8	Nalin Vithal Khandeparkar	NIL/NA	775
	11	Balkrishna Arjun Mandrekar	Balkrishna Arjun Mandrekar	925
	12	Nalin Vithal Khandeparkar	NIL/NA	6625
	13	Latika Ramnath Betkar	Ramnath Chandrakant Betkar	6275
		Lavu Ramnath Betkar		
		Ankush Ramnath Betkar		

Annexure 4 (Cntd...)
Area C2 in Chorao (Varona): Owners, Tenants and Cultivators

Survey No.	Sub-division no.	Name of Occupant	Name of Tenant	Area (Sq.m.)
AREA A				
121	1	Comunidade of Chorao	Premavati Raghuvir Vaigankar	9375
	2	Comunidade of Chorao	Vithal Manohar Kundaikar	4775
	3	Comunidade of Chorao	Vishnu Manohar Kundaikar	4400
	4	Comunidade of Chorao	Vishnu Pundalik Gaonkar	4000
	5	Comunidade of Chorao	Sitabai Rama Sawant	6150
	6	Comunidade of Chorao	Ramnath Pandurang Madkair	2225
	7	Arjun Shankar Gaonkar	Arjun Shankar Gaonkar	3400
	8	Comunidade of Chorao	Mukund C. Khandeparkar	2575
			Sagun C. Khandeparkar	
			Ratnakar C. Khandeparkar	
			Krishnanath C. Khandeparkar	
			Anandi C.Khandeparkar	
	10	Comunidade of Chorao	Mahdeo Lumo Khandeparkar	4400
			Ramrai Lumo Khandeparkar	
	11	Comunidade of Chorao	Pandurang Arjun Mandrekar	7850
	12	Yeshwanti S.Mandrekar	NIL/NA	5150
		Dattaram A. Mandrekar		
	13	Smt. Pires	Yeshwant Govind Mayekar	4325
	15	Balkrishna A.Mandrekar	NIL/NA	5800
		Yeshwanti S.Mandrekar		
	16	Comunidade of Chorao	Dattaram Arjun Mandrekar	200
	17	Cormelina deAlmeida	Vithal Manohar Kundaikar	6600
120	5	Praksh Jiotam Camotim Shankhavlkar	Vishnu Manohar Kundaikar	9600
	6	Ramchandra Kundaikar	Babi Manohar Kundaikar	7000
		Suresh B. Kundaikar		
		Shrikant Kundaikar		
		Rajashree Kundaikar		
		Suvidha S. Kundaikar		
		Shrimati Kundaikar		

Authors



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Rayson K. Alex is Assistant Professor of English at the Department of Humanities and Social Sciences at the Birla Institute of Technology and Science Pilani, K.K. Birla Goa Campus, Goa. He was awarded his Ph.D. in 2011 for his dissertation titled *Symbiosis in the Songs of Mudugar* by the University of Madras. He is one of the editors of *Essays in Ecocriticism* (2007), the first volume in the area of ecocriticism in India, and *Culture and Media: Ecocritical Explorations* (2014). His recent documentary titled *Thorny Land: Invasion of Cheemakaruvel*, which tells the story of an exotic but social, cultural and political plant, *Prosopis juliflora*, is being screened in various film festivals in India and other countries. He is the founder and co-director of *tiNai Ecofilm Festival* (www.teff.in).



Namrata Namdeo Naik completed her M.A. in Sociology from Goa University in 2014. The short dissertation titled 'The Ambivalence in Possession: Vocal Gods, Silent Ancestors, Invisible Women and Missing Dalits', done as part of the M.A. programme, was a result of extensive ethnographic fieldwork. In her dissertation, she argues that in the context of a traditional community, there is a difference between 'trance' and 'possession'. She teaches sociology and commerce at the Government Multipurpose Higher Secondary School, Borda-Margao.



Sushobhan Parida is a fourth year B.E. (Hons.) student at Birla Institute of Technology and Science Pilani, K.K. Birla Goa Campus. Studying for his degree in mechanical engineering, he has a keen interest in the humanities and social Sciences. He has done courses in English literature, development studies and politics. He is the Chief Organizer of the campus's TEDx event, TEDxBITSGoa, Vice-President of the institute's discussion forum, MATRIX, and the President of the Regional Association of Odisha.

About the Study

The study *An Analysis of the Stakeholders in Dr Salim Ali Bird Sanctuary, Chorao, Goa*, seeks to aid the fundamental objective of the CMPA Project to sustainably manage the Dr Salim Ali Bird Sanctuary, by identifying and understanding the social challenges and opportunities involved. Therefore the study aims to (i) understand the current human activities (within and outside especially that undertaken in close proximity of the site) that affect the site; and (ii) identify the wider stakeholders critical to support any conservation measures put in place. The study identified two broad sets of stakeholders (i) stakeholders who derived livelihoods from both in and around the sanctuary and another set of stakeholders (ii) which were institutions exercising authority over the sanctuary and its surroundings. The first set of stakeholders is labelled as livelihood stakeholders and the latter as institutional or regulatory stakeholders.

The CMPA Project

The Project “Conservation and Sustainable Management of Coastal and Marine Protected Areas” (CMPA) is a project of 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.

An Analysis of the Stakeholders in Dr. Salim Ali Bird Sanctuary Chorao, Goa

November 2014



Implemented by

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German India Partnership
for International
Sustainable Development

On behalf of:



Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany