महाराष्ट्र वन विभाग

Thane Creek Flamingo Sanctuary Management Plan

2020-21 to 2029-30

Thane Creek Flamingo Sanctuary, Management Plan 2019-20 to 2029-30

By

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Preface

Thane Creek Flamingo Sanctuary (TCFS) is located right in the midst of a mega-city and is crucial for the conservation of this unique natural environment with its eclectic mix of mangroves, mudflats and threatened bird species.

TCFS is important area of Central Asian Migratory Flyway (CAMF) and is occupied by large number of wading birds especially Lesser Flamingos and Greater Flamingos. Even though, it is a small area, it has significant cover of mangroves and harbours rich biodiversity.

The Sanctuary harbours more than 12 species of mangroves and mangrove associates, 167 species of avifauna including large number of migratory birds like Lesser Flamingos, Greater Flamingos, Pied Avocet, Western Reef Heron, Black-headed Ibis, Common Redshank, Marsh Sandpiper, Common Greenshank, Curlew Sandpiper, Brown-headed Gull, Whiskered Tern, Gull-billed Tern, Caspian Tern, Little Tern, White Bellied Sea Eagle, Eurasian Marsh Harrier etc. visit this sanctuary during winters. Biodiversity in and around TCFS comprises good diversity of birds, reptiles, mammals and invertebrates like butterflies, moths, honeybees, wasps, spiders, benthic organisms etc.

The Management Plan of this Sanctuary is the need of the hour for scientific management of the area and for its sustainable management as the area faces serious threats like discharge of effluents, dumping of sewage and other biotic interferences. Many activities like habitat improvement works, eco-development, education and awareness activities etc., have been proposed to conserve and protect this unique ecosystem. This Management Plan will be helpful in achieving the objectives of

managing such small yet pristine areas for improving the health of the creek thereby conserving the biodiversity of the Sanctuary.

This document will be helpful to all future Managers and will go a long way in Management of the Sanctuary.

Acknowledgement

I wish to acknowledge my profound sense of gratitude to Shri N. Vasudevan, IFS, the then Additional Principal Chief Conservator of Forests (APCCF), Mangrove Cell whose constant guidance and direction has made it easy for me to come out with this Management Plan of the Thane Creek Flamingo Sanctuary (TCFS).

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List of Annexures

Part I
The Existing Situation

Chapter 1

Introduction to the Area

1.1 Name

The area has been notified as 'Thane Creek Flamingo Sanctuary'.

1.2 Location

The Thane Creek Flamingo Sanctuary (TCFS) is located between 19° 00' to 19° 15' N latitudes and 72° 55' to 73° 00' E longitudes on the Western bank of the Thane creek, Maharashtra, India. It is situated in between Greater Mumbai City & Navi Mumbai City. It is a part of Kurla tehsil of Mumbai Suburban District. For Map of TCFS refer to **Annexure 1 (Page 84).**

1.3 Approach and Access

Thane Creek Flamingo Sanctuary is easily accessed through road and railway network from various sides because it is situated between Mumbai, Thane and Navi Mumbai. Nearest railway stations are Thane, Airoli and Nahur. Access point from these railway stations to Thane creek is through Airoli jetty, which is around 8 km from there and nearest Airport is Chhatrapati Shivaji Maharaj International Airport, which is approximately 25 km from the Sanctuary.

Thane Creek Flamingo Sanctuary can be accessed by road through the following routes:

a) **Mulund - Airoli Bridge:** This bridge lies on the Northern side of the Sanctuary, from where one can visit the Forest Range Office, the Interpretation center and Airoli jetty.

b) Vashi - Mandale Bridge: This is the Southern boundary of the Sanctuary and leads to the mangrove wetlands near NRI colony, Uran and Panje-Funde which also serve as sites for roosting of flamingos.

c) Eastern Express Highway: The highway connects Mandale to Thane and falls on the Western side of the Sanctuary and access to the Sanctuary can be from two points, first is from Bhandup jetty and second point is from the Vikhroli jetty.

d) Thane- Belapur Road: This road runs parallel to the proposed 'Eco Sensitive Zone' of the Thane Creek Flamingo Sanctuary, connects Thane to Belapur and Vashi. Access points to the Sanctuary are from Ghansoli jetty and Sagar Vihar, Vashi. Map of the route is given in **Annexure 2 (Page 85)**

Railway Station on Main Line - Thane - 6 kms

Airport– Chhatrapati Shivaji Maharaj International Airport, Sahar – 25 kms

There is regular bus service to Airoli from various parts of Mumbai, Navi Mumbai, and Thane region.

1.4 Statement of Significance

Mangrove and marine environment of TCFS region plays a vital role in supporting variety of avifauna and marine aquatic fauna and provides healthy environment for human beings creating oxygen releasing pockets in the region. It serves as important eco-system conserving and balancing the marine food chain and attracting huge biodiversity and is instrumental in providing many eco-system services such as breeding grounds for marine aquatic fauna and marine fishery, which is an important source of livelihood for the local people and source of food for the people in the area. The large numbers and diversity of the avifauna, abundant population of lesser flamingos and greater flamingos and lush green pockets of mangroves of the area are excellent

resources for eco-tourism for a metropolitan city with huge population. Apart from being the major factor for ameliorating the air pollution in industrial city, it is an equally good avenue for bird watching and related nature education activities. The beautiful lush green patches of the mangroves in the creek add to the aesthetic value of metropolitan city like Mumbai. In addition to above, Thane Creek Flamingo Sanctuary and its adjoining landscape plays a crucial role in regional economic and livelihood development besides providing various ecosystem services that are essential as life supporting system for myriad of aquatic fauna and the dependent fishermen communities in the surrounding region.

Global Significance: The high species diversity of birds in Thane Creek Flamingo Sanctuary and presence of many globally important species along with the rich abundance of Lesser Flamingos and Greater Flamingos makes this area globally significant and the site has also been categorized as an **Important Bird Area (IBA)**. Secondly, it is an important part of the wetland complex of the Central Asian Flyway of the birds.

The Thane Creek Flamingo Sanctuary is a marine protected area declared under Wildlife (Protection) Act, 1972. The key species of this Sanctuary being flamingo and hence the name. It also is an important bird area as per the International Bird Area criteria namely A1 and A4(ii).

IBA criteria A1 is for **Globally Threatened species**: Criterion: The site is known or thought regularly to hold significant numbers of a globally threatened species, or other species of global conservation concern.

IBA criteria A4 is for Congregations of which the sub section (ii) Site known or thought to hold, on a regular basis, >1% of the global population of a congregator seabird or terrestrial species.

TCFS is known to hold significant number of Lesser Flamingos which is categorized by IUCN as Near Threatened species and the site of TCFS is also an area where significant global population of the Lesser Flamingos visit every year. Greater flamingos have been categorized by IUCN as least Concerned.

Chapter 2

Background Information and Attributes

2.1. Boundaries

The Eastern boundary of the TCFS is between Thane & Mumbai Suburban district and lies in the middle of the creek. The Southern & Northern boundaries are partly in the creek and partly in marshy land. The Western boundary is on the marshy land. Due to the marshy nature of land and the water in the creek, the boundaries are not well demarcated. Refer **Annexure 3 (Page 86)** for map showing boundaries of TCFS.

2.2 Biogeographical Zone & Sanctuary Types

It comes under the "Coasts" zone in the zonation of the different biogeographic zones of India as classified by Rodgers et.al., (2002) and under biogeographic province of Coastal zone (8). The Thane Creek Flamingo Sanctuary comes in the "humid category" under the classification of the bioclimatic zones of India.

2.3 Altitude/Terrain Types

The area of the Sanctuary is mainly covered with water, mangroves and intertidal marshy zone. The Sanctuary area at low tide shows the undulations that are present in the catchment area. The Sanctuary is hardly 10-15 meters above sea level.

2.4 Geology, Rock and Soil

The region is underlain by basaltic rocks. Basalt flow forms the predominant formation capped at a few places by laterite at higher levels. A number of hot

springs occur in Thane district which have positive relation with the geology of the area. The hill ranges in the area are predominantly aligned North-South and have more or less escarpments. Basalt flows, popularly known as Deccan traps, forms the predominant formation. It is capped by laterite on a few high plateaus and covered by shore sands along the coast.

A general geological sequence is as follows:

Shore sand- Recent, Laterite-Pleistocene and Basalt-Eocene.

a) **Deccan Traps:**

The Deccan trap has been divided into three major groups, i.e. upper, middle and lower. The Bombay basalt flows have been grouped into upper traps on the basis of the intertrappean and ash beds present in them (Krishnan, 1968). Being in the contiguous area, the Deccan traps in the district can also be grouped with the upper flows. There are number of dyke's criss-crossing the area. The general trend is however, North-NorthWest, South-SouthEast and North-NorthEast, South-SouthWest, dipping steeply to the East. The thickness seldom exceeds six meters. The dykes send out offshoots of different sizes, at places enclosing lenticular wedges of country rock. Chilled margins are seen along dykes flow contact. The dykes vary from coarse dolerite to fine grained basalts. Most of the dykes are porphyritic of feldspars.

b) **Laterite:** Few places are capped by laterites.

c) **Shore Sands:** The sea coast of the district stretching several kilometers along the Western boundary is covered by sands.

d) **Common Salt:** Common salt is collected in artificial evaporation pans (saltpan) along the coast. It is a thriving industry. The region is underlain by basaltic rocks. It is composed of Alluvial soil- Recent Basalt (Deccan trap), Rhyolite- Upper cretaceous to lower Trachyte- Eocene. The soil found in this area is majorly alluvial soil and coastal saline soil. Alluvial soil is formed due to deposition of clay and silt. Coastal saline soil has very large amount of salt

that is harmful for growth of any economically important plant which is why only halophytes can grow in this region.

2.5 Characteristics of Thane Creek Catchment

Thane creek is named after the adjoining city/ taluka/ district Thane on its North where it meets the Ulhas River through a small connection to link it to the Mumbai harbor situated about 26 kms Southwards. However, the Creek is said to extend from the river to the Vashi bridge about 12 km's to its South, beyond which the waters are said to be part of the Panvel and Dharamtar Creeks. It is narrower and shallow at the riverine end and is broader and deeper towards the sea and its boundary is divided by saltpans and stretches of mangroves.

2.5.1. Soil Types in Catchment Area of Thane Creek

The catchment area of Thane creek is rich in mangrove cover and thus contains alluvial soil/coastal saline soil. Alluvial soil is a fine-grained fertile soil deposited by water flowing over flood plains or in river beds. Since, Thane creek is in the heart of the city it is exposed to running water from flood drains in the form of drainage and to river beds due to its proximity to the Ulhas River by a narrow and shallow 2 km stretch. Alluvial deposits are mainly clay/silt or gravel that is carried by running water and is deposited where the stream slows down.

2.5.2 Forest Cover in Catchment of Thane creek

The forest cover in the catchment of Thane creek consists of mangrove species and mangrove associates. The list of mangrove and associate mangrove species are given in **Annexure 4 (Page 87)**. In addition to the mangroves, there is presence of few wetlands that are in the intertidal area.

Picture 1 showing mangrove vegetation in Thane Creek Flamingo Sanctuary

Picture 2 showing *Avicennia marina* dominant mangrove species in Thane Creek Flamingo Sanctuary

a) Mangrove Vegetation: There are about 80 different species of mangrove trees present throughout the world. All of these trees grow in areas with low-oxygen soil, where slow-moving waters allow fine sediments to accumulate. Mangrove forests only grow at tropical and subtropical latitudes near the equator because they cannot withstand freezing temperatures. Many mangrove forests can be recognized by their dense tangle of prop roots that make the trees appear to be standing on stilts above the water. This tangle of roots allows the trees to handle the daily rise and fall of tides, which means that most mangroves get inundated by tides atleast twice per day. The roots also slowdown the movement of tidal waters, causing sediments to settle out of the water and build up the muddy bottom.

Mangrove forests stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides. The intricate root system of mangroves also makes these forests attractive to fish and other organisms seeking food and shelter from predators. Mangrove forests are vital ecosystems as they:

- Provide support to a complex community assemblage
- Reduce coastal erosion
- Serve as sinks for macro-nutrients, micro nutrients and heavy metals.

They take nutrients from tidal water and in turn provide food to mangrove dwelling fauna. Special adaptation of these plants is that they are tolerant to fluctuating water salinity. In a study carried out on salinity induced changes in leaves of *Avicennia marina* in Thane creek, it was observed that the plants spend more energy on development of salt extruding glands and water storage tissue and have relatively less photosynthetic tissue in high saline environments which leads to their stunted growth. Opposite changes in these structures, at lower salinity i.e. in monsoon season and at riverine end stations, favor growth of mangrove. They also have adaptation in terms of columnar roots that help them grow in unstable substrate.

In Thane creek three types of vegetation has been recognized:

- Mangrove species
- Mangrove associates
- Non-mangrove plants
- Halophytes

The baseline studies were conducted by Salim Ali Centre for Ornithology and Natural History (SACON) from various sampling stations across Thane creek. Based on the report by SACON the list of biodiversity at TCFS is given in **Annexure 4** (**Page 87)**

a) Mangroves and associate mangrove species

TCFS Comprises 12 true mangrove species and 39 associate mangrove species **(Annexure 4.1; Page 88-90).** *Avicennia marina* was the dominant mangrove and most abundant species throughout the creek. Two variant of Avicennia marina namely Avicennia marina var marina and Avicennia marina var accutissima.

Similarly, other species that were reported during the study comprised of *A. officinalis, Sonneratia apetala* ,*Sonneratia alba*, *Bruguiera cylindrica Ceriops tagal, Excoecaria agallocha , Aegeiceras corniculatum, Rhizhophora mucronata . Assosciate* mangrove species namely *Acanthus illicifolious* and *Salvadora persica* were also found abundant in some patches along the creek.

b) Fauna

The Thane creek ranks amongst the most important bird habitats in the region and is an interesting dividing line between the Mumbai and Mumbai suburbs, Thane and the city of Navi Mumbai. A total of around 167 species of birds **(Annexure 4.2 ; Page 91 - 101)** have been recorded, 45 species of fishes **(Annexure 4.3 ; Page 102 - 104)** , 59 species of butterflies **(Annexure 4.4; Page 105-107**), 67 species of Insects **(Annexure 4.5; Page 108-111**), 35

species of Phytoplankton **(Annexure 4.6; Page 112-113),** 24 species of Zooplankton **(Annexure 4.7; Page 113-115)** and 23 species of Benthos **(Annexure 4.8 ; Page 116-117)** which together make this place an important area representing the marine biodiversity of the region.

c) Important invertebrates (Phytoplankton, Zooplankton and Macrobenthos) their status, distribution and habitat

Phytoplankton forms the essential link between the abiotic factors and the biota in the aquatic ecosystem. The phytoplanktons are the primary producers of the aquatic food chain, and play a pivotal role in making energy available to the higher organisms. Some plankton species are known to produce toxins that kill fish and other organisms. Due to various anthropogenic activities, there is tremendous pollution pressure on the waters of the creek and estuaries, which affects the phytoplankton type and density, thereby necessitating their study. A comparison of the percentage composition of the phytoplankton shows that the *Rhizosolenia sp.* and *Skeletonema sp* formed the highest proportion during the neap tide while during the spring tide the *Rhizosolenia* formed 54% of the composition followed by other species. Moreover, the dominance of Bacillariophyceae class in the creek can be attributed to the nutrient rich waters that are known to trigger reproduction in the single celled phytoplanktons.

The zooplankton community mostly consists of invertebrates, larvae and immature stages of both invertebrates and vertebrates. According to Nair *et al.* (1999), the zooplankton community comprises of herbivores, omnivores and carnivores, of which generally herbivores form a major fraction. Associated with the phytoplankton bloom initial zooplankton standing stock will be dominated by herbivore and omnivore community, which later develop into a region with higher ratio of carnivores (Nair, 1980). Further, Lodh (1990) attributed the changes from normal pattern to relatively higher share of carnivores, to the stress induced on the ecosystem.

In the creek, the coelenterates were seen to increase towards the seaward end with very few numbers along the riverine end. Insect larvae were restricted to the riverine end and they did not have a wide distribution. Similarly, other plankters like fish eggs, foraminifera, bivalves and gastropod larvae were governed by the salinity gradient and were much sporadic in their occurrence.

Benthic organisms, those living in or on the sediment, constitute an important component of the food web. They convert detritus and small planktonic and bottom organisms into the food chain (Mann, 1976). Benthic fauna are important mediators of nutrient recycling from the sediments into the water column. Benthic studies can indicate the magnitude, as well as well as spatial and temporal distribution of pollution in the environment, Hartley (1982). Benthos are superior to other biological groups in indicating pollution stress because they are sedentary and must adapt to environmental stress or perish. Benthic organisms are very sensitive to habitat disturbance, including organic enrichment of the sediments and some species and communities of benthic fauna are often regarded as being the best indicators of organic pollution.

d) Habitat quality, quantity and key areas

Habitat mapping of the Sanctuary was done by interpretation of satellite imageries. The mapping was done on GIS domain in Arc Info 10.2 platform. A habitat map was generated which showed the extent of different habitats. Refer **Annexure 5 (Page 118)** for Map showing different habitats around TCFS

Table 2.1. Showing habitat area (Sq. Km.) in TCFS

Habitat	Area (in Sq. Km.)
Mangrove cover	9.18
Water spread area	7.72
Total Area	16.90

2.5.3 Water Quality and Flow

Highly saline to moderate water changes from season to season and as per tide time, flow is downward from Ulhas River and upwards in the form of high tide from the Arabian Sea.

2.6 Climate/ Temperature (Year-round Pattern)/ Rainfall

Mumbai has a tropical climate particularly that of tropical savannah or tropical wet and dry climate under Koppen Climate classification which means that an average temperature of around 18°C is maintained throughout the year. The climate is characterized by 7 months of dryness followed by peak showers in the month of July- August.

Winter season is recorded from December to February, followed by summer that lasts from March to June. June to September constitutes the monsoon season. The months of October and November are usually regarded as the post monsoon season as the climate is neither too warm nor cold.

Table 2.2. showing seasonal variations in average low and high temperature recorded at TCFS

Month	Average Low temperature (°C)	Average High temperature (°C)
December to March	16 to 18	30 to 33
March to June	21 to 26	30 to 37
June to September	24 to 26	29to 32
October and November	20 to 23	30 to 32

Pre-monsoon showers are received in May and the Southwest monsoon rains hit the city during the months of June to September. Occasionally, North-East monsoon showers occur in October and November.

The maximum rainfall ever recorded was 3,452 mm (136 in) in the year 1954. The highest rainfall recorded in one day was 944 mm (37 in) on 26th July 2005. The average total rainfall is 2,146 mm (85 in) for the Island city and 2,457 mm (97 in) for the suburbs.

2.7 Hydrological Features

Hydrology by definition is the scientific study of the movement, distribution, and quality of water including the water cycle, water resources and environmental watershed sustainability. This information is important as it provides an insight into the physico-chemical aspects of the water and helps us to assess the quality of water and further in its proper management.

i. Source of water:

The creek gets the largest source of fresh water from Ulhas River and numerous drainage channels from the suburban areas of Mumbai, Navi Mumbai and Thane. Thane creek receives saline water from Arabian sea.

ii. Changes in water regime

The water level in the Thane Creek Flamingo Sanctuary remains fairly constant with tidal variations. The water is turbid.

iii. Physico -Chemical Characteristics:

Wetland ecosystem such as mangroves, salt marshes etc., are subject to both marine (tides, waves, the influx of saline water) and to the riverine influences (flow of fresh water and sediment). These leads to the formation of brackish water (formed by the mixing of seawater and the freshwater) which provide high levels of nutrients in the water column

and the sediment, making them among the most productive natural habitats worldwide.

The chemical composition of the brackish water and the sediments can influence the existence of mangrove vegetation to the greater extent. Currently most of these ecosystems are under severe anthropogenic stress. The degree of pollution in water depends on the physical and chemical nature of the material discharged, water depth and hydrographic conditions (Cairns, 1992). According to Chitmanat (2010), the release of municipal and industrial effluents might deteriorate the quality of water. Also, the activities like logging, road construction, river channelization, and development in watersheds leads to poor water quality (Kehoe, 1982). These might result in increased estuarine sedimentation and turbidity, reduced productivity and biodiversity (Clark, 1996).

Table 2.3: The range and the average values for the water parameters studied from Thane creek during Neap tide.

	Temp (°C)	pH	DO (mg/l)	TSS (gm/l)	Salinity (ppt)	PO4-P (mg/l)	NO3-N (mg/l)	SiO3-Si (mg/l)	Oil & grease (mg/l)
Average	21.58	7.407	3.38	0.047	26.53	3.09	0.215	0.047	0.009
Minimum	19.8	7.06	0.41	0.03	5.77	0.25	0.069	0.016	0
Maximum	27	7.96	10.16	0.076	34.48	10.54	0.777	0.078	0.032

(Temp = Temperature, DO = Dissolved Oxygen, TSS = Total Suspended Solids, PO4 -P = Phosphates, NO3-N = Nitrates, SiO3-Si = Silicates, ppt = parts per thousand)

Table 2.4: The range and average values for the water parameters studied from Thane creek during spring tide.

	Temp (°C)	LP (cm)	pH	DO (mg/l)	TSS (gm/l)	Sal. (ppt)	PO4-P (mg/l)	NO3-N (mg/l)	SiO3 - Si (mg/l)	O & G (mg/l)
Average	23	42.2	7.16	2.47	0.03	27.87	7.66	0.875	0.024	0.119
Minimum	22	24	6.88	0.81	0.01	20.12	5.39	0.001	0.008	0.002
Maximum	24	64	7.46	5.08	0.04	34.12	13.5	2.593	0.038	0.358

(Temp = Temperature, LP= Light Penetration, DO = Dissolved Oxygen, TSS = Total Suspended Solids, Sal = Salinity ; PO4 -P = Phosphates, NO3-N = Nitrates, SiO3-Si = Silicates; O& G = Oil and Greases)

2.8. Sedimentological Features

The sediments act as reservoirs of nutrients in an aquatic ecosystem. Whenever nutrients are low in water they are replenished from the sediment, so also excess nutrients from water are also removed by the sediment. Due to association with mangroves, these sediments receive nutrients through mangrove litter. They also receive nutrients through terrestrial runoff and estuarine outflow. The sediments in creeks and estuaries thus become highly nutrient rich and productive. They also act as sink for heavy metals. All these processes are affected by biological, chemical and physical properties of soil such as soil texture and nutrients. Hence, sediment studies indicate the quality of the overlying water and are useful tool in assessment of environmental pollution. In the present study the sediment parameters were assessed for moisture content, sediment texture, organic carbon, total nitrogen and total and available phosphorus. The range and the average values are given in a Table. The samples were collected from the High Tide watermark, Mid Tide watermark and Low Tide watermark during the Neap and Spring tidal phase. For ease of explanation, the data is pooled together and the average values are presented here.

Table 2.5: The range and the average values for the Sediment parameters studies from Thane creek during Neap and Spring tide.

	pH	MC (%)	OC (%)	Ch (%)	Sediment Texture (%)				TP (%)	AP (%)	TN (%)
					Sand	C. Silt	Silt	Clay			
Avg	7.57	65.3	2.14	0.92	8.5	39.7	34.4	15.9	0.6	0.07	0.05
Min	7.26	51.1	0.5	0.1	0.4	29.2	23.2	4	0.2	0.008	0.007
Max	7.90	83.4	5.1	2.13	28.2	49.7	65.6	26.1	5.2	0.09	0.07

(MC- Moisture Content; OC- Organic Carbon; Ch- Chlorides; TP- Total Phosphorus; AP- Available Phosphorus, TN – Total Nitrogen)

2.9. The Limiting Factors and Threats

i) Disturbance: Flamingos and other water birds may get disturbed due to use of motor boats. There is no regulation as of now in terms of the permissible number of motor boats allowed into the sanctuary at any given point of time. This leads to sometimes as many as 4-5 motor boats being present in the sanctuary at the same time. The noise and ripples caused by the motor boats cause severe distress to the birds.

ii) Poaching: Hunting and poaching were practiced in the Thane creek in the earlier times however, as of now no official records exist of the same, but stray incidents do occur in the North Western area of the Sanctuary.

iii) Incidents of Injuries to the Flamingos: There have been a few cases of injuries to the flamingos (broken limbs) which have been reported. (The cause of which is unknown)

iv) Change in creek characteristics (Increase in mangrove vegetation due to leaching and siltage /waterfront profile): Leaching and siltation has been increasing over the year which can be concluded from the research done in this area over the past decade. The continuous silting has led to increased changes in the creek profile mainly the formation of wetland that has led to increase in the mangrove cover of the creek.

v) Industrial effluents and domestic waste being released in the creek indiscriminately: Most of the industries release untreated industrial effluents and households also release waste into the creek. Since there is no monitoring of the all the outlets into the creek, most of the untreated effluent goes into the creek unchecked which leads to increase in pollution and adversely impacts the diversity of flora and habitat of aquatic fauna.

vi) Dumping ground for solid waste and plastic: People travelling via road and rail on either side of the Sanctuary dump/throw waste into the creek as well as immerse floral waste offered to GOD during rituals in polythene bags leading to plastic pollution and blockage of channels.

2.10. Major Functions and Values

a) Direct use value: The TCFS has direct value for sustainable fishing in the surrounding region. TCFS acts as a source population for various fishes and other species of marine species namely mud crab which is highly valued as food and is also a source of livelihood for fishermen around the Sanctuary. It has the potential to act as major source of alternative livelihood in the form of various activities for eco-tourism which will fetch them good earnings.

b) Indirect use value: Indirect values of TCFS are in terms of reservoir of wild gene pool reserve of local marine flora and fauna. Similarly, it is also immensely valuable as a reservoir of marine biodiversity of the region and a habitat for flamingos which attract the visitors for recreation and aesthetic value. Mangroves also are the sites for breeding of marine species and they help indirectly in preventing the flash floods and help in prevention of erosion of silt. Areas with mangroves have higher levels of rainfall. They make the area green and aesthetically rich. It also serves as an important carbon sink for the region.

2.11. Ecological and Economic Services Provided by Thane Creek Flamingo Sanctuary

Provisioning services

i. **Food:** Mangroves in TCFS provide permanent and temporary habitats for many aquatic organisms like crabs, fishes, prawns, etc. They also provide breeding and nursery grounds for many marine fishes. It is estimated that most of the local fish catch are directly dependent on mangroves ecosystem. On an average, 20 traditional boats, 40-50 rubber tube fishers and 15-20 crab collectors were involved in fishing every day except monsoon, inside TCFS. At present, the fisherman communities who are undergoing fishing by traditional method are allowed to continue fishing.

ii. **Primary Source of Income:** Some local people on both West & East side rely on TCFS, as their primary source of income for fishing and tourism during the season.

iii. **Enrichment of Creek:** The coastal vegetation especially mangroves along both the banks of the creek play a significant role in enriching the creek. Presence of mangroves in the creek not only play an important role in transport of organic matter and nutrients etc., but also provides nursery grounds for various marine organisms and excellent feeding ground for diversity of residential and migratory birds especially Flamingos.

iv. **Fawning Ground:** These mangroves are the home to a variety of commercially important fishes, crabs, prawn, etc. thereby providing subsistence to the local fisherman communities. There are around 11 fishermen villages around Thane Creek Flamingo Sanctuary and dependency of these villages is 100% on the creek for their livelihood.

v. **Biodiversity:** Mangroves in Thane creek are rich in biodiversity comprising of huge population density of various life forms such as birds, fishes, mammals etc.

vi. **Importance of Flora** – The mangroves form the main flora of this region. Mangroves play various roles like:

a) Protecting the shoreline – Mangroves in this region act as physical buffers between the elements and the shore and can absorb 70-90% of the tidal and wave energy, depending on their ecological condition.

b) Carbon Sequestration: Mangroves are important carbon sinks. They sequester about millions of tonnes of carbon per year globally. A 20-year-old mangrove plant has a carbon burial rate of 580 grams per square meter per year. Carbon sequestration potential of TCFS was estimated approximately 3.0 ton/ha/y = Rs. 5180 / ha/Year i.e. Rs. 5130X896 ha = Rs. 46 lakhs/year.

c) Promoting accretion: Mangroves function much like a living groove to build up sediment, stabilizing the ground and fixing mud banks and thus preventing erosion. It is estimated that there is an annual sedimentation rate ranging between 1 and 8 millimetres in mangrove areas that are expanding in land area.

d) Trapping pollutants: Mangrove roots help trap sediments thereby function as filters to sift out pollutants reaching the sea from inland waters.

e) Habitat for avifauna: The canopy of mangrove trees provides an essential terrestrial habitat for avifauna which prefers arboreal life. Mangrove sediment is soft; mud mixed with sand and contains fauna which is not found in sandy and rocky shores. Apart from these residential bird species, there are a number of migratory birds which are attracted to these forests since they provide food for them in the form of fishes, crabs, micro-organism, algae, and mud-skippers. They also provide a good canopy for heronaries.

f) Biodiversity: As mangroves grow in intertidal zone, these species are adapted to extreme and variable conditions. Mangroves therefore carry unique assemblage of flora and fauna found in no other ecosystem and maintains the balance of the marine food chain

g) Other Aesthetic and Commercial Values – The TCFS situated in a thickly populated city and also in an industrially developed city has a unique aesthetic value due to its lush green vegetation and the beautiful creek.

h) Eco-tourism: This region has a high potential for eco-tourism, as the Sanctuary is situated between Mumbai and Navi Mumbai metropolitan city, which has a population of more than 20 million people. Mumbai being a small island with huge population, has very few natural areas for recreation and enjoying the nature. Therefore, the mangroves of this TCFS are crucially important for the population of Mumbai for eco-tourism. Many nature lovers visit this area for bird watching and also to enjoy beauty of mangrove and especially for viewing the flamingos which are present in thousands in and around the creek.

i) Support traditional fishing: Traditional fisheries are being sustained here because of mangrove and as fishing is major source of livelihood of about 200 fisherman families. In order to sustain the requirement of traditional fishermen, who are dependent on these areas for fishing, the availability of the fish and other marine fauna on a sustained basis is the key to their survival. This is ensured by the mangrove areas of the TCFS by acting as breeding nurseries of the aquatic marine fish and other fauna. Hence, it is acting as a crucial life support system for fishermen by providing the non-commercial avenues of livelihood through traditional fishing.

Chapter 3

History of Management and Present Practices

3.1 Establishment of the Sanctuary

Thane Creek Flamingo Sanctuary is one of the sites with significant conservation and economic values in Maharashtra. It is Maharashtra's second marine Sanctuary after Malvan Marine Sanctuary in Sindhudurg. It is spread over an area of 1690 hectares that comprises of 896 Ha. of mangrove and 794 Ha. of adjacent water body of the creek. At present, it is under the administrative control of Divisional Forest Officer (DFO), Mumbai Mangrove Conservation Unit (MMCU) under Additional Principal Chief Conservator of Forests (APCCF), Mangrove Cell, Mumbai.

3.2 Timber Operations

This area was under the jurisdiction of Revenue Department before 2008 and there is no history of timber operations in this area before and after 2008.

3.3 Non-Timber Forest Produce

No Non-Timber Forest Produce collection has been recorded in the area.

3.4 Leases

Lease has been given only to the Tata Power units that connect power/transmission lines that connect the mainland with the suburbs.

3.5 Other Programmes and Activities

The area is declared as a Sanctuary in year 2015 and was not in possession of Forest Department earlier. After the possession, two boat rides for tourist are operated from Coastal and Marine Biodiversity Centre, Airoli and two boat rides are operated by Local fishing community from Bhandup Pumping Station. Apart from that, all municipal schools are allowed to visit the centre free of cost. Also, through a 36 seater bus which Mangrove cell has received through Corporate Social Responsibility (CSR) funding, pick up and drop facility to the centre is provided to the schools lacking transportation.

3.6 Forest Protection

3.6.1 Legal Status

Before 2008, the lands were in the possession of Revenue Department and no special legal provisions were attracted other than CRZ regulations after 1991. In 2005, the Bombay High Court ruled to prevent any further destruction of the city's mangroves. It is cited in the Forest (Conservation) Act of 1980 as well as the Coastal Regulation Zone Notification of 1991.

Under the FCA, the diversion of forest land for non-forest purposes is prohibited without the prior approval of the Central government. With the CRZ Notification, mangroves are protected because they only grow along the coast and are ecologically sensitive. The Northern part of the Thane creek has been declared as Wildlife Sanctuary (Thane Creek Flamingo Sanctuary) under section 18 of the Wildlife (Protection) Act, 1972.

The Sanctuary was declared under Section 18 of the Wildlife (Protection) Act, 1972, vide Notification No. WLP 0315/CR-76/F-1 dated 6th August, 2015 **(Annexure 6; Page 119-123)** by the State Government of Maharashtra. SDO

East Suburb Mumbai conducted enquiry under provisions of section 19 to 25 of Wildlife (Protection) Act, 1972 and passed order vide his letter dated 9th October 2017 **(Annexure 7; Page 124-144)**. Subsequently Government of Maharashtra issued final notification under clause (a) of sub sec. 1 of sec. 26 A of Wildlife (Protection) Act, 1972 vide Notification No. WLP 0315/CR-76/F-1 dated 10th May 2018**. (Annexure 8; Page 145-150).** Thane Creek Flamingo Sanctuary covers an area of 1690 hectares, of these, 896 ha comprises of mangroves and rest 794 ha comprises of the adjacent water body and mudflats. Map of Thane Creek Flamingo Sanctuary is attached in **Annexure 1; Page 84.**

The total area notified is 16.905 sq. kms (896.0385 ha.) is the Western part comprising of Mumbai Suburban district and is Reserve Forest whereas 794.487 ha area is Creek Part which is Revenue land. The areas for Eco Sensitive Zone have been proposed which are part of the Thane creek but that do not come in the Sanctuary area.

3.6.2 Hunting

Fishermen of the area are dependent on the Sanctuary for fishing. On an average fisherman from either side of the Sanctuary fish for about 10 to 15 days in a month for non-commercial fishing. The creek was also a centre of annual religious ritual of immersion of idols and floral wastes. Poaching cases in TCFS area detected so far from 2018-19 till date are nil.

3.6.3 Navigation

Navigation of boats ferrying fishermen is the only activity that occurs. At present, there is no navigation of ships or larger vehicles in this area.

3.6.4 Fishing

Fishing occurs extensively in the creek from both sides i.e. from the Sanctuary side and from the Eco Sensitive Zone. Mostly, traditional fishing practiced here is using indigenous crafts and gears. There are landing sites at Bhandup, Vikhroli and Kanjurmarg in the Sanctuary side and at Airoli, Ghansoli, and Vashi in the Eco Sensitive Zone side.

3.6.5 Biomass Cultivation

In the Thane Creek Flamingo Sanctuary there is no biomass cultivation done owing to the fact that it is flanked by mangroves on both sides which make cultivation of anything difficult.

3.6.6 Biomass Extraction

There is no biomass extraction accept traditional fishing that occurs in Thane Creek Flamingo Sanctuary primarily since it has been declared as a 'Reserved Forest' which means that the integrity of mangroves has to be maintained.

3.6.7 Religious Sentiments

The Koli community in Mumbai worships mangroves because they know that these are breeding and nursing grounds for marine organisms and their sustenance is dependent on it.

3.6.8 Encroachment & Other Forms of Sanctuary Reclamation

There are official reports of encroachment of land in the North Western side of the Sanctuary i.e. Vikhroli Survey no. 209. Earlier encroachment at Mandale Survey no. 80 CTS no. 6 have been removed.

3.6.9 Sand Mining, Quarrying, and Other Activities

Sand mining and quarrying does not occur in the Thane Creek Flamingo Sanctuary.

3.6.10 Livestock Grazing in the Sanctuary and in the Surroundings

Livestock grazing does not occur in the Sanctuary.

3.6.11 Local Aquaculture Practices

Aquaculture is the artificial cultivation of aquatic plants or animals. It is primarily carried out for cultivating certain commercially important edible species of fishes, molluscs and crustaceans. Fisheries include the extraction of food from the sea and the fresh water whereas aquaculture is rearing of the aquatic organisms in artificially made water bodies. It is prevalent on both sides of the creek i.e. the Sanctuary and the Eco Sensitive Zone wherein locals have created a “bund” around the ponds they own. The catch during monsoon is highest according to locals, the catch retrieved from the ponds include mainly catfish, crab and prawns.

3.7 Current Issues

3.7.1 Sewage, Effluent and Solid Waste Disposal

There are four sewage plants in totality which include two on either side of the creek i.e. two sewage treatment plants (STPs) lie in the Sanctuary area i.e. Mumbai side and two sewage treatment plants lie in the Eco-Sensitive Zone area i.e. Navi Mumbai side. Locations of the STP's are: Bhandup, Ghatkopar, Airoli and Koparkhairne. These plants release their treated water into the Thane creek. In addition to the sewage treatment plants there are two dumping grounds located on the Sanctuary side they include the Kanjurmarg dumping ground and the Deonar dumping ground. There is a solid waste management plant in Kanjurmarg.

3.7.2 Wildlife Health

There have been cases of hurt flamingos (mostly with broken legs) being rescued by animal welfare workers, an organization Plants and Animal Welfare Society (PAWS). Besides a few stray cases like the above mentioned there is no threat to flamingos as such.

3.7.3 Interagency Programmes and Problems

Power transmission lines run on the North side and South side of the Sanctuary that serve as the only link for power transport between the mainland and the suburbs. This comes in conflict with nature conservation as it is a part of the Sanctuary. Therefore, the Forest Department will work in collaboration with Tata Power to ensure holistic conservation of the Sanctuary and surrounding Eco Sensitive Zone.

3.7.4 Tourism

Another use of the Sanctuary is that of tourism i.e. use of motor boats for recreational activities that lead to disturbance of the water birds due to the noise and continuous ripples. There is need for a clear regulation about the permissible number of motor boats allowed for recreational purposes and the activity to be monitored so that there is minimal disturbance to the biodiversity in the area especially the avifauna.

3.7.5 Human Activities in the Surrounding Areas

Most people in the surrounding area of the Sanctuary and the Eco Sensitive Zone have settled into corporate/government jobs. A fraction of them are still involved in fishing. Therefore, fishing forms the major human activity in addition to waste dumping in the dumping grounds around the Sanctuary.

3.8 Scope

The Thane Creek Flamingo Sanctuary is placed in the metropolitan city of Mumbai wherein wildlife tourism exists only in Sanjay Gandhi National Park and in the Sewri-Mahul mudflats area during the flamingo festival organized by Bombay Natural History Society (BNHS) in February every year. In the wake of that, the Thane Creek Flamingo Sanctuary has immense tourism potential. Presently, the Sanctuary area is visited by researchers/college students for training/research purposes and by avid birders. Besides, it also would provide school and college students to learn more about the wetland birds, for conservation education programs and generate awareness for the need to conserve the flora and fauna.

3.9 Visitor Statistics

During winter season wherein the congregation of migratory birds is at its peak the Sanctuary area records the maximum footfall of visitors for tourism. During the remaining months the footfall decreases, however on weekends the footfall picks up to about 15-20 people who engage in activities of boating, birding and photography.

Table 3.9.1. showing number of people who visited the sanctuary and the interpretation centre and revenue generated per annum (in last three years)

Year	Number of people	Revenue (Rs. In lakhs)
2017-18	7678	9.98
2018-19	16193	31.9
2019-20	14687	29.4

3.10 Interpretation Programme

A Coastal and Marine Biodiversity Centre (CMBC) has been set up at Airoli under CMPA-GIZ project. In this Centre, there are three sections having different themes. The displays on coastal flora, fauna and marine life are state of the art interactive, informative and thought provoking. The display depicts the mangroves and its importance as nurseries for fish, supporting livelihoods, adaptability of flora and fauna to low tide, high tide and fluctuating water supply, wave action, major changes in temperature and high salinity and that it is still full of life. Displays showing nocturnal life in coast, eco-system of mud flats supporting thousands of migratory birds, variety and diversity of coastal and marine life, importance of corals. It is made with latest technology and the displays are made so as to give detailed information and pictures which can be enlarged, tilted and moved around on the computer screen for better appreciation of various interesting features of the animals or birds. The displays on the walls are also interactive having the option of listening the calls of the birds, dolphin, frog and the sound of lesser flamingos, interesting information about feeding of flamingos etc. There is an interesting turtle

display that gives an idea of size of various species of turtles compared to height of visitor. There are displays which guides a visitor on what he/she can do to contribute for conservation and how can he prevent use of plastic, reduce pollution in sea, rivers and streams. In addition to this, the literature about identification of birds is also provided free of cost. There is souvenir shop where the t-shirts, caps, hats, eco-friendly products, books etc. are kept for sale. The Centre has still scope to add many conservation education activities. In near future, there is a proposal for Marine Museum for the 'Giants of the Seas and Oceans'. There are plans to develop this centre as an eco-tourism and nature education hub for the students. It is planned to develop facilities outside the Sanctuary limits but near the entrance of the Sanctuary to sensitize the visitor about mangroves and coastal and marine biodiversity just before the visit to the TCFS.

3.11 Facilities

Currently, there is a facility of orientation room, audio-visual facility for screening documentaries and discussions, lectures, workshops etc. There is a boat ride facility for mangrove safari along with watching flamingos.

Watch towers & mangrove trails along with signages would be developed in Bhandup and other areas. There is a scope to develop a mangrove park and jetty for boat ride that gives the visitors a view of the Sanctuary while being situated in a thicket of mangroves.

3.12 Research, Monitoring and Training

i. Research and monitoring: Thane creek as such is a site for research, monitoring and training. Mainly because of its proximity to the mainland and educational institutes many research programs have been conducted & are going on. VPM's Bandodkar College, BNHS, St. Xavier's college, have

also conducted research in this area. Government regulatory bodies such as Maharashtra Pollution Control Board and the Municipal Corporations of Mumbai and Navi Mumbai also conduct monthly assessment of the water quality and quantity that is released into the Thane creek. SACON has conducted a study that documents the entire biodiversity profile of Thane creek. The Institute of Wood science and Technology in Bangalore is presently studying the anatomical properties and the various pest infections which occur in the mangroves of Thane creek.

ii) Training

Bombay Natural History Society has provided training on the biodiversity of the area to various stakeholder. Mangrove foundation conducts regular training and awareness programmes at CMBC, Airoli. The CMBC is used as a training centre for some of the livelihood activities culture presently been implemented by the mangrove cell mangrove foundation under the mangrove conservation and livelihood development scheme. **(Annexure 9; Page 151-162)**

3.13 Biodiversity Conservation Strategies and their Evaluation

After the July 2005 floods in Mumbai, as per Hon. High Court of Bombay orders, stricter rules were enforced with respect to conservation of mangroves. They were declared as Protected Forests. However, in 2013, the legal status of mangroves was upgraded as "Reserve Forest" (**Annexure 10, Page 163-171)**, which is now declared as Thane Creek Flamingo Sanctuary.

3.14 Administrative Set up

The Thane Creek mangroves and the Thane Creek Flamingo Sanctuary come under the control of the Additional Principal Chief Conservator of Forests, Mangrove Cell of Maharashtra Forest Department. For protection of mangroves in Mumbai and Navi Mumbai, a separate division was established under Divisional Forest Officer (DFO), Mumbai Mangrove Conservation Unit. Under DFO, Range Forest Officer, two foresters and four forest guards have been deployed for management of TCFS and management of the Coastal and Marine Biodiversity Centre in Airoli.

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Chapter 4

The Sanctuary Area and the Interface Land Use Situation

4.1. The Existing Situation in the Zone of Influence (Z I)

The Thane creek is fed by the Ulhas River in the North and the Arabian Sea in the South. In addition, there is discharge of effluents from Sewage treatment plants located on both sides of the creek.

4.2. Villages In and Around the Sanctuary

There are six villages partly in the Sanctuary, namely Mulund, Bhandup, Kanjur, Vikhroli, Deonar, Mankhurd. These villages come in Mumbai Suburban district in Municipal Corporation of Greater Mumbai. The communities that the individuals belong to from the areas that are engaged in fishing from the above-mentioned villages are Agri and Koli. The number of individuals from the above-mentioned villages whose primary occupation is fishing has reduced over the years as majority have switched from fishing as the primary occupation to a better job with a stable and significantly higher income. However, among the individuals from this village that still prefer fishing as their primary income generation occupation, their average monthly income ranges from less than Rs.10,000 to Rs.25,000. Their educational qualification is either equal to or below 12th pass and the average family size of the individuals is between 3-5 persons per household. A majority of individuals from these villages are aware of the Thane creek being declared as a “Flamingo Sanctuary”.

There are 6 villages around the TCFS on the Eastern side and these villages are Airoli, Diva, Talavali, Ghansoli, Koparkhairne, Vashi. These villages come in the city of Navi Mumbai which comes under the Navi Mumbai Municipal Corporation. The number of individuals from the above-mentioned villages involved in fishing has reduced over the years but as compared to the Sanctuary side, there are more villagers/individuals in this area that rely on the Thane creek and have their primary source of income as fishing. Aquaculture is also practiced on this side, mainly in the areas of Airoli sector 10A, Gothivali and Talavli that come in the area of Airoli. The individuals that carry out fishing using the technique of aquaculture belong to the Koli community. The average monthly income of individuals who fish through aquaculture is around Rs. 10,000, a majority of individuals have not studied in school and are illiterate and the average family size is about 4-6 individuals per house. Majority are not aware of the part of Thane Creek being declared as a "Thane Creek Flamingo Sanctuary".

However, in areas of Airoli i.e. Diva Gaon, Ghansoli, Koparkhairne and Vashi, the individuals who fish from the creek, belong to the Koli or Sonkoli community. Their average monthly income ranges from less than Rs.10,000 to Rs.15,000 per month, their educational level is 12th pass or lower and the average number of individuals per household are 3-6 persons. The ratio of individuals who are aware of the declaration of the Thane creek as Sanctuary is 70:30 wherein 70 denotes the number of individuals who have no knowledge of this whereas 30 denotes the number of individuals who have knowledge about the Thane creek being declared as 'Flamingo Sanctuary' mainly due to their participation in interagency programs.

4.3. Ethnic Identities, Traditions, Customs, Relationships between Distinct Groups

Mostly, Koli community is predominant in the areas that are dependent on the Sanctuary, besides the Koli community, communities like Sonkoli, Agri are

also prevalent. Fishing was the traditional livelihood activity for these communities. They celebrate “Narali Pournima” which marks the beginning of the fishing season after marathi calender month of “Shravan”. Ganesh Chaturthi is another festival that is celebrated with great pomp and glory in this region which is usually a 10-day long festival that ends with the immersion of the Lord’s idol into a water body.

4.4. Relationship of Local Communities with Sanctuary

There are around 15-20 species of fish and crabs that local communities catch for their personal consumption and for selling. Besides this a few of the members from these ethnic communities also work as guides for avid bird watchers as the Thane creek is a biodiversity hotspot.

4.5. The State of People's Economy

People who are dependent on the Sanctuary for their livelihood and sustenance are usually earning an average of 1,20,000 per annum. This figure majorly depends on the catch size, quality and type of fish also technique used for fishing and boat type and size, that the people are able to procure on the days they go to fish.

4.6. Vocations, Land Use, Use of Sanctuary and Sanctuary Products

The vocations of the people that live in and around the Sanctuary include: fishing, drivers, contractual workers, contractors for various purposes such as tiles/building material etc., working in public/private sector jobs.

Land use of the area in and around the Sanctuary is mainly for the vocation of fishing.

Use of Sanctuary is solely for fishing and tourism purposes. Real estate moguls are using 'Thane creek and the flamingos' as a view for attracting more buyers. There are no Sanctuary products that people use as such.

4.7. Implications of the Land Use and Resource Dependency

1. Excessive fishing could lead to drastic reduction in the number of fishes available
2. Immersion of prayer materials along with plastics and other non-biodegradable/organic materials would lead to increase in the already existing pollution levels and will reduce the amount of dissolved oxygen that is available for aquatic organisms.
3. The most serious impact of the festival on the environment of Thane creek is due to the immersion of Plaster Of Paris (POP) idols in bodies of water. Traditionally, idols were sculpted from mud taken from nearby bodies of water; after the festival they were returned to their source, a cycle meant to represent the natural cycle of creation and dissolution. As the commercial production of Ganesh idols increased, earthen or "natural" clay (shaadu maati in Marathi and Banka matti in Telugu) was replaced by POP. This man-made plaster is easier to mould, lighter and less expensive than clay but is non-biodegradable (insoluble in water). The paint used to decorate the plaster idols contains heavy metals such as mercury and cadmium, which pollute the water bodies. In addition, the non- biodegradable accessories adorning the idol accumulate in beach sand.
4. Plaster of Paris idols may take anywhere between several months to years to fully dissolve.

- It also reduces the oxygen level in the water, killing the fish and other aquatic organisms.
- The paints contain heavy metals such as mercury and lead, which seep into the water as the idol dissolves.
- The acid content in the waters increases.

- Idols made using plastic, cement, etc. do not dissolve in the water; thus polluting the water.
- Several accessories used during the festival like plastic flowers, cloth, incense, camphor and numerous other materials are dumped carelessly adding more stress to the already polluted creek water.
- Careless dumping of Ganesh idols in water bodies blocks the natural flow of water which results in breeding of mosquitoes and other harmful pests.
- The polluted water causes several diseases including skin diseases.

5. Tourism: Excessive tourism can also lead to increased disturbance to the fauna of the Sanctuary and the eco- sensitive zone area while ecotourism boosts the local economy. In excess, it had debilitating effects on the biodiversity. Hence, the regulation of eco – tourism is a necessity.

4.8. Sanctuary Management Practices and their Implications for People

The only form of direct dependence of the people on the Sanctuary is through fishing, so the implication of Sanctuary management practices would fall only on the people whose livelihood depends solely on fishing from the Thane creek. Since 2002 tourism activity has started to a smaller extent, mainly on weekends from November to May.

Table 4.1: showing below lists the activities allowed and not allowed in the Thane creek.

Activities	Tourism	Boating	Traditional Fishing	Hunting	Cutting mangroves for fuel wood	Dumping/ throwing waste
Allowed/ Not allowed	√	√	√	X	X	X

4.9. The Development Programmes and Conservation Issues

Except for "Coastal and Marine Biodiversity Centre" at Airoli, no other development program has been initiated.

4.10. A Summary of Problems Faced by People that Affect the Management of the TCFS

The people living in the villages in the areas around the Sanctuary are from middle class category and have great expectation from the 'Thane Creek Flamingo Sanctuary' in terms of employment and income generation in the ecotourism arena. The fish catch has also been decreasing over the years due to increased anthropogenic activity and pollution levels (dumping of solid waste, sewage, plastic into the creek). If the traditional fishermen are not allowed to enter into the TCFS for fishing, the livelihood of the local communities would be adversely affected and it may result adversely on management of TCFS. Therefore, local fishermen community is allowed to carry out only traditional fishing in the Sanctuary area. In terms of infrastructure, the fishermen have a complaint that they do not have a larger landing site at Airoli, the pathway to the jetty is extremely small for a four-wheeler that would be used for carting their catch. If the jetty is provided at Bhandup, it will also help in promoting eco-tourism. Thus, it is a challenge for the Forest Department to maintain equilibrium between the expectations of the local communities and conservation of biodiversity.

Part II
Future management

Chapter 5

The Vision, Objectives, Issues and Problems

5.1. The Vision

To conserve the unique natural habitat of TCFS and to develop it as a wetland of international importance, in order to promote coastal habitat protection, conservation education and recreation.

5.2. Objectives of Management

1. Protection, Conservation and Management of habitat of the TCFS for the long-term sustenance of flamingos, other avifauna, marine fauna as well as mangroves.
2. To promote the integrated and sustainable management of TCFS with the active involvement of all the stake holders.
3. Promote eco-tourism activities as an alternative source of livelihood and to create awareness about mangroves, avifauna and coastal habitats.

5.3. SWOT Analysis for the TCFS

Strength –

1. **Location -** The TCFS is located between Mumbai & Navi Mumbai, i.e. two important mega cities. It holds enormous potential to attract the large population residing in these cities.
2. Thane creek is Asia's largest creek. In spite of being the nerve centre of many economic activities, it harbors a rich and varied biodiversity.

3. **Large number of flamingos and rich diversity of avifauna** – Large numbers of Lesser & Greater Flamingos visit the area annually (Approx 1.5 lakhs in numbers) and reside from November to middle of June i.e. till onset of monsoon. About 167 species of birds have been documented in the area.
4. Lush green patches of mangroves provide roosting sites for avifauna and act as a huge carbon sink.
5. **Approach and Access –** The Sanctuary is easily approachable and thus accessible from all sides & any place from outside.
6. It has **good source of fresh water** from Ulhas river and other nallas.
7. TCFS has been **finally notified as Sanctuary under section 26 of Wildlife Protection Act, 1972.**
8. **Already an Important Bird Area (IBA) and a part of Central Asian Flyway of Water birds.**
9. The mangrove forests provide ecosystem services to the city of Mumbai, including disaster protection and pollution abatement services.
10. There are many opportunities for provision of livelihoods through eco-tourism and subsistent fisheries

Weakness –

1. **Location -** The TCFS is located between Mumbai & Navi Mumbai, i.e. two important mega cities and is therefore vulnerable to heavy anthropogenic pressures.
2. **Less internal Access/ connectivity –** Being wetland & mangroves, internal access is limited.
3. **Staff** –With only one RFO, two Round Officers and four Guards for managing TCFS as well as its ESZ, the number of staff available is grossly inadequate.
4. **Pollution-** High level of pollution due to industrial effluents, sewage and household waste poses a great challenge to the health of the ecosystem.
5. Electric transmission line passing through the sanctuary are a potential threat to the flamingos.

6. Siltation is resulting in a decrease in the inflow of fresh water from the river, and this can lead to intrusion of mangroves into the mudflats and loss of the foraging area available for the waders.

Opportunities –

1. TCFS can be developed into a good ecotourism & public awareness centre about coastal and marine biodiversity.
2. Location of the Sanctuary, combined with its rich biodiversity provides ample opportunities to attract tourists and nature lovers in large numbers.
3. Declaration of the Sanctuary provides a vibrant platform for interaction amongst government departments (Forests, MMB, Revenue, Police, Veterinary, Fisheries, Industries, Pollution Control Board), local municipal bodies (Mumbai, Navi Mumbai & Thane), NGOs and other stake holders for the sustainable development of the area.
4. Ecotourism activities in the Sanctuary and Coastal and Marine Biodiversity Centre can provide new livelihood opportunities for the local communities.

Threats –

1. Pressure for various development projects: new bridges and road constructions, sewage treatment facilities, landfills. The disturbance caused by the building of roads, buildings and other infrastructure projects near flamingo habitat may result in long term increase in human activity in the area and such disturbance to habitat may result in abandonment of the site by flamingos and other avifauna.
2. Dumping of solid wastes and debris as a result of constant redevelopment works in the adjoining urban belt is a constant threat.
3. Pollution is a growing concern in the area. Due to easy accessibility and proximity to dumping grounds as well as road and rail, a lot of solid waste including plastics, worship items, idols etc. are being dumped, which in the long term can disrupt the fragile ecosystem and the ecosystem services

provided by it. Seepage of organic and inorganic wastes, industrialization, urbanization and development of slums can have adverse impact on the habitat of TCFS.

4. Siltation, causing decrease in supply of fresh water from the river & nallas.
5. Minor and major oil spills that happen from time to time can have varying degrees of impact on the flora and fauna.
6. Electric transmission lines passing through the Sanctuary is a potential threat to the large birds like flamingos. The bird being heavy may not be able to change its trajectory and avoid hitting the thin electric lines.
7. Eutrophication due to high nutrient levels in the creek can have adverse impact on the marine fauna.

Management Effectiveness Evaluation (MEE) of National Parks and Sanctuaries, 2018-19 covered TCFS and the detailed report is attached in **Annexure 11 (Page 172-174)** It is proposed to incorporate prescriptions regarding immediate actionable measures suggested in the report in the plan.

5.4. Tourism/Recreation

Excessive tourism and recreation activities can impact the Sanctuary adversely. The effect of motorized tour boats on the behavior of flamingos has been studied and it has been found that some disturbance is caused to the birds due to tourist boats. Therefore, number of tourist boats visiting the sanctuary will be managed accordingly during peak times especially in winter season and holidays/weekends.

Chapter 6

The Strategies

6.1. Management Strategies

The strategies of Thane Creek Flamingo Sanctuary Management Plan (2020-2030) are built on the pillars of International Conventions, National and Regional programs of Actions, Partnerships, Self-reliance and Sustainability objectives of management.

6.1.1. Management Philosophy

The management philosophy of the TCFS is to promote the 'Integrated and sustainable management of TCFS with active participation of stakeholders' and make TCFS as a representative coastal habitat. Further, it is an Adaptive Management Plan that may be reviewed after five years after approval of the management plan.

6.1.2. Participative Decision Making

1. A "Management Plan Implementation and Review Committee" of TCFS will be constituted with representation of all stakeholders including nearby municipal corporations, fishermen communities, industries, Pollution Control Board, tourism sector, etc.
2. Periodic meetings of this Committee will be organized atleast once in six months to review management activities of TCFS under the Chairmanship of APCCF, Mangrove Cell.
3. As far as possible, the concerns of the stakeholders will be taken in to account during implementation of the management plan.

6.1.3 Degree of Intervention

A policy of minimal intervention in the natural biological processes and clean atmosphere shall be given priority while taking up any management interventions. Basic infrastructure required for Sanctuary management and ecotourism facilities shall be developed with the least possible interferences in the habitat. Preventive interventions to minimize industrial effluents, pollutants and the factors that adversely influence the habitat of flamingos would be taken up by the management through appropriate agencies/government departments. Interventions would also be done to minimize mortality of birds in the Sanctuary and its ESZ due to electrical transmission lines.

6.1.4 Integration of Management Plan of TCFS in the Sectoral Plans of all Planning Authorities in the Region (Municipal Corporations of Greater Mumbai, Thane, Navi Mumbai, Ulhasnagar, City and Industrial Development Corporation, Mumbai Metropolitan Region Development Authority etc.)

It will be ensured that the management of sectoral plans of corporations include all the preventive measures to check the pollution and industrial effluents and solid waste management.

6.2 Boundaries

Although the boundaries of the Sanctuary are well defined in the notification but it is not visible on the ground. Therefore, it is important to demarcate boundaries of Sanctuary and Eco-Sensitive Zone of Sanctuary to prevent any kind of illegal trespassing and encroachment. Being a marshy and woody area, the demarcation is difficult and will require time and manpower.

6.3 Zonation or Zone Plans

The zonation for the management of Thane Creek Flamingo Sanctuary is proposed under the following categories. Total area of the Thane Creek Flamingo Sanctuary is 16.905 km². There are broadly two categories.

Table 6.1 showing Wilderness and Tourism Zone of TCFS

Zone	Purpose	Area in Ha.	Description
i. Wilderness Zone	Areas of high conservation values	896.0385	Mangrove Reserved Forest areas.
ii. Tourism Zone	Area of education and nature interpretation	794.487	Creek area under Revenue Department's ownership. .

Wilderness Zone/TCFS (896.0385 Ha.): Critical wildlife area of 8.96 sq. km. is being proposed as "Wilderness Zone" (**Annexure 12; Page 175)** that should be areas with minimum human interventions. This zone is presently having high potential to support breeding, roosting and nursery grounds for the aquatic, marine and avian biodiversity. Ranching of fish seeds for stock enhancement, research and monitoring and ornithological observations are the only activities allowed inside the 'Wilderness Zone'.

Prescriptions –

1. Being a marshy land, which poses challenges in accessibility, the Sanctuary boundary can be demarcated through indicative boundary pillars at accessible points on the landward side.
2. Area will be kept generally free from anthropogenic interventions. Harvesting of crabs and fishes by local fishermen using traditional methods will be permitted subject to any other restrictions imposed by management from time to time.

3. Patrolling pathways, board walks, mangrove trails, watch towers, observation platforms and other necessary infrastructure will be prepared / erected for effective protection. While identifying patrolling pathways only existing bunds in the mangrove patches should be used and no new constructions of bunds except very small length just to connect to existing bunds should be done in Wilderness Zone
4. Area needs to be kept clean from all type of plastic, debris etc. and necessary cleanup operations may be undertaken from time to time as per the need.

Tourism Zone – Tourism zone will be limited to the creek and mudflat area, which is spread over 7.9445 sq. km. Tourists will be permitted in this zone only through designated boats. This zone is also extremely important for the wellbeing of flamingos and other birds which forage on the mudflats. Continuing siltation on the mudflats may promote the growth of mangroves on the existing mudflats leading to undesirable reduction in foraging area. Hence, measures to maintain the integrity of mudflats at the current levels and to prevent expansion of the mangrove line on the seaward side will be affected, if necessary, by uprooting fresh mangrove colonizers on the mudflats. Harvesting of crabs and fishes by local fishermen using traditional methods will be permitted subject to any other restrictions imposed by management from time to time.

Prescriptions –

1. Area will be demarcated with floating buoys.
2. Existing mudflats are important habitat for the flamingos, waders and other avifauna and hence this habitat shall be maintained as such. In order to prevent shrinking of mudflat habitat through proliferation of mangroves, uprooting of mangrove saplings from mudflats will be taken up post monsoon generally in the month of October – December. Uprooting of mangrove saplings shall be done only after preparation

and approval of detailed estimates and written permission of APCCF, Mangrove Cell. The record of uprooting of mangrove saplings shall be kept in the Control Form prescribed in **Annexure 15, page 211.**

3. Watch towers and other necessary infrastructure will be erected for effective protection.
4. Part of wilderness zone, having boardwalks, mangrove trails, watchtowers, observation platform will be included in the tourism zone.
5. Tourism in this zone will only be through designated boats, operated either directly by the Sanctuary authorities or through local fishermen specifically authorized by the management. The modalities are elaborated in Chapter 9.
6. Area will be kept clean from all type of plastic, debris etc. Use of specialized equipment like trash skimmers, trash traps, mesh bags etc. will be utilized to keep the area free from these debris and floating waste.

6.4. Infrastructure Development

TCFS is a new Sanctuary of the Maharashtra State; therefore, there is an urgent need to develop appropriate infrastructure for the efficient management of TCFS and its ESZ, which are under tremendous pressure from the urban areas in their vicinity. Therefore, the field head quarter of TCFS will be located at Airoli, where staff office and all other management unit staff will be positioned with necessary infrastructure that may include patrolling boats and vehicles for patrolling and tourism. The services of a veterinary doctor would be made available through contractual employment.

- Wherever necessary, the experts would be engaged on contractual basis for detailed and complex investigations of creek to prevent the growth of unwanted vegetation and also to maintain the desired habitat or micro habitat for avifauna and to monitor and evaluate the changes in habitat on regular basis.

- Existing Jetty at Airoli will be extended till low tide line which would help the patrolling team access to the creek 24X7 hrs. A small all-weather jetty is required at Bhandup creek for better patrolling and protection and same will also be useful for eco-tourism activities and will improve management effectiveness.

6.5. Theme Plans

The specific requirements of respective sectoral plans are mentioned in the following chapters. They are termed as theme plans. They are:

- Species Action Plan for Long Term Conservation of Flamingos (Chapter 7)
- Mangrove management plan (Chapter 8)
- Eco-Tourism, Interpretation and Conservation Education (Chapter 9)
- Pollution Management Plan (Chapter 10)
- Satellite Wetland Management and Conservation Plan (Chapter 11)
- Sustainable fisheries Management Plan (Chapter 12)
- Disaster Management Plan (Chapter 13)
- Research, Monitoring and Training Plan (Chapter 14)
- Sustainable Eco-development Plan for Livelihood Generation (Chapter 15)

Chapter 7

Species Action Plan for Long Term Conservation of Flamingo (Zone Plan Management Prescriptions)

7.1 Objectives

Flamingos which are categorized as Globally 'Near Threatened' is a flagship species of TCFS and needs protection from threats arising due to urbanisation, industrialisation and other hazards.

The most critical threats to the survival of the Flamingos are the degradation of its specialized feeding habitats due to altered hydrology and water quality, extraction of salt and soda ash, and the disruption of its few feeding areas by human activities

7.2 Proposed Species Action Plan

Species Action Plan for Long Term Conservation of Flamingos is proposed as follows: -

1. The trash and plastic will be collected and removed. The necessary equipment's for collection of plastics and debris will be employed to keep the habitat free from such debris. The authorities responsible for monitoring the solid waste, sewage, plastic and controlling water pollution will also be involved to take appropriate action to keep this Sanctuary free from such debris, waste and effluents. All the solid wastes such as plastics should be removed from the intertidal zone of Thane Creek and it should be on regular basis by regular collection by the TCFS authorities and periodic collection campaigns involving

communities, students and decision makers so as to minimize the waste running into the TCFS.

2. The violators would be penalized as per the law. Modern equipment's will be used to collect the trash before it lands in the flamingo habitat and a strict watch will be kept on water and air quality through expert agencies/organizations. The authorities would be insisted to put in place the mechanism to stop trash and plastic bottles and other plastic and waste material from entering the TCFS by appropriate size nets on the effluent and drainage pipes. The trapped material would be removed from time to time so that the drainage is not blocked. This will be done by using nets of various size at appropriate places and at appropriate intervals.
3. The flamingos are itinerant species (travelling from place to place) adapted to respond to changes in local environmental conditions by moving, and thus depends on a network of suitable sites. Therefore, conservation of satellite wetlands around TCFS is also equally critical for the long-term survival of flamingos in the region. Such satellite wetlands have been identified and movements of flamingos will be monitored with the help of experts.
4. Some portion of flamingo's habitats in Thane Creek falls in the Southern bank of creek that is outside TCFS but inside the Eco Sensitive Zone of TCFS. Therefore, these intertidal mudflats will be monitored and conserved with help of fishing communities.
5. Local fishermen from all the villages along the boundary of Southern part of ESZ of TCFS will be brought under the Eco-Development Programme. An additional livelihood to these villagers who are dependent on Thane Creek for their livelihoods will be looked into.
6. Monitoring of pollution levels will be conducted by outsourcing to expert agency and appropriate measures will be undertaken.
7. The Lesser Flamingo is sensitive to changes in water levels and quality. Cyanobacteria, its primary food, require a certain range of salinity to reproduce in sufficient quantities to feed large numbers of Lesser Flamingos. Changes in the abundance of cyanobacteria can

have a substantial effect on the Lesser Flamingo population at a site. Water levels are also critical to successful feeding. Therefore, consistent efforts would be made to minimise drainage of sewage or other wastes into the creek in general and mudflats in particular. All concerned authorities as well as communities around the TCFS would be sensitized to take adequate measures for the same.

8. Green cops comprising school and college students, volunteers from nearby areas will be encouraged to participate in clean-up drive near the Creek with help of Municipal Corporations and NGOs.
9. Ensure the proper tidal flushing that would enrich the feeding habitats of flamingos naturally. Therefore, natural hydrology and water quality will be maintained at good conditions. If required, controlled dredging can be carried out to facilitate the normal tidal flushing of the Thane creek.
10. A study will be initiated on satellite tracking of flamingos to study their movements and understand their habitat requirements in the region. Flamingos of TCFS also use nearby satellite wetlands.
11. A research will be initiated to study the ecology, behavior of flamingos and monitoring of flamingo population in Thane Creek and continuously monitor its population and recruitment.
12. It will be ensured that human disturbance, particularly disturbance from boating, fishing, tourists, birdwatchers and photographers is minimum.
13. Raise awareness about the conservation needs of the species at national and local level.
14. Flamingo being a heavy and large bird is unable to change its trajectory of flight quickly on spotting transmission lines and hence there is high possibility of birds getting hit by the transmission wires and birds can die. Therefore, bird diverters will be erected on the transmission lines passing over the TCFS by concerned authority and in surrounding areas so as to reduce the bird hits and mortality of flamingos of due to such transmission lines.

Chapter 8

Management of Mangroves (Zone Plan Management Prescriptions)

8.1 Introduction

Mangroves are crucially important for maintaining the habitat of flamingos which are the key species of TCFS, therefore it needs to be monitored and conserved for the wellbeing of TCFS and also for people around it. There are 12 species of mangroves and 37 species of mangrove associates present in TCFS and its ESZ.

At present, the available information revealed that there is an increase in the mangrove cover of Thane Creek in the recent past due to sedimentation because of sewage effluents drained from urban areas.

Presently there is no direct profound threat to the mangrove ecosystem in the Sanctuary. Activities such as docking of small boats, crab catching were also observed but they pose very little damage.

8.2 Proposed Action Plan

Monitoring to assist in the management of potential impacts on mangrove vegetation associations will consist of:

- Mangrove mapping shall be done at interval of every five years using the support of competent agencies.
- Mangrove health surveys will be conducted based on the study being conducted by Indian Institute of Space Science and Technology (IIST) and action shall be taken as per the recommendations given.

- Monitoring of any sediment accumulation within mangrove vegetation associations shall be done by taking support from the competent agencies.
- Plantation of mangrove species to enhance biodiversity wherever required. Accordingly, nursery and plantation shall be undertaken by Range Forest Officer, TCFS.

Chapter 9

Eco-Tourism, Interpretation and Conservation Education

At present tourism, interpretation and environmental education activities in TCFS are in a developing stage. This area gained prominence due to large flocks of flamingos, mangroves and other migratory and native birds. In case of the Thane Creek Flamingo Sanctuary, ecotourism will be implemented for creating public awareness and to enhance the livelihood opportunities of the dependent local communities.

9.1. Objectives

a) To promote conservation awareness about biodiversity of mangroves, its role in climate change and to create awareness about importance of the flamingos which is a key species of TCFS, amongst the students, visitors and local people through conservation education and awareness programme / campaigns and through development of inter-active interpretation facilities for students and visitors at Airoli and Bhandup.

b) To develop eco-tourism facilities and infrastructure for enhancing and enriching visitor experience with an objective to seek public support to the TCFS, mangroves and related conservation initiatives for marine biodiversity conservation and to create harmonious relationship between the place, the visitor and the host community through guided tours, nature trails, nature workshops involving interaction with experts, bird watching and observation of marine flora and fauna/ mangroves by visits to TCFS.

Picture 3 Image of Coastal and Marine Biodiversity Centre

Picture 4 Image of Interpretation centre showing interactive displays

c) To conduct the awareness workshops for the school teachers to create future conservation supporters and decision makers of concerned departments in government to take informed decisions so as to prevent adverse impacts of their decisions on TCFS.

9.2. Ecotourism Participants

To effectively use eco-tourism as management tool, it is necessary to involve all stakeholders that are dependent on the Sanctuary.

The participants for the same would include:

a) Local communities i.e. mainly fishermen will be involved as guides to give an information about biodiversity of the TCFS which will also provide an avenue of livelihood to enhance their livelihood opportunities.

b) Non-Government Organizations would also be involved to create awareness about the importance of biodiversity, mangroves, role of TCFS and importance of mangroves in climate change amongst various strata of society and communities and decision makers. They would be involved as partners in eco-tourism and nature education activities. NGOs can play a major part in generating eco-tourism in the area with the advent and widespread coverage of social media. They can promote awareness about the Sanctuary and also provide a means for communication with a wider audience.

c) Educational and Research Institutes: The research and educational institutes would be actively involved and would be appraised about various activities in and around the TCFS to study the positive or negative impacts of management practices. Educational institutes would be encouraged to participate in various programs and they would also be encouraged to hold National Social Service Camps etc. in and around the TCFS. This would have a positive impact on the young minds and will result in better support for the conservation in future.

Picture 5 Image of Flamingos at Thane Creek Flamingo Sanctuary

Picture 6 Image of Tourist experiencing boat ride at Thane creek Flamingo Sanctuary

9.3 Proposed Action Plan

a. Website of TCFS (www.flamingosanctuary.com)

An exclusive website for TCFS has been developed and this website will be linked to the websites of Maharashtra Forest Department, Maharashtra Tourism Development Corporation, Incredible India and other PAs etc.

TCFS website will provide all basic and necessary information about facilities, rules and regulations, time for visit, advance bookings, dos and don'ts, contacts etc. in the sanctuaries required by all kind of visitors and stakeholders of TCFS.

b. Infrastructure development for strengthening eco-tourism

i. A Coastal and Marine Biodiversity Centre is already developed at Airoli wherein the Centre has an interactive system in place for visitors to identify and understand the flora and fauna in the Thane creek. It will be used to promote nature information education to students. The Centre comprises Interactive displays giving additional information about the species and related calls/sounds, pictures, peculiarities etc.

ii. A nature trail on the theme of avifauna and mangroves will be developed at Airoli.

iii. Similarly, another Container based Interpretation Centre and Mangrove nature trail will be established near Bhandup Pumping Station. Efforts will be made to make any infrastructure that is durable and eco-friendly. These trails will take visitors to mangroves to show them avifauna and mangrove species and to educate them about importance of the TCFS with minimum disturbance to its biodiversity.

iv. Existing Jetty at Airoli will be extended till low-tide line to facilitate eco-tourism.

v. Watch tower will be developed at the end of the mangrove trail which can be used for bird watching, monitoring and vigilance. In the present plan three watchtowers are proposed to be constructed each at Airoli, Vikhroli and Bhandup

vi. The facilities inside TCFS will be developed to suit the natural surroundings

vii. Further development is proposed for Phase II development at CMBC, Airoli, that will comprise of Visitor amenities including Eateries/Food Courts, Education facilities such as training halls with audio- video facilities and small hostel, Mangrove arboretum, Parking and safety measures, Landscaping and gardening suitable for the area, taking into account current landscaping, Signages, Jetty upgradation, Boardwalk/ Mangrove trail, Light arrangements to the various parts as per need, Compound Wall etc

viii. Coastal and Marine Biodiversity Centre (CMBC), Airoli is a Park and a Centre of learning on marine bio diversity. It is further proposed to develop a Museum on Marine Animals for 'Giant of the Seas' comprising exhibits of whales and other marine species in order to enhance the awareness about those species.

c. Interpretation and Information Centres

i. Coastal and Marine Biodiversity Centre at Airoli will serve the educational and awareness needs of both the visitors and the villagers living in and around TCFS.

ii. Coastal and Marine Biodiversity Centre, Airoli is developed to serve as 'Multipurpose Centre' catering short term training for frontline forest staff, local youth and organizing nature camps for schools and colleges.

iii. A nature information Centre will be established at Bhandup in the vicinity of the proposed 'Mangrove Trail' for proper orientation of the visitors. These Interpretation and Information centres will be equipped with state-of-the-art awareness materials like displays/ brochures/ books etc. covering avifauna, mangroves, marine and coastal

biodiversity etc. Workshops for students would be conducted at Airoli, for that additional infrastructure will be created to accommodate minimum 20 students at any given time. This facility will be utilized for conducting short term training related to eco-tourism to local youths and frontline staff of Forest Department.

d. Participatory Eco-tourism

Local youths will be trained and engaged in all tourism related activities such as tourist guides, bird watchers guide, managing information centre, interpretation centre. Further, local communities would be engaged and involved in providing and maintaining all amenities facilities provided to visitors/tourists at the Tourism Zone.

e. **Awareness materials:** Interpretation centre/information centre will provide the following materials to visitors;

- Sanctuary Brochure with details of nature trails
- Checklist of Birds
- Checklist of key fauna
- Plant and bird identification guide
- Posters

f. Outreach Programs

- Outreach programs will be taken up for the people who cannot visit the Sanctuary. Print and electronic media will be utilized to reach out to the people in order to enhance the awareness of the coastal biodiversity.
- Outreach material can be used during special events such as World Environment Day- 5th June, Wildlife week- 2-8th October, Wetland Day- 2nd February and 6th August, the day the Sanctuary was declared.

- Special events would be organized with the students and active volunteers/ NGOs and other organizations.
- Activity booklets like draw and colour, sheets or cards, quizzes can be distributed in the institutions and also in nature information canters. Bilingual material on various themes will be produced.
- Environmental clubs can be formed in schools and colleges and if they already exist then the outreach activities can be undertaken in the clubs.
- Social media and e-platforms will be utilized for outreach activities.
- Regular visits of the school children would be arranged at Coastal and Marine Biodiversity Centre, Airoli for sensitizing them about the marine biodiversity and mangroves, with special focus on educational institutions in and around TCFS.
- Volunteers from Fisheries/ Oceanography /environmental and related themes and interested college students would be involved to act as resource persons for creating awareness and outreach programmes.

g. Audio-Visual Facilities

- Two small auditoria with seating capacity of 50 people each have been established which are being used for awareness programs, training and nature workshop activities.
- Short films or documentaries on the Thane Creek Flamingo Sanctuary about its importance, threats and its mitigation, progress have been prepared with strong visual content and is being shown to the visitors. Commentary of the audio-visuals has been made in Marathi and English.
- The publicity of the ecotourism facilities will be given through State tourism, hotels, TV networks, social media, and print media etc.

h. Differential Pricing

An entry fee will be levied for access to the Sanctuary and for using other facilities. School and College Students will be given 50% concession in the

rates for entry. Presently, through CSR and foundation funds free pickup and drop facility, to the CMBC is given to the government schools and schools lacking the bus service and shall be continued and be expanded in future. Local fishermen can also be licensed to operate their boats for tourism but they also should not charge more than Rs.500/person for a boat ride. Department should give license to fishermen who has traditional rights to fish here at least in last 10 years. Efforts should be made to prevent other business players getting into tourism business inside the Thane Creek using these fishermen.

i. Safety measures:

Eco-tourism related activities of TCFS should not adversely impact biodiversity, harm staff and visitors. Necessary safety measures will be taken by the TCFS Authority that boats are in good condition and there should not be any oil spillage and should have low noise engines. Further, all boats that takes visitors to the Creek should have all lifesaving gear including life-jacket for everyone who is on board.

j. Carrying capacity

A study has been conducted to decide the carrying capacity of TCFS. At present the tourism is picking-up inside the Thane Creek, which will be managed in a organized fashion. The visitors to TCFS are expected to increased in several folds in near future. Therefore, there will be a regulation on number of visitors and boats that enter the creek every day. Birdlife of TCFS can be watched better if less disturbance prevails in their habitat.

In this context, it is proposed maximum 10 boat trips in one session i.e. 5 boats at Airoli (start from Airoli and get back to Airoli after reaching Bhandup creek), similarly 5 boats from Bhandup Creek (starts and get back to the same place after reaching Vashi Bridge). Similarly, 10 boats trips can

be carried out at evening. The number of visitors visiting inside the Creek should not exceed more than 500 people/day and the number of visitors to Coastal & Marine Biodiversity Centre will not exceed 1300 people/day.

Chapter 10

Pollution Management

The Thane creek is situated in the heart of three cities Mumbai, Navi Mumbai and Thane. In past few decades there has been heavy growth of industries along the creek which has led to dense urbanization in this area. The load of effluents, sewage and garbage dumping has deteriorated the creek and allied biodiversity significantly and it is very much essential to restore and revive the ecosystem.

10.1. Objectives Behind Pollution Management Plan

- The industrial and urban growth around Thane creek has caused increasing load of industrial effluents, sewage and also solid wastes. Monitoring of polluted water entering creek is crucial to maintain the health of the creek.
- Currently there are four Sewage Treatment Plants (STP's) on either side of the Thane creek, of which two are located in the sanctuary area at Ghatkopar and Bhandup and others lies in ESZ. Proper functioning of these STP's needs to be monitored on timely basis by respective municipal authority.
- Discharge of effluents, cooling waters etc., to be monitored accurately as temperature is crucial parameter in the survival of marine organisms. Similarly details of other physico-chemical parameters need to documented for development of necessary strategies.
- Solid waste entering in the sanctuary area should be controlled.

10.2 Proposed Action Plan

Concerned Municipal Corporations & MPCB would be insisted to take preventive measures & actions on the following points.

- It will be the responsibility of the nearby Municipal Corporations to ensure proper functioning of the treatment plants and release the treated sewage water to the Creek.
- Natural streams used as sewage canals should be stopped immediately and restoration should be carried out to recover the beauty of Thane and Mumbai.
- Management of pollution should be carried out as per the guidelines laid down by MoEF & CC for the development of new industries/projects and for the existing industries, projects, treatment and dumping grounds in and around the Thane Creek area that is notified as sanctuary.
- Monitoring of the pollution levels should be carried out as per the guidelines laid down by the Maharashtra Pollution Control Board (MPCB).
- Concerned Municipal authority should ensure the Sanctuary area is Plastic free zone. It is recommended to install 'Trash Boom or Trash Trap' for collection of floating plastics and other wastes and its disposal.
- All sewage and industrial waste waters should be treated at the source itself and then released into Creeks via streams. This will be taken up with appropriate authorities for implementation.
- Establishment and protection of Ulhas River Buffers as Riparian buffers (green belt on the banks) can provide long-term pollutant removal capabilities of Ulhas River without the comparatively high costs usually associated with constructing and maintaining structural controls.

Chapter 11

Satellite Wetland Management and Conservation Plan

TCFS is a "Birder's Paradise" for the people of Thane and Mumbai as the Sanctuary lies on the Central Asian Flyway of the Asia Pacific Global Migratory Flyway. In that capacity, it is a staging /wintering ground for a large number of migratory waterfowl that breed in the Palearctic region. The Sanctuary is home of large population of flamingos and wintering grounds of several migratory birds. Birds known to reside within TCFS are known to utilize the nearby satellite wetlands for food.

11.1 List of identified Satellite Wetlands

The study conducted by BNHS (For BNHS Report refer **Annexure13; Page 176 - 201**) has identified six satellite wetlands which are as follows: -

Table 11.1 showing list of Satellite Wetlands identified by BNHS

Sr. No	Name of Identified Wetland	GPS location	Approx Area (in ha)
1	Training Ship Chanakya (TSC) Wetland	19°0'56.54"N, 73°0'20.48"E	13
2	Non-Residential Indian (NRI) Complex Wetland	19°0'24.24"N, 73°0'42.47"E	19
3	Panje Wetland	18°54'0.95"N, 72°57'2.04"E	124
4	Belpada Wetland	18°55'45.68"N, 72°59'50.68"E	30
5	Bhendkhal Wetland	18°52'21.68"N, 72°59'10.42"E	8
6	Bhandup Pumping Station (BPS) Wetland	19°8'21.31"N, 72°57'42.10"E	11

11.2 Objective for Satellite Wetland Management and Conservation Plan

1. Identification and monitoring of satellite wetland which are important for conservation of Avifauna with respect to TCFS

2. Protection and conservation of satellite wetlands in consultation with concerned authority

11. 3 Proposed Action Plan

1. Understand the linkages between TCFS and its satellite wetlands in the radius of 50 km.
2. To work with competent research organisations to monitor the status of the wetland
3. Mangrove Cell to liaise with the concerned agencies to formulate necessary policy for conservation of identified wetlands.
4. Declare the critical satellite wetlands either as Conservation Reserves or Community Reserves

Chapter 12

Sustainable Fisheries Management Plan

The fishing in the creek is a small-scale fishery and fishing operations are dependent on tidal influence. The fishers are dependent on the creek for their livelihood and other services. There would be fishing restriction inside TCFS to make TCFS as viable breeding ground of fishes for the long-term sustainable fisheries in ESZ and adjoining areas. Traditional fishing in the Eco-sensitive Zone is permitted in accordance with the law prevailing in the State. Further, fishing by trawlers and non-traditional methods as a large-scale commercial activity is prohibited. Though, fish catch in the creek has reduced drastically, still fishing is the important livelihood activity around the creek followed by tourism.

12.1 Objectives of Fisheries Management Plan

1. Monitor the diversity of fish species in the TCFS and adjoining ESZ area
2. Documentation of data pertaining the factors affecting fishing and formulation of necessary implementation strategies
3. Understand the economics of the fishery, including the socio-economic profile and market status
4. Management plan for control and monitoring of the harvest, decision rules, licensing, and habitat protection measures.
5. Evaluation of creek fisheries management with the help of state fisheries department
6. Planning and implementation of various marine fishing policies to the stakeholders for ensuring sustainable fisheries management in TCFS area.

7. Involvement of local and national level organisations in policy making and strategy formation and implementation for future management measures.

12.2 Proposed Action Plan

1. Development of common platform for Inter-sectoral coordination between various sectors especially between the State Forest Department, Fisheries Department, Pollution Control Board and local governing bodies for the mainstreaming biodiversity conservation into fisheries sector in the creek region. This will involve documentation of catch and fishing operations, stock enhancement for maintaining the biodiversity of the creek and generation of livelihood options for dependent fisherman community on TCFS.
2. Awareness programs will be organized for minimizing catch of juveniles using slightly increased mesh size.
3. The proper enforcement of closed season will be done inside ESZ which will ensure the long-term sustainability of fishery resources.

Chapter 13

Research, Monitoring and Training

Research and Monitoring of the biodiversity, water quality and socio-economic condition of dependent communities of TCFS, ESZ of TCFS and surrounding satellite wetlands is required at uniform intervals. This would ensure the ecological services of TCFS to the people and also help to evaluate and review the management effectiveness of this Management Plan. The main consideration would be to have a holistic approach to the monitoring and involve as many locals as possible as they are the driving force to ensure conservation is carried out in the area.

13.1. Objectives for Research Monitoring and Training plan

1. Compilation of existing data to describe the resources and provide baseline information for every five years
2. Undertaking research programs for conservation and protection of biodiversity in TCFS
3. Monitoring of avifauna especially the flagship species flamingos in TCFS in every year

13.2 Proposed Action Plan

1. Appointment of Scientific bodies / agencies to conduct research and documentation of important data pertaining to biodiversity in TCFS
2. Make detailed report on socio economic status of the dependent communities on TCFS and ESZ at the interval of every five years
3. Special training programs for capacity building for Forest department Staff, Local communities, students and other stake holders
4. Procurement of Important report pertaining to water pollution and other related report from concerned municipal authorities.

Chapter 14

Sustainable Eco-Development Plan for Community Involved Livelihood Generations

The eleven fishing villages falling within the boundaries of the eco-sensitive zone comprising 3966.35 ha., area for the Thane Creek Flamingo Sanctuary are Mulund, Bhandup, Kanjur, Vikhroli, Mandale, Airoli, Dive, Talavali, Ghansoli, Koparkhairne and Nahur. The major fishing activities are carried out by the fishers where accessibility of landing sites/ jetties for catch and mooring of vessels are available.

14.1 The main objectives of building a sustainable eco-development plan

a) Involving the village communities and other stakeholders that are associated with the Thane creek so as to generate long term support to the Sanctuary area.
b) Generating new employment opportunities as well as supplementary employment opportunities to local communities so as to boost the local economy in the area.
c) Creating awareness and knowledge of the rich biodiversity at TCFS among local communities.

14.2 Proposed Action Plan

1. Mangrove Co-Management Committees will be constituted consisting of a forest staff (Forest guard as a member Secretary of MCMC) and the representatives of village communities under the leadership of local range forest officer for conducting various awareness programs and giving alternate livelihood to the dependent population.

2. Preparation of micro-plans for understanding the potential of livelihood activities to be undertaken in respective villages. Accordingly, Village Marine Conservation plans will be made for respective villages and implemented especially in the villages were communities are still dependent on fishing in TCFS area for the livelihood under the government scheme on protection of mangroves and livelihood development dated 20th September 2017 vide GR No S-10/2017/C.No. 63/F-3 Mantralaya. **(Annexure 9, Page 151 - 162)**
3. Involving Colleges, Research institutes and NGOs in Capacity building programs.
4. Inhouse training programs will be conducted for strengthening the knowledge of the staff for enhancing sustainability of the outreach programmes.
5. Periodic evaluation and necessary review of implemented works and their expected outputs will be carried out both by in-house agencies as well as independent specialized agencies or a group or individuals.

Chapter 15

Organisation and Administration

To implement, administer and review the management activities of TCFS, the Forest Department has placed an administrative setup.

15.1 Requirement of staff and Vehicles for TCFS

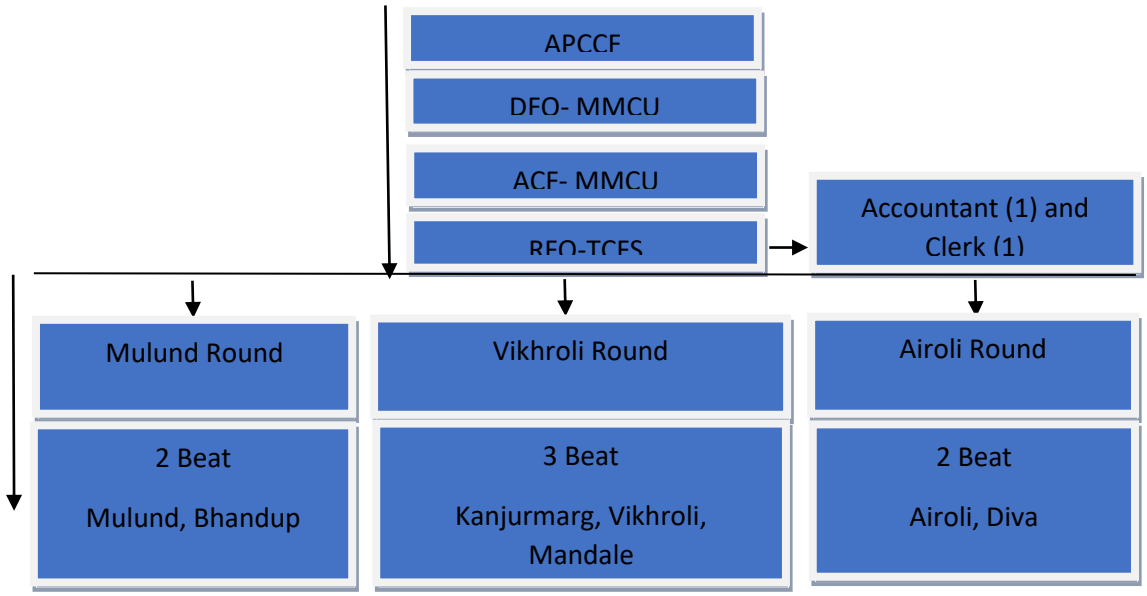
1. Staff required: Integrated Management of TCFS requires a dedicated Team to implement this Management Plan. In this regard, it is proposed to create a TCFS Management Unit. The management unit will involve permanent and contractual staff. As the present staff is inadequate, restructuring in the existing system is recommended. Tentative plan is given in flowchart 15.1
2. At present there are two Rounds namely Mulund and Airoli, that have been established by the Forest Department in the Sanctuary area. However, for efficient monitoring three Rounds are proposed to monitor the activities that occur in the Sanctuary and Eco Sensitive Zone. All three Rounds will be regularly monitored by the Forester and Guards appointed and will report to the Range Forest Officer.
3. There should be sufficient four wheelers and boats for patrolling and monitoring purposes. At present there is one four-wheeler vehicle for RFO. It is proposed to have one additional four wheeler with carrier. The number of boats at present are four. They may be increased as per the needs. As this being Mangrove area, each Beat guard will be assisted by forest labors for safety purposes, who will be hired on contract basis

15.2 Permanent and Contractual Post Proposed for TCFS

15.1 Table Showing Permanent Posts Proposed for TCFS Management

Sr.No	Designation	No of Posts	Purpose
1	Range Forest Officer	1	For protection, conservation livelihood activity & Eco-tourism.
2	Foresters	3	Rounds- Mulund, Vikhroli, Airoli
3	Forest Guards	7	Beats- Mulund, Bhandup, Kanjurmarg, Vikhroli, Mandale, Airoli, Diva
4	Accountants	1	For Range Forest Officer
5	Clerk/Peon	1	For Range Forest Officer
Overall Supervision as incharge of TCFS will be done by Divisional Forest Officer, MMCU.			

Flowchart 15.1 showing new proposed permanent staff for management of TCFS



15.2 Table Showing Contractual Staff for Interpretation Centre and Sanctuary

Sr No	Staff Requirement (Contractual)	Total No of Staff
1	**For Interpretation Centre and Office of RFO**	
	Receptionist	2
	Ticket booking office operator	1
	Cleanliness and Housekeeping	3
2	**For Garden/ Sanctuary/ Ecotourism**	
	Veterinary doctor	1
	Engine Drivers	2
	Boat Drivers	4
	Sailors	4
	Naturalist	4
	Garden Supervisor	1
	Gardeners	4
3	**Security and maintenance of Sanctuary**	
	Security Guards	
	- Near Gate	3
	- Near Jetty	3
	- Near Parking Area	2
	Forest labour	3+6
4	**Repair and Maintenance**	
	Plumber	1
	Software and Hardware technician	1
	Electrician	1
• **All contractual staff will report to Airoli Forester and further Forester will report to Range Forest Officer** • **As per the necessity the contractual staff will be appointed for any work other than mentioned above**		

15.3 The Management Committee/Advisory Committee for the Sanctuary

15.3 Table Showing the Management Committee/Advisory Committee for the Sanctuary

Sr. no.	Name of Authority	Post in the committee
1	Additional Principal Chief Conservator of Forests (Mangrove cell) Mumbai.	Chairman
2	DCF, Mangrove cell	Member
3	DFO, Mumbai Mangrove Conservation Unit	Member
4	Representative of Commissioner, Greater Mumbai Municipal Corporation	Member
5	Representative of Commissioner, Navi Mumbai Municipal Corporation	Member
6	Representative of Municipal Commissioner, Thane.	Member
7	Collector, Mumbai Suburban District.	Member
8	Collector, Thane District.	Member
9	MLA, Bhandup.	Member
10.	MLA, Mulund	Member
11.	Executive Engineer, MMB	Member
12.	Representative of M.D., Maharashtra Tourism Development Corporation	Member
13.	Representative of M.D., Maharashtra Pollution Control Board	Member
14.	Asst. Conservator of Forests, MMCU	Member Secretary

Chapter 16

The Budget

16.1 The Plan Budget

Detailed budgetary requirement has been worked – out and prescribed with annual physical and financial targets for various components of the plan such as

1. Development and Maintenance for Sanctuary and a mangrove ecosystem
2. Salary, allowances and amenities for staff
3. Research, monitoring and training
4. Eco- development related activities

The budget provision for proposed Management plan for Thane Creek Flamingo Sanctuary will work out for ten years. Funds for this plan would be made available through State plan, District Plan, Centrally Sponsored Schemes, CAMPA, CSR, Mangrove Foundation, MMRDA etc. Details of the budget are given in **Annexure 14; Page 202**

The maintenance works are to be continued regularly otherwise it is highly prone to degradation due to natural coastal weather conditions.

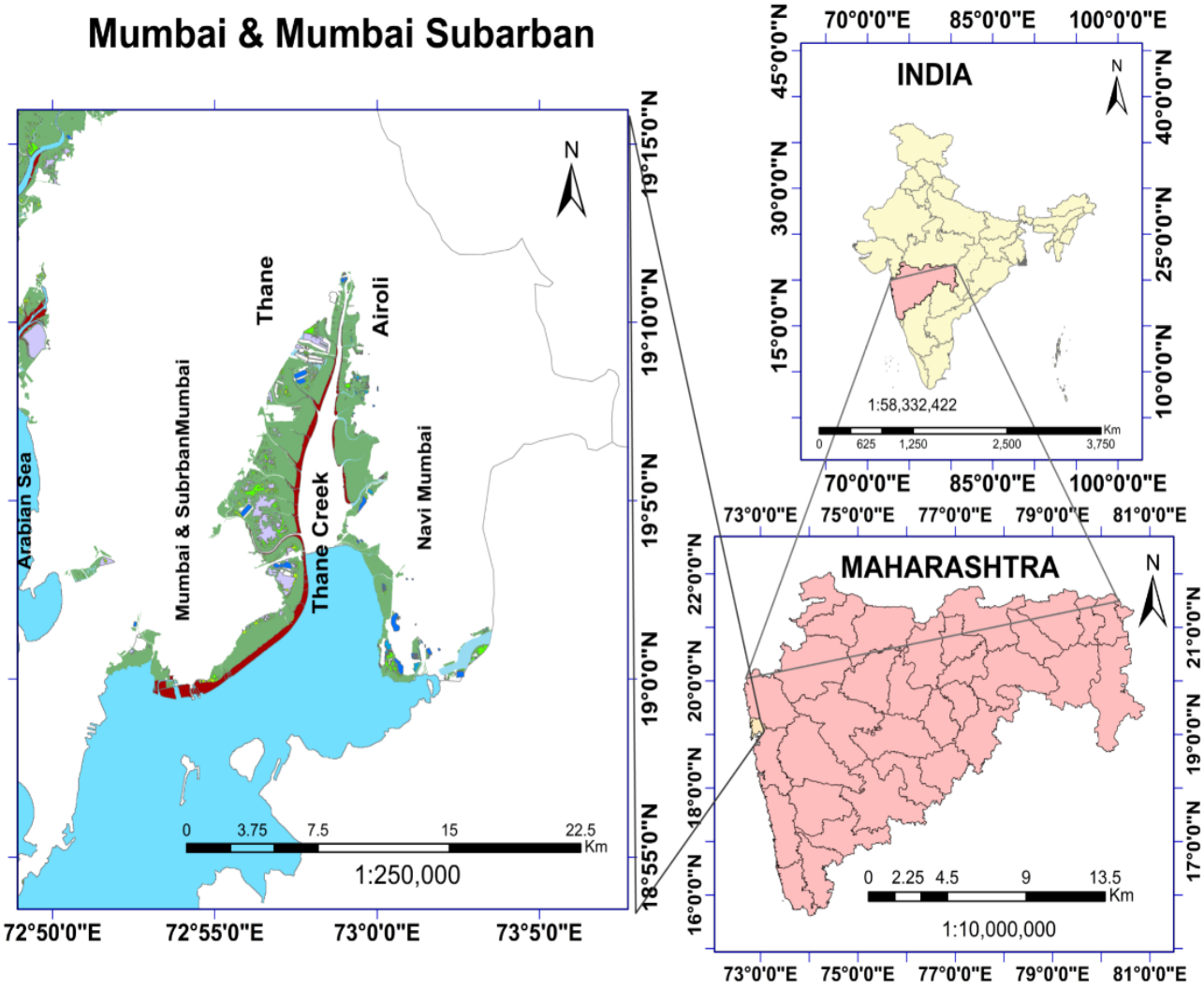
16.2 Financial Implications

Aggregate expenditure for the entire plan period of 10 years is Rs 106.66 Cr

Component wise details of the same are annexed herewith at Annexure-14.1 to 14.7 (Page 203 – 210)

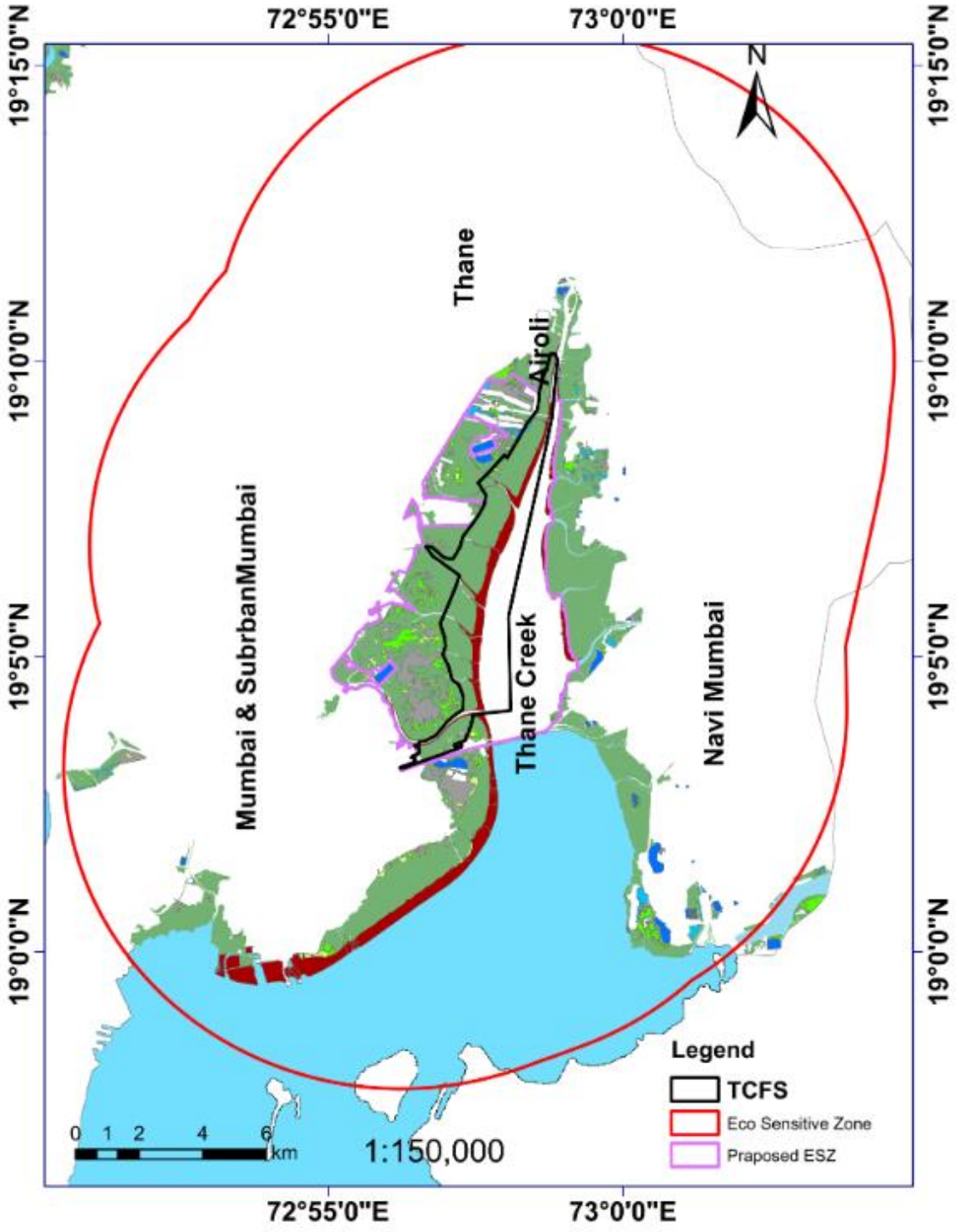
Part III
Annexures

Annexure 1: Map Showing Location of Thane Creek



Annexure 2: Map showing Approach and Access to Thane Creek Flamingo Sanctuary (TCFS)

Annexure 3: Map Showing Boundaries of TCFS



Annexure 4 – List of Biodiversity at TCFS

No of Mangrove species = 12

No of Associate Mangrove species = 37

No of Birds = 167

No of Fishes = 45

No of Butterflies = 59

No of Insects = 67

No of Phytoplankton= 35

No of Zooplankton = 24

No of Macrobenthos = 23

Annexure 4.1 - List of Mangrove and Associate Mangrove Species found along Thane creek

a) True mangroves

Sr. No.	Family	Scientific Name	Common Name	Type
1	**2**	**3**	**4**	**5**
1	Avicenniaceae	*Avicennia marina*	Grey Mangrove	
2		*Avicennia officinalis*	Indian Mangrove	
3		*Avicennia marina acutissima*	Grey Mangrove	
4	Rhizphoraceae	*Rhizophora mucronata*	Burma Mangrove	
5		*Bruguiera gymnorrhiza*	Asiatic Mangrove	Mangrove Tree
6		*Rhizophora apiculata*		Mangrove Tree
7		*Ceriops tagal*	Tagal Mangrove	
8	Lythraceae	*Sonneratia apetala*	*Sonneratia* Mangrove	
9		*Sonneratia caseolaris*		Mangrove Tree
10		*Sonneratia alba*		Mangrove tree
11	Euphorbiaceae	*Excoecaria agallocha*	Blinding Tree	Mangrove Shrub
12	Myrsinaceae	*Aegiceras corniculatum*	River Mangrove	Mangrove Shrub

b) Mangrove associates

Sr. No.	Family	*Scientific name*	Common Name	Type
1	**2**	**3**	**4**	**5**
1	Salvadoraceae	*Salvadora persica*	Meswak	Mangrove Shrub
2	Verbenaceae	*Clerodendrum inerme*	Glory Bower	Mangrove Shrub
3	Acanthaceae	*Acanthus ilicifolius*	Sea Holly	Mongrove Shrub
4		*Hygrophila schulli*	Marsh Barbel	Herb
5		Hygrophila anriculata	*Marsh Barbel*	
6		Hygrophila spinosa	-	
7		Hygrophila sp.	-	
8	Aizoaceae	*Sesuvium portulacastrum*	Sea purslane	Shrub
9	Amaranthaceae	*Alternanthera sessilis*	Sessile Joyweed	Shrub
10		Celosia argentea	*Cockscomb Crested*	Shrub
11	Asteraceae	*Pluchea odorata*	Shrubby camphorweed	Herb
12	Caesalpiniaceae	*Cassia sps.*	-	Shrub
13	Chenopodeaceae	*Suaeda martime*	-	Herb
14		Suaeda nudiflora		*Herb*
15	Convolvulaceae	*Ipomoea sps.*	-	Herb
16	Cyperaceae	*Cyperus rotundus*	Common Nut Sedge	Herb
17		Cyperus scariosus	*Umbrella Sedge*	Herb
18		Fimbristylis ferrugine		*Herb*
19	Dioscoreaceae	*Dioscorea pentaphylla*	Five Leaf Yam	Climber
20	Euphorbiaceae	*Euphorbia hispida*	Bristly Spurge	Herb
21		Euphorbia hirta	*Asthma Weed*	Herb

Sr. No.	Family	*Scientific name*	Common Name	Type
22	Fabaceae	*Derris trifoliata*	Common Derris	Climber
23		Derris pentaphyla		*Climber*
24		Mucuna pruriens	*Velvet Bean*	Climber
25	Malvaceae	*Abelmoschus manihot*	Sweet Hibiscus	Shrub
26		Abelmoschus sps	*Hibiscus*	Shrub
27		*Thespesia populnea*		Tree
28		*Sida acuta*	Common Wireweed	Shrub
29		*Acacia sps.*	-	Tree
30		*Pithecellobium dulce*	Madras Thorn	Tree
31		*Biophytum sensitivum*	Little Tree Plant	Shrub
32		*Cynodon dactylon*	Bermuda Grass	Herb
33		*Aeluropus lagopoides*		Grass
34		*Proteresia coarctata*		Herb
35		*Panicum sps.*		Herb
36		*Cressa critica*		Herb
37		*Tamarix troupii*		Herb

Annexure 4.2- List of Birds found in Thane Creek

Sr. No.	Order	Family (Scientific)	Scientific Name	Bird Common Name	IUCN Status
1	ANSERIFORMES	Anatidae	Dendrocygna javanica	Lesser Whistling Duck	LC
2			Anas clypeata	Northern shoveller	LC
3			Anas acuta	Northern Pintail	LC
4			Anas Penelope	Eurasian Wigeon	LC
5			Anas poecilorhynchs	Indian Spot-billed Duck	LC
6			Tadorna ferruginea	Ruddy Shelduck	LC
7			Anas querquedula	Garganey	LC
8			Anas crecca	Common Teal	LC
9	Galliformes	Phasianidae	Perdicula asiatica	Jungle Bush Quail	LC
10	PHOENICOPTERIFORMES	Phoenicopteridae	Phoeniconaias minor	Lesser Flamingo	NT
11			Phoeniconaias roseus	Greater Flamingo	LC
12	CICONIIFORMES	Ciconiidae	Anastomus oscitans	Asian Openbill	LC
13			Ciconia ciconia	White Stork	LC
14			Mycteria leucocephala	Painted Stork	NT
15	PELECANIFORMES	Threskiomithidae	Pseudibis papillosa	Red-naped Ibis	LC
16			Threskiornis melanocephalus	Black headed ibis	NT

Sr. No.	Order	Family (Scientific)	Scientific Name	Bird Common Name	IUCN Status
17	PELECANIFORMES	Threskiomithidae	Plegadis falcinellus	Glossy ibis	LC
18			Platalea leucorodia	Eurasian spoonbill	LC
19		Ardeidae	Nycticorax nycticorax	Black-crown Night Heron	LC
20			Ardeola grayii	Indian Pond Heron	LC
21			Bubulcus ibis	Cattle Egret	LC
22			Ardea cinerea	Grey Heron	LC
23			Ardea purpurea	Purple heron	LC
24			Butorides striata	Little heron	LC
25			Ardea alba	Great Egret	LC
26			Ardea intermedia	Intermedian Egret	LC
27			Egretta garzetta	Little Egret	LC
28			Egretta gularis	Western Reef Heron	LC
29	SULIFORMES	Phalacrocoracidae	Microcarbo niger	Little Cormorant	LC
30			Phalacrocorax fuscicollis	Indian cormorant	LC
31			Anhinga melanogaster	Oriental Darter	NT
32	ACCIPITRIFORMES	Accipitridae	Clanga clanga	Greater Spotted Eagle	VU
33			Clanga pomarina	Lesser spotted eagle	LC
34			Circus macrourus	Pallid Harrier	NT
35			Circus pygargus	Montagu's Harrier	LC

Sr. No.	Order	Family (Scientific)	Scientific Name	Bird Common Name	IUCN Status
36	ACCIPITRIFORMES	Accipitridae	Accipiter badius	Shikra	LC
37			Ictinaetus malaiensis	Black Eagle	LC
38			Butastur teesa	White-eyed Buzzard	LC
39			Buteo buteo	Common Buzzard	LC
40			Accipiter nisus	Eurasian Sparrowhawk	LC
41			Circus aeruginosus	Marsh Harrier	LC
42			Milvus migrans	Black Kite	LC
43			Haliastur indus	Brahminy Kite	LC
44		Pandionidae	Pandion haliaetus	Osprey	LC
45	GRUIFORMES	Rallidae	Fulica atra	Eurasian coot	LC
46			Porphyrio porphyrio	Grey-headed Swamphen	LC
47			Amaurornis phoenicurus	White Breasted Waterhen	LC
48	CHARADRIIFORMES	Recurvirostridae	Himantopus hmantopus	Black-winged Stilt	LC
49			Recurvirostra avosetta	Pied Avocet	LC
50		Charadriidae	Vanellus indicus	Red-wattled Lapwing	LC
51			Charadrius mongolus	Lesser sand plover	LC
52			Pluvialis fulva	Pacific Golden Plover	LC

Sr. No.	Order	Family (Scientific)	Scientific Name	Bird Common Name	IUCN Status
53	CHARADRIIFORMES	Charadriidae	Charadrius alexandrines	Kentish Plover	LC
54			Charadrius leschenaultia	Greater Sand Plover	LC
55			Pluvialis squatarola	Grey Plover	LC
56			Charadrius dubius	Little Ringed Plover	LC
57		Jacanidae	Metopidius indicus	Bronze-winged Jacana	LC
58		Scolopacidae	Limosa limosa	Black-tailed Godwit	NT
59			Limosa lapponica	Bar-tailed Godwit	NT
60			Tringa erythropus	Spotted Redshank	LC
61			Tringa Totanus	Common Redshank	LC
62			Tringa stagnatilis	Marsh Sandpiper	LC
63			Tringa nebularia	Common Greenshank	LC
64			Tringa glareola	Wood Sandpiper	LC
65			Calidris ferruginea	Curlew Sandpiper	NT
66			Xenus cinereus	Terek sandpiper	LC
67			Tringa ochropus	Green sandpiper	LC
68			Calidris alba	Sanderling	LC
69			Actitis hypoleucos	Common Sandpiper	LC
70			Arenaria interpres	Ruddy Turnstone	LC

Sr. No.	Order	Family (Scientific)	Scientific Name	Bird Common Name	IUCN Status
71	Charadriidae	Scolopacidae	Calidris minuta	Little Stint	LC
72			Numenius arquata	Eurasian curlew	NT
73			Gallinago gallinago	Common Snipe	LC
74			Calidris temminckii	Temminck stint	LC
75			Philomachus pugnax	Ruff	LC
76			Calidris alpine	Dunlin	LC
77		Rostratulidae	Rostratula benghalensis	Greater Painted-snipe	LC
78		Laridae	Chroicocephalus brunnicephalus	Brownheaded Gull	LC
79			Chroicocephalus ridibundus	Blackheaded Gull	LC
80			Chroicocephalus genei	Slender-billed Gull	LC
81			Larus barabensis	Steppe Gull	LC
82			Larus canus	Mew gull	LC
83			Larus heuglini	Heuglin's Gull	LC
84			Ichthyaetus ichthyaetus	Pallas Gull	LC
85		Sternidae	Gelochelidon nilotica	Gull-billed Tern	LC
86			Hydroprogne caspia	Caspian Tern	LC
87			Thalasseus sandvicensis	Sandwich tern	LC
88			Sterna hirundo	River Tern	NT

Sr. No.	Order	Family (Scientific)	Scientific Name	Bird Common Name	IUCN Status
89	Charadriidae	Sternidae	Chlidonias hybrid	Indian Whiskerd Tern	LC
90	COLUMBIFORMES	Columbidae	Columba livia	Rock Pigeon	LC
91			treptopelia senegalensis	Laughing dove	LC
92			Stigmatopelia chinensis	Spotted Dove	LC
93	CUCULIFORMES	Cuculidae	Centropus sinensis	Greater coucal	LC
94			Clamator jacobinus	Jacobin cuckoo	LC
95			Eudynamys scolopaceus	Asian Koel	LC
96	APODIFORMES	Apodidae	Cypsiurus balasiensis	Asian Palm Swift	LC
97			Apus nipalensis	House Swift	LC
98	CORACIIFORMES	Halcyonidae	Halcyon smyrnensis	White-throated Kingfisher	LC
99		Alcedinidae	Alcedo atthis	Common Kingfisher	LC
100		Meropidae	Merops persicus	Blue cheek bee eater	LC
101			Merops philippinus	Blue tailed bee eater	LC
102			Merops orientalis	Green Bee-eater	LC
103	BUCEROTIFORMES	Upupidae	Upupa epops	Eurasian Hoopoe	LC
104	PSITTACIFORMES	Psittaculidae	Psittacula krameri	Roseringed Parakeet	LC
105	PASSERIFORMES	Laniidae	Lanius schach	Long-tailed Shrike	LC
106		Dicruridae	Dicrurus leucophaeus	Ashy Drongo	LC

Sr. No.		Family (Scientific)	Scientific Name	Bird Common Name	IUCN Status
107	PASSERIFORMES	Dicruridae	Dicrurus macrocercus	Black Drongo	LC
108		Rhipiduridae	Rhipidura albogularis	White spotted fantail	LC
109			Rhipidura aureola	White-browed Fantail	LC
110		Corvidae	Corvus splendens	House Crow	LC
111			Corvus macrorhynchos	Large-billed Crow	LC
112		Pycnonotidae	Pycnonotus jocosus	Red-whiskered Bulbul	LC
113			Pycnonotus luteolus	White-browed bulbul	LC
114			Pycnonotus leucotis	White-eared Bulbul	LC
115			Pycnonotus cafer	Red Vented Bulbul	LC
116		Hirundinidae	Ptyonoprogne concolor	Dusky crag Martin	LC
117			Hirundo rustica	Barn Swallow	LC
118			Hirundo smithii	Wire-tailed Swallow	LC
119		Cisticolidae	Orthomus sutorius	Tailorbird	LC
120			Cisticola juncidis	Zitting Cisticola	LC
121			Prinia inornata	Plain Prinia	LC
122			Prinia socialis	Ashy Prinia	LC
123		Sturnidae	Acridotheres tristis	Common Myna	LC

Sr. No.	Order	Family (Scientific)	Scientific Name	Bird Common Name	IUCN Status
124	PASSERIFORMES	Sturnidae	Gracupica contra	Pied Myna	LC
125			Sturnia malabarica	Chestnut-tailed Starling	LC
126			Acridotheres fuscus	Jungle Myna	LC
127			Pastor roseus	Rosy Starling	LC
128		Muscicapidae	Saxicola fulicatus	Indian Robin	LC
129			Copsychus saularis	Oriental Magpie Robin	LC
130			Ficedula parva	Red breasted Flycatcher	LC
131			Cyornis tickelliae	Tickell's Blue Flycatcher	LC
132			Muscicapa latirostris	Asian Brown Flycatcher	LC
133			Saxicola maurus	Common Stonechat	LC
134			Saxicola caprata	Pied Bush Chat	LC
135		Passeridae	Passer domesticus	House Sparrow	LC
136			Petronia xanthocollis	Yellow-throated Sparrow	LC
137		Estrildidae	Amandava amandava	Red Avadavat	LC
138			Euodice malabarica	Indian Silverbill	LC
139			Lonchura punctulata	Scaly-breasted Munia	LC
140			Lonchura Malacca	Tricolored Munia	LC
141		Motacillidae	Motacilla flava	Western Yellow Wagtail	LC

142			Motacilla alba	White Wagtail	LC
143			Motacilla cinerea	Grey Wagtail	LC
144			Anthus rufulus	Paddyfield Pipit	LC
145		Monarchidae	Terpsihpone paradise	Indian Paradise Flycatcher	LC
146		Ploceidae	Ploceus philippinus	Baya Weaver	LC
147		Leiothrichidae	Turdoides caudate	Common Babbler	LC
148			Turdoides striata	Jungle Babbler	LC
149		Nectariniidae	Leptocoma zeylonica	Purple rumped sunbird	LC
150			Cinnyris asiaticus	Purple Sunbird	LC
151		Dicaeidae	Dicaeum erythrorhynchos	Pale billed Flowerpecker	LC
152			Dicaeum agile	Thick billed Flowerpecker	LC
153		Oriolidae	Oriolus kundoo	Indian Golden Oriole	LC
154		Emberizidae	Emberiza bruniceps	Red Headed Bunting	LC
155		Phylloscopidae	Phylloscopus griseolus	Sulphur bellied warbler	LC
156			Phylloscopus trochiloides	Greenish Warbler	LC
157			Phylloscopus occipitalis	Western crowned warbler	LC
158		Acrocephalidae	Acrocephalus dumetorum	Blyth's Reed Warbler	LC
159			Acrocephalus stentoreus	Clamorous Reed Warbler	LC
160		Sylviidae	Chrysomma sinense	Yellow Eyed babbler	LC

161		Aegithinidae	Aegithina tiphia	Common Iora	LC
162		Fringillidae	Carpodacus erythrinus	Common Rosefinch	LC
163	Piciformes	Megalaimidae	Megalaima haemacephala	Coppersmith barbet	LC
164		Picidae	Jynx torquilla	Eurasian wryneck	LC
165	Podicipediformes	Podicipedidae	Tachybaptus ruficollis	Little Grebe	LC
166	Strigiformes	Strigidae	Otus brucei	Pallied scops owl	LC
167		Tytonidae	Tyto alba	Barn Owl	LC

Annexure 4.3 – List of Fishes at TCFS

Sr. no	Order	Family	Species		
			Scientific name	Common Name (English)	Vernacular Name (Marathi)
1	2	3	4	5	6
1	Anguilliformes	Muraenesocidae	*Congresox talabonoides*	Indian Pike Conger	Vam
2	Beloniformes	Belonidae	*Strongylura strongylura*	Spot needlefish	Tol
3	Clupeiformes	Clupeidae	*Anodontostoma chacunda*	Chacunda gizzard shad	Gubir/Nir
4	Clupeiformes	Clupeidae	*Tenualosa toli*	Toli shad	Bhing
5	Clupeiformes	Engraulidae	*Coilia dussumieri*	Goldspotted grenadier anchovy	Mandeli
6	Clupeiformes	Pristigasteridae	*Ilisha filigera*	Coromandal ilisha	Kati
7.	Elopiformes	Elopidae	*Elops machnata*	Tenpounder	Chirya/Dandeli/ Shonas
8.	Elopiformes	Megalopidae	*Megalops cyprinoides*	Indo pacific tarpon	Chirai
9	Mugiliformes	Mugilidae	*Moolgarda seheli*	Bluespot mullet	Boi
10	Mugiliformes	Mugilidae	*Mugil cephalus*	Flathead grey mullet	Boi
11	Perciformes	Ambassidae	*Ambassis ambassis*	Commerson's glassy	Kachki/ Kachak
12	Perciformes	Cichlidae	*Etroplus suratensis*	Pearl spot	Kalunder
13	Perciformes	Cichlidae	*Oreochromis mossambicus*	Mozambique Tilapia	Tilapia/Chilapi

1	2	3	4	5	6
14	Perciformes	Gobiidae	*Boleophthalmus dussumieri*	Mud skipper	Nivti
15	Perciformes	Gobiidae	*Glossogobius giuris*	Tank goby	Kharbi/ Kharpa
16	Perciformes	Gobiidae	*Oxyurichthys microlepis*	Maned goby	Kharbi/ Kharpa
17	Perciformes	Gobiidae	*Periophthalmus gracilis*	Graceful mudskipper	Nivti
18	Perciformes	Gobiidae	*Tripauchen vagina*	Burrowing Goby	Tambade
19	Perciformes	Latidae	*Lates calcarifer*	Asian seabass/ Barramundi	Jitada/ Jitadi
20	Perciformes	Polynemidae	*Eleutheronema tetradactylum*	Indian Salmon/ Fourfinger threadfin	Rawas
21	Perciformes	Scatophagidae	*Scatophagus argus*	Spotted Scat	Kaski
22	Perciformes	Sciaenidae	*Johnius dussumieri*	Sin croaker	Dhoma
23	Perciformes	Sciaenidae	*Otolithes cuvieri*	Lesser Tigertooth Croaker	Dhoma
24	Perciformes	Sciaenidae	*Otolithoides biauritus*	Bronze Croaker	Koth
25	Perciformes	Serranidae	*Epinephelus coioides*		Gobra/Hekru
26	Perciformes	Sillaginidae	*Sillago sihama*	Silver sillago	Renvi/Muddoshi
27	Perciformes	Stromateidae	*Pampus argenteus*	Silver pomfret	Chandava/ paplet/Sarang a
28	Perciformes	Stromateidae	*Pampus chinensis*	Chinese silver Pomfret	Kalwad/ kapri/ Chand ava
29	Perciformes	Terapontidae	*Terapon jarbua*	Target Fish	Naveri
30	Pleuronectiformes	Cynoglossidae	*Cynoglossus arel*	Largescale tonguesole	Lep

1	2	3	4	5	6
31	Siluriformes	Ariidae	*Plicofollis tenuispinis*	Thin spine sea catfish	Singala/ Shingada
32	Siluriformes	Bagridae	*Mystus gulio*	Long Whiskers Catfish	Singhati
33	Tetraodontiformes	Tetraodontidae	*Lagocephalus inermis*	Smooth Blaasop Puffer	Bebo
34	Decapoda	Lysmatidae	*Exhippolysmata ensirostris*	Hunter Shrimp	Bhoba
35	Decapoda	Palaemonidae	*Exopalaemon styliferus*	Roshna Prawn	Roshna
36	Decapoda	Penaeidae	*Metapenaeus affinis*	Jinga shrimp	Medium kolabi/ Chaiti
37	Decapoda	Penaeidae	*Penaeus indicus*	White Shrimp	White kolambi
38	Decapoda	Penaeidae	*Penaeus monodon*	Tiger shrimp	Tiger kolambi
39	Decapoda	Sergestidae	*Acetes indicus*	Paste shrimp	Jawla
40	Decapoda	Palinuridae	*Panulirus polyphagus*	Spiny mud Lobster	Shevand
41	Decapoda	Portunidae	*Charybdis (Charybdis) callianassa*	Swimming Crab	Khekda
42	Decapoda	Portunidae	*Portunus pelagicus*	Blue swimming Crab	Neela khekda
43	Decapoda	Portunidae	*Scylla serrata*	Giant mud Crab	Khekda
44	Decapoda	Portunidae	*Scylla tranquebarica*	Purple Mud Crab	Khekda
45	Cardiida	Cardiidae	*Vasticardium angulatum*	Angluated Cockle	Dhari/Moole

Annexure 4.4 List of Butterfly Species found at TCFS

Sr. No.	Family	*Scientific Name*	Common Name
1	Papilionidae	*Graphium Agamemnon*	Tailed Jay
2		*Graphium doson*	Common Jay
3		*Graphium sarpedon*	Common Bluebottle
4		*Papilio demoleus*	Lime Butterfly
5		*Papilio polytes*	Common Mormon
6		*Papilio polymnestor*	Blue Mormon
7		*Pachliopta hector*	Crimson Rose
8		*Pachliopta aristolochiae*	Common Rose
9	Pieridae	*Eurema hecabe*	Common Grass Yellow
10		*Delias eucharis*	Common Jezebel
11		*Catopsilia Pomona*	Common Emigrant
12		*Leptosia nina*	Psyche Butterfly
13		*Colotis fausta*	Salmon Arab
14		*Ixias pyrene*	Yellow Orange tip
15		*Ixias Marianne*	White Orange tip
16		*Catopsilia pyranthe*	Mottled Emigrant
17		*Colotis amata*	Small Salmon Aab
18		*Pareronia valeria*	Common Wanderer
19		*Appias albino*	Common Albatross
20	Lycinidae	*Jamides celeno*	Common Cerulean

21		*Castalius rosimon*	Common pierrot
22		*Talicada nyseus*	Red pierrot
23		*Zizula hylax*	Tiny grass blue
24		*Euchrysops cnejus*	Gram Blue
25		*Curetis thetis*	Indian sunbeam
26		*Pseudozizeeria maha*	Pale Grass Blue
27		*Tarucus nara*	Striped Pierrot
28		*Curetis dentate*	Angled Sunbeam
29		*Jamides bochus*	Dark cerulean
30		*Monodontides musina*	Hedge blue
31		*Chilades pandava*	Oriental plain cupid
32		*Everes lacturnus*	Indian cupid
33	Nymphalidae	*Junonia almanac*	Peacock pansy
34		*Junonia atlites*	Grey pansy
35		*Junonia lemonias*	Lemon pansy
36		*Junonia iphita*	Chocolate pansy
37		*Charaxes solon*	Black rajah
38		*Phalanta phalantha*	Common leopard
39		*Hypolimnas bolina*	Great Eggfly
40		*Hypolimnas misippus*	Danaid Eggfly
41		*Neptis laeta*	Common Sailer
42		*Vanessa cardui*	Painted Lady
43		*Ariadne merione*	Common Castor

44		*Ariadne Ariadne*	Angled Castor
45		*Euthalia aconthea*	Common Baron
46		*Euploea core*	Common crow
47		*Danaus chrysippus*	Plain tiger
48		*Tirumala limniace*	Blue tiger
49		*Danaus genutia*	Striped tiger
50		*Melanitis leda*	Common evening brown
51		*Elymnias hypermnestra*	Common Palmfly
52		*Euthalia nais*	Baronet
53		*Acraea terpsicore*	Tawny Coster
54		*Moduza procris*	Commander
55	Hesperiidae	*Udaspes folus*	Grass demon
56		*Spialia galba*	Indian skipper
57		*Caltoris kumara*	Blank Swift
58		*Imbrix salsala*	Chestnut Bob
59		*Hasora vitta*	Plain Banded Owl

Annexure 4.5 List of Insect Species Found Along TCFS

Sr. No.	Order	Family	Genus and species
1	Diptera	Syrphidae	Hover fly
2		Sarcophagidae	Sarcophaga sp (Flesh fly)
3		Muscidae	Musca domestica (House fly)
4		Tipulidae	Crane fly
5		Culicidae	Mosquito
6		Asilidae	Robber fly
7		Calliphoriae	Lucilia sericata(Green bottle fly)
8	Hemiptera	Pseudococcidae	Mealy bug (Scale insect)
9		Cicadellidae	Cicadella viridis (Green leaf hopper)
10		Pyrrhocoridae	Red bug
11		Reduviidae	Assassin bug
12		Pentatomidae	Stink bug
13		Membracidae	Tree hopper
14		Gerridae	Water strider
15	Hymenoptera	Vespidae	Ropalidia fasciata (Common paper wasp)
16			Potter wasp
17		Apidae	Apis indica (Honey bee)
18			xylocopa sp. (Carpenter bee)
19		Formicidae	Crematogaster sp
20			Tapinoma melanocephalum (Ghost ant)
21			Paratrechina longicornis (Longhorn crazy ant)

22			Tetraponera rufonigra (Slender ant)
23	Lepidoptera		Camponotus sp.
24		Crambidae	Hymenoptychis sordida (pneumatophore moth)
25		Nymphalidae	Junonia almana (Peacock Pansy)
26			Junonia orithya (Blue pansy)
27			Junonia hierta(Yellow pansy)
28			Danaus chrysippus (Plain tiger)
29			Danaus genutia(Striped tiger)
30			Tirumala limniace (Blue tiger)
31			Euthalia aconthea (Common baron)
32			Ariadne merione (common castor)
33			Euploea core (Common crow)
34			Mycalesis perseus (Common Evening bushbrown)
35			Neptis hylas (Common sailor
36			Hypolimnas misippus (Danaid eggfly)
37			Junonia atlites (Grey pansy)
38			Acraea terpsicore (Tawny coster)
39			Junonia iphita (chocolate pansy)
40			Hypolimnas bolina (Great eggfly)
41		Papilionidae	Graphium evemon eventus (Blue jay)
42			Pachliopta aristolochiae (Common Rose)
43			Papilio polytes (Common mormon)
44		Lycaenidae	Jamides celeno (Common cerulean)

45			Acytolepis puspa (Common Hedge Blue)
46			Talicada nyseus (Red pierrot)
47			Caleta caleta(Angled pierrot)
48			Catopsilia pomona (Common emigrant)
49			Eurema hecabe (Common grass yellow)
50		Pieridae	Ceporanerissa (Common Gull)
51			Leptosia nina (The Psyche)
52			Colotisamata (Salman Arab)
53			Ixias pyrene (Yellow orange tip)
54	Mantodea	Hymenopodidae	Odontomantis sp (Asian ant mantis)
55		Mantidae	Mantis sp (Praying mantis)
56	Neuroptera	Chrysopidae	Green lacewing
57		Myrmeleontidae	Antlion lacewing
58	Odonata	Gomphidae	Gomphus vulgatissimus (Common club tail)
59		Libellulidae	Aethriamanta brevipennis (Scarlet marsh hawk)
60			Crocothemis servilia(Ruddy marsh skimmer)
61			Diplacodes trivialis (Blue ground skimmer)
62			Neurothemis tullia (Pied paddy skimmer)
63			Trithemis pallidinervis (Long legged marsh glider)
64			Bradinopyga geminata (Granite Ghost)
65			Brachythemis contaminate (Ditch jewel)

66	Orthoptera	Gryllidae	Cricket
67		Gryllotalpidae	Mole cricket

Annexure 4.6 Phytoplankton Species studied at TCFS

Sr. No.	Species
1	Amphirora sp.
2	Amphora sp.
3	Anabaena sp.
4	Aphanocapsa sp.
5	Chaetoceros
6	Chaetoceros sp.
7	Chromomonas sp.
8	Ciliate sp.
9	Cocconeis sp.
10	Coscinodiscus sp.
11	Cyclotella sp.
12	Fluviatilis sp.
13	Gymnodinium sp.
14	Gyrosigma sp.
15	Isthmia sp .
16	Lauderia sp.
17	Leptocylindrus sp.
18	Mallomonas sp.
19	Melosira sp.
20	Navicula sp.
21	Nitzschia sp.
22	Odontella sp.
23	Peridinium sp.
24	Phacus sp.
25	Pinnularia sp .
26	Pleurosigma sp.
27	Prorocentrum sp.

Sr. No.	Species
28	Protoperidinium sp.
29	Pseudo-nitzschia sp.
30	Rhizosolenia sp.
31	Scenesesmus Obliques
32	Skeletonema sp.
33	Spirulina sp.
34	Surirella sp.
35	Thalassiosira sp.

Annexure 4.7 List of Zooplankton species studied at TCFS

Sr. No.	Species
1	Textularia sp
2	Globigerina sp
3	Tintinnida sp
4	Obelia sp (Medusa)
5	Obelia sp (Polyp)
6	Phialidium sp
7	Round worm
8	Oligochaete worm
9	Polychaete worm
10	Gastropod veliger larva
11	Bivalve larva
12	Cyprid larva
13	Mosquito larva
14	Insect larva
15	Acetes indicus
16	Protozoea larva
17	Zoea larva
18	Mysis larva

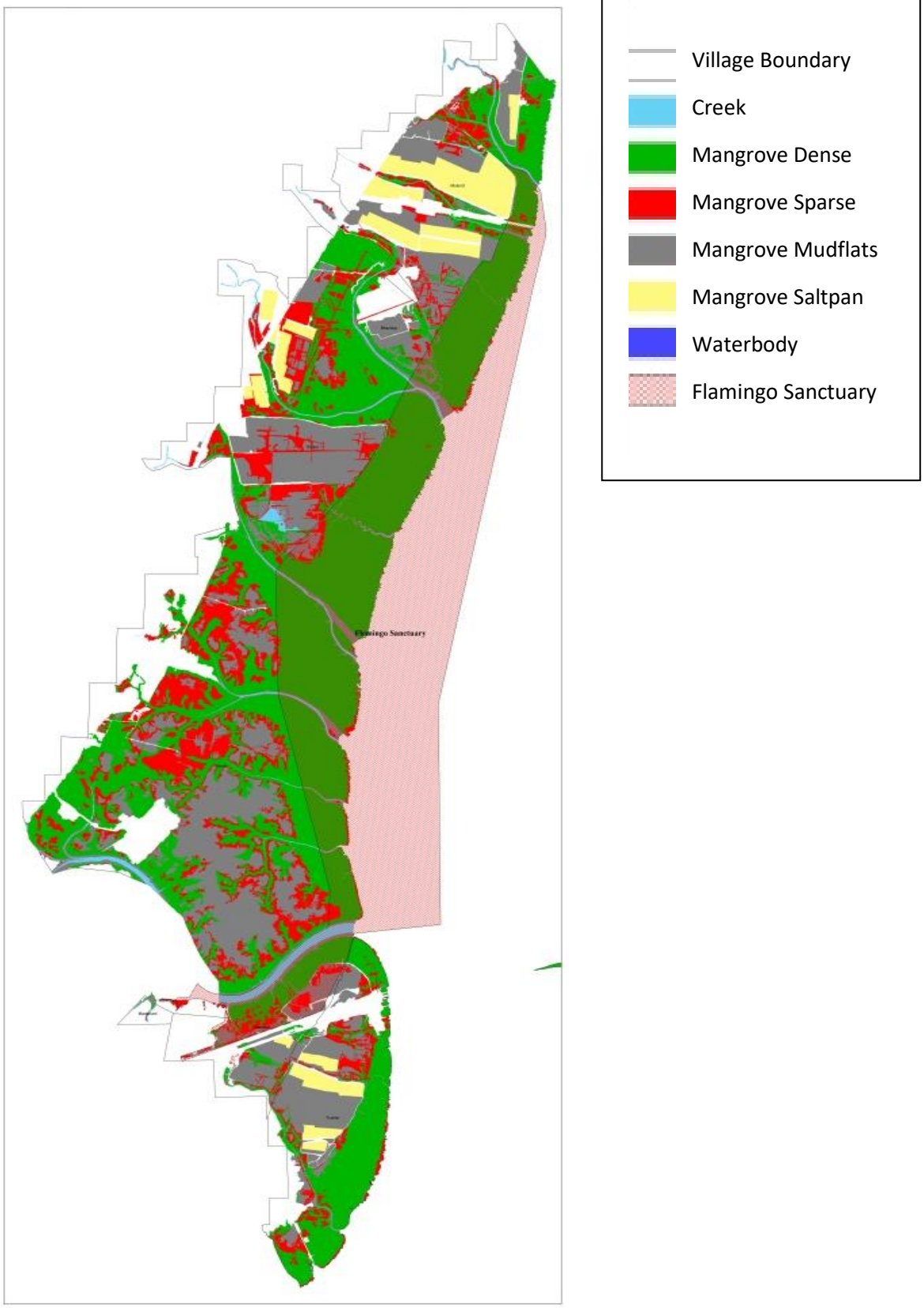
Sr. No.	Species
19	Nauplius larva
20	Cyclopoid copepod
21	Calanoid copepod
22	Harpacticoid copepod
23	Marine tick
24	Fish egg

Annexure 4.8 List of Macrobenthos found in the Intertidal region of TCFS

Sr. No.	Phylum	Class	Sub class	Order	Family	Species
1	Mollusca	Gastropoda	Caenogastropoda	Caenogastropoda	Potamididae	Cerithidea cingulata
2						Cerithidea obtuse
3				Neogastropoda	Nassariidae	Nassarius sp
4			Heterobranchia	Pulmonata	Ellobiidae	Auricula elongate
5						Melampus sp1
6						melampus sp2
7					Amphibolidae	Salinator burmana
8			-	-	Thiaridae	Thiara sp
9		Bivalvia	Pteriomorphia	Arcida	Arcidae	Arca sp
10			Heterodonta	Venerida	Veneridae	Katelysia opima
11						Meretrix meretrix
12						Dosinia pubescens
13					Cuspidariidae	Cuspidaria cochinensis
14					Glauconomidae	Glauconome cerea

Sr. No.	Phylum	Class	Sub class	Order	Family	Species
15	Cnidaria	Anthozoa	-	-	-	Sea anemone sp
16	Annelida	Polychaeta	-	-	-	Polychaete worm sp
17	Arthropoda	Malacostraca	-	Decapoda	-	Illyoplax gangetica
18			-		-	Crab sp2
19			-		-	Crab sp3
20			Eumalacostraca		Penaeidae	Acetes indicus
21		Maxillopoda	Thecostraca	-	-	Barnacle sp
22		Insecta	Pterygota	Diptera	-	Insect larva
23	Chordata	Actinopterygii	-	Perciformes	Gobiidae	Trypauchen vagina

Annexure 5: Map Showing Different Habitats Around TCFS



Annexure 6: Notification Declaration of TCFS under section 18(1) of WPA- 1972 dated 6th August 2015

RNI No. MAHBIL /2009/31733

महाराष्ट्र शासन राजपत्र

असाधारण भाग चार–अ

वर्ष १, अंक ६१] शुक्रवार, ऑगस्ट ७, २०१५/श्रावण १६, शके १९३७ [पृष्ठे ५, किंमत : रुपये १५.००

असाधारण क्रमांक १२७

प्राधिकृत प्रकाशन

महाराष्ट्र शासनाने केंद्रीय अधिनियमांन्वये तयार केलेले
(भाग एक, एक-अ आणि एक-ल यांमध्ये प्रसिद्ध केलेले नियम व आदेश यांव्यतिरिक्त) नियम व आदेश.

महसूल व वन विभाग

मादाम कामा मार्ग, हुतात्मा राजगुरू चौक, मंत्रालय, मुंबई ४०० ०३२, दिनांक ६ ऑगस्ट २०१५

अधिसूचना

वन्यजीव (संरक्षण) अधिनियम, १९७२.

क्रमांक डब्ल्यूएलपी. ०३१५/प्र.क्र.७६/फ-१.— ज्याअर्थी, या सोबतच्या अनुसूचीमध्ये वर्णन केलेल्या क्षेत्राला (यात यापुढे ज्याचा निर्देश "उक्त क्षेत्र" असा करण्यात आला आहे) परिस्थितीकीय, प्राणीजातीय, वनस्पतीजातीय, भूरूपीकीय, नैसर्गिक व प्राणीशास्त्रविषयक पुरेसे महत्त्व असल्यामुळे त्यामधील वन्यजीवाचे संरक्षण, त्याची पैदास व वाढ करण्याच्या प्रयोजनासाठी व त्याच्या पर्यावरणासाठी या क्षेत्राचा एका अभयारण्यात समावेश करणे महाराष्ट्र शासनास इष्ट वाटते ;

त्याअर्थी , आता, वन्यजीव (संरक्षण) अधिनियम, १९७२ (१९७२ चा ५३) चे कलम १८ व कलम १८ बी चे उप-कलम (१) व (२) या बाबतीत त्यास समर्थ करणाऱ्या सर्व अधिकारांचा वापर करून, महाराष्ट्र शासन, याद्वारे,—

(अ) "ठाणे खाडी फ्लेमिंगो अभयारण्य" या नावाने ओळखले जाणारे वन्यजीव अभयारण्य म्हणून अनुसूचीत नमूद केलेले क्षेत्र गठीत करण्याचा आपला इरादा घोषित करीत आहे. आणि उक्त अनुसूचीत जाहीर केल्याप्रमाणे त्याच्या हद्दी सीमांकीत करीत आहे; आणि त्या प्रयोजनासाठी ;

(ब) प्रस्तावित "ठाणे खाडी फ्लेमिंगो अभयारण्य" अधिसूचित करण्यासाठी उक्त क्षेत्रातील जमिनींमध्ये किंवा त्यावर कोणत्याही व्यक्तीच्या नावे असलेल्या कोणत्याही अभिकथित अधिकारांचे अस्तित्व, स्वरूप व व्याप्ती यांची चौकशी करण्यासाठी व ते निश्चित करण्यासाठी आणि उक्त अधिनियमाची कलमे १९ ते २५ (दोन्ही धरून) या अन्वये तरतूद केली असेल तशीच कार्यवाही करण्यासाठी, जिल्हाधिकारी म्हणून, उप विभागीय अधिकारी, मुंबई उपनगर, जिल्हा मुंबई उपनगर यांची नियुक्ती करीत आहे.

अनुसूची

मुंबई उपनगर जिल्हयातील "ठाणे खाडी फ्लेमिंगो" अभयारण्याची स्थिती आणि हद्दी :—

१. अभयारण्याचे नाव : ठाणे खाडी फ्लेमिंगो अभयारण्य

२. वन विभागाचे नाव : मुंबई कांदळवन संवर्धन घटक

३. मूळ प्रादेशिक वन विभागाचे नाव : ठाणे वन विभाग

४. जिल्ह्याचे नाव : मुंबई उपनगर

५. अभयारण्यामध्ये समाविष्ट केलेल्या क्षेत्राचा तपशील :—

अ. क्र.	जिल्हा	तालुका	गावाचे नाव	सर्वे क्रमांक /सिटी सर्वे क्रमांक	क्षेत्र (हे. मध्ये)	शेरा
(१)	(२)	(३)	(४)	(५)	(६)	(७)
१	मुंबई उपनगर	कुर्ला	मुलुंड	नवीन १३२७	१४३.१६	खाडी लगतचा पश्चिमेकडील भाग
२			विक्रोळी	नवीन २०९	२५७.३५	
३			भांडुप	नवीन १०४९	९४.९२	
४			कांजूर	नवीन १३५१	२६४.८७	
५			मंडाले	स.नं. ९१ पैकी. (सि.स.नं. १ पैकी)	३४.५००	
				स.नं. ८९ पैकी (सि.स.नं. २)	२८.९५	
				स.नं. ९० पैकी (सि.स.नं. ३)	१४.७२०	
				स.नं. ९१ पैकी (सि.स.नं. ४)	१०.७३०	
				स.नं. ८० पैकी (सि.स.नं. ६)	१५.२६०	
				नवीन ८२	०.५४०	
				नवीन ८३	०.०९०	
				नवीन ८४	३०.९४८५	
				एकूण . .	८९६.०३८५	
६			मुलुंड, विक्रोळी, भांडुप, कांजूर, मंडाले		७९४.४८७	खाडी क्षेत्र
				एकूण . .	१६९०.५२५५	

"ठाणे खाडी फ्लेमिंगो" अभयारण्यात समाविष्ट होणारे खाडी लगतचे पश्चिमेकडील क्षेत्र : ८९६.०३८५ हे.

खाडी क्षेत्र (महसूल क्षेत्र) : ७९४.४८७ हे.

एकूण क्षेत्र : १६९०.५२५५ हे.

किंवा

१६.९०५ चौ.कि.मी.

ठाणे खाडी फ्लेमिंगो अभयारण्याच्या चतुःसिमा :—

गाव/स.नं. (१)	उत्तर (२)	पूर्व (३)	दक्षिण (४)	पश्चिम (५)
मौजे मुलुंड नवीन १३२७	मौजे कोपरीची शीव	खाडी	मौजे भांडुपची शीव	सि.स.नं. १३२१, १३२०, १३१९, १३१८
मौजे विक्रोळी नवीन २०९	मौजे कांजूर शीव व खाडी	खाडी	खाडी	सि.स.नं. १
मौजे भांडुप नवीन १०४९	मौजे नाहूरची शीव	खाडी	खाडी	स.नं. ६३
मौजे कांजूर नवीन १३५१	मौजे भांडुपची शीव	खाडी	विक्रोळीची शीव	स.नं.२७५
मंडाले स. नं. ९१ पैकी (सि.स.नं. १ पैकी) स. नं. ८९ पैकी, (सि.स.नं. २) स. नं. ९० पैकी, (सि.स.नं. ३) स. नं. ९१ पैकी, (सि.स.नं. ४) स. नं. ८० पैकी, (सि.स.नं. ६) नवीन ८२, नवीन ८३ नवीन ८४	खाडी	खाडी	सायन-पनवेल महामार्ग आणि तुर्भे गावाची शीव	सि.स.नं. ६ पैकी

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नावाने,

प्रकाश महाजन,
शासनाचे सहसचिव.

REVENUE AND FORESTS DEPARTMENT

Madam Cama Road, Hutatma Rajguru Chowk, Mantralaya
Mumbai 400 032, dated the 6th August 2015

NOTIFICATION

WILD LIFE (PROTECTION) ACT, 1972.

No. WLP. 0315/CR-76/ F-1.— Whereas, the Government of Maharashtra considers that the area described in Schedule appended hereto (hereinafter referred to as "the said area") being the area other than the area comprised in a reserved forest by reasons of its adequate ecological, faunal, floral, geomorphological, natural and zoological significance for the purpose of protecting, propagating and developing wild life therein and its environment, shall be a sanctuary ;

Now, therefore, in exercise of the powers conferred by sub-section (*1*) and (*2*) of section 18 and section 18B of the Wild Life (Protection) Act, 1972 (53 of 1972), and of all the powers enabling it in this behalf, the Government of Maharashtra hereby,—

(*a*) declares its intention to constitute the said area as a Sanctuary to be known as the "Thane Creek Flamingo Sanctuary" and defines the limits thereof as set out in the said Schedule ; and

(*b*) appoints the Sub-Divisional Officer, Mumbai Suburban District to act as the Collector under the said Act to inquire into and determine the existence, nature and extent of rights of any person in or over the land within the limits of the said area and proposed to be notified as "Thane Creek Flamingo Sanctuary" as provided under sections 19 to 25 (both inclusive) of the said Act :—

Schedule

Situation and limits of the "Thane Creek Flamingo Sanctuary" in Mumbai Suburban District.

1. Name of the Sanctuary : Thane Creek Flamingo Sanctuary
2. Name of the Division : Mumbai Mangrove Conservation Unit
3. Name of original Forest Division : Thane Forest Division
4. Name of Districts : Mumbai Suburban District
5. Particulars of area to be included in the Sanctuary :—

Sr. No.	District	Tahsil	Village	Survey Number / City Survey Number	Area in ha.	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Mumbai Suburban	Kurla	Mulund	New 1327	143.16	Area along western side of creek
2			Vikhroli	New 209	257.35	
3			Bhandup	New1049	94.92	
4			Kanjur	New1351	264.87	
5			Mandale	Survey Number 91 Part (City Survey Number1 Part)	34.500	
				Survey Number 89 Part (City Survey Number 2)	28.95	
				Survey Number 90 Part (City Survey Number 3)	14.720	
				Survey Number 91 Part (City Survey Number 4)	10.730	
				Survey Number 80 Part (City Survey Number 6)	15.260	

(1)	(2)	(3)	(4)	(5)	(6)	(7)
				New 82	0.540	
				New 83	0.090	
				New 84	30.9485	
				Total . .	896.0385	
6			Mulund, Vikhroli, Bhandup, Kanjur, Mandale		794.487	Area of creek
				Total . .	1690.5255 ha.	

Area along western side of creek : 896.0385 Ha.
Creek Area (Revenue Land) : 794.487 Ha
Total : 1690.5255 Ha. or 16.905 Sq. Km.

Boundaries of proposed "Thane Creek Flamingo" Sanctuary :—

Village/City Survey Number (1)	North (2)	East (3)	South (4)	West (5)
Mulund New1327	Village Boundary of Kopari.	Creek	Village Boundary of Bhandup	City Survey Number 1321, 1320, 1319, 1318.
Vikhroli New 209	Village Boundary of Kanjur and Creek.	Creek	Creek	City Survey Number 1.
Bhandup New 1049	Village Boundary of Nahur.	Creek	Creek	Survey Number 63
Kanjur New 1351	Village Boundary of Bhandup.	Creek	Village Boundary of Vikhroli.	Survey Number 275.
Mandale Survey No. 91 Part (City Survey Number 1 Part) Survey Number 89 Part (CTS No. 2,) Survey Number 90 Part (City Survey Number 3,) Survey Number 91 Part (City Survey Number 4,) Survey Number 80 Part (City Survey Number 6,) New 82, New 83, New 84.	Creek	Creek	Sion-Panvel Highway, Village Boundary of Turbhe	City Survey Number 6 Part.

By order and in the name of the Governor of Maharashtra,

PRAKASH MAHAJAN,
Joint Secretary to Government.

ON BEHALF OF GOVERNMENT PRINTING, STATIONERY AND PUBLICATION, PRINTED AND PUBLISHED BY SHRI PARSHURAM JAGANNATH GOSAVI, PRINTED AT GOVERNMENT CENTRAL PRESS, 21-A, NETAJI SUBHASH ROAD, CHARNI ROAD, MUMBAI 400 004 AND PUBLISHED AT DIRECTORATE OF GOVERNMENT PRINTING, STATIONERY AND PUBLICATION, 21-A, NETAJI SUBHASH ROAD, CHARNI ROAD, MUMBAI 400 004, EDITOR : SHRI PARSHURAM JAGANNATH GOSAVI.

Annexure 7: Enquiry report of SDO Regarding Declaration of TCFS dated 9th October 2017

उपविभागीय अधिकारी, पूर्व उपनगर, मुंबई उपनगर जिल्हा यांचे कार्यालय
निळकंठ बिझनेस पार्क, ए विंग, तळ मजला, किरोळ रोड, विद्याविहार (पश्चिम), मुंबई -०८६
ई-मेल - sdoeasternsuburban@gmail.com दुरध्वनी क्र. २५१११११२६

क्र.उविअ/पू.उ./ठाणे खाडी फ्लेमिंगो अभयारण्य/६१/१६
दिनांक : ९ /१०/२०१७

वाचले :-

१. महाराष्ट्र शासन, राजपत्र, असाधारण भाग क्र.चार अ दिनांक ७/८/२०१५ मध्ये प्रसिध्द झालेली महसूल व वन विभागाकडील अधिसुचना शुध्दीपत्र क्रमांक डब्ल्यूएलपी ०३१५/प्र.क्र.७६/फ-१ दिनांक ०६/०८/२०१५
२. महाराष्ट्र शासन,राजपत्र, असाधारण भाग क्र.चार अ दिनांक ५/२/२०१६ मध्ये प्रसिध्द झालेली महसूल व वन विभागाकडील अधिसूचना क्रमांक डब्ल्यूएलपी ०३१५/प्र.क्र.७६/फ-१ दिनांक ५/२/२०१६.
३. मा.जिल्हाधिकारी, मुंबई उपनगर जिल्हा यांचेकडील पत्र क्र.सी.कार्या-२ आय/कावि-७६/२०१६ दिनांक २६/०२/२०१६.
३. वन्यजीव संरक्षण अधिनियम, १९७२.

आदेश :-

१. महाराष्ट्र शासनराजपत्र, असाधारण भाग चार-अ दिनांक ७/८/२०१५ मध्ये प्रसिध्द झालेली महसूल व वन विभागाकडील अधिसूचना क्रमांक डब्ल्यूएलपी ०३१५/प्र.क्र.७६/फ-१ दिनांक ०६/०८/२०१५ अन्वये वन्यजीव संरक्षण अधिनियम, १९७२ (१९७२ चा ५३) चे कलम १८ व कलम १८ 'बी' चे उप कलम (१) व (२) याबाबतीत त्यास समर्थ करणा-या सर्व अधिकाराचा वापर करुन उक्त अधिसुचना निर्गमित केलेवरुन कुर्ला तालुक्यातील खालील नमुद अनुसूचीमध्ये जाहीर केलेले क्षेत्र "ठाणे खाडी फ्लेमिंगो अभयारण्य" म्हणून गठीत करण्याचा इरादा घोषित केला आहे. प्रस्तावित "ठाणे खाडी फ्लेमिंगो अभयारण्य" अधिसूचित करण्यासाठी खालील अनुसूचित नमूद क्षेत्रातील जमिनीमध्ये किंवा त्यावर कोणत्याही व्यक्तीच्या नावे असलेल्या कोणत्याही अभिकथित अधिकारांचे अस्तित्व, स्वरुप व व्याप्ती यांची चौकशी करण्यासाठी व ते निश्चित करण्यासाठी आणि उक्त अधिनियमाची कलमे १९ ते २५ (दोन्ही धरुन) या अन्वये तरतूद केली असेल तशीच कार्यवाही करणेसाठी जिल्हाधिकारी म्हणून उपविभागीय अधिकारी, पूर्व उपनगर यांची नियुक्ती केली आहे.

अनुसूची

मुंबई उपनगर जिल्हयातील "ठाणे खाडी फ्लेमिंगो अभयारण्य" स्थिती आणि हद्दी-

१. अभयारण्याचे नाव - "ठाणे खाडी फ्लेमिंगो अभयारण्य"

२. वनविभागाचे नाव - मुंबई कांदळवन संवर्धन घटक

३. मूळ प्रादेशिक वन विभागाचे नाव - ठाणे वन विभाग

४. जिल्हयाचे नाव - मुंबई उपनगर

अ) अभयारण्यामध्ये समाविष्ट केलेल्या क्षेत्राचा तपशिल-

अ.क्र.	जिल्हा	तालुका	गावाचे नाव	सर्वे क्रमांक/सिटी सर्वे क्रमांक	क्षेत्र (हे.मध्ये)	शेरा
१	मुंबई उपनगर	कुर्ला	मुलुंड	नवीन १३२७	१४३.१६	खाडी लगतचा पश्चिमेकडील भाग
२			विक्रोळी	नवीन २०९	२५७.३५	
३			भांडुप	नवीन १०४९	९४.९२	
४			कांजुर	नवीन १३५१	२६४.८७	
५			मंडाले	स.नं.९१ पैकी (सि.स.क्र. १पैकी)	३४.५००	
				स.नं.८९ पैकी (सि.स.क्र. २)	२८.९५	
				स.नं.९० पैकी (सि.स.क्र. ३पैकी)	१४.७२०	
				स.नं.९१ पैकी (सि.स.क्र. ४)	१०.७३०	
				स.नं.८० पैकी (सि.स.क्र. ६)	१५.२६०	
				नवीन ८२	०.५४०	
				नवीन ८३	०.०९०	
				नवीन ८४	३०.९४८५	
				एकूण	८९६.०३८५	
६			मुलुंड, विक्रोळी, भांडुप, कांजूर, मंडाले		७९४.४८७	खाडी क्षेत्र
				एकूण	१६९०.५२५५	

ठाणे खाडी फ्लैमिंगो अभयारण्यात समाविष्ट होणारे खाडी लगतचे पश्चिमेकडील क्षेत्र - ८९६.०३८५ हे.

खाडी क्षेत्र (महसूल क्षेत्र) - ७९४.४८७ हे.

एकूण क्षेत्र - १६९०.५२५५ हे.

किंवा १६.९०५ चौ.कि.मी.

ठाणे खाडी फ्लेमिंगो अभयारण्याच्या चतुःसिमा -

गाव/स.नं.	उत्तर	पूर्व	दक्षिण	पश्चिम
मौजे मुलुंड नवीन १३२७	मौजे कोपरीची शीव	खाडी	मौजे भांडुपची शीव	सि.स.नं.१३२१, १३२०,१३१९, १३१८
मौजे विक्रोळी नवीन २०९	मौजे कांजूर शीव व खाडी	खाडी	खाडी	सि.स.नं. १
मौजे भांडुप नवीन १०४९	मौजे नाहुरची शीव	खाडी	खाडी	स.नं.६३
मौजे कांजूर नवीन १३५१	मौजे भांडुपची शीव	खाडी	विक्रोळीची शीव	स.नं.२७५
मंडाले स.नं.९१ पैकी (सि.स.क्र. १पैकी) स.नं.८९ पैकी (सि.स.क्र. २) स.नं.९० पैकी (सि.स.क्र. ३) स.नं.९१ पैकी (सि.स.क्र. ४) स.नं.८० पैकी (सि.स.क्र. ६) नवीन ८२, नवीन ८३, नवीन ८४	खाडी	खाडी	सायन-पनवेल महामार्ग आणि तुर्भे गावाची शीव	सि.स.नं.६ पैकी

मा.जिल्हाधिकारी, मुंबई उपनगर जिल्हा यांचेकडील वाचले ३ चे पत्र क्रं.सी.कार्या-२ आय/कावि-७६/२०१६ दिनांक २६/२/२०१६ अन्वये या कार्यालयास आवश्यकती कार्यवाही करुन शासनास अहवाल सादर करण्याच्या सूचना दिल्या आहेत.

२. महाराष्ट्र शासनाकडील उक्त अधिसूचना व मा.जिल्हाधिकारी यांनी संदर्भ क्रंमांक ३ नुसार दिलेल्या निर्देशाप्रमाणे उक्त अनूसुचीमध्ये नमूद करण्यात आलेल्या उक्त अभयारण्याच्या हद्दींमध्ये समाविष्ट असलेल्या जमिनीमधील किंवा जमिनीसंबंधातील कोणत्याही व्यक्तीच्या हक्कांचे अस्तित्व, त्यांचे स्वरुप व व्याप्ती यांचे तपशील तसेच त्या संदर्भात कोणतीही भरपाईची मागणी असल्यास तिचे तपशील व रक्कम विनिर्दिष्ट करणारी लेखी हक्क मागणी तसेच नमूद केलेल्या जमीनीत कोणाचे हितसंबंध असल्यास त्यांनी आपले म्हणणे उपविभागीय अधिकारी, पूर्व उपनगर यांचे कार्यालयात कळवावे म्हणून दिनांक २९/१/२०१६ रोजी जाहीरनामा प्रसिध्द करण्यात आला आहे. तसेच तलाठी यांचेमार्फत सदर जागेवर व चावडीवर जाहिरानामा प्रसिध्द करण्यात आला असुन दि.७/२/२०१६ रोजी दैनिक प्रहार व दि.९/२/२०१६ रोजी दैनिक महाराष्ट्र टाइम्स या वृत्तपत्रामध्ये जाहिरनामा प्रसिध्द करण्यात आलेला आहे. मा.जिल्हाधिकारी, मुंबई उपनगर जिल्हा कार्यालयाच्या संकेतस्थळावरही उक्त जाहिरनामा प्रसिध्द करण्यात आलेला असून अभयारण्य घोषित होणा-या प्रस्तावीत क्षेत्राबाबत संबधीत असलेल्या कार्यालयांना त्यांचे कार्यालयाचै नोटीस बोर्डवर जाहिरनामा प्रसिध्द करण्यासाठी पाठविण्यात आलेले आहेत.

३. सदर जाहीरनामा प्रसिध्द झालेनंतर ज्या हितसंबधितांनी दावे व हरकती सादर केल्या त्यांना या कार्यालयात विविध तारखांना सुनावणी देण्यात आलेली आहे. हितसंबियतांनी खालीलप्रमाणे निवेदने सादर केलेली आहेत.

i) मुख्य अभियंता, मुंबई मलनिस्सारण प्रकल्प, बृहन्मुंबई महानगरपालीका यांनी त्यांचेकडील दिनांक ३/११/२०१५ चे पत्रान्वये केलेल्या लेखी विनंतीच्या अनुषंगाने या कार्यालयात दिनांक ९/३/२०१६ रोजी सुनावणी घेण्यात आली त्यावेळी सदर सुनावणीमध्ये श्री.प.द. तावरे, कार्यकारी अभियंता (मुंबई मलनिस्सारण प्रकल्प), मुंबई महानगरपालीका, यांनी दिनांक ३/११/२०१५ रोजी देण्यात आलेले निवेदन ग्राहय धरण्यात यावे असे सूनावणीवेळी सांगितले.

दिनांक ३/११/२०१५ चे निवेदनामध्ये नमुद केलेप्रमाणे ठाणे खाडी फ्लेमिंगोच्या अधिसुचीत क्षेत्रात भांडूप व घाटकोपरमधील अधिसुचीत क्षेत्रालगत पश्चिम बाजूला मलनिस्सारण प्रकल्प आहे, सदरचा प्रकल्प हा सन २००० पासून सुरु असून सदर प्रकल्प पर्यावरणदृष्टया महत्वाचा असल्यामुळे केंद्रिय प्रदुषण नियंत्रण मंडळ भारत सरकार यांनी सदर प्रकल्पाला २००७ मध्ये मान्यता दिली आहे, सदरचा प्रकल्प हा सर्वसामान्य जनतेच्या आरोग्याच्या दृष्टीने हिताचा असल्यामुळे सदर प्रकल्पामध्ये सुधारणा करण्याचे काम सुरु आहे. त्यामुळे भांडूप आणि घाटकोपरमधील "ठाणे खाडी फ्लेमिंगो अभयारण्यासाठी" इको सेंसेटीव्ह (संवेदनशील) झोनमधून अधिसूचित क्षेत्रातून सदर प्रकल्प असलेली जागा वगळण्यात यावी अशी विनंती निवेदनाव्दारे केली आहे.

ii) उपायुक्त मीठ, मुंबई यांनी दिनांक ९/५/२०१६ चे पत्रान्वये मौजे मुलुंड, भांडूप, नाहुर कांजुर व मंडाळे येथील जमीनीहया मीठ विभाग, भारत सरकार यांच्या मालकीच्या असून सदर सॉल्ट पॅनच्या जमीनीबाबत त्यांचेकडील सादर नकाशामध्ये त्या जमीनी (Bhandup STP, Bhandup-IPS व Ghatkaoper -STP, Ghatkaoper - IPS) पिवळया रंगाने दर्शविलेल्या आहेत. उक्त पत्रातील मुद्दा क्रं.८ मध्ये नमुद केलेनुसार सदर जमीनी मीठ पिकविण्यासाठी भाडेपटयाने सन १९७१ पासून दिलेल्या असून मौजे मंडाळे यंथील जमीनीबाबत न्यायालयात दावे प्रलंबित आहेत. सबब उक्त जमीनी हया केंद्रशासनाच्या मालकीच्या असल्याने त्या ठाणे खाडी फ्लेमिंगो अभयारंण्यासाठी घोषित करणेपूर्वी केंद्र शासनाच्या संक्षम प्राधिका-याची परवानगी घेण्यात यावी असे निवेदनामध्ये नमूद केले आहे.

iii) पुर्णानंद आणि कंपनी (ॲडव्होकेट ॲण्ड असोसिएट) यांनी श्री.मुकेश एम.पटेल व इतर ११ यांचेवतीने दि.२५/४/२०१६ रोजी सादर केलेल्या निवेदनाव्दारे मौजे मंडाळे सर्वे नं.९१ पार्ट सीटीएस नं.४ ही जमीन त्यांचे मालकीची असून त्या जमीनीबाबत महाराष्ट्र जमिन महसुल अधिनियम १९६६ चे कलम २०(२) अन्वये मा.जिल्हाधिकारी, मुंबई उपनगर जिल्हा यांनी आदेश पारित करुन सदरची जमीन अर्जदाराचे मालकीची ठरविण्यात आलेली असली तरी. मा.विभागिय आयुक्त, कोकण विभाग यांचेकडील आदेश दिनांक २१/५/२०१५ अन्वये मा.जिल्हाधिकारी, मुंबई उपनगर जिल्हा यांचे आदेश रद्द बादल ठरविले आहेत. त्याअनुषंगाने मालकी

हक्क घोषित करण्यासाठी सॉल्ट विभाग यांनी न्यायालयात सिव्हील सूट नं.२९३१/२००० अन्वये दावा दाखल केला असून सदरचा दावा प्रलंबित असल्याचे कळविले आहे. तसेच सदर प्रकरणी उक्त जमीन ठाणे खाडी फ्लेमिंगो अभयारण्यासाठी घेण्याची झाल्यास त्यांना न्याय नुकसानभरपाई मिळण्याचा हक्क आणि पुनर्वसन व पुनर्वसाहत यांमध्ये पारदर्शकता राखणे अधिनियम-२०१३ चे कलम २४ नुसार नुकसान भरपाई किंवा टिडीआर मिळण्याची विनंती केली आहे.

iv) लोक हाऊसिंग ॲण्ड कन्ट्रक्शन ली. यांनी दि.२२/४/२०१६ रोजीचे पत्रान्वये मौजे मंडाळे येथील सर्वे नं.८९ पार्ट सीटीएस नं.२ या जमीनीबाबत मीठ आयुक्त व त्यांचेमध्ये वाद असून सदर प्रकरण मा.सर्वोच्च न्यायालयात प्रलंबित असल्यामुळे कोणत्याही प्रकारची चौकशी करुन कार्यवाही करु नये. सदर जमीनीमध्ये ठाणावाला हे सन १८६५ पासुन मीठ उत्पादन करत असुन सदर जागेच्या जवळ रेल्वे, ब्रीज पोलीस स्टेशन असून गजबजलेला परिसर आहे, त्या भागात कधीही फ्लेमिंगो पक्षी पाहिलेले नाहीत असे कळविले आहे. आणि सदर जागे संदर्भात न्यायालात दावा सुरु असल्यामुळे सदर जागा अभयारण्यासाठी घेऊ नये असे कळविले आहे.

v) महाराष्ट्र मेरीटाईम बोर्ड, मुंबई यांनी दि.१०/५/२०१६ चे पत्रान्वये खालीलप्रमाणे लेखी म्हणणे सादर आहे ठाणे खाडीमध्ये मौजे मानखुर्द येथे बहुउद्देशिय जेटी निर्माण करण्यासाठी मे.योगायतन पोर्टस् प्रा.लि. यांचेशी त्यांच्या प्रकल्पाच्या अनुषंगाने शासन मान्यतेअंती महाराष्ट्र मेरीटाईम बोर्डाने त्यांचेशी दि.२२/१०/२००९ रोजी ३० वर्षाचा करारनामा स्वाक्षांकित केलेला आहे. सदर जेट्टीचे पहिल्या टप्यातील काम अंतिम टप्यात आहे. सदर प्रकल्पाअंतर्गत फ्लेमिंगो अभयारण्याखालील आरक्षित काही क्षेत्रामध्ये भविष्यात प्रवासी टर्मिनल उभारण्याचे नियोजित आहे. तसेच विक्रोळी, मुंबई उपनगर जिल्हा येथील गोदरेज कंपनीच्या जेट्टीवरुन कंपनीच्या अवजड उत्पादने बार्जव्दारे MBPT आणि JNPT येथे आणण्यात येतात. त्यामुळे वरील बाबीचा विचार करता अधिसूचनेव्दारे घोषित करण्यात आलेल्या क्षेत्रामुळे उपरोक्त बंदर विकास प्रकल्प बाधीत होण्याची शक्यता आहे त्यामुळै सायन पनवेल महामार्गानजीकचे मानखुर्द खाडीक्षेत्र तसेच विक्रोळी गोदरेज जेट्टी नजीकचे खाडी क्षेत्र अधिसूचनेमधून वगळण्याची विनंती केली आहे.

vi) योगायतन ग्रुप ऑफ कंपनीज यांनी दि.५/५/२०१६ चे पत्रान्वये चीफ एक्युक्यूटीव्ह ऑफीसर , महाराष्ट्र मेरीटाईम बोर्ड यांना प्रस्तावित प्रकल्पाची जमीन ठाणे खाडी फ्लेमिंगो अभयारंण्यासाठी घोषित करण्याच्या अधिसूचनेची दखल घेऊन योग्य ती कार्यवाही करणेबाबत कळवून त्यांची प्रत या कार्यालयास सादर केली. त्यानुसार सायन-पनवेल हायवेच्या बाजूने सप्लाय बेसीस व पॅसेंजर टर्मिनल, कंटेनर टर्मिनल, व यॉट क्लब व वॉटर स्पोर्टचे काम प्रस्तावित असल्याने त्याबाबत विचार करावा असे कळविले आहे. तसेच रेल्वे ब्रिज व रोड ब्रिजवर मोठया प्रमाणावर ट्रॅफीक असल्यामुळे त्याठिकाणी फ्लेमिंगो पक्षी येत नाहीत. तसेच नविन ब्रिज होणार असून नवीन विकास आराखडयामध्ये सार्वजनिक प्रकल्पाचे आरक्षण आहे.

vii) कार्यकारी अभियंता ठाणे खाडी पूल विभाग क्रं. १ कोकण भवन, नवी मुंबई यांना या कार्यालयाचे दिनांक ३०/०४/२०१६ चे पत्रान्वये प्रस्तावित "ठाणे खाडी फ्लेमिंगो अभयारण्याबाबत" लेखी म्हणणे सादर करण्याबाबत कळविले असता कार्यकारी अभियंता ठाणे खाडी पूल विभाग क्रं.१ कोकण भवन, नवी मुंबई यांनी सदर प्रकरणी कार्यकारी अभियंता बहुमजली इमारत बांधकाम विभाग कमानी कुर्ला यांना पुढील कार्यवाहीसाठी कळविले असता त्यांनी कोणतेही लेखी म्हणणे सादर केलेले नाही. यानंतर कार्यकारी अभियंता, ठाणे खाडी पूल विभाग क्र.१ कोकण भवन, यांनी त्यांचेकडील पत्र जा.क्र.ठाखापूवि-१/प्रशा/६२४/२०१६ दिनांक १७/५/२०१६ अन्वये सायन-पनवेल महामार्गावरील ठाणे खाडी पूल (नविन व जुना) हा महाराष्ट्र राज्य रस्ते विकास महामंडळ, बांद्रा मुंबई या कार्यालयाच्या अखत्यारीत येत असून या विभागाअंतर्गत ठाणे खाडी पूल १ व २ ची देखभाल व दुरुस्तीची कामे केली जातात असे कळविले आहे.

viii) मा.श्री.तुकाराम रामकृष्ण काते, विधानसभा सदस्य, अणुशक्ती नगर यांनी दि.५/५/२०१६ रोजी लेखी पत्र पाठविले असून त्यानुसार त्यांनी ठाणे खाडी फ्लेमिंगो अभयारण्य घोषित करण्याचा निर्णय लोकप्रतिनिधीना विश्वासात न घेता घेतला असल्यामुळे त्याला विरोध दर्शविला असून सदर ठिकाणी गणेशोत्सवात गणपती विसर्जन व नवरात्र उत्सवात देवी मातेचे विसर्जन केले जाते. भविष्यात या ठिकाणी दुसरा उड्डाण पूल होणार आहे आणि खाडीच्या बाजूलाच लागून झोपडपट्टी आहे असे नमूद करुन फ्लेमिंगो अभयारण्य घोषित केल्यास मानखुर्द व आजूबाजूच्या परिसराचा विकास पूर्णपणे थांबला जाईल म्हणून फ्लेमिंगो अभयारण्य घोषित करु नये अशी विनंती केली आहे.

ix) टाटा रियालीटी ॲण्ड इन्फ्रास्ट्रक्चर लि. यांनी दि.३०/६/२०१६ चे पत्रान्वये अधिसूचित क्षेत्रातून वाशी ते घाटकोपर असा रोप वे प्रस्तावित असून वाशी ते घाटकोपर रोप वे मधील क्षेत्र "ठाणे खाडी फ्लेमिंगो अभयारण्याच्या" अधिसूचीत क्षेत्रातून वगळण्यात यावे अशी विनंती केली आहे.

x) मुख्य अभियंता महा ट्रान्सको यांचे यांनी अधिकारी दिनांक ८/३/२०१६ रोजी सुनावणीवेळी उपस्थित राहून त्यांचेकडील पत्र क्रमांक सी.ई./EHV/CCO&M/ Zone/VSH/482 दिनांक ८/३/२०१६ अन्वये खालीलप्रमाणे लेखी म्हणणे सादर केले आहे.

ठाणे खाडी फ्लेमिंगो अभयारंण्य म्हणून घोषीत करण्यात येणा-या जागेत MSETCL व Tata Power यांच्या EHV पॉवर लाईन सदरच्या अधिसूचीत क्षेत्रातून जात आहेत. सदरच्या पॉवरलाईन ४० ते ५० वर्षांपूर्वीच्या जुन्या असून त्यामध्ये मुंबई सर्कलला विद्युत पुरवठा केला जातो. सदर पॉवर लाईनची नियमित देखभाल व तांतडीच्या दुरुस्त्या कराव्या लागतात. तरी सदरच्या EHV पॉवर लाईन जात असलेल्या जमिनीमध्ये नियमित दुरुस्ती व तांतडीच्या दुरुस्तीसाठी जावे लागत असल्यामुळे ठाणे खाडी फ्लेमिंगो अभयारण्यामधून सदरचे क्षेत्र अंदाजे १४८.७१५६ हेक्टर क्षेत्र वगळण्यात यावे अशी विनंती केली आहे. तथापि मुख्य अभियंता, महा ट्रान्सकोकडील दि.२/९/२०१६ चै पत्रान्वयै ठाणे खाडी फ्लेमिंगो अभयारण्य म्हणून घोषित करण्यात येणा-या

क्षेत्रातून MSETCL व Tata Power यांच्या EHV पॉवर लाईन जात असलेल्या क्षेत्राचा सुधारीत नकाशा तयार करुन सादर केलेला असुन सदर क्षेत्रात सध्या अस्तित्वात असलेले EHV पॉवर लाईनचे बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] चे अधिकार Right of way कायम ठेवण्याची मागणी केली आहे.

xi) टाटा पॉवर कंपनी लि. यांना दिनांक ८/३/२०१६ रोजी सुनावणी देण्यात आली असता टाटा पॉवर कंपनी लि. यांनी त्यांच्याकडील पत्र क्रमांक टीपी/व्हीके/पी.आर.जे.400kv/CRZ/396 दिनांक ८/३/२०१६ च्या पत्रान्वये त्यांचे लेखी म्हणणे सादर केले आहे. त्यानुसार MSETCL व Tata Power Co. Ltd यांच्या ठाणे खाडी फ्लेमिंगो अभयारण्य अधिसूचित क्षेत्रातून ट्रान्समिशन लाईन जात असून सदर ट्रॉन्समिशन लाईन्सची नियमित देखभाल, दुरुस्ती करणे आवश्यक असते व यासाठी सदर क्षेत्रात नियमित जावे लागते. सदर ट्रान्समिशन लाईनमधून मुंबईला वीज वितरण केले जाते. सदरची ट्रान्समिशन लाईन्स ही वाशी ब्रिजच्या उत्तरेकडील बाजूने जात असून याबाबतचा नकाशा त्यांनी सादर केला आहे. सबब ठाणे खाडी फलेमिंगो अभयारण्याच्या अधिसुचीत क्षेत्रातून सदरचा पॉवर ट्रान्समिशन कॉरिडॉर वगळण्यात यावा अशी विनंती केली आहे.

तथापि, टाटा पॉवर कंपनी यांनी दि.२/९/२०१६ चे पत्रान्वये ठाणे खाडी फलेमिंगो अभयारण्य म्हणून घोषित करण्यात येणा-या क्षेत्रातून MSETCL व Tata Power यांच्या EHV पॉवर लाईन जात असलेल्या क्षेत्राचा सुधारीत नकाशा तयार करुन सादर केलेला असुन सदर क्षेत्रात सध्या अस्तित्वात असलेले EHV पॉवर लाईनचे बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] चे अधिकार Right of way कायम ठेवण्याची मागणी केली आहे.

४. उपरोक्त प्रमाणे प्राप्त झालेले दावे व हरकती मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांचेकडे विधिवत अभिप्रायासाठी पाठविणेत आले असून सदर आक्षेपाच्या अनुषंगाने त्यांचेकडून आक्षेपनिहाय अनुक्रमे प्राप्त झालेले अभिप्राय खालीलप्रमाणे आहेत.

i) मुख्य अभियंता, मुंबई सिवेज डिस्पोजल प्रोजेक्ट, बृहन्मुंबई महानगरपालिका यांनी नोदंविलेले आक्षेप हे इको सेंसटिव्ह झोन (पर्यावरण संवेदनशिल क्षेत्र) घोषित करण्याबाबत असुन, अभयारण्यांबाबत नाहीत. त्यामुळे सद्यस्थितीत त्यांचे आक्षेपावर विचार करण्याची आवश्यकता नाही असे अभिप्राय मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी दि.२९/६/२०१६ चे पत्रान्वये दिलेले आहेत.

ii) उपायुक्त मिठ यांचेकडील हरकतीबाबत पुढीलप्रमाणे अभिप्राय दिलेले आहेत.

मा. विभागीय आयुक्त, कोकण विभाग यांचेकडील दि.५/७/२००८ चे अधिसुचनेप्रमाणे मुलुंड, भांडुप, नाहुर, कांजुर व मंडाले मधील जमीन "संरक्षित वने" म्हणून घोषित करण्यात आलेले आहे. वरील गावातील "संरक्षित वने" म्हणुन क्षेत्र घोषित करण्यात आलेले असताना कोणीही हरकत घेतलेली नाही, त्यामुळे सदर क्षेत्र

शासनाचे होते म्हणुनच मा.उच्च न्यायालयाच्या आदेशानुसार "संरक्षित वन" म्हणुन घोषित करण्यात आले होते. वरीलप्रमाणे सदर क्षेत्राची वैधानिक स्थिती आहे. सदर क्षेत्रात फ्लेमिंगो व अन्य इतर पक्षांचे आश्रयस्थान व अधिवास आहे त्यामुळे सदर पक्षांना परिणामकारक संरक्षण प्रदान करणे यासाठी अभयारण्याची निर्मिती करणे आवश्यक असल्याने आक्षेपकर्त्यांचा आक्षेप निकाली काढण्याबाबत मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी हरकतीचे अनुषंगाने दि.२९/७/२०१६ चे पत्रान्वये विनंती केली आहे.

iii) & iv) पुर्नानंद आणि कंपनी व लोक हाऊसिंग अॅण्ड कन्स्ट्रक्शन ली. यांचे आक्षेपाबाबत मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी त्यांचेकडील दि.३/८/२०१६ चे पत्रान्वये असे अभिप्राय सादर केले आहेत की, मौजे मंडाळे येथील नभूक्रं २ सर्वे नं.८९ नभुक्रं.१ सर्वे नं.८८ आणि तुर्भे येथील मिठागरापैकी नभूक्र.५ मधील सरकारी जागेवरील कांदळवन क्षेत्र मा. उच्च न्यायालयाने याचिका क्रं.३२४६/२००४ रुपांतरीत जनहित याचिका ८७/२००६ मध्ये दि.७/७/२००८ रोजी दिलेल्या निर्णयानुसार दि.७/७/२००८ मध्ये "संरक्षित वने" म्हणुन घोषित करण्यात आले होते. सदरचे क्षेत्र शासन निर्णय क्रं.महसुल व वन विभाग एस१०/२०१३/प्र.क्र.६४/फ-३ दि.२५/६/२०१३ नुसार दि.१९/९/२०१३ रोजी भारतीय वन अधिनियम १९२७ चे कलम ४ अंतर्गत "राखीव वने" म्हणुन अधिसुचीत करण्यात आलेले आहे. सदरची अधिसूचना प्रसिध्द झाल्यानंतर कोणत्याही पक्षकारानी हरकती घेतलेल्या नाहीत.

तसेच मंडाळे येथील सर्वे नं.८९ नभूक्रं.२ मधील २८.९५ हे. सरकारी जमिनीवरील "राखीव वन" म्हणून घोषित झालेले क्षेत्र ठाणे फ्लेमिंगो अभयारण्याची निर्मिती करीता प्रस्तावित करण्यात आलेले आहे. ठाणे फ्लेमिंगो अभयारण्याचे प्रस्तावित क्षेत्रात सरकारी जमिनीवरील अधिसूचीत कांदळवन क्षेत्राचा समावेश करण्यात आलेला असून त्यामध्ये अधिसूचीत खाजगी कांदळवन क्षेत्राचा समावेश नाही. सर्वे नं.८८ नभूक्रं.२ मधील २०.९४ हे. तसेच मौजे तुर्भे येथील नभूक्र.५ मिठागरापैकी २१.८३० हे. क्षेत्र भारतीय वन अधिनियम १९२७ कलम ४ अंतर्गत "राखीव वन" म्हणून अधिसूचीत करण्यात आले होते. सदर क्षेत्राचा वैधानिक दर्जा वरीलप्रमाणे आहे. सदर क्षेत्रात असणा-या फ्लेमिंगो व इतर पक्षांचे आश्रयस्थान व अधिवास आहे. तसेच खाडी किना-यावरील आढळणा-या जैव विविधता यांचे अधिक परिणामकारक संवर्धन करता येऊ शकेल. त्यामुळे सदर पक्षांना परिणामकारक संरक्षण प्रदान करणेसाठी अभयारंण्य निर्माण करणे आवश्यक असून अर्जदार यांचे आक्षेप निकाली काढणेबाबत कळविले आहे.

v) मेरीटाईम बोर्ड यांचे आक्षेपासंदर्भात मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी त्यांचेकडील दि.१६/९/२०१६ चे पत्रान्वये पुढील प्रमाणे अभिप्राय दिलेले आहेत.

प्रस्तावित "ठाणे खाडी फ्लेमिंगो अभयारंण्य" मध्ये प्रवासी टर्मिनल उभारण्याबाबत प्रस्तावित करण्यात आलेला प्रकल्प भविष्यात होणार आहे त्यामुळे सदर भविष्यातील प्रकल्पाबाबत आत्ता विचार करणे अपेक्षित नाही. तसेच मानखुर्द खाडी क्षेत्र तसेच विक्रोळी गोदरेज जेट्टी नजीकचे क्षेत्र वगळण्याबाबत पुढील प्रमाणे

अभिप्राय दिले आहेत. मा.उच्च न्यायालयाने दिलेल्या आदेशानुसार कांदळवन क्षेत्र हे प्रथम "संरक्षित वने" म्हणून आणि नंतर "राखीव वने" म्हणुन अधिसुचित करण्यात आलेले आहे. "राखीव वने" म्हणुन अधिसुचीत झालेल्या क्षेत्रापैकी "ठाणे खाडी फ्लेमिंगो अभयारण्याकरिता" प्रस्तावित करण्यात आलेले आहे.

vi) मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी योगायतन ग्रुप यांचे आक्षेपाबाबत स्वतंत्र अभिप्राय दिलेले नाहीत. तथापी मेरीटाईम बोर्ड यांनी योगायतन ग्रुप यांचेसोबत प्रवासी टर्मिनल उभारण्याबाबत केलेल्या कराराच्या अनुषगाने घेतलेल्या आक्षेपाबाबत मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबइ यांनी दि.१०/५/२०१६ चे पत्रान्वये प्रस्तावित "ठाणे खाडी फ्लेमिंगो अभयारण्यामध्ये" प्रवासी टर्मिनल उभारण्याबाबत प्रस्तावित करण्यात आलेला प्रकल्प भविष्यात होणार आहे त्यामुळे सदर भविष्यातील प्रकल्पाबाबत आत्ता विचार करणे अपेक्षित नाही. अभयारण्यासाठी प्रस्तावित असलेली जमीन "राखीव वन" म्हणून अधिसूचीत असुन "राखीव वने" म्हणुन अधिसुचीत झालेल्या क्षेत्रापैकी "ठाणे खाडी फ्लेमिंगो अभयारण्याकरिता" प्रस्तावित करण्यात आलेले असल्यामुळे आक्षेप मान्य करता येणार नाही असे अभिप्राय दिले आहेत.

vii) ठाणेखाडी पूल विभाग क्र.१, कोकण भवन नवी मुंबई यांचे आक्षेपाच्या अनुषंगाने मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी कोणतेही अभिप्राय दिलेले नाहीत.

viii) मा.आमदार श्री.तुकाराम काते यांच्या पत्राच्या अनुषंगाने मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी त्याचेकडील पत्र दि.२९/७/२०१६ अन्वये प्रस्तावित अभयारण्य हे कांदळवन क्षेत्रात आहे व सदर क्षेत्र हे यापुर्वीच "राखीव वन" म्हणुन घोषीत करण्यात आलेले आहे. त्यामुळे उक्त हरकती वन कायद्याप्रमाणे प्रतिबंधीत आहेत. मा.आमदार महोदयांच्या पत्रात सर्व्हे क्रमांक नमूद केलेले नाहीत. तथापी सदरचे अभयारण्य वाशी खाडी पुलापर्यंतच असून ते मंडाळा गावापर्यंतच आहे त्यामुळे सदर अभयारण्यात मानखुर्द गावाचा समावेश होत नाही.

अभयारण्य म्हणुन घोषित करण्यात आलेले कांदळवन क्षेत्र हे मुख्यत्वे नव्याने तयार झालेल्या क्षेत्राची पट्टी आहे. जी प्रामुख्याने खाडी किनारी असल्याने त्या क्षेत्रावर कोणाचेही वास्तव्य अथवा अधिकार असण्याचा प्रश्न उद्भवत नाही अशी धारणा असल्याचे स्पष्ट केले आहे. अभयारण्य क्षेत्र हे फ्लेमींगो व अन्य असंख्य पक्षांचे अधिवास स्थळ व आश्रय ठिकाण असल्यामुळे सदर क्षेत्रात अभयारण्य झाल्यास सदर पक्षांना वैधानिक रित्या परिणामकारक संरक्षण मिळेल तसेच खाडी क्षेत्रातील जैव विविधता अबाधित राहील. त्यामुळे सदरचे आक्षेप संयुक्तिक वाटत नाही असे कळविले आहे.

ix) टाटा रियरलीटी आणि इन्फ्रास्टक्चर लि. यांच्या पत्राच्या अनुषंगाने मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी त्याचेकडील पत्र दि.१६/९/२०१६ अन्वये प्रस्तावित ठाणे खाडी अभयारण्य अधिसूचित करण्यासाठी उक्त क्षेत्रातील जमिनीमध्ये किवा त्यावर कोणत्याही व्यक्तीच्या नावे असलेल्या अभिकथीत अधिकाराचे अस्तित्व, स्वरुप व व्याप्ती यांची चौकशी करण्याकरीता व ते निश्चित करण्याकरीता वन्यजीव संरक्षण अधिनियम १९७२

वरील तरतूदीनुसार निर्णय घेणे योग्य राहील तथापी नमूद केलेला प्रकल्प भविष्यात करण्यात येणार आहे म्हणुन सदर भविष्यातील प्रकल्पाबाबत विचार करणे अपेक्षित नाही असे कळविले आहे.

x) & xi) मुख्य अभियंता, महाराष्ट्र राज्य विद्युत वितरण कंपनी लि व मे.टाटा पॉवर कंपनी लि. यांचे उपरोक्त हरकतीचे अनुषंगाने मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांनी दि.२९/६/२०१६ चे पत्रान्वये खालीलप्रमाणे अभिप्राय कळविले आहेत.

मुख्य अभियंता, महाराष्ट्र राज्य विद्युत वितरण कंपनी लि व मे.टाटा पॉवर कंपनी लि. यांनी मौजे मंडाले येथील सुमारे १४८.७१५६ हे. क्षेत्र अभयारण्य अधिसूचनेतून वगळण्यासाठी निवेदन दिले आहे. मौजे मंडाले येथील स.नं. ८८,८९,९०,९१ व ८० तसेच स.नं.८२, ८३ व ८४ चे क्षेत्र अभयारण्यासाठी अधिसूचित करण्याचे प्रस्तावित आहे. सदर क्षेत्रातून वरील यंत्रणेच्या विद्युत वाहिन्याचे जाळे (Transmission line corridor) पसरलेले आहे. सदर विद्युत वाहिन्याचे जाळे तसेच नव्याने निर्मित विद्युत वाहिन्यांचे बांधकाम, संचालन व दुरुस्ती यासाठी प्रत्येक वेळी राष्ट्रीय वन्यप्राणी मंडळाकडे परवानगी घ्यावी लागेल व या प्रक्रियेत कालपव्यय होवून त्याचा परिणाम मुंबई शहराच्या विद्युत पुरवठयावर होईल असे यंत्रणेने नमूद केले आहे.

वरील वस्तुस्थिती ही बरोबर असली तरीही सदर क्षेत्र हे असंख्य पक्षी प्रजातींचे आश्रयस्थान अधिवास आहे. म्हणून सदर क्षेत्राचा अंतर्भाव अभयारण्यात केलेला आहे. तथापि उक्त क्षेत्र वगळावयाचे असल्यास सदर क्षेत्रातून जाणा-या सर्व विद्युत वाहिन्यावर परावर्तक (Reflectors) बसविण्याबाबत यंत्रणेला अट टाकण्यात यावी, असेही पुढे नमूद करण्यात आले आहे.

उक्त अभिप्रायाच्या अनुषंगाने अहवाल उपविभागीय कार्यालयाकडून शासनास सादर केला असता महसूल व वन विभाग यांचेकडील पत्र क्र.डब्ल्युएलपी-०३१५/प्र.क्र.७६/फ-१ दि.२४/३/२०१७ चे पत्रान्वये काही मुद्याबाबत पुनश्च खात्री करुन सुधारीत चौकशी अहवाल सादर करण्याबाबत कळविले आहे. सदर पत्राचे अनुषंगाने अपर प्रधान मुख्य वनसरक्षक, कांदळवन कक्ष बांद्रा, मुंबई यांचेकडून पुनश्च अभिप्राय अपेक्षिले असता त्यांनी दि.२१/९/२०१७ च्या पत्रान्वये खालीलप्रमाणे अभिप्राय कळविले आहेत.

१. लोक हौसिंग कन्स्ट्रक्शन व

२. पार्टनर पुर्नानंद आणि कंपनी - यांच्या प्राप्त हरकतीच्या अनुषंगाने पत्र क्रं.सर्वे/१०४२ दि.३/८/२०१६ अन्वये अहवाल अग्रेषित करण्यात आलेला आहे. सदर अहवालामध्ये त्यांचा दावा नाकरुन त्यांचे सविस्तर स्पष्टीकरण अभिप्रायामध्ये नमूद करण्यात आलेले आहे असा अभिप्राय कळविला आहे.

३. उप आयुक्त मीठ - यांनी दाखल केलेले मौजे मुलुंड, भांडुप, नाहुर, कांजूर व मंडाळे येथील क्षेत्राबाबत सादर केलेल्या हरकतीच्या अनुषंगाने कार्यालयीन पत्र क्र.कक्ष-४/वजी/अभयारण्य/२०१३ दि.२९/७/२०१६ अन्वये

अभिप्राय अग्रेषित करण्यात आलेला आहे. शासन पत्रामध्ये मीठ आयुक्त यांनी नोंदविलेल्या आक्षपाच्या अनुषंगाने उपस्थित केलेल्या मुद्यांच्या अनुषंगाने या पुर्वी सादर केलेल्या अभिप्रायाच्या व्यतिरिक्त काही बाबी निदर्शनास आणुन देत आहे.

उप आयुक्त मीठ यांनी त्यांच्या पत्रात नमुद केलेले मुलुंड, भांडुप, नाहुर, कांजूर मधील खालील नमूद केलेले सर्वे क्र. पुढीलप्रमाणे आहेत.

जिल्हा	तालुका	गावचे नांव	सर्वे क्रमांक
मुंबई उपनगर	कुर्ला	मुलुंड	८९, ९५,९७, ९८,९९, १००, १०१, १०२, १०३, १०४, १०५, ३५१, ३७८, ३८७, ३८८, २८९, ३९०.
		भांडुप	१६, १७, १८, १९, २०, २१, २२, २३, २४, २५, २६, २७, २८, २९, ३०, ३३, ३४, ३५, ६१, ६२, ६३.
		नाहुर	१०, १९, २०, १५७, १८०, १८२.
		कांजुर	१३, १४, १७, १९, २०, २१, २२, २३, ४३, ४८, २७५.
		मंडाळे	८८, ८९/१/१, ९०/१/१, ९१/१/१, ९२

वरील नमुद करण्यात आलेल्या सर्वे क्रमांकापैकी फक्त मंडाळे मधील सर्वे क्रमांक ८८ हा प्रारुप अधिसुचनेमध्यै समाविष्ट आहे. प्रारुप अधिसुचनेमध्ये सर्वे क्र.८८ मधील नभूक्र.१ मधील ३४.५०० हे. क्षेत्र समाविष्ट करण्यात आलेले आहे असे नमुद केले असले तरी अधिसुचनेमध्ये स.क्रं.९१, न.भू.क्र. १ मधील ३४.५०.०० हे.आर क्षेत्र समाविष्ठ केलेले आहे.

याशिवाय सदरचे क्षेत्र राखीव वन म्हणून अधिसुचित होण्यापुर्वी सन २००८ मध्ये संरक्षित वने म्हणुन अधिसुचित करण्यात आलेले होते. शासन आदेश क्र.महसुल व वन विभाग, एस-१०/२०१३/प्र.क्र.६४/फ-३ दि.२६/६/२०१३ नुसार संरक्षित वने म्हणून शासकीय जमिनीवरील घोषित झालेले कांदळवन क्षेत्रास पुरेसे वैधानिक संरक्षण प्रदान करण्याच्या दृष्टीने त्यास "राखीव वनै" म्हणून घोषित करण्याबाबत शासन स्तरावरुन निर्णय घेण्यात आलेला होता. त्यानुसार १९ सप्टेंबर २०१३ अन्वये सदरचे संरक्षित वनक्षेत्र भारतीय वन अधिनियम १९२७ चे कलम ४ अंतर्गत "राखीव वने" म्हणून घोषित करण्यात आलेला आहे.

सन २००८ मध्ये सदरचे क्षेत्र संरक्षित वने म्हणून अधिसुचित झाल्यानंतर तसेच सन २०१३ मध्ये भारतीय वन अधिनियम १९२७ चे कलम ४ अंतर्गत "राखीव वने" म्हणून अधिसुचित झाल्यानंतर मीठ उप

आयुक्त यांच्या मार्फत सदर क्षेत्राचे मालकी हक्काबाबत आक्षेप नोंदविण्यात आलेले नाहीत. त्यामुळे सदर क्षेत्राबाबत असणा-या वस्तुस्थितीनुसार माहिती अग्रेषित करीत आहे. तसेच शासन पत्रात दिलेल्या निर्देशानुसार जमीनीचे ७/१२ उतारे, मालमत्ता व इतर मालकी विषयक दस्ताऐवज तपासून त्यांची मालकी निश्चित करण्याबाबत आपले मार्फत कार्यवाही करावी असे अभिप्राय कळविले आहेत.

४. श्री.तुकाराम रामकृष्ण काते, वि.स.स.- यांनी दाखल केलेल्या हरकतीच्या अनुषंगाने या कार्यालयाचे पत्र क्र.वजी/अभयारण्य/२०१२ दि.२९/६/२०१६ अन्वये सविस्तर अभिप्राय अग्रेषित करण्यात आलेला आहे.

५.महाराष्ट्र मेरीटाईम बोर्ड- यांनी दाखल केलेल्या हरकतीच्या अनुषंगाने या कार्यालयाचे पत्र क्रसर्वे/१३६५ दि.१६/९/२०१६ अन्वये सविस्तर अभिप्राय अग्रेषित करण्यात आलेला आहे.

६. Tata Realitirs & Insfrastucture यांनी दाखल केलेल्या हरकतीच्या अनुषंगाने या कार्यालयाचे पत्र क्र.सर्वे/१३६४ दि.१६/९/२०१६ अन्वये सविस्तर अभिप्राय अग्रेषित करण्यात आलेला आहे.

७. मुख्य अभियंता मलनिस्सारण विभाग बृहन्मुंबई महानगरपालीका यांनी दाखल केलेल्या हरकतीच्या अनुषंगाने या कार्यालयाचे पत्र क्र.वजी/अभयारण्य/२०१२ दि.२९/६/२०१६ अन्वये सविस्तर अभिप्राय अग्रेषित करण्यात आलेला आहे.

८. मुख्य अभियंता महाराष्ट्र राज्य, विद्युत वितरण कंपनी लि व मे.टाटा पॉवर कंपनी लि. यांनी दाखल केलेल्या हरकतीच्या अनुषंगाने या कार्यालयाचे पत्र क्र.कक्ष-९/वन्यजीव/६८३ दि.२९/६/२०१६ अन्वये सविस्तर अभिप्राय अग्रेषित करण्यात आलेला आहे.

प्रस्तावित ठाणे खाडी फ्लेमिंगो अभयारण्यातील मौजे मंडाळे येथील स.क्र.८८, ८९, ९०, ९१, ८० तसेच स.क्र. ८२, ८३, ८४ व वाशी खाडी क्षेत्राचा अंदाजे १४८.७१५६ हे.वर Maharashtra State Electricity Transmission Co.Ltd. And Tata Power Co. या कंपनीची २२० kv, ११०kv, ४००kv अशा एकुण सात विद्युत वाहिन्या आहेत. सदर क्षेत्रातील विद्युत वाहिन्याचे Upgradation या करिता तसेच त्या क्षेत्रामध्ये बांधकाम, संचालन व सुव्यवस्था यांचे अधिकार (Right of way) संपुर्ण शासकीय तथा निमशाकीय यंत्रणेकरिता कायम ठेवुन विद्युत वाहिन्यामुळे बाधित होणा-या क्षेत्राची मोजणी करुन सदर प्रस्तावित क्षेत्र अंतिम अंधिसुचनेमधुन वगळुन अंतिमत: ठाणे खाडी फ्लेमिंगो अभयारण्य म्हणुन घोषित करण्यास हरकत नाही असे अभिप्राय कळविले आहेत.

५. मा. प्रधान मुख्य वन संरक्षक (वन्यजीव) तथा मुख्य वन्यजीव संरक्षक, महाराष्ट्र राज्य, नागपुर यांचेकडून वन्य जीव संरक्षण अधिनियम १९७२ चे कलम २४(२)(क) मधील तरतुदीनुसार मागविण्यात आलेल्या अहवालानुसार त्यांनी पत्र क्र.कक्ष-२३/(२)/सर्वे/ प्र.क्र.२२१/२२०८-अ/२०१६-१७ दिनांक ८/९/२०१६ अन्वये खालीलप्रमाणे अभिप्राय दिलेले आहेत.

प्रस्तावित फ्लेमिंगो अभयारण्यातील मौजे मंडाळे ता.कुर्ला येथील गट/सर्व्हे क्र.८८, ८९, ९०, ८० तसेच नविन गट क्रमांक ८२, ८३ व ८४ व वाशी खाडी क्षेत्राचा भाग अंदाजे क्षेत्र १४८.७१५६ हे. वर महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड (MSETCL) व टाटा पॉवर या कंपनीची २२० किलोवोल्ट, ११०किलोवोल्ट, व ४०० किलोवोल्टची खालीलप्रमाणे एकूण ७ विद्युत वाहीन्या आहेत.

SN	Name of transmission lines	Name of Utility
1	220 kV Kalwa-Trombay & Mulund-Trombay	MSETCL
2	220 kV Sonkhar-Trombay & TIFIL-Trombay	
3	220 kV Kharghar-Trombay & TIFIL-Trombay	
4	220 kV Bhira-Dharavi	Tata Power
5	110 kV Khopoli-Mankhurd	
6	110 kV Khopoli-Chembur	
7	400 kV Kharghar-Vikhroli	

वरील प्रमाणे महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड (MSETCL) व टाटा पॉवर या कंपनीच्या विद्युतवाहीन्या कायम ठेवून सदर विद्युतवाहीनीचे बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] यांचे पोच रस्याचेअधिकार (Right of way) पुढे ही कायम ठेवण्यास हरकत नाही. परंतू सदर विद्युत कंपनीने अभयारंण्याचे भागात कोणतेही काम करण्याअगोदर संबंधित अभयारंण्याचे अधिका-यांना सूचित करावे व त्यांचे सुचनेनुसार कामे करावीत. बांधकाम संचालन व सुव्यवस्थेची कामे पार पाडतांना तेथील पक्षी तसेच त्यांचे आश्रयस्थळाला कोणतीही हानी पोहचणार नाही यांची संपुर्ण दक्षता घेणे आवश्यक राहील. अभयारण्य क्षेत्रात प्रवेश करतेवेळी व अभयारण्यात असेपर्यंत वन्यजीव (संरक्षण) अधिनियम १९७२ चे कलम २७ (२) व (३) मधील तरतूदीचे काटेकोर पालन करावे.

वरील प्रमाणे वन्यजीव (संरक्षण) अधिनियम १९७२ चे कलम २४ (२) (क) च्या प्रावधनाप्रमाणे मुख्य वन्यजीव रंक्षक, महाराष्ट्र राज्य यांचेकडुन मान्यता प्रदान करण्यात आली आहे.

६. चेअरमन व मॅनेर्जीग डायरेक्टर, महाराष्ट्र राज्य विद्युत वितरण कंपनी लि. यांनी दि.३/१०/२०१७ रोजी अपर प्रधान मुख्य वनसरक्षक, कांदळवन कक्ष मुंबई यांना पाठविलेलया पत्राची प्रत या कार्यालयाकडे पाठविली आहे. सदर पत्रान्वये त्यांनी महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड (MSETCL) व टाटा पॉवर या कंपनीच्या विद्युतवाहीन्या असलेले व (Right of way) असलेले क्षेत्र ठाणे खाडी फ्लेमिंगो अभयारण्यातून वगळण्याची विनंती केली आहे.

७ प्रस्तुत प्रकरणातील प्राप्त झालेले आक्षेप व त्या अनुषंगाने मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई व मुख्य वन्यजीव सरंक्षक, महाराष्ट्र राज्य यांचे अभिप्राय, चेअरमन व मॅनेजींग डायरेक्टर, महाराष्ट्र राज्य विद्युत वितरण कंपनी लि., अपर प्रधान मुख्य वनसरक्षक, कांदळवन कक्ष यांचे अभिप्राय, तहसिलदार कुर्ला (मुलुंड) यांचेकडील स्थळनिरीक्षण पंचनामा व अहवाल आणि प्रकरणातील इतर कागदपत्रे/अभिलेख यांचे अवलोकन केले असता खालीलप्रमाणे निष्कर्ष आहेत.

i) मुख्य अभियंता, मुंबई मलनिस्सारण प्रकल्प, बृहन्मुंबई महानगरपालीका यांनी मलनिस्सारण प्रकल्प हे भांडूप व घाटकोपर मधील अभयारण्य अधिसुचीत क्षेत्रालगत असल्यामुळे ते क्षेत्र वगळण्याची विनंती केलेली आहे. परंतु सदरचे क्षेत्र हे ठाणे खाडी फ्लेमिंगो अभयारण्य अधिसूचीत क्षेत्रामध्ये येत नाही. तसेच मुख्य वनसंरक्षक कांदळवन कंक्ष यांचे अभिप्रायानुसार महानगरपालीकेचे आक्षेप हे इको सेंसटिव्ह झोन (पर्यावरण संवेदनशिल क्षेत्र) घोषित करण्याबाबत असुन फ्लेमिंगो पक्षी अभयारण्यांबाबत नाहीत. त्यामुळे सद्यस्थितीत त्यांचे आक्षेप मान्य करणे उचित होणार नाही.

ii उपायुक्त मीठ, मुंबई यांनी दिनांक ९/५/२०१६ चे पत्रान्वये मौजे मुलुंड, भांडूप, नाहुर कांजुर व मंडाळे येथील जमीनीहया मीठ विभाग, भारत सरकार यांच्या मालकीच्या असून सदर सॉल्ट पॅनच्या जमीनीबाबत त्यांचेकडील सादर नकाशामध्ये त्या जमीनी (Bhandup STP, Bhandup-IPS व Ghatkaoper -STP, Ghatkaoper - IPS) पिवळया रंगाने दर्शविलेल्या आहेत. उक्त पत्रातील मुद्दा क्रं.८ मध्ये नमुद केलेनुसार सदर जमीनी मीठ पिकविण्यासाठी भाडेपटयाने सन १९७१ पासून दिलेल्या असून मौजे मंडाळे येथील जमीनीबाबत न्यायालयात दावे प्रलंबित आहेत. सबब उक्त जमीनी हया केंद्रशासनाच्या मालकीच्या असल्याने त्या ठाणे खाडी फ्लेमिंगो अभयारंण्यासाठी घोषित करणेपूर्वी केंद्र शासनाच्या संक्षम प्राधिका-याची परवानगी घेण्यात यावी असे निवेदनामध्ये नमूद केले आहे. परंतु त्यांनी सादर केलेल्या नकाशामध्ये मीठ उत्पादनासाठी वापरण्यात येत असलेली जागा (Bhandup STP, Bhandup-IPS व Ghatkaoper -STP, Ghatkaoper - IPS) पिवळया रंगाने दर्शविलेली असून ती जागा ठाणे फ्लेमिंगो अभयारंण्यासाठी अधिसूचीत झालेल्या क्षेत्राच्या बाहेर दिसते. आक्षेपीत क्षेत्र हे ठाणे फ्लेमिंगो अभयारंण्यासाठी अधिसूचीत क्षेत्राच्या बाहेर असल्यामुळे ते वगळण्याची विनंती मान्य करण्याचा प्रश्न उद्भवत नाही. सबब त्यांचे आक्षेप फेटाळण्यात येत आहेत.

iii & iv) श्री.मुकेश एम.पटेल व इतर ११ यांचेवतीने पुर्णानंद आणि कंपनी (ॲडव्होकेट ॲण्ड असोशिएट) व लोक हाऊसिंग व कन्स्ट्रक्शन कंपनी लि. यांनी त्यांचे मालकीच्या जमिनीसंबंधी न्यायालयात दावा प्रलंबीत असल्याचे व जमीन घेण्याची झाल्यास भूसंपादन कायद्याअंतर्गत संपादन करुन त्याबाबत मोबदला देण्याची विनंती केली आहे परंतु सदर जमिनीसंबंधी असलेला वाद मीठ विभाग यांचेशी मीठागराच्या जमीनीसंबधी असल्याचे आक्षेपावरुन दिसत असून मीठागराची जमीन ही ठाणे खाडी फ्लेमिंगो अभयारण्यासाठी अधिसुचीत क्षेत्राचे बाहेर आहे. तसेच मुख्य वनसंरक्षक, कांदळवन कक्ष यांचे अभिप्रायानुसार आक्षेपीत जमीन ही मा.उच्च

न्यायालयामधील याचिका क्र.३२४६/२००४ व रुपांतरीत याचिका क्र.८७/२००६ मध्ये पारित झालेल्या निर्णयाप्रमाणे व त्याप्रमाणे दि.१९/९/२०१३ चे शासन निर्णयाप्रमाणे पूर्वीच "राखीव वन" म्हणून गठीत करण्याचे निश्चित केल्याची अधिसूचना केली असुन त्यावेळी कोणत्याही पक्षकाराने हरकत घेतलेली नाही. त्यामुळे त्या अधिसुचीत झालेल्या क्षेत्रापैकी "ठाणे खाडी फ्लेमिंगो अभयारण्याकरिता" प्रस्तावित करण्यात आलेले असल्यामुळे पुर्नानंद आणि कंपनी व लोक हाऊसिंग ॲण्ड कन्स्ट्रक्शन ली. यांचे आक्षेप मान्य करण्याचा प्रश्न उद्भवत नाही.

v) महाराष्ट्र मेरीटाईम बोर्ड, मुंबई यांनी प्रवासी टर्मिनल उभारण्याबाबत प्रस्तावित झाल्याचे नमूद केले असून ती जमीन अभयारण्यामधून वगळण्याची विनंती केली आहे. परंतु सदर प्रकल्प भविष्यात होणार आहे असे कळविले आहे. त्यामुळे सदर भविष्यातील प्रकल्पाबाबत सद्यस्थितीत विचार करणे उचित होणार नाही. त्यामुळे महाराष्ट्र मेरीटाईम बोर्ड, मुंबई यांचे आक्षेप मान्य करता येणार नाही.

vi) योगायतन ग्रूप ऑफ कंपनीज यांनी प्रवासी टर्मिनल उभारण्याबाबत प्रस्तावित करण्यात आलेला असून त्या प्रकल्पाबाबत त्यांनी मेरीटाईम बोर्ड यांचेबरोबर करारनामा केलेला असल्याचे नमूद केले आहे. सदर प्रस्तावित प्रकल्प अंतर्गत असणारी जमीन फ्लेमिंगो अभयारण्या खालील आरक्षीत क्षेत्रामधून वगळण्याची विनंती केली आहे. परंतू सदर प्रकल्प भविष्यात होणार असल्यामुळे त्या भविष्यातील प्रकल्पाबाबत सद्यस्थितीत विचार करणे उचित होणार नाही. त्यामुळे योगायतन ग्रुप ऑफ कंपनीज यांनी केलेली विनंती मान्य करता येणार नाही.

vii) कार्यकारी अभियंता, ठाणे खाडी पूल विभाग क्र.१ कोकण भवन, यांनी सायन-पनवेल महामार्गावरील ठाणे खाडी पूल (नविन व जुना) हे महाराष्ट्र राज्य रस्ते विकास महामंडळ, बांद्रा मुंबई या कार्यालयाच्या अखत्यारीत येत असून या विभागाअंतर्गत ठाणे खाडी पूल १ व २ ची देखभाल व दुरुस्तीची कामे त्यांचेकडुन केली जातात असे कळविले आहे. तथापी सायन-पनवेल महामार्गावरील ठाणे खाडी पूल (नविन व जुना) हे "ठाणे खाडी फ्लेमिंगो अभयारण्याकरिता" दाखल नकाशानुसार अधिसूचित क्षेत्राच्या बाहेर आहेत. त्यामुळे सदर आक्षेप विचारात घेण्याची आवश्यकता नाही.

viii) मा.आमदार श्री.तुकाराम काते - विधानसभा सदस्य अणुशक्ती नगर यांनी खाडी ठिकाणी गणेशोस्तवामध्ये गणेश विसर्जन, नवरात्र उत्सवामध्ये देवीचे विसर्जन केले जाते, भविष्यात त्या ठिकाणी दुसरा उड्डाणपूल होणार असुन खाडीला लागून झोपडपट्टी आहे असे नमूद करुन अभयारण्य घोषीत केल्यास मानखुर्द व आजूबाजूचा विकास पूर्णपणे थांबला जाईल, म्हणून फ्लेमिंगो अभयारण्य घोषीत करु नये अशी विनंती केली आहे. तथापी त्यांनी अभयारण्य अधिसुचीत क्षेत्राबाबत घेतलेला आक्षेप पाहता त्यांनी आक्षेपीत जमीनीबाबत मानखुर्द गावचा उल्लेख केलेला असून सर्वे नंबर नमूद केलेले नाहीत. त्यामुळे आक्षेपीत जमीन निश्चित कोणती आहे हे त्यांनी नमूद केले नाही त्यामुळे त्यांचे आक्षेप घेण्यामागचे प्रयोजन समजून येत नाही. अधिसुचचित क्षेत्र हे वाशी खाडी पुलापर्यंत असून ते मंडाळा गावापर्यंतच असून सदर अभयारण्यात मानखुर्द गावाचा समावेश होत नाही.

अभयारण्य म्हणुन घोषित करण्यात आलेले कांदळवन क्षेत्र हे मुख्यत्वे नव्याने तयार झालेल्या क्षेत्राची पट्टी आहे. जी प्रामुख्याने खाडी किनारी असल्याने त्या क्षेत्रावर कोणाचेही वास्तव्य अथवा अधिकार असण्याचा प्रश्न उद्भवत नाही. त्यामुळे सदरचे आक्षेप संयुक्तिक नसलेने ते फेटाळण्यात येत आहेत.

ix) टाटा रियालीटी ॲण्ड इन्फ्रास्ट्रक्चर लि. यांनी अधिसुचित क्षेत्रामधून रोप वे तयार करण्यात येणार असल्याने वाशी ते घाटकोपर मधील अधिसुचीत क्षेत्रामधून वगळण्याची विनंती केली आहे. परंतु प्रस्तावित ठाणे खाडी फ्लेमिंगो अभयारण्यामध्ये प्रस्तावित रोप वे हा भविष्यात होणार आहे. त्यामुळे सदर भविष्यातील प्रकल्पाबाबत आता विचार करणे अपेक्षित नाही. त्यामुळे टाटा रियालीटी ॲण्ड इन्फ्रास्ट्रक्चर लि. यांचे आक्षेप मान्य करता येणार नाहीत.

x) ठाणे खाडी फ्लेमिंगो अभयारण्य क्षेत्रातून महाराष्ट्र राज्य विद्युत वितरण कंपनी लि व मे.टाटा पॉवर कंपनी लि. यांच्या सद्यस्थितीत अस्तित्वात असलेल्या विद्युतवाहिन्याचे जाळे (Trandmission line corridor) सुधारीत नकाशामध्ये दर्शविलेल्या क्षेत्रामध्ये सध्या अस्तित्वात असलेले EHV पॉवर लाईनचे बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] चे पोच मार्गाचे अधिकार Right of way कायम ठेवण्याची विनंती कैलैली आहे. त्यानुसार महाराष्ट्र राज्य विद्युत वितरण कंपनी लि व मे. टाटा पॉवर कंपनी लि. यांच्या विद्युतवाहिन्याचे जाळे (Trandmiddion line corridor) पसरलेले आहे. सदर विद्युत वाहिन्याचे जाळे तसेच नव्याने निर्मित विद्युत वाहिन्यांचे व्यवस्थापन, संचालन व दुरुस्ती यासाठी प्रत्येक वेळी राष्ट्रीय वन्यप्राणी मंडळाकडे परवानगी घ्यावी लागेल व या प्रक्रियेत कालपव्यय होवून त्याचा परिणाम मुंबई शहराच्या विद्युत पुरवठयावर होईल असे कळविले आहे. तसेच सदर विद्युत वाहिन्या असलेल्या क्षेत्राची मोजणी करुन ते क्षेत्र फ्लेमिंगो अभयारण्यातुन वगळण्याबाबत अपर प्रधान मुख्य वनसंरक्षक यांनी अभिप्राय दिले आहेत. सदरची वस्तुस्थिती बरोबर असली तरीही सदर क्षेत्र है असंख्य पक्षी प्रजातींचे आश्रयस्थान व अधिवास आहे. याबाबींचा साकल्याने विचार करता अभयारण्यातून सदरची जमीन वगळणे योग्य होणार नाही. त्यामुळे महाराष्ट्र राज्य विद्युत वितरण कंपनी लि व मे.टाटा पॉवर कंपनी लि. यांच्या सद्यस्थितीत अस्तित्वात असलेल्या विद्युत वाहिन्याचे जाळे (Transmission line corridor) चे क्षेत्रामध्यै सध्या अस्तित्वात असलेले EHV पॉवर लाईनचे बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] चे पोच मार्गाचे अधिकार (Right of way) कायम ठेवणे उचित राहील असे मत आहे.

मा. प्रधान मुख्य व संरक्षक (वन्य जीव) महाराष्ट्र राज्य, यांनी प्रस्तावित फ्लेमिंगो अभयारण्यातील मौजे मंडाळे ता.कुर्ला येथील गट/सर्व्हे क्र.८८, ८९, ९०, ८० तसेच नविन गट क्रमांक ८२, ८३ व ८४ व वाशी खाडी क्षेत्राचा भाग अंदाजे क्षेत्र १४८.७१५६ हे. वर महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड

(MSETCL) व टाटा पॉवर या कंपनीची २२० किलो वोल्ट, ११० किलोवोल्ट, व ४०० किलोवोल्टची खालीलप्रमाणे एकूण ७ विद्युत वाहीन्या आहेत.

SN	Name of transmission lines	Name of Utility
1	220 kV Kalwa-Trombay & Mulund-Trombay	MSETCL
2	220 kV Sonkhar-Trombay & TIFIL-Trombay	
3	220 kV Kharghar-Trombay & TIFIL-Trombay	
4	220 kV Bhira-Dharavi	Tata Power
5	110 kV Khopoli-Mankhurd	
6	110 kV Khopoli-Chembur	
7	400 kV Kharghar-Vikhroli	

वरील प्रमाणे महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड (MSETCL) व टाटा पॉवर या कंपनीच्या विद्युतवाहीन्या कायम ठेवून सदर विद्युत वाहीनीचे बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] यांचे पोच मार्गाचे अधिकार (Right of way) पुढे ही कायम ठेवण्यास हरकत नाही. परंतू सदर विद्युत कंपनीने अभयारंण्याचे भागात कोणतेही काम करण्याअगोदर संबंधित अभयारंण्याचे अधिका-यांना सूचित करावे व त्यांचे सुचनेनुसार कामे करावीत. बांधकाम संचालन व सुव्यवस्थेची कामे पार पाडतांना तेथील पक्षी तसेच त्यांचे आश्रयस्थळाला कोणतीही हानी पोहचणार नाही यांची संपुर्ण दक्षता घेणे आवश्यक राहील. अभयारण्य क्षेत्रात प्रवेश करतेवेळी व अभयारण्यात असेपर्यंत वन्यजीव (संरक्षण) अधिनियम १९७२ चे कलम २७ (२) व (३) मधील तरतूदीचे काटेकोर पालन कराणे बंधनकारक राहील.

वरील प्रमाणे वन्यजीव (संरक्षण) अधिनियम १९७२ चे कलम २४ (२) (क) च्या प्रावधनाप्रमाणे मुख्य वन्यजीव संरक्षक, महाराष्ट्र राज्य यांचेकडुन मान्यता प्रदान करण्यात आली आहे.

मा. प्रधान मुख्य वन संरक्षक (वन्यजीव) तथा मुख्य वन्यजीव रक्षक, महाराष्ट्र राज्य नागपूर यांनी वर नमूद केलेल्या अटींवर उपरोक्त तक्त्यामध्ये नमुद केलेल्या महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड (MSETCL) व टाटा पॉवर या कंपनीची २२० किलोवोल्ट, ११० किलोवोल्ट, व ४०० किलोवोल्टच्या एकूण ७ विद्युत वाहीन्या असलेल्या क्षेत्रामध्ये बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] यांचे पोच मार्गाचे अधिकार (Right of way) पुढे ही कायम ठेवण्यास मान्यता देणे आवश्यक आहे.

७. ठाणे खाडी फ्लेमिंगो अभयारण्याकरिता अधिसुचित झालेल्या मिळकतींचे गाव अभिलेख व न.भू.अधिकारी यांचेकडील अभिलेखाप्रमाणे माहिती खालीलप्रमाणे आहे.

अ. क्र.	गावाचे नाव	सर्वे नं.	नभूक्र.	अधिसूचित क्षेत्र हेक्टर	अभिलेखाप्रमाणे संद्यस्थिती
१	मुलुंड	-	नविन १३२७	१४३.१६	मिळकत पत्रिकेप्रमाणे धारणाधिकार "ग" आहे. धारक सदरी महाराष्ट्र शासन संरक्षीत वने (कांदळवन) असे दाखल आहे.
२	विक्रोळी	-	नविन २०९	२५७.३५	धारणाधिकार "ग" आहे.
३	भांडूप	-	नविन १०४९	९४.९२	धारणाधिकार "ग" आहे. धारक सदरी महाराष्ट्र शासन संरक्षीत वने (कांदळवन) असे दाखल आहे.
४	कांजूर		नविन १३५१	२६४.८७	धारणाधिकार "ग" आहे. धारक सदरी महाराष्ट्र शासन संरक्षीत वने (कांदळवन) असे दाखल आहे.
५	मंडाळा	९१	१पै ४पै.	३४.५०.० १०.७३.००	७/१२ प्रमाणे कब्जेदार सदरी महाराष्ट्र शासन असे नाव दाखल आहे. इतर हक्कात संरक्षित वने अधिसुचित क्षेत्र नभूक्र १ क्षेत्र ४१.६०७८हे. व नभूक्र ४पै १०.७३० हे.अशी नोंद आहे. मिळकत पत्रिकेप्रमाणे नभूक्र १ चे क्षेत्र २५८९९६.५ चौ.मी. असून धारणाधिकार "ग" असा आहे. न.भू.क्र.४ चे एकूण क्षेत्र १३२६५६.७चौ.मी. असून १०.७३० हे. क्षेत्रास महाराष्ट्र सरकार कांदळवन असे नाव फेरफार क्र.४९१ अन्वये दाखल आहे.
६	मंडाळे	८९ पै.	२	२८.९५.००	७/१२ प्रमाणे मुळ क्षेत्र ८४ एकर ८ गुंठे ४ आणे होते. मिळकत पत्रिकेप्रमाणे न.भू.क्र.२ चे एकूणू क्षेत्र २३१७२८.८ चौ.मी. असून अभिलेखामध्ये महाराष्ट्र सरकार संरक्षित वने (कांदळवन) फेरफार क्र.४९१ अन्वये २८.९५ हे. क्षेत्रास नाव दाखल आहे.
७	मंडाळे	९०पै	न.भू.क्र.३	१४.७२०	७/१२ प्रमाणे जमिनीचे क्षेत्र ४१ एकर ३८ गुंठे ४ आणे क्षेत्र महाराष्ट्र शासनाचे नावे होते. त्यापैकी ३ गुंठे ४ आणे (३४०२ चौ.मी. क्षेत्र महाराष्ट्र सरकारव्दारा बांधकाम खाते ठाणे खाडीपूल यांचे नावे फे.क्र.२८७ तसेच २ एकर ३४ गूंठे क्षेत्र फे.क्र. १९१ अन्वये व १९ गुंठे फे.क्र.२०५ अन्वये सायन पनवेल रोड यांचे नावे दाखल झाले आहे. सद्यस्थितीत महाराष्ट्र शासनाचे नावे ३७ एकर ३२ गुंठे क्षेत्र असून सदरी तिवरांचा झाडोरा नष्ट करणेस प्रतिबंध व संरक्षीत वने अधिसूचित क्षेत्र न.भूक्र.३ क्षेत्र १४.७२० हे. अशी नोंद आहे. मिळकत पत्रिकेप्रमाणे न.भू.क्र.३ क्षेत्र १६७१२८.८० चौ.मी. असून धारणाधिकार जी १ असा आहे. व धारक सदरी महाराष्ट्र सरकार संरक्षित वने

					(कांदळवन) फेरफार क्र.४९१ प्रमाणे १४.७२० हे. क्षेत्रास नाव दाखल आहे.
८	मंडाळे	८० पै.	६	१५.२६०	७/१२ प्रमाणे जमीनीचे एकूण क्षेत्र ३३४.१८ एकर १८ गुंठे एवढे क्षेत्र महाराष्ट्र सरकार यांचे नावे दाखल होते. त्यापैकी विविध संस्थांना भाडेपटयाने दिलेले क्षेत्र वजा जाता सद्यस्थितीत ३०२ एकर २२ गुंठे १२ आणे क्षेत्र महाराष्ट्र सरकारचे नावे दाखल आहे व इतर हक्क सदरी तिवरांची झाडोरा नष्ट करणेस प्रतिबध व संरक्षीत वने अधिसूचित क्षेत्र न.भूक्र.६ क्षेत्र १५.२६० हे. अशी नोंद आहे. मिळकत पत्रिकेप्रमाणे न.भूक्र. ६/१ अ चे एकूण क्षेत्र ११४२९८१.६० चौ.मी. असून धारणाधिकार "जी" आहे व धारक सदरी महाराष्ट्र शासनाचे नाव दाखल आहे.
९	मंडाळे	-	नविन ८२	५४००.०० चौ.मी	धारणाधिकारी "ग" आहे. मिळकत पत्रिका कांदळवन क्षेत्रासाठी नव्याने उघडण्यात आल्याबाबतची नोंद आहे.
१०	मंडाळे	-	८३	९००.०० चौ.मी.	धारणाधिकारी "ग" आहे. मिळकत पत्रिका कांदळवन क्षेत्रासाठी नव्याने उघडण्यात आल्याबाबतची नोंद आहे.
११	मंडाळे	-	८४	३०९४८५.००	धारणाधिकारी "ग" आहे. मिळकत पत्रिका कांदळवन क्षेत्रासाठी नव्याने उघडण्यात आल्याबाबतची नोंद आहे.
१२	मुलुंड , विक्रोळी भाडुप, कांजूर, मंडाळे	-	-	७९४.४८७ हे.	सदरचे क्षेत्र खाडीपैकी असून त्यास मिळकत पत्रिका किंवा ७/१२ नाही.

सदर अभयारण्यातील अधिसुचीत क्षेत्राबाबत तहसिलदार, कुर्ला यांचेमार्फत प्राप्त झालेला स्थळ निरीक्षण पंचनामा व अहवालानुसार मौजे मुलुंड येथील नवीन न.भू.क्र.१३२७, विक्रोळी येथील नवीन न.भू.क्र.२०९, भांडूप येथील नवीन न.भू.क्र.१०४९ व कांजूर येथील नवीन न.भू.क्र.१३५१ या जागेवर कांदळवन झाडे असून जागा दलदल व खाडीची असून त्याजागेवर कोणत्याही स्वरूपाचे अतिक्रमण नाही. मौजे मंडाळा येथील सर्वे नं.९१ पैकी न.भू.क्र.१ पैकी, सर्वे नं.८९ पैकी न.भू.क्र.२, सर्वे नं.९० नं.भू.क्र.३ पैकी, सर्वे नं.९१ पैकी न.भू.क्र.४, नवीन न.भू.क्र.८२,८३,८४, या जागेवर कांदळवन असून जागा दलदल व खाडीची असून सदर जागेवर कोणत्याही स्वरूपाचे अतिक्रमण नाही.

वरील प्रमाणे नमूद जागेची सद्यस्थिती असून अधिसुचित क्षेत्रामध्ये कोणाचेही हक्क, हितसंबध प्रत्यक्ष अथवा वास्तव्य असल्याचे, कोणत्याही व्यक्तींचे वैयक्तिक अथवा सार्वजनिक हक्कांचे अस्तित्व आढळून आलेले नाही.

प्रकरणातील प्राप्त झालेले आक्षेप व त्या अनुषंगाने मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई व मुख्य वन्यजीव रक्षक, महाराष्ट्र राज्य यांचे अभिप्राय, तहसिलदार कुर्ला (मुलुंड) यांचेकडील स्थळनिरीक्षण पंचनामा व अहवाल व प्रकरणातील इतर कागदपत्रे/अभिलेख यांचे अवलोकन केले असता, महसूल व वन विभागाकडील अधिसूचना क्रमांक डब्ल्यूएलपी ०३१५/प्र.क्र.७६/फ-१ दिनांक ०६/०८/२०१५ मध्ये व सोबतच्या अनूसुची मध्ये नमूद करण्यात आलेल्या अभयारण्याच्या हद्दींमध्ये समाविष्ट असलेल्या जमिनीमधील किंवा जमिनीसंबंधातील कोणत्याही व्यक्तींचे वैयक्तिक अथवा सार्वजनिक हक्कांचे अस्तित्व आढळून आलेले नाहीत. दिनांक ४/१०/२०१७ रोजी कांदळवन कक्ष, मुंबई यांचे अधिकारी, संबधित मंडळ अधिकारी व संबधित तलाठी यांचेसमवेत अधिसूचित क्षेत्राची पाहणी करण्यात आली असून महाराष्ट्र शासनराजपत्र, असाधारण भाग चार-अ दिनांक ७/८/२०१५ मध्ये प्रसिध्द झालेली महसूल व वन विभागाकडील अधिसूचना क्रमांक डब्ल्यूएलपी ०३१५/प्र.क्र.७६/फ-१ दिनांक ०६/०८/२०१५ अन्वये "ठाणे खाडी फ्लेमिंगो अभयारण्याकरिता" निर्गमित केलेल्या अधिसूचनेत दर्शविलेल्या चतुसिमांप्रमाणे मंडाळे गावातील सायन पनवेल महामार्गाच्या उत्तरेकडील व लगत तुर्भे गावाची शीव मधील क्षेत्र हे "ठाणे खाडी फ्लेमिंगो अभयारण्याकरिता" अंतिमत: अधिसूचित करणे आवश्यक आहे.

तथापि महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड (MSETCL) व टाटा पॉवर या कंपनीची २२० किलोवोल्ट, ११० किलोवोल्ट, व ४०० क्रिलोवोल्टच्या एकूण ७ विद्युत वाहीन्या असलेल्या क्षेत्रामध्ये बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] यांचे पोच मार्गाचे अधिकार (Right of way) कायम ठेवणे आवश्यक आहे असे मत आहे.

उक्त अभयारण्याच्या हददीमध्ये समावेश असलेल्या जमिनीमधील अथवा जमिनीसंबंधातील कोणत्याही व्यक्तीचे अस्तीत्व, त्यांचे स्वरुप व व्याप्ती यांचे तपशील तसेच त्या संदर्भात कोणतीही भरपाईची मागणी असलेस तिचे तपशील व रक्कम विनिर्दिष्ट करणारी लेखी हक्क मागणी तसेच नमुद केलेल्या जमिनीत कोर्टाचे हितसंबंध असल्यास तसे म्हणणे दाखल करणेबाबत जाहीरनामा प्रसिध्द केला होता. तथापी जाहिरनामा प्रसिध्द झाल्यानंतर प्राप्त झालेल्या हरकतीनुसार कोणत्याही व्यक्तीचे/संस्थेचे अस्तित्व, हक्क मान्य करण्यासारखे नाहीत याबाबत माझी खात्री झाली आहे. सदर क्षेत्रात फ्लेमिंगो व अन्न इतर पक्षांचे अभयारण्य व अधिवास आहे. त्यामुळे सदर पक्षांना परिणामकारक संरक्षण प्रदान करणेसाठी अभयारण्याची निमिर्ती करणे आवश्यक आहे. तसेच खाडी किना-यावरील आढळणा-या जैव विविधता यांचे अधिक परिणामकारक संवर्धन होणार आहे. सदर पक्षांना परिणामकारक संरक्षण प्रदान करणेसाठी अभयारण्य निर्माण करणे आवश्यक आहे.

वरीलप्रमाणे नमूद केलेली वस्तुस्थिती विचारात घेता, वन्यजीव संरक्षण अधिनियम, १९७२ नुसार मला कलम १९ ते २५ (दोन्ही धरुन) अंतर्गत प्राप्त झालेल्या अधिकाराचा वापर करुन मी खालील प्रमाणे आदेश पारित करीत आहे.

- आदेश -

१. महसूल व वन विभागाकडील अधिसूचना क्रमांक डब्ल्यूएलपी ०३१५/प्र.क्र.७६/फ-१ दिनांक ०६/०८/२०१५ मध्ये व सोबतच्या अनूसुची मध्ये नमूद करण्यात आलेल्या १६९०.५२५५ हेक्टर या अभयारण्याच्या अधिसूचित क्षेत्रामध्ये समाविष्ट असलेल्या जमिनीमध्ये किंवा जमिनीसंबंधातील कोणत्याही व्यक्तीच्या वैयक्तिक अथवा सार्वजनिक हक्कांचे अस्तित्व आढळून आले नसलेने अधिसूचित क्षेत्रावर/जमिनीवर कोणत्याही व्यक्ती/समुह अगर संस्था यांचे सार्वजनिक अथवा वैयक्तिक हक्क नाहीत.

२. महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड (MSETCL) व टाटा पॉवर या कंपनीची २२० किलोवोल्ट, ११० किलोवोल्ट, व ४०० किलोवोल्टच्या एकूण ७ विद्युत वाहीन्या असलेल्या क्षेत्रामध्ये बांधकाम, संचालन व सुव्यवस्था [Construction, Operation and Maintenance] यांचे पोच मार्गाचे अधिकार (Right of way)कायम करणेस व मुख्य वन्यजीव रंक्षक, महाराष्ट्र राज्य यांचेकडील विवक्षित अटी-शर्तीस अधीन राहुन मान्य करण्यात येत आहेत.

३. महाराष्ट्र स्टेट इलेक्ट्रीसिटी, ट्रान्सपोर्ट कंपनी लिमीटेड (MSETCL) व टाटा पॉवर या कंपनीने अभयारंण्याचे भागात कोणतेही काम करण्याअगोदर संबंधित अभयारंण्याचे अधिका-यांची कलम २७ प्रमाणे परवानगी घेणे बंधनकारक आहे.अभयारण्य क्षेत्रात बांधकाम, संचालन व सुव्यवस्थेची कामे पार पाडतांना तेथील पक्षी तसेच त्यांचे आश्रयस्थळाला कोणतीही हानी पोहचणार नाही यांची संपुर्ण दक्षता घेणे आवश्यक राहील. अभयारण्य क्षेत्रात प्रवेश करतेवेळी व अभयारण्यात असेपर्यंत वन्यजीव (संरक्षण) अधिनियम १९७२ चे कलम २७ (२) व (३) मधील तरतूदीचे काटेकोर पालन करणे संबधितांना बंधनकारक राहिल.

SUB DIVISIONAL OFFICER
Eastern Suburban
Mumbai Suburban District

ठिकाण - विद्याविहार (प.)
दिनांक ०९/१०/२०१७

(राजेश श्रीपतराव काटकर)
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मा.प्रधान सचिव (वने),
महसूल व वन विभाग,
महाराष्ट्र राज्य, मंत्रालय, मुंबई ३२.

प्रत :- मा.जिल्हाधिकारी, मुंबई उपनगर जिल्हा, प्रशासकीय इमारत, १० वा मजला, बांद्रा मुंबई ५१ यांचेकडे माहितीसाठी सादर.

D/G/Report 7-1721

Annexure 8 Final Notification of Declaration of TCFS Dated 10th May 2018

RNI No. MAHBIL /2009/31733

महाराष्ट्र शासन राजपत्र

असाधारण भाग चार–अ

वर्ष ४, अंक ५७] गुरुवार, मे १०, २०१८/वैशाख २०, शके १९४० [पृष्ठे ६, किंमत : रुपये १५.००

असाधारण क्रमांक ९८

प्राधिकृत प्रकाशन

महाराष्ट्र शासनाने केंद्रीय अधिनियमांन्वये तयार केलेले
(भाग एक, एक-अ आणि एक-ल यांमध्ये प्रसिद्ध केलेले नियम व आदेश यांव्यतिरिक्त) नियम व आदेश.

महसूल व वन विभाग

मादाम कामा मार्ग, हुतात्मा राजगुरू चौक, मंत्रालय, मुंबई ४०० ०३२, दिनांक १० मे २०१८.

अधिसूचना

वन्यजीव (संरक्षण) अधिनियम, १९७२.

क्रमांक डब्ल्यूएलपी. ०३१५/प्र.क्र.७६/फ-१.—ज्याअर्थी, महाराष्ट्र शासनाने, वन्यजीव (संरक्षण) अधिनियम, १९७२ (१९७२ चा ५३) चे कलम १८ चे उप-कलम (१) व (२) व कलम १८ बी याद्वारे प्रदान केलेल्या अधिकारांचा वापर करुन, महसूल व वन विभाग क्रमांक डब्ल्यूएलपी. ०३१५/प्र.क्र.७६/फ-१, दिनांक ६ ऑगस्ट २०१५ अन्वये काढलेली शासन अधिसूचना व त्यासोबत जोडलेल्या अनुसूचीमध्ये विनिर्दिष्ट केलेल्या मुंबई उपनगर जिल्ह्यातील १६.९०५ चौ.कि.मी. इतके एकूण क्षेत्र " ठाणे खाडी फ्लेमिंगो अभयारण्य " म्हणून गठीत करणेबाबतचा आपला मानस घोषित केला आहे ;

आणि ज्याअर्थी, महाराष्ट्र शासनाने, महसूल व वन विभाग क्रमांक डब्ल्यूएलपी. ०३१५/प्र.क्र.७६/फ-१, दिनांक ०६ ऑगस्ट २०१५ द्वारे उक्त अधिसूचनेत विनिर्दिष्ट केलेल्या क्षेत्राचे हद्दीतील जमिनीसंबंधी उक्त अधिनियमाच्या कलम १९ ते २५ अन्वये प्रदान केलेल्या अधिकारांचा व कर्तव्यांचा वापर करण्यास जिल्हाधिकारी म्हणून, उप विभागीय अधिकारी, पूर्व उपनगर, मुंबई उपनगर जिल्हा यांना निर्देश दिले आहेत ;

आणि ज्याअर्थी, उप विभागीय अधिकारी, पूर्व उपनगर, मुंबई उपनगर यांनी " ठाणे खाडी फ्लेमिंगो अभयारण्य " मध्ये समाविष्ट १६.९०५ चौ.कि.मी. क्षेत्राबाबत चौकशी करुन त्याबाबतचे आदेश क्रमांक उविअ/पू.उ./ठाणे खाडी फ्लेमिंगो अभयारण्य/६१/१६/४५५, दिनांक ९ ऑक्टोबर २०१७ अन्वये पारीत केले आहेत ;

आणि ज्याअर्थी, उप विभागीय अधिकारी, पूर्व उपनगर, मुंबई उपनगर यांनी महाराष्ट्र स्टेट इलेक्ट्रिसिटी ट्रान्समिशन कंपनी लिमिटेड व टाटा पावर या कंपनींच्या खालील प्रमाणे अस्तित्वात असलेल्या विद्युत वाहिन्यांचे क्षेत्रामध्ये बांधकाम, संचालन व सुव्यवस्था करण्याकरिता पोच मार्गाचे अधिकार (Right of Way) मुख्य वन्यजीव रक्षक, महाराष्ट्र राज्य यांचेकडील विवक्षित अटी-शर्तीस अधीन राहून कायम ठेवण्यास मान्यता दिली आहे :–

अ.क्र. (१)	विद्युत वाहिन्यांचे नांव (२)	वापर करणारी यंत्रणा (३)
१	२२० किलोवोल्ट कळवा-ट्रॉम्बे आणि मुलुंड ट्रॉम्बे	
२	२२० किलोवोल्ट सोनाखार- ट्रॉम्बे आणि टीफील- ट्रॉम्बे	महाराष्ट्र स्टेट इलेक्ट्रिसिटी ट्रॉन्समिशन कंपनी लिमिटेड
३	२२० किलोवोल्ट खारघर- ट्रॉम्बे आणि टीफील- ट्रॉम्बे	
४	२२० किलोवोल्ट भीरा-धारावी	
५	११० किलोवोल्ट खोपोली- मानखुर्द	टाटा पावर
६	११० किलोवोल्ट खोपोली- चेंबुर	
७	४०० किलोवोल्ट खारघर- विक्रोळी	

आणि ज्याअर्थी, उक्त अधिसूचनेत विनिर्दिष्ट केलेल्या जमिनीच्या संबंधीतील हक्काबाबतचे सर्व दावे राज्य शासनाकडून निकाली काढण्यात आलेले आहेत ;

त्याअर्थी, आता, वन्यजीव (संरक्षण) अधिनियम, १९७२ (१९७२ चा ५३) चे कलम २६-क चे पोट कलम (१) चे खंड (क) द्वारे प्रदान करण्यात आलेल्या आणि त्याबाबतीत समर्थ करणाऱ्या इतर सर्व अधिकारांचा वापर करून, महाराष्ट्र शासन, याद्वारे सोबत जोडलेल्या अनुसूचीत विनिर्दिष्ट केलेले क्षेत्र, ही अधिसूचना **शासन राजपत्रात** प्रसिध्द झाल्याच्या दिनांकापासून अभयारण्यात समाविष्ट असेल व उक्त क्षेत्र " ठाणे खाडी फ्लेमिंगो " अभयारण्याचा भाग असल्याचे घोषित करीत आहे :–

अनुसूची

मुंबई उपनगर जिल्ह्यातील " ठाणे खाडी फ्लेमिंगो " अभयारण्याची स्थिती आणि हद्दी :-

१. अभयारण्याचे नाव :- ठाणे खाडी फ्लेमिंगो अभयारण्य

२. वन विभागाचे नाव :- मुंबई कांदळवन संधारण घटक

३. मूळ प्रादेशिक वन विभागाचे नाव :- ठाणे वन विभाग

४. जिल्ह्याचे नाव :- मुंबई उपनगर

५. अभयारण्यामध्ये समाविष्ट केलेल्या क्षेत्राचा तपशिल :-

अ.क्र. (१)	जिल्हा (२)	तालुका (३)	गावाचे नाव (४)	स.नं./सि.स.नं. (५)	क्षेत्र (हे.मध्ये) (६)	शेरा (७)
१	मुंबई उपनगर	कुर्ला	मुलुंड	नवीन १३२७	१४३.१६०	खाडी लगतचा
२			विक्रोळी	नवीन २०९	२५७.३५०	पश्चिमेकडील भाग
३			भांडुप	नवीन १०४९	९४.९२०	
४			कांजूर	नवीन १३५१	२६४.८७०	
५			मंडाळे	स. नं. ९१ पैकी (सि.स.नं. १ पैकी)	३४.५००	
				स. नं. ८९ पैकी (सि.स.नं. २)	२८.९५०	
				स. नं. ९० पैकी (सि.स.नं. ३ पैकी)	१४.७२०	
				स. नं. ९१ पैकी (सि.स.नं. ४)	१०.७३०	
				स. नं. ८० पैकी (सि.स.नं.६)	१५.२६०	

(१)	(२)	(३)	(४)	(५)	(६)	(७)
				नवीन ८२	०.५४०	
				नवीन ८३	०.०९०	
				नवीन ८४	३०.९४८५	
				एकूण	**८९६.०३८५**	
६			मुलुंड, विक्रोळी, भांडुप, कांजूर, मंडाले		७९४.४८७	खाडी क्षेत्र (महसूली क्षेत्र)
				एकूण एकंदर	**१६९०.५२५५**	

" ठाणे खाडी फ्लेमिंगो " अभयारण्यात समाविष्ट होणारे खाडी लगतचे पश्चिमेकडील क्षेत्र : ८९६.०३८५ हे.
खाडी क्षेत्र (महसूल क्षेत्र) : ७९४.४८७० हे.
एकूण क्षेत्र : १६९०.५२५५ हे.
किंवा १६.९०५ चौ.कि.मी.

ठाणे खाडी फ्लेमिंगो अभयारण्याच्या चतु:सिमा :-

गाव/स.नं. (१)	उत्तर (२)	पूर्व (३)	दक्षिण (४)	पश्चिम (५)
मौजे मुलुंड नवीन १३२७	मौजे कोपरीची शीव	खाडी	मौजे भांडुपची शीव	सि.स. नं. १३२१, १३२०, १३१९, १३१८
मौजे विक्रोळी नवीन २०९	मौजे कांजूर शीव व खाडी	खाडी	खाडी	सि.स. नं. १
मौजे भांडुप नवीन १०४९	मौजे नाहूरची शीव	खाडी	खाडी	स. नं. ६३
मौजे कांजूर नवीन १३५१	मौजे भांडुपची शीव	खाडी	विक्रोळीची शीव	स. नं. २७५
मंडाळे स.नं. ९१ पैकी, (सि.स.नं.१ पैकी) स.नं. ८९ पैकी, (सि.स. नं.२) स.नं. ९० पैकी, (सि.स. नं.३) स.नं. ९१ पैकी, (सि.स. नं.४) स.न. ८० पैकी, (सि.स. नं.६) नवीन ८२, नवीन ८३, नवीन ८४	खाडी	खाडी	सायन-पनवेल महामार्ग आणि तुर्भे गावाची शीव	सि.स. नं. ६ पैकी.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नावाने,

स्वप्निल देशभ्रतार,
विशेष कार्य अधिकारी.

भाग चार-अ-९८-२

Revenue and Forests Department

Madam Cama Marg, Hutatma Rajguru Chowk, Mantralaya,
Mumbai 400 032, dated the 10th May 2018.

NOTIFICATION

WILD LIFE (PROTECTION) ACT, 1972.

No. WLP.0315/CR-76/ F-1.—Whereas, the Government of Maharashtra, has, *vide* the Government Notification, Revenue and Forests Department, No. WLP.0315/CR-76/F-1, dated the 6th August 2015, issued in exercise of the powers conferred by sub-section(*1*) and (*2*) of section 18 and 18 B of the Wild Life (Protection) Act, 1972 (53 of 1972), declared the intention of establishing area of 16.905 Sq.Km. area in Mumbai Suburban District specified in the Schedule appended thereto as a Sanctuary to be called as " Thane Creek Flamingo Sanctuary ";

And Whereas, the Government of Maharashtra has, *vide* the Government Notification, Revenue and Forests Department, No.0315/CR-76/F-1, dated 6th August 2015, directed the Sub-Divisional Officer, Eastern Suburban, Mumbai Suburban District, to exercise powers and functions under Section 19 to 25 of the said Act in respect of the lands comprised within the limits of the area specified in the said Notification ;

And Whereas, Sub-Divisional Officer, Eastern Suburban, Mumbai Suburban District has also concluded the enquiry in respect of 16.905 Sq. Km. area of the sanctuary and passed the order *vide* Order no. SDO/East suburban/Thane Creek Flemingo WLS/61/16/455, dated 09/10/2017;

And Whereas, Sub-Divisional Officer, Eastern Suburban, Mumbai has allowed right of way for construction, operation and maintenance of transmission lines of Maharashtra State Electricity Transmission Company Limited (MSETCL) and Tata Power subject to terms and conditions specified by Chief Wildlife Warden, Maharashtra State, as per following details :—

Sr. No. (1)	Name of transmission lines (2)	Name of Utility (3)
1	220 KV Kalwa-Trombay & Mulund-Trombay	MSETCL
2	220 KV Sonkhar-Trombay & TIFIL-Trombay	
3	220 KV Kharghar-Trombay & TIFIL-Trombay	
4	220 KV Bhira-Dharavi	Tata Power
5	110 KV Khopoli-Mankhurd	
6	110 KV Khopoli-Chembur	
7	400 KV Kharghar-Vikhroli	

And Whereas, all claims in respect of the lands specified in the said Notification have been disposed of by the State Government ;

Now, therefore, is in exercise of powers conferred under clause (a) of sub-section (*1*) of section 26-A of the Wildlife (Protection) Act, 1972 (53 of 1972), and of all other powers enabling it in that behalf, the Government of Maharashtra hereby declares that the areas specified in the Schedule appended hereto shall, with effect from the date of publication of this Notification in the *Official*

Gazette, be comprised within the Sanctuary and the said areas shall be the part of the " Thane Creek Flamingo Sanctuary " :—

SCHEDULE

Situation and limits of the "Thane Creek Flamingo Sanctuary" Which is in Mumbai Suburban District.

1. Name of the Sanctuary : Thane Creek Flamingo Sanctuary
2. Name of the Division : Mumbai Mangrove Conservation Unit
3. Name of original Forest Division : Thane Forest Division.
4. Name of Districts : Mumbai Suburban District.
5. Particulars of area to be included in the Sanctuary :

Sr. No.	District	Tahsil	Village	Survey Number / City Survey Number	Area in ha.	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Mumbai	Kurla	Mulund	New Sy. 1327	143.16	Area along
2	Suburban		Vikhroli	New Sy. 209	257.350	western side
3			Bhandup	New Sy. 1049	94.920	of creek
4			Kanjur	New 1351	264.870	
5			Mandale	Survey No. 91 Part, (City Survey No. 1 Part)	~~34.500~~	
				Survey No. 89 Part, (City Survey No. 2)	~~28.950~~	
				Survey No. 90 Part (City Survey No. 3 Part)	14.720	
				Survey. No .91Part, (City Survey No. 4)	10.730	
				Survey. No. 80 Part, (City Survey No. 6)	15.260	
				New 82	0.540	
				New 83	0.090	
				New 84	30.9485	
				Total	**896.0385**	
6			Mulund, Vikhroli, Bhandup, Kanjur, Mandale	Creek Area (Revenue land)	794.487	Creek Area (Revenue land)
				Grand Total	**1690.5255**	

Area along western side of creek : 896.0385 Ha. or 8.96 Sq. Km.
Creek Area (Revenue Land) : 794.487 Ha. or 7.94 Sq.Km.
Total : 1690.5255 Ha. or 16.905 Sq. Km.

Boundaries of proposed " Thane Creek Flamingo" Sanctuary.

Village/ C. S. No. (1)	North (2)	East (3)	South (4)	West (5)
Mulund New 1327	Village Boundary of Kopari	Creek	Village Boundary of Bhandup	City Survey Number 1321, 1320,1319,1318
Vikhroli New 209	Village Boundary of Kanjur and Creek	Creek	Creek	City Survey Number 1.
Bhandup New 1049	Village Boundary of Nahur	Creek	Creek	Survey Number 63.
Kanjur New 1351	Village Boundary of Bhandup	Creek	Village Boundary of Vikhroli	Survey Number 275.
Mandale Survey Number 91Part, (City Survey Number 1Part) Survey Number 89 Part, (CTS No. 2) Survey Number 90 Part, (City Survey Number 3,) Survey Number 91 Part, (City Survey Number 4,) Survey Number 80 Part, (City Survey Number 6,) New 82, New 83, New 84	Creek	Creek	Sion-Panvel Highway, & boundary of Turbhe village	City Survey Number 6 (Part)

By order and in the name of the Governor of Maharashtra,

SWAPNIL DESHBHRATAR,
Officer on Special Duty,

ON BEHALF OF GOVERNMENT PRINTING, STATIONERY AND PUBLICATION, PRINTED AND PUBLISHED BY SHRI PARSHURAM JAGANNATH GOSAVI, PRINTED AT GOVERNMENT CENTRAL PRESS, 21-A, NETAJI SUBHASH ROAD, CHARNI ROAD, MUMBAI 400 004 AND PUBLISHED AT DIRECTORATE OF GOVERNMENT PRINTING, STATIONERY AND PUBLICATION, 21-A, NETAJI SUBHASH ROAD, CHARNI ROAD, MUMBAI 400 004, EDITOR : SHRI PARSHURAM JAGANNATH GOSAVI.

Annexure 9 GR on Mangrove protection and Livelihood Generation Scheme dated 20th September 2017

कांदळवन संरक्षण व उपजिविका निर्माण योजना राबविण्याबाबत..

महाराष्ट्र शासन
महसूल व वन विभाग
शासन निर्णय क्रमांक :- एस-१०/२०१७/प्र.क्र.६३/फ-३
मादाम कामा रोड, हुतात्मा राजगुरु चौक,
मंत्रालय, मुंबई ४०० ०३२,
दिनांक : २० सप्टेंबर, २०१७.

प्रस्तावना:-

महाराष्ट्र राज्यास ७२० कि.मी. लांबीचा समुद्र किनारा लाभला असून सदर किनाऱ्याजवळ अंदाजे ३०,००० हेक्टर क्षेत्रावर कांदळवने अस्तित्वात आहेत. समुद्रापासून किनाऱ्यांचे संरक्षण तसेच सायक्लॉन व फायान सारख्या नैसर्गिक आपदांपासून कांदळवनांमुळे संरक्षण प्राप्त होते. कांदळवनांचा पर्यावरणीय महत्व विचारात घेता, त्यांना पुरेसे वैधानिक संरक्षण प्रदान करावे, या स्वरुपांचे आदेश मा.उच्च न्यायालय, मुंबई यांनी वेळोवेळी दिलेले आहेत, त्यास अनुसरुन आतापर्यंत सुमारे १५,०८८ हेक्टर शासकीय जमिनीवरील व १,७७५ हेक्टर खाजगी क्षेत्रावरील कांदळवन अनुक्रमे "**राखीव वने**" व "**वने**" म्हणून अधिसूचित करण्यात आलेले आहे. कांदळवनांमुळे किनारी प्रदेशांचे वादळांपासून संरक्षण होते, मासे व खेकडे यांना अल्प वयात संरक्षण मिळून उपयोगी उत्पादन वाढते, पर्यटनाची साधने उपलब्ध होतात व किनारी जैवविविधता टिकून राहण्यास मदत होते.

शासकीय कांदळवनांचे संरक्षण होणे व त्यावर अवलंबून असलेल्या लोकांची उपजिविका यांचा मेळ घालणे, तसेच खाजगी मालकीच्या कांदळवनापासून सुद्धा उपजिविकेची साधने उपलब्ध करुन देणे, कांदळवनाचा दर्जा उंचावणे यासाठी संयुक्त वन व्यवस्थापनाच्या धर्तीवर कांदळवनांचे वैशिष्ठये लक्षात घेऊन **"कांदळवन संरक्षण व उपजिविका निर्माण योजना"** राबविण्याचे शासनाच्या विचाराधीन होते. त्यास अनुसरुन खालीलप्रमाणे निर्णय घेण्यात येत आहे :-

शासन निर्णय :-

राज्याचे सागरी व खाडी क्षेत्रालगत असलेल्या गावांतील / नागरी समूहातील गावांमध्ये जर कांदळवन क्षेत्रावर अवलंबून असलेल्या व्यक्ती / मच्छिमारी समाज / अन्य समाज असतील तर अशा ठिकाणी **कांदळवन सह व्यवस्थापन समिती** गठीत करुन सदस्यांचे वैयक्तिक व सामूहिक उत्पन्न वाढवण्यासाठी आणि कांदळवनांचे प्रभावी संरक्षण त्यांचे माध्यमातून करण्यासाठी सन २०१७-१८ ते २०१९-२० या कालावधीत **"कांदळवन संरक्षण व उपजिविका निर्माण योजना"** प्रकल्प स्वरुपात (Project Mode) राबविण्यात येईल.

१.०० योजनेची उदिष्टे :

१. खाजगी, शासकीय व सामूहिक कांदळवन क्षेत्रास उत्पादनक्षम साधन बनवणे व कांदळवनांचा दर्जा उंचावणे.
२. शासकीय कांदळवनांचे नियोजनबद्ध संरक्षण व संवर्धनामध्ये त्यावर अवलंबून असलेल्या ग्रामस्थांचे योगदान घेणे व त्यांच्या उपजिविका साधनांचा विकास करणे.
३. वन विभाग व स्थानिक जनता यांच्यातील सहजीवन वाढवून परस्पर सहकार्य वृध्दींगत करणे.
४. त्यासाठी अवलंबितत्व असलेल्या व्यक्तींचे समूह तयार करुन अशा संस्थांशी करारनामे करणे, सदर क्षेत्राबाबत सूक्ष्म व्यवस्थापन आराखडा (Micro plan) तयार करणे, सदर समूहांना आवश्यक प्रशिक्षण देणे.

५. योजनेच्या माध्यमातून प्राप्त होणारे उत्पन्न वन संवर्धन व सदर समूहाच्या विकासासाठी वापरणे.
६. शासनाच्या विविध विभागांच्या योजनेतील तरतूदींची सांगड (Convergence) घालणे.

२.०० योजनेची अंमलबजावणी :-

२.०१ कार्यान्वयीन यंत्रणा - सदर योजना अपर प्रधान मुख्य वनसंरक्षक (कांदळवन कक्ष), मुंबई यांचे नियंत्रणाखाली राहील. योजनेचा वार्षिक आराखडा तयार करणे, आवश्यक निधीची मागणी करणे व वितरीत करणे, कामांचे मूल्यमापन करणे, योजनेत बदल आवश्यक असल्यास राज्य स्तरीय समितीच्या पूर्व मान्यतेने बदल करणे व त्याबाबत शासनास आवश्यक तो अहवाल सादर करणे, योजनेचे सर्वसाधारण नियंत्रण करणे इत्यादी बाबी त्यांच्या अधिनस्त राहतील.

ज्या गावचे / वस्तीचे क्षेत्रात कांदळवन आहे, तेथे सामूहिक स्वरुपाचे फायदे देण्यासाठी संस्थात्मक उभारणी करुन **"कांदळवन संरक्षण व उपजिविका निर्माण योजना"** राबवण्यात येईल. यासाठी **कांदळवन सह व्यवस्थापन समिती** स्थापन करण्यात येईल. सदर समितीची एक कार्यकारिणी अस्तित्वात राहील.

वैयक्तिक लाभार्थींसाठी ४० आर पेक्षा जास्त क्षेत्र असल्यास, संस्थेचे सदस्य असणे अथवा संस्थेमार्फत योजना राबविणे बंधनकारक राहणार नाही. अशी व्यक्ती संबंधित विभागीय वन अधिकारी / उप वनसंरक्षक यांचेमार्फत आवश्यक ती छाननी पूर्ण झाल्यावर अपर प्रधान मुख्य वनसंरक्षक (कांदळवन कक्ष), मुंबई यांचेकडे लाभार्थी म्हणून नोंदणीकृत होऊ शकेल व योजनेचे लाभ घेऊ शकेल.

२.०२ समूह निवडीचे निकष -

अ) **खाजगी क्षेत्र लाभार्थी -**

खाजगी क्षेत्रात लाभार्थी निवड करताना **४० आर पेक्षा जादा** कांदळवनक्षेत्र असलेल्या व्यक्तींना स्वतंत्र लाभार्थी म्हणून सहभागी होता येईल. त्यांचेसाठी खेकडापालन, मधुमक्षिका पालन इत्यादी सारखे पर्यावरण पूरक लघु व्यवसाय तसेच पर्यटन विकास, गृह पर्यटण इत्यादी सारखे कौशल्य विकास आणि क्षमता बांधणी यासाठी स्वतंत्र तांत्रिक व आर्थिक मदत देण्यात येईल.

खाजगी क्षेत्रातील कांदळवन धारकांना ४० आर पेक्षा कमी क्षेत्र असल्यास सामूहिकरित्या कांदळवन सह-व्यवस्थापन समितीमार्फत (MCMC) खेकडा व कालवेपालन, मधुमक्षिकापालन व पर्यटन विकास या सारखे लाभ देण्यात येतील. पर्यटन विकासासाठी व मच्छिमारीसाठी होडया व जाळी खरेदीस मदत, पक्षीनिरिक्षण, खेकडे व मासे याची विक्रीव्यवस्था, मधुमक्षिकापालन, पिंजऱ्यातील मत्स्यपालन, शोभेचे मासे निर्मिती इ. बाबींसाठी क्षमता बांधणी उपक्रम राबवण्यात येतील. कांदळवनावरील अवलंबित्व कमी करण्यासाठी स्वयंपाक गॅसचा पुरवठा, सौर उपकरणे ही साधने सुध्दा वैयक्तिक लाभाच्या योजनेत देण्यात येतील.

खाजगी व्यक्तीं साठी वैयक्तिक लाभाच्या योजनेत शासन व व्यक्ती यांच्या **सहभागाचे प्रमाण (टक्केवारी) ७५:२५** तर सामूहिक स्वरुपाच्या कामांसाठी शासन व समिती यांच्या **सहभागाचे प्रमाण (टक्केवारी) ९०:१०** असे राहील.

पृष्ठ १३ पैकी २

लाभार्थी निवडीचे निकष -

१. अशा व्यक्तींचे वय किमान १८ वर्षे असावे व सदर व्यक्ती अशा कांदळवनक्षेत्राची कायदेशीर मालक असावी.

२. वैयक्तिकरित्या योजनेचा लाभ घ्यावयाचा असल्यास किमान ४० आर कांदळवन क्षेत्र असणे आवश्यक आहे.

३. उप वनसंरक्षक / विभागीय वन अधिकारी वरील निकषांच्या आधारे व्यक्तींची निवड करुन त्यांची यादी अपर प्रधान मुख्य वनसंरक्षक (कांदळवन कक्ष), मुंबई यांना सादर करतील. अपर प्रधान मुख्य वन संरक्षक (कांदळवन कक्ष), मुंबई यांच्या मान्यतेनंतर सदर यादी अंतिम होईल.

ब) **सामूहिक क्षेत्रे / शासकीय वने** -

वन (संवर्धन) अधिनियम, १९८० तसेच इतर अनुषांगिक पर्यावरणीय कायद्याचा भंग न करता, सामूहिक / शासकीय कांदळवनावर अवलंबून असलेल्या व्यक्तीसाठी शास्वत मासेमारीस प्रोत्साहन, पर्यावरणपुरक उपजिवीकेचा विकास, निसर्ग-पर्यटन, कौशल्य विकास व इतर बाबींना संयुक्त वन व्यवस्थापनाची तत्वे सांभाळून, सामूहिक स्वरुपात चालना देण्याची शासनाची योजना आहे. यामध्ये कांदळवनक्षेत्रात पुर्नलागवड, कांदळवनांचे संरक्षण, संवेदनशील क्षेत्राभोवती संरक्षक भिंती बांधणे, कालवे पालन, खेकडे पालन, मधुक्षिकापालन, मासेमारीपुरक योजना राबवणे, पिंजऱ्यातून मत्स्यपालन, शोभिवंत मत्स्यशेती, खेकडा उबवणी केंद्रे विकसित करणे, स्कूबा डायव्हिंग, स्नॉरकलिंग (Snorkelling), पर्यटन मार्गदर्शक इत्यादी कौशल्य विकास आणि क्षमता बांधणी कामांना प्राधान्य देण्यात येईल.

३.०० कांदळवन सह व्यवस्थापन समितीचे गठण व नोंदणी :-

कांदळवनांचे संरक्षण करणे व त्यावर अवलंबून असलेल्या लोकांची उपजिविका यांचा मेळ घालणे, कांदळवनाचा दर्जा उंचावणे यासाठी सागरी व खाडी क्षेत्रालगत असलेल्या गावात **कांदळवन सह व्यवस्थापन समिती** गठीत करण्यात येईल. अशा समित्यांना **कांदळवन सह व्यवस्थापन समिती,** . . . . . (गाव / वाडी / वस्तीचे नाव) **(MCMC - Mangrove Co Management Committee, ...)** असे संबोधले जाईल. तथापि, अशा सर्व समितींवर सचिव म्हणून संबंधित कांदळवन क्षेत्राचे वनपाल / वनरक्षक यांची नियुक्ती करण्यात येईल. जर संबंधित क्षेत्रासाठी नियतक्षेत्र वनरक्षक उपलब्ध नसेल, तर त्या ठिकाणी सचिव म्हणून कांदळवन कक्ष / कांदळवन प्राधिकरणातील इतर कर्मचाऱ्याची नियुक्ती करता येईल.

समितींची नोंदणी सोसायटी रजिस्टेशन ॲक्ट, १८६० खाली संबंधित जिल्हयाच्या रजिस्ट्रार ऑफ सोसायटीजकडे करणे बंधनकारक राहील. शासन निर्णयाव्यतिरिक्तचे नियम / उप नियम, सदर संस्थेच्या सभासदांच्या सर्वसाधारण सभेमध्ये स्थानिक परिस्थितीनुसार मंजूर करण्यात आलेले असावेत.

३.०१ कांदळवन सह व्यवस्थापन समितीचे कार्यक्षेत्र -

प्रत्येक पंचायतीसाठी एक कांदळवन सह व्यवस्थापन समितीचे गठन करण्यात येईल. मात्र समितीचे कार्यक्षेत्र संबधित पंचायतीमधील किनारी प्रभागापूर्ती (Coastal Wards) मर्यादित राहील.

३.०२ कांदळवन सह व्यवस्थापन समितीचे सदस्य निवडीचे निकष -

कांदळवन सह व्यवस्थापन समितीच्या **सर्व साधारण समिती** मध्ये खालील सदस्य निवडण्यात येतील :-

१. किनारी प्रभागात (Wards) मतदार असलेल्या व्यक्ती.

पृष्ठ १३ पैकी ३

२. समितीच्या कार्यक्षेत्रात खाजगी मालकीचे कांदळवन असलेल्या व्यक्ती.

३. कार्यक्षेत्रातील मच्छिमार समाज / सोसायटीचे सदस्य असलेल्या व्यक्ती.

समितीच्या सर्व सदस्यांना समिती कार्यामध्ये सक्रिय सहभाग नोंदविणे आवश्यक राहील.

कार्यकारी समिती - कार्यकारी समितीत ७ सदस्यांचा समावेश असेल. समितीमध्ये ३ महिला व ३ पुरुष सदस्य असतील. त्यापैकी एक सदस्य अध्यक्ष असेल तर कांदळवन कक्षाचे वनपाल / वनरक्षक हे समितीचे सचिव असतील. समितीचे सदस्य हे शक्यतो कांदळवन क्षेत्रालगत राहणारे असावेत. समितीचे सदस्य एकाच कुटुंबातील नसावेत.

३.०३ कांदळवन सह व्यवस्थापन समितीची कर्तव्ये :-

१ गावातील कांदळवन क्षेत्रासाठी सूक्ष्म आराखडा तयार करणे.

२ कांदळवनांचे संरक्षण व संवर्धन करणे.

३ कांदळवन क्षेत्राचे सीमांकन करणे.

४ कांदळवनांसाठी आवश्यकता असल्यास कुंपण उभारणे.

५ कांदळवन रोपवने व नैसर्गिक पुर्न:निर्मिती बाबत कामे करणे.

६ कांदळवनांवर उर्जेसाठी अवलंबून असलेल्या कुटुंबांना स्वंयपांकाचा गॅस (L.P.G) व सौर उत्पादने यांचा पुरवठा करणे.

३.०४. सहव्यवस्थापन समितीतील सदस्यांना सामुहिकरित्या उपजिविका साधने उपलब्ध करुन घेण्यास पात्र असलेल्या व्यक्तीचे प्राधान्यक्रम -

१. एक एकरपेक्षा कमी कांदळवन क्षेत्र धारण करणाऱ्या व्यक्ती.

२. एक एकरपेक्षा जादा कांदळवन क्षेत्र धारण करणाऱ्या अशा व्यक्ती की ज्या इतर योजनांच्या सदस्य नाहीत.

३. मच्छिमारी समाजातील महिला.

४. मच्छिमारी समाजातील पुरुष

५. स्वयंसहाय्यता गट.

६. इतर भूमिहीन व्यक्ती.

७. कांदळवन क्षेत्रातील सीमांकित (Marginal) शेतकरी.

३.०५. सह-व्यवस्थापन समितीतील सदस्यांना उपजिविकेसाठी सूक्ष्म आराखडयाप्रमाणे खालील उपजिविका साधने उपलब्ध करुन देण्यात येतील.

१. खेकडापालन

२. बहुआयामी मत्स्य शेती (मत्स्य व्यवसाय विभागाच्या सहभागांने Square Mesh Net व Turtle excluder devices मत्स्य व्यवसायांकाना पुरविणे)

३. कालवेपालन

४. मधुमक्षिकापालन

५. शिंपले पालन

६. गृहपर्यटन

७. शोभिवंत मत्स्य शेती

८. SRI भातशेती.

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३.०६. कांदळवन सह व्यवस्थापन समितीचे खाते :

शासनाकडून प्राप्त होणाऱ्या निधीच्या व्यवस्थापनेसाठी राष्ट्रीयीकृत बँक किंवा पोस्ट ऑफीसमध्ये संयुक्त बचत खाते उघडण्यात येईल. सदर खात्यास **सरकारी खाते** असे संबोधण्यात येईल. सदर खात्याचे संचालन कार्यकारी समितीचे अध्यक्ष व सदस्य सचिव या दोघांद्वारे संयुक्तपणे करण्यात येईल. या खात्यांतर्गत होणाऱ्या निधीच्या विनियोगास संबंधित उप वनसंरक्षक / विभागीय वन अधिकारी यांचे स्तरावर मंजूरी घेतली जाईल.

समितीच्या स्वत:च्या उत्पन्नातून तसेच इतर स्त्रोतांकडून (वरील स्त्रोतांशिवाय) प्राप्त होणाऱ्या निधीच्या व्यवस्थापनेसाठी राष्ट्रीयकृत बँक किंवा पोस्ट ऑफीसमध्ये स्वतंत्ररित्या बचत खाते उघडण्यात येईल. सदर बचत खात्यास **कांदळवन विकास समिती खाते** असे संबोधण्यात येईल. सदर खात्याचे संचालन अध्यक्ष व कोषाध्यक्ष किंवा कार्यकारणीतील एक सदस्य संयुक्तपणे करतील. सदरहू खात्यातील निधीच्या विनियोगास संस्थेच्या सर्वसाधारण बैठकीत मंजूरी घेतली जाईल.

३.०७. वार्षिक लेखा परिक्षण :

कांदळवन सह व्यवस्थापन समितीच्या सरकारी खात्याचे लेखापरिक्षण राज्य वन विकास यंत्रणा (SFDA) करिता शासनाने प्रचलित केलेल्या लेखापरिक्षण पध्दतीनुसार करण्यात येईल.

४.०० समझौता - समयलेख

कांदळवन संरक्षण व उपजिविका निर्माण योजना राबविण्यात येणाऱ्या व्यक्तींच्या समूहांनी / मच्छिमार संस्थांनी सर्वप्रथम सदर कार्यक्रम राबविण्यास तयार असल्याचा ठराव घेणे आवश्यक राहील. सदर ठरावामध्ये कांदळवन संवर्धन कार्यक्रमाअंतर्गत मिळणारे फायदे घेण्याकरिता कु-हाड बंदी, चराई बंदी, कांदळवन संरक्षणाकामी वन विभागास मदत, डेब्रिस टाकण्यास मनाई, वनवणवा नियंत्रण व संरक्षण कामात सहकार्य करणे, गौण वनोपजांचा -हास थांबविणे, या बाबींचा स्पष्ट उल्लेख असणे आवश्यक राहील. वैयक्तिक लाभाच्या योजनांचा फायदा घेणारे सर्व लाभधारकही कांदळवन संरक्षणाकामी सहभाग घेण्यास बांधील राहतील. याबाबत सोबत जोडलेल्या प्रारुपानुसार समझोता-समयलेख अध्यक्ष, कांदळवन सह व्यवस्थापन समिती / वैयक्तिक लाभार्थी व संबंधित विभागीय वन अधिकारी / उप वनसंरक्षक यांच्यामध्ये करण्यात येईल.

४.०१ सदर योजनेत खाजगी व्यक्ती / समाविष्ट संस्थेतील व्यक्तींना खालील बाबींची परवानगी राहील : -

कांदळवनांचे कोणत्याही तऱ्हेचे नुकसान होणार नाही तसेच वन (संवर्धन) अधिनियम, १९८० व इतर अनुषांगीक पर्यावरण संबंधित कायद्यांतील तरतूदींचा भंग होणार नाही, अशा पध्दतीने अभ्यासपूर्वक सूक्ष्म आराखडा तयार करुन सदर समितींना कांदळवन क्षेत्रात खालील कामे करता येतील : -

१. मत्स्य पालन, कालवे पालन, खेकडे पालन.
२. वरील प्रकारचे मत्स्य पालन, कालवे पालन, खेकडे पालन व इतर उपजिविका साधने यांचे विकासासाठी आवश्यक ते प्रशिक्षण आयोजित करणे.
३. पर्यटनासाठी तात्पुरता निवारा निर्माण करणे.
४. समिती सदस्यांनी आरोपी व वाहने पकडून वन / पोलीस विभागास हस्तांतरीत करणे व वनगुन्हे रोखण्यासाठी वन विभागास मदत करणे.
५. समिती सदस्याच्या मार्गदर्शनाखाली पर्यटकांना राखीव वनात प्रवेश व मच्छिमारीचा आनंद घेणे.

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५.०० गावनिहाय कांदळवन निहाय सूक्ष्म आराखडे तयार करणेः-

५.०१ आधारभूत माहिती संकलित करणे व सूक्ष्म आराखडे तयार करणेः -

कांदळवनांचे कोणत्याही तऱ्हेचे नुकसान होणार नाही व न्यायालयीन आदेशांचे सर्वत: पालन होईल अशा पध्दतीने अभ्यासपुर्वक सूक्ष्म आराखडा तयार करणे आवश्यक राहील. कांदळवनांच्या विकासाच्या सूक्ष्म कृती आराखडा अंतर्गत केलेल्या कामांचे मूल्यमापन करणे व फलनिष्पत्तीबाबत निष्कर्ष काढणे यासाठी सुरुवातीला "बेंच मार्कींग" करणे आवश्यक आहे. त्यामुळे सुरुवातीलाच संस्था पातळीवर उपलब्ध जन-जल-जंगल-जमीन या कांदळवनांशी संबंधित संसाधनांची सद्यस्थिती व सांख्यिकी माहिती (आधारभूत माहिती) संकलित करण्यात यावी व त्याच आधारे व्यक्तिसमूह विकासासाठी आवश्यक उपचार / उपाययोजनांचा सूक्ष्म आराखडयामध्ये समावेश करावा. यासाठी सहभागीय ग्रामीण समीक्षण (Participatory Rural Appraisal) पध्दतीचा वापर करु शकतात. त्यासाठी सामाजिक व साधन संपत्ती नकाशा, शिवार फेरी, हंगामाचे विश्लेषण, इतिहासकालीन घटनाक्रम, मॅट्रीक्स रँकींग, चपाती आकृती, स्थानिक तंत्रज्ञानची साधने इत्यादी पध्दतींचा वापर करता येईल. निवड केलेल्या गांवाचे सभोवताल ३ कि.मी परिघातील कांदळवन आच्छादनाची सन २००५ रोजीची स्थिती दाखविणारे सुरुवातीचे उपग्रह छायाचित्र प्राप्त करुन ठेवण्यात यावे, जेणेकरुन वेळोवेळी वनाच्छादनात होत असलेले बदल परिगणीत करता येतील.

सदर योजने अंतर्गत गावांचे सूक्ष्म कृती आराखडे समितीशी सल्लामसलत करुन, सदस्यांच्या सहभागाने, निवडलेल्या तज्ञांचा सल्ला व मार्गदर्शनाखाली अतिशय शास्त्रोक्त पध्दतीने तयार करणे व काळजीपूर्वक अंमलबजावणी करणे अपेक्षित आहे. सूक्ष्म आराखडा १० वर्षाचे कालावधीकरिता तयार करण्यात यावा. तथापि, सूक्ष्म आराखडयात सन २०१७-१८ ते २०१९-२० या कालावधीकरिता नियोजित करण्यात आलेली कामे या योजनांतर्गत करावी.

सदर आराखडा प्रति समिती प्रति वर्ष रु. १००.०० लाखाच्या कमाल मर्यादा पर्यंत ठेवण्यात यावा. यापेक्षा जास्त निधीची मागणी असेल तर त्याबाबत सविस्तर तपशील सादर करुन, राज्य स्तरीय समितीची पूर्व मंजूरी घेऊन राबवण्यात यावा. क्लस्टर (समूह) स्वरुपातील काही कामांसाठी जर प्रस्ताव असेल (उदा. हॅचरी, शीतगृह इ.) व त्याकरिता समूहातील समित्यांची एकात्मिक मागणी असेल तर ज्यादा तरतूद करण्याचे अधिकार राज्यस्तरीय समितीलाही राहतील. याबाबत अंतिम अधिकार अपर प्रधान मुख्य वनसंरक्षक (कांदळवन कक्ष), मुंबई यांचे राहतील. त्यांनी योजना अंतर्गत वार्षिक तरतूद विचारात घेऊन याबाबत आवश्यक ती मंजूरी द्यावी.

गावाचा सूक्ष्म कृती आराखडा संबंधित क्षेत्रास लागू असलेल्या कार्यआयोजना / व्यवस्थापन आराखडा यांच्याशी सुसंगत राहील. त्यामध्ये भारतीय वन अधिनियम, १९२७, वन्यजीव (संरक्षण) अधिनियम, १९७२, वन (संवर्धन) अधिनियम, १९८०, पर्यावरण (संरक्षण), अधिनियम, १९८६, अनुसूचित जाती व इतर पारंपारिक वन निवासी (वनहक्कांची मान्यता) अधिनियम, २००६ व त्यातील नियमावली, न्यायालयीन आदेश इत्यादीचा उल्लघंन होणार नाही, याची दक्षता घेण्यात यावी.

समझौता समयलेख झाल्यानंतर पुढील २ महिन्यात सूक्ष्म आराखडा तयार करुन मंजूरी प्राप्त करुन घेण्याची जबाबदारी संबंधित कांदळवन सह व्यवस्थापन समितीची राहील. सुक्ष्म आराखडा मंजूर करण्याचे अधिकार संबंधित उप वनसंरक्षक / विभागीय वन आधिकारी यांना राहील.

५.०२ वार्षिक कृती आराखडा तयार करणे :

सूक्ष्म आराखडा तयार केल्यानंतर वार्षिक कृती आराखडा तयार करण्यात यावा व त्यात वर्षनिहाय प्रस्तावित कामे व लागणारे अनुदान इत्यादी समाविष्ट करावे, जेणे करुन प्रकल्प स्वरुपात (Project Mode) कामांची अंमलबजावणी व संनियंत्रण करणे शक्य होईल.

६.०० तज्ञांची नियुक्ती :

सदर योजने अंतर्गत गावांचे सूक्ष्म कृती आराखडे शास्त्रोक्त पध्दतीने तयार करणे अपेक्षित आहे. याकरिता कांदळवने व सागरी जैवविविधता संवर्धन प्रतिष्ठानकडील कृषी तज्ञ, वानिकी तज्ञ, निसर्ग तज्ञ, उपजिविका विषयावरील तज्ञ यांची सेवा कंत्राटी पध्दतीने प्रतिष्ठानमार्फत नियुक्ती करण्यात येईल. तसेच नियुक्त करावयाचे तज्ञांचे मानधन त्यांच्या शैक्षणिक अर्हतेनुसार निश्चित करता येईल. तज्ञांच्या नियुक्तीवर होणारा खर्च प्रशासकीय खर्चातून भागविण्यात येईल.

७.०० योजना समन्वयकाची निवड :

"कांदळवन सह व्यवस्थापन समिती" च्या मार्फत सदर योजनेअंतर्गत राबविण्यात येणाऱ्या योजनांच्या बाबतीत वन, इतर विभाग व गाव समितीशी योग्य समन्वय साधने आवश्यक आहे. योजनेतील तांत्रिक सुसूत्रता व अंमलबजावणी यासाठी प्रति दोन गावांमागे एक समन्वयकाची कांदळवन प्रतिष्ठानमार्फत कंत्राटीपध्दतीने नियुक्ती योजना कालावधीत करता येईल. सदर समन्वयक मत्स्य व्यवसाय पदवीधारक असावा. यामध्ये स्थानिक व्यक्तीला गुणवत्तेच्या आधारे प्राधान्य देण्यात येईल.

८.०० योजने अंतर्गत करावयाची कामे :-

८.०१ कांदळवन संधारण : वन विभागाच्या ताब्यात असलेल्या कांदळवन क्षेत्रावर नैसर्गिक / कृत्रीम पुन:उत्पादनाची कामे घेणे, पाण्याचे चॅनेल्स अबाधित व नव्याने तयार करणे, वन विभागांतर्गत मंजूर नमूना आराखडयाचा वापर करुन या योजनेअंतर्गत मंजूर निधी खर्च करण्यात येईल.

८.०२ पर्यायी रोजगारांची संधी वाढविणे :

अ) गावातील महिला व युवकांना स्वयंरोजगारविषयी प्रशिक्षण देणे, क्षमता बांधणी करणे व रोजगाराची संधी उपलब्ध करुन देणे, याकरिता औदयोगिक तज्ञांचा व पर्यटन संस्थाचा सहभाग घेणे, गौण वनउपज संकलन, मूल्यवृध्दी व विक्रीस सहाय्य करणे.

ब) निसर्ग पर्यटन व गृह पर्यटनाचा (Home stay) विकास करणे तसेच अनुषांगिक क्षमता बांधणी करणे, प्रशिक्षण देणे.

क) समझोता समय लेखातील समाविष्ट बाबी.

८.०३ स्वच्छता अभियान राबविणे :

निसर्ग पर्यटन / गृह पर्यटनास चालना देण्यासाठी त्या वस्तीत / गावात स्वच्छता राखणे अत्यंत आवश्यक आहे. त्याकरीता शौचालयाचे बांधकाम करणे, मैला प्रक्रिया व व्यवस्थापन (Sewage Management), सांडपाणी शुध्दीकरण / प्रक्रिया (Treatment of Waste Water), घन कचरा व्यवस्थापन (Solid Waste Management), स्वच्छ पिण्याच्या पाण्याचे नियोजन करणे, इत्यादी कार्यक्रम शासनाचे संबंधित योजनेअंतर्गत घेण्यात यावे.

८.०४ **कृषी संसाधनांचा विकास** :-

कांदळवन सह व्यवस्थापन समितीतील सदस्यांची कृषी उत्पादकता वाढविणे, उत्पादन खर्च कमी करण्याकरिता गांडूळ खत / सेंद्रीय खत / जैविक कीटकनाशक ग्राम स्तरावर तयार करणे व वापरण्यास प्रोत्साहन देणे, रासायनिक शेतीचे "सेंद्रिय शेतीत" रुपांतर करणे, SRI/SRT भात उत्पादन, कृषी उत्पादन प्रक्रिया / मूल्यवर्धन (Agro Processing / Value Addition) सुरु करणे, बांबू लागवड, फलोत्पादन विकास, खाजगी पडीक शेतात तसेच शेतातील बांधे, वनशेतीसारखे कार्यक्रम इत्यादी राबविणेकरीता शासनाच्या विविध योजनामार्फत आवश्यक ती कामे करण्यात येतील.

८.०५ **कांदळवनाची लागवड** :-

सन २०१७-१८ ते २०१९-२० या ३ वर्षात किमान १० लाख कांदळ वृक्षाची लागवड करण्यात येईल. तसेच कांदळवनांच्या संरक्षणाबाबत भरीव उपाययोजना ग्रामस्थांचे / समित्यांचे माध्यमातून करण्यात येईल.

९.०० **निधी वितरण**

शासनाकडून निधी प्रधान मुख्य वनसंरक्षक (वनबल प्रमुख), महाराष्ट्र राज्य, नागपूर यांच्यामार्फत अपर प्रधान मुख्य वन संरक्षक (कांदळवन कक्ष), मुंबई यांना वितरीत होईल, तेथून तो मागणीप्रमाणे संबंधित उप वनसंरक्षकांना / विभागीय वन अधिकारी यांना तसेच कांदळवन प्रतिष्ठानला वितरीत होईल, संबंधित उप वनसंरक्षकांना / विभागीय वन अधिकारी यांनी मागणी करतांना सुक्ष्म आराखडयास मंजूरी प्राप्त झाल्याची खात्री करावी तसेच मंजूर कामाचे प्राधान्यक्रम ठरवून, वर्षनिहाय आराखडा तयार करुन अपेक्षित कामांसाठीच्या रक्कमेची मागणी करावी.

एकूणच उपलब्ध होणारा निधी हा वन विभागामार्फत किंवा समिती मार्फत किंवा कांदळवन प्रतिष्ठान मार्फत अशा त्रिविध पध्दतीने परंतु अपर प्रधान मुख्य वन संरक्षक (कांदळवन कक्ष), मुंबई यांचे एकात्मिक नियंत्रणाखाली विनियोगात आणण्यात येईल.

९.०१ योजनेचा खर्च ज्या लेखाशिर्षा खाली भागविण्यात येईल, त्याबाबतचा शासन निर्णय वेगळयाने निर्गमित करण्यात येईल.

१०.०० **प्रशासकीय खर्च**

सदर योजने अंतर्गत मंजूर अनुदानाच्या ५% रक्कम प्रशासकीय खर्चासाठी देय राहील. यामध्ये तज्ञ व्यक्तींचे व गाव योजना समन्वयकाचे मानधन, मत्स्य व्यवसाय पदवी धारकांचे मानधन तसेच माहिती भरण्या करिता प्रकल्प स्तरावरील Data Entry Operators चे मानधन, सविस्तर अंदाजपत्रके तयार करणे व इतर प्रशासकिय खर्च यांचा समावेश राहील.

११.०० **मूल्यमापन** :

प्रकल्पस्तरीय समितीने या योजनेतंर्गत केलेल्या कामाचे वेळोवेळी अंर्तगत मूल्यमापन करुन घेण्यात यावे व आवश्यकतेनुसार त्रयस्थ यंत्रणेमार्फत विशिष्ट कामांचे मूल्यमापन करुन घेण्यात येईल.

१२.०० **सामाजिक अंकेक्षण** :

सामाजिक अंकेक्षणासाठी आवश्यक असलेली सर्व कागदपत्रे उदा. मस्टर रोल, कॅशबुक, बिल, मोजमाप पुस्तके, तांत्रिक मंजूरी, प्रशासकीय मंजूरी, कामाची तपासणी, कामाची गुणवत्ता, कागदपत्रांची तपासणी करणे, सामाजिक अंकेक्षण संपल्यानंतर अहवाल वाचून दाखविणे इत्यादी सामाजिक अंकेक्षणाची

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जबाबदारी संबंधित कांदळवन सह व्यवस्थापन समितीची राहील. सामाजिक अंकेक्षणाची पूर्व सूचना कमीत कमी १५ दिवस अगोदर देणे आवश्यक आहे.

१३.०० माहिती व्यवस्थापन कार्यप्रणाली :

सदर योजनेकरिता कांदळवन कक्षाच्या संकेत स्थळावर एक स्वतंत्र जागा (Page) देण्यात येईल, ज्यामध्ये खालील माहितीचा समावेश असेल : -

१) सदर योजने अंतर्गत प्रकल्प निहाय निवडलेल्या गावांची यादी, गाव निहाय मंजूर सुक्ष्म आराखडा व गाव निहाय / वर्षवार करावयाच्या कामाची यादी.

२) उपलब्ध अनुदान, झालेला खर्च, कामाची सदयस्थिती, कामाचे छायाचित्र, वार्षिक लेखापरिक्षण अहवाल, ग्राम परिस्थितीकी विकास समितीचे मासिक सभेचे कार्यवृत्तांत व प्रकल्प स्तरीय समितीचे / राज्यस्तरीय समिती सभेचे कार्यवृत्तांत.

१४.०० कांदळवन सह व्यवस्थापन समितीची / सदस्यांची मान्यता रद्द करणे :

कांदळवन सह व्यवस्थापन समितीने त्यांचे कर्तव्ये व जबाबदाऱ्यांचे पालन करताना हयगय केल्यास तसेच वन अधिनियमांचे भंग केल्यास विभागीय वन अधिकारी / उप वनसंरक्षक ही समिती बरखास्त करु शकतील.

सदस्याचा सदस्यता रद्द करण्याचा निर्णय कांदळवन सह व्यवस्थापन समिती घेईल, हे करताना नैसर्गिक न्यायाच्या तत्वाचे पालन करण्यात येईल.

१५.०० अपील करणे :

समिती बरखास्त होणे किंवा सदस्याची सदस्यता भंग झाल्यानंतर एक महिन्याच्या आत संबधित समिती किंवा सदर सदस्य, अपर प्रधान मुख्य वनसंरक्षक, कांदळवन कक्ष, मुंबई यांचेकडील अपील करु शकतील. अपर प्रधान मुख्य वनसंरक्षक (कांदळवन कक्ष), मुंबई यांचा निर्णय अंतिम राहील व सर्व संबंधितांवर बंधनकारक असेल.

१६.०० जिल्हास्तरीय समिती :

कांदळवन संनियंत्रणासाठी व अंमलबजावणी करण्याकरिता संबंधित जिल्हाधिकारी यांच्या अध्यक्षतेखाली खालीलप्रमाणे जिल्हास्तरीय समिती गठीत करण्यात येईल :

१)	जिल्हाधिकारी	अध्यक्ष
२)	संबंधित विभागीय वन अधिकारी / संबंधित उप वनसंरक्षक	सदस्य सचिव
३)	मुख्य कार्यकारी अधिकारी, जिल्हा परिषद किंवा त्यांचे प्रतिनिधी	सदस्य
४)	जिल्हा कृषी अधिक्षक	सदस्य
५)	सहाय्यक आयुक्त, मत्स्य व्यवसाय अधिकारी	सदस्य
६)	जिल्हा प्रतिनिधी, अग्रणी बँक	सदस्य
७)	पर्यावरण विभाग प्रतिनिधी	सदस्य
८)	दोन विकास समितीचे अध्यक्ष	सदस्य
९)	प्रादेशिक व्यवस्थापक, महाराष्ट्र राज्य पर्यटन विकास महामंडळ	सदस्य

जिल्हास्तरीय समितीच्या कार्याचे स्वरुप खालीलप्रमाणे राहील -

१. सूक्ष्म आराखडयास व त्यातील कामांना मंजूरी देणे.

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२. योजनेचा अहवाल तयार करणे.

३. विविध विभागामार्फत राबविण्यात येणाऱ्या योजना प्राधान्याने निवडलेल्या गावांमध्ये राबविणे व त्याकरिता विविध विभागाचे समन्वय करणे.

४. सूक्ष्म आराखडयाप्रमाणे काम राबविण्यावर नियंत्रण ठेवणे व कामाचे मूल्यमापन करणे.

जिल्हास्तरीय समितीची बैठक वर्षातून किमान दोनदा आयोजित करणे अनिवार्य राहील.

१७.०० राज्यस्तरीय समिती :

कांदळवन संरक्षण योजना कार्यक्रमाची अंमलबजावणीचा आढावा संनियंत्रण करणे, उदभवणारी प्रश्ने सोडविणे यासाठी "राज्यस्तरीय समिती" पुढीलप्रमाणे राहील :-

१)	प्रधान मुख्य वनसंरक्षक (वन्यजीव), महाराष्ट्र राज्य, नागपूर	अध्यक्ष
२)	अपर प्रधान मुख्य वनसंरक्षक (कांदळवन कक्ष), मुंबई	सदस्य
३)	आयुक्त, कोंकण विभाग	सदस्य
४)	मुख्य वनसंरक्षक (प्रा.), ठाणे	सदस्य
५)	मुख्य वनसंरक्षक (प्रा.), कोल्हापूर	सदस्य
६)	व्यवस्थापकीय संचालक, महाराष्ट्र राज्य पर्यटन विकास महामंडळ	सदस्य
७)	मत्स्यव्यवसाय आयुक्त, महाराष्ट्र राज्य	सदस्य
८)	दोन विकास समितीचे अध्यक्ष	सदस्य
९)	उप वनसंरक्षक (कांदळवन), मुंबई	सदस्य सचिव

राज्यस्तरीय समितीच्या कार्याचे स्वरुप खालीलप्रमाणे राहील :-

१. योजनेच्या प्रभावी कार्यन्वयनासाठी जिल्हास्तरीय समितीला सविस्तर मार्गदर्शन करणे, मागदर्शक सूचना जारी करणे.

२. योजनेच्या अंमलबजावणीमध्ये येणाऱ्या अडीअडचणी दूर करणे.

३. योजनेच्या प्रभावी अंमलबजावणीसाठी शासनास धोरणात्मक शिफारशी करणे.

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राज्यस्तरीय समितीची बैठक वर्षातून किमान एकदा आयोजित करणे अनिवार्य राहील.

वरील शासन निर्णय वित्त, नियोजन, पर्यावरण विभाग, कृषी व पदुम विभाग यांचे सहमतीने निर्गमित करण्यात येत आहे.

सदर शासन निर्णय महाराष्ट्र शासनाच्या www.maharashtra.gov.in या संकेत स्थळावर उपलब्ध करण्यात आला असून त्याचा संकेतांक २०१७०९२०१७३५५९३८१९ असा आहे. हा शासन निर्णय डिजीटल स्वाक्षरीने साक्षांकित करुन काढण्यात येत आहे.

महाराष्ट्राचे राज्यपाल यांचे आदेशानुसार व नावाने,

Virendra R Tiwari

Digitally signed by Virendra R Tiwari
DN: c=IN, o=Government Of Maharashtra, ou=Revenue And Forest Department, postalCode=400032, st=Maharashtra, 2.5.4.20=a95e1a9759002ee190cd79464daaba7dc840ec375cd62a646a64986631086810, cn=Virendra R Tiwari
Date: 2017.09.20 17:26:53 +05'30'

(वीरेन्द्र तिवारी)

मुख्य वनसंरक्षक (मंत्रालय)

प्रत :-

१. मा.मुख्य सचिव यांचे खाजगी सचिव.

पृष्ठ १३ पैकी १०

२. मा.मंत्री (वने) यांचे खाजगी सचिव.
३. मा.मंत्री (महसूल) यांचे खाजगी सचिव.
४. अपर मुख्य सचिव (वित्त), मंत्रालय, मुंबई.
५. अपर मुख्य सचिव (नियोजन), मंत्रालय, मुंबई.
६. अपर मुख्य सचिव (पर्यावरण), मंत्रालय, मुंबई.
७. प्रधान सचिव (महसूल), महसूल व वन विभाग, मंत्रालय, मुंबई.
८. प्रधान सचिव, पर्यटन व सांस्कृतिक कार्य विभाग, मंत्रालय, मुंबई.
९. सचिव (पदुम), मंत्रालय, मुंबई.
१०. प्रधान मुख्य वनसंरक्षक (वनबल प्रमुख), महाराष्ट्र राज्य, नागपूर.
११. प्रधान मुख्य वनसंरक्षक (वन्यजीव), महाराष्ट्र राज्य, नागपूर.
१२. विभागीय आयुक्त, कोंकण विभाग, कोंकण.
१३. अपर प्रधान मुख्य वनसंरक्षक (संधारण), महाराष्ट्र राज्य, नागपूर.
१४. अपर प्रधान मुख्य वनसंरक्षक (वन्यजीव), पश्चिम मुंबई.
१५. अपर प्रधान मुख्य वनसंरक्षक (कांदळवन कक्ष), मुंबई.
१६. मुख्य वनसंरक्षक (प्रादेशिक), ठाणे / कोल्हापूर.
१७. आयुक्त, मत्स्यव्यवसाय, महाराष्ट्र राज्य, मुंबई.
१८. जिल्हाधिकारी, ठाणे /रायगड/पालघर/रत्नागिरी/सिंधुदूर्ग.
१९. मुख्य कार्यकारी अधिकारी, जिल्हा परिषद (ठाणे /रायगड/पालघर/रत्नागिरी/सिंधुदूर्ग).
२०. सर्व संबंधित उप वनसंरक्षक / विभागीय वन अधिकारी
२१. सर्व संबंधित उप विभागीय अधिकारी.
२२. प्रादेशिक व्यवस्थापक, महाराष्ट्र राज्य पर्यटन विकास महामंडळ.
२३ जिल्हा कृषी अधिक्षक (ठाणे /रायगड/पालघर/रत्नागिरी/सिंधुदूर्ग).
२४. जिल्हा प्रतिनिधी, अग्रणी बँक (ठाणे /रायगड/पालघर/रत्नागिरी/सिंधुदूर्ग).
२५. निवड नस्ती, महसूल व वन विभाग, फ-३.

समझौता समयलेखाचे प्रारुप

"**कांदळवन संरक्षण व उपजिविका निर्माण योजना**" (खाजगी व्यक्ती / संस्था) यामध्ये सुक्ष्म नियोजन आराखडयाच्या अंमलबजावणीकरिता समझौता समयलेख.

सदर समझौता समयलेख श्री. . . . . उप वनसंरक्षक / विभागीय वन अधिकारी, ... वन विभाग (यांना यानंतर पक्ष क्रमांक १ असे संबोधण्यात येईल) व श्री. / श्रीमती . .. . रा. . . . . तालुका .. . . . . जिल्हा . . . . . हा . . . . अध्यक्ष, कांदळवन सह व्यवस्थापन समिती, गांव . . . . . "कांदळवन संरक्षण व उपजिविका निर्माण योजना" राबविण्यासाठी करण्यात येत आहे.

१. "कांदळवन संरक्षण व उपजिविका निर्माण योजना" राबविण्यास तयार असल्याबाबतचा ठराव दिनांक . . . . . चे सभेत पारीत करण्यात आलेला आहे.

२. "कांदळवन संरक्षण व उपजिविका निर्माण योजना" अंतर्गत मिळणारे फायदे घेण्याकरिता कांदळवनांमध्ये विना परवाना प्रवेश, डेब्रिस अथवा अन्य घनकचरा टाकण्यास मनाई, कुऱ्हाड बंदी, वनवणवा नियंत्रण व संरक्षण कामात सहाकार्य करणे इत्यादी बाबींमध्ये गावाच्या जबाबदाऱ्या व कर्तव्य पार पाडण्यास व्यक्ती / संस्था यांची संमती आहे.

३. "कांदळवन संरक्षण व उपजिविका निर्माण योजना" राबविण्यासाठी शासनाने वेळोवेळी निश्चित केलेल्या जबाबदाऱ्या पार पाडतील व त्या अनुषंगाने विहित केलेले फायदे मिळण्यास समिती पात्र राहतील.

४. समितीस अनुज्ञेय फायदे व योजनेच्या मार्गदर्शक तत्वे / शासनाने वेळोवेळी निर्गमित केलेल्या मापदंडानुसार राहील.

५. सूक्ष्म आराखडयामधील कामे शासनाने वेळोवेळी विहित केलेल्या कार्यपध्दती व वित्तिय नियमावलीच्या अधीन राहून करण्यात येतील.

६. सदर करारनामा कार्यान्वयन करतांना दोन्ही पक्षात वाद निर्माण झाल्यास संबंधित अपर प्रधान मुख्य वनसंरक्षक (कांदळवन कक्ष), मुंबई यांचा निर्णय अंतिम राहील व तो दोन्ही पक्षांना बंधनकारक राहील.

स्वाक्षरी

"कांदळवन संरक्षण व उपजिविका निर्माण योजना"
खाजगी व्यक्तीचे नाव

साक्षीदार

१) नाव . . . . . स्वाक्षरी . . . . . .
२) नाव . . . . . स्वाक्षरी . . . . . .

स्वाक्षरी

(उप वनसंरक्षक / विभागीय वन अधिकारी)

साक्षीदार

१) नाव . . . . . स्वाक्षरी . . ..
२) नाव . . . . . स्वाक्षरी . . ..

पृष्ठ १३ पैकी १२

Annexure 10 Notification of Declaration of Reserved Forest

OFFICE OF THE DIVISIONAL COMMISSIONER

Konkan Division, Konkan Bhavan,1st Floor, CBD Belapur, Navi Mumbai.

Dated 17th September 2013

NOTIFICATION

No. RB/Desk-2/Forest/CR- 2331/2013.—Whereas * the Divisional Commissioner of Konkan Division has, in exercise of the powers conferred by section 29 of the Indian Forest Act, 1927 (16 of 1927), *vide* *the Government, Memorandum Revenue and Forests Department, No. S-30/2005/C No. 62/F-1/dated 5th July 2008, * the Notification, Divisional Commissioner of Konkan Division's, No. RB/Desk-II/Forest/CR-2211/B-1, dated 5th July 2008, declared that the provisions of Chapter IV-OF PROTECTED FORESTS of the said Act shall be applicable to *the forest land/waste-land which is not included in the reserved forests but which is the property of Government, or over which the Government has proprietary rights, or to the whole or any part of the forest produce of which the Government is entitled, more specifically mentioned in the Schedule appended hereto (hereinafter referred to as "the said land"), as a protected forests ;

And whereas, the Government of Maharashtra has, in exercise of the powers conferred by section 3 of the Indian Forest Act, 1927 (16 of 1927), decided to constitute the said land, to be a reserved forest.

Now, therefore, in exercise of the powers conferred by sections 4, 17 and 29 of the Indian Forests Act, 1927 (16 of 1927), read with the Government Notification, Revenue and Forests Department , No. FLD. 1081-F-6, dated the 21st October 1981 issued in exercise of the powers conferred by sub-section (*4*) of section 3 of the Bombay Commissioners of Divisions Act, 1957 (Bom. VIII of 1958), the Divisional Commissioner of Konkan Division hereby,—

(*a*) declares that the provisions of Chapter IV relating to Protected Forest of the said Act shall ceased to apply to the said land ;

(*b*) declares that the Government of Maharashtra has decided to constitute the said land as reserved forests ;

(*c*) specifies the situation and limits of reserved forests as per the Schedule appended hereto ; and

(*d*) appoints the * Sub Divisional Officer Kurla (Mulund) to be the Forest Settlement Officer to inquire into and determine the existence, nature and extent of any rights alleged to exist in favour of any person in or over any land comprised within the limits of the reserved forest, or in or over any forest produce, and to deal with the same as provided in Chapter II of the said Act ;

(*e*) appoints the Collector of Mumbai Suburban, to hear appeals from any orders passed by the Forest Settlement Officer under sections 11,12,15 and 16 of the said Act.

Schedule

District Mumbai Suburban, Taluka Kurla

Sr. No.	Village	C.T.S. No.	S.No.	Total Area (Ha)	Notified Area (Ha)	Boundaries (* *)			
						North	South	East	West
(1)	(2)	(3)	(3A)	(4)	(4A)	(5)	(6)	(7)	(8)
1	Bhandup	477	63p	112.210	102.5198	V.B.of Nahur	New CTS 1049	V.B. of Kanjur	Eastern Express Highway

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3	Mulund (E)	1327 New	143.16	V.B.of Kopri Creek	Creek	V.B.of Bhandup	CTS No. 1318, 1319 & 1320 A/19, 1320A/ 184 Creek.
	Total of Kurla Taluka . .			502.95			

(**) These are boundaries of the entire S. No. (Col. No. 3) and not necessarily of the notified area.

Navi Mumbai,
dated 17th September 2013.

RADHESHYAM MOPALWAR,
Divisional Commissioner, Konkan Division.

ON BEHALF OF GOVERNMENT PRINTING, STATIONERY AND PUBLICATION, PRINTED AND PUBLISHED BY SHRI PARSHURAM JAGANNATH GOSAVI, PRINTED AT GOVERNMENT CENTRAL PRESS, 21-A, NETAJI SUBHASH ROAD, CHARNI ROAD, MUMBAI 400 004 AND PUBLISHED AT DIRECTORATE OF GOVERNMENT PRINTING, STATIONERY AND PUBLICATION, 21-A, NETAJI SUBHASH ROAD, CHARNI ROAD, MUMBAI 400 004, EDITOR : SHRI PARSHURAM JAGANNATH GOSAVI.

OFFICE OF THE DIVISIONAL COMMISSIONER

Konkan Division, Konkan Bhavan,1st Floor, CBD Belapur, Navi Mumbai.

Dated 17th September 2013

NOTIFICATION

No. RB/Desk-2/Forest/CR- 2331/2013.—Whereas * the Divisional Commissioner of Konkan Division has, in exercise of the powers conferred by section 29 of the Indian Forest Act, 1927 (16 of 1927), *vide* *the Government, Memorandum Revenue and Forests Department, No. S-30/2005/C No. 62/F-1/dated 5th July 2008, * the Notification, Divisional Commissioner of Konkan Division's, No. RB/Desk-II/Forest/CR-2211/B-1, dated 5th July 2008, declared that the provisions of Chapter IV-OF PROTECTED FORESTS of the said Act shall be applicable to *the forest land/waste-land which is not included in the reserved forests but which is the property of Government, or over which the Government has proprietary rights, or to the whole or any part of the forest produce of which the Government is entitled, more specifically mentioned in the Schedule appended hereto (hereinafter referred to as "the said land"), as a protected forests ;

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Schedule

District Mumbai Suburban, Taluka Kurla

Sr. No.	Village	C.T.S. No.	S.No.	Total Area (Ha)	Notified Area (Ha)	Boundaries (* *)			
						North	South	East	West
(1)	(2)	(3)	(3A)	(4)	(4A)	(5)	(6)	(7)	(8)
1	Bhandup	477	63p	112.210	102.5198	V.B.of Nahur	New CTS 1049	V.B. of Kanjur	Eastern Express Highway

(1)	(2)	(3)	(3A)	(4)	(4A)	(5)	(6)	(7)	(8)
2	Kanjur	657a	275	434.01	305.983	V.B. of Bhandup	CTS 1351 and V.B. of Bhandup	Creek & New CTS 1351	Eastern Express Highway & V.B.of Hariyali
3	Nahur	795/17	157	1.35	1.35	Trolly line & CTS No. 795/17	795/27 pt	795/27 p	795/27 p
		795/27	157	0.300	0.300	V.B. of Mulund	CTS 796 Pt V.B. of Mulund	796 p	Eastern Express Highway
		796	157	1.700	1.700	V.B.of Mulund	CTS 796 pt V.B.of Mulund	CTS 796 p	Eastern Express Highway
		796/1	157	3.350	3.2493	Trolly line & CTS No.796/1	V.B.of Mulund	CTS.796/2 Trolly line	796/1 Part
		796/2	157	17.3100	17.0721	Trolly line & CTS No.796/1	V.B.of Mulund	V.B. of Bhandup	796/2 pt
4	Mulund (E)	1320/ A	386	43.75	42.1583	1320 a/6/4 to 6/20 1320 a/7 Creek	Creek 1319 pt	1319	1280 1320 a/7 1320a/6/4 1320a/6/20
		1320A/18/1	386	0.610	0.610	1320 A/11, 1320A/18/2 1320A/18/3 1320A/18/4	1320A/18/2 1320A/18/3 & V.B.of Kopri	1320A/18/4 100 pt	100
		1320 A /18/2	386	0.14	0.14	1320 A /11, 1320 A /18/2 1320 A /18/3	1320 A /18/2 1320 A /18/3 1320 A /18/4 V.B.of Kopri	1320 A /18/4 100 pt	100
		1320A/18/3	386	0.160	0.160	1320 A/18/2 V.B.of Kopri	V.B.of Kopri	1320 A/18/1	1320A/18/1
		1320/A/18/4	386	25.070	24.1083	1320 A/18/1 V.B.of Kopri	1320 A/19 CTS No. 1327	Creek	1320 A/17 Creek
		1320/A/19	386	12.340	12.340	V.B.of Kopri	New CTS No. 1327	CTS No. 1327	1320 A/18/4
		1320/A/17	386	6.090	3.59	Creek 1320 A/18/4	1320 A/18/4	Creek	Creek
		1319	387	46.170	45.499	Creek 1320 A 1280/1291/1	New CTS 1327	CTS 1318	Eastern Express Highway

(1)	(2)	(3)	(3A)	(4)	(4A)	(5)	(6)	(7)	(8)
		100	39	1.03	1.03	100 pt	1320 A/18/1 1320 A/18/4	1320 A/18/4	100 pt
		1279	81/3	0.87	0.87	1279 pt.	1280	1280	Eastern Express Highway 1281,1282.
		1318	351	107.50	106.4880	1319	New CTS 1327	New CTS 1327	V.B.of Nahur
		1280	390	10.75	10.24	1320 A	1320 A	1319	Eastern Express Highway 1279, 1280 pt 1291/1.
5	Anik	1 pt	173	1.9600	1.9600	V.B.of Marawali	CTS 1 pt.	CTS 3	V.B. of Matunga & Creek
		3 pt	171	1.2600	1.2600	CTS 1 pt	CTS 2, 31	B.P.T.Road	V.B. of Matunga & Creek
		New 401	-	0.040	0.040	V.B.of Marawali	1 S.No.173	(1) S.No.173	V.B. of Matunga.
		New 402	-	0.010	0.010	Creek	Creek	V.B. of Matunga	V.B. of Matunga.
6	Mankhurd	1 pt	138 pt	1.67	1.67	Creek & V.B. of Devnar	V.B.of Mandala 1pt. S.No.138 pt	CTS 1 S.No.138 pt	V.B. of Devnar
		New 186	-	0.82	0.82	Creek & V.B. of Devnar	Creek	Creek	1 pt S.No.138 pt
		New 187	-	0.33	0.33	Creek	Creek	Creek	Creek
7	Mandala	1 Part	80.81 91 p	46.810	41.6078	Creek	V.B.of Turbhe	Creek CTS 1 S.No.88	Creek CTS 1 (S.No.88)
		2 Part	89 p	28.95	28.95	Creek	V.B. of Turbhe	Harbour Railway	Creek
		3	90 part	14.720	14.720	1 (S.No.88)	3 (S.No.90p)	1 (S.No.88)	4 (S.No.91 pt)
		4	91 p	10.730	10.730	1 (S.No.88)	3 (S.No.90p)	1 (S.No.88p)	1p (S.No.88)
		5	88.92 p	20.940	20.940	1 (S.No.88)	1 (S.No.88)	1 (S.No.88)	1p (S.No.88)
		6	80 p	15.260	15.260	Creek 6 (S.No. 80)	Creek	Mumbai Panvel road	6p (S.No.80)

(1)	(2)	(3)	(3A)	(4)	(4A)	(5)	(6)	(7)	(8)
		New 82	-	0.540	0.540	Creek	Creek	Creek	Creek
		New 83	-	0.090	0.090	Creek	Creek	Creek	Creek
		New 84	-	30.9485	30.9485	Creek	Creek	1 (S.No.88part)	Creek
8	Turbhe	1 Salt land Mith gare	-	23.970	23.970	Creek	Creek	CTS No. 2	V.B. of Mandale
		2 Salt land	-	15.350	15.350	CTS No. 1	CTS No. 1	Creek	CTS No. 1 & Creek
		5 Salt land	-	21.830	21.830	Creek	Creek	Creek	CTS No.4
		6 Salt land	-	89.480	89.480	Creek	Creek	Creek	CTS No. 7, 8
		7 Salt land	-	16.890	16.890	Creek	CTS No. 6	CTS No.8	V.B. of Mandale
		8 Salt land	-	7.260	7.260	CTS No. 7	CTS No.6	Creek	V.B. of Mandale
		9 Salt land	-	17.780	17.780	Creek	Creek	Creek	Creek
		10	152	13.090	13.090	V.B.of Mandale	Creek	Creek	CTS 10pt
		269	152	7.650	7.650	CTS 10 pt.	CTS 10 Pt.	CTS 2	270 Gaothan
		New 507	-	146.210	146.210	Creek	Creek	Creek	CTS No. 1,2,5,6, 9,10, S.No.152 pt.
9	Mahul	CTS 1	72	40.630	40.42	V.B.of Anik Nala	V.B.of Anik	CTS No. 472	Creek
		472	73	51.75	51.75	CTS No. 1.	CTS No. 338 B.P.T. Road	CTS No. 474 .	Creek New CTS 643
		473	72	18.670	18.670	CTS No. 472	CTS No. 472	CTS No. 474	Creek CTS 643
		474	71	79.100	57.25	CTS No. 472	CTS No. 589	Creek	Creek CTS 643
		638	77	23.68	23.68	CTS No.638 pt	Creek	Creek	CTS No. No.638 pt
		471	77p	0.830	0.830	CTS No. 471 pt	B.P.T.Road	CTS No. 472	CTS No. 472
		480	74p	0.010	0.010	CTS No. 481 pt	CTS No. 480 P.	CTS No. 472	CTS 472
		481	72 p	0.010	0.010	CTS No. 482	CTS No. 478.	CTS 480 Pt	CTS 472 pt
		642 New	-	5.250	5.250	Creek	CTS No.1	Creek	Creek

(1)	(2)	(3)	(3A)	(4)	(4A)	(5)	(6)	(7)	(8)
		643 New	-	4.310	4.310	Creek, CTS No. 472 pt. S.No.72	CTS No. 472 Pt.	Creek	Creek
		644 New	-	0.090	0.090	Creek	Creek	Creek	Creek
		645 New	-	0.110	0.110	CTS 474 pt	Creek	Creek	Creek
		646 New	-	0.100	0.100	CTS 474 pt	Creek	Creek	Creek
10	Chembur	1856 New	-	10.250	10.250	V.B.of Ghatkopar	Creek & V.B. of Ghatkopar	CTS No. 823 S.No.320	CTS No. 823 S.No.320
11	Ghatkopar	194 B	236	10.11	7.6422	CTS No. 194 A 195 Creek	Creek New CTS No.223 V.B.of Borla	Creek New CTS No.223	V.B. of Chembur New CTS No. 223 (part) & Creek.
		New CTS No.223	-	16.27	16.27	CTS No. 194 A& V.B. of Vikhroli.	V.B.of Vikhroli & Creek	V.B.of Borla & Creek	V.B. of Chembur Creek CTS No. 194 A,B Eastern Express.
12	Deonar	448 New	-	30.640	30.640	V.B. of Vikhroli	V.B. of Vikhroli	V.B. of Mankurd	CTS No.1A (S.No.93) & Creek
13	Vikhroli	1 C	136	101.380	49.2569	CTS 1A	CTS 1A	Creek & CTS 1A	V.B. of Ghatkopar CTS 1A pt.
		New 209	-	257.35	257.35	V.B. of Hariayali	Creek	Creek	CTS No.1-A CTS No.56
		Total of Kurla Taluka . .		2016.460	1782.6832				

(**) These are boundaries of the entire S. No. (Col. No. 3) and not necessarily of the notified area.

Navi Mumbai ,
dated 17th September 2013.

RADHESHYAM MOPALWAR,
Divisional Commissioner, Konkan Division.

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Annexure 11 Management Effectiveness Evaluation (MEE) Report of National Parks and Sanctuaries, 2018-19 for TCFS

Management Effectiveness Evaluation (MEE) of National Parks and Wildlife Sanctuaries, 2018-19

Northern Region: MAHARASHTRA

MEE Team

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Shri U.M. Sahai Former Chief Wildlife Warden, Government of Rajasthan umsahai@gmail.com, umsahai@rediffmail.com Ph: 09414134421	**Dr. Advait Edgoankar** Faculty, IIM, Bhopal Email: advaite@iifm.ac.in Ph: 07828566626 **Ms. Seema Bhatt** Independent Scientist New Delhi Ph: 09810827212 Email: seemabhatt60@gmail.com	**Dr. S.P. Goyal** Scientist-Emeritus Email: goyalsp@wii.gov.in Tel: 0135 2646224 (O) 9410186496 (M)

State		Name of PA
Maharashtra	1.	Mayureswar Supe WLS
Maharashtra	2.	Nandur Madhameshwar WLS
Maharashtra	3.	Painganga WLS
Maharashtra	4.	Sagareshwar WLS
Maharashtra	5.	Sanjay Gandhi NP*
Maharashtra	6.	Thane Creek Flamingo WLS
Maharashtra	7.	Tipeshwar WLS
Maharashtra	8.	Tungareshwar WLS
Maharashtra	9.	Yawal WLS
Maharashtra	10.	Yedsi Ramlin Ghat WLS
Maharashtra	11.	Naigaon Peacock WLS

List of PAs of Maharashtra evaluated during 2018-19

Name of PA	MEE Score (%)*	Current MEE Rating	Page No.
1. Mayureswar Supe WLS	75.00	Very Good	2
2. Nandur Madhameshwar WLS	64.60	Good	26
3. Painganga WLS	62.06	Good	43
4. Sagareshwar WLS	71.50	Good	58
5. Sanjay Gandhi NP#	75.80 (Score in 2018) 62.10 (Score in 2006)	Very Good Good	79
6. Thane Creek Flamingo WLS	75.92	Very Good	97
7. Tipeshwar WLS	70.80	Good	112
8. Tungareshwar WLS	64.00	Good	130
9. Yawal WLS	65.80	Good	147
10. Yedsi Ramlin Ghat WLS	72.41	Good	168
11. Naigaon Peacock WLS	66.40	Good	189

**Rating in %: Poor – Upto 40; Fair - 41 to 59; Good - 60 to 74; Very Good - 75 and above*
**This PAs was first evaluated during 2005-06, and now subjected to evaluation for second time*

6. Thane Creek Flamingo Sanctuary, Maharashtra

Management Strengths

1. The final notification of Thane Creek Flamingo Sanctuary (TCFS) under section 26 of the Wildlife (Protection) Act 1972 has been issued.
2. The strategic location and easy access of the sanctuary can lead to a large tourism influx from Mumbai and the surrounding areas.
3. The sanctuary—Asia's largest creek ecosystem—has a very rich biodiversity. The mangroves act as a huge carbon sink.
4. Flamingos (both the lesser flamingo and the greater flamingo) visit the sanctuary each year in very large numbers (18,000–20,000 greater flamingos and 10,000–12,000 lesser flamingos).
5. The mangrove forests provide ecosystem services to the city of Mumbai, including disaster protection and pollution abatement services.
6. There are many opportunities for provision of livelihoods through eco-tourism and subsistence fisheries.
7. An excellent state-of-the-art interpretation centre is functional, catering to the needs of Mumbai's schools and eco-tourists.
8. An ESZ proposal is ready and has been sent to the government.
9. Freshwater intake is continuous from the Ulhas river.
10. The sanctuary has four or five satellite wetlands around it.
11. The available funds are adequate and are mostly utilized.
12. A draft management plan is ready.

Management Weaknesses

1. The current staff strength is inadequate for the management of TCFS and the eco-sensitive zone.
2. Development projects have been proposed, including the construction of new bridges, roads, sewage treatment facilities and landfills, which may increase the level of human activity and disturb the flamingo habitat.
3. Dumping of solid wastes and debris generated by constant redevelopment works in the urban belt is a threat to the ecosystem.
4. Pollution of the water body and mangroves caused by domestic waste and sewage is an increasing concern. Seepage of industrial and organic wastes, including plastics, will have a deleterious effect on the ecosystem.
5. Electric transmission lines passing through the sanctuary are a potential threat to the flamingos.
6. Eutrophication due to high nutrient levels has not been checked, resulting in algal blooms, which may affect the community of aquatic organisms.
7. Siltation is resulting in a decrease in the inflow of fresh water from the river, and this can lead to intrusion of mangroves into the mudflats and loss of the foraging area available for the waders.

Immediate Actionable Points

1. At least four water stations should be established at vantage or vulnerable points and regular monitoring of the health of the water, including the aquatic flora and fauna, must be taken up at least once every 3 months, and the reports should be analysed.
2. Installation of CCTV and cameras at strategic points is needed to establish a surveillance network.
3. Regular monitoring of the ecosystem should be carried out using at least two drones.
4. The process of gathering intelligence through informers must be strengthened using the funds available for the purpose.
5. A system of regular collection and disposal of trash and plastic must be established.
6. A list of traditional fishermen may be prepared. No new fishing licences should be issued in the future.
7. Eco-tourism needs to be promoted as a means of livelihood generation for the fishing community.
8. The removal of encroachments must be given the highest priority.

9. Bird diverters may be installed along the electricity lines passing through the sanctuary.
10. The mudflats are to be kept free of mangrove vegetation so that the waders can forage effectively.
11. The boundary demarcation work must be completed at the earliest.
12. Census of the flamingos should be carried out annually in collaboration with the BNHS and volunteers.
13. Railings need to be put up on both sides of the jetty. Some signage is also needed.
14. The boats of the local fishermen may be utilized for tourism.
15. The skeleton of the blue whale, displayed in the open, needs to be kept within a glass enclosure so that the vagaries of weather will not cause it to deteriorate.

Annexure 12 Map Showing Wilderness Zone and Tourism Zone
Refer para 6.3, p 45

Annexure 13 Report on Satellite Wetlands by BNHS

Coastal wetlands and waterbirds of Navi Mumbai: Current status

BNHS INDIA CONSERVING NATURE SINCE 1883

Bombay Natural History Society

COASTAL WETLANDS AND WATERBIRDS OF NAVI MUMBAI: CURRENT STATUS

Prepared by

Sameer Bajaru

Mrugank Prabhu

Rahul Khot

Dr. Deepak Apte

Citation: Bajaru, S., Prabhu, M., Khot R., and Apte D (2019): Coastal wetlands and waterbirds of Navi Mumbai: Current Status. Bombay Natural History Society, Pp 35.

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Photo credit: Amol Lokhande, Mrugank Prabhu and Sameer Bajaru

Table of contents

1. Introduction

The rapid expansion of the world's urban population is a significant global driver of land-use conversion and ecosystem modification (Leston and Rodewald 2006), which has resulted into tremendous loss in the biodiversity, particularly so in tropical cities. Mumbai located in coastal plains of the Western Ghats is no exception to this. It has always been a center of development since European colonization due to its key geographic position and abundance of natural resources. It is the financial capital of the nation and ninth populous city in the world with a current population of 26.6 million (UN 2012) which would grow to 44 million by 2052 and spread over 1050 sq. km., almost double the present area of 603 sq. km. (Kamdar 2014). This means there will be tremendous pressure on the already shrunken natural habitats, especially mangroves and remnant forest patches, that will eventually impact the local biodiversity (Nagendra et al. 2013). While looking at the coastal nature of the city, loss of the biodiversity, natural vegetation in particular, may not only leaves the city vulnerable to local environmental issues such as floods, runoff of pollutants, reduction in the groundwater but also global disasters like cyclone, tsunamis and sea level rise due to global climate change (Kleppel et al. 2006). Therefore, it is indeed crucial now to know how changing land use patterns would influence the local biodiversity in this region for its conservation and management.

Mumbai is a well-known and important site for migratory birds due to its extensive mudflats, favorite foraging areas for shorebirds— some of the key areas are Mahul-Sewri Creek, Thane Creek and wetlands and Navi Mumbai. These areas are under huge anthropogenic pressure, as urban lands replacing the natural habitats. Hence we shortlisted nine wetlands in Thane Creek and Navi Mumbai for investigating the status of waterbirds and wetlands. However, only six wetlands were monitored considering their high potential to support and sustain large populations of waterbirds (Map 1). All these wetlands were used by birds as high tide roosting sites. Local people also utilized these wetlands for fishing and salt farming and hence their water level is controlled by tide gates and pipe culverts. These wetlands are diverse in size, depth, distance from shore and surrounding habitat: Bhendkhal is a smallest (8 ha) and Panje is the largest wetland (124 ha); Non-Residential Indian (NRI) complex and Bhandup Pumping Station (BPS) wetlands are comparatively deeper than other wetlands; Belpada and BPS are relatively distant from the shore and they are embedded in mangroves whereas NRI, TSC and Bhendkhal are surrounded by human settlements. All these factors influence the composition and abundance of the waterbirds in the wetlands.

These wetlands have an interesting ecological history. Navi Mumbai, where these wetlands are located, had been covered with large expanses of salt pans and paddy fields

till the 1970s. Tidal water was regulated by tide gates for agriculture, salt farming and fishing, however, these traditional practices were declined remarkably by 1980s. This coincided with the establishment of City and Industrial Development Corporation of Maharashtra (CIDCO), which was founded to develop this region into the new metropolitan area, now known as Navi Mumbai, inorder to shift exploding population in old Mumbai. Thus, increasing land prices, changing hydrology and economy of this region due to construction activities, government policies and changing lifestyles could have made people to abandon farming and fishing. This might have brought transformation in this region — new wetlands were formed naturally in abandoned salt pans and paddy fields and artificially by soil excavation — existing wetlands became shallow or disappeared due to heavy siltation and landfilling and along with uncultivated and unmanaged lands, they were replaced by prolific growth of mangroves and scrubs.

Currently, these wetlands are in grave threat from unsustainable developmental activities, especially landfilling for residential, recreational and commercial purpose. Though these wetlands constitute a small fraction of area, they support around a quarter of a million birds belong to more than a hundred species and most of them are migratory with declining populations around the globe. Therefore, it is crucial to assess the potential of these wetlands and threats to them in order to implement the appropriate conservation and management actions for long term preservation of these habitats. We conducted monthly bird counts on all six wetlands from January to September 2018 and examined their water regulation mechanism and threats. In addition, we also collected secondary data from fishermen, farmers and other local people on past and present ecological history of this region and particularly of these wetlands. We did the supervised classification of Landsat images of 1973, 1987, 2002 and 2018 for quantifying land use and land cover change around these wetlands. Nine categories were finalized for classification, viz., seawater, salt pan, mudflat, settlement, agriculture, settlement, mangrove, closed forest (semi-evergreen and moist deciduous forest) and open forest (grassland and scrub). We not included seawater and mudflat in quantitative analysis, as seawater was not a category of interest and area of mudflat captured in the satellite image is depends on tide which was not constant in images we studied. Based on these multiple sources of information we assessed the current status of waterbirds and wetlands in Navi Mumbai and suggested actions for their conservation.

2. Wetlands

2.1. Panje Wetland

1. Characteristics

Location: This wetland is located on the west of Dongri and Panje villages (18°54'0.95"N, 72°57'2.04"E). It is enclosed by 8-10 feet high concrete wall and therefore almost isolated from tidal influence. West side of the wetland bordered with a narrow patch of mangrove (300–500m wide and 1.5 km long), whereas east side surrounded with degraded mangroves, villages and roads. Internally, the wetland is divided into a number of compartments using soil bunds, usually, most of the area is shallow but some parts are excavated and deepened for fishing. These areas are transformed into reeds.

Area: 124 ha
Number of bird species: 50 (Table 2.1.2)
Number of individuals: 565 (minimum)–11560 (maximum). The numbers of birds in the winter season can reach up to 50,000, however frequently observed numbers fluctuate between 15000 to 20000.
Number of migratory species: 31
Number of near-threatened species: 6
Number of vulnerable species: 1
Wildlife Protection Act schedule species: Schedule I–5, **Schedule IV** –45
Remark: The site was notified as a Special Economic Zone (SEZ) of Uran, Navi Mumbai in 2009.

2. Water control

A narrow creek on the west side of the wetland runs in the northwest to southeast direction from Mora to Funde, is replenishes it through discharging water during high tide. However, the quantity of water entering the wetland is controlled by a tidal gate (Image 1) and three single concrete pipe culverts on this creek (Map 4; Images 2-4). A tidal gate is located (18°53'41.25"N, 72°56'50.14"E) on the southwest of the wetland. It is about 40m wide and 7-8m high with two rows of square iron flap valves (35 above and 35 below). This gate is constructed and monitored by CIDCO. The wetland also has three single concrete pipe culverts (<1m diameter), two located on northwest (18°54'24.14"N, 72°56'34.35"E; 18°54'11.24"N, 72°56'44.59"E) and one on southwest

(18°53'39.18"N, 72°57'4.78"E). These culverts are operated by local fisherman from Panje and Dongri villages.

During our site visit on 3rd October 2018 tidal gate was under maintenance, replacing old flaps and installing additional new flaps (some valves are open for a long period due to lack of flaps). We saw only four flaps from the lower row were open. Discussion with local people and gate operator revealed that 10 flaps must be opened to maintain the desirable water level in the wetland, opening 30–35 flaps would be recommended for the ideal water level in wetland and villages. Obstruction of high tidal water movement around the villages by tidal gate had altered local hydrology and created health-related issues in villages, viz., Panje, Dongri, Funde and Bokadvira. A restricted flow of tidal water had created stagnated water bodies around these villages which were excellent breeding grounds for mosquitoes and other parasites, those otherwise could be controlled by the natural tidal movement of water.

3. Chronology of wetland: Please refer to map 2, map 10, fig.1.

Table 2.1.1. Chronology of land use and land cover change in 2.5km radius circle around Panje Wetland (% = proportion of the land use or land cover category, ha = area of land use or land cover category in hectare).

	Mangrove		Saltpan		Wetland		Settlement		Open Forest		Closed Forest		Agriculture	
	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha
1973	9.25	136.42	6.20	91.42	7.48	110.36	8.34	123.00	11.96	176.48	5.83	85.98	50.95	751.71
1987	15.53	270.57	3.88	67.66	3.96	68.95	14.37	250.28	13.32	232.01	4.77	83.17	44.17	769.50
2002	19.18	426.30	9.49	210.87	0.79	17.63	27.24	605.61	15.38	341.80	1.50	33.26	26.43	587.48
2018	27.19	645.65	0.32	7.56	4.90	116.48	42.55	1010.43	10.78	256.07	1.74	41.35	12.52	297.28

Table 2.1.2. Protection and conservation status and summary statistic of observed populations of the waterbirds at Panje Wetland from January to September 2018.

WLPA=Wildlife Protection Act; IUCN=International Union for Conservation of Nature; LC=Least concerned; NT=Near threatened; V=Vulnerable; M=Migratory; R=Residential; Min=Minimum; Max=Maximum.

Common name	Scientific name	WLPA Status	IUCN Status	M/R	Min	Max	Mean
Lesser Whistling Duck	*Dendrocygna javanica*	IV	LC	M	4	200	35.33
Ruddy Shelduck	*Tadorna ferruginea*	IV	LC	M	5	5	0.83
Indian Spot-billed Duck	*Anas poecilorhyncha*	IV	LC	R	11	21	10.67
Little Grebe	*Tachybaptus ruficollis*	IV	LC	R	3	4	1.17
Painted Stork	*Mycteria leucocephala*	IV	NT	R	9	185	39.17
Greater Flamingo	*Phoenicopterus roseus*	I	LC	M	15	1500	411.67
Lesser Flamingo	*Phoeniconaias minor*	I	NT	M	1	432	78.50
Black-headed Ibis	*Threskiornis melanocephalus*	IV	NT	R	1	6	1.50
Glossy Ibis	*Plegadis falcinellus*	IV	LC	M	12	37	10.67

Eurasian Spoonbill	*Platalea leucorodia*	I	LC	M	2	70	19.83
Indian Pond Heron	*Ardeola grayii*	IV	LC	R	1	3	0.67
Grey Heron	*Ardea cinerea*	IV	LC	R	2	5	2.17
Purple Heron	*Ardea purpurea*	IV	LC	R	1	5	1.17
Great Egret	*Casmerodius albus*	IV	LC	R	2	3	1.17
Intermediate Egret	*Mesophoyx intermedia*	IV	LC	R	5	25	9.33
Little Egret	*Egretta garzetta*	IV	LC	R	2	20	6.67
Western Reef Egret	*Egretta gularis*	IV	LC	R	2	10	4.17
Little Cormorant	*Phalacrocorax niger*	IV	LC	R	1	38	18.33
Brahminy Kite	*Heliastur indus*	I	LC	R	2	2	0.33
Western Marsh Harrier	*Circus aeruginosus*	I	LC	M	1	1	0.17
White-breasted Waterhen	*Amaurornis phoenicurus*	IV	LC	R	2	2	0.67
Purple Swamphen	*Porphyrio porphyrio*	IV	LC	R	2	2	0.33
Eurasian Coot	*Fulica atra*	IV	LC	R	5	9	3.67
Black-winged Stilt	*Himantopus himantopus*	IV	LC	R	8	200	94.33
Pied Avocet	*Recurvirostra avosetta*	IV	LC	M	2	2	0.33
Red-wattled Lapwing	*Vanellus indicus*	IV	LC	R	2	3	0.83
Pacific Golden Plover	*Plover Pluvialis fulva*	IV	LC	M	2	2	0.33
Grey Plover	*Pluvialis squatarola*	IV	LC	M	5	10	2.50
Greater Sand Plover	*Charadrius leschenaultii*	IV	LC	M	208	1050	418
Lesser Sand Plover	*Charadrius mongolus*	IV	LC	M	122	3250	970.33
Ruff	*Philomachus pugnax*	IV	LC	M	2	2	0.33
Red-necked Phalarope	*Phalaropus lobatus*	IV	LC	M	1	1	0.17
Black-tailed Godwit	*Limosa limosa*	IV	NT	M	30	278	109.67
Whimbrel	*Numenius phaeopus*	IV	LC	M	9	20	6.83
Eurasian Curlew	*Numenius arquata*	IV	NT	M	1	80	23
Common Redshank	*Tringa totanus*	IV	LC	M	17	350	136.17
Marsh Sandpiper	*Tringa stagnatilis*	IV	LC	M	1	29	11.67
Common Greenshank	*Tringa nebularia*	IV	LC	M	5	27	7
Terek sandpiper	*Xenus cinereus*	IV	LC	M	24	24	4
Common Sandpiper	*Actitis hypoleucos*	IV	LC	M	15	15	2.50
Little Stint	*Calidris minuta*	IV	LC	M	505	2100	735
Curlew Sandpiper	*Calidris ferruginea*	IV	NT	M	53	3250	779
Dunlin	*Calidris alpina*	IV	LC	M	3	1050	175.50
Broad-billed Sandpiper	*Limicola falcinellus*	IV	LC	M	700	900	266.67
Heuglin's Gull	*Larus heuglini*	IV	LC	M	38	38	6.33
Black-headed Gull	*Chroicococephalus ridibundus*	IV	LC	M	26	26	4.33
Gull-billed Tern	*Gelochelidon nilotica*	IV	LC	M	10	1500	335
Caspian Tern	*Hydroprogne caspia*	IV	LC	M	10	59	21.83
Whiskered Tern	*Chlidonias hybrida*	IV	LC	M	7	872	317.50
Indian Skimmer	*Rynchops albicollis*	IV	V	M	1	1	0.17

2.2. Belpada Wetland

1. Characteristics

Location: This wetland is located (18°55'45.68"N, 72°59'50.68"E) on the northwest of Belpada village, Uran tahsil. It is situated between two narrow creeks on the east and west sides and surrounded by mangroves. This wetland also has scattered patches of mangroves.

Area: 30 ha

Number of bird species: 30 (Table 2.2.2)

Number of individuals: 15 (minimum)–605 (maximum)

Number of migratory species: 19

Number of near-threatened species: 5

Wildlife Protection Act schedule species: Schedule I–5, **Schedule IV** –25

2. Water control

In this wetland during high tide water enters from both the creeks. East side of the wetland is bordered by the creek (about 30–40m wide) which has sluice gate at beginning of the wetland (18°55'55.54"N, 73°0'5.76"E; Map 5). However, water from this creek enters into wetland through single concrete pipe culvert (18°55'48.61"N, 73°0'1.12"E). Similarly, two narrow channels after flowing 400-500m from west creek drain into the wetland through single concrete pipe culverts at the west (18°55'49.51"N, 72°59'43.64"E) and south (18°55'34.64"N, 72°59'43.90"E). This wetland was used for fishing by local people but currently (after 2017) the channels are not being monitored.

3. Chronology of wetland: Please refer to map 2 and map 10, and fig.1.

Table 2.2.1. Chronology of land use and land cover change in 2.5km radius circle around Belpada Wetland (% = proportion of the land use or land cover category, ha = area of land use or land cover category in hectare).

	Mangrove		Saltpan		Wetland		Settlement		Open Forest		Closed Forest		Agriculture	
	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha
1973	15.21	298.66	13.82	271.29	7.54	147.98	6.56	128.75	16.32	320.38	2.83	55.62	37.73	740.82
1987	31.23	464.34	0.41	6.09	1.57	23.30	15.19	225.83	21.76	323.43	0.31	4.62	29.53	439.01
2002	17.30	407.50	0.74	17.51	5.55	130.66	27.64	650.94	8.92	210.15	0.04	0.83	39.82	937.85
2018	40.74	972.49	0.00	0.00	2.22	53.00	53.64	1280.29	3.15	75.15	0.02	0.37	0.23	5.52

Table 2.2.2. Protection and conservation status and summary statistic of observed populations of the waterbirds at Belpada Wetland from January to September 2018.

WLPA=Wildlife Protection Act; IUCN=International Union for conservation of Nature; LC=Least concerned; NT=Near threatened; M=Migratory; R=Residential; Min=Minimum; Max=Maximum.

Common name	Scientific name	WLPA status	IUCN status	M/R	Min	Max	Mean
Lesser Whistling Duck	*Dendrocygna javanica*	IV	LC	M	3	50	8.83
Indian Spot-billed Duck	*Anas poecilorhyncha*	IV	LC	R	4	11	2.50
Painted Stork	*Mycteria leucocephala*	IV	NT	R	16	16	2.67
Greater Flamingo	*Phoenicopterus roseus*	I	LC	M	180	200	63.33
Lesser Flamingo	*Phoeniconaias minor*	I	NT	M	10	10	1.67
Black-headed Ibis	*Threskiornis melanocephalus*	IV	NT	R	1	1	0.17
Eurasian Spoonbill	*Platalea leucorodia*	I	LC	M	1	4	0.83
Grey Heron	*Ardea cinerea*	IV	LC	R	1	1	0.17
Intermediate Egret	*Mesophoyx intermedia*	IV	LC	R	1	2	1
Little Egret	*Egretta garzetta*	IV	LC	R	1	3	1
Western Reef Egret	*Egretta gularis*	IV	LC	R	1	1	0.50
Little Cormorant	*Phalacrocorax niger*	IV	LC	R	2	14	3.17
Indian Cormorant	*Phalacrocorax fuscicollis*	IV	LC	R	1	1	0.17
Black-winged Kite	*Elanus caeruleus*	I	LC	R	23	23	3.83
Western Marsh Harrier	*Circus aeruginosus*	I	LC	M	1	1	0.17
Black-winged Stilt	*Himantopus himantopus*	IV	LC	R	2	6	1.33
Pacific Golden Plover	*Plover Pluvialis fulva*	IV	LC	M	13	13	2.17
Grey Plover	*Pluvialis squatarola*	IV	LC	M	1	19	4.83
Lesser Sand Plover	*Charadrius mongolus*	IV	LC	M	4	4	0.67
Black-tailed Godwit	*Limosa limosa*	IV	NT	M	1	1	0.17
Common Redshank	*Tringa totanus*	IV	LC	M	4	35	6.50
Marsh Sandpiper	*Tringa stagnatilis*	IV	LC	M	6	6	1
Common Greenshank	*Tringa nebularia*	IV	LC	M	2	10	2
Wood Sandpiper	*Tringa glareola*	IV	LC	M	6	6	1
Little Stint	*Calidris minuta*	IV	LC	M	150	194	57.33
Curlew Sandpiper	*Calidris ferruginea*	IV	NT	M	56	56	9.33
Slender-billed Gull	*Chroicocephalus genei*	IV	LC	M	36	36	6
Gull-billed Tern	*Gelochelidon nilotica*	IV	LC	M	7	10	2.83
Caspian Tern	*Hydroprogne caspia*	IV	LC	M	1	1	0.17
Whiskered Tern	*Chlidonias hybrida*	IV	LC	M	1	1	0.17

2.3. Bhendkhal Wetland

1. Characteristics

Location: This site is located (18°52'21.68"N, 72°59'10.42"E) south of Bhendkhal village, Uran tahsil. It has six wetlands, a freshwater wetland (on northwest) and five saltwater wetlands. These wetlands are surrounded by mangroves on east and west sides, the north side is delimited with settlement while the south side is bordered by a creek.

Area: 8 ha

Number of bird species: 40 (Table 2.3.2)

Number of individuals: 42 (minimum)–814 (maximum)

Number of migratory species: 19

Number of near-threatened species: 3

Wildlife Protection Act schedule species: Schedule I–4, **Schedule IV** –36

Remark: The site was notified as a Special Economic Zone (SEZ) of Uran, Navi Mumbai.

2. Water control

Though south and east sides of the wetland are 150m away from a broad creek (200m wide), water enters in it through two single concrete pipe culverts on north (18°52'25.51"N,72°59'20.92"E; 18°52'22.91"N,72°59'23.42"E; Map 6). These channels are very narrow, 160–170m long and flow through a small patch of mangrove on the east. Currently, the water intake was reduced due to landfilling and other ongoing construction activities. The freshwater wetland is totally depended on rainfall for water and become dry soon after the rainy season.

3. Chronology of wetland: Please refer to map 2 and map 10, and fig.1.

Table 2.3.1. Chronology of land use and land cover change in 2.5km radius circle around Bhendkhal Wetland (% = proportion of the land use or land cover category, ha = area of land use or land cover category in hectare).

	Mangrove		Saltpan		Wetland		Settlement		Open Forest		Closed Forest		Agriculture	
	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha
1973	10.99	183.79	0.97	16.16	10.36	173.24	6.36	106.41	0.53	8.89	1.13	18.94	69.66	1165.19
1987	17.18	285.97	3.48	57.87	1.75	29.16	5.46	90.90	0.38	6.25	0.02	0.37	71.73	1193.62
2002	13.50	256.95	5.21	99.26	1.38	26.36	32.73	623.15	2.71	51.55	0.10	1.84	44.37	844.68
2018	26.21	538.46	0.00	0.00	4.33	88.97	40.57	833.51	1.90	39.07	0.08	1.63	26.92	553.10

Table 2.3.2. Protection and conservation status and summary statistic of observed populations of the waterbirds at Bhendkhal Wetlands from January to September 2018.

WLPA=Wildlife Protection Act; IUCN=International Union for Conservation of Nature; LC=Least concerned; NT=Near threatened, M=Migratory; R=Residential; Min=Minimum; Max=Maximum.

Common name	Scientific name	WLPA Status	IUCN Status	M/R	Min	Max	Mean
Lesser Whistling Duck	*Dendrocygna javanica*	IV	LC	M	4	550	112.80
Ruddy Shelduck	*Tadorna ferruginea*	IV	LC	M	3	3	0.60
Indian Spot-billed Duck	*Anas poecilorhyncha*	IV	LC	R	3	67	20.40
Little Grebe	*Tachybaptus ruficollis*	IV	LC	R	45	3	1
Painted Stork	*Mycteria leucocephala*	IV	NT	R	51	47	18.40
Greater Flamingo	*Phoenicopterus roseus*	I	LC	M	1	51	10.20
Black-headed Ibis	*Threskiornis melanocephalus*	IV	NT	R	1	2	1
Glossy Ibis	*Plegadis falcinellus*	IV	LC	M	1	1	0.20
Eurasian Spoonbill	*Platalea leucorodia*	I	LC	M	8	8	1.60
Indian Pond Heron	*Ardeola grayii*	IV	LC	R	1	4	1
Grey Heron	*Ardea cinerea*	IV	LC	R	1	1	0.60
Purple Heron	*Ardea purpurea*	IV	LC	R	2	15	3.40
Cattle Egret	*Bubulcus ibis*	IV	LC	R	5	5	1
Great Egret	*Casmerodius albus*	IV	LC	R	1	4	1.40
Intermediate Egret	*Mesophoyx intermedia*	IV	LC	R	4	22	8
Little Egret	*Egretta garzetta*	IV	LC	R	1	8	1.80
Western Reef Egret	*Egretta gularis*	IV	LC	R	1	2	0.60
Little Cormorant	*Phalacrocorax niger*	IV	LC	R	1	21	5.20
Indian Cormorant	*Phalacrocorax fuscicollis*	IV	LC	R	1	1	0.20
Osprey	*Pandion haliaetus*	I	LC	M	1	1	0.20
Western Marsh Harrier	*Circus aeruginosus*	I	LC	M	3	3	0.60
Purple Swamphen	*Porphyrio porphyrio*	IV	LC	R	2	8	4.20
Eurasian Coot	*Fulica atra*	IV	LC	R	2	69	42.20
Pheasant-tailed Jacana	*Metopidius indicus*	IV	LC	R	3	3	0.60
Black-winged Stilt	*Himantopus himantopus*	IV	LC	R	4	17	6.60
Red-wattled Lapwing	*Vanellus indicus*	IV	LC	R	2	3	1.40
Little Ringed Plover	*Charadrius dubius*	IV	LC	M	1	1	0.20
Common Snipe	*Gallinago gallinago*	IV	LC	M	34	34	6.80
Black-tailed Godwit	*Limosa limosa*	IV	NT	M	12	12	2.40
Common Redshank	*Tringa totanus*	IV	LC	M	1	13	2.80
Marsh Sandpiper	*Tringa stagnatilis*	IV	LC	M	24	24	4.80
Common Greenshank	*Tringa nebularia*	IV	LC	M	2	2	0.40
Common Sandpiper	*Actitis hypoleucos*	IV	LC	M	11	11	2.20
Little Stint	*Calidris minuta*	IV	LC	M	60	60	12
Brown-headed Gull	*Chroicocephalus*	IV	LC	M	4	4	0.80
Black-headed Gull	*Chroicococephalus*	IV	LC	M	6	6	1.20
Gull-billed Tern	*Gelochelidon nilotica*	IV	LC	M	7	7	1.40
Whiskered Tern	*Chlidonias hybrida*	IV	LC	M	5	6	2.20
White-throated	*Halcyon smyrnensis*	IV	LC	R	1	1	0.20
Common Kingfisher	*Alcedo atthis*	IV	LC	R	1	1	0.20

2.4. Training Ship Chanakya (TSC) Wetland

1. Characteristics

Location: This wetland is located (19°0'56.54"N 73°0'20.48"E) behind the Training Ship Chanakya (TSC) Maritime Institute, Palm Beach Road, Seawoods. West side of this wetland is bound with a large patch of abandoned paddy fields and scrub (200m wide 1.5 km long), which separated from the seashore by a narrow strip of mangroves (100-200m wide and 1.5 km long). In contrast, the east side of the wetland is demarcated by palm beach road and beyond it is a dense urban settlement. Whereas north and south sides of the wetland are bordered with mangroves.

Area: 13 ha
Number of bird species: 21 (Table 2.4.2)
Number of individuals: 32 (minimum)–1174 (maximum)
Number of migratory species: 11
Number of near-threatened species: 4
Number of vulnerable species: 1
Wildlife Protection Act schedule species: Schedule I–2, **Schedule IV** –19

2. Water control

This wetland is replenished during high tide by small water channel (<5m wide) on the north, water also enters from the south end but don't have a well-defined channel like north (Map 7). The water level is mainly controlled by a wooden sluice gate (2–2.5m high and 2m wide; 19°1'5.85"N, 73°0'19.46"E) on the north channel and about one hectare of the area around the gate is used for fishing. Water is usually taken during the highest high tides of the month and is released back during the lowest low tides of the month to maintain the productivity of this fishing pond. However, almost 93% of the wetland is submerged in the water (>50cm deep) because of blocking the drainage of the water by the pond, this water would be used as a reserve in case fishermen failed to replenish the pond during high tide.

Discussion with local fisherman revealed that during the colonial period this entire stretch of coast from Seawood to Koparkhairane was regulated with tidal gates for production of salt and paddy and it continued till the 1970s. After that, the tidal gates were abandoned due to lack of maintenance, even though the area was used for salt production and paddy cultivation till the 1980s and early 1990s. But rapid urbanization in this area increased the prices of the lands and disturbed the local hydrodynamics of

the area on which local people depended for salt, paddy and fish. It had resulted into abandoning of agriculture, salt framing and fishing and hence entire landscape transformed into dense urban settlements, deep wetlands, shrublands and mangroves.

3. Chronology of wetland: Please refer to map 3 and map 10 and fig.1.

Table 2.4.1. Chronology of land use and land cover change in 2.5km radius circle around TSC Wetland (% = proportion of the land use or land cover category, ha = area of land use or land cover category in hectare).

	Mangrove		Saltpan		Wetland		Settlement		Open Forest		Closed Forest		Agriculture	
	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha
1973	0.47	3.88	7.54	62.95	15.07	125.88	16.16	134.93	5.27	44.01	0.97	8.09	54.53	455.38
1987	13.56	130.24	0.00	0.00	0.49	4.73	15.67	150.54	12.78	122.75	0.14	1.38	57.35	550.73
2002	19.01	199.28	0.00	0.00	8.09	84.83	69.82	732.09	2.99	31.33	0.09	0.97	0.00	0.00
2018	29.64	356.87	0.00	0.00	5.08	61.13	64.46	776.08	0.66	7.91	0.11	1.33	0.05	0.62

Table 2.4.2. Protection and conservation status and summary statistic of observed populations of the waterbirds at TSC Wetland from January to September 2018.

WLPA=Wildlife Protection Act; IUCN=International Union for Conservation of Nature; LC=Least concerned; NT=Near threatened; M=Migratory; R=Residential; Min=Minimum; Max=Maximum.

Common name	Scientific name	WLPA Status	IUCN Status	M/R	*Min*	*Max*	*Mean*
Indian Spot-billed Duck	*Anas poecilorhyncha*	IV	LC	R	2	9	4
Painted Stork	*Mycteria leucocephala*	IV	NT	R	1	3	1
Greater Flamingo	*Phoenicopterus roseus*	I	LC	M	45	70	28.75
Lesser Flamingo	*Phoeniconaias minor*	I	NT	M	3	700	175.75
Indian Pond Heron	*Ardeola grayii*	IV	LC	R	1	3	1.50
Grey Heron	*Ardea cinerea*	IV	LC	R	1	1	0.25
Great Egret	*Casmerodius albus*	IV	LC	R	1	10	3.50
Intermediate Egret	*Mesophoyx intermedia*	IV	LC	R	1	13	8
Little Egret	*Egretta garzetta*	IV	LC	R	1	6	2.75
Little Cormorant	*Phalacrocorax niger*	IV	LC	R	2	25	8
Indian Cormorant	*Phalacrocorax fuscicollis*	IV	LC	R	1	1	0.25
White-breasted Waterhen	*Amaurornis phoenicurus*	IV	LC	R	1	1	0.50
Lesser Sand Plover	*Charadrius mongolus*	IV	LC	M	7	7	1.75
Eurasian Curlew	*Numenius arquata*	IV	NT	M	74	74	18.50
Common Redshank	*Tringa totanus*	IV	LC	M	5	36	10.25
Marsh Sandpiper	*Tringa stagnatilis*	IV	LC	M	2	2	0.50
Common Greenshank	*Tringa nebularia*	IV	LC	M	3	3	0.75
Curlew Sandpiper	*Calidris ferruginea*	IV	NT	M	9	9	2.25
Dunlin	*Calidris alpina*	IV	LC	M	1	1	0.25
Slender-billed Gull	*Chroicocephalus genei*	IV	LC	M	1	1	0.25
Gull-billed Tern	*Gelochelidon nilotica*	IV	LC	M	2	3	1.25

2.5. Non-Residential Indian (NRI) Complex Wetland

1. Characteristics

Location: This wetland is located (19°0'24.24"N, 73° 0'42.47"E) near NRI Complex, south of TSC. West and south sides of this wetland are surrounded with mangroves, whereas northeast and southeast sides are bordered by residential apartments. It is divided into two compartments by soil bund, the smaller compartment on north and larger compartment on south. Bund on west separating this wetland from mangrove has almost a km long dirt path, planted with aesthetic trees and is used for walking and jogging. Southeast side of this wetland is also bordered with tall trees.

Area: 19 ha

Number of bird species: 37 (Table 2.5.2)

Number of individuals: 130 (minimum)–5755 (maximum)

Number of migratory species: 22

Number of near-threatened species: 4

Number of vulnerable species: 1

Wildlife Protection Act schedule species: Schedule I–3, **Schedule IV** –33

2. Water control

This wetland has a sluice gate (19°0'8.08"N, 73°0'47.58"E) and two single concert pipe culverts (19°0'26.02"N, 73° 0'36.12"E; 19°0'21.97"N, 73°0'37.62"E; Map 8) to control the high tide water entering in it. Pipe culverts on the west side of the wetland, about 150m apart from each other, are located on very narrow bifurcated channels (<5m wide), those drain into a comparatively larger channel located at 500m. A sluice gate is placed on a narrow channel at the south end of the wetland, this channel after flowing 400m through mangroves reaches to the shore. This wetland is mainly used for fishing hence is relatively deeper, this could be the reason it is preferred by large size birds like flamingos or birds those can swim like ducks.

3. Chronology of wetland: Please refer to map 3 and map 10, and fig.1.

Table 2.5.1. Chronology of land use and land cover change in 2.5km radius circle around

NRI complex Wetland (% = proportion of the land use or land cover category, ha = area of land use or land cover category in hectare).

	Mangrove		Saltpan		Wetland		Settlement		Open Forest		Closed Forest		Agriculture	
	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha
1973	1.53	13.05	7.79	66.40	16.77	142.95	16.91	144.17	4.48	38.20	1.22	10.43	51.29	437.24
1987	16.22	160.92	0.00	0.00	0.54	5.33	19.75	196.00	13.60	134.95	0.19	1.84	49.70	493.16
2002	16.14	171.40	0.28	3.01	8.04	85.40	68.49	727.33	3.50	37.19	0.14	1.52	3.40	36.08
2018	27.10	346.12	0.00	0.00	6.41	81.82	65.78	840.06	0.55	7.03	0.11	1.36	0.05	0.62

Table 2.5.2. Protection and conservation status and summary statistic of observed populations of the waterbirds at NRI complex Wetland from January to September 2018.

WLPA=Wildlife Protection Act; IUCN=International Union for conservation of Nature; LC=Least concerned; NT=Near threatened; M=Migratory; R=Residential; Min=Minimum; Max=Maximum.

Common name	Scientific name	WLPA	IUCN	M/R	*Min*	*Max*	*Mean*
Lesser Whistling	*Dendrocygna javanica*	IV	LC	M	9	9	1.80
Indian Spot-billed	*Anas poecilorhyncha*	IV	LC	R	2	5	1.80
Little Grebe	*Tachybaptus ruficollis*	IV	LC	R	1	5	1.20
Painted Stork	*Mycteria leucocephala*	IV	NT	R	25	173	59.40
Asian Openbill	*Anastomus oscitans*	IV	LC	R	0	0	0
Greater Flamingo	*Phoenicopterus roseus*	I	LC	M	74	74	14.80
Lesser Flamingo	*Phoeniconaias minor*	I	NT	M	5	5350	1071
Indian Pond Heron	*Ardeola grayii*	IV	LC	R	1	7	2.40
Grey Heron	*Ardea cinerea*	IV	LC	R	2	2	0.40
Purple Heron	*Ardea purpurea*	IV	LC	R	0	0	0
Cattle Egret	*Bubulcus ibis*	IV	LC	R	1	1	0.20
Intermediate Egret	*Mesophoyx intermedia*	IV	LC	R	2	19	7
Little Egret	*Egretta garzetta*	IV	LC	R	1	18	5.20
Western Reef Egret	*Egretta gularis*	IV	LC	R	1	1	0.40
Little Cormorant	*Phalacrocorax niger*	IV	LC	R	16	33	9.80
Black-winged Kite	*Elanus caeruleus*	I	LC	R	22	22	4.40
Eurasian Coot	*Fulica atra*	IV	LC	R	8	8	1.60
Black-winged Stilt	*Himantopus himantopus*	IV	LC	R	1	3	0.80
Red-wattled Lapwing	*Vanellus indicus*	IV	LC	R	1	5	2.60
Pacific Golden Plover	*Plover Pluvialis fulva*	IV	LC	M	4	4	0.80
Grey Plover	*Pluvialis squatarola*	IV	LC	M	13	13	2.60
Whimbrel	*Numenius phaeopus*	IV	LC	M	2	2	0.40
Eurasian Curlew	*Numenius arquata*	IV	NT	M	13	15	5.60
Common Redshank	*Tringa totanus*	IV	LC	M	9	186	69.80
Marsh Sandpiper	*Tringa stagnatilis*	IV	LC	M	2	4	1.20
Common	*Tringa nebularia*	IV	LC	M	12	12	2.40
Common Sandpiper	*Actitis hypoleucos*	IV	LC	M	2	3	1.60
Ruddy Turnstone	*Arenaria interpres*	IV	LC	M	2	2	0.40
Curlew Sandpiper	*Calidris ferruginea*	IV	NT	M	1	1	0.20
Broad-billed	*Limicola falcinellus*	IV	LC	M	7	7	1.40
Caspian Gull	*Larus cachinnans*	IV	LC	M	32	32	6.40

Brown-headed Gull	*Chroicocephalus*	IV	LC	M	390	390	78
Black-headed Gull	*Chroicococephalus*	IV	LC	M	10	520	106
Slender-billed Gull	*Chroicocephalus genei*	IV	LC	M	74	150	44.80
Gull-billed Tern	*Gelochelidon nilotica*	IV	LC	M	13	200	42.60
Caspian Tern	*Hydroprogne caspia*	IV	LC	M	8	8	1.60
Whiskered Tern	*Chlidonias hybrida*	IV	LC	M	20	390	87.40

2.6. Bhandup Pumping Station (BPS) Wetland

1. Characteristics

Location: This wetland is located (19°8'21.31"N, 72°57'40.10"E) on the east of Bhandup, Thane. It is completely surrounded with mangroves, except east which is occupied with salt farms.

Area: 11 ha

Number of bird species: 30 (Table 6)

A number of individuals: 12 (minimum)–3352 (maximum).

Number of migratory species: 14

Number of near-threatened species: 4

Wildlife Protection Act schedule species: Schedule I–7, Schedule IV –23

2. Water control

The water level in this wetland is controlled by iron sluice gate (19°8'19.81"N, 72°57'48.34"E) on the east (Map 9). Usually, it has deep water and occasionally used for fishing.

3. Chronology of wetland: Please refer to map 3 and map 10, and fig. 1.

Table 2.6.1. Chronology of land use and land cover change in 2.5km radius circle around BPS Wetland (% = proportion of the land use or land cover category, ha = area of land use or land cover category in hectare).

	Mangrove		Saltpan		Wetland		Settlement		Open Forest		Closed Forest		Agriculture	
	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%	ha
1973	42.90	651.88	7.90	120.02	22.66	344.28	8.69	132.06	2.72	41.37	1.84	27.90	13.29	201.95
1987	48.23	769.83	4.90	78.16	14.05	224.26	19.68	314.20	5.37	85.73	0.29	4.60	7.48	119.44
2002	41.83	689.71	10.95	180.62	3.68	60.67	40.79	672.52	2.05	33.81	0.01	0.21	0.68	11.28
2018	51.08	999.61	2.24	43.87	5.31	103.93	40.21	786.90	0.82	15.97	0.06	1.26	0.28	5.45

Table 2.6.2. Protection and conservation status and summary statistic of observed populations of the waterbirds at BPS Wetland from January to September 2018.

WLPA=Wildlife Protection Act; IUCN=International Union for Conservation of Nature; LC=Least concerned; NT=Near threatened; M=Migratory; R=Residential; Min=Minimum; Max=Maximum.

Common name	Scientific name	WLPA Status	IUCN Status	M/R	Min	Max	Mean
Lesser Whistling Duck	*Dendrocygna javanica*	IV	LC	M	2	2	0.33
Cotton Pygmy Goose	*Nettapus coromandelianus*	IV	LC	M	5	5	0.83
Indian Spot-billed Duck	*Anas poecilorhyncha*	IV	LC	R	2	105	17.83
Garganey	*Anas querquedula*	IV	LC	M	3	3	0.50
Little Grebe	*Tachybaptus ruficollis*	IV	LC	R	1	10	2
Painted Stork	*Mycteria leucocephala*	IV	NT	R	1	18	3.17
Greater Flamingo	*Phoenicopterus roseus*	I	LC	M	2	2650	442.17
Lesser Flamingo	*Phoeniconaias minor*	I	NT	M	700	700	116.67
Black-headed Ibis	*Threskiornis melanocephalus*	IV	NT	R	2	2	0.33
Eurasian Spoonbill	*Platalea leucorodia*	I	LC	M	14	14	2.33
Indian Pond Heron	*Ardeola grayii*	IV	LC	R	1	1	0.17
Grey Heron	*Ardea cinerea*	IV	LC	R	1	4	0.83
Great Egret	*Casmerodius albus*	IV	LC	R	1	1	0.17
Intermediate Egret	*Mesophoyx intermedia*	IV	LC	R	1	50	9.17
Little Egret	*Egretta garzetta*	IV	LC	R	1	98	16.67
Western Reef Egret	*Egretta gularis*	IV	LC	R	1	1	0.17
Little Cormorant	*Phalacrocorax niger*	IV	LC	R	1	5	2.33
Black Kite	*Milvus migrans*	I	LC	R	1	1	0.50
Brahminy Kite	*Heliastur indus*	I	LC	R	1	1	0.17
Osprey	*Pandion haliaetus*	I	LC	M	1	1	0.17
Western Marsh Harrier	*Circus aeruginosus*	I	LC	M	1	4	1.33
Common Moorhen	*Gallinula chloropus*	IV	LC	R	1	1	0.17
Eurasian Coot	*Fulica atra*	IV	LC	R	1	8	1.50
Black-winged Stilt	*Himantopus himantopus*	IV	LC	R	1	88	15.17
Black-tailed Godwit	*Limosa limosa*	IV	NT	M	1	1	0.17
Common Redshank	*Tringa totanus*	IV	LC	M	1	1	0.17
Marsh Sandpiper	*Tringa stagnatilis*	IV	LC	M	7	7	1.17
Wood Sandpiper	*Tringa glareola*	IV	LC	M	1	1	0.17
Common Sandpiper	*Actitis hypoleucos*	IV	LC	M	1	1	0.17
Whiskered Tern	*Chlidonias hybrida*	IV	LC	M	6	78	19.67

A)

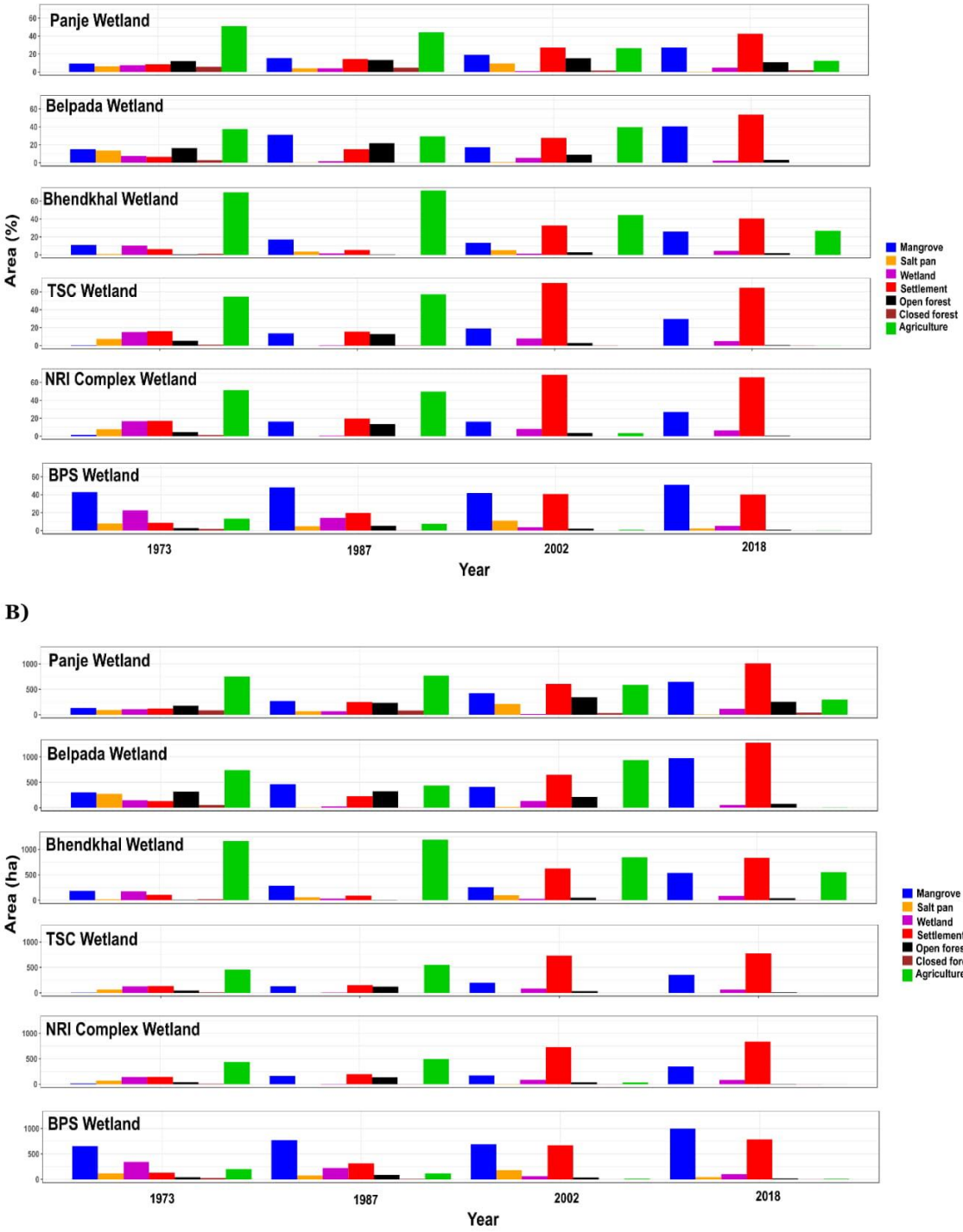


Fig. 1. Land use and land cover change in 2.5 km radius circle around wetlands in A) percentages and B) hectares.

3. List of threatened birds in the study area

Sr. No.	Species	IUCN Status
1	Painted Stork *Mycteria leucocephala*	NT
2	Lesser Flamingo *Phoenicopterus minor*	NT
3	Black-headed Ibis *Threskiornis melanocephalus*	NT
4	Black-tailed Godwit *Limosa limosa*	NT
5	Asian Dowitcher *Limnodromus semipalmatus*	NT
6	Eurasian Curlew *Numenius arquata*	NT
7	Curlew Sandpiper *Calidris ferruginea*	NT
8	Indian Skimmer *Rynchops albicollis*	VU

4. Threats, potential consequences and conservation and management actions for the preservation of the wetlands

Wetlands	Threats	Potential consequences	Conservation and management actions
Panje Wetland	• Landfilling • Excavation • Blocking of tidal water • Intensive fishing • Health-related issues in nearby villages • Overcrowding of spectators and birdwatchers	• Partial or complete destruction of this wetland would lead to the displacement of a large population of the waterbirds, which may induce random movement of the flocks in search of suitable high tide roosts or increase competition for space and food in already existing habitat due to overpopulation. In both, the scenarios birds will be under tremendous stress and are more likely to spend much time in the air and form large flocks which seem alarming for aircraft. • Waterbirds will lose a large amount of energy	• Panje Wetland is the largest migratory waterbird congregation site in Navi Mumbai and one of the best birding sites in Maharashtra. We suggest declaring this and other wetlands as protected areas associated with Thane Creek Flamingo Sanctuary because waterbirds from the sanctuary are using these wetlands as high tide roost when sanctuary gets flooded during high tide. • One of the most critical factors in

		in search of new habitats or while competing in existing habitat or if they found suitable roost at a longer distance, ultimately, they may not store the fats (energy reserve) essential for completing their migration. It would adversely affect the survival of the birds and will impact negatively to already declining populations of these species. • Stagnation of sewage water, rainwater and tide water during highest tide in villages, especially around creek/water channels will cause serious health and hygiene issues due to blocking of hightide water. • Loss of this wetland will pose extremely high risk of bird hazard to Navi Mumbai International Airport	sustaining bird population in this wetland is the presence and depth of water, preferably less than 25cm deep (<10cm deep would be ideal). We recommend 20-25 flaps of the tidal gate should be opened periodically to replenish the wetland and pipe culverts are also operated accordingly to maintain a desirable level of water and avoid excessive draining which eventually dries the wetland. • Landfilling, excavation of soil and deepening of the wetland should be strictly prevented. • Intensive fishing should be avoided and two hours before and after high tide (total four hours) would be declared as no fishing hours. • A number of people visiting a wetland,

			especially birdwatchers and spectators, should be regulated in order to prevent excessive stress on birds due to human disturbances. • Construction of container terminal by Port of Singapore Authority (PSA) – see addendum for details.
TSC Wetland	• Landfilling for residential, recreational and commercial development • Excavation of soil • Intensive fishing • Overcrowding of spectators and birdwatchers	• This wetland serves as a refuge for a large number of lesser flamingos and other waders. partial or complete reclamation of it will cause displacement of large flocks of birds more likely to inland wetlands at Jawaharlal Nehru Port Trust (JNPT) and Uran. This would be a matter of serious concern for upcoming Navi Mumbai International Airport (NMIA). • The water level in the wetland plays a crucial role in bird congregation and hence highwater level maintained for fishing forces birds to move in search of suitable roosting	• TSC Wetland is an important site for bird congregation during high tide as it is adjacent to mudflats of Thane-Vashi creek area which is feeding ground for a large number of wintering birds visiting Mumbai and Navi-Mumbai shores. Hence, land reclamation work should be strictly prohibited at this site. • This wetland should be declared amongst protected areas associated with Thane Creek Flamingo Sanctuary because waterbirds from the

		sites during hightide, which can result into large flocks of wandering birds in the air and it may not be the favorable situation for aircraft.	sanctuary are using it as high tide roost when sanctuary gets flooded during high tide. • Traditional fishing practices should be managed in such a way that water level in the wetland is kept ideal for birds (10-25cm deep). • The number of people visiting a wetland, especially birdwatchers and spectators, should be regulated in order to prevent excessive stress on birds due to human disturbances.
NRI Wetland	• Landfilling • Intensive fishing • Overcrowding of spectators and birdwatchers	• This wetland is inhabited by large flocks of lesser flamingos, greater flamingos and ducks. Therefore, it is also overcrowded with spectators and birdwatchers. This disturbance along with other human disturbances such as construction, landfill reclamation and modification of wetland for	• Traditional fishing practices should be managed in such a way that water level in the wetland is kept ideal for birds (10-25cm deep). • The number of people visiting a wetland, especially birdwatchers and

		fishing may lead to the displacement of large flocks of birds more likely to inland wetlands at JNPT and Uran. This would be a matter of serious concern for upcoming Navi Mumbai International Airport (NMIA).	spectators, should be regulated in order to prevent excessive stress on birds due to human disturbances.
Bhendkal Wetland	• Landfilling	• This is a complex wetland which has fresh as well as brackish water areas. The freshwater area of this wetland is an only remaining site for residential breeding birds like purple moorhens, Eurasian coots, Spot-billed ducks and Pheasant-tailed Jacana in this area. Landfilling and excavation of this wetland will eradicate breeding grounds of these residential birds and feeding and resting grounds of migratory birds like ducks, godwits, ruff and marsh sandpipers, and displace these birds to nearby wetlands. Those wetlands would be overpopulated and likely to induce the stress among birds due to competition for limited space and food, which may put them in the air for long and it seems	• It is a unique wetland, has both fresh as well as brackish water and only suitable wetland for waterbirds on the south coast of Uran-JNPT, therefore ongoing land reclamation work in this wetland must be stopped.

		hazardous while looking at a close distance of this wetland and other wetlands to NMIA.	
Belpada Wetland	• Mangrove plantation	• Waterbirds prefer to congregate at open wetlands those have low water depth and sparse vegetation. This wetland is the only remnant patch in this area which surrounded by mangroves and shrubs, but it seems more likely that resilient and dominant mangrove species like *Avicenia marina,* already growing rapidly in this region, will cover this wetland in near future. It will force birds to move in the adjoining wetlands which may result in overcrowding, competition and considerable movement of the flocks in the air.	• This wetland should be managed to improve and sustain waterbird populations. This could be achieved by simple management practices like uprooting of the mangrove saplings and cutting of the existing mangrove trees in this wetland. Plantation of mangroves in this wetland should be avoided.
BPS Wetland	• Overcrowding of spectators and birdwatchers • Intensive fishing	• This wetland is a well-known birding site and therefore always crowded with spectators, birdwatchers and photographers. This overcrowding of people can induce stress among waterbirds and they may move to other wetlands or keep flying until the high	• This wetland should be declared as protected areas associated with Thane Creek Flamingo Sanctuary because waterbirds from the sanctuary are using it as high tide roost when sanctuary gets flooded during high

		tide recedes or settle in unsuitable habitat. All these situations would adversely affect the survival of the birds and ultimately have a negative impact on their populations.	tide and it is very close to the sanctuary. • Intensive fishing should be avoided and two hours before and after high tide (total four hours) would be declared as no fishing hours. • The number of people visiting a wetland, especially birdwatchers and spectators, should be regulated in order to prevent excessive stress on birds due to human disturbances.

5. Images and maps

Image 1: Tide gate on the creek at Panje Wetland. Image shows upper 35 flip valves while lower 35 valves are submerged. Currently these flaps are open allowing tidal water to flood the wetland. The closer of these flaps will kill the entire wetland

Image 2: Wooden sluice gate on the water channel at TSC.

Image 3: Single concrete pipe culvert with a door at Panje Wetland.

Image 4: Single concrete pipe culvert with fishing net at Panje Wetland.

6. References

1. Kamdar, S. (2014). The Challenges of Mumbai as a Mega-city- A way forward with the European Union. First Working Group Meeting on environmental issues – Mumbai.

2. Kleppel, G. S., DeVoe, M. R., and Rawson, M. V. (Eds.). (2006). Changing Land Use Patterns in the Coastal Zone: Managing Environmental Quality in Rapidly Developing Regions. Springer Science and Business Media

3. Leston L.F.V. and A.D. Rodewald. (2006). Are urban forests ecological traps for understory birds? An examination using Northern cardinals. Biological Conservation 131:566-574.

4. Nagendra, H., Nagendran, S., Paul, S., and Pareeth, S. (2012). Graying, greening and fragmentation in the rapidly expanding Indian city of Bangalore. Landscape and Urban Planning 105, 400–406.

5. Manoj, P. (2018). PSA opens its big box terminal at JNPT. https://www.thehindubusinessline.com/companies/singapores-psa-starts-operations-at-jnpt/article22636261.ece. Accessed on 14 May 2019.

7. Addendum

Fig.2. Map showing the new container terminal (white arrow), area of the mudflat likely to affect (blue polygon) and Panje Wetland (red polygon).

Ports of Singapore Authority (PSA) constructed 1 km long container terminal on the south-eastern side of the JNPT, near Panje, Uran and was opened on 2nd February 2018. In the second phase, PSA will be going to extend this terminal 1km more by 2022 (Fig.2., Manoj, 2018)

This terminal is adjacent to Panje Wetland which is one of the most preferred high tide roosting site for the shorebirds (for details see section 2.1). Currently, the aerial distance between Mora Jetty and the terminal is 2.17 km and it will be reduced to 1.17 km after the further extension of the terminal. Hence, it seems likely that it will affect the water movement in the existing mudflat and roughly 700 ha of the area will be going to influence. It may have adverse impact on the shorebirds because they mainly feed on the benthic fauna in the mudflats and due to restricted movement of water, it will diminish.

We suggest the assessment of shorebirds and benthic fauna in the potential influence area should be carried out to understand the impact of this terminal on the shorebirds and to develop an appropriate conservation plan.

8. Map legend

Map 1: Land use and land cover map of Mumbai showing wetlands monitored in this study, it is developed using band combinations of 7, 5 and 3 from Landsat 8 image taken in January 2018. Forest and mangroves appear in shades of green, the darker color indicates healthy and dense vegetation; urban areas look cyan or purple; and soil varies from dark to light brown, moist soils are darker in color. Wetlands appear dark blue and coastal water from light to dark blue.

Map 2: Land use and land cover maps of wetlands in Navi Mumbai, viz., Panje, NSPS, Bhendkhal, Jasai and Belpada were developed using band combinations 2, 3 and 4 (Landsat 1 = 1973–1987) and 7, 5 and 3 (Landsat 5, 7 and 8 = 1993–2018). Forest and mangroves appear in shades of red or green, the darker color indicates healthy and dense vegetation; urban areas look cyan or purple; and soil varies from dark to light brown, moist soils are darker in color. Extensive stretches of paddy field and salt pans can easily recognize by light to dark brownish grey in color from 1973 to 1987; while they occupied with anthropogenic structures, wetlands and mangroves from 1993 to 2018 and saltpans and barren areas appear in light green or brown. Wetlands look dark blue. Black arrows show large expanses of saltpans and paddy fields, whereas yellow arrows highlight landfilling carried out at wetlands.

Map 3: Land use and land cover maps of wetlands in Navi Mumbai, viz., NRI, TSC, and DPS were developed using band combinations 2, 3 and 4 (Landsat 1 = 1973–1987) and 7, 5 and 3 (Landsat 5, 7 and 8 = 1993–2018). Forest and mangroves appear in shades of red or green, the darker color indicates healthy and dense vegetation; urban areas look cyan or purple; and soil varies from dark to light brown, moist soils are darker in color. Extensive stretches of paddy field and salt pans can easily recognize by light to dark brownish grey in color from 1973 to 1987; while they occupied with anthropogenic structures, wetlands and mangroves from 1993 to 2018 and saltpans and barren areas appear in light green or brown. Wetlands look dark blue. Black arrows show large expanses of saltpans and paddy fields, whereas yellow arrows highlight landfilling carried out at wetlands.

Annexure 14: Statement Showing Sector Wise, Year Wise Budget For TCFS During The Period Of Plan

Annexure No.	Particulars	Total Cost (in lakhs)
14.1	Statement showing year wise physical and financial details of staff requirement	3243
14.2	Statement showing year wise physical and financial details of staff quarter/ building requirement	389
14..3	Statement showing year wise physical and financial details of Vehicle and Equipments	552
14.4	Statement showing year wise physical and financial details of Habitat improvement works	987
14.5	Statement showing year wise physical and financial details of Tourism Development	4380
14.6	Statement showing year wise physical and financial details of site protection and outreach	965
14.7	Statement showing year wise physical and financial details of Capacity building programmes	150
	Total Budget	**10666**

Annexure 14.1 Statement Showing Year Wise Physical and Financial Details Of Staff Requirement

Sr No	Particulars		Yearwise Budget (in lakhs)																			Total in lakhs
			2020-21		2021-22		2022-23		2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30	
	Salary wages/month		Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
	A. Salary of Government Staff																					
1	R.F.O	0.65	1.0	7.8	1.0	8.6	1.0	9.4	1.0	10.4	1.0	11.4	1.0	12.6	1.0	13.8	1.0	15.2	1.0	16.7	1.0	18.4	124.3
2	Forestor	0.45	3.0	16.2	3.0	17.8	3.0	19.6	3.0	21.6	3.0	23.7	3.0	26.1	3.0	28.7	3.0	31.6	3.0	34.7	3.0	38.2	258.2
3	Beatguard	0.35	7.0	29.4	7.0	32.3	7.0	35.6	7.0	39.1	7.0	43.0	7.0	47.3	7.0	52.1	7.0	57.3	7.0	63.0	7.0	69.3	468.4
4	Accountant	0.45	1.0	5.4	1.0	5.9	1.0	6.5	1.0	7.2	1.0	7.9	1.0	8.7	1.0	9.6	1.0	10.5	1.0	11.6	1.0	12.7	86.1
5	Peon	0.26	1.0	3.1	1.0	3.4	1.0	3.8	1.0	4.2	1.0	4.6	1.0	5.0	1.0	5.5	1.0	6.1	1.0	6.7	1.0	7.4	49.7
	Total A			61.9		68		74.9		82.5		90.6		99.7		109.7		120.7		132.7		146	986.9
	B. Salary Contractual Staff (For interpretation centre and staff office)																					
6	Receptionist/ticket booking office operator	0.16	2.0	5.8	2.0	6.3	2.0	7.0	2.0	7.7	2.0	8.4	2.0	9.3	2.0	10.2	2.0	11.2	2.0	12.3	2.0	13.6	91.8
7	Cleanliness and housekeeping	0.13	3.0	4.7	3.0	5.1	3.0	5.7	3.0	6.2	3.0	6.9	3.0	7.5	3.0	8.3	3.0	9.1	3.0	10.0	3.0	11.0	74.5
8	Software and HardwareTechnician	0.2	1.0	2.4	1.0	2.6	1.0	2.9	1.0	3.2	1.0	3.5	1.0	3.9	1.0	4.3	1.0	4.7	1.0	5.1	1.0	5.7	38.3
9	Garden Supervisor	0.16	1.0	1.9	1.0	2.1	1.0	2.3	1.0	2.6	1.0	2.8	1.0	3.1	1.0	3.4	1.0	3.7	1.0	4.1	1.0	4.5	30.5
10	Gardeners	0.13	4.0	6.2	4.0	6.9	4.0	7.6	4.0	8.3	4.0	9.1	4.0	10.0	4.0	11.1	4.0	12.2	4.0	13.4	4.0	14.7	99.5
11	Plumber	0.16	1.0	1.9	1.0	2.1	1.0	2.3	1.0	2.6	1.0	2.8	1.0	3.1	1.0	3.4	1.0	3.7	1.0	4.1	1.0	4.5	30.5
12	Electrician	0.16	1.0	1.9	1.0	2.1	1.0	2.3	1.0	2.6	1.0	2.8	1.0	3.1	1.0	3.4	1.0	3.7	1.0	4.1	1.0	4.5	30.5
	Total B			24.8		27.2		30.1		33.2		36.3		40		40.7		48.3		53`.1		58.5	395.6

Sr. No.	Particulars		Yearwise Budget (in lakhs)																				Total
			2020-21		2021-22		2022-23		2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30		
	Salary wages/month		Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
	C. Salary for Contractual Staff (TCFS)																						
13	Veternery doctor	0.4	1.0	57.6	1.0	63.4	1.0	69.7	1.0	76.7	1.0	84.3	1.0	92.8	1.0	102.0	1.0	112.2	1.0	123.5	1.0	135.8	918.0
14	Engine drivers	0.24	2.0	5.8	2.0	6.3	2.0	7.0	2.0	7.7	2.0	8.4	2.0	9.3	2.0	10.2	2.0	11.2	2.0	12.3	2.0	13.6	91.8
15	Boat drivers	0.24	4.0	11.5	4.0	12.7	4.0	13.9	4.0	15.3	4.0	16.9	4.0	18.6	4.0	20.4	4.0	22.4	4.0	24.7	4.0	27.2	183.6
16	Sailors	0.16	4.0	7.7	4.0	8.4	4.0	9.3	4.0	10.2	4.0	11.2	4.0	12.4	4.0	13.6	4.0	15.0	4.0	16.5	4.0	18.1	122.4
17	Naturalist	0.16	4.0	7.7	4.0	8.4	4.0	9.3	4.0	10.2	4.0	11.2	4.0	12.4	4.0	13.6	4.0	15.0	4.0	16.5	4.0	18.1	122.4
18	Security guards	0.13	8.0	12.5	8.0	13.7	8.0	15.1	8.0	16.6	8.0	18.3	8.0	20.1	8.0	22.1	8.0	24.3	8.0	26.8	8.0	29.4	198.9
19	Forest labors	0.13	9.0	14.0	9.0	15.4	9.0	17.0	9.0	18.7	9.0	20.6	9.0	22.6	9.0	24.9	9.0	27.4	9.0	30.1	9.0	33.1	223.8
	Total C			116.8		128.3		141.3		155.4		170.9		188.2		206.8		227.5		250.4		275.3	1860.9
																					Total A +B+C		**3243.2**

Annexure 14.2: Statement Showing Year Wise Physical and Financial Details Of Staff Quarter/ Building Requirement

Sr . No.	Particulars	Unit Cost (in Lakhs)	Yearwise Budget (in lakhs)																				Total
			2020-21		2021-22		2022-23		2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30		
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
1	**RFO Office**	40	1	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	40
	Staff quarters																						
2	R.F.O (Type 3)	45	--	--	1	45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	45
3	Forester (Type 2)	30	--	--	3	90	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	90
4	Beat Guard (Type 1)	23	--	--	--	--	7	161	--	--	--	--	--	--	--	--	--	--	--	--	--	--	161
5	Accountant (Type 2)	30	--	--	--	--	1	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30
6	Peon (Type 1)	23	--	--	--	--	1	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23
	Total		--	--	--	135	--	214	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**389**

Annexure 14.3 Statement Showing Year Wise Physical and Financial Details of Vehicle and Equipment's

Sr No	Particulars	Per unit cost	Yearwise Budget (in lakhs)																			Total
			2020-21		2021-22		2022-23		2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Four-wheeler with carrier	12	1	12																		12
2	Boat (24-seater)	110	1	110									1	110								220
3	Speed boat (7-seater)	35					1	35	1	35												70
4	GPS	0.5	6	3							6	3										6
5	Walky-talky	1.5	20	30							20	15										45
6	Binocular	0.25	24	6													24	6				12
7	Search light	0.08	10	0.8			10	0.8			10	0.8			10	0.8			10	0.8		4
8	Camera	1.8	1	1.8									1	1.8								3.6
9	LCD Projector	0.6	1	0.6							1	0.6										1.2
10	Computer	0.4	5	2							5	2										4
11	Laptop	0.65	1	0.65											1	0.75						1.4
12	Dingi	3.5									1	3.5										3.5
13	kayaking 2	40	2	80													2	80				160
14	Drone	4.5	1	4.5									1	4.5								9
Total				**251.3**				**35.8**		**35**		**24.9**		**116.3**		**1.55**		**86**				**551.7**

Annexure 14.4: Statement Showing Yearwise Physical and Financial Details Of Habitat Improvement Works

Sr. No.	Particulars	Yearwise Budget (in lakhs)																				Total
		2020-21		2021-22		2022-23		2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30		
		Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
1	Plantation and restoration (Buffer area)	0.3	11.3	0.25	11.3	0.3	11.3	0.25	11.3	0.25	11.3	0.25	11.3	0.25	11.3	0.25	11.3	0.25	11.3	0.25	11.3	113
2	Removal of sapling on mudflats	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	336
3	Garbage removal onsite	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	2	33.6	336
4	Revival of pond	1	20	1	08	1	08	1	08	1	08	1	08	1	08	1	08	1	08	1	08	92
5	Restoration of alternative bird feeding habitat	1	20	1	10	1	10	1	10	1	10	1	10	1	10	1	10	1	10	1	10	110
Total			**118.5**		**96.5**		**96.5**		**96.5**		**96.5**		**96.5**		**96.5**		**96.5**		**96.5**		**96.5**	**987**

Annexure 14.5: Statement Showing Year wise Physical and Financial Details Of Tourism Development

Sr No	Particulars	Yearwise Budget (in lakhs)																				Total
		2020-21		2021-22		2022-23		2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30		
		Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
1	Extension of existing jetty	1	126	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	126
2	Const. of jetty at Bhandup	--	--	--	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100
3	Const, of watchtowers	1	14	--	--	1	14	--	--	1	14	--	--	--	--	--	--	--	--	--	--	42
4	Installation of container-based interpretation centre at Bhandup	1	70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	70
5	Development of boardwalk in mangroves	1	14	--	--	--	--	1	14	--	--	--	--	--	--	1	14	--	--	--	--	42
6	Development of Phase II at CMBC Airoli	--	--	1	1000	--	1000	--	1000	--	--	--	--	--	--	--	--	--	--	--	--	3000
7	Development of Museum Gaints of the Sea	--	--	1	500	--	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1000
Total			**224**		**1600**		**1514**		**1014**		**14**						**14**					**4380**

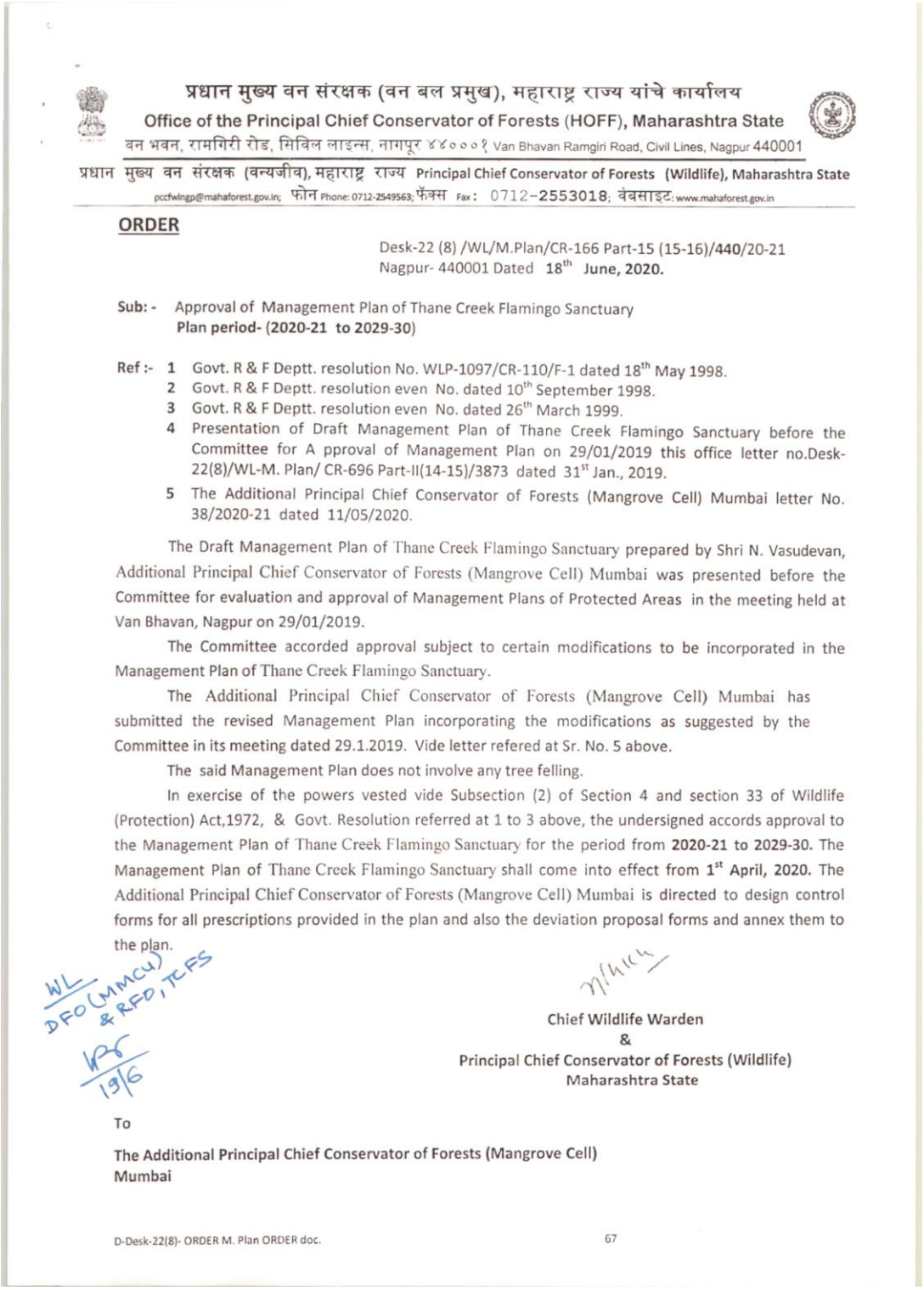
Annexure 14.6: Statement showing year wise physical and financial details of Site Protection and Outreach

Sr No	Particulars	Yearwise Budget (in lakhs)																				Total
		2020-21		2021-22		2022-23		2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30		
		Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
1	Boundary fencing and demarcation (4680 m)	950m	139	1200m	177	1360m	201	660m	98	510m	75	--	--	--	--	--	--	--	--	--	--	690
2	Signboard and information boards	--	25	--	--	--	--	--	25	--	--	--	--	--	--	--	25	--	--	--	--	75
3	Publications and advertisement and website	--	10	--	10	--	10	--	10	--	10	--	10	--	10	--	10	--	10	--	10	100
4	Research monitoring and training	--	10	--	10	--	10	--	10	--	10	--	10	--	10	--	10	--	10	--	10	100
Total			**184**		**197**		**221**		**143**		**95**		**20**		**20**		**45**		**20**		**20**	**965**

Annexure 14.7: Statement showing year wise physical and financial details of Capacity building programmes

Sr No	Particulars	Yearwise Budget (in lakhs)																				Total
		2020-21		2021-22		2022-23		2023-24		2024-25		2025-26		2026-27		2027-28		2028-29		2029-30		
		Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
1	For Schools and colleges and stakeholders including local communities and Organisation of green event like marathon, cycling, bird watching, various competions etc	--	15	--	15	--	15	--	15	--	15	--	15	--	15	--	15	--	15	--	15	150
Total		**--**	**15**	**--**	**15**	**--**	**15**	**--**	**15**	**--**	**15**	**--**	**15**	**--**	**15**	**--**	**15**	**--**	**15**	**--**	**15**	**150**

Annexure 15: Approval of Thane creek Flamingo Sanctuary Management Plan



प्रधान मुख्य वन संरक्षक (वन बल प्रमुख), महाराष्ट्र राज्य यांचे कार्यालय
Office of the Principal Chief Conservator of Forests (HOFF), Maharashtra State
वन भवन, रामगिरी रोड, सिविल लाइन्स, नागपूर ४४०००१ Van Bhavan Ramgiri Road, Civil Lines, Nagpur 440001
प्रधान मुख्य वन संरक्षक (वन्यजीव), महाराष्ट्र राज्य Principal Chief Conservator of Forests (Wildlife), Maharashtra State
pccfwlngp@mahaforest.gov.in; फोन Phone: 0712-2549563; फॅक्स Fax: 0712-2553018; वेबसाइट: www.mahaforest.gov.in

ORDER

Desk-22 (8) /WL/M.Plan/CR-166 Part-15 (15-16)/440/20-21
Nagpur- 440001 Dated 18th June, 2020.

Sub: - Approval of Management Plan of Thane Creek Flamingo Sanctuary
Plan period- (2020-21 to 2029-30)

Ref :-
1. Govt. R & F Deptt. resolution No. WLP-1097/CR-110/F-1 dated 18th May 1998.
2. Govt. R & F Deptt. resolution even No. dated 10th September 1998.
3. Govt. R & F Deptt. resolution even No. dated 26th March 1999.
4. Presentation of Draft Management Plan of Thane Creek Flamingo Sanctuary before the Committee for A pproval of Management Plan on 29/01/2019 this office letter no.Desk-22(8)/WL-M. Plan/ CR-696 Part-II(14-15)/3873 dated 31st Jan., 2019.
5. The Additional Principal Chief Conservator of Forests (Mangrove Cell) Mumbai letter No. 38/2020-21 dated 11/05/2020.

The Draft Management Plan of Thane Creek Flamingo Sanctuary prepared by Shri N. Vasudevan, Additional Principal Chief Conservator of Forests (Mangrove Cell) Mumbai was presented before the Committee for evaluation and approval of Management Plans of Protected Areas in the meeting held at Van Bhavan, Nagpur on 29/01/2019.

The Committee accorded approval subject to certain modifications to be incorporated in the Management Plan of Thane Creek Flamingo Sanctuary.

The Additional Principal Chief Conservator of Forests (Mangrove Cell) Mumbai has submitted the revised Management Plan incorporating the modifications as suggested by the Committee in its meeting dated 29.1.2019. Vide letter refered at Sr. No. 5 above.

The said Management Plan does not involve any tree felling.

In exercise of the powers vested vide Subsection (2) of Section 4 and section 33 of Wildlife (Protection) Act,1972, & Govt. Resolution referred at 1 to 3 above, the undersigned accords approval to the Management Plan of Thane Creek Flamingo Sanctuary for the period from **2020-21 to 2029-30.** The Management Plan of Thane Creek Flamingo Sanctuary shall come into effect from **1st April, 2020.** The Additional Principal Chief Conservator of Forests (Mangrove Cell) Mumbai is directed to design control forms for all prescriptions provided in the plan and also the deviation proposal forms and annex them to the plan.

WL
DFO (MMCU) & RFO, TCFS
19/6

Chief Wildlife Warden
&
Principal Chief Conservator of Forests (Wildlife)
Maharashtra State

To

The Additional Principal Chief Conservator of Forests (Mangrove Cell)
Mumbai

D-Desk-22(8)- ORDER M. Plan ORDER doc. 67

1. Copy submitted to the Additional Chief Secretary (Forest) Revenue & Forest Department, Mantralaya Mumbai-32.
2. Copy submitted to the Principal Chief Conservator of Forests (HoFF) M.S. Nagpur
3. Copy to the Dy. Conservator of Forests (Mangrove Cell) Mumbai for information and necessary action. He is requested to submit the five copies of the approved management plan annexed with control forms & deviation proposal forms along with the soft copy, to this office.

Copy forwarded for information to :-

All Committee Members :- The PCCF(P&M) M.S. Nagpur / PCCF & M.S. M.S.B.B. Nagpur/ PCCF(BPD) M.S. Nagpur/ PCCF (IT &Policy) M.S. Nagpur/ APCCF Adm-Sub-Cader, M.S. Nagpur / APCCF(Conservation) M.S. Nagpur /APCCF (Protection) M.S. Nagpur / APCCF (NTFP,M&E) M.S. Nagpur /APCCF (Nodal Cell) M.S. Nagpur / APCCF(Personnel) M.S. Nagpur / APCCF(WL) East-Nagpur/APCCF (WL) West, Mumbai/ CCF (Working Plan) East-Nagpur /CCF (HRM) Nagpur/Dy.CF (P&M-WL) Nagpur/ DFO (WL) O/o PCCF(WL) M.S. Nagpur.

Annexure 16 Control Forms

Form 1 Restoration of Habitat: Nursery Development and Plantation of Mangrove Saplings

Sr. No	Location & Name of Site	Year	Extent of Area (Ha)	Species	Planting Stock	Spacing	Operations	Total Cost	Cost Per Ha	Remark

Note: Location: Kml file, gps readings, landmarks

Casualty replacement: Mention planting stock by species

Operations: Planting, sowing technique, protection measures

Remarks: Operational problems, any other useful information

Form 2 Restoration of Habitat: Removal of Mangrove Saplings from Mudflats for Maintaining the Feeding Ground of Birds

Sr. No	Location & Name of Site	Year	Extent Of Area (Ha)	Operations	Total Cost	Cost Per Ha	Remark

Note: Location: By compartment site name or land feature

Operations: Uprooting, cutting etc

Remarks: Percentage of coverage of area by mangrove saplings

Form 3 Plants New Record

Sr. No	Family	Species	Year	Location	Habitat	Status	Remarks

Note: Habitat: Description of where the species has occurred, inside the mangrove forest or towards the landward side

Status: A broad idea on its frequency, national status e.g. endangered, rare, endemic etc

Remarks: Any specific information

Form 4. Plants: Diseases and Mortality

Sr. No	Species	Location	Year	Particulars of diseases morbidity & mortality	Area affected	Reamrks

Note: Location: By compartment or landmarks

Particulars of disease : In cases of mangroves, the mortality by diameter classes and number, symptoms, insect pest activity or any other external indicators if visible, none if not seen. No mortality but infestation detected, mention that as morbidity

Area affected: in hectares

Remarks: Any specific environmental condition, or site factors you may suspect as being related to the problem or any other information

Form 5. Animals/ Birds: New Record

Sr. No	Species	Location	Year	How discovered	Details of number age, sex	Habitat description	Remarks

Note Animals will include vertebrates and invertebrates

How discovered: sighting, dead specimen, reliability of sighting, captured specimen, incontrovertible other evidence

Number, age, sex etc: As applicable

Habitat description: Broad habitat description such as vegetation, and elements such as water, mangroves etc

Remark: Any other useful information

Form 6. Construction/ Maintenance of infrastructure: Buildings (Existing/New)

Year :_____

Sr. No	Range	Nature Of The Building	Location	Type Of Construction	Numbers	Total Cost	Numbers	Total Cost	Status

Note: Nature of building: eg, residential, office, watch tower, jetty etc

Location: By compartment or village or landmark as appropriate

Type of construction: Masonry, log or wooden, metal etc

Status: Complete or ongoing

Form 7 Development/ Maintenance of infrastructure: Vehicles (Existing/New)

Year :_____

Sr. No	Kind of Vehicle	Number	HQ if any	Intended Use	Cost	Remarks

Note: Kind of vehicle: Jeep, trailer, tractor, bicycle etc

Intended use: Management support, patrolling/ antipoaching, tourism etc

Remark: Any other useful information

Form 8. Developing Infrastructure: Boundaries, Fences, (Existing/New)

Year :_____

Sr. No	Category of construction	Range	Location	Length(meters)	Numbers	Specifications	Remarks

Note: Category: Kind of boundary such as RCC, Chain link fence, Pillars etc

Location: By Compartment or suitable landmark

Numbers: In case of number of pillars etc as applicable

Specifications: As applicable to the construction: dry rubble, chain link, local material, height, area, depth, etc

Remarks: Any other relevant information

Form 9. Tourism

Total number of visitors all categories
Total Revenue earned

Year :_____

Sr. No	Month	No. of Adult	Amt	No. of Children	Amt	No. of Sr. Citizen	Amt	Camera	Amt	Souvenier shop Amt	Boat ride	Amt	Total Amt

Form 10 Outbreak of Fires

Year :_____

Sr. No.	Range	Location	Extent(ha)	Dates		Reasons	Estimated loss	Remarks
				Detected	Controlled			

Note: Location: By Compartments

Reasons: Established or suspected

Estimated Loss: Damage caused

Remarks: State particularly the problems encountered in detection and suppression and any other useful information.

Form 11 Offence Cases Detected

Year:_____

Sr. No.	Range	Category	Numbers	Number of cases decided	Extent(ha)	Number of cases under process	Number of cases compounded	Remarks

Notes: Category: illegal cutting of mangroves, poaching, encroachment, etc.,

Remarks: Any other useful information. This should also include the number of cases pending decision with the department.

Form12 Research Projects Under Implementation Through PA Manpower with or without Collaboration with External Agencies

Year:_____

Sr No	Title	Completed	Ongoing	New	Status	Financial Outlay (Rs)	Expenditure incurred (Rs)	Remarks

Note: Completed: State date of completion and the status of project report

Ongoing: State since when the project in under operation and expected period of completion

New: State the date of commencement and duration

Status: State the progress towards achievement of objectives

Remarks: Any other relevant information

Form 13 Ecodevelopment Programme: Targets and Implementation

Year :_____

Sr No	Nature of the programme	Sector (Central/State) or NGO Sponsored	Target set		Achievements		Village (Buffer/enclaved)	Remarks
			Physical	Financial	Physical	Financial		

Note: Nature of the programme: capacity development programs, livelihood generation etc

Village: Site where program is implemented whether buffer or inside PA

Remarks: State problems, failures, and reasons thereof. State whether it is on right tracks in context of achievement of objectives

Form 14 Progress of All Strategies Under the Zone and Theme Plans

Year :_____

Sr no	Zone/Theme	Nature of strategy	Target as per the schedule of operations/APO		Achievement		Location	Remark
			Physical	Financial	Physical	Financial		

Note: Zone/Theme plan: Mention title

Nature of strategy: e.g. demarcation of boundary, based on theme plans of TCFS Management plan etc

Location: mention name of the village and GPS readings

Remarks: State problems, Failures and reasons thereof, shortfall and reason, deviations if any

APO: Annual plan of operation

Form 15: Format for Deviation Proposal

Year				Division-
Serial No. of deviation	Control book name, form no. page	Reference to working plan		Nature of Deviation requiring sanction
		Paragraph	Nature of prescription	
1	2	3	4	5

References

Anonymous1. 2016. A Draft Proposal For Declaring Eco Sensitive Zone Around Thane Creek Flamingo Sanctuary, Mangrove Cell, Mumbai, Maharashtra Forest Department.

Anonymous 2. 2012. Great Barrier Reef: Climate Change Adaptation Strategy and Action Plan (2012-2017), Great Barrier Reef Marine Park Authority, Australian Government.

Anonymous3. 2011. District Census Handbook Mumbai, Village and Town Wise Primary Census Abstract. Directorate of Census Operations Maharashtra, Census of India 2011.

Anonymous4. 2005. Mumbai City Development Plan 2005-2025, Municipal Corporation of Greater Mumbai. Government of Maharashtra.

Anonymous5. 2013. Ground Water Information Greater Mumbai District Maharashtra, Ministry of Water Resources Central Ground Water Board, Government of India.

Anonymous6. 2007. Environmental Status Report 2007-2018. Thane Municipal Corporation, Government of India.

Anonymous7. Integrated Solid Waste Management Project for Navi Mumbai Municipal Corporation, Ministry of Urban Development & Poverty Alleviation. Government of India.

Anonymous8. 2010. ACTION PLAN FOR INDUSTRIAL CLUSTER: NAVI MUMBAI, Environmental status and action plan for prevention and control of pollution. Maharashtra Pollution Control Board.

Anonymous9. 2016. Conservation and Management of Mangroves- Guidelines for Coastal State/ UT Government. Ministry of Environment, Forest and Climate Change. Government of India.

Anonymous10. 2011. National Wetland Atlas: Ministry of Environment and Forests, Government of India.

Athalye, R.P., Mishra, V., Quadros, G., Ullal, V. and Gokhale, K. (2001). Heavy Metals in the Abiotic and Biotic Components of Thane Creek, India. Ecol. Env. and Cons, 7(3), 319-325.

Athalye, R.P. (2013). Biodiversity of Thane Creek. National Conference on Biodiversity: Status and Challenges in Conservation - 'FAVEO' 2013.9-14.

Athalye, R.P., Quadros, G., Ullal, V., Mishra, V. and Gokhle, K.S. (2001). Status of Fishery of Thane Creek. Ecol, Env, & Cons, 7(3), 273-279.

Athalye, R.P. and G. Quadros (2002). Studies on the intertidal sediments of Thane Creek and Ulhas River Estuary, 66-71. Proceedings of the National Seminar on Creek, Estuaries and Mangroves- Pollution and Conservation, November 2002. Department of Zoology, B.N. Bandodkar College of Science, Thane.

Athalye, R.P., Patil, N.N., Borkar, M.U., Quadros, G. and Somani, V.U. (2002). Study of flora, intertidal macrobenthis fauna and fishery of Ulhas River Estuar y and Thane Creek to assess the pollution status and decide mitigation strategy. Department of Zoology, B.N. Bandodkar College of Science, Thane.

Barbier, E. B., Acremen, M. & Knowler, D. (1997). Economic valuation of wetlands: A guide for policy makers and planners. Ramsar Convention Bureau, Gland, Switzerland.

BirdLife International (2014a). Important Bird Areas factsheet: Mahul-Sewre Creek. Downloaded from http://www.birdlife.org on 11/05/2016.

Borkar, M.U., Quadros, G. and Athalye, R.P. (2002). Phytoplankton of Ulhas River Estuary and Thane Creek, pp.86-92. Proceedings of the National Seminar on Creek, Estuaries and

Mangroves- Pollution and Conservation, November 2002. Department of Zoology, B.N. Bandodkar College of Science, Thane.

Borkar, M.U., Quadros, G. and Athalye, R.P. (2007). Threats To The Mangroves Of Thane Creek And Ulhas River Estuary, India. Journal of Coastal Development, Vol.11(1), 49-57.

Borkar, M.U., Athalye, R.P. and Quadros, G. (2006). Occurrence of heavy metals in abiotic and biotic components of the mangrove ecosystem of Thane creek. Ecol.Env. & Cons. 723-728.

Borkar, M.U., Athalye, R.P. and Quadros, G. (2011). SALINITY INDUCED CHANGES IN THE LEAF ANATOMY OF THE MANGROVE Avicennia marina ALONG THE ANTHROPOGENICALLY STRESSED TROPICAL CREEK. Journal of Coastal Development, Vol. 14(3) 191-201.

Chaudhari, S. and Pejaver, M. (2010). Conservation of Mangroves with respect to their potentially of Organic Carbon accumulation in sediments of Thane Creek, Maharashtra, India. Lake 2010: Wetlands, Biodiversity and Climate Change, 1-12.

Choudhury, B. C., Sivakumar, K., Kumar, P.B.M., Mosses, K. and Subburaman, S. (2007). Integrated Management Plan for the Gulf of Mannar Marine National Park and Biosphere Reserve (2007-2016). Wildlife Institute of India, Dehradun. Published by the Gulf of Mannar Biosphere Reserve Trust, Ramanathapuram. 442 pp.

Gilman, E.L., Ellison, J., Duke, N.C. and Field, C. (2008). Threats to mangroves from climate change and adaptation options: A review. Aquatic Botany, Vol 89, 237-250.

Grampurohit, B. and Karkhanis, H. (2013). Insect Biodiversity At Mangrove Ecosystem. National Conference on Biodiversity: Status and Challenges in Conservation - 'FAVEO' 2013, 108-115.

Lad, D. and Patil, S. (2016). Studies on Phytoplankton Diversity in the Estuarine Water of Bhayander and Naigaon, Thane, Maharashtra, India. International Journal of Scientific Research, Vol.5 (3), 442-443.

Krishna, A.K. and Govil, P.K. (2005). Heavy metal distribution and contamination in soils of Thane-Belapur industrial development area, Mumbai, Western India, Environ Geo (47)1054-1061

Krishnamurti, A.J. and Nair, V.J. (1999). Concentration of metals in fishes from Thane and Bassein creeks of Bombay, India. Indian Journal of Marine Science, Vol. 28, 9-44.

Krishnamurti, A.J. and Nair, V.J. (1999). Concentration of metals in shrimps and crabs from Thane - Bassein creeks system, Maharashtra. Indian Journal of Marine Science, Vol. 28, 92-95.

Integrated Management Plan of the Thane Creek Flamingo Sanctuary (2016-2025) Mendiratta, P. and Gedam, S. (2014). The Dynamic Land Form – Thane Creek and Its Profile. Indian Institute of Technology Bombay, Mumbai, India.

Menon, J.S. and Mahajan, S.V. (2010). Site-wise Mercury Levels in Ulhas River Estuary and Thane Creek near Mumbai, India and its Relation to Water Parameters. Our Nature. Vol, 8. 170-179.

Nachane, A., Patil, A., More, S., Salunke, P. and Indap, M. (2014). A BASELINE STUDY OF HABITAT AND ABUNDANCE OF LESSER FLAMINGO (PHOENICONAIAS MINOR) IN SEWRI MUDFLATS, MUMBAI, INDIA. Proceeding of the National Conference on Modern Trends in Zoological Research, 183-185.

Naidu, V.S. and Sarma, R.V. (2001). NUMERICAL MODELING OF TIDE-INDUCED CURRENTS IN THANE CREEK, WEST COAST OF INDIA. Journal of Waterway, Port, Coastal and Ocean Engineering, 241-244.

Nikam, V.S., Kumar, A., Lalla, K. and Gupta, K. (2008). Conservation of Wetlands and Mangroves in Thane Creek and Ulhas River Estuary, India. The 12Th World Lake Conference, 1635-1642.

Pachpande, S.C. and Pejaver, M. (2015). Natural Carbon sequestration by dominant mangrove species Avicennia marina var. accutissima ex Staf & Moldenke ex Moldenke found across Thane creek, Maharashtra, India. nternational Journal of Scientific & Engineering Research, Vol 6(2), 1162-1165

Prasad, S.N., Ramachandra, T.V., Ahalya, N., Sengupta, T., Kumar, T., Tiwari, A.K., Vijayan, V.S. and Vijayan, L. (2002). Conservation of Wetlands of India – a review. Tropical Ecology, Vol. 43(1), 173-186.

Patil, N.N., Quadros, G., Somani, V.U., Kurve, P.N. and Athalye, R.P. (2002). Study of zooplankton distribution from Ulhas River Estuary and Thane Creek, pp.109-115. Proceedings of the National Seminar on Creek, Estuaries and Mangroves-Pollution and Conservation, November 2002. Department of Zoology, B.N. Bandodkar College of Science, Thane.

Pawar, P.R. (2011). Species diversity of birds in mangroves of Uran (Raigad), Navi Mumbai, Maharashtra, West coast of India. *Journal of Experimental Science*s, 2(10), 73-77.

Quadros, G., Mishra, V., Ullal, K., Gokhale, K. and Athalye, R.P. (2001). Status of water quality of Thane Creek (India). Ecol.Env. & Cons, 7(3), 235-240.

Quadros, G. and Athalye, R.P. (2002). Intertidal macro benthos from Ulhas River Estuary and Thane Creek, 216-222. Proceedings of the National Seminar on Creek, Estuaries and Mangroves-Pollution and Conservation, November 2002. Department of Zoology, B.N. Bandodkar College of Science, Thane.

Quadros, G., Athalye, R.P., Azeez, P.A., Mylswamy, M. and Shirish, M.S. (2016). Carrying out Ecotoxicology of Fishes, Crabs and Bivalves at Thane Creek, March 2016. Sálim Ali Centre for Ornithology and Natural History (SACON)

Quadros, G., Mishra, V., Borkar, M.U. and Athalye, R.P. (2004). IMPACT OF CONSTRUCTION AND RECLAMATION ACTIVITIES ON THE WATER QUALITY OF THE THANE CREEK, CENTRAL-WEST COAST OF INDIA. Journal, Vol. 7(2) 71-78.

Quadros, G., Athalye, R.P., Azeez, P.A., Mylswamy, M. and Shirish, M.S. (2016). Conducting baseline studies for Thane Creek, Preliminary eport Objective 2- Biodiversity of Thane creek. February 2016. Salim Ali Centre for Ornithology and Natural History (SACON)

Quadros, G. and Athalye, R.P. (2012). Decline of fish diversity in the anthropogenically polluted Thane creek along the Central West Coast of India. International Research Journal of Biological Sciences, Vol. 1(4), 17-21.

Ramachandra, T. V. (2001). Restoration and management strategies of wetlands in developing countries. global environment problems and policies (pp.) ATLANTIC: New Delhi. Ramsar convention secretariat, (2013). The Ramsar Convention Manual: a guide to the convention on Wetlands (Ramsar, Iran, 1971), 6th ed. Ramsar Convention Secretariat, Gland, Switzerland.

Singare, P.U., Lokhande, R.S. and Pathak, P.P. (2010). Soil Pollution along Kalwa Bridge at Thane Creek of Maharashtra, India. Journal of Environmental Protection, 121-128.

Vijay, R., Khobragade, P.J., Dhage, S.S., Gupta, A. and Wate, S.R. (2015). Tidal and seasonal variations in water quality of Thane Creek, Mumbai, India: a statistical analysis. Indian Journal of Geo-Marine Sciences, Vol. 44(6).

Verma, A., Balachandran, S., Chaturvedi, N. and Patil, V. (2004). A preliminary report on the biodiversity of Mahul Creek, Mumbai, India, with special reference to the avifauna. Zooprint Journal, 19(9): 1599-1605.

Wildlife Division (2010), Tanzania National Single Species Action Plan for the Conservation of Lesser Flamingo Phoeniconaias minor. Ministry of Natural Resources and Tourism, Dar es Salaam, Tanzania.