

## PREFACE

The Nandur Madhameshwar Wildlife Sanctuary is notified vide Gazette Notification No.WLP/1085/C.R.-75/F-5/(II) dt. 25.02.1986. The said area prior to declaration of sanctuary said to be protected as closed area since 1983. It is unique protected area in the sense that the ownership of the reservoir which forms the area of the sanctuary is under the effective control & management of Irrigation Department. The forest department is supposed to conserve & manage the said area as sanctuary as per the provisions of Wildlife (Protection) Act, 1972. The focus of conservation is primarily birds, who do not follow any boundries ,making the task of trying to manage their habitat all the more difficult. Other factors which impact the preparation & implementation of the scheme are the multiple stakeholders in the use of the reservoir like the inhabitants of the 11 villages located on the fringes of the reservoir ,the fisherman who regularly carryout fishing, the people who carryout galpera or seasonal cropping ,those dependent on the reservoir for irrigation, drinking water, tourists, Bird-lovers and government departments like Irrigation, Fisheries, Tourism the Forest. Therefore, this Nandur Madhameshwar Wildlife Sanctuary needs more flexible management plan.

In order to conserve this vast treasure of biodiversity, which has multifaceted significance, a planned & foresighted approach through a management plan was felt necessary. The last management plan was for ten years from 2003-04 to 2012-13.Since,the area is still not handed over to the forest department, it was felt to make a Management scheme for the coming two years as it may require two more years for Revenue and Irrigation department to hand over the area to Forest Department .The period of this management scheme is of two years from 2015-16 to 2016-17 .This management scheme is written in consonance with the guidelines issued by Principal Chief Conservator of Forests (Wildlife),M.S. Nagpur and Addl. Principal chief Conservator of Forests (wildlife) Nashik. The management prescriptions are suggested considering the objectives of management, available resources, limiting factors , climatic conditions & Impact of previous management plan. The efforts have been made to make this document sufficient to the extent possible in all respects.

The management scheme comprises of three parts. The part I is the documentation of current state of resources of sanctuary & basic data related to it . It highlights the shortcomings & problems faced by the management of P.A during the execution of last management plan. The part II of this management scheme lays down the objectives of management of the P.A. around which the prescriptions for various development works to be undertaken during the scheme period is based. The part III is documents of Appendices related to part I & II .

It is hoped that this scheme will be of great use for future scientific management of Nandur Madhameshwar Wildlife Sanctuary till a ten year management plan is prepared from 2017-18 to 2026-27.

Nashik  
Date: 1-3-2015

(S. V. Ramarao)  
Conservator of Forests  
(Wildlife) Nashik

## ACKNOWLEDGEMENT

It is to acknowledge the efforts made by all those associated and involved in preparation of this management scheme.

I am very grateful to Shri. K.N.Khavare, IFS, Additional Principal Chief conservator of Forest (Wildlife) Nashik for providing necessary direction and guidance from time to time.

I am thankful to Shri.S. B. Shelke the then Conservator of Forest (Wildlife) Nashik for doing all initial work for this management scheme and for giving proper shape to this management scheme.

I am thankful to Shri. N. B. Bhure , ACF(Rtd.) who has extended all possible help in preparing this plan. I am also thankful to Shri.M.D.Pawar, ACF (Rtd.) Nandur Madhameshwar Wildlife Sanctuary for co-operation in this behalf. .

Special mention is made of Shri. Bishwarup Raha, NCSN, Nashik and Shri. Datta Ugaonkar the Member of Pakshi Mitra Mandal, Niphad who extended co-operation in estimating the bird population periodically.

I am also very grateful to Shri V.C. Bagul, Divisional forest officer (wildlife) Nashik Shri. S. S. Ranalkar,A.C.F.(wildlife) Kalsubai Harishchandragad Sanctuary who provided initial support for preparation of this management scheme. I keep on record the hard work done by Shri. R.G.Vaidya , Range Forest Officer,Nandur Madhameshwar Wildlife Sanctuary, shri. S.G.Bhadke ,Clerk in Nandur Madhameshwar Wildlife Sanctuary Range office.

My sincere thanks are due to Prof. R.T.Patil, Dept. of Microbiology , Art, Commerce & Science College, Lasalgaon for his input on various aspect of Nandur Madhameshwar Wildlife Sanctuary reservoir and Credit also goes to Shri .G.G. Gaikwad, surveyor for his contribution in preparing all maps of management plan.

Lastly, I am thankful to all staff of wildlife Division, Nashik for rendering all kind of support for the preparation of this management plan.

**Place : Nashik**  
**Date: 1-3-2015**

**(S.V. RAMARAO)**  
**Conservator of Forests**  
**(Wildlife) Nashik.**

## THE EXECUTIVE SUMMARY OF NANDUR MADHAMESHWAR WILDLIFE SANCTUARY

The people of Aurangabad & Ahmadnagar District in the past were facing continuous scarcity of drinking water. To overcome this situation, the British Govt. had constructed Nandur Madhameshwar pickup weir at confluence of rivers Godavari & Kadva. It was constructed during the year 1907 to 1913. The water is released through its channels to the far off areas of Aurangabad & Ahmadnagar Dist.

Lot of silt and organic matter is carried by water flow and the same is deposited in Nadur Madhameshwar Lake. The process of deposition is going on for last several years and water level in the Lake has become shallow. Repeated deposition of silt and organic matter resulted in formation of islands and ponds. The deposition of silt has also enriched the surrounding agricultural lands and enriched the biodiversity in and around the water body. Thus the Lake area resulted into a wetland habitat, which attracted Migratory birds visiting to this place every winter. Nature lovers and Bird watchers demanded this area to be declared as a sanctuary.

The Maharashtra State Government declared this area first as a closed area in the year 1983 & subsequently as a Wildlife Sanctuary vide Gazette Notification No.WLP/1085/C.R.-75/F-5/(II) dt. 25.02.1986. under sub section (1) and (2) of section 18 of the Wildlife (Protection) Act, 1972(53 of 1972 for 10012.737 ha.

The Sanctuary is located in Niphad Taluka of Nashik District. It is 40 km away towards East of Nashik. The sanctuary has the area of 100.12 Sq.km. Private area of 11 villages namely (1) Nadurmadhameshwar (2) Kurudgaon (3) Chapadgaon (4) Khangaon-Thadi (5) Dindori (6) Katargaon (7) Karanjgaon (8) Kothure (9) Pimplas (10) Manjargaon (11) Shivare, area in possession of Forest Department, area in possession of Revenue Department & area in possession of irrigation Department forms the Sanctuary area.

The area can be classified as fresh water manmade wetland. About 240 species of migratory birds have been visiting the sanctuary area. The migratory birds include mostly water birds viz. Duck, Domoiselle Crane, Flamingos, Storks and many Waders etc. Besides birds, 24 species of fishes are noticed. The shallow water ponds are rich in algae. Partly submerged area has thick aquatic vegetation. Aquatic plants are mainly *Ipomea fistulosa*, *Ipomea aquatica*, *Hydrophylla ariculata*, *Phylonodiflora*, *Polygonum glabroum*, *Hydrilla verticillata* etc.

The climate of this area is semiarid tropical type with average annual rainfall of 500 mm to 600 mm. The summer temperature ranges from 25 °C to 43°C & winter temperature drops to 4 °C.

The proposed management scheme is for 2 years from 2015-16 to 2017-18. Bird estimation conducted by Forest Department with the help of local NGOs, bird watchers and nature lovers has been used for preparation of management plan. The Enquiry Officer, Nandur Madhameshwar sanctuary, in his report stated that 1176.457 Ha. area should be declared as Sanctuary limiting to areas owned by Irrigation, Revenue and Forest Departments.

The main objectives for management of this sanctuary are as below-

1. To maintain and conserve the area as a wetland.
2. To Provide refuge to migratory birds during the migration season.
3. To ensure the protection of avianfauna.
4. To develop the area for Nature Education & Eco tourism.

For proper management and monitoring of the works in this sanctuary, sufficient staff is required. At present only 1 ACF, 1 RFO ,1 Forester & 2 Forest Guards are appointed to manage the sanctuary.

During the past management plan period, various protection activities were undertaken. Construction of Watch Towers , infrastructure development activities such as construction of staff quarter etc. were undertaken. Apart from this, regular bird census, eco awareness activities such as organisation of vanmahotsav, celebration of wildlife week, workshop for local people, seminars etc. were undertaken with a view to increase people participation in protection & management of sanctuary. To boost up the eco-tourism in sanctuary, activities such as establishment of interpretation centre, provision of facilities like, tent, Binoculars, Spotting scope, preparation of Broachers, construction of Rest house, dormitory were undertaken. Attractive signages/ information boards are installed at important places. Habitat improvement activities such as eradication of weeds, construction of jetties were taken up regularly to improve the bird habitat. Training to field staff, checklisting of birds etc. were undertaken. In addition to that preparation of garden, parking facilities etc. were undertaken to catch tourist attraction.

The present management scheme is mainly focused on systematic management of wetland. To achieve this sanctuary is divided into three zones such as Development zone, Ecotourism zone and Multiple Eco-development activity zone. Sensitization of people of villages around sanctuary will be achieved by installation of signages/Information brochures, educational trips , library facilities and wildlife film etc. Ecotourism development is mainly focused to boost up tourism in sanctuary there by generating employment in local villages through guide facilities , parking facilities, canteen facilities to tourist etc. Creation of view points, erection of watch towers , training to field staff etc will be undertaken. Research activities will be focused on check listing of birds, migratory behavior of birds. In order to minimise the disturbance to the wetland by villagers residing around sanctuary, eco-development committees will be formed in all remaining villages. The different facilities such as LPG connections, street lights, vocational training will be given to local people. To achieve international cooperation for its conservation & wise use, proposals to include Nadur Madhameshwar sanctuary in Ramsar site has been submitted to Government of Maharashtra through Principal Chief Conservator of Forest (HoFF) M.S, Nagpur.

## CHAPTER-1: INTRODUCTION OF THE AREA

### 1.1 INTRODUCTION :

The vast area of Deccan plateau - province from the foothills of Sahyadris in Maharashtra State of India faces acute shortage of water during summer. Aurangabad and Ahamadnagar Districts in the past were facing continuous scarcity of water. To overcome this situation, the then British Govt had formulated a scheme to overcome this shortage of water called Godavari Canal System by constructing dams across the river Darna at Nandgaon and at the confluence of rivers Godavari and Kadva at Nandur Madhameshwar in the years 1907-1913.

The Nandur Madhameshwar reservoir is situated in Niphad tahasil 40 km away from Nashik city. In the year 1956 an earthen dam was also constructed at Gangapur across the river Godavari, upstream site close to its origin i.e. Trimbakeshwar. The Nandur Madhameshwar reservoir gets the water only when it is released from Gangapur & Nandgaon reservoirs. The water stored in the Nandur Madhameshwar reservoir is subsequently released through its canal to far off areas in Aurangabad and Ahamadnagar districts for irrigation and drinking purposes. The lot of silt and organic matter is carried by the water flow and the same is deposited in the Nandur Madhameshwar reservoir and surrounding areas which are mainly agricultural lands. The repeated deposition of silt and organic matter annually resulted into formation of the islands and many shallow water ponds. It has resulted in enriching biological conditions and stabilizing the vegetation and fauna. The man made reservoir thus turned into a wetland habitat.

Dr.Salim Ali during his visit to Nandur Madhameshwar had stated that the site was known to him since 1941 and he opined that, this wetland has the potential of becoming "Bharatpur" of Maharashtra.

The survey of this wetland was done by WWF & BNHS in the year 1975. The real focus on the area and demand for its protection started when the nature lovers raised voice through the news paper for stopping the poaching of birds in the year 1982.83. In response to the demand of nature lovers and after assessing the ecological importance of the area, Government of Maharashtra declared this as closed area in the year 1983 and subsequently was declared as sanctuary as per provision of section 18 of the Wildlife (Protection) Act 1972 in the year 1986. As per the notification dt.25.2.86. Nandur Madhameshwar sanctuary includes 11 villages namely (1) Nadur Madhameshwar (2) Kurudgaon (3) Chapadgaon (4) Khangaon-Thadi (5) Dindori (6) Khathargaon (7) Karanjaon (8) Kothure (9) Pimplas (10) Manjargaon (11) Shivare having total area of 10012.73 ha.

To determine existence and nature of rights in the Nandur Madhameshwar Wildlife sanctuary, Government of Maharashtra vide notification No.WLP/PN 266/F-5,Dt.14.7.94 appointed Sub Divisional Officer, Niphad as enquiry officer.

The total area of the sanctuary as per notification, issued by the Govt.of Maharashtra Vide No.NO/D/WLP/1085/CR/75/F (V) (II) dt.25.2.86 is 10012.937 ha.Out of this 8177.74 ha.is private land. The enquiry officer excluded all the private land from the sanctuary area. The enquiry officer was of the opinion that the area, which is in charge of Govt.Departments and which is water spread & inhabited by avianfauna and other wetland flora and fauna in the sanctuary shall be included in final notification of the sanctuary.

The enquiry officer has submitted the final report of inquiry to the government and recommended for inclusion of an area of 1176.457 ha. Declaration of final notification is still

awaited. Therefore, the management plan is prepared for an area of 1176.457 ha. and no special prescriptions are prescribed for the private area of villages i.e. 8177.74 ha which is considered as buffer area.

Hence, this management plan is prepared for an area of 1176.457 ha. which includes-

|   |                     |
|---|---------------------|
| 1. Area incharge of Irrigation Department                   | 971.39 ha.          |
| 2. Area under River down stream site in charge of Rev. Dept | 150.000 ha.         |
| 3. Reserved Forest incharge of forest department            | <u>55.067 ha.</u>   |
| <b>TOTAL</b>  | <b>1176.457 ha.</b> |

## 1.2 APPROACH & ACCESS

Nandur Madhameshwar is having longitude 74°2' to 74°10' E. and latitude 19°59' to 20°4' N. The Nandur Madhameshwar is located at a distance of about 40 km East of Nishik in Niphad Taluka in Nashik district of Maharashtra State. It is about 55 km from Nashik Road Railway station. Niphad Township is 12 km to the North of the pick-up weir of Nandur Madhameshwar. The area is easily approachable by pucca roads from Nashik as well as from Niphad. State transport buses are plying regularly over these roads.

## 1.3 STATEMENT OF SIGNIFICANCE

The Nandur Madhameshwar reservoir falls in the biogeographic province 6D. of central plateau region. Topography is mostly flat, with average elevation of 640 ms. Highest point 815 ms. In the last 100 year, Nandur Madhmeshwer pick up weir has accumulated vast amount of silt, numerous tiny mud island have formed in addition to permanent island near Manjargaon. These islands are covered with reeds and sedges. Shallow water stretches run along the bank of river. Old river course remain deep. Downstream of the dam, pools of water with rock create a niche for a rich algae growth, thereby providing food to waders and ducks.

In past various research activities were carried out by different organizations. Findings of their research activities is listed in Individual profile and management status by Pratibha Pandy and published by BNHS, Mumbai in a year 2005 as follows.

1. First survey of this wetland was done by BNHS in 1975.
2. Mr. Debi Goenka and Mr. Lav Kumar Khachar undertook another survey in 1982.
3. Since 1986, Pakshi Mitra Mandal conduct annual bird counts in January and February (when water start receding).
4. Annual bird counts are also done by other NGO/NGIs co-ordinated by the AWB (now IWB) during the Asian Waterfowl Count.
5. For the first time bird ringing was initiated by BNHS between 22-26 January 1983. Total of 86 birds were ringed (of 21 species) and released.
6. During 1998-2002 BNHS has ringed and released a total of 519 birds.
7. In 1999-2000 they ringed 1968 birds of 68 species and in 2000-2001 a total of 251 birds of 52 species were ringed (BNHS 2002). Recovery rates of the ringed bird is not known.
8. A Ph.D dissertation was done by Raju Shinde, under the guidance of Dr. Almeida, in 1983 on the flora of Nandur.
9. WWF and BNHS bird survey were conducted in 1982-84.
10. Dr. Almeida (1983) has listed 463 species of plants, including 80 aquatic species from here.

Some significant observations noted in this book are as follows:

- There is almost a total absence of tree cover around the reservoir, which is surrounded by cultivated revenue and private land.
- Shallow water pools are rich in algae and partly submerged have growth of aquatic vegetation.
- Marshy areas support reeds.
- 0.55 sq.km area was planted during 1987-88. to provide refuge for terrestrial birds and initiate afforestation to check soil erosion.
- Weeds such as water hyacinth are fast spreading in the lake and congress grass along the river banks.
- Removal of aquatic vegetation for fuel was also reported.
- In 1982, breeding colony of Cliff Swallows was noted here (BNHS 2002)
- In adjoining areas where scattered tree growth exists, numbers of peafowl have increased .
- Land along the riverbanks and edges of the reservoir are being cultivated , predominantly with sugarcane .To some extent ,Wablers,Bayas and some other species may find these suitable for roosting,but danger of chemical fertilizer and pesticide leaching into the reservoir from fields is very high.
- Village livestock graze unregulated on the banks of the lake.
- Temporary, but regular build-up of agriculture labour (for sugarcane harvest )is also reported to add pressure on areas adjoining this wetland.
- Galpera area is cultivated with cash crops like onions,sugarcane and grapes . Fertilizers and pesticides are used .Run-off from the fields seeps into the reservoir.Potassium and nitrogen seeping into the water kills fish and degrades water quality.
- Siltation is bound to increase if tilling of fields is permitted in the draw- down area of the reservoir.Alternate use such as growing harvestable fodder grass and horticulture ,in the same area ,could be explored instead.
- Water hyacinth infestation can suffocate and replace the original aquatic flora.
- Considering the high rate of siltation , a proposal was made to build another dam close to the existing one.Dr. Salim Ali had however suggested that desilting of the existing reservoir will be more beneficial ecologically.and economically.Desilting of reservoir was started in 2 November ,2000 by Irrigation Department which was later stopped by Chief wildlife warden on 12 Feb. 2002.Irrigation department wanted to desilt the reservoir up to 250m from the edge of the Dam.

Irrigation Department asked BNHS to inspect the site and recommend measures to mitigate the possible damage desilting could have caused. BNHS submitted the following recommendation in April 2002.

1. Adequate wetland and foraging areas are to be maintained before return migration time.( February – March)
2. Maintain optimum water level in the pick up weir during fall (winter)for migration species.
3. Water for both irrigation needs and optimum water level needs of migratory birds have to be kept in mind.
4. Afforestation with species like Khair,babul and imili needs to be done along the periphery of the reservoir to compensate for the loss of tree cover during desilting.

5. Environmental appraisal clearance (given by GOI on 27/6/1980) conditions have to be strictly adhered to. These include: afforestation in catchment area to arrest soil erosion; no cultivation across contours to check soil erosion; compensatory afforestation at project cost to off-set loss of vegetation cover in submergence; 500m greenbelt to be maintained in the reservoir periphery to check direct impact of sediment flow into reservoir. Plants like salix sp, agave and bamboo to be planted in consultation with Forest Department.
6. Joint inspection (with representative of irrigation department, forest department (wildlife), NGO and local villagers) to be conducted periodically to ascertain extent of adherence to recommendations. Inspection by MoEF(GOI), State Forest department (wildlife) and BNHS also to be carried out.
7. Irrigation department to facilitate fortnightly monitoring exercise by BNHS during the breeding and migratory seasons of birds to evaluate effects of silting on bird populations.

### **Importance of Wetland :**

#### **A) Biological:**

Nandur Madhameshwar wetland is formed by the water of pick up weir. Masonry pick-up weir is constructed in the past just below the confluence of river Kadwa & Godavari. The water stored in the reservoir is released through canals for irrigation purposes to far off places. Over the last 75 years considerable amount of siltation which has taken place altering to the appearance of the original river course. The difference of height above the weir & down is striking. The original nature of riverbed is clearly visible below the weir. The climate of the area is semi arid. Annual average rainfall is 500 mm to 600 mm. Summer temperature ranges from 25 °C to 43°C & winter temperature from 4°C to 26 °C.

This wetland is basically formed because of deposition of silts. The numerous tiny islands have been formed in addition to the permanent island near Manjargaon. A number of shallow water stretches have also been formed along the riverbanks. The main river course of kadwa and Godavari is deep. The shallow water pools are rich in algae. Partly submerged area has a thick growth of aquatic vegetation. The marsh is largely covered by good growth of reeds. The water Hyacinth has made considerable invasion. Parthenium growth is also increasing. Almedia (1983) listed 80 species of aquatic plants, notables are *Ipomea fitulosa*, *Ipomea aquatica*, *Hydrophila auriculata*, *Phyllanthus floridus*, *Polygonum glabrum*, *Rumex detatus*, *Hydrilla verticillata*, *Elchornia species*, *Typha species*, *Pontamogeton species*, *Paspalum species*. Tree species are Ficus, Mango, Tamarind, Neem, Acacias etc.

Nandur Madhameshwar wetland is biologically rich and it is the habitat for diverse variety of flora and fauna. Migration season of birds is October- Nov. to Feb-March each year. During this season the area attracts lots of migratory birds coming from far off places. The major migratory species are Ducks, Storks, Ibises, Cranes, Flamingos and Weaders. In the migration season the scene at Nandur Madhameshwar is amazing, as one can observe large flocks of various species of birds together.

The terrestrial animals like black naper Hare, Jackle, Civet cat, Jungle cat, Mongoose and many species of Snakes have been seen often by the people. There are occasional sightings of Wolf, Mongoose, Lizards, Leopard etc. in the wetland area of Nandur Madhameshwar.



**B)Economic :**

Prior to the construction of the Nandur Madhameshwer weir this region was quite dry. But due to construction of the weir, irrigation to the adjoining cultivation is assured. This has helped to bring areas under irrigation thereby changing the economy of the region. Fishing is another major economical activity that has resulted because of formation of reservoir. Another activity that has enriched the local economy is galpera or the seasonal cropping carried out on the reservoir bed as the water recedes. Thus, one can see that the Nandur Madhameshwer wetland has major economic significance in this region.

**C) Recreational:**

The Nandur Madhameshwer reservoir has a great recreational & aesthetic value. The scenic beauty of landscape particularly at sunrise & sunset is unique. The flocks of thousands of migratory & local birds during the peak season i.e. in between October & March make a fascinating sight. The entire reservoir gets covered with colorful avian fauna in this period. Even walking along the lake side is enjoyable.

**D) Scientific:**

This wetland is a complex ecosystem with interlinkages with other wetlands in the proximity. The main water course of river Godavari & Kadwa, the small islands, shallow water pond, adjoining cultivation field, all other small Town forms a unique complex chain of wetland.

**E) Educational:**

The scope for conservation, Education & awareness through the NMS is tremendous. The conservation biology of different resident birds, the migratory patterns, the habit & habitat of diverse species inhabiting the reservoir, the special ecological niches, interlinkages between the various components of the ecosystem are source of many aspects of ecological studies.

**F)Religious value:**

There are religious temples around Nandur Madhameshwer reservoir such as Siddeshwer at Karanjaon, Sangameshwer & Nawsya Ganpati at Khangaon Thadi, Mrugwadeshwer at Nandur Madhameshwer. Pilgrims & tourist are visiting these Temples every year. These sites of religious importance needs to be developed from the view of tourist attraction.

**CHAPTER.2**  
**THE RESOURCES**

**2.1 LOCATION & AREA :**

**2.1.1 LOCATION :**

Nandur Madhameshwar Sanctuary is located at a distance of about 40 km east of Nashik in Niphad Taluka of Nashik District in Maharashtra State. It is about 55 km from Nashik Road Railway Station. Niphad Township is 12 km to the north of Nandur Madhameshwar. It is easily approachable from Nashik as well as Niphad. The state transport buses are plying regularly on connecting Nandur Madhameshwar with major cities of the adjoining area.

**2.1.2 AREA:**

The State Government of Maharashtra vide its No.WLP/1085/CR-75/F-5 (II) Dt.25.2.86 under section 18 of the Wildlife (Protection) Act.1972 declared said area as wildlife sanctuary to be called as “Nandur Madhameshwar Wildlife Sanctuary “ particulars of area included in the Nandur Madhameshwar sanctuary is as under.

| <b>Sr.No.</b> | <b>Name of villages</b>  | <b>Area (in ha.)</b> |
|---------------|--|----------------------|
| 1             | 1.Nandur Madhameshwar 2.Karanjaon<br>3.Shingve 4.Chapadgaon 5.Khangaon-Thadi<br>6.Manjargaon 7.Dindori 8.Kathargaon<br>9.Kurudgaon 10.Pimplas 11.Kothure | 10012.73             |

The inquiry officer has submitted The final report of inquiry to the government for an area of 1176.457 ha. Declaration of final notification is still awaited. Therefore, the the management scheme is prepared for an area of 1176.457 ha. which is having major bird activities. and no special prescription prescribed for the private area of villages i.e.8177.74 ha.

Thus this management plan prepared for on area of 1176.457 ha. includes-

- |   |                  |
|---|------------------|
| 1. Area incharge of Irrigation Department                   | 971.39 ha.       |
| 2. Area under River down stream site in charge of Rev. Dept | 150.000 ha.      |
| 3. Reserved Forest incharge of forest Dept.                 | <u>55.067ha.</u> |

**TOTAL            1176.457 ha.**

**2.2 BOUNDARIES**

**2.2.1 (A) External boundaries**

The external boundaries are not demarcated and marked on the ground.

**2.2.1 (B) Internal boundaries**

The forest area of 55.067 ha. is demarcated. Other internal boundaries are not demarcated on the ground.

**2.3 LEGAL STATUS**

The total area of the sanctuary as per notification, issued by the Govt. of Maharashtra Vide No.NO/D/WLP/1085/CR/75/F (V) (II) dt.25.2.86 is 10012.937 ha. Out of this 8177.74 ha. is a private land. The enquiry officer excluded all the private land from the sanctuary area. The enquiry officer was of the opinion that the area, which is in charge of Govt. Departments and which is under water spread & inhabited by avian fauna and other wetland flora and fauna should form the sanctuary.

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| <b>TOTAL</b>  | <b>1176.457 ha.</b> |

The suggestios of enquiry officer is still not accepted by Govt. of Maharashtra. Hence final notification is still pending. The enquiry report of enquiry officer and Sub divisional officer, Niphad alters the boundaries of sanctuary. Hence, it is necessary to rationalize the boundaries of sanctuary as per the guideline under Wildlife (Protection) Act, 1972 .This proposal in under process.

#### **2.4 GEOLOGY, ROCK & SOIL.**

The rock is generally of basaltic in origin and the soil is generally black cotton soil in upstream area.

#### **2.5 CLIMATE**

The climate is generally semi arid tropical monsoon climate with average annual rainfall of 500 to 600 mm. The summer temperature ranges from 25<sup>0</sup> c to 43<sup>0</sup> c . The winter temperature from 26<sup>0</sup> c reduces to 4<sup>0</sup> c.

#### **2.6 COMMUNICATION**

The sanctuary is well connected with road networks.

#### **2.7 HABITAT**

In the sanctuary, the major habitat is wetland with patches of croplands & galpera. The major components of habitat are water and aquatic vegetation.

##### **2.7.1 WATER**

The weir was constructed on confluence of Godavari & Kadwa rivers and the water is released from Gangapur & Darna dam. Water is being used for irrigation and drinking purposes. The water level fluctuates depending upon the release of water from upstream . The water remains full in reservoir when it is released .

##### **2.7.2 VEGETATION**

The wetland formed because of huge siltation alongwith small Island support the unique aquatic vegetation. There are number of shallow water stretches have been formed along the riverbanks. However the main river course of Godavari & Kadwa is deep. The shallow water pools are rich in algae and the partly submerged area has thick growth of aquatic vegetation. The marsh is covered by growth of reeds. The water hyacinth has made considerable invasion and similarly Parthenium. About 216 plant species has been listed in Nandur Madhmeshwar wetland in the past.(Appendix No.I).

##### **2.7.3 FOOD**

The area adjoining the lake has various tree species like Ficus, Acacia, Mango, Tamarind, Neem etc. The water pools are rich in algae, which is the food for number of Waders. The lake has much variety of fishes, abundance of crabs, snails, pawns, amphibians, micro invertebrate, insect etc. The vast tract of plain land in the vicinity of the lake is under cultivation. Mostly the crop is sugarcane, wheat, grams,onion,vegetables etc. Birds feeding and roosting on ground use the crop fields and the fallow land. (List of fishes is given in Appendix No.13)

#### **2.7.4 CLASSIFICATION OF HABITAT**

The water body mainly falls in the category of wetland habitat .The adjoining area falls in cropland category. The migratory birds prefer the wetlands and uses farmland for feeding and roosting.

#### **2.8 PRESENT STATUS OF HABITAT**

Wetland habitat has mainly many species of aquatic plants and other tree species in the adjoining areas. This wetland habitat of Nandur Madhmeshwar attracts number of migratory birds. Nandur Madhmeshwar water level keeps on fluctuating. The birds reside in the vicinity of reservoir if dam water level is full and come in reservoir for roosting when the water level is shallow. The aquatic plants are abundant in wetland.

#### **2.9 EDGES**

The edges do not exist in the sanctuary area. The waders favor cropland and wetland for their feeding and roosting.

##### **2.9.1 SPECIES DIVERSITY**

The number and variety of birds in Nandur Madhmeshwar is fairly large. The bird Census - 2013 reports estimating the number of migratory birds to around of 41819. The wetland is biologically rich. There are 240 species of resident and migratory birds and fishery department listed out 24 species of fishes from the area.

##### **2.9.2 LIMITING FACTORS**

Water from the Darna & Gangapur dam is released periodically as per the requirement. The water level in Nandur Madhmeshwar reservoir keeps on fluctuating and therefore, sometimes the reservoir is full to its capacity and sometimes the reservoir becomes dry. Water level is the important factor to the migratory birds.

##### **2.9.3 DISTRIBUTION OF BIRDS**

In every winter the congregation of thousands of migratory birds are noticed in the vicinity of Nandur Madhmeshwar reservoir. The migratory birds visit the other waterbodies also in the vicinity of Nandur Madhmeshwar. Hiwargaon minor irrigation tank and Nimgaon areas are predominantly used by the birds whenever Nandur Madhmeshwar lake remains either full of water or completely dry as the case may be.

It is observed that birds such as Carmorants , ibises , Openbilled storks etc. are permanently residing throughout the year. Birds like Brahminy ducks, ibise, storks etc. have prolonged their stay in the Sanctuary. Migratory birds as well as the local birds have distributed all over the sanctuary area but places of roosting are yet to be demarcated. Birds such as Herons, Egrets are seen more in number in the out skirts of the sanctuary and in shallow water. Birds such as Brahminy ducks, Coots, Dabchicks,Shoveller, Wigeon etc. are seen in the Interior water bodies.

**CHAPTER – 3**  
**PAST MANAGEMENT & PRESENT PRACTICES**

**3.1 PAST SYSTEM OF MANAGEMENT**

Nandur Madhmeshwar earlier was declared as protected area vide Government Notification Dt.25.2.1986. The area was not managed by Forest Department prior to the notification. The Dy. Conservator of Forests, East Nashik Division, managed the Reserved Forest area. 55.067ha prior to declaration. Forest area was afforested by the Dy. Conservator of Forests, East Nashik.

The area was declared as Wildlife Sanctuary under section 18 of wildlife (Protection) Act (1972) vide Govt. Notification Dt.25.2.1986 and the RF area of 55.067 ha was included in it. In the past the area was given protection and no other management practices were undertaken except the census of the birds with the help of the local N.G.O.

Due to biological richness of Nandur Madhmeshwar Sanctuary wetland values and overall bio-diversity conservation, the post of Dy. Conservator of Forests (wildlife) Nashik, Asstt. Conservator of Forests and Range Forest Officer Nandur Madhmeshwar Wildlife Sanctuary were created in November 1993 in the Wildlife wing of the Forest Department. The Nandur Madhmeshwar Sanctuary was transferred to Dy. Conservator of Forests (wildlife) Nashik, from Dy. Conservator of Forests, East Nashik in March 1994.

The area notified includes 8177.874 ha. private land. This area is mainly agricultural land and it is deleted from sanctuary area by the enquiry officer vide his letter no. jamabandi/568/1996 dt. 16 may 1998 also Revenue land 21.867 ha. is deleted by the enquiry officer vide his letter no jamabandi/ws/1340, dated 6.8.98. (Appendix No. VI & VII) respectively.

The following area remains in sanctuary after deleting the above private area.

|   |                     |
|---|---------------------|
| 1 Area in charge of Irrigation Department | 1757.929 ha.        |
| 2 Area in charge of Revenue Department    | 150.00 ha.          |
| 3 Area in charge of Forest Department     | <u>55.067 ha.</u>   |
| <b>TOTAL</b>                              | <b>1962.996 ha.</b> |

The sub Divisional Officer/Enquiry Officer, Niphad held the detail enquiry & submitted his enquiry report to the Govt. vide his No. Jamabandi/WS/1638 Dt. 28.10.96. He has allowed following rights in proposed sanctuary area. (appendix No VII)

- i) Visits of local people to the religious places in sanctuary area may be allowed.
- ii) The rights of way in sanctuary area may be continued.
- iii) The persons having permission to lift water from sanctuary area may be continued.
- iv) Regulation of grazing as per the wildlife (Protection) Act. 1972 & amended in 1991 under the control and order of Chief wildlife Warden, Maharashtra State, Nagpur.

During last plan period only 1962.996 ha area is managed by department. The various infrastructure facilities viz. Interpretation centre, waiting room, dormitory, forest rest house, watch towers, parking, watch gallery etc. are created to boost tourism and awareness among the nature lovers & people.

But Available area in charge of Irrigation Dept. is 971.39 ha which was wrongly indicated as 1757.929 ha. by inquiry officer, Niphad. So, the total area of sanctuary remain after inquiry is 1176.457 ha. Hence, The Inquiry officer, Niphad has submitted his final report of inquiry to the government dated 31.12.2004 for an area of 1176.457 ha.

Therefore, this management scheme is prepared for an area of 1176.457 ha. which is having major bird activities. and no special prescriptions prescribed for the private area of villages i.e. 8177.74 ha.

Thus this management scheme prepared for on area of 1176.457 ha. includes-

|  |    |                    |
|--|----|--------------------|
| 1. Area incharge of Irrigation Department                    | :- | 971.39 ha.         |
| 2. Area under River down stream site in charge of Rev. Dept. | :- | 150.000 ha.        |
| 3. Reserved Forest incharge of forest Dept.                  | :- | <u>55.067ha</u>    |
| <b>TOTAL</b>   |    | <b>1176.457 ha</b> |

### **3.2 LEASES**

Though the area for lake was assigned by the Irrigation department at the time of construction of pickup weir, Revenue Department had distributed part of the land which is partly submerged to the local landless people for cultivation through co-operative farming societies on annual lease.. A total of 6.82 sq.km of silted banks were being leased out to 881 persons annually (for Eksali), and to members of farming co-operative societies by Revenue department. This was started after the repeated droughts of 1960-65. However, the Revenue Department has not renewed the leases from 1990. The people are still cultivating the land inspite of the fact that the leases have not been renewed.

### **3.3 GRAZING**

During summer period, when Nandur Madhmeshwar dam become almost dry, cattle from the villages are grazing in the sanctuary. Since no provision of forest guard and foresters for several years, vanmajur are used for protection of sanctuary.

### **3.4 POACHING**

The poaching in the area is much controlled after it is declared as sanctuary under section 18 of wildlife (Protection) Act. 1972. No such incidences were recorded in the past.

#### **3.4.1 FIRE PROTECTION**

People cultivating sugarcane in the adjoining areas burn the field after harvesting sugarcane. which may sometimes spread in the adjoining dried bed of lake. Therefore adequate care is taken for the dried bed of lake. Otherwise no major threat from fire incidences.

#### **3.4.2 EXISTING INFRASTRUCTURE**

The unit of Asst. Conservator of Forests and one Range Forest Officer has been created to manage the sanctuary under the control of Conservator of Forests, wildlife Nashik. The posts of Foresters & Forest Guards however have not been created. Asst. Conservator of Forests is having his head quarter at Nashik.

One Jeep for Asst. Conservator of Forests and one motor cycle for Range Forest Officer has been provided.

The infrastructure like forest quarter at Khangaon Thadi has been created. The Sanctuary is having tourism facilities like Interpretation centre, waiting Room, Forest Rest House, Dormitory, Toilets, Parking facilities at Khangaon Thadi. and watch Tower, watch gallery, Tent facilities, garden, Parking, Toilets & waiting room facilities at chapadgaon. Because of this, the Tourists visiting the area has been increased for last two years. As per the Govt. circular, Entry fee from Tourist & vehicle is recovered.

### **3.5 WILDLIFE CONSERVATION STRATEGIES AND THEIR ANALYSIS**

Although the area was notified under the provision of wildlife (Protection) Act. 1972 in 1986, very little efforts of protecting, managing & conserving the biodiversity of the area were taken

in the beginning. After handing over of the PA to wildlife wing of forest department, habitat development works etc. are taken under the World Bank aided Maharashtra Forestry Project and other plan schemes. The sanctuary is basically intended for conservation of migratory birds. The fluctuations in the population of migratory birds, planning of the research studies etc. are yet to be streamlined.

The Bird census is carried out every year. The data of Bird census for last plan period i.e. 2003.04 to 2012.13 reveals that the bird population remains more than 12000 for most of the period except during the year 2011 & 2012.

### **3.6 WILDLIFE HEALTH**

The wetland is biologically rich with diverse variety of flock of avifauna, 240 species of resident & migratory birds have been reported to be present in the wetland. The area is rich in aquatic flora and fauna. Occurrence of epidemics or noticeable diseases have not been observed so far.

### **3.7 RESEARCH, MONITORING & TRAINING**

The bird counts are organized in the sanctuary during November to March every year with the help of NGOs to monitor the number of species of birds. Training for field staff was arranged during the year 2005.06, 2009.10 and 2012.13.

### **3.8 ECO TOURISM**

Tourists & bird lovers visit the wetland every year during November to March. Tourists comprises of school children, bird watchers from far off places like Mumbai, Pune etc. To assess the number of tourist visiting the sanctuary, information was collected during 2011.12 and it revealed that total number of tourist were about 6,442 within a period of four months which shows that this place has a potential of attracting huge number of tourist every year.

The Sanctuary is having tourism facilities like Interpretation centre, waiting Room, Forest Rest House, Dormitory, Toilets, Parking facilities at Khangaon Thadi. and watch Tower, watch gallery, Tent facilities Forest garden, Parking, Toilets & waiting room facilities at Chapadgaon.

#### **3.8.1 ACCOMMODATION ARRANGEMENT**

There is one rest house at Khangaon-Thadi owned by the irrigation Deptt. The accommodation is not sufficient for the tourists. Now recently one Dormitory has been constructed for 20 to 30 tourists and 2 suits for halt at Khangaon Thadi. Food being arranged by local VEDC members.

### **3.9 IMPACT OF PAST MANAGEMENT PLAN**

#### **3.9.1 Protection of sanctuary**

During previous management plan, Boundary maintenance work in RF area of 55.067 ha. was done which reduces the chances of encroachment. Fire line cutting & burning of 4km RF area reduces the incidence of fire during summer. For protection of Sanctuary, 4 Watch Towers are erected which keep area under continuous vigilance & thereby control all sorts of biotic pressure on Sanctuary. No new post was sanctioned during last plan period. Protection work remains fully depends on contractual labourer engaged in sanctuary as per requirement. The sanctuary is facing shortage of staff for protection of sanctuary.

### **3.9.2 Infrastructure Development**

During previous plan period one forest guard quarter & one labour shed was constructed which is used by forest labourers for their stay in sanctuary and storage of equipment & materials such as Tent, binoculars etc.

### **3.9.3 Wildlife health & census**

It involves construction of Treatment centre & Treatment cage, Purchase of medicine & yearly census. During the previous plan period, provision was made for all these activities. But expenditure is incurred only on census. Therefore, Treatment of injured birds remains solely depends on veterinary officer, Niphad.

### **3.9.4 Eco awareness activities**

Eco awareness activities are important for generating awareness about birds among the adjoining villagers & sensitizing them for protecting & conservation of birds & their habitat. It involves activities like supply of fruits species to local people, Vanmahotsav, Awareness programmes of wildlife week, workshop, school camps, seminars, awareness camp for villagers etc.

All above activities except school camp was conducted in NMS. Which generated awareness about birds conservation. It also reduces biotic pressure on Sanctuary to some extent. Some people are now showing their active involvement in protection of Sanctuary.

### **3.9.5 Habitat improvement**

Habitat is important criteria which affect bird population & their migration. During previous management plan, habitat improvement involves creation of water ponds, Eradication of weeds & plantation of fruit trees in Forest area. Three Ponds were created, and yearly eradication of weeds & plantation of trees in open spaces were undertaken. Water ponds fulfil the water requirement during summer season when weir became dry all most for longer period. Secondly, weeds like besharmi, water hyacinth destroy wetland habitat which compete with beneficial food plants. Therefore, programme of weed eradication on annual basis helped in wetland conservation & there by increase in birds population upto 41819 during last year. Apart from it, plantation of fruit trees in open spaces helps in resting & feeding of birds. There are 6 jetties for resting of birds in sanctuary, which are not sufficient.

### **3.9.6 Ecotourism Development**

Being called a Bharatpur of Maharashtra, Nandur Madhameswar Sanctuary has enough potential for Ecotourism. In this context, activities were undertaken like construction of Interpretation centre, Dormitory, platform & Tent along with provision of facilities are made like paddle boat, Binocular/spotting scope, camera, brochures, Books & publication and preparation of Garden etc.

During 2012-13 different works were undertaken under ecotourism viz. construction of watch tower, forest garden at Chapdgaon and Khangaon thadi Construction of cycle track around Nandur Madhmeshwar Dam, Parking at Chapdgaon etc.

### **3.9.7 Research & training programme**

In this, check listing of birds, taxonomical study of plants and check listing of plants, aquatic habitat study, vegetation plots study and study of migratory behaviour of birds have been taken up during previous plan period, but their report of finding is not found. Also, a research programme on effects of weeds like *Ipomoea* sp., water hyacinth and *Parthenium* sp. on this wetland ecosystem and assessment of damages caused to birds is carried during period of 2012-13.



### **3.9.8 Eco-Development**

Eco development activities were initiated with formation of EDCs in adjoining villages i.e. Khangaon Thadi during year 2011-12 & Dindori Tas during 2012-13. Provision of alternative sources of energy by supply of LPG connection to locals, Street light ,electric appliances to EDCs.Vocational Training to EDCs members are some of the activities undertaken during last plan period.These activites help in minimising disturbance to the wetland by controlling fishing,movement of cattle & collection of firewood.

## CHAPTER- 4

### **THE PROTECTED AREA & THE INTERFACE LAND USE SITUATION**

#### **4.1 THE EXISTING SITUATION**

The Enquiry Officer, Nandur Madhameshwar sanctuary, in his report stated that 1176.457 Ha. area should be declared as Sanctuary limiting to areas owned by Irrigation, Revenue and Forest Departments.

The surrounding area of the Sanctuary is irrigated. Hence cash crops are mostly grown. The people are not depending on any forest produce but they send their cattle to graze in the sanctuary area.

The encroachment will have to be evicted from sanctuary area. Similarly some people are lifting water from the sanctuary area illegally and hence this practice should be stopped. The people are aware of the birds & their migration. They do not disturb the birds but their activities like grazing, fishing and cultivation keep away the birds and destruct as well as disturb their habitat. Rights of fishing & cultivation are rejected. Presently the local people are moving through the area of water reservoir as access to their own cultivation areas. This activity needs to be stopped. Similarly professional grazers with their livestock & imported labourers brought for cutting the sugarcane causes disturbance to the habitat.

#### **4.2 DEVELOPMENT PROGRAMME & CONSERVATION ISSUES**

The sanctuary has tourist facilities like Rest house, Dormitory, waiting rooms, watch Gallery, observation towers, Garden etc. Similarly the Information Centre at Khangaon-Thadi is constructed. The visitors get the information of birds & their habitat. Water level is fluctuating over the year which is beyond the control of forest department. Similarly, dry spell occur during summer season. Therefore, to mitigate such situation, water ponds were dugged at different locations during last plan period. The major issues of conservation are providing facilities of breeding for resident birds, controlling fishing by locals, developing nesting and resting site in sanctuary.

Jetties were constructed at different locations. Also, water pond at some places is used as breeding site for purple morhen. Prosopis and Bhabul is used as resting site by painted stork, egret, therefore such indigenous trees need to be planted on suitable area. Boundary demarcation is also important issue for avoiding illegal excavation of sand, soil etc. The galpera area which needs to be planted by fruit trees & trees having large shed.

#### **4.3 STAKEHOLDER CONSULTATION**

A Stakeholder suggestion has been recorded during meeting with all stakeholders at Khangaon Thadi on dated 04/10/2013. All valuable suggestions have been incorporated in the management prescriptions as follow.

1. Rotation of water must be regulated with the help of irrigation Department.
2. Fishing for Domestic use need to be regularised with some restriction. Fishing net size Must be char boti so that only big size fishes will be taken and smaller one will be protected For birds
3. Gas connection through EDC's will be distributed on a large scale to reduce illicit Cutting of trees.
4. Waterhole and jetties must be taken on large scale.
5. All waterbodies surrounding sanctuary must be managed with the view of improving bird habitat.
6. Water pollution report on monthly basis must be taken to analyse impact of water pollution on bird habitat.

7. Desiltation should be done by irrigation Department.
8. Information of Bird nesting period must be collected.
9. Pakshi Gram Yojna must be impemented.
10. NGOs must be involved in small scale research project.
11. Yearly census data must be analysed and evaluated.
12. All important historic places in and around sanctuary need to be developed as tourist sites.
13. Plantation must be taken along river and upper end of reservoir.
14. Local bird census must be conducted separately.

#### **4.4 Report on Pollution problem in Nandur Madhmeshwar Dam and its control measures .**

Water pollution is mainly observed at Nandur Madhmeshwer Sanctuary which not only affect water quality but also biodiversity of wetland. Therefore, this issue was discussed with Maharashtra Pollution Control Board(MPCB), Nashik .There report shows that –

- i. No any factory and firm is permitted in the area of Nandur Madhmeshwer Sanctuary. But, Satpur and Ambad MIDC in Nashik city is located along Godavari river.
- ii. No any factory and firm in Nashik District is permitted for release of industrial waste into river water.
- iii. Mechanism for regular checking of pollution and action against defaulter is done by MPCB.
- iv. No any industrial waste is released from any factory and firm in Nashik District into river water. However, domestic waste water from Nashik city is released into the river water to some extent and a PIL has been filed in Hon. High court .In this context, NIRI- an agency was appointed for giving recommendation to control water pollution of Godawari river.
- v. A water sample from Godawari river is taken regularly by MPCB for analysis. A water analysis report of last year is attached as Anex. XIV.

#### **4.5 Research report of MPCB in the context of fishery development in the Godavari river basin.**

The Godhavari river is considered to be one of the very sacred rivers of India. It is often referred to as the ‘Vridha Ganga’ or ‘Dakshina Ganga’. The people believe that taking a holy dip in the river relieves them from all the sins. Being the ultimate sink of anything and everything drained through surface runoff, the river has been subjected to considerable stress. As a result, the fishery has suffered both qualitatively and quantitatively. Therefore, the special attention to improve environmental conditions for eco-restoration and development of norms for management of rivers from the fishery point of view is required.

The study was carried out by fishery department in collaboration with the Maharashtra Pollution Control Board (MPCB) with the following objectives :

1. To evaluate the water quality of River Godavari.
2. To study the fish biodiversity in the river
3. To study the quality of riverine environment, particularly in the river stretches identified by MPCB in relation to fishery status
4. To study the changes in fish diversity and productivity with respect to water quality changes .

A Final Report of assessment of riverine fisheries and linking with water quality restoration programme- river Godavari in Maharashtra 2011. Maharashtra Pollution Control Board, Central Institute of Fisheries Education, *Indian Council of Agricultural Research*, Versova, Mumbai – 400061 has following conclusions and recommendations.

## Conclusions :

- ❖ Among the stations studied, the water quality of River Godavari was found to be fit for the propagation of fishing in Nandur-Madhyameshwar.
- ❖ Fishing activity was limited and the fish catch modest, majority of the fish caught being small, mainly minnows. No commercially important catch could be observed at Nandur-Madhyameshwar.
- ❖ There is no considerable depletion in species diversity when compared to the data available.
- ❖ The commercially important species have very limited presence in the samples collected as well as the fishermen's catches. This shows that the river's contribution to commercial fisheries is limited.
- ❖ The Nygaard Index for plankton during post-monsoon and winter indicated Nandur-Madhyameshwar as moderately eutrophic.
- ❖ Palmer Index indicated low organic pollution at Nandur-Madhyameshwar.
- ❖ Nandur-Madhyameshwar was found to be the least polluted station when the presence of indicator genera was analysed.
- ❖ The analysis of plankton clearly indicates that Nandur-Madhyameshwar is organically polluted as per the different indices and indicator genera.

## Recommendations

- ❖ Actions are to be initiated to maintain the minimum waterflow, otherwise known as environmental flow, to sustain the ecological functions at a healthy status. The lack of this flow adversely affects the loading of nutrients as also the distribution and recruitment of fish species. The lack of a continuous stream of water adversely affects the migration and breeding of the fishes.
- ❖ Urgent action is needed for the treatment of domestic sewage and industrial effluents, especially at Tapovan (at Nashik city). This would help in the restoration of this stretch, which is the most polluted section of the river.
- ❖ Another area requiring attention is water recharge. It would be necessary to find ways and means to recharge the river with rain water and seepage from the surrounding area by channelizing the excess water into the river. In the interest of the health of the river and the fishery resources, maintaining continuous flow almost throughout the year becomes mandatory.
- ❖ At least four species of exotic fishes (such as *Cyprinus carpio carpio*, *Poecilia reticulata*, *Oreochromis mossambicus* and *Oreochromis niloticus*.) could be found in the river. With the introduction of more species of fishes and shellfishes officially and clandestinely, it is possible that more and more exotics would make the river their home. This has to be curbed by vigorous monitoring and control of the fish farming activities in the watershed area of the river.

**CHAPTER- 5**  
**OBJECTIVES OF MANAGEMENT AND STRATEGIES**

**5.1 OBJECTIVES OF MANAGEMENT**

Following are the objectives of management

1. To maintain & conserve the area as a wetland
2. Provide refuge to migratory birds during the migration season.
3. To ensure the protection of avifauna.
4. To develop the area for Nature Education & Ecotourism.

**5.2 STRATEGY :**

The conservation of biodiversity is a long term programme. The activities in this scheme are directed more towards understanding the biodiversity and various ecological factors in the area. Various sets of activities prescribed in the scheme have been grouped as follows.

**1. PROTECTION OF SANCTUARY**

The protection of the area will include constant foot as well as vehicle patrolling, vigilance through watch towers, erection of check nakas etc.

**2. BOUNDARY DEMARCATION**

Boundary Demarcation will be given top priority.

**3. WILDLIFE HEALTH AND CENSUS.**

Wildlife health and census will include vaccination to cattle of villages around the sanctuary, veterinary care, census of birds etc.

**4. ECO AWARENESS ACTIVITIES.**

Eco awareness activities will include supply of fruits species seedlings to the local people, organization of Vanmahotsav, awareness programmes during wildlife week, workshops and seminars involving local people, providing facilities to tourists in Sanctuary etc.

**5. HABITAT IMPROVEMENT**

Habitat improvement works will include eradication of weeds, planting of fruit trees in gaps as per the necessity provision of adequate elevated islands and roosting platforms etc.

**6. ECO TOURISM DEVELOPMENT**

Eco Tourism development will include, provision of basic amenities to the tourists visiting sanctuary which in turn will provide employment to the local people.

**7. RESEARCH AND TRAINING**

Research and training will include check listing of birds, taxonomical study of plants and check listing of plants, aquatic habitat study, vegetation plots study and study of migratory behaviour of birds, Study of water Quality and Management etc.

**CHAPTER- 6**  
**MANAGEMENT PRESCRIPTIONS**

**6.1. CONSOLIDATION OF THE AREA**

The Govt.of Maharashtra vide no.NDD/WLP/1085/CR/75/F(V)(II) Dt.25.2.86 has declared its intention to notify 10012.737 ha.area i.e.100.12 sq km. as a sanctuary. which consist 8177.874 ha.of private area.On enquiring into notified area, the Enquiry Officer proposed to exclude the private area from sanctuary.

As per enquiry report dt.31-12-2004 the area proposed for sanctuary is as under.

|  |                   |
|--|-------------------|
| 1.Area incharge of Irrigation Dept.                        | 971.39 ha.        |
| 2. Area under River down stream site incharge of Rev.Dept. | 150.00 ha.        |
| 3. Forest area in charge of Forest Dept.                   | <u>55.067 ha.</u> |
| TOTAL 1176.457ha.  |                   |

Although the area under control of Irrigation Department is indicated as 971.39 ha. in the enquiry report but its demarcation on map and on the ground is not yet been finalized by irrigation department and same in the case of Revenue Department also.

All the villages of Sanctuary are situated on the fringe of water body so there is no need of shifting and relocation of any village .

The area of the reservoir which is under control of Govt. Department i.e. 1176.457ha will be managed for the conservation of resident and migratory birds.. Efforts will be made to speed up the process and get the final notification issued under section 26 (a) of the Wildlife Protection Act, 1972.

After the final notification of the sanctuary , the notified area will be proposed to be taken over from Revenue and Irrigation departments and it will be declared as Reserve Forest u/s 4 of IFA,1927.

**6.2 ZONATION OF AREA**

The Development zone will comprise an area of 971.38 ha( i.e.821.39ha(Irrigation Dept. area) +150ha(Revenue Dept.area). As a preliminary exercise, areas with relatively large density of birds within the sanctuary have been identified and it is proposed that this area be demarcated as Development zone. Only protection, surveillance and monitoring activities will be carried out in Development zone. These areas will be kept out of bounds for the regular tourists. Sighting of birds will be allowed only from some specially identified points located at a safe distance from Development zone.

The Eco tourism Zone of 205.067 ha. consisting of area near Manjargaon submergence, area adjoining to Dam site and area incharge of forest department.

The rest of the area which is private area under control of indivisual farmers which is excluded by enquiry officer but not accepted by Govt. so far will be the multiple Eco development activity zone . It is total 8823.663 ha. area of 11 villages. This area will be used as buffer area, an area for eco development programme to protect and conserve the wetland with awareness programmes.

**6.3 PROTECTION OF SANCTUARY**

The protection of the area will include constant foot as well as vehicle patrolling . In the previous plan period , five watch towers were erected and during the year 2013-14 , three watch towers have been erected . Protection Labour will be deployed at watch Towers for better protection.

Presently there is one check naka in the P. A. at Chapadgaon for controlling Tourist in the sanctuary. Two more check nakas will be constructed additionally at two places i.e. one at Nandur Madhmeshwer - Dindori Tas Road and another at Chapadgaon -Manjargaon - Bhuse Road .These check nakas will be managed by the regular staff of P. A.

#### **6.4 BOUNDARY DEMARCATION**

Boundary of reserve forest area 55.067 Ha. is well demarcated and needs to be maintained. However the area incharge of Irrigation Dept and the area incharge of Revenue Department has not been demarcated on ground. The same need to be demarcated on the ground. It will be demarcated after final notification of sanctuary got issued. A provision will be made accordingly.

#### **6.5 WILDLIFE HEALTH & CENSUS**

There are incidences of birds injury & illness which requires immediate treatment. Treatment cages & sufficient medicine will be made available to the veterinary department as required. Training will be imparted for field staff for preliminary treatment of birds & overall management of habitat of birds. Regular field visit of expert in birds will be arranged for guidance & suggestions for management of sanctuary. Timely veterinary care will be provided.

#### **6.6 ECO AWARENESS ACTIVITIES**

Awareness programme for officers, field staff & stakeholders for conservation of wetland will be arranged. Also educational trips for field officers and field staff will be arranged. Apart from it, library facility inside interpretation centre will be provided for educating visitors about birds & their conservation. Signage boards at all important locations in & around sanctuary will be installed for creation of awareness on birds.

#### **6.7 HABITAT IMPROVEMENT**

##### **6.7.1 GENERAL PRESCRIPTION :**

At present no basic data is available regarding the food and the feeding habits of various species of birds in the reservoir. However, it is felt that the area has enough food resources for birds. A summary of existing vegetation will be carried out and then only planting of fruit and nesting trees like *Acacia nilotica*, *Ficus religiosa*, *Ficus bengalensis* will be taken up during the scheme period on all the suitable sites within the sanctuary area if requires.

Optimum level of water in the reservoir will be maintained with help of irrigation department during peak summer .

Boundary area adjoining farmers field will be planted with useful fruit trees which reduces the encroachment as well as act as shelter , nesting & resting site for birds like painted stork ,egrets etc.

Artificial jetties will be created at suitable locations in Submerged area which will act as resting sites for birds. When the reservoir is full to its maximum capacity these elevated platforms would be of greater use for the birds. Roosting platforms will be provided at suitable locations as per the necessity.

##### **6.7.2. REGULATIONS:**

As mentioned in chapter III, the most important activities that impact the Nandur Madhameshwar wetland are fishing, cultivation in acquired area referred to as galpera and lifting water from reservoir for irrigation. For management of the Nandur Madhameshwar reservoir as a bird habitat, some regulations and restrictions on above activities need to be imposed. Keeping in view, the concept of " the wise use of wet land" the following suggestions are being made .

### **6.7.2.1 FISHING:**

Though enquiry officer rejected the fishing right of people, still fishing is carried out at few pockets of reservoir by local people having complete dependency on it. Proper study on fishing and its impact on habitat will be carried out during this scheme period and proper regulation will be prescribed later on.

### **6.7.2.2 GALPERA:**

The agricultural cultivation in acquired areas on both the banks of the reservoir has become the regular practice of the people. The crops grown are sugarcane, maize, wheat, grapes, groundnuts and vegetables. With assured water availability for agriculture, these farmers have tendency to use large-scale chemical fertilizers and insecticides. These chemicals finally reach the bottom of the reservoir causing pollution, as well as increasing siltation. The total galpera area is 587 ha.

These agricultural fields also form the habitat for some non-fish eating birds. Hence it is not desirable, or possible to stop or ban these agricultural activities in the acquired area. The total ban on this activity will provoke anger and misunderstandings among the people, which will ultimately result in increasing the opposition for the existence of bird sanctuary. It is found that people in these villages are very sensitive towards this issue. To minimize the damages & disturbance to wetland, following activities are proposed.

- A study will be conducted regarding the impact of Galpera on the bird habitat.
- To restrict galpera on barren land planting will be carried out at all barren land which will reduce encroachment.
- More emphasis should be given on adopting organic farming.
- No more new permissions for galpera should be given.
- The farmers should be persuaded to undertake planting of trees suitable for birds on farm bunds.

### **6.7.2.3 IRRIGATION:**

The very purpose of this dam is to supply drinking water and for irrigation. Therefore, no major restrictions can be imposed on them except restricting their movements from sunset to sunrise. The irrigation department, being the custodian of the dam and reservoir should be persuaded to maintain minimum water level in the reservoir.

### **6.7.2.4 POLLUTION CONTROL**

Pollution is a another issue in the management of Nandur Madhameswar Bird Sanctuary. The extent of pollution can be understood from the fact that all the sewage from 11 villages located on the periphery of the reservoir, as well as from Nashik released into the reservoir. Waste water of Eklahre Thermal Power plant and Niphad co-operative sugar factory also finds its way into the reservoir, resulting in eutrophication. The chemicals and fertilizers used in agriculture fields in and around the acquired area are also leached out in the reservoir. Above mentioned factors cause water pollution of the reservoir. No systematic observations and study on the concentration levels of pesticides in the reservoir has been carried out so far.

For controlling pollution in the reservoir ,the help of Pollution Control Board authorities will be taken from time to time. Nashik Corporation and MIDC would be persuaded for installation of sewage water treatment plants. Efforts will be made to see that all pollution permitting factories such as sugar factories would not be allowed to release their untreated wastewater in the reservoir. The farmers around the sanctuary would be persuaded slowly but surely to switch over to



organic farming. This will be done with support of Agriculture Dept. A study in proposed be carried out on water quality and management in Nandur Madhmeshwer Sanctuary.

### **6.7.3 ERADICATION OF UNWANTED VEGETATION**

Aquatic weeds found in the Nandur Madhmeshwer reservoir is affecting waterfowl habitat. No systematic observations and study on the effect of weeds on the reservoir has been carried out in the past. Therefore, a Research on a aquatic weed is undertaken during last year i.e. 2012 & final recommendation is awaited. Therefore, eradication of unwanted vegetation ie. weeds like *Ipomea* species, Water Hyacinth, Parthenium grass etc. will be carried out.

It is seen that parthenium is invading the area hence it is proposed to map the Parthenium in 3 years and should be eradicated with available resources in a phased manner.

### **6.8 ECO TOURISM DEVELOPMENT**

In Nandur Madhmeshwer Sanctuary, tourism is limited mostly to winter season. Tourism can be boosted by proper advertisement through use of media like cable, newspaper, radio etc. Signage boards need to be installed at all important locations along the roads connecting sanctuary. Field guides will be encouraged for creating awareness among the tourism.

#### **1. Strengthening of Nature Interpretation Centre**

Interpretation Centers at Khangaon Thadi is aimed at increasing awareness to the visitors of the Bird Sanctuary. The aim is to increase awareness about conservation of wetland in general and waterfowl in particular. The displays inside the NIC are incomplete which will be proposed to be completed after consulting the experts.

#### **2. Signage at appropriate sites:**

At appropriate places on approach roads, along the banks and at selected points in the tourist zone, signages will be erected. Photographs of different resident and migratory birds, their habitat and importance, food web in a wetland ecosystem, importance of wetlands etc. will be displayed. Signage boards will be updated regularly and yearly repairing will be done. Signage board will be installed at a height of less than 5 feet.

#### **3. Watch Towers:**

Watch towers constructed at strategic locations will be equipped with binoculars, spotting scopes etc. for bird observation.

#### **4. Nature Trail along the boundaries of wetland:**

Nature Trail along the boundaries of wetland will be prepared to increase tourist attraction as well as for effective protection of sanctuary.

#### **5. Creation of view point:**

River view in front of the interpretation centre can be developed as view point.

#### **6. Community participation in eco tourism:**

In order to increase local people's stake in conservation & protection of the Bird Sanctuary, Eco development committees and self help groups will be motivated for running Eco shop & small canteen as a source of earning. Those suitable amongst them will be given training on various aspects of eco-tourism like they will be encouraged to take up eco-friendly practices like, plastic free zone, no litter zones, minimising use of loud music / advertising, switching to organic farming etc. Along with these they will be encouraged to create home stay tourism in their villages so as to minimize the ill effects of modern which will generate most of non – bio degradable waste.

Some selected members will be trained as guides who will be able to generate interest in tourist and also earn their livelihood.

#### **7. Training for staff:**

The staff posted at Sanctuary will be given a short orientation training on Ecotourism.

### **6.9 RESEARCH & TRAINING**

Research and training will include check list of birds, taxonomical study of plants and microorganism and check listing of plants, aquatic habitat study, vegetation plots study and study of migratory behaviour of birds.

Some research topics are identified which includes: Study of migration patterns: study of nesting and breeding of resident birds, effects of water chemistry on wetland ecosystem, effects of weeds like *Ipomoea* sp., water hyacinth and *Parenium* sp. on this wetland ecosystem and assessment of damages caused to birds. Particularly Cranes, in the adjoining agricultural fields.

Preservation plots will be laid on the ground to study the growth of vegetation in P.A. It is necessary to make and update the check list of birds visiting this area. Migratory behaviour of birds needs to be studied. Works have been done in P.A. Research will be necessary to increase the facilities for bird population in and around the lake area.

### **6.10 PROPOSAL FOR RAMSAR SITE**

The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

The Ramsar Convention is the only global environmental treaty that deals with this particular ecosystem. The treaty was adopted in the Iranian city of Ramsar in 1971 and the Convention's member countries cover all geographic regions of the planet. India acceded to the convention in 1982.

The Convention's mission is "the conservation and wise use of all wetlands through local and national actions and international cooperation, as contribution towards achieving sustainable development throughout the world".

The centre of the Ramsar philosophy is the "wise use" concept. The wise use of wetlands is defined as "the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development". "Wise use" therefore has at its heart the conservation and sustainable use of wetlands and their resources, for the benefit of humankind.

The broad objectives of the convention are to stop the degradation and loss of wetlands and ensure their conservation. The parties contracting the convention are obligated to take measures to preserve the ecological character of the listed sites.

The Nandur Madhmeshwer reservoir is a unique water body of the Nashik region. It is a typical water body having shallow wetland character, which attracts thousands of migratory waterfowls every year. It is estimated that thousands of Geese, Ducks and coots visit the reservoir every year. The Nandur Madhmeshwer also has a great chance of being included in the Ramsar convention a proposal has been submitted to Govt. of Maharashtra through Principal Chief Conservator of Forest (HoF), M.S., Nagpur.

To include this wetland ecosystem in Ramsar is given top priority.

**CHAPTER-7**  
**BUDGETARY PROVISION AND EMPLOYMENT GENERATION**

At present the budget for the management of the sanctuary receives from the following sources.

1. Centrally sponsored scheme of Govt.of India.
2. State Non-Plan funds.
3. Plan funds from State Govt.
4. CAMPA
5. District planning committee, Nashik.

The details of annual budget to implement the prescriptions of this scheme is Rs 202.48 lakhs and approximate mandays to be generated is 76055 .In order to implement works of the scheme, funds will have to be procured from the various schemes of State and Central Government.

Financial forecast of Management plan is as below. (Rs.in lakhs.)

|                               |        |
|-------------------------------|--------|
| 1. Protection                 | 27.72  |
| 2. Boundary Demarcation       | 0.34   |
| 3. Wildlife health and census | 1.47   |
| 4. Eco awareness activities   | 5.67   |
| 5. Habitat improvement        | 8.90   |
| 6. Eco.Tourism development    | 29.82  |
| 7. Research and training      | 4.05   |
| 8. Infrastructure development | 104.85 |
| 9. Eco development activities | 20.00  |

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**TOTAL 202.82**

**APPENDIX NO. 21**

**GRANTS AND EXPENDITURE OF WORK OF MANAGEMENT PLAN PERIOD (2003-04 to 2014-15)**

| Sr.No. | Item                       | Target |             | Quantity undertaken yearwise |     |              | Location                                  | Result/Field Observation  |
|--------|----------------------------|--------|-------------|------------------------------|-----|--------------|---|---|
|        |                            | Phy    | Fin         | year                         | Phy | Fin          |   |   |
|        | <b>PPROTECTION</b>         |        |             |                              |     |              |   |   |
| 1      | Boundary maintenance       | 4 km   | 1.65        | 2004-05                      | 0   | 0.03         | R.F. Survey No.194                        | Boundary has been demarcated around R.F.  |
|        |                            |        |             | 2005-06                      | 0   | 0.06         |   |   |
|        |                            |        |             | 2010-11                      | 0   | 0.04         |   |   |
| 2      | Watch Towar                | 2      | 1.60        | 2005-06                      | 1   | 0.61         | Manjargaon                                | Some awareness about wildlife has been created                                  |
|        |                            |        |             | 2013-14                      | 3   | 10.42        | Chapadgaon,Dindori tas-R.F. Survey No.194 |   |
| 3      | Moped                      | 2      | 0.65        | 0                            | 0   | 0.00         |   | Target is not achieved .Since fund is not received                              |
| 4      | Cycle                      | 4      | 0.25        | 0                            | 0   | 0.00         |   |   |
| 5      | Construction of Check Naka | 0      | 0.00        | 2010-11                      | 1   | 2.97         | Chapadgaon                                | Controlling tourist visiting sanctuary and recovery of tourist fee is possible. |
|        | <b>TOTAL</b>               |        | <b>4.15</b> |                              |     | <b>14.13</b> |   |   |

| Sr.No. | Item                              | Target |       | Quantity undertaken yearwise |     |      | Location       | Result/Field Observation                                |
|--------|-----------------------------------|--------|-------|------------------------------|-----|------|----------------|---|
|        |                                   | Phy    | Fin   | year                         | Phy | Fin  |                |   |
|        | <b>INFRASTRUCTURE DEVELOPMENT</b> |        |       |                              |     |      |                |   |
| 1      | Staff Quarter- Forester           | 2      | 6.25  |                              |     |      |                | Post is not sanctioned. Fund is not received            |
| 2      | Staff Quarter- Guard              | 3      | 8.50  | 2007-08                      | 1   | 0.74 | Khangaon Thadi | Monitoring of Field work is become effective.           |
| 3      | Labour shed                       | 1      | 2.10  |                              |     |      | Chapadgaon     | Useful for storage of Material such as Tent, chair etc. |
|        | <b>TOTAL</b>                      |        | 16.85 |                              |     | 0.74 |                |   |

| Sr.No.                              | Item                              | Target |             | Quantity undertaken yearwise |     |             | Location                    | Result/Field Observation                   |
|-------------------------------------|-----------------------------------|--------|-------------|------------------------------|-----|-------------|-----------------------------|--|
|                                     |                                   | Phy    | Fin         | year                         | Phy | Fin         |                             |  |
| <b>WILDLIFE HEALTH &amp; CENSUS</b> |                                   |        |             |                              |     |             |                             |  |
| 1                                   | Establishment of Treatment centre | 1      | 1.25        |                              |     |             |                             | Target not achieved                        |
| 2                                   | Treatment cage                    | 2      | 0.50        |                              |     |             |                             |  |
| 3                                   | Purchase medicine etc.            | 0      | 1.45        |                              |     |             |                             |  |
| 4                                   | Census                            | 0      | 1.45        | 2004-05                      | 0   | 0.07        | Selected point in Sanctuary | Estimation of bird population is possible. |
|                                     |                                   |        |             | 2005-06                      | 0   | 0.15        |                             |  |
|                                     |                                   |        |             | 2006-07                      | 0   | 0.10        |                             |  |
|                                     |                                   |        |             | 2007-08                      | 0   | 0.07        |                             |  |
|                                     |                                   |        |             | 2008-09                      | 0   | 0.04        |                             |  |
|                                     |                                   |        |             | 2009-10                      | 0   | 0.16        |                             |  |
|                                     |                                   |        |             | 2010-11                      | 0   | 0.04        |                             |  |
|                                     |                                   |        |             | 2011-12                      | 0   | 1.00        |                             |  |
|                                     |                                   |        |             | 2013-14                      | 0   | 1.00        |                             |  |
|                                     |                                   |        |             | 2014-15                      | 0   | 0.50        |                             |  |
|                                     |                                   |        | <b>4.65</b> |                              |     | <b>3.13</b> |                             |  |

| Sr.No.       | Item                                      | Target |              | Quantity undertaken yearwise |     |             | Location   | Result/Field Observation                                   |
|--------------|---|--------|--------------|------------------------------|-----|-------------|--|--|
|              |   | Phy    | Fin          | year                         | Phy | Fin         |  |  |
|              | <b>ECO-AWARENESS ACTIVITIES</b>           |        |              |                              |     |             |  |  |
| 1            | Supply of fruits species to local people  | 20000  | 4.78         | 2005-06                      | 0   | 0.07        |  | Awareness about conservation of birds habitat is achieved. |
| 2            | Organisation of Vanmahotsav               | 20     | 1.45         | 2006-07                      | 0   | 0.01        | Villages in sanctuary                                | Some awareness about wildlife has been created             |
|              |   |        |              | 2009-10                      | 0   | 0.03        |  |  |
|              |   |        |              | 2011-12                      | 1   | 0.02        |  |  |
| 3            | Awareness programme ( wildlife week etc.) | 20     | 3.18         | 2005-06                      | 0   | 0.40        | Villages in sanctuary                                |  |
|              |   |        |              | 2013-14                      | 0   | 0.50        |  |  |
|              |   |        |              | 2014-15                      | 0   | 1.00        |  |  |
| 4            | Workshop of local people                  | 10     | 1.00         | 2004-05                      | 1   | 0.01        | At different location viz.Khangaon Thadi,Nashik etc. |  |
|              |   |        |              | 2006-07                      | 0   | 0.09        |  |  |
|              |   |        |              | 2007-08                      | 0   | 0.10        |  |  |
|              |   |        |              | 2008-09                      | 0   | 0.44        |  |  |
|              |   |        |              | 2009-10                      | 0   | 0.71        |  |  |
|              |   |        |              | 2010-11                      | 1   | 1.23        |  |  |
|              |   |        |              | 2011-12                      | 1   | 0.25        |  |  |
| 2012-13      | 1   | 1.00   |              |                              |     |             |  |  |
|              |   |        |              | 2014-15                      | 1   | 1.72        |  |  |
| 5            | School camps                              | 50     | 3.65         |                              | 0   | 0.00        |  | Target is not achieved .Since fund is not received         |
| 6            | Seminar Expenses                          | 3      | 1.65         | 2007-08                      | 0   | 0.04        | khangaon thadi                                       | Some awareness about wildlife has been created             |
| <b>TOTAL</b> |   |        | <b>15.71</b> |                              |     | <b>7.62</b> |  |  |

| Sr.No.       | Item   | Target |              | Quantity undertaken yearwise |     |              | Location                    | Result/Field Observation  |
|--------------|--|--------|--------------|------------------------------|-----|--------------|-----------------------------|---|
|              |  | Phy    | Fin          | year                         | Phy | Fin          |                             |   |
|              | <b>HABITAT IMPROVEMENT</b>                                   |        |              |                              |     |              |                             |   |
| 1            | Creation of water ponds                                      | 20     | 4.75         | 2005-06                      | 0   | 0.39         | Manjargaon                  | Water availability during summer is possible.                             |
|              |  |        |              | 2009-10                      | 0   | 0.42         |                             |   |
| 2            | Eradication of weeds and reseach                             | 200    | 12.75        | 2005-06                      | 0   | 0.40         | Chapadgaon,Manjargaon       | Improvement in Habitat is possible.and reseach recommondation is awaited. |
|              |  |        |              | 2006-07                      | 0   | 0.68         |                             |   |
|              |  |        |              | 2007-08                      | 0   | 0.04         |                             |   |
|              |  |        |              | 2009-10                      | 0   | 0.67         |                             |   |
|              |  |        |              | 2010-11                      | 0   | 3.29         |                             |   |
|              |  |        |              | 2012-13                      | 0   | 2.00         |                             |   |
|              |  |        |              | 2014-15                      | 0   | 2.00         |                             |   |
| 3            | Plantation of fruits Trees in forest area 100 plants per ha. | 50     | 14.36        | 2003-04                      | 0   | 0.33         | Dindoti tas ,Khangaon Thadi | Habitat improvement is possible.  |
|              |  |        |              | 2005-06                      | 0   | 0.39         |                             |   |
|              |  |        |              | 2010-11                      | 0   | 0.25         |                             |   |
| <b>TOTAL</b> |  |        | <b>31.86</b> |                              |     | <b>10.61</b> |                             |   |



| Sr.No. | Item  | Target |              | Quantity undertaken yearwise |     |              | Location                              | Result/Field Observation                              |
|--------|---|--------|--------------|------------------------------|-----|--------------|---------------------------------------|---|
|        |   | Phy    | Fin          | year                         | Phy | Fin          |                                       |   |
|        | <b>ECO TOURISM DEVELOPMENT</b>                            |        |              |                              |     |              |                                       |   |
| 1      | Establishment of Interpretation centre including building | 1      | 9.50         | 2009-10                      | 1   | 27.84        | Khangaon thadi                        | Some awareness about wildlife has been created        |
|        |   |        |              | 2007-08                      | 0   | 2.33         |                                       |   |
|        |   |        |              | 2010-11                      | 0   | 2.19         |                                       |   |
| 2      | Watch Towar   | 2      | 1.25         | 2006-07                      | 1   | 0.92         | Chapadgaon, Khangaonthadi             | Useful for tourist as well as for protection purpose. |
|        |   |        |              | 2011-12                      | 2   | 7.98         |                                       |   |
| 3      | Platform and Tent   | 5      | 6.75         | 2009-10                      | 10  | 2.33         | Chapadgaon                            | Useful for tourist                                    |
| 4      | Signages/Information Board                                | 5      | 0.75         | 2005-06                      | 2   | 0.07         | Chapadgaon, Manjargaon, Khangaonthadi | Some awareness about wildlife has been created        |
|        |   |        |              | 2008-09                      | 13  | 0.05         |                                       |   |
|        |   |        |              | 2010-11                      | 11  | 0.49         |                                       |   |
|        |   |        |              | 2014-15                      | 20  | 2.03         |                                       |   |
| 5      | Paddle Boats  | 1      | 0.65         | 2005-06                      | 0   | 0.80         | Khangaon thadi                        | Useful for management purpose.                        |
| 6      | Binocular   | 8      | 0.40         | 2010-11                      | 10  | 1.02         | Chapadaon                             | Useful for tourist                                    |
|        |   |        |              | 2014-15                      | 10  | 0.50         |                                       |   |
| 7      | Camera and accesaries                                     | 2      | 1.50         | 2005-06                      | 1   | 0.73         | Nashik                                |   |
| 8      | Dormitary (20 Bed)  | 1      | 5.25         | 2005-06                      | 0   | 0.09         | Khangaon thadi                        | Accomodation for Tourist is possible.                 |
|        |   |        |              | 2009-10                      | 1   | 18.44        |                                       |   |
| 9      | Publicity & Broachers                                     | 0      | 0.60         | 2005-06                      | 0   | 0.80         | Khangaon thadi                        | Some awareness about wildlife has been created        |
|        |   |        |              | 2008-09                      | 0   | 0.21         |                                       |   |
|        |   |        |              | 2010-11                      | 0   | 0.13         |                                       |   |
| 10     | Books & Publication                                       | 0      | 1.70         | 2010-11                      | 0   | 0.09         | Nashik                                |   |
| 11     | spotting scope  | 0      | 0.00         | 2014-15                      | 5   | 2.00         | Chapadaon                             | Useful for tourist                                    |
|        | <b>TOTAL</b>  |        | <b>28.35</b> |                              |     | <b>71.04</b> |                                       |   |

| Sr.No. | Item   | Target  |             | Quantity undertaken yearwise |     |              | Location | Result/Field Observation  |
|--------|--|---------|-------------|------------------------------|-----|--------------|----------|---|
|        |  | Phy     | Fin         | year                         | Phy | Fin          |          |   |
|        | <b>RESEARCH &amp; TRAINING PROGRAMME</b>       |         |             |                              |     |              |          |   |
| 1      | Check listing of bird                          | 1       | 0.70        | 2007-08                      | 0   | 0.25         |          | Evaluation of health of wetland and species estimation of bird is possible. |
| 2      | Taxonomically study & check listing of plants  | 1       | 0.70        |                              |     |              |          |   |
| 3      | Aquatic habitat study                          | 1       | 0.70        |                              |     |              |          |   |
| 4      | Preservation plot & ground Flora & Fauna study | 3.25 ha | 0.75        | 2009-10                      | 0   | 12.78        |          |   |
| 5      | Migration behaviour study                      | 1       | 0.75        | 2005-06                      | 0   | 7.5          |          |   |
|        |  |         |             | 2008-09                      | 0   | 0.12         |          |   |
|        |  |         |             | 2009-10                      | 0   | 0.33         |          |   |
| 6      | Training for the staff                         | 0       | 2.50        | 2005-06                      | 0   | 0.81         |          |   |
|        |  |         |             | 2009-10                      | 0   | 0.59         |          |   |
|        |  |         |             | 2013-14                      | 2   | 0.85         |          |   |
|        |  |         |             | 2014-15                      | 1   | 0.48         |          |   |
|        | <b>TOTAL</b>                                   |         | <b>6.10</b> |                              |     | <b>23.71</b> |          |   |

| Sr.No.       | Item                                 | Target |              | Quantity undertaken yearwise |     |              | Location | Result/Field Observation                       |
|--------------|--------------------------------------|--------|--------------|------------------------------|-----|--------------|----------|--|
|              |                                      | Phy    | Fin          | year                         | Phy | Fin          |          |  |
|              | <b>BUDGETARY PROVISION FOR STAFF</b> |        |              |                              |     |              |          |  |
| 1            | Pay & Allowance of All staff 11 No.  | 0      | 26.35        | 2003-04                      | 0   | 7.69         | Nashik   | Effective management of sanctuary is possible. |
|              |                                      |        |              | 2004-05                      | 0   | 6.95         |          |  |
|              |                                      |        |              | 2005-06                      | 0   | 7.50         |          |  |
|              |                                      |        |              | 2006-07                      | 0   | 7.26         |          |  |
|              |                                      |        |              | 2007-08                      | 0   | 5.04         |          |  |
|              |                                      |        |              | 2008-09                      | 0   | 12.21        |          |  |
|              |                                      |        |              | 2009-10                      | 0   | 12.78        |          |  |
|              |                                      |        |              | 2010-11                      | 0   | 14.74        |          |  |
|              |                                      |        |              | 2011-12                      | 0   | 0.00         |          |  |
|              |                                      |        |              | 2012-13                      | 0   | 0.00         |          |  |
| 2            | Office Exp.                          | 0      | 15.92        | 2003-04                      | 0   | 0.00         |          |  |
| 3            | Maintance of vehicle                 | 0      | 15.92        | 2003-04                      | 1   | 0.14         |          |  |
|              |                                      |        |              | 2004-05                      | 1   | 0.49         |          |  |
|              |                                      |        |              | 2005-06                      | 1   | 0.67         |          |  |
|              |                                      |        |              | 2006-07                      | 1   | 0.38         |          |  |
|              |                                      |        |              | 2007-08                      | 1   | 0.37         |          |  |
|              |                                      |        |              | 2008-09                      | 1   | 0.43         |          |  |
|              |                                      |        |              | 2009-10                      | 1   | 0.33         |          |  |
|              |                                      |        |              | 2010-11                      | 1   | 0.24         |          |  |
|              |                                      |        |              | 2011-12                      | 1   | 0.51         |          |  |
|              |                                      |        |              | 2012-13                      | 1   | 2.00         |          |  |
| <b>TOTAL</b> |                                      |        | <b>58.19</b> |                              |     | <b>79.73</b> |          |  |

| Sr.No.                        | Item                                    | Target |     | Quantity undertaken yearwise |     |       | Location                   | Result/Field Observation                               |
|-------------------------------|---|--------|-----|------------------------------|-----|-------|----------------------------|--|
|                               |   | Phy    | Fin | year                         | Phy | Fin   |                            |  |
| <b>MISCELLANEOUS EXPENCES</b> |   |        |     |                              |     |       |                            |  |
| 1                             | Invertar Battery                        | 0      | 0   | 2004-05                      | 1   | 0.13  | Khangaon thadi             |  |
| 2                             | Jetty                                   | 0      | 0   | 2006-07                      | 1   | 0.14  | Chapadgaon                 | Habitatat improvement of birds is possible.            |
|                               |   |        |     | 2012- 13                     | 2   | 2.40  |                            |  |
|                               |   |        |     | 2013-14                      | 6   | 2.00  |                            |  |
|                               |   |        |     | 2014-15                      | 3   | 1.00  |                            |  |
| 3                             | Dry stone pitching                      | 0      | 0   | 2006-07                      | 0   | 0.54  | Chapadgaon ,Khangaon thadi | for Management of sanctuary                            |
|                               |   |        |     | 2011-12                      | 2   | 2.40  |                            |  |
| 5                             | Protection Hut with toilet              | 0      | 0   | 2007-08                      | 1   | 1.52  | Chapadgaon ,Khangaon thadi | Tourist facilities result in increse in no.of Tourist  |
|                               |   |        |     | 2010-11                      | 0   | 6.40  |                            |  |
| 6                             | Water Tank 15000 ltrs                   | 0      | 0   | 2006-07                      | 1   | 1.51  | Chapadgaon ,Khangaon thadi | Tourist facilities result in increse in no.of Tourist  |
|                               |   |        |     | 2008-09                      | 1   | 1.76  |                            |  |
|                               |   |        |     | 2010-11                      | 0   | 2.19  |                            |  |
| 7                             | Chainlink fixing 1800 mtrs and gate     | 0      | 0   | 2008-09                      | 0   | 1.61  | Chapadgaon                 | Tourist facilities result in increse in no.of Tourist. |
|                               |   |        |     | 2010-11                      | 0   | 6.40  | Chapadgaon ,Khangaon thadi |  |
| 8                             | Bird watch varanda                      | 0      | 0   | 2009-10                      | 1   | 8.96  | Chapadgaon                 |  |
| 9                             | Forest Gardan-Khangaonthadi             | 0      | 0   | 2009-10                      | 1   | 4.14  | Khangaonthadi              |  |
| 10                            | Toilt-Bathroom (Woman)                  | 0      | 0   | 2009-10                      | 3   | 6.47  | Chapadgaon ,Khangaon thadi |  |
| 13                            | Entry gate (Chapadgaon)                 | 0      | 0   | 2010-11                      | 1   | 2.97  | Chapadgaon                 |  |
| 14                            | Parking                                 | 0      | 0   | 2010-11                      | 1   | 3.12  | Khangaonthadi              |  |
|                               |   |        |     | 2012-13                      | 1   | 6.00  | Chapadgaon                 |  |
| 15                            | Reception Hall - Chapadgaon             | 0      | 0   | 2010-11                      | 1   | 5.72  | Chapadgaon                 |  |
| 16                            | Dormitary – Chainlink fixing,Entry gate | 0      | 0   | 2010-11                      | 1   | 2.70  | Khangaonthadi              |  |
| 17                            | Preparation of garden                   | 0      | 0   | 2012-13                      | 2   | 39.96 | Khangaonthadi              |  |
| 18                            | Awareness camp for villagers            | 0      | 0   | 2012-13                      | 0   | 0.58  | Khangaonthadi              | Some awareness about wildlife has been increased       |
|                               |   |        |     | 2014-15                      | 0   | 0.88  |                            |  |

|    |  |   |   |         |   |       |                                      |   |
|----|--|---|---|---------|---|-------|--------------------------------------|---|
| 19 | Reception Hall - Khangaon-thadi  | 0 | 0 | 2010-11 | 1 | 5.72  | Khangaon thadi                       | Tourist facilities result in increase in no.of Tourist  |
| 20 | Plantation of fruits Trees in forest area 100 plants per ha.   | 0 | 0 | 2003-04 | 0 | 0.33  | Dindori tas                          | Habitatat improvement of birds is possible.             |
| 21 | Earthen stucture for bird resting 80 m long  | 0 | 0 | 2006-07 | 1 | 1.38  | Chapadgaon, Manjargaon               | Habitatat improvement of birds is possible.             |
|    |  |   |   | 2008-09 | 1 | 1.06  |                                      |   |
| 22 | Life jacket & ores (Paddle boats)  | 0 | 0 | 2006-07 | 0 | 0.08  | Chapadgaon                           |   |
| 23 | Plantation of ornamental trees   | 0 | 0 | 2009-10 | 1 | 0.42  | Khangaonthadi                        | Tourist attraction is increased.                        |
| 24 | Repairs to roads(Khangaon Thadi to NIC building Rs. 4.23., Chapadgaon to bird watch gallaryRs.5.77, Manjargaon to watchtowerRs.3.62) | 0 | 0 | 2009-10 | 3 | 13.62 | Chapadgaon,Khangaont hadi,Manjargaon | Useful for protection as well as tourism purpose.       |
|    |  |   |   | 2011-12 | 1 | 4.82  |                                      |   |
| 24 | Construction of cycle track around NMS weir  | 0 | 0 | 2011-12 | 1 | 7.24  | Chapadgaon                           |   |
| 25 | Repair of watch Tower  | 0 | 0 | 2013-14 | 0 | 1.50  | Manjargaon                           | Tourist facilities result in increase in no.of Tourist. |
| 26 | Vaccination  | 0 | 0 | 2013-14 | 0 | 0.50  | sanctuary area                       |   |
|    |  |   |   | 2014-15 | 0 | 0.50  |                                      |   |
| 27 | Installation of solar sysytem  | 0 | 0 | 2014-15 | 0 | 14.54 | Chapadgaon,Khangaont hadi            | Tourist facilities result in increase in no.of Tourist. |
| 28 | Purchase of material for rest house  | 0 | 0 | 2013-14 | 0 | 4.00  | Khangaonthadi                        |   |
| 29 | Purchase of material for NIC   | 0 | 0 | 2014-15 | 0 | 1.00  | Khangaonthadi                        |   |
| 30 | Pipe ralling   | 0 | 0 | 2013-14 | 0 | 10.38 | Karanjgaon                           |   |
|    |  |   |   | 2014-15 | 0 | 10.36 |                                      |   |
| 31 | Nature trail for connecting watch tower  | 0 | 0 | 2014-15 | 0 | 9.56  | Chapadgaon                           |   |

|       |  |   |             |         |   |               |               |   |
|-------|--|---|-------------|---------|---|---------------|---------------|---|
| 32    | Fencing around NIC   | 0 | 0           | 2013-14 | 0 | 9.41          | Khangaonthadi |   |
| 33    | Base studies for wildlife related and other forestry related subjects. | 0 | 0           | 2014-15 | 0 | 2.00          | Chapadgaon    | Habitat improvement of birds is possible.               |
| 34    | Pagoda   | 0 | 0           | 2013-14 | 2 | 5.76          | Karanjgaon    | Tourist facilities result in increase in no.of Tourist. |
| 35    | Bird hide  | 0 | 0           | 2013-14 | 1 | 2.93          | Chapadgaon    |   |
| TOTAL |  |   | <b>0.00</b> |         |   | <b>148.67</b> |               |   |

**APPENDIX NO. 22**

**Budgetary provision for management scheme  
(Period 2015,16 TO 2016,17) (Rs. In lakhs)**

| Sr. No.                             | Item  | 2015-16 |       | 2016-17 |       | TOTAL  |       |
|-------------------------------------|---|---------|-------|---------|-------|--------|-------|
|                                     |   | Target  |       | Target  |       | Target |       |
|                                     |   | Phy     | Fin   | Phy     | Fin   | Phy    | Fin   |
| <b>PPROTECTION</b>                  |   |         |       |         |       |        |       |
| 1                                   | Watch Tower & maintenance   | 1       | 1.00  | 1       | 1.10  | 2      | 2.10  |
| 2                                   | Protection labour 12 per year   | 12      | 7.20  | 12      | 7.92  | 24     | 15.12 |
| 3                                   | Construction of Check nakas & maintenance                                 | 1       | 5.00  | 0       | 5.50  | 1      | 10.50 |
|                                     | <b>TOTAL</b>  |         | 13.20 |         | 14.52 | 0      | 27.72 |
| <b>BOUNDARY DEMARCATION</b>         |   |         |       |         |       |        |       |
| 4                                   | Boundary Demarcation and Maintenance                                      | 4 km    | 0.16  | 4 km    | 0.18  | 4 km   | 0.34  |
|                                     | <b>TOTAL</b>  |         | 0.16  |         | 0.18  |        | 0.34  |
| <b>WILDLIFE HEALTH &amp; CENSUS</b> |   |         |       |         |       |        |       |
| 5                                   | Purchase medicine   | 0       | 0.20  | 0       | 0.22  | 0      | 0.42  |
| 6                                   | Census  | 5       | 0.50  | 5       | 0.55  | 10     | 1.05  |
|                                     | <b>TOTAL</b>  |         | 0.70  |         | 0.77  | 0      | 1.47  |
| <b>ECO AWARENESS ACTIVITIES</b>     |   |         |       |         |       |        |       |
| 7                                   | Education trip for field staff & officers                                 | 1       | 0.50  | 1       | 0.55  | 2      | 1.05  |
| 8                                   | Awareness programme of wildlife week                                      | 1       | 0.50  | 1       | 0.55  | 2      | 1.05  |
| 9                                   | Workshop  | 1       | 1.00  | 1       | 1.10  | 2      | 2.10  |
| 10                                  | School camps  | 4       | 0.20  | 4       | 0.22  | 8      | 0.42  |
| 11                                  | Seminar Expenses  | 1       | 0.50  | 1       | 0.55  | 2      | 1.05  |
|                                     | <b>TOTAL</b>  |         | 2.70  |         | 2.97  | 0      | 5.67  |
| <b>HABITAT IMPROVEMENT</b>          |   |         |       |         |       |        |       |
| 12                                  | Eradication of Panweli (weed)   | 20 ha   | 2.00  | 20 ha   | 2.20  | 20 ha  | 4.20  |
| 13                                  | Mapping and Eradication of parthenium.                                    | 1       | 0.50  | 0       | 0.00  | 1      | 0.50  |
| 14                                  | Plantation of fruit trees in forest area (Gapplanting) 100 Plants per ha. | 5       | 0.50  | 5       | 0.55  | 10     | 1.05  |
| 15                                  | Plantation of fruit trees along the periphery of the lake.                | 1       | 0.50  | 1       | 0.55  | 2      | 1.05  |
| 16                                  | Construction of Jetties   | 1       | 1.00  | 1       | 1.10  | 2      | 2.10  |
|                                     | <b>TOTAL</b>  |         | 4.50  |         | 4.40  | 0      | 8.90  |
| <b>ECO TOURISM DEVELOPMENT</b>      |   |         |       |         |       |        |       |
| 17                                  | Development of Interpretation centre                                      | 1       | 10.00 | 1       | 11.00 | 2      | 21.00 |
| 18                                  | Information Board   | 10      | 1.00  | 10      | 1.10  | 20     | 2.10  |
| 19                                  | Binocular   | 5       | 0.30  | 5       | 0.33  | 10     | 0.63  |
| 20                                  | spotting scope  | 1       | 0.40  | 1       | 0.44  | 2      | 0.84  |
| 21                                  | Preparation of broucher for tourist                                       | 1       | 0.50  | 1       | 0.55  | 2      | 1.05  |
| 22                                  | Publicity by local T.V. channel.  | 1       | 1.00  | 1       | 1.10  | 2      | 2.10  |
| 23                                  | Preparation of nature trail and maintainance                              | 1       | 1.00  | 1       | 1.10  | 2      | 2.10  |

|                                   |   |   |        |      |        |      |        |
|-----------------------------------|---|---|--------|------|--------|------|--------|
|                                   | <b>TOTAL</b>  |   | 14.20  |      | 15.62  | 0    | 29.82  |
| <b>RESEARCH &amp; TRAINING</b>    |   |   |        |      |        |      |        |
| 24                                | Check listing of bird   | 1 | 0.50   | 0    | 0.00   | 1    | 0.50   |
| 25                                | Taxonomically study & check listing of plants                                     | 1 | 0.50   | 0    | 0.00   | 1    | 0.50   |
| 26                                | Aquatic habitat study   | 0 | 0.00   | 1    | 0.50   | 1    | 0.50   |
| 27                                | Preservation plot & ground Flora & Fauna study                                    | 0 | 0.00   | 5 ha | 0.50   | 5 ha | 0.50   |
| 28                                | Migration behavior study  | 0 | 0.00   | 1    | 0.50   | 1    | 0.50   |
| 29                                | Study of nesting and breeding of resident birds.                                  | 0 | 0.00   | 0    | 0.50   | 0    | 0.50   |
| 30                                | Training for the staff  | 1 | 0.50   | 1    | 0.55   | 2    | 1.05   |
|                                   | <b>TOTAL</b>  |   | 1.50   |      | 2.55   | 0    | 4.05   |
| <b>INFRASTRUCTURE DEVELOPMENT</b> |   |   |        |      |        |      |        |
| 31                                | Construction of Staff Quarter- Forest Guard and forester                          | 1 | 15.00  | 1    | 16.50  | 2    | 31.50  |
| 32                                | Labour shed   | 1 | 6.00   | 0    | 0.00   | 1    | 6.00   |
| 33                                | Provision of library facilities in interpretation centre.                         | 1 | 1.00   | 0    | 0.00   | 1    | 1.00   |
| 34                                | protection cabin for labour   | 1 | 2.00   | 1    | 2.20   | 2    | 4.20   |
| 35                                | Repairing of cycle track  | 1 | 1.00   | 1    | 1.10   | 2    | 2.10   |
| 36                                | Pay & Allowance of range staff 13 No.   | 1 | 20.00  | 1    | 23.00  | 2    | 43.00  |
| 37                                | Range Office Expences- Telephone bill,electricity bill etc.                       | 0 | 2.00   | 0    | 2.30   | 0    | 4.30   |
| 38                                | Fuel for RFO ,ACF & CF vehicle (3000 lit. per year per veh.)                      | 3 | 3.00   | 3    | 3.30   | 6    | 6.30   |
| 39                                | Maintainance of RFO,ACF &CF vehicles. Diesel Rs 50000 / yr., petrol Rs. 40000/yr. | 3 | 1.10   | 3    | 1.15   | 6    | 2.25   |
| 40                                | Maintainance of Interpretation centre ,Dormatary & resthouse & other building..   | 3 | 1.00   | 3    | 1.10   | 6    | 2.10   |
| 41                                | Watch and ward and maintainance of garden at Chapadgaon and Khangaon thadi        | 1 | 1.00   | 1    | 1.10   | 2    | 2.10   |
|                                   | <b>TOTAL</b>  |   | 53.10  |      | 51.75  | 0    | 104.85 |
| <b>ECODEVELPMENT ACTIVITES</b>    |   |   |        |      |        |      |        |
| 42                                | Development activities in VEDC at Khangaon Thadi & Dindori Tas                    | 1 | 10.00  | 1    | 10.00  | 2    | 20.00  |
|                                   | <b>TOTAL</b>  |   | 10.00  |      | 10.00  |      | 20.00  |
|                                   | <b>G.TOTAL</b>  |   | 100.06 |      | 102.76 |      | 202.82 |