



MANAGEMENT PLAN OF WADHAVANA WETLAND



PROJECT PERIOD

Five Years

PREPARED BY

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| <p style="text-align: center;">MANAGEMENT ACTION PLAN FOR WADHAVANA WETLAND VADODARA DISTRICT, GUJARAT STATE</p> |
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1. DESCRIPTION OF THE SITE

1.1. LOCATION:-

Wadhavana Irrigation Tank is located near Wadhavana village of Dabhoi Taluka of Vadodara district. It is approx. 45 kms away from Vadodara city on Vadodara-Dabhoi-Chhotaudepur state highway. The nearest town is Dabhoi on Vadodara-Rajpipla road. Dabhoi town is approx. 15 kms away from Wadhavana wetland.

1.2. AREA:-

Wadhavana Irrigation Tank wetland was constructed in the year 1909-10 for irrigation purposes. It is an earthen dam structure of approx. 8.5 kms length covering an approximate area of 579 ha. Water storage capacity of this wetland is approx. 500 MCFT at FSL level.

1.3. ALTITUDE:-

Situated in more or less plain area of Vadodara district, the wetland has an altitude of approx. 160 Mts. above MSL.

1.4. CLIMATIC FEATURES:-

1.4.1 Climate:-

The climate of the region is characterized by a hot summer and general dryness. The year may be divided into three seasons. The period from March to mid-June is summer season. South-West monsoon season commences from 15 June to end of September. The winter season starts from December and ends in February. A detailed account of climatic conditions like temperature, rainfall, wind and humidity are as follows.

1.4.2. Temperature:-

Depending upon the seasons, there is very wide variation in maximum and minimum temperatures. During the hot season, the temperatures rise gradually from March to May. Thus, May is regarded as the hottest month of the year with maximum daily temperature rising upto 44°C and even 45°C and minimum temperature falling down to 20°C. The difference between day and night temperature is also considerably high. With the advent of monsoon by June, the temperature begins to fall down and in July-August, the weather becomes mild. The season starting from December to February experience winter conditions. During the cold season the minimum temperature falls down to 7°C and maximum temperature reaches upto 24°C in January. When snow falls on high hills of Himalayas, the area experience quite chilly conditions.

APPROXIMATE MONTHLY TEMPERATURE DATA

| Sr. No. | Month | Average Temperature (°C) | |
|---------|-----------|--------------------------|---------|
| | | Maximum | Minimum |
| 1 | January | 24.0 | 7.0 |
| 2 | February | 29.5 | 10.5 |
| 3 | March | 31.9 | 15.0 |
| 4 | April | 34.8 | 21.9 |
| 5 | May | 38.5 | 20.2 |
| 6 | June | 40.4 | 29.4 |
| 7 | July | 39.7 | 31.0 |
| 8 | August | 32.7 | 26.8 |
| 9 | September | 31.0 | 26.8 |
| 10 | October | 34.4 | 27.4 |
| 11 | November | 36.4 | 26.2 |
| 12 | December | 33.3 | 21.10 |

1.4.3. Rain fall:-

Almost entire annual rainfall is received from South-West monsoon during June to September. Only occasional unseasonal a few showers may occur in winter (November to February) and at times during summer (April-May). In general, rainfall is erratic and irregular, consisting of few heavy showers interspersed with long spells of drought. Total rainfall varies widely from year to year. The monsoon prevails highest in July-August and maximum rainy days are also recorded in these months. Taking average of last 15 years, average annual rainfall recorded is 953 mm and average number of rainy days is around 47.

1.4.4. Winds:-

Winds are generally light in the post monsoon and winter season and increase in intensity during summer and monsoon season. General direction of wind is from the West or South-West from April to September. During summer season, hot dry desiccating winds and dust storms blow on many days and the entire period is uncomfortable. Cyclonic winds occur occasionally during summer months causing mild damage to trees. Further, the winds are strong during rains and pre-monsoon period with wind speeds reaching to 20 kms. to 40 kms. per hour during April to August. Pre-monsoon and Post-monsoon gales are common.

1.4.5. Humidity:-

The climate remains generally dry in most of the period of year. The relative humidity is high during monsoon and in July-August it reaches upto 70 to 90%. In other seasons the weather is dry with humidity reading below 20% in the evening and reaching upto 40% in mornings during February to May.

1.5. LAND USE PATTERN IN THE CATCHMENT:-

Main source of water for Wadhavana wetland was Jojwa head works at Jojwa village located at approx. 65 kms to the south east of Vadodara city in Chhotaudepur taluka. Jojwa head works is on Orsang river which as area of approx. 1150 sq. kms as its catchment spread over Chhotaudepur taluka of Chhotaudepur district as well as area of western parts of Alirajpur district of M. P. State. Major parts of the catchment area mainly comprises tribal area of north east Gujarat and western M.P. State having traditional agriculture and animal husbandry practices. Estimated land use pattern of the area is 25% agriculture, 40% forest, 15% pasture lands and 20% area as Government wastelands. The area is comparatively backward in economic as well as industrial growth and main sources of livelihood of local people are Agriculture and Animal husbandry augmented by collection of non-timber forest produce.

1.6. SOURCES OF INFLOW AND OUTFLOW OF WATER:-

Main source of water for Wadhavana tank was from Jojwa head works at Jojwa village which is approx. 20 kms NE from the tank. Total catchment of this irrigation tank is spread over approx. 1150 sq. kms (approx. 20% of which lie in M.P. State). It is drained by 5 major outlets (canals) having a total gross command area of 8815 ha. But, now a days since last 3 to 4 years this source of inflow is Narmada canal. At any time this source is available on payment base too.

1.7. FLORA:-

Important plant species identified at Wadhavana wetland with their scientific name and family as well as remarks for their occurrence, etc. are annexed here to as Annexure - 1. As listed out in the annexure, as many as 81 species of higher plants and 5 species of algae and diatoms are identified in Wadhavana wetland.

1.8. FAUNA:-

Important species of fauna including major animal groups like birds, reptiles, mammals, invertebrates, etc. are provided as **Annexure - 2**.

1.9. HUMAN POPULATION DIRECTLY DEPENDENT ON WADHAVANA WETLAND:-

Wadhavana wetland was basically an irrigation tank fed through Jojwa head work on Orsang river having a storage capacity of 500 MCFT at FSL level. Now a day Narmada canal is the main source of water for this irrigation tank. It is well connected through a good canal. Nature of Sardar Sarovar dam water is available any time. It is drained by five major outlets for irrigation. It has gross command area of more than 8800 ha spread over 25 villages which depend on this wetland for irrigation purposes. Apart from this, people of Wadhavana and nearby villages practice fishing in this wetland.

1.10. CULTURAL AND INDIGENOUS PRACTICES OF WETLAND RESOURCE UTILISATION:-

Apart from irrigation and fishing purposes, the Wadhavana tank is being used by local people for drawing drinking water, for washing clothes, as source of drinking water for their cattle, etc. No other cultural or indigenous uses are known for this wetland.

1.11. EXISTING CONSERVATION MEASURES TAKEN:-

The area is patrolled continuously by local staff of forest department to minimize poaching of birds. Protection needs to be strengthened along with other conservation measures. Conservation measures/ activities taken up since last five year are as following.

- Planting
- Ipomea removal

- Mounds
- Stand Parching
- Census
- Awareness Program
- Upgrading wetland
- Camps
- Training to staff
- Eco Development activities

1.12. RESEARCH NEEDS:-

The Wadhavana wetland is an important wetland representing one of the richest refuge for migratory as well as local and local migratory birds. In spite of its richness and importance, it has not attracted attention of academicians for carrying out research their-in. Research and monitoring of the area in following fields is required to be carried out.

1. Biodiversity study of the area.
2. Anthropogenic pressure and its effects on the resource.
3. Monitoring of physical changes such as quality and quantity of water retained, etc.
4. Monitoring changes in vegetation, its causes and effects.
5. Monitoring changes in wild life populations.
6. Monitoring wildlife health and diseases.
7. Migration patterns, territoriality and home ranges.
8. Changes in wildlife behavior etc.

2. PROBLEMS / THREATS:-

1. The area adjoining the wetland does not have adequate tree cover for perching, roosting and nesting of the birds.

2. During March to May, the wetland dries up. At this time, the upper portion of wetland becomes totally dry because of which the birds concentrate in smaller pockets in the lower regions.
3. There are a few instances of poaching of birds.
4. Regulation of fishing activities by specifying the size of fishing nets.
5. Maintaining optimum water levels (4 - 10 ft).
6. Invasion of Ipomea and other obnoxious weeds needs to be controlled.

3. MANAGEMENT OBJECTIVES:-

3.1 SHORT TERM OBJECTIVES:-

Short term objectives for Wadhavana wetland are:

- (1) Provide protection to birds and other wildlife against poaching and disturbances.
- (2) To prevent further degradation of the wetland due to invasion of weeds, siltation, etc and to improve it through removal of unwanted weed growth, silt etc.
- (3) To maintain optimum water level suitable for birds and improve the habitat by tree planting etc measures.
- (4) To organize local people through creating awareness for conservation of this important resource.

3.2 LONG TERM OBJECTIVES:-

- (1) Preservation and improvement of this wetland ecosystem to provide ideal habitat for Avifauna.
- (2) To conserve the genetic diversity of the area by improving and ameliorating the habitat with special emphasis to the rare and endangered species.
- (3) Eco-development works for the rural community living around the sanctuary and reducing man-wildlife conflicts.

- (4) To provide and build up scientific database through organization of research. To develop facilities for specialized studies and research for naturalists, scientists and research workers in the field of wildlife biology, ecology, zoology, botany, ornithology, nature conservation and related subjects.
- (5) To inculcate love and reverence for wildlife, bird life and nature amongst people and especially the younger generation through nature education, etc.

4. STRATEGIES FOR ACHIEVING THE OBJECTIVES:-

4.1 PROTECTION:-

- (1) To improve protection through organizing local people in a society for preservation and conservation of this wetland.
- (2) To provide sufficient manpower to guard for this wetland.
- (3) Constructing of eight observation towers (small structures) for the visitors to use them. The bird watching will be allowed from these eight points
- (4) To make conscious efforts to minimize pesticide contamination in water in the adjoining agriculture fields. In long term the efforts will be to minimize pesticide contamination in the catchment of this wetland.

4.2 WATER MANAGEMENT, HABITAT RESTORATION AND IMPROVEMENT MEASURES:-

- (1) Removal of Ipomea (Weed) growth from the wetland areas.
- (2) Excavation of channels in the upper regions of the wetland and putting this soil as a mound in the nearby area so that the upper areas will also have water in the channels and birds may use the habitat throughout the wetland.
- (3) Tree planting in the adjoining areas for more perching, roosting and nesting sites for the birds.

- (4) Survey of catchments area and planning afforestation wherever needed. Planting of fruits species on the peripheries of the agriculture fields of the adjoining villages.
- (5) Improvement of the link road from state highway to the wetland and connecting to observation towers (viewing centers).
- (6) To maintain minimum water level in the wetland.
- (7) To introduce suitable aquatic plants to attract more number of birds.
- (8) To introduce suitable species of fishes useful as food to birds.

4.3 SOCIO ECONOMIC DEVELOPMENT OF STAKE HOLDERS:

- (1) Training locals for eco-tourism and to develop local expertise in bird watching so that the educated youth may benefit by the development of this wetland.
- (2) Eco-development of nearby villages.
- (3) To have more public awareness for the Wadhavana wetland by attracting birds lovers to develop as it a eco-tourism center. This will help the local villagers by generating employment for providing services to the visitors coming for bird watching in the area. This will help in generating some income for the local villagers. This will also help in reducing the hunting of birds by the poachers.
- (4) Interaction with fishing community and training them about fishing methods which are better and safer for the flora and fauna of the wetland.

4.4 RESEARCH, MONITORING AND EVALUATION:-

- (1) A continuous monitoring is required. The data available should be collated with data of neighboring water bodies and with other water bodies collected during same period. It should be analysed constantly to evaluate changes, if any.

- (2) Research, monitoring & evaluation for the wetland on following topics.
 - (a) Biodiversity study of the area.
 - (b) Anthropogenic pressure and its effects on the resource.
 - (c) Monitoring physical changes such as quality and quantity of water retained etc.
 - (d) Monitoring changes in vegetation, its causes and effects.
 - (e) Monitoring changes in wild life populations.
 - (f) Monitoring wildlife health and diseases.
 - (g) Migration patterns, territoriality and home ranges.
 - (h) Changes in wildlife behavior etc.

4.5 PUBLIC AWARENESS AND EDUCATION:-

- (1) Environment education programme for the people of the adjoining areas.
- (2) Interaction with fishing community to educate them about better and safer methods of fishing.
- (3) To organize nature education camps for different target groups at Wadhavana to educate target groups regarding its importance.
- (4) Arranging awareness campaigns periodically to boost perceived value of this resources.

5. FINANCIAL ESTIMATES:-

Financial estimates for various activities to be undertaken for five year i.e. from the year 2014-15 to 2018-19 is Rs.510.85 lakh. Details of various activities, their yearwise phasing and financial requirement for the same are as per Annexure-3

An amount of Rs.80.25 lakh is proposed for the year 2014-15 for various activities to be undertaken as per recommendations of wetland committee.

6. A PROPOSAL FOR THE DECLARATION OF RAMSAR SITE

This Wetland is appropriate for Ramsar Site. A proposal for declaration/sanction has been sent to the authorities, & the details are as follows.

6.1. PHYSICAL FEATURES OF THE SITE:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Origin: Wadhavana Wetland is non-forest area located in biotic province 4B Gujarat Rajwada in Semi Arid Biogeographical Zone of the country as per the classification of Pawar & Rogers W II 1988, Dehradun. It is one of the eight wetland sites of Gujarat declared in 2004.

Geology: The soil of lake is mixed black cotton with clay and abundance of organic matter and also calcareous kankar sporadically. Partly the area is also comprising alluvial track.

Water: Depth of the wetland varies from area to area, as the wetland is quite big and maximum depth is nearly 5.00 m. The water availability is perennial in nature. The area gets rainwater drained from eastern and western regions mainly. The irrigation department is filling the water from the Orsang River & Narmada Canal for irrigation purpose. The water storage capacity of the Wetland is estimated around 500 MCFT. Physico chemical analysis is shown in table:4.

Table:4.

| Sr. No. | Observation | Upper Surface | Lower Surface |
|---------|------------------------------|-----------------|-----------------|
| 1 | PH | 7.81 + 0.09 | 7.8 + 0.09 |
| 2 | Total Solids (T) | 9.83 + 1.42 | 8.3 + 1.25 ppm |
| 3 | Total Suspended Solids (TSS) | 5.78 + 0.89 ppm | 5.2 + 0.83 ppm |
| 4 | Total Dissolved Solids (TDS) | 4.1 + 0.63 ppm | 2.9 + 0.48 ppm |
| 5 | Total Hardness (TH) | 171 + 6.85 ppm | 144 + 6.26 ppm |
| 6 | Alkalinity | 574 + 38.53 ppm | 522 + 38.59 ppm |
| 7 | Acidity | 89 + 7.49 ppm | 78 + 5.88 ppm |
| 8 | Dissolved Oxygen (DO) | 12 + 0.37 ppm | 12 + 0.39 ppm |

Water permanence: Sometimes, in summer months Wadhavana wetland dries up partially for a very small period. However, during good rainfall year, water remains till next season. Water availability is almost perennial in nature.

General Climate: Rainfall of the area ranges from 700 mm. to 1200 mm. approximately, with a temperature range of 8° C to 45° C. Wind velocity is normal and very conducive for the birds' habitat.. The year is divided into four seasons. The winter season is short from December to January is followed by summer from March to July. South Westerly monsoon sets during late June and lasts till August – September. The period between October to December is the post-monsoon period, which is a salubrious season. The winter are mild and the summer is severe. Particularly after October till mid-February the season is light winter to light summer and that is the reason of birds availability in abundance in this particularly period. Even the migratory birds from Europe and latin American countries.

6.2. PHYSICAL FEATURES OF THE CATCHMENT AREA:

As stated above physical features of the wetland's catchment area is quite vast, receiving rainfall from the eastern and western side mainly.

6.3. HYDROLOGICAL VALUES:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

It is an irrigation reservoir commanding 8815 ha of vast agriculture land covering 25 villages. Ground water table is quite high i.e. 100 to 150 ft. and richly recharged by the wetland water. With its irrigation all the three seasonal crops like wheat, rice, millet, cajan, mung & other pulses and also good vegetable production are cultivated.

6.4. WETLAND TYPES:-

a) Presence:

Circle or underline the applicable codes for the wetland types of the Ramsar “Classification System for Wetland Type” present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va • Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) Dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

6>P> Ss

Water storage area> Seasonal/intermittent freshwater lake>Seasonal/intermittent saline/brackish/alkaline marshes/pool.

6.5. GENERAL ECOLOGICAL FEATURES:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

Habitat types:

- (i) Deep open water habitat ✓
- (ii) Shallow open water habitat ✓
- (iii) Emergent aquatic vegetation
- (iv) Muddy habitat
- (v) Bank land ✓
- (vi) Cultivation in surrounding area ✓
- (vii) Fallow land in surrounding area ✓
- (viii) Wood land habitat

Vegetation types: As per the survey conducted by M.S.University, Baroda with association of forest department, important species are shortlisted which are good habitat for the migratory and local birds. All the three canopy species are quite distinguishable .

Main Tree species: The surrounding is covered by different type of spp. like *Syzygium crimini* (Jamun), *Ficus virens*, *Oxystelma esculentum*, *Pithocolobium dulce*, *Tamarindus indica*, *Mangifera indica*, *Tecomella spp.*, *Azadiracta indica* (Neem), *Eucalyptus*, *Prosopis juliflora*, *Leucaena leucocephala* (Subabul) etc

- i. **Middle canopy:** *Dendrocalamus strictus* (Bamboos), *Pandanus tectorius* (kevada), *Ficus virens* (piple), *Ficus bengalensis* (Vad), *Ficus racemosa* (udumbar), *Manilkara hexandra* (rayan), etc
- ii. **Ground cover :** A good number of grasses, lantana, ipomea etc are plentifully covering the area. The banks and the submergence area is having algae like *Spirogyra spp*, *Oscilltoria spp*, *Nitella spp*, *Anabena spp*, *Nitzschia*, (diatoms) and lichens which are the good food for the birds.
- iii. **Cultivation area:** In agricultural area surrounding the wetland, paddy, wheat, gram and cotton, cajanus are grown. While the surrounding area of cultivation are also having sufficient tree covering providing good perching sites.
- iv. **Faunal Diversity:** Faunal diversity particularly of insect variety are quite rich and abundantly available. The insect diversity are from the Phylum arthropoda viz. order-Odonata, Orthoptera which includes grass hoppers &

crickets, order-Hemiptera, Coleoptera, Diptera etc. These insects are making a good source of food for the insectivores.

It is also observed that nearly seven types of fishes are available in the wetland. The detail information is given in table.5.

Table:5.

| Sr. No. | Local Name | Zoological Name | Family |
|---------|------------|-------------------------|------------|
| 1 | Rohu/ Rohi | Labio rohita | Cyprinidea |
| 2 | Katala | Catla catla | |
| 3 | Mringal | Cirrhinus cirrhosus | Cirrhinus |
| 4 | Grass carp | Ctenopharyngodon idella | Cyprinidae |
| 5 | Zinga | Micro rosenburgy | |
| 6 | NA | Wallago attu | |
| 7 | NA | Mystus shingala | |

- v. **Plantation:** Eco-development Centre established for the tourist is covered by Plantation by planting 184 plants of 11 sp. in 2007-08 & 1120 plants of 16 sp. in 2009-10 free space available around the boundary is covered by 7254 plants of 13 sp. in 2009-10. Status of birds in each category as on 2013-14 is shown in table.6.

Table:6

| Sr. No. | Catagory | No. of Species | No. of Birds | Percentage |
|---------|----------------------------|----------------|--------------|------------|
| 1 | 2 | 3 | 4 | 5 |
| 1 | Extinct (EX) | | | |
| 2 | Critically Endangered (CR) | | | |
| 3 | Endangered (E) | | | |
| 4 | Vulnerable (V) | | | |
| 5 | Near Threatened (NT) | 6 | 2029 | 6 |
| 6 | Data Deficient (DD) | | | |
| 7 | Rare/ Accidental (R) | | | |
| 8 | Others (O) | 93 | 34559 | 94 |
| | GRAND TOTAL | 99 | 36578 | 100 |

6.6. NOTEWORTHY FLORA:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Almost all the representative spp of this area are sufficiently available. As many as 81 important plant spp are identified around the wetland and 5 spp of algae and diatoms are recorded and are in abundance.

6.7. NOTEWORTHY FAUNA:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

The wetland is enjoying sufficiently large number of avian fauna diversity of 125 belonging to more than 60 genera and 28 families out of which nearly 33 spp. are migratory in nature and majority 11 spp. are resident migratory. The mammals are comprising of hanuman langur (*Samnopithicus entilus*), monkeys and fruit bats are in abundance. Reptiles, Lizards, spiders are also available. Butterflies, Moths and fire flies are imparting charming colours to the wetland.

6.8. SOCIAL AND CULTURAL VALUES:

a) The area is quite rich in agriculture production which are comprising all the three seasonal crops. Granary, pulses and vegetables are cultivated richly

and yielding rich earning to the farmers. As the area is well connected by highways, so the area is modernly developed.

b) Culturally it can be stated that the area does not have any history of wildlife crimes. Even the surrounding farms are not having any problem with the birds. In the Nature Education Camps, it is emphasised that birds are the good natural control of the pests and the insects. Moreover it is experienced that the villagers are quite convinced about this natural control and not harming the birds.

6.9. LAND TENURE/OWNERSHIP:

a) within the Ramsar site:

The wetland which is quite big pond, is a revenue land and under the administration of the Irrigation department. The irrigation department which is also under the state government having good harmony with the forest department. But actually, wetland policy at the national level is not binding and forceful by & large by which other departments particularly irrigation department owns the responsibility of maintaining or conserving the wetlands.

b) in the surrounding area:

The surrounding area is under revenue department comprising human habitation, farmlands etc and they are dependent on wetland for getting the irrigation. Up till now there is no friction with the nearby dwellers with the forest department which is taking care of conservation measures for the wetland.

6.10. CURRENT LAND (INCLUDING WATER) USE:

a) within the Ramsar site:

The water is supplied through canals for irrigation purposes. After March-April when the birds are quite few in number, the fishes are harvested by the fishery department. The fishery department are releasing fingerlings of fishes in the monsoon season for increasing production of the fish. When the bird season from Monsoon period - July to March - April, the fishing is not allowed by the

fishery department as well as by the forest department. So there is no disturbance for the birds and fishing.

b) in the surroundings/catchment:

The surrounding area is under revenue department comprising human habitation, farmlands etc. Particularly the farmlands in the surrounding are quite fertile and yielding good dividends to the farmers which are taking all three crops round the year as the agriculture area is totally irrigated.

6.11. FACTORS (PAST, PRESENT OR POTENTIAL) ADVERSELY AFFECTING THE SITE'S ECOLOGICAL CHARACTER, INCLUDING CHANGES IN LAND (INCLUDING WATER) USE AND DEVELOPMENT PROJECTS:

a) Within the Ramsar site:

When the pond is partly dried in some portion of the wetland, grasses are abundantly available on which the nearby domestic cattle graze the area. Though the pond is perennial source of water, so partly a small portion is having threat of illegal grazing.

b) in the surrounding area:

Illegal grazing, supplying of water for irrigation, use of pesticide and chemical fertilities do pose some adverse effect to the ecology of the wetland, however application of organic farming is suggested as a remedial measure which is to be motivated and necessary inducement like training, incentives and financial supports should be provided.

Actually irrigation is not required upto February or so, after the monsoon, so disturbance due to irrigation supply is much less. Similarly grazing in the pond is not possible due to water-filled pond, during the period of bird visits i.e. Oct. to Feb.

6.12. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

Actually major conservation measures are not required. Except some minor measures are to be taken for birds habitat improvement and facilitating the ecotourism.

Mound making in the corner of the pond where water is shallow should be adopted to meet the semi-terrestrial habitat of the birds. The plants which can withstand water logging condition like jamun, Ficus spp., Accacia nilotica, A. auriculiformis etc are required to be planted more for improving perching habitat of birds on the trees. In the surroundings of the pond, a good chunk of land is available for planting. so nearly 5000 fruit species can be planted. Removal of the alien plant species is also to be done regularly.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented? Yes

Approved Annual Plan of Operation for wetland management conservation is operative.

d) Describe any other current management practices:

- Implementation of Centrally Sponsored Scheme on Wetlands of National Importance of (New name of Wetland Project Scheme) National Plan for Conservation of aquatic Eco-system (NPCA) by Government of India for the 5 years commencing since 2005-06.

- Ecotourism activities include maintaining interpretation center, watch towers, nature trails, signage, board, walks and walking tracks to minimize negative impacts on birdlife and habitat are already constructed which are in the use.
- Annual water bird Surveys and census is done by the staff, NGO, M.S. University students.
- In order to generate mass awareness about the importance of the wetland ecosystem, Nature Education camps are regularly conducted at Wadhavana during winter largely involving the school children, NGO's and village communities. Eco- Development Committee is already made which is doing the works like handling cafeterias, guiding etc. and are earning too.
- Small eco-development works like hand pump installment, guiding for improving the agriculture etc are implemented. Checkdem making required for further progress of the area.
- Research and monitoring programs for studying the biodiversity and chemical analysis of water of the pond is on hand in association with the M.S. University, Baroda.

6.13. CONSERVATION MEASURES PROPOSED BUT NOT YET IMPLEMENTED:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

The wadhavana wetland is basically irrigation pond which supplies water for irrigation for the crops taken round the year. Irrigation Department is taking care of filling the pond as well as supply of water through canals, however protection measures particularly for almost 9 months from June-July to March/

April to the following year is taken care by forest department. Around the pond small chunk of the area is taken up under the plantation for the birds habitat improvement. However a large area which can have around 5000 tree plants of spp. like *Syzygium cummini* (Jamun), *Ficus virens*, *Oxystelma esculentum*, *Pithocolobium dulce*, *syzygium cumini* (Jamun), *Pandanus odoratissimus* (kevada), *Cordia wallichii* (Gunda), *Ficus virens* (piple), *Ficus bengalensis* (Vad), *Ficus racemosa* (udumbar), *Manilkara hexandra* (rayan), *Anthocephalus cadamba* (Kadamb), *tecomella*, *Pithocolomn dulce*, *Ficus religiosa* (Pipal), *Zizyphus mauritiana* (Bore fruits) species can be planted.

Within the pond certain species for the habitat improvement for the birds can be planted prior to the monsoon. And also, planting of the fruit species in the surrounding area can improve the habitat.

Presently small mounds 5 to 10 in numbers are constructed which attracts substantial number of birds and fulfil the semi terrestrial habitat requirement of the birds. Actually big mounds are required to be constructed for the proper habitat improvement, which will definitely facilitated a good number of birds for the perching habit. This will also suffice the facility providing proximity with a safe distance to visitors besides augmenting the ecotones in the wetland.

6.14. CURRENT SCIENTIFIC RESEARCH AND FACILITIES:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

M.S.university of Baroda has taken up a biodiversity study research project for the wetland which narrates about the biodiversity i.e. algae, fungi, hydrophytes and water chemical analysis of water etc. It is of three years. However there is no long duration scientific research project for the wetland which can be thought of subject to long term planned management.

6.15. CURRENT COMMUNICATIONS, EDUCATION AND PUBLIC AWARENESS (CEPA) ACTIVITIES RELATED TO OR BENEFITING THE SITE:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

The Wadhavana wetland has a provisions of eco-tourism centre having lodging & boarding facilities. Three watchtowers namely, Wadhavana, Simaliya and Manjrol are available for citing of birds. Small interpretation centre is also provided for orienting the public towards the awareness generation. Nature education camps for school students are conducted regularly. Natural trails for reaching to the birds proximity with a safety distance, are provided along the banks of the pond. Small booklet for identification of birds and creating awareness is available at the eco-tourism centre and also a pamphlet is available at the ecotourism centre for ready reference to the general information. about birds. Binoculars and telescope facility are provided to the visitors. Nearly one lakh visitors are visiting to the site every year. Particularly on holidays. Good congregation of visitors is witnessed. However limited facilities of the lodging & boarding for tourist and bird watchers can be augmented and upgraded on the availability of funds.

6.16. CURRENT RECREATION AND TOURISM:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

The Wadhavana Wetland is an important eco-tourism destination in Gujarat particularly for nearby districts, even it is included in the list of tourism destination by the district administration and becoming popular at state level. It is a popular destination for many domestic and foreign birdwatchers.

Accommodation of 5 furnished rooms with attached toilet facilities are available for the tourists. The restaurant facility is also available at government rates which is run by Eco-development committee, comprising of poor people of Wadhavana village. The clean water facility is also provided round the clock. Garden is developed with more than 100 trees, shrubs & flowers with small children play ground, which is additional attraction for the people. Two cafeterias at the Manjrol tower and Simaliya tower are constructed for providing light snacks to the tourists. The small interpretation centre is constructed with details of birds for orienting and imparting knowledge to the people. The recreation factor is also considered by arranging tradition tribal dance & films show on demand. The broacher published for providing basic information to the people is enclosed herewith for reference. The atmosphere of the wetland site is remarkable with peace & calm. Further intensive planning & upgradation of the centre is needed as a measure of long term planning depending on availability of funds, which will be some good help for nature conservation as well as creating awareness amongst people.

6.17. JURISDICTION:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

Department of Forests & Environment, Government of Gujarat, India.

6.18. MANAGEMENT AUTHORITY:

Provide the name and address of the local office(s) of the agency (ies) or organisation(s) directly responsible for managing the wetland. Wherever

possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

| Sr. No. | Management Authority | Address | Phone no. | E-mail Address |
|---------|-------------------------------------|---|--|--------------------------|
| 1 | 2 | 3 | 4 | 5 |
| 1 | CF, Wildlife Circle, Vadodara | Office of the Conservator of Forest, Annexe building, Raopura, Vadodara | (O) 0265-2431679 (F) 0265-2425136 | fo-wl-vad@gujarat.gov.in |
| 2 | Dy. CF, Wildlife Division, Vadodara | Office of the Dy. Conservator of Forest, Annexe building, Raopura, Vadodara | (O) 0265-2428940 (F) 0265-2425136 | dcf.wl.vra2@gmail.com |
| 3 | RFO, Shivrajpur | Range Forest Office, Wildlife, Shivrajpur | (O) 02676- 243697 (F) 02676- 243697 | - |
| 4 | Forester Wadhavana | Forester Wadhavana | (O) 02676- 243697 (F) 02676- 243697 | - |
| 5 | Beat Guard, Wadhavana | Beat Guard, Wadhavana | (O) 02676- 243697 (F) 02676- 243697 | - |

ANNEXURE: 1

LIST OF PLANTS SPECIES IDENTIFIED AT WADHWANA WETLAND

| Sr. No. | Scientific Name | Family | Remarks |
|---------|--|-----------------|---|
| 1 | 2 | 3 | 4 |
| 1 | <i>Acacia nilotica</i> (L) Del. Subsp. <i>indica</i> (Bth.) Brenan | MIMOSACEAE | Few sparsely distributed trees |
| 2 | <i>Achyranthus aspera</i> L. | ACHNTHSECAE | |
| 3 | <i>Aeschynomene indica</i> L. | FABOCEAE | |
| 4 | <i>Alternanthera paronychoides</i> St. Hil | ACANTHACEAE | |
| 5 | <i>Alysicarpur monilifer</i> (L.) DC. | FABACEAE | |
| 6 | <i>Ammania baccifera</i> L. | CRUCIFERAE | Few plants beneath panandus & Ficus trees |
| 7 | <i>Apluda mutica</i> L. | POACEAE | Several Plants outside lake |
| 8 | <i>Aponogetone natans</i> L. | APONOGETONACEAE | Along with Vallisneria in waters gregarious in southeast. |

| Sr. No. | Scientific Name | Family | Remarks |
|---------|--|------------------|---|
| 1 | 2 | 3 | 4 |
| 9 | <i>Azadirachta indica</i> A. Juss | MELIACEAE | Very few trees planted sparsely around lake. |
| 10 | <i>Bacopa monnieri</i> (L.) Pennell | SCROPHULARIACEAE | Outside lake beneath Pandanus. |
| 11 | <i>Bergia ammannioides</i> Roxb. ex Roth | ELATINACEAE | Several scattered on bunds and on dried lake soils. |
| 12 | <i>Blumea bifoliata</i> (L.) DC | ASTERACEAE | Outside lake few plants. |
| 13 | <i>Blumea mollis</i> (D.Don) Merr. | ASTERACEAE | On dried lake soils and outside. |
| 14 | <i>Boerhavia rependa</i> Willd. | NYCAGINACEAE | Few on bunds and on outside of lake. |
| 15 | <i>Brachiaria setigera</i> (Retz.) Hubb | POACEAE | Among grasses outside lake. |
| 16 | <i>Butea monosperma</i> L. | FABACEAE | Heavily pruned bushy trees outside lake. |
| 17 | <i>Cadaba fruticosa</i> (L.) Druce | CAPPARIDACEAE | NR agricultural fields. |
| 18 | <i>Calotropis gigentia</i> (L) R. Br. | ASCLEPADACEAE | Very few plants on roadside. |
| 19 | <i>Cassia tora</i> L. | CAESALPINIACEAE | Few reported on road (bund) |
| 20 | <i>Casuarina equisetifolia</i> L. | CASUARINACEAE | Few trees previously planted by Dept. in south. |
| 21 | <i>Cenchrus setigerus</i> Vahl. | POACEAE | |
| 22 | <i>Ceratophyllum demersum</i> L. | CERATOPHYLLACEAE | |
| 23 | <i>Chrozophora prostrata</i> Dalz. | EUPHORBIACEAE | |
| 24 | <i>Coldenia procumbens</i> L. | BORAGINACEAE | |
| 25 | <i>Corchorus fascicularis</i> L. | TILIACEAE | |
| 26 | <i>Cynodon dactylon</i> (L.) Pers. | POACEAE | |
| 27 | <i>Cyperus arenarius</i> Retz. | CYPERACEAE | Growing on lake and around soils. |
| 28 | <i>Cyperus exaltatus</i> Retz. | CYPERACEAE | Growing on outside. |
| 29 | <i>Cyperus iria</i> L. | CYPERACEAE | Growing in and around lake. |
| 30 | <i>Cyprus mischelianus</i> L. | CYPERACEAE | Seen on lake soils. |
| 31 | <i>Cyperus squarrosus</i> L. | CYPERACEAE | Growing outside lake. |
| 32 | <i>Dactyloctenium aegypticum</i> (L.) P. Beauv. | POACEAE | Several found in south, outside lake. |
| 33 | <i>Dentella repens</i> (L.) Forst. | FABACEAE | Few among grasses. |
| 34 | <i>Desmodium triflorum</i> (L.) DC. | FABACEAE | Few plants among grasses. |
| 35 | <i>Eclipta prostrata</i> (L.) L. | ACANTHACEAE | At few places. |
| 36 | <i>Eleusine indica</i> (L.) Gaertn. | POACEAE | Several among grasses on bunds. |
| 37 | <i>Enicpstema hyssopifoliym</i> (Willd.) Verdoon | GENTIANACEAE | Several, sparsely in an outside of lake on bunds. |
| 38 | <i>Eucalyptus globulus</i> Labill. | MYRTACEAE | Few, sparsely around lake. |
| 39 | <i>Euphorbia hirta</i> L. | EUPHORBIACEAE | Among grasses |
| 40 | <i>Evolvulus alsenoides</i> (L.) L. | CONVOLUULACEAE | Few, sparsely distributed. |

| Sr. No. | Scientific Name | Family | Remarks |
|---------|--|-------------------------|--|
| 1 | 2 | 3 | 4 |
| 41 | <i>Ficus hispida</i> L.f. | MORACEAE | Few, sparsely found on outside. |
| 42 | <i>Ficus religiosa</i> L. | MORACEAE | Single tree in south outside lake. |
| 43 | <i>Ficus virens</i> Ait. | MORACEAE | Few trees in south of lake. |
| 44 | <i>Fimbristylis dichotoma</i> (L.) Vahl. | POACEAE | |
| 45 | <i>Gramgea maderaspatana</i> (L.) Poir. | COMPOSITAE (ASTERACEAE) | |
| 46 | <i>Indigofera</i> Sp. | FABACEAE | |
| 47 | Ipomoea aquatica | CONVOLVULACEAE | Water bodies outside lake and shank low waters. |
| 48 | <i>Ipomoea fistulosa</i> L. | CONVOLVULACEAE | In and out of lake soil. |
| 49 | <i>Ipomoea seiparia</i> L. | CONVOLVULACEAE | On dried lake soils. |
| 50 | <i>Heliotropium supinum</i> L. | BORAGINACEAE | Among grasses |
| 51 | <i>Hygrohila auriculata</i> R. Br. | ACANTHACEAE | In water bodies outside lake. |
| 52 | <i>Hygrohila serpyllum</i> (Nees) T. Anders. | ACANTHACEAE | In water bodies outside lake. |
| 53 | Hydrilla verticellata | HYDORCHARITACEAE | In water of lake. |
| 54 | <i>Launaea procumbens</i> (Roxb). Ram & Raj. | ASTERACEAE | |
| 55 | <i>Leucena leucophoa</i> R. Br. | MIMOSACEAE | |
| 56 | <i>Lymnophyton optusifolium</i> (L.) Miq. | ALISMATACEAE | In lake waters. |
| 57 | Mollugo oppositifolius | MOLLUGINACEAE | |
| 58 | Najas minor | NAJADACEAE | Water plants found in lake. |
| 59 | <i>Najas</i> sp. | NAJADACEAE | Water plants found in lake. |
| 60 | <i>Nymphoides indica</i> (L.) O.kuntze | MEYANTHACEAE | |
| 61 | <i>Oxystelma esculentum</i> (L.) R. Brown ex schutles. | APOCYNACEAE | |
| 62 | <i>Pandanus odoratissimus</i> L. | PANDANACEAE | Outside lake in south. |
| 63 | <i>Phaseohus trilobatum</i> L. | FABACEAE | |
| 64 | <i>Phyla nodiflora</i> L. | ASTERACEAE | |
| 65 | <i>Phyllanthus reticulata</i> L. | EUPHORBIACEAE | |
| 66 | Phyllanthus simplex | EUPHORBIACEAE | Among grasses very few seen |
| 67 | Prosopis ceneria | MIMOSACEAE | Planted in south of pond. |
| 68 | <i>Prosopis juliflora</i> | MIMOSACEAE | Bushy, invasion on roads and field boundaries around lake. |
| 69 | <i>Pithecellobium dulce</i> L. | MIMOSACEAE | Planted few frees. |
| 70 | Rungia pectinata | ACANTHACEAE | On slope of road. |
| 71 | <i>Scripus littoralis</i> | CYPERACEAE | |
| 72 | <i>Sida acuta</i> | MALVACEAE | On bunds near road and |

| Sr. No. | Scientific Name | Family | Remarks |
|---------------------|--------------------------------|------------------|---|
| 1 | 2 | 3 | 4 |
| | | | outside |
| 73 | <i>Sida coudifolia</i> | MALVACEAE | On bunds near road and outside |
| 74 | Solanum xanthocarpon | SOLANACEAE | Few on outside dry lands. |
| 75 | <i>Sphaeranthus indicus</i> L. | ASTERACEAE | |
| 76 | <i>Tephrosia purpurea</i> L. | FABACEAE | Few on outside. |
| 77 | <i>Tridax procumbens</i> L. | ASTERACEAE | Few on outside. |
| 78 | <i>Typha angustata</i> L. | TYPHACEAE | Scattered populations near ditches, out-lets. |
| 79 | <i>Vallisneria spiralis</i> L. | HYDROCHARITACEAE | In water body abundant. |
| 80 | <i>Zizyphus nummularia</i> L. | RHAMNACEAE | On outlets. |
| 81 | <i>Xanthium strumarium</i> L. | ASTERACEAE | In outlets around lake. |
| LOWER PLANTS | | | |
| 82 | <i>Spirogyra</i> Sp. | Algae | |
| 83 | <i>Oscillatoria</i> Sp. | Algae | |
| 84 | <i>Nitella</i> Sp. | Algae | |
| 85 | <i>Anabena</i> Sp. | Algae | |
| 86 | <i>Nitzschia</i> Sp. | Diatom | |

ANNEXURE - 2

(2.1) LIST OF MAMMALS IDENTIFIED WADHWANA WETLAND

| Sr. No. | Name | Scientific Name |
|---------|-----------------------------|-----------------------------|
| 1 | Common Indian Mongoose | <i>Herpestes dewardsi</i> |
| 2 | Five Stripped Palm squirrel | <i>Funambukus pennantii</i> |
| 3 | Jackal | <i>Canis aureus</i> |
| 4 | Fox | <i>Vulpes bengalensis</i> |
| 5 | Small Indian Civet | <i>Viverricula indica</i> |
| 6 | Hare | <i>Lepus nigricollis</i> |
| 7 | Hanuman Langoor | <i>Presbytis entellus</i> |

(2.2) LIST OF INVERTEBRATES IDENTIFIED WADHWANA WETLAND

| Sr. No. | Name | Scientific Name |
|---------|----------------------------|---------------------------|
| | Butterflies | |
| 1 | -Plain tiger | <i>Danaus chrysippus</i> |
| 2 | -Gram blue | <i>Euchrysops cnejus</i> |
| 3 | -Zebra blue | <i>Syntarucus plinius</i> |
| 4 | -Joker | <i>Byblia ilithyia</i> |
| 5 | -Common crow | <i>Euploea core</i> |
| 6 | -Common gram yellow | |
| 7 | Cricket | |
| 8 | Ground beetle | |
| 9 | Lady bird beetle | <i>Coccinellidae</i> |
| 10 | Dung beetle | <i>Scarabidae</i> |
| 11 | Bombardier beetle | |
| 12 | Assassin bugs | <i>Reduviidae</i> |
| 13 | Leaf hopper | <i>Cicadellidae</i> |
| 14 | Ear Wings | |
| 15 | Ants (3 types) | |
| 16 | blow fly | <i>Calliphoridae</i> |
| 17 | Skelet solitary wasp | |
| 18 | Bundle bee | |
| 19 | Honey bee | <i>Apis</i> |
| 20 | Dragon fly (4 types) | <i>Anisoptera</i> |
| 21 | Dalsal fly (4 types) | |
| 22 | Hunting wasp | |
| 23 | Praying mantis | <i>Mantodea</i> |
| 24 | Long horned grasshopper | <i>Tettigoniidae</i> |
| 25 | Short horned grasshopper | <i>Acrididae</i> |
| 26 | Mole Cricket | <i>Gryllotalpidae</i> |
| 27 | Forest Cockroach | |
| 28 | House fly | |
| 29 | Hawk moth | |
| | Small Invertebrates | |
| 30 | Snail | |
| 31 | Flat Wheel molluse | |
| 32 | Slug | |
| 33 | Centipede | <i>Chilopoda</i> |
| 34 | Prawns | <i>Penaeus monodon</i> |

(2.3) LIST OF REPTILES IDENTIFIED WADHWANA WETLAND

| Sr. No. | Name | Scientific Name |
|---------|------------------------------|------------------------------|
| 1 | Cobra | <i>Naja oxiana</i> |
| 2 | Russell's Viper | <i>Vipera russelli</i> |
| 3 | saw scaled Viper | <i>Echis carinata</i> |
| 4 | Rat snake | <i>Ptyas mucosus</i> |
| 5 | Red sand Boa | <i>Ptyas mucosus</i> |
| 6 | Checkered Kell back Sand Boa | <i>Xenochrophis piscator</i> |
| 7 | Russell's Sand Boa. | <i>Eryx johnii</i> |

(2.4) Fishes

| Sr. No. | Local Name | Zoological Name | Family |
|---------|------------|--------------------------------|------------|
| 1 | Rohu/ Rohi | <i>Labio rohita</i> | Cyprinidea |
| 2 | Katala | <i>Catla catla</i> | |
| 3 | Mringal | <i>Cirrhinus cirrhosus</i> | Cirrhinus |
| 4 | Grass carp | <i>Ctenopharyngodon idella</i> | Cyprindae |
| 5 | Zinga | <i>Micro rosenburgy</i> | |
| 6 | NA | <i>Wallago attu</i> | |
| 7 | NA | <i>Mystus shingala</i> | |

Annexure : 3

WILDLIFE CIRCLE, VADODARA

Wadhavana Wetland Ta.Dabhoi, Dist.Vadodara

Statement showing birds visited at Wetland

| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
|----------|---|-------------------|--------|------|----------|
| 1 | 2 | 3 | 9 | 10 | 11 |
| A | GREBES | | | | |
| 1 | Great Crested Grebe (Podiceps Cristatus) | મોટી ચોટીલી ડૂબકી | RM | IV | |
| 2 | Black-necked Grebe (Podiceps nigricollis) | શિયાળુ નાની ડૂબકી | M | IV | |
| 3 | Little Grebe (Podiceps ruficollis) | નાની ડૂબકી | R | IV | |
| 4 | Red Necked Grebes | શિયાળુ મોટી ડુબકી | M | IV | |
| 5 | Unidentified grebes | | O | | |
| B | PELICANS | | | | |
| 6 | White or Rosy Pelican (Pelecanus onocrotalus) | ગુલાબી પેણ | RM | IV | |
| 7 | Spot-billed Pelican (P. p Philippensis) | ટીલીયાળી ચાચ પેણ | M | IV | |
| 8 | Dalmatian Pelican (Pelecanus p. crispus) | રૂપેરી પેણ | M | IV | |
| 9 | Unidentified pelicans | વણ ઓળખાયેલ પેણ | | | |
| C | CORMORANTS & DARTERS | | | | |
| 10 | Large Cormorant (Phalacrocorax carbo) | મોટી કાજીયો | R | IV | |
| 11 | Indian Shag (Phalacrocorax fuscicollis) | વચેટ કાજીયો | R | IV | |
| 12 | Little Cormorant (Phalacrocorax niger) | નાનો કાજીયો | R | IV | |
| 13 | Darter (Anhinga rufa) | સર્પ ગ્રીવ | R | IV | |
| 14 | Unidentified cormorants | વણ ઓળખાયેલ કાજીયા | O | | |
| D | HERONS & EGRETS | | | | |
| 15 | Grey Heron (Ardea cinerea) | કબુત બગલો | R | | |

| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
|----------|--|-----------------|--------|------|----------|
| 1 | 2 | 3 | 9 | 10 | 11 |
| 16 | Purple Heron (<i>Ardea purpurea</i>) | નડી બગલો | R | | |
| 17 | Little Heron (<i>Butorides striatus</i>) | લીલી બગલી | R | | |
| 18 | Pond Heron (<i>Ardeola grayii</i>) | કાણી બગલી | R | | |
| 19 | Cattle Egret (<i>Bubulcus ibis</i>) | ઢોર બગલો | R | IV | |
| 20 | Large Egret (<i>Ardea alba</i>) | મોટો ધોળો બગલો | R | IV | |
| 21 | Smaller Egret (<i>Egretta intermedia</i>) | વચેટ ધોળો બગલો | R | IV | |
| 22 | Little Egret (<i>Egretta grazetta</i>) | નાનો ધોળો બગલો | R | IV | |
| 23 | Reef Egret (<i>Egretta gularis</i>) | દરિયાઈ બગલો | R | | |
| 24 | Black-crowned Night Heron (<i>Nycticorax nycticorax</i>) | રાત બગલો | R | | |
| 25 | Little Bittern (<i>Ixobrychus minutus</i>) | નાની પાન બગલી | | | |
| 26 | Chestnut Bittern (<i>Ixobrychus cinnamomeus</i>) | સુરંગી પાન બગલી | | | |
| 27 | Yellow Bittern (<i>Ixobrychus sinensis</i>) | પીળી પાન બગલી | R | IV | |
| 28 | Black Bittern (<i>Ixobrychus flavicollis</i>) | કાળી પાન બગલી | | IV | |
| 29 | Bittern (<i>Botaurus stellaris</i>) | પાન બગલી | | IV | |
| 30 | Unidentified herons and egrets | વણ ઓળખાયેલ | | | |
| 31 | Unidentified cormorants | બગલા બગલીઓ | O | | |
| E | STORKS | | | | |
| 32 | Painted Stork (<i>Mycteria leucocephala</i>) | પીળી ચાંચ ઢોક | R | IV | |
| 33 | Openbill Stork (<i>Anastomus oscitans</i>) | ફાટી ચાંચ ઢોક | R | IV | |
| 34 | Whitenecked Stork (<i>Ciconia episcopus</i>) | ધોળી ડોક ઢોક | R | IV | |
| 35 | White stork (<i>Ciconia ciconia ciconia</i>) | સફેદ ઢોક | M | IV | |
| 36 | Black Stork (<i>Ciconia nigra</i>) | કાળો ઢોક | M | IV | |
| 37 | Black-necked Stork (<i>Ephippiorhynchus asiaticus</i>) | કાળો કંઠ ઢોક | R | IV | NT |
| 38 | Greater Adjutant stork | મોટો જમાદાર | | | |

| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
|----------|--|-----------------|--------|------|----------|
| 1 | 2 | 3 | 9 | 10 | 11 |
| 39 | Unidentified stroks | વણ ઓળખાયેલ ઢોક | | | |
| F | IBISES & SPOONBILLS | | | | |
| 40 | White Ibis (Threskiornis aethiopica) | સફેદ કાંકણસાર | RM | IV | NT |
| 41 | Indian Black Ibis (Pseudibis papillosa) | કાળી કાંકણસાર | R | IV | |
| 42 | Glossy ibis (Plegadis falcinellus) | નાની કાંકણસાર | RM | IV | |
| 43 | Spoonbill (Plectalea leucorodia) | ચમચો | RM | IV | |
| G | FLAMINGOS | | | | |
| 44 | Greater Flamingo (Phoenicopterus roseus) | મોટો હંજ | RM | IV | |
| 45 | Lesser Flamingo (Phoenicopterus minor) (RM) | નાનો હંજ | RM | IV | NT |
| 46 | Unidentified falmingos | વણ ઓળખાયેલ હંજ | | | |
| H | GEESE & DUCKS | | | | |
| 47 | Greylag Goose (Anser anser) | ગાજ હંસ | M | IV | |
| 48 | Barheaded Goose (Anser indicus) | રાજ હંસ | M | IV | |
| 49 | Lesser Whistling Teal (Dendrocygna javanica) | નાની સિસોટી બતક | R | IV | |
| 50 | Ruddy Shelduck (Tadoma ferruginea) | ભગવી સુરખાબ | M | | |
| 51 | Common Shelduck (Tadorna tadirba) | સફેદ સુરખાબ | M | | |
| 52 | Northern Pintail (Anas falcata) | સિંગપર | M | | NT |
| 53 | Common Teal (Anas crecca) | નાની મુરઘાબી | M | IV | |
| 54 | Spot-billed Duck (Anas poecilorhyncha) | ટીલીયાળી બતક | R | IV | |
| 55 | Red Crested Pohard | લાલ ચાચ કારચીયા | M | | |
| 56 | Mallard (Anas platyrhynchos) | નીલ શીર | M | | |
| 57 | Gadwall (Anas strepera) | લુહાર | M | | |
| 58 | Eurasian Wigeon (Anas penelope) | પિયાસણ | M | | |
| 59 | Garganey Teal (Anas querquedula) | ચેતવા | M | | |
| 60 | Northern Shoveller (Anas clypeata) | ગચણો | M | | |

| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
|----------|---|------------------|--------|------|----------|
| 1 | 2 | 3 | 9 | 10 | 11 |
| 61 | Common Pochard (Aythya ferina) | રાખોડી કારચિયા | M | | |
| 62 | Ferruginous Pohard / White-eyed Pochard (Aythya nyroca) | ધોળી આંખ કારચિયા | M | | NT |
| 63 | Tufted Duck (Aythya fuligula) | કાબરી કારચિયા | M | IV | |
| 64 | Cotton-Pygmy goose (Nettapus coromandelianus) | ગિરજા | R | IV | |
| 65 | Comb Duck (Sarkidiornis melanotus) | નકટો | R | IV | |
| 66 | Unidentified ducks | વણ ઓળખાયેલ બતક | O | | |
| 67 | Unidentified geese | વણ ઓળખાયેલ હંસ | | | |
| I | EAGLES, VULTURES & HARRIERS | | | | |
| 68 | Greater Spotted Eagle (Aquila clanga) | મોટો કાળો સુમ્મસ | R | | V |
| 69 | Palla's Fishing Eagle (Haliaeetus leucoryphus) | મત્સ્ય ગરૂડ | O | | V |
| 70 | Grey-headed Fish Eagle (Ichthyophaga ichthyaetus) | રાખોડી શિર ગરૂડ | O | | |
| 71 | Peregrine Falcon (F.P. Calidus) | મોસમી સાહિન | M | I | |
| 72 | Black Kite | સમડી | R | | |
| 73 | Shikra | શકરો | R | I | |
| 74 | Tawny Eagle | દેશી સુમ્મસ | R | | |
| 75 | Red necked falcon | તરૂમ્મતી | R | I | |
| 76 | Short - toed snake eagle | સાપમાર | R | | |
| 77 | Longbilled Vulture (Gyps indicus) | ગીરનારી ગીધ | R | I | |
| 78 | White-rumped Vulture (Gyps bengalensis) | ગીધ | R | I | |
| 79 | Pallid Harrier (Circus macrourus) | ઉજળી પટ્ટાઈ | M | | NT |
| 80 | Montagu's Harrier (Circus pygargus) | પટ્ટી પટ્ટાઈ | M | | |
| 81 | Marsh Harrier (Circus aeruginosus) | પાન પટ્ટાઈ | M | | |

| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
|----------|--|------------------------|--------|------|----------|
| 1 | 2 | 3 | 9 | 10 | 11 |
| 82 | Osprey (Pandion haliaetus) | મત્સ્ય ભોજ | M | I | |
| 83 | Steppe Eagle | પરદેશી ઝુમસ | R | | |
| 84 | Crested Serpant Eagle | ચોટલીયો સાપમાર | R | | |
| 85 | Unidentified bird of Prey (Shikra size) | | | | |
| 86 | Unidentified bird of Prey (Kite size) | | | | |
| J | CRANES | | | | |
| 87 | Common Crane (Grus grus) | કુંજ | M | IV | |
| 88 | Sarus Crane (G.rus antigone) | સારસ | R | IV | V |
| 89 | Demoiselle Crane (Anthropoides virgo) | કરકરો | M | IV | |
| 90 | Unidentified cranes | વણ ઓળખાયેલ કુંજ | | | |
| K | RAILS, CRAKES, GALLINULES & COOTS | | | | |
| 91 | Water Rail (Rallus aquaticus) | | | IV | |
| 92 | Bluebreasted Banded Rail (Rallus striatus) | | | | |
| 93 | Eastern Baillon's Crake (Porzana pusilla) | પૂર્વીય નાની સંતાકુકડી | | | |
| 94 | Spotted Crake (Porzana porzana) | ટપકીલી સંતાકુકડી | M | | |
| 95 | Brown Crake (Amauornis akool) | તપખીરી સંતાકુકડી | R | | |
| 96 | Whitebreasted Waterhen (Amauornis phoenicurus) | સફેદ છાતી સંતાકુકડી | R | | |
| 97 | Watercock (Gallicrex cinerea) | જલ મુરઘો | R | | |
| 98 | Common Moorhen (Gallinula chloropus) | જલ મુરઘી | RM | | |
| 99 | Purple Swamphen (Porphyrio porphyrio) | નીલ જલ મુરઘો | R | | |
| 100 | Coot (Fulica atra) | આડ/ભગતડુ | RM | IV | |
| L | | | | | |
| 101 | Pheasant-tailed Jacana (Hydrophasinus | શ્વેત પાંખ જલમાંજર | R | IV | |

| | chirurgus) | | | | |
|----------|---|-----------------------|--------|------|----------|
| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Category |
| 1 | 2 | 3 | 9 | 10 | 11 |
| 102 | Bronze-winged Jacana (Metopidius indicus) | કાળો જલમાંજર | R | IV | |
| M | WADERS | | | | |
| 103 | White-tailed Lapwing (Vanellus leucurus) | સફેદ પુંછ ટીટોડી | M | | |
| 104 | Red-wattled Lapwing (Vanellus indicus) | ટીટોડી | R | | |
| 105 | Yellow-wattled Lapwing (Vanellus malabaricus) | વગડોઉ ટીટોટી | R | | |
| 106 | Ruff & Reeve (Philomachus pugnax) | ટીલીયો | M | | |
| 107 | Golden Plover (Pluvialis dominica) | સોનીરી બાટણ | M | IV | |
| 108 | Unidentified | | O | | |
| 109 | Large Sand Plover (Charadrius leschenaultii) | માટી ઢોંગીલી | M | IV | |
| 110 | Little Ringed Plover (Charadrius dubius) | કાઠલાવાળી નાનીઢોંગીલી | RM | IV | |
| 111 | Kentish Plover (Chararius alexandrinus) | ભુલામણી ઢોંગીલી | RM | IV | |
| 112 | Lesser Sand Plover (Charadrius mongolus) | નાની ઢોંગીલી | M | IV | |
| 113 | Whimbrel (Numenius phaeopus) | નાની ખલેલી | M | | |
| 114 | Eurasian Curlew (Numenius arquata) | ખલીલી | M | IV | NT |
| 115 | Blacktailed Godwit (Limosa limosa) | મોટો ગડેરો | M | | NT |
| 116 | Bartailed Godwit (Limosa lapponica) | નાનો ગડેરો | M | | |
| 117 | Spotted Redshank (Tringa erythropus) | કોળો રાતા પગ | M | | |
| 118 | Common Redshank (Tringa totanus) | રાતા પગ | M | | |
| 119 | Marsh Sandpiper (Tringa stagnatilis) | નાનો લીલા પગ | M | IV | |
| 120 | Green shank (Tringa nebularia) | લીલા પગ | M | | |
| 121 | Green Sandpiper (Tringa ochropus) | સફેદ પુંછ તુતવારી | O | IV | |
| 122 | Spotted Sandpiper (Tringa glareola) | | M | | |
| 123 | Terek Sandpiper (Tringa terek) | દરિયાઈ તુતવારી | O | IV | |

| | | | | | |
|----------------|--|------------------------------------|---------------|-------------|-----------------|
| 124 | Wood Sandpiper | ટપકીલી તુતવારી | M | IV | |
| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
| 1 | 2 | 3 | 9 | 10 | 11 |
| 125 | Common Sandpiper (<i>Tringa hypoleucos</i>) | નાની તુતવારી | M | IV | |
| 126 | Tumstone (<i>Arenaria interpres</i>) | કાચબરંગી | M | | |
| 127 | Pintail Snipe (<i>Gallinago stenura</i>) | સળી પુંછ ગારખોદ | M | IV | |
| 128 | Common or Fantail Snipe (<i>Gallinago gallinago</i>) | પંખાપુંછ ગારખોદ | M | IV | |
| 129 | Jack Snipe (<i>Gallinago minima</i>) | નાની ગારખોદ | M | IV | |
| 130 | Wood cock (<i>Scolopax rusticola</i>) | | | | |
| 131 | Sanderling (<i>Calidris alba</i>) | | | | |
| 132 | Little Stint (<i>Calidris minuta</i>) | કાળા પગ કિચડીઓ | M | | |
| 133 | Temminck's Stint (<i>Calidris temminckii</i>) | ઉજળા પગ કિચડીઓ | M | | |
| 134 | Dunlin (<i>Calidris alpina</i>) | કાળા પેટ કિચડીઓ | M | | |
| 135 | Curlew Sandpiper (<i>Calidris testacea</i>) | શ્વેત પીઠ કિચડીઓ | M | IV | |
| 136 | Broadbilled Sandpiper (<i>Limicola falcinellus</i>) | જાડી ચાચ તુતવારી/ વેતનેણ કિચડીઓ | | IV | |
| 137 | Painted Snipe (<i>Rostratula benghalensis</i>) | રૂપાળું ગારખોદ/ પાનલવા | R | | |
| 138 | Blackwinged Stilt (<i>Himantopus himantopus</i>) | ગજપાંઉ | R | IV | |
| 139 | Avocet (<i>Recurvirostra avoserta</i>) | ઉલટી ચાંચ | | | |
| 140 | Little Pratincole (<i>G. lactea</i>) | નાનુ તેજપર | R | | |
| 141 | Oriental Penticole | બદામી તેજપર | RM | | |
| O | GULLS, TERNS & SKIMMERS | | | | |
| 142 | Herring Gull (<i>Larus argentatus</i>) | નાનો ધોમડો | RM | | |
| 143 | Lesser Black-backed Gull (<i>Larus fuscus</i>) | કાળી પીઠ ધોમડો | | | |
| 144 | Palla's Gull | મોટો ધોમડો | M | | |
| 145 | Brown-headed Gull (<i>Larus brunnicephalus</i>) | લડાખી ધોમડો | M | | |
| 146 | Black headed Gull (<i>Larus ridibundus</i>) | શ્યામ શિર ધોમડો | M | | |

| | | | | | |
|----------------|--|------------------------|---------------|-------------|-----------------|
| 147 | Slenderbilled Gull (<i>Larus genei</i>) | વાધોમડી | M | | |
| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
| 1 | 2 | 3 | 9 | 10 | 11 |
| 148 | Little Gull (<i>Larus minutus</i>) | નાની ધોમડો | RM | | Rare |
| 149 | Whiskered Tern (<i>Chlidonias hybrida</i>) | કાશ્મીરી વા બગલી | M | | |
| 150 | Little Tern (<i>S. albifronos</i>) | નાની વા બગલી | R | | |
| 151 | White winged Black tern (<i>Chlidonias leucopterus</i>) | શ્વેત પંખ કાળી વા બગલી | O | | |
| 152 | Gull-billed Tern (<i>Gelchelidon nilotica</i>) | ધોળી વા બગલી | M | | |
| 153 | Gaspran Tern (<i>Hydroprogne caspia</i>) | મોટી વા બગલી | RM | | |
| 154 | Indian River Tern (<i>Sterna aurantia</i>) | કેચી પુંછ વા બગલી | R | | |
| 155 | Common Tern (<i>Sterna hirundo</i>) | લડાખી વા બગલી | M | | |
| 156 | Blackbellied Tern (<i>Sterna acuticauda</i>) | કાળા પેટ વા બગલી | R | | |
| 157 | Marsh Sandpiper (<i>Tringa stagnatilis</i>) | નાનો લીલાપગ | M | IV | |
| 158 | Unidentified gulls | વણ ઓળખાયેલ ધોમડા | O | | |
| 159 | Unidentified terns | વણ ઓળખાયેલ વા બગલી | O | | |
| P | KING FISHERS | | | | |
| 160 | Indian Pied Kingfisher (<i>Ceryle rudis leucomelanura</i>) | કાબરો કલકલીયો | R | IV | |
| 161 | Small Blue kingfisher (<i>Alcedo atthis pallasii</i>) | નાનો વાદળી કલકલીયો | R | IV | |
| 162 | Storkbilled Kingfisher (<i>Pelargopsis capensis</i>) | ઢોંક ચાંચ કલકલીયો | R | IV | |
| 163 | White Brested Kingfisher (<i>Halcyon smymensis</i>) | સફેદ છાતી કલકલીયો | R | IV | |
| Q | SWALLOWS, WARBLERS, PIPITS & WAGTAILS | | | | |
| 164 | Barn Swallow | શિયાળુ તારોળીયુ | M | | |
| 165 | Eastern Swallow (<i>Hirundo rustica</i>) | | | | |
| 166 | Wiretailed Swallow (<i>Hirundo smithii filifera</i>) | લાંબી પુંછ તારોળીયુ | R | | |
| 167 | Indian Cliff Swallow (<i>Hirundo fulvicola</i>) | | | | |

| 168 | Unidentified swallow | | | | |
|----------------|--|--------------------|---------------|-------------|-----------------|
| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
| 1 | 2 | 3 | 9 | 10 | 11 |
| 169 | Streaked Fantail Warbler (Cisticola juncidis) | | | | |
| 170 | Clamorous Reed Warbler (Acrocephalus stentoreus) | મોટો પાન કરકરીયો | | | |
| 171 | Eurasian Great Reed Warbler (A. arundinaceus) | | | | |
| 172 | Blyth's Reed Warbler (Acrocephalus dumetorum) | નાનો પાન કરકરીયો | | | |
| 173 | Paddyfield Warbler (Acrocephalus agricola) | ડાંગર કરકરીયો | | | |
| 174 | Pipit (Anthus sp.) | | O | | |
| 175 | Grey Wagtail (Motacilla caspica) | વન પીળકીયો | M | | |
| 176 | Yellow headed Wagtail (Motacilla flava) | પીત શિર પીળકીયો | M | | |
| 177 | Yellow wagtail | રાખોડી શિર પીળકીયો | M | | |
| 178 | Forest wagtail | વન દિવાળી ઘોડો | M | | |
| 179 | Citrine wagtail | પીત શિર પીળકીયો | M | | |
| 180 | Larged Pied Wegtail | | O | | |
| 181 | White Wagtail (Motacilla alba) | દિવાળી ઘોડો | M | | |
| 182 | Unidentified Wegtail | | O | | |
| R | OTHERS | | | | |
| 183 | Unidentified bird of Prey | | O | | |
| 184 | Unidentified Plover | | O | | |
| 185 | Unidentified shore birds | | O | | |
| 186 | Red Avadavat | લાલ મુનીયા | R | IV | |
| 187 | Unidentified Warbeers | | O | | |
| 188 | Malbar Trogon | સુહાગણ | R | IV | |
| 189 | Tree pipit | ખેતરધાન ચીડી | M | | |

| 190 | Common Hoopee | ઘંટી ટાંકણો | RM | | |
|----------------|---|-------------------|---------------|-------------|-----------------|
| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
| 1 | 2 | 3 | 9 | 10 | 11 |
| 191 | Purple Sunbird | શકકરખોરો | R | | |
| 192 | Baya Weaver | સુગરી | R | | |
| 193 | Common Myna | કાબર | R | IV | |
| 194 | Singing bush lark | અગનચંદુલ | R | IV | |
| 195 | Black headed Munia | શ્યામશિર ટપુશીયુ | R | IV | |
| 196 | Painted francolin | તલીયોતેતર | R | IV | |
| 197 | Black drongo | કાળીયો કોશી | R | IV | |
| 198 | Gray Francolin | તેતર | R | | |
| 199 | Orange headed thrush | નારંગી કસ્તૂરો | R | IV | |
| 200 | Bay backed shrike | પચનક લટોરો | R | | |
| 201 | Indian bush lark | અગિયો ચંડુલ | R | IV | |
| 202 | Crested lark | મોટો ચંડુલ | R | IV | |
| 203 | Stone Curlew | | R | | |
| 204 | Rose ringed parakeet | પોપટ/ સુડો | R | IV | |
| 205 | Plum headed parakeet | તુઈ | R | IV | |
| 206 | Alexandrine parakeet | રાજપીપળાનો પોપટ | R | IV | |
| 207 | Jungle Babbler | વનલેલુ | R | IV | |
| 208 | Brown headed barbet | મોટો લીલો કંસારો | R | IV | |
| 209 | Indian Roller (Coracias benghalensis) | ચાષ | R | IV | NT |
| 210 | Rufous Treepie | ખેર ખટ્ટો | R | IV | |
| 211 | Oriental Magpie Robin | દૈપડ | R | | |
| 212 | White browed fentail | નાચણ/ પંખો | R | | |
| 213 | Sykes's Night Jar | રણ દશરથીયું | O | IV | |

| | | | | | |
|----------------|---|--------------------|---------------|-------------|-----------------|
| 214 | White naped wood pecker | લકકડખોદ | O | IV | |
| Sr. No. | Name of Bird / Group and Species | Local Name | Status | WLPA | Catagory |
| 1 | 2 | 3 | 9 | 10 | 11 |
| 215 | Red headed Bunting | લાલ માથાનો ગંદમ | O | | |
| 216 | Jungle Owlet | ચીબરી | O | IV | |
| 217 | Rock Pigeon | કબુતર | O | IV | |
| 218 | White earned Bulbul | શુગ બુલબુલ | O | IV | |
| 219 | Copper smith Barbet | કંસારો | O | IV | |
| 220 | Greater Coucal | હુકો | O | IV | |
| 221 | Spotted Dove | હોલો | O | IV | |
| 222 | Common Kingfisher | પતરંગો | O | IV | |
| 223 | Rafous treepie | ખેરખટ્ટો | O | IV | |
| 224 | Asian Koel | કોયલ | O | IV | |
| 225 | House Crow | કાગડા | O | IV | |
| 226 | Green Pigeon | હરીયલ | O | IV | |
| 227 | | વાગોળ | O | IV | |
| 228 | | પીપક | O | IV | |
| 229 | | કપાસી | O | IV | |
| 230 | | ઢૈલા | O | IV | |
| 231 | | લાવરી | O | IV | |
| 232 | | ચકવો | O | IV | |
| 233 | Unidentified Sandpiper | વણ ઓળખાયેલ તુતવારી | | | |
| 234 | Bay backed shrike (Zoothera citrina) | પનચક લટોરી | | | |
| 235 | Tree pipit (Anthus Trivialis) | ખેતર ધાન ચિડી | | | |
| 236 | Unidentified Others | | | | |

Annexure : 4

Financial Statement for the Period of 2014-15 to 2018-19

Wildlife Circle, Vadodara

Name of Wetland :- Wadhvana Wetland

| Sr. No | Item of Works | Year | | | | | | | | | |
|----------|---|---|---|---|--|---|--|---|--|---|---|
| | | 2014-15 | | 2015-16 | | 2016-17 | | 2017-18 | | 2018-19 | |
| | | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| C | Protection and Monitoring | | | | | | | | | | |
| | Patrolling and Surveillance | 300 ha | 2.40 | 300 ha | 2.70 | 300 ha | 3.00 | 300 ha | 3.30 | 300 ha | 3.60 |
| | Socio-economic development through community participation | | | | | | | | | | |
| 1 | Maintanance and repairs of observation center/watch towers. | 3 | 3.00 | 3 | 0.75 | 3 | 0.75 | 3 | 1.00 | 3 | 1.00 |
| 2 | Watch and ward & Camps Maintainance (Filling, Cleaning and weeding) | 350 ha | 3.00 | 350 ha | 3.50 | 350 ha | 4.00 | 350 ha | 4.50 | 350 ha | 5.00 |
| | | 350 ha | 3.00 | 350 ha | 3.50 | 350 ha | 4.00 | 350 ha | 4.50 | 350 ha | 5.00 |
| | | | 6.00 | | 7.00 | | 8.00 | | 9.00 | | 10.00 |
| 3 | Other Equipment for protection major | 5 Motor cycle 10 Binoculars | 4.00 1.00 5.00 | 1 Motor cycle 2 Binoculars | 1.00 0.20 1.20 | 1 Motor cycle 2 Binoculars | 1.00 0.20 1.20 | 1 Motor cycle 2 Binoculars | 1.00 0.20 1.20 | 1 Motor cycle 2 Binoculars | 1.00 0.20 1.20 |
| 4 | Socio Economic activities in nearby villages (3 villages) Provision of 1-Hand Pump and 1 mandap unit with vessels | 2 HP Machine 1 mandap Road reparing Checkdam | 1.20 0.80 1.00 3.00 6.00 | 2 HP Machine 1 mandap Road reparing | 1.00 0.80 1.00 2.80 | 2 HP Machine 1 mandap Road reparing | 1.00 0.80 1.00 2.80 | 2 HP Machine 1 mandap Road reparing | - 0.80 1.00 1.80 | 2 HP Machine 1 mandap Road reparing | - |

| Sr. No | Item of Works | Year | | | | | | | | | |
|----------|--|--|---|--|---|--|---|--|---|--|---|
| | | 2014-15 | | 2015-16 | | 2016-17 | | 2017-18 | | 2018-19 | |
| | | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 5 | Motor vehicle driving training | 50 Individuals. | 2.50 | 50 Individuals. | 5.00 | 50 Individuals | 5.00 | 50 Individuals. | 5.00 | 50 Individuals. | 5.00 |
| 6 | Medical camps | 3 camps 1/ Village | 0.90 | 5 camps | 2.00 | 5 camps | 2.00 | 5 camps | 2.00 | 5 camps | 2.00 |
| 7 | Cattle health camps | 3 camps | 0.75 | 5 camps | 1.50 | 5 camps | 1.50 | 5 camps | 1.50 | 5 camps | 1.50 |
| 8 | Development and Maintenance of tourist facilities | Garden Maintenance-1 Play unit-1 | 1.00 1.50 2.50 | Garden Maintenance-1 Play unit-1 | 1.50 2.50 4.00 | Garden Maintenance-1 Play unit-1 | 1.75 2.75 4.50 | Garden Maintenance-1 Play unit-1 | 2.00 3.00 5.00 | Garden Maintenance-1 Play unit-1 | 2.50 3.50 6.00 |
| 9 | Training local youths as tourist guides | 20 | 3.00 | 20 | 4.00 | 20 | 5.00 | 20 | 6.00 | 20 | 6.00 |
| | Formation of advisory committees for mid-term reviews | 0 | 0.20 | 0 | 0.30 | 0 | 0.40 | 0 | 0.50 | 0 | 0.60 |
| | Sub Total | | 32.25 | | 31.25 | | 34.15 | | 36.30 | | 36.90 |
| D | Restoration Measures | | | | | | | | | | |
| | Rehabilitation of Rare, Endangered and Threatened (RET) species | | | | | | | | | | |
| 1 | Removal of Ipomea and other weeds | 50 ha. | 7.50 | 50 ha. | 10.00 | 50 ha. | 10.00 | 50 ha. | 10.00 | 50 ha. | 10.00 |
| 2 | Tree planting & tending Operation & Maintainance | 2500 plant | 2.50 | 2500 plant | 2.50 | 2500 plant | 2.50 | 2500 plant | 4.00 | 2500 plant | 4.00 |
| 3 | Perching stands | 20 Stand | 1.00 | 30 Stand | 1.80 | 40 Stand | 2.80 | 50 Stand | 4.00 | 60 Stand | 5.40 |
| 4 | MOUND making | 3 mounds | 5.00 | 5 mounds | 10.00 | 6 mounds | 13.50 | 7 mounds | 17.50 | 7 mounds | 18.00 |
| | Sub Total | | 16.00 | | 24.30 | | 28.80 | | 35.50 | | 37.40 |

| Sr. No | Item of Works | Year | | | | | | | | | |
|----------|--|-------------------------|---|-------------------------|---|-------------------------|---|-------------------------|---|-------------------------|---|
| | | 2014-15 | | 2015-16 | | 2016-17 | | 2017-18 | | 2018-19 | |
| | | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| G | Biodiversity Conservation | | | | | | | | | | |
| .. | Conservation of sensitive species through in situ and ex-situ methods | | | | | | | | | | |
| 1 | Details study of biodiversity of wetland | 1 | 2.00 | - | - | - | - | - | - | - | - |
| 2 | Collection of baseline date | | 1.00 | - | - | - | - | - | - | - | - |
| 3 | Monitoring of Biota (Study from M.S. University, Vadodara) | | | | | | | | | | |
| 4 | Targeted research on keytone spp. | | | | | | | | | | |
| 5 | Introduction of plants & fish-seeds to improve food availability for birds | 1000 Nos. 2000 Plant | 2.60 <u>0.40</u> 3.00 | 1000 Nos. 2000 Plant | 3.00 <u>0.50</u> 3.50 | 1000 Nos. 2000 Plant | 3.25 <u>0.75</u> 4.00 | 1000 Nos. 2000 Plant | 3.50 <u>1.00</u> 4.50 | 1000 Nos. 2000 Plant | 3.75 <u>1.25</u> 5.00 |
| . | Identification of RET species and Endemic and Vulnerable (E and V) species | 0 | 0 | - | - | - | - | - | - | - | - |
| | Sub Total | | 6.00 | | 3.5 | | 4 | | 4.5 | | 5 |
| H | Sustainable Resource Development | | | | | | | | | | |
| . | Assessment of Current resource utilization and its impacts | LS | 0.50 | LS | 0.75 | LS | 1.00 | LS | 1.25 | LS | 1.50 |

| Sr. No | Item of Works | Year | | | | | | | | | |
|----------|--|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| | | 2014-15 | | 2015-16 | | 2016-17 | | 2017-18 | | 2018-19 | |
| | | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| . | Enhancement of sustainable wetland resources for communities | LS | 0.50 | LS | 0.75 | LS | 1.00 | LS | 1.25 | LS | 1.50 |
| . | Studies on carrying capacity of Wetlands | LS | 0.50 | LS | 0.75 | LS | 1.00 | LS | 1.25 | LS | 1.50 |
| | Sub Total | | 1.50 | | 2.25 | | 3.00 | | 3.75 | | 4.50 |
| K | Supplementary / Alternate Livelihoods | | | | | | | | | | |
| ∴ | Involment of local people in decision-making on alternate/supplementary livelihoods | | | | | | | | | | |
| 1 | Formation of village wetland committee | 3 | - | 3 | 0.75 | - | - | 3 | 0.75 | - | - |
| . | Encouraging various activities like piggery, animal husbandry duckery, small cottage industry, mushroom cultivation, tailoring and carpet weaving to reduce pressure on Wetlands for livelihood options. | 4 Units | 1.00 | 5 Units | 1.50 | 6 Units | 2.00 | 6 Units | 2.50 | 6 Units | 3.00 |
| | Sub Total | | 1.00 | | 2.25 | | 2.00 | | 3.25 | | 3.00 |

| Sr. No | Item of Works | Year | | | | | | | | | |
|--------|---|--|--|--|--|--|---|------------------------------|--|---|---|
| | | 2014-15 | | 2015-16 | | 2016-17 | | 2017-18 | | 2018-19 | |
| | | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| L | Environmental Education and Awareness | | | | | | | | | | |
| . | Launching various environmental awareness campaigns | LS | 1.00 | LS | 1.50 | LS | 2.00 | LS | 2.50 | LS | 3.00 |
| . | Organizing various programmes, work shops, folk dances, street theatre for creating environmental awareness | LS | 1.00 | LS | 1.50 | LS | 2.00 | LS | 2.50 | LS | 3.00 |
| . | Using both formal and non-formal education tools for awareness generation. | LS | 1.00 | LS | 1.50 | LS | 2.00 | LS | 2.50 | LS | 3.00 |
| .. | Creation of environmental awarens through brochers, training programmes, padayatras and hoardings. | | | | | | | | | | |
| 1 | Maintenance & upgradation of interpretation centre | Models-25 Pict.Tiles-100 Sound Sys-1 Bird Paintings | 2.00 1.00 1.00 <u>1.00</u> 5.00 | Models-25 Pict.Tiles-100 Sound Sys-1 Bird Paintings | 2.00 1.00 1.00 <u>1.00</u> 5.00 | Models-25 Sound Sys-1 Bird Paintings | 2.00 1.00 <u>2.00</u> 5.00 | Sound Sys1 Bird Paintings | 1.00 <u>2.00</u> 3.00 | Models-25 Pict.Tiles-100 Bird Paintings | 2.00 1.00 <u>2.50</u> 5.50 |
| 2 | Nature education camps | 20 camps | 3.00 | 25 camps | 5.00 | 30 camps | 6.00 | 30 camps | 6.00 | 30 camps | 6.00 |

| Sr. No | Item of Works | Year | | | | | | | | | |
|--------|---|---|------------------------------|---|------------------------------|---|------------------------------|---|------------------------------|---|------------------------------|
| | | 2014-15 | | 2015-16 | | 2016-17 | | 2017-18 | | 2018-19 | |
| | | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 3 | Training of staff and wetland committee. | 5 15 20 | 3.00 | LS | 3.00 | LS | 3.00 | LS | 3.00 | LS | 3.00 |
| 4 | Signboards, hoardings and other literature and advertisement material | No.40 Size 4*3 No.20 Size 5*4 No.80 Size 2*3 | 1.00 1.00 2.00 4.00 | No.40 Size 4*3 No.20 Size 5*4 No.80 Size 2*3 | 1.25 1.25 2.25 4.75 | No.40 Size 4*3 No.20 Size 5*4 No.80 Size 2*3 | 1.50 1.50 2.50 5.50 | No.40 Size 4*3 No.20 Size 5*4 No.80 Size 2*3 | 2.00 2.00 3.00 7.00 | No.40 Size 4*3 No.20 Size 5*4 No.80 Size 2*3 | 2.50 2.50 4.00 9.00 |
| 5 | Administration, expences, training & awareness for wetland committee. | 7 | 1.50 | 7 | 2.00 | 7 | 2.25 | 7 | 2.50 | 7 | 3.00 |
| . | Developning varoius publicity materials on wetlands | LS | 1.50 | LS | 2.00 | LS | 2.50 | LS | 3.00 | LS | 3.50 |
| . | Use of Media | LS | 1.50 | LS | 1.50 | LS | 2.00 | LS | 2.00 | LS | 2.00 |
| | Sub Total | | 22.50 | | 27.75 | | 32.25 | | 34.00 | | 41.00 |

| Sr. No | Item of Works | Year | | | | | | | | | | |
|--------|---|---------|-------|---------|-------|---------|--------|---------|--------|---------|--------|--|
| | | 2014-15 | | 2015-16 | | 2016-17 | | 2017-18 | | 2018-19 | | |
| | | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | Phy. | Fin. | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| M | impact Assessment through concurrent and Terminal Evaluation | | | | | | | | | | | |
| | Preparation of baseline data for parameters like extent of silt, quantum of biomass, quality of water, groundwater level, change in biodiversity. | LS | 0.50 | LS | 1.00 | LS | 1.50 | LS | 2.00 | LS | 2.50 | |
| | Evaluation of Programmes through independent agencies/consortia of agencies. | LS | 0.50 | LS | 1.00 | LS | 1.50 | LS | 2.00 | LS | 2.50 | |
| | Sub Total | | 1.00 | 0 | 1.00 | 0 | 1.50 | 0 | 2.00 | 0 | 2.50 | |
| | Grand Total | | 80.25 | | 88.80 | | 101.70 | | 114.80 | | 125.30 | |

