



BEFORE THE NATIONAL GREEN TRIBUNAL
WESTERN ZONE BENCH, PUNE
Original Application No. 91 of 2019 (WZ)

IN THE MATTER OF:

Pohra Bachav Samiti

.....Appellant

Versus

Amravati Municipal Corporation & Ors.

.....Respondents

**COMPLIANCE AFFIDAVIT OF THE ORDER DATED 29.08.2023
PASSED BY THIS TRIBUNAL**

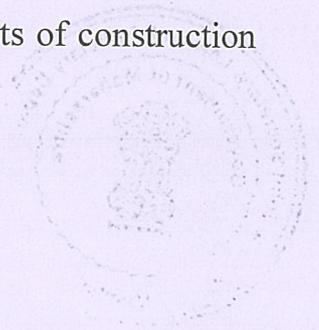
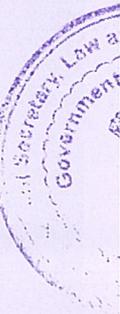
I, Abhay Madhukar Pimparkar, aged about 47 years, Occupation Service, Director, Environment and Climate Change Department and Member Secretary, State Wetland Authority, Government of Maharashtra of the respondent No.2 above named, having my office address at 15th Floor, New Administrative Building, Mantralaya, Mumbai 400 032, do hereby beg to state on solemnly affirm as under:



2

1. That I am in the above noted capacity and as per records available in the department, I am fully conversant with the facts and circumstances of the case, hence competent to swear this compliance affidavit on behalf of the answering respondent.
2. That I have gone through and understood the contents of the O.A. and order dated 29.08.2023 passed by this Hon'ble Tribunal.
3. That in compliance of the order dated 29.08.2023 the respondent No.2 Wetland Authority hereby submits as follows:
 - I. The Hon'ble NGT vide order dated on 29/03/2023 directed to constitute a joint Committee comprising the Wetland Authority of the State of Maharashtra, The Collector, Amravati and The Deputy Conservator of Forest, Amravati. In consonance with the directions issued by Hon'ble NGT, Joint Committee has been constituted. I further say and submit that, the said committee has done site visit on 12.07.2023. Site visit report of the Joint Committee is attached herewith as **Annexure – I**.
 - II. I say and submit that, Hon'ble National Green Tribunal has permitted Maharashtra State Wetland Authority to take technical assistance from institutes like NEERI/IIT. Accordingly, Maharashtra State Wetland Authority has appointed NEERI to assess the impacts of construction

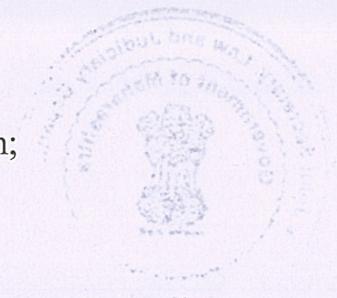
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activity on ecology/eco-system of Chatri Talao, Amravati and to suggest corrective/ remedial measures. I further submit that, NEERI has submitted the said proposal to Maharashtra State Wetland Authority which is attached herewith as **Annexure -II**.

III. I say and submit that, the preparation of brief document for each of the wetland identified for notification, following data collection is required as per para 7(1) of the Wetlands (Conservation and Management) Rules 2017:

- a) demarcation of wetland boundary supported by accurate digital maps with coordinates and validated by ground truthing;
- b) demarcation of its zone of influence and land use and land cover thereof indicated in a digital map;
- c) ecological character description;
- d) account of pre-existing rights and privileges;
- e) list of site-specific activities to be permitted within the wetland and its zone of influence;
- f) list of site specific activities to be regulated within the wetland and its zone of influence; and
- g) modalities for enforcement of regulation;



2

After compilation of above data, the brief document for each of the wetland can be prepared.

I further say and submit that, Maharashtra State Wetland Authority has appointed National Centre for Sustainable Coastal Management, Chennai for preparation of Wetland maps and Brief Document along with assessment of Tourism Potential of Wetlands for the State of Maharashtra on 19/10/2023. The contract Agreement is attached herewith as **Annexure – III**. I also submit that, Wetland maps and Brief Document as submitted by National Centre for Sustainable Coastal Management, Chennai will be submitted before Maharashtra State Wetland Authority and appropriate measures will be taken to prepare brief document of Chatri Talao, Amravati on priority.

4. Hence this submission.

Place: Mumbai.

Date: 20/11/2023.



[Abhay Madhukar Pimparkar]

Deponent

Director, Environment & CC and
Member Secretary, State Wetland Authority



VERIFICATION:

I, Abhay Madhukar Pimparkar, aged about 47 years, Occupation Service, Director, Environment and Climate Change Department and Member Secretary, State Wetland Authority, Government of Maharashtra of the respondent No.2 above named having my office address at 15th Floor, New Administrative Building, Mantralaya, Mumbai - 400 032 do hereby verify and say that the contents of my above affidavit are true and correct to my knowledge, no part of it is false and nothing material has been concealed there from. The legal submissions are further true as per legal advice received and believed to be true and correct.

Verified at Mumbai on this 20th day of November, 2023

Place: Mumbai
Date: 20/11/2023.



[Abhay Madhukar Pimparkar]
Deponent
Director, Environment & CC and
Member Secretary, State Wetland Authority

Identify by me



(Chandrakant Vibhute)
Scientist Grade – 1 & Deputy Secretary,
Environment & CC GoM.

SOLEMNLY AFFIRMED

BEFORE ME BY DEPONENT

SHRI A. M. Pimparkar.

WHO IS IDENTIFIED

BY SHRI C. A. Vibhute.



Joint Secretary
Government of Maharashtra
Law and Judiciary Department
Mantralaya, Mumbai 400 032



Site visit report by the Committee constituted as per Hon'ble National Green Tribunal, directions vide order dated 29/03/2023 in the matter of Original Application No. 91/2019 (Western Zone) (Pohra Bachav Samiti Vs. Amravati Municipal Corporation & Ors.)

1 The Applicant (Pohra Bachav Samiti Vs. Amravati Municipal Corporation & Ors.) filed an Original Application No. 91/2019 in Hon'ble National Green Tribunal, Western Zone, Bench Pune against Violation of Wetlands (Conservation and Management) Rules, 2017 for protecting the Chhatri Tank, Amravati District.

2 The Hon'ble National Green Tribunal vide order dated on 29/03/2023 directed to constitute a Committee in this case comprising one member of each of :-

- I) The Wetland Authority of State of Maharashtra.
- II) The Collector, Amravati and
- III) The Deputy Conservator of Forest Amravati.

3 The committee is directed to assess the impact on Ecology/Ecosystem by the construction activity, which is being carried out on Chatri Talao and suggest corrective/remediation measures.

4 As per the directions of Hon'ble National Green Tribunal, the committee was constituted vide circular dated 29/03/2023 and same is informed to Hon'ble National Green Tribunal vide affidavit dated 03/05/2023.

5 The Wetland authority of State of Maharashtra humbly submitted in Hon'ble National Green Tribunal that, the committee formed does not have technical expertise to assess the impact on Ecology/Ecosystem by the construction activity which is being carried out on Chatri Tank. Therefore, it is requested to appoint technical institutions like National Environmental Engineering Research institute (NEERI) / Indian Institute of Technology (IIT) for the same. Considering request from the Wetland Authority of State of Maharashtra Hon'ble National Green Tribunal permitted to take assistance of the institute like NEERI or IIT. After obtaining permission from Hon'ble National Green Tribunal the Wetland Authority of State of Maharashtra received proposal from NEERI, The Wetland authority of State of Maharashtra accepted NEERI proposal regarding "assessment of impacts of construction activity on ecology/eco-system of Chatri Talao, Amravati and to suggest corrective/ remedial measure"



Site visit :-

The site visit of the committee was scheduled on 12.7.2023 at 10 am. The Committee members along with the representative of applicants and NEERI were present for the site visit. The list of Members /Officials /Representatives of applicants were present for the site visit is attached as Annexure-I.

The Member Secretary State Wetland Authority briefed all member about Hon'ble National Green Tribunal order and purpose of site visit. The Member Secretary State Wetland Authority also informed Collector Amravati that as per National Wetland Atlas (Wetland rules, 2010), there are 292 nos of Wetlands are marked in the Amravati District. But while uploading the information on mobile app prepared for Wetlands it was uploaded as NIL. The District Collector shall relook in to the same and correct the earlier information submitted in mobile app. Collector Amravati also agreed to the same.

During site visit representative of applicants stated that the Chatri Talao is surrounded by forest area from three sides. Due to the construction activity carried out by Amravati Municipal Corporation, the natural habitat of the animals of water body is disturbed. Representative also stated that the Amravati Municipal Corporation had constructed shops/ Galas for food courts for the visitors this may lead to littering of solid waste and may hamper the environmental quality around the Talao. They suggested to shift all the food courts at the entrance of the garden. They further stated that natural habitat of Chatri Talao needs to be maintained.

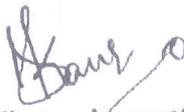
After site visit the meeting was held at Collector Office Amravati under the Chairmanship of Collector, Amravati. Collector, Amravati requested DCF Amravati to submit report to the NEERI regarding impact of construction activity on wild animal habitat. Collector, Amravati also requested Commissioner Municipal Corporation, Amravati to mark the high flood level/low flood level of Chatri Talao from last ten years through Irrigation Department and submit report to the NEERI. Collector Amravati further requested NEERI to submit required information and prepare report as directed by the State Wetland Authority. Collector, Amravati directed representative of NEERI to submit their report at the end of July, 2023.

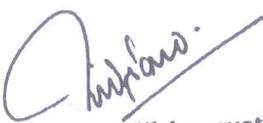
DCF, Amravati informed that, they will furnish all required information to the NEERI. Commissioner, Amravati Municipal Corporation

also confirmed that they will also furnish all information regarding Chatri Talao to the NEERI.

Representative of NEERI submitted that they will visit the site as and when required to prepare and submit, the report to the State Wetland Authority as per direction received from State Wetland Authority.

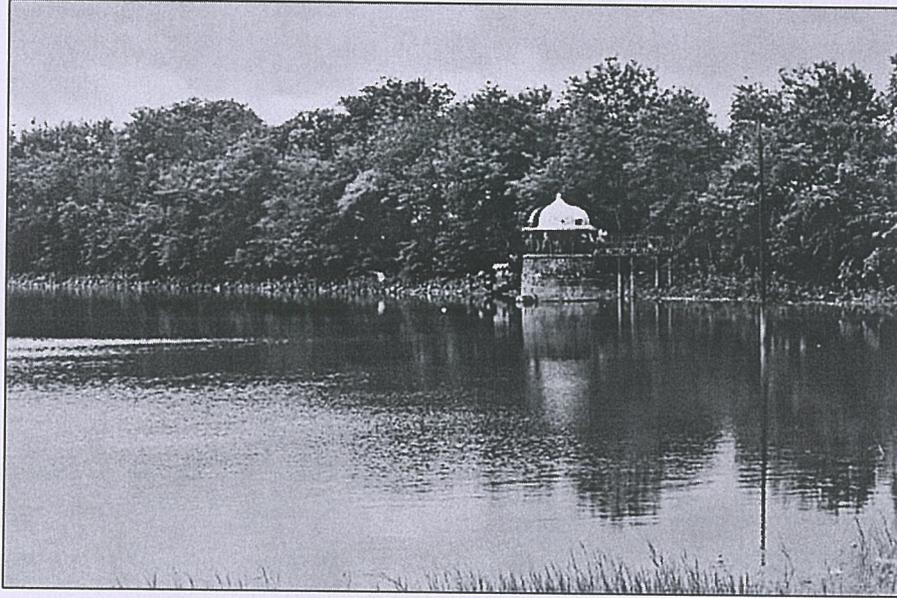
The Meeting is ended with the vote of thanks.


Collector Amravati.


DCF Amravati


Member Secretary & Director
State Wetland Authority

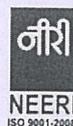
“Impact Assessment Report”
On the impact of construction activity on Ecology of Chatri
Talao, Amravati, Maharashtra



Submitted to
High Power Committee
Constituted by Hon'ble National Green Tribunal
(OA No.91/2019, dated 29 March 2023)

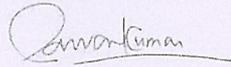
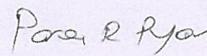
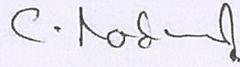


CSIR-National Environmental Engineering Research
Institute, Nehru Marg, Nagpur – 440 020



August 2023

Team of Experts from CSIR-NEERI

Sr. No	Name	Signature
1	Dr. Pawan Kumar Labhassetwar (Water Resources Expert)	
2	Dr. Paras R Pujari (Hydro-geological Expert)	
3	Dr. G K Khadse (Water quality Expert)	
4	Dr. Shalini Dhyani (Ecological Expert)	
5	Dr. C. Padmakar (Hydro-geological Expert)	

Contents

<i>Chapter 1 Introduction</i>	1
1.1 Background	1
1.2 Objectives of the study	2
1.3 Planning and methodology of the study	2
1.4 Report layout	2
<i>Chapter 2 Study Area</i>	3
2.1 Location.....	3
2.2 Topography	3
2.3 Drainage pattern	4
2.4 Soil Type	4
2.5 Climate	4
2.6 Geology	4
2.7 Hydrogeology.....	5
2.8 Natural Vegetation.....	5
<i>Chapter 3 Site visits</i>	6
<i>Chapter 4 Observations and Findings</i>	9
4.1 Hydrogeology	9
4.2 Drainage and surface run off.....	10
4.3 Change in Land use land cover	11
4.4 Water Quality	14
4.5 Ecology and Biodiversity	15
<i>Chapter 5 Recommendations</i>	20
<i>References</i>	22
<i>Annexures</i>	24

List of Tables

Table 1.1 Details of site visits undertaken by the CSIR-NEERI team.....	2
Table 4.1 Ground water level in observation wells near Chatri Talao.....	9
Table 4.2 Details of sampling locations at Chatri Talao, Amravati.....	14
Table 4.3 Water quality parameters analysed for Chatri Talao	14
Table 4.4 Birds reported from Chatri Talao belonging to different schedule categories of WPA, 1972 and IUCN Red List of species.....	17
Table 4.5 Schedule status and IUCN red list status of animal images captured in camera traps.....	19

List of Figures

Figure 2.1 Location map of the study area.....	3
Figure 2.2 Digital Elevation Model of the study area.....	4
Figure 2.3 Reserve Forest boundaries of Amravati Forest Division around the Chatri Talao.....	5
Figure 4.1 Landuse/Landcover (LULC) Classification of 5km buffer area around Chatri Talao (2003).....	12
Figure 4.2 Landuse/Landcover (LULC) Classification of 5km buffer area around Chatri Talao (2013).....	12
Figure 4.3 Landuse/Landcover (LULC) Classification of 5km buffer area around Chatri Talao (2023).....	13
Figure 4.4 Landuse/Landcover (LULC) Comparison chart.....	13

List of Plates

Plate 1.1 Chatri Talao and its consructed pavements.....	1
Plate 3.1 CSIR-NEERI team visit to Amravati Municipal Corporation (AMC) on 20.07.23.....	7
Plate 3.2 Site visit carried out by the CSIR-NEERI team, along with the officials of Amravati Municipal Corporation and Amravati Forest Division authorities on 20.7.23.....	7
Plate 3.3 Water sampling by the CSIR –NEERI team on 20.7.23	7
Plate 3.4 Overview of vegetation, biodiversity and construction at Chatri Talao	8
Plate 4.1 Measurement of water level in mark-II hand pumps	9
Plate 4.2 Third order stream (feeder stream) at the entrance of the biodiversity Park which feeds the Chatri Talao	10
Plate 4.3 Intervention measures for diverting the storm water	11
Plate 4.4 Common birds observed in Chatri Talao by the CSIR-NEERI team.....	16
Plate 4.5 Camera trap results from the camera trap fixed closed to Chatri Talao.....	19

List of Annexure

Annexure I	Communication from Government of Maharashtra.....	24
Annexure II	Proposal submitted to Maharashtra Government.....	26
Annexure III	Maharashtra Government communication on Sanction of proposal.....	27
Annexure IV	Water samples Physico-chemical Parameters.....	28
Annexure V	Water samples Heavy Metals.....	29
Annexure VI	Water samples Phytoplankton.....	29
Annexure VII	Distribution Pattern of Phytoplankton.....	30
Annexure VIII	Phytoplankton <i>Hemiauleussinesis</i> and various phytoplankton observed.....	30
Annexure IX	Water samples Zooplankton.....	31
Annexure X	Various Zooplanktons observed in the samples.....	31
Annexure XI	Bacteriological Parameters.....	32
Annexure XII	List of Avifaunal.....	32
Annexure XIII	Reported cases of Leopard attacks.....	34
Annexure XIV	Camera Trap Information.....	36

1.1 Background

The Chatri Talao, a man-made reservoir is situated on the south-eastern part of the Amravati district of Maharashtra (Plate 1.1). Chatri Talao was constructed in the year 1888. The Talao served as the source for providing drinking water to the Amravati City. Chatri Talao was marked as wetland in the Wetland Atlas for Maharashtra (Wetland Code number 16959) as per Wetland Rules, 2010. Apart from providing the drinking water requirements of the city, it serves as a preferred recreational site for people living in the city and adjoining areas. However, with the provision of supply of water from the Upper Wardha Dam to the city, the water supply from the Chatri Talao was discontinued since 1993. The Talao is being maintained by the Amravati Municipal Corporation (AMC). The AMC planned the development of the site to boost the tourism. As part of the developmental activities, concrete pavement was constructed on the periphery of the Talao facing the Reserve Forest area along with a jungle gym, playing areas, open air theatre and structures of toilets and restaurants (Plate 1.1).



Plate 1.1 Chatri Talao and its constructed pavements

These construction activities were challenged by many individuals from the city in the Honourable National Green Tribunal (NGT). The Honourable NGT (Pune Bench) in its order (OA No: 91 of 2019 (WZ)) dated 22.5.2023 permitted the respondent (Respondent 2: Maharashtra State Wetland Authority) to seek the expertise of CSIR-NEERI in the matter of assessing the impacts on the ecology and ecosystem due to the construction of the pavement at Chatri Talao in Amravati. On the basis of the communication from Government of Maharashtra (Annexure-I), proposal was submitted to State Government of Maharashtra

(Annexure II). The proposal was sanctioned for assessing the “Impact of construction activity on Ecology of Chatri Talao, Amravati, Maharashtra” (Annexure III).

Accordingly, CSIR-NEERI has undertaken the study under the following objectives.

1.2 Objectives of the study

- To study the impacts on the ecology due to developmental activities e.g. construction of the pavement
- To study the impacts on the storm water runoff due to developmental activities e.g. construction of the pavement

1.3 Planning and methodology of the study

Keeping in view the directives of the Honourable NGT to address the issue, the study is based on primary data collection during the site visits (04 nos.) (Table 1.1) and secondary data collected from different Government departments of Government of Maharashtra.

Table 1.1 Details of site visits undertaken by the CSIR-NEERI team

Visit	Date
First Visit	12.7.2023
Second Visit	20.7.2023 and 21.07.2023
Third Visit	03.08.2023
Fourth Visit	17.8. 2023 and 18.8.2023

During the field visit CSIR-NEERI team assessed following concerns:

- a. Impact of pavement construction on local ecology and existing biodiversity
- b. Interception of the existing drainage pattern by the construction of pavement
- c. Storm water management provision at the site due to construction of the pavement
- d. Groundwater level in wells close to the Talao
- e. Water quality of the Talao and nearby ground water sources

1.4 Report layout

Chapter 2: Discusses the study area

Chapter 3: Details the tasks during the field visits

Chapter 4: Documents the results & findings

Chapter 5: Delineates the recommendations

2.1 Location

The watershed of Chatri Talao is located between latitude of $20^{\circ} 52' 32.53''$ to $20^{\circ} 54' 30.55''$ N and longitude of $77^{\circ} 45' 46.52''$ to $77^{\circ} 48' 23.62''$ E in Amravati Taluka of Amravati district in Maharashtra, India (Figure 2.1). The Talao covers an area of 0.55 km^2 . It is covered by Survey of India Toposheet 55H/13 (1:50,000 scale) and is approximately 300 m from the Main road (NH-53) connecting Amravati to Badnera.

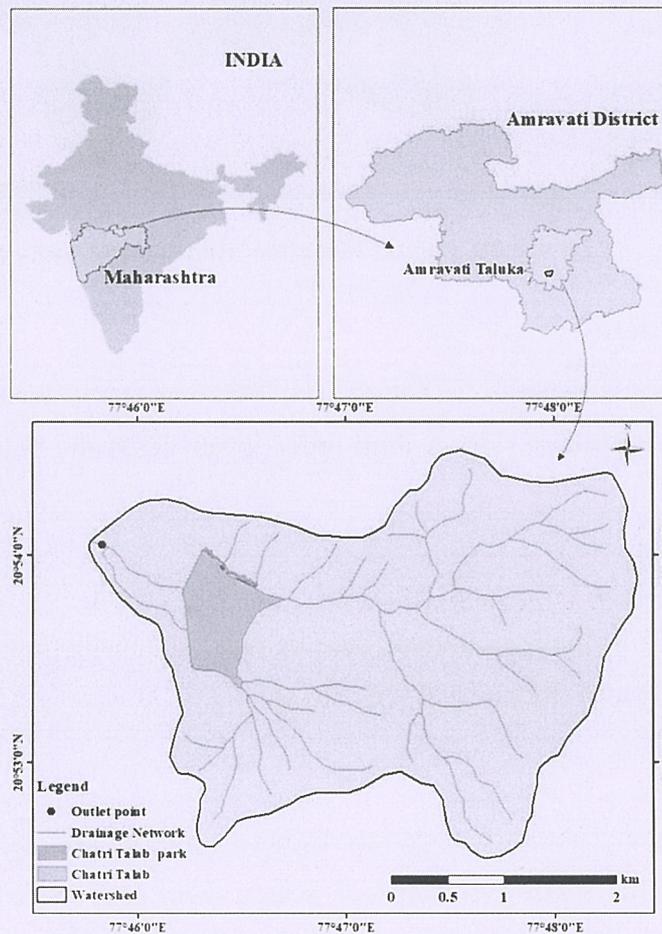


Figure 2.1 Location map of the study area

2.2 Topography

The topography map (Figure 2.2) is developed from 30m resolution SRTM DEM (earthexplorer.usgs.gov/). The Drainage pattern of the watershed is dendritic in nature. The study area (sub watershed) surrounding the Talao is in the elevation range of 353 to 473 m amsl (Above Mean Sea Level-AMSL). The Talao is at an approximate elevation of 365m

amsl.

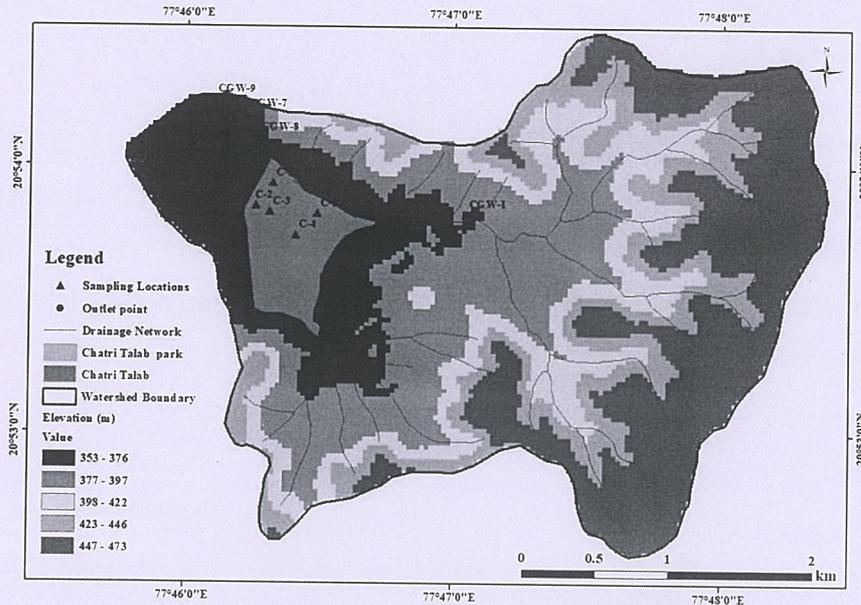


Figure 2.2 Digital Elevation Model of the study area

2.3 Drainage pattern

The drainage pattern is dendritic in nature. The Talao has many feeder streams from the eastern side and the northern side. A third order stream feeds the Talao on the north-east corner.

2.4 Soil Type

The soil is derived from the Deccan trap (Basaltic rock) and medium to deep black soil was observed in the study area (Regur) (CGWB, 2013).

2.5 Climate

The climate of the study area is characterized by hot summer and dry climate throughout the year except during the south-west monsoon season from June to September. The mean minimum and maximum temperatures vary between 15.1°C and 42.2°C, respectively. The average annual rainfall varies from 700 mm to 1700 mm (CGWB, 2013).

2.6 Geology

The regional geology is mostly characterized by basaltic rocks, along with alluvium, lameta beds, Gondwana Sediments, and unclassified metamorphic rocks. The study area falls under the Deccan Trap, whereas soft rock area consists of alluvium deposits (CGWB 2013).

2.7 Hydrogeology

The geological basement of the study areas is deposited by the basaltic flow of Deccan trap volcanism. Joints, fractures, and vesicular texture create a secondary porosity that plays an important role in the movement, occurrence, and storage of water in the porous medium. Weathered and vesicular basalt shows a high range of porosity as compared with fractured-jointed basalt. Percolation of rainwater through a set of joints and fractures recharges the aquifer of the study area in the monsoon season. The occurrence of groundwater in the region is also controlled by rainfall, topography, vegetation, drainage, etc. The groundwater stage development in Amravati Taluka is 72.67% and is categorized under the semi-critical category.

2.8 Natural Vegetation

Chatri Talao is in the Wadali range and Jewad beat of Pohra Malkhed Reserve Forest in Amravati Forest Division (Figure. 2.3). Study area has Tropical Dry Deciduous Forest vegetation (5A/C) (Champion and Seth, 1968). Talao has Reserve Forest boundaries on three sides whereas, NH 53 passes through the east side of Chatri Talao (Figure. 2.3).

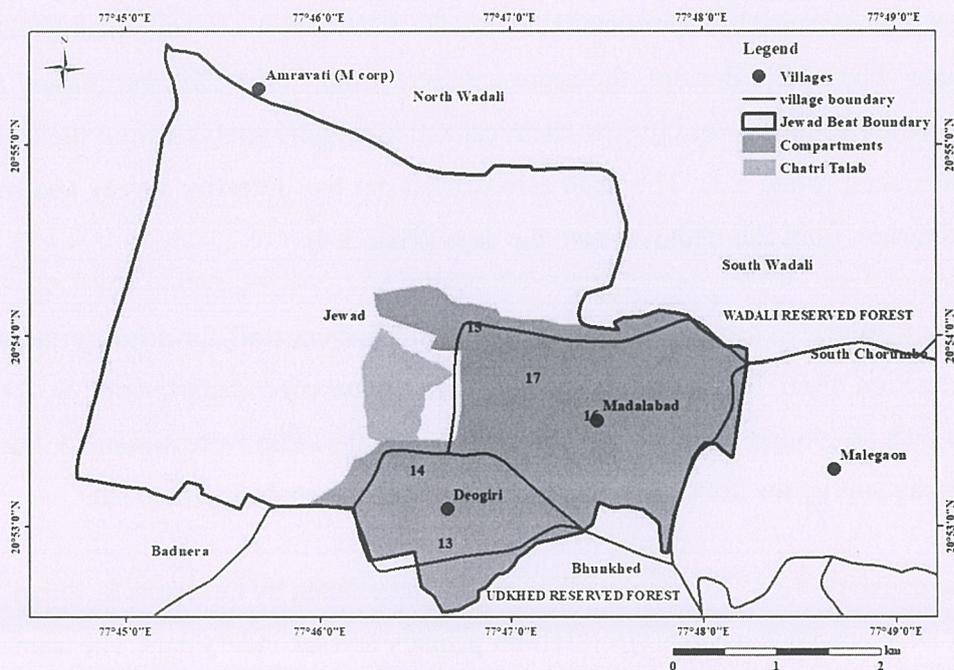


Figure 2.3 Reserve Forest boundaries of Amravati Forest Division around the Chatri Talao

Site visit details undertaken by the CSIR-NEERI team.

1. First reconnaissance visit to the site was undertaken on 12.7.2023 by Dr. G. K. Khadse, and Dr. C. Padmakar. The team had discussions with the officials from District Collector's office, Amravati Municipal Corporation (AMC), Forest Department, and Department of Environment (Government of Maharashtra based in Mumbai), and the petitioner (*Pohra Bachao Samiti*).
2. Second site visit was undertaken by Dr. Paras R. Pujari, Dr. G. K. Khadse and Dr. Shalini Dhyani on 20.7.2023 and 21.07.2023 for primary and secondary data collection. The team had detailed discussions with the officials from the AMC and the District Forest Officer and other officials of Forest Department (Plate 3.1). The history, usage and the current status of the Talao were discussed during these meetings. The CSIR-NEERI team also visited the Amravati Forest Division to understand the area around the Chatri Talao. The CSIR-NEERI team was accompanied by representatives from the AMC and Amravati Forest Division to the study area (Plate 3.2). Besides, the representatives from *Pohra Bacchao Samiti* were also present. Water sampling for physico-chemical and biological analysis from the Chatri Talao was undertaken (Plate 3.3). The team also carried out bio diversity survey and monitoring with a focus on flora and fauna on both the days (Plate 3.4).
3. Third site visit was undertaken by the CSIR-NEERI Project staff for primary and secondary data collection from forest department and other concerned departments on 03.08.2023. Primary data on ground water level in wells closed to the Talao were measured. Ecology and Biodiversity survey for flora and fauna were also undertaken during the visit.
4. Fourth site visit on 17.8. 2023 and 18.8.2023 was undertaken by Dr. Paras R. Pujari, Dr. G.K. Khadse, Dr. C. Padmakar and project staff for primary and secondary data. The team discussed with the officials of AMC regarding the measures taken at the site. Secondary data were collected from the concerned departments. Besides, the team did field checks on the surface water run off management measures at the site. The team also did the field checks on the 1st order streams on the northern side of the Talao.

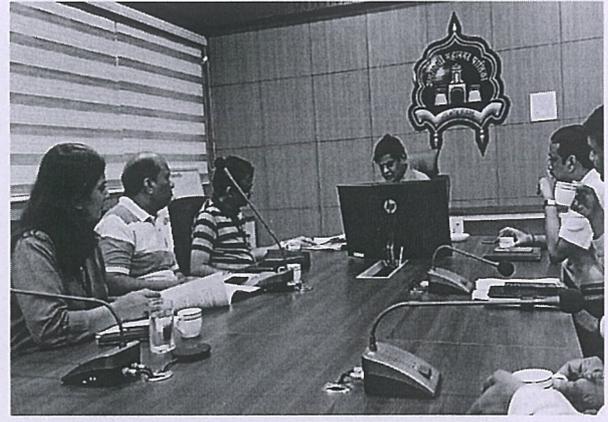
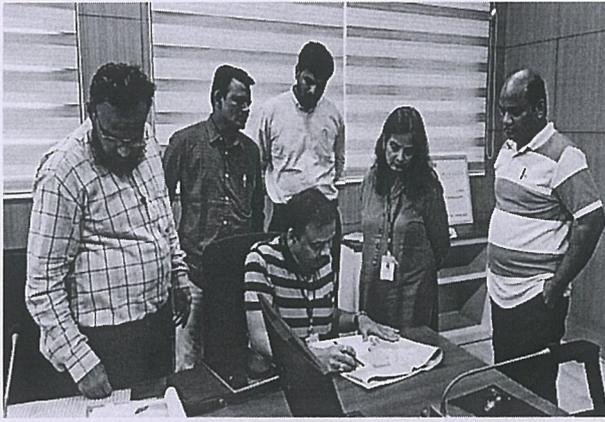


Plate 3.1 CSIR-NEERI team visit to Amravati Municipal Corporation (AMC) on 20.07.23

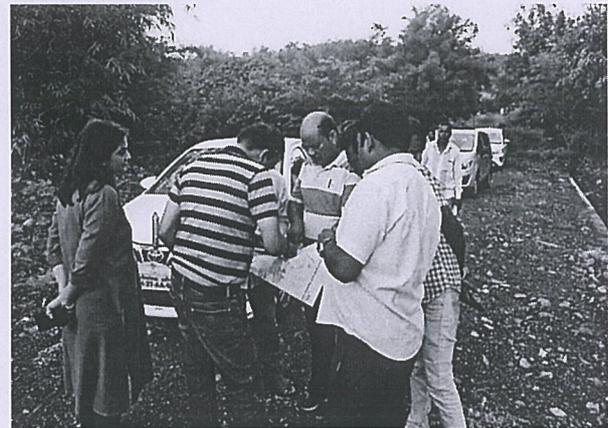


Plate 3.2 Site visit carried out by the CSIR-NEERI team, along with the officials of Amravati Municipal Corporation and Amravati Forest Division authorities on 20.7.23



Plate 3.3 Water sampling by the CSIR –NEERI team on 20.7.23

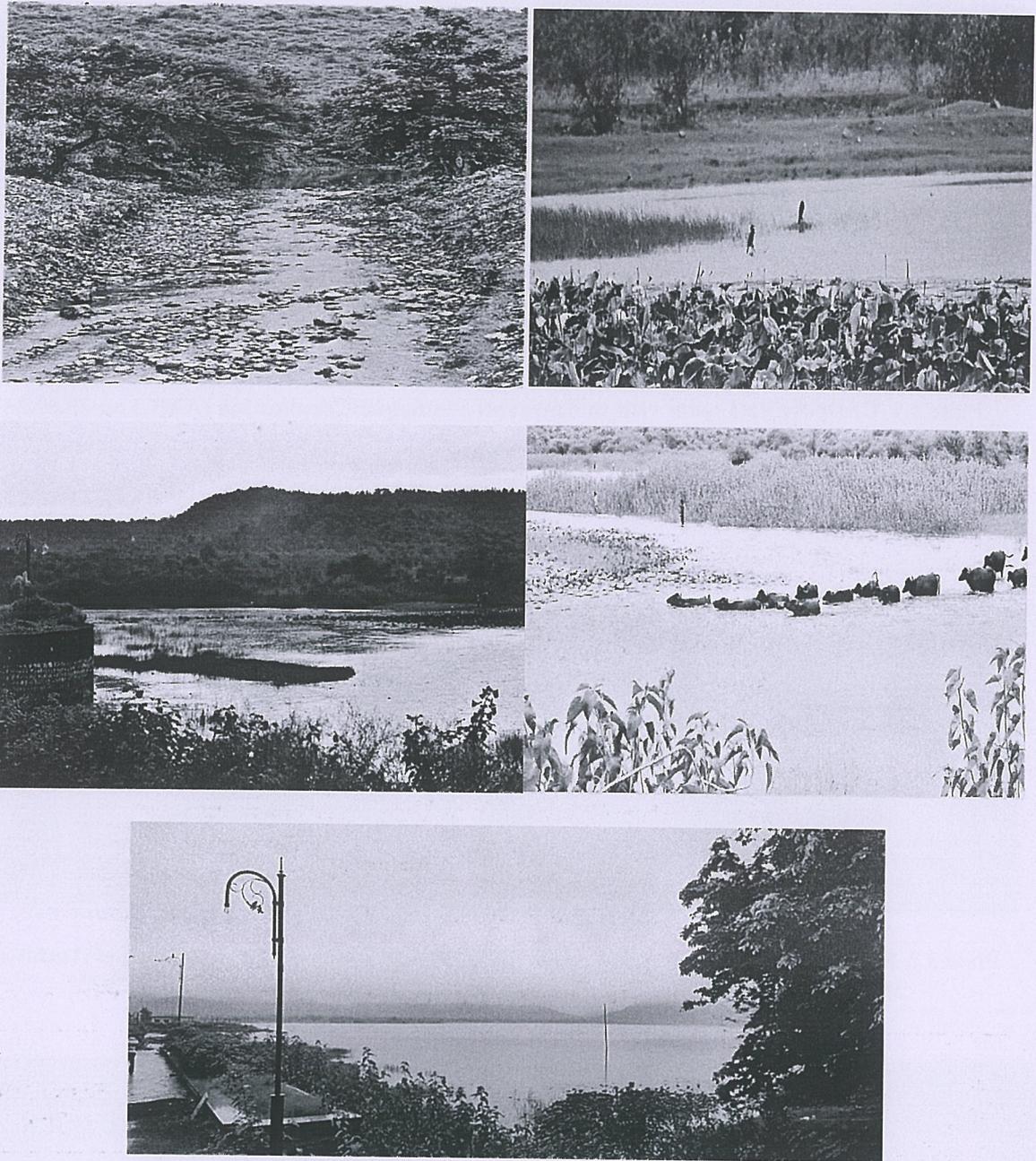


Plate 3.4 Overview of vegetation, biodiversity and construction at Chatri Talao

Chapter 4 Observations and Findings

4.1 Hydrogeology

The groundwater level was measured by Electric Contact Gauge (Make: Encardio Rite Model-EPP-10/6) in the observation wells (09 Nos) during survey period (3rd August 2023) (Plate 4.1) and it was observed that the groundwater level (bgl) varied from 1.28 m to 7.49 m (Table 4.1). The ground water occurs under water table (unconfined) conditions. Overall, the groundwater level is shallow with the water level not exceeding more than 10m (bgl).



Plate 4.1 Measurement of water level in mark-II hand pumps

Table 4.1 Ground water level in observation wells near Chatri Talao

Sr. No.	Code	Location Sample	Latitude	Longitude	Water level (bgl)
1	CGW1	Dugwell opposite to Chatri Talao	20°53'49.27 N	77°47'2.79 E	1.5
2	CGW2	Hand Pump Adjacent to the main road on RHS	20°54'12.12 N	77°46'9.64 E	4.9
3	CGW3	Hand Pump in Dastur Nagar	20°54'5.34 N	77°46'1.32 E	5.54
4	CGW4	Borewell in Ashok Hingne's house, Dastur Nagar	20°54'3.91 N	77°46'0.37 E	2.56
5	CGW5	Dugwell in Ashok Hingne's house, Dastur Nagar	20°54'3.91 N	77°46'0.37 E	2.16
6	CGW6	Hand Pump in LHS of main road before Bypass bridge	20°54'12.64 N	77°46'11.22 E	5.86
7	CGW7	Beside Highway LHS of	20°54'11.73 N	77°46'13.09 E	6.73

		Main Road			
8	CGW8	Adjacent to Chatri Talao compound	20°54'6.37 N	77°46'15.7 E	7.49
9	CGW9	Borewell in the premises of Vinayak Vidya Mandir	20°54'0.95 N	77°46'9.25 E	1.28

4.2 Drainage and surface run off

The drainage of the study area (Figure. 2.2) indicates feeder streams to the Talao. Site visits carried out during the site indicates significant change in the Land use land cover of the area. The third order stream joining the Talao on the north east corner was observed (Plate 4.2).



Plate 4.2 Third order stream (feeder stream) at the entrance of the biodiversity Park which feeds the Chatri Talao

Out of the two streams joining the northern side of the Talao, one stream towards the north-east corner was observed. There is gradient from the Reserve Forest area towards the Talao which indicates the surface run off joining the Talao. The pavement was inspected during the site visit and it was observed that intervention measures have been made at 04 places to divert the run-off from the catchment to the Talao through 600 mm diameter pipes (Plate 4.3). It is also observed that intervention measures have been taken for diverting the storm water at the pavements to the Talao by 200 mm diameter pipes at 04 locations (Plate 4.3)

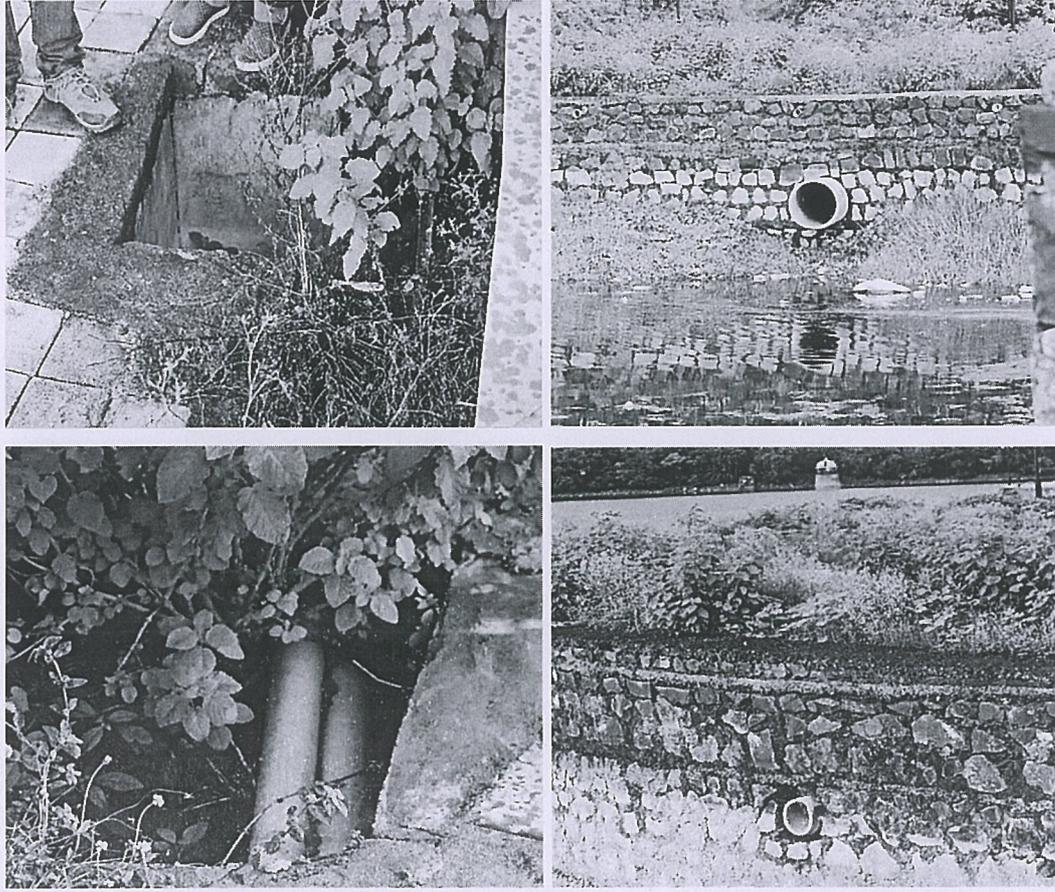


Plate 4.3 Intervention measures for diverting the storm water

4.3 Change in Land use land cover

The LULC classification for year 2003 (Figure 4.1), 2013 (Figure 4.2) and 2023 (Figure 4.3) has been undertaken on the basis of Landsat satellite data. The LULC maps have been generated in ArcGIS 10.8. Landsat-7 data dated 19/05/2003, Landsat-8 data dated 06/05/2013 and Landsat-8 data dated 18/05/2023 have been used for LULC change detection. The change detection (Figure 4.4) indicates that the built up area has increased by 11.77% while, vegetation by 3.21% and forest by 5.66% area have decreased in last 20 years. The Talao area has increased by 0.07% in May 2013 as compared to the area occupied by the Talao in May 2003. It is observed from the recent satellite data of May 2023 that the Talao area has decreased marginally with respect to the 2013 condition however, it is 0.03% more than 2003.

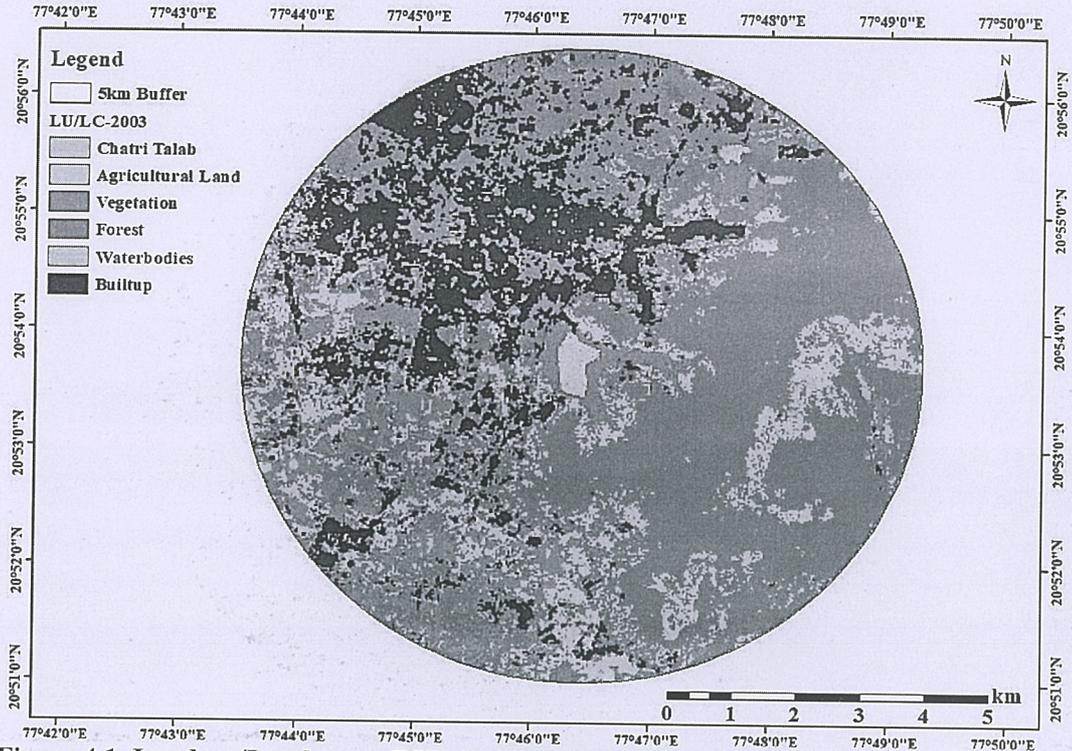


Figure 4.1 Landuse/Landcover (LULC) Classification of 5km buffer area around Chatri Talao (2003)

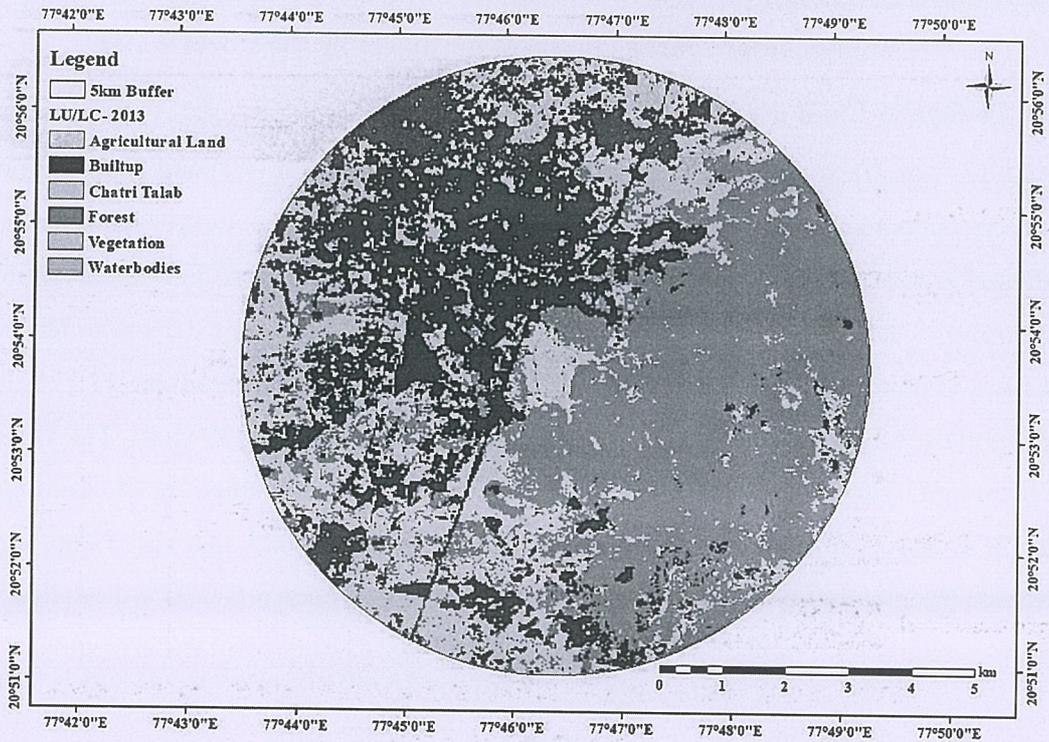


Figure 4.2 Landuse/Landcover (LULC) Classification of 5km buffer area around Chatri Talao (2013)

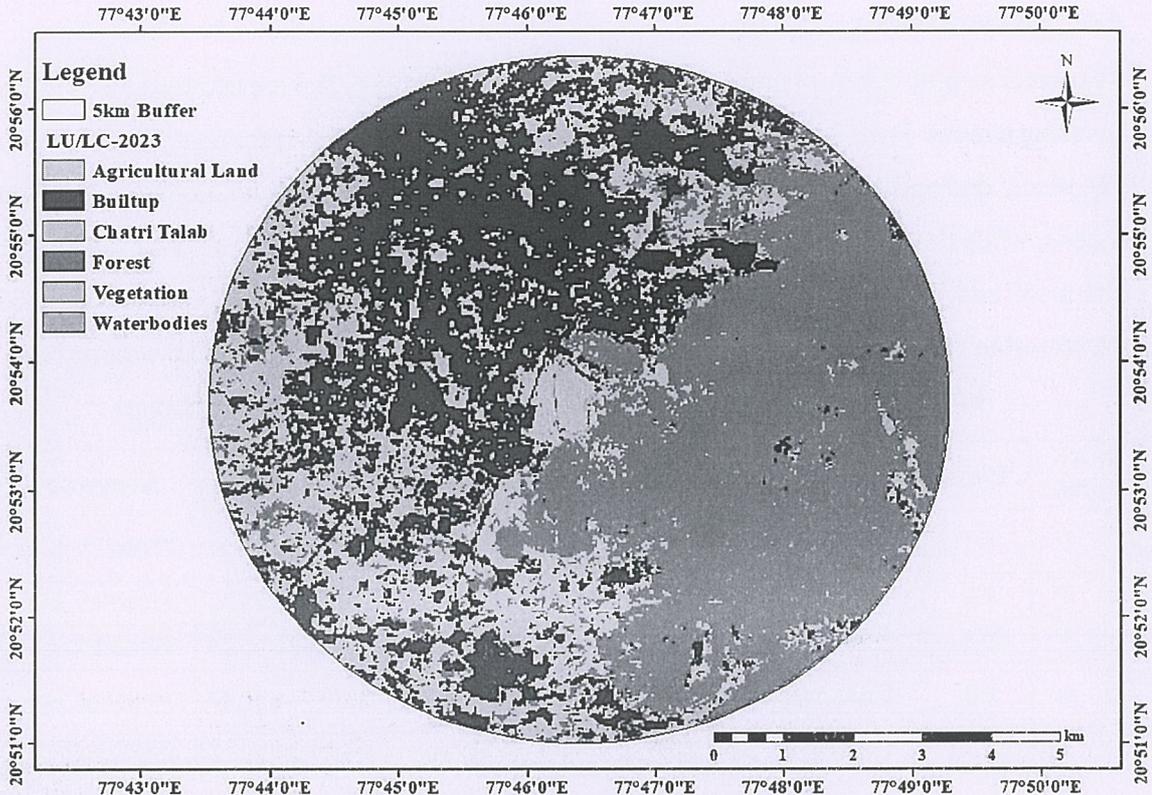


Figure 4.3 Landuse/Landcover (LULC) Classification of 5km buffer area around Chatri Talao (2023)

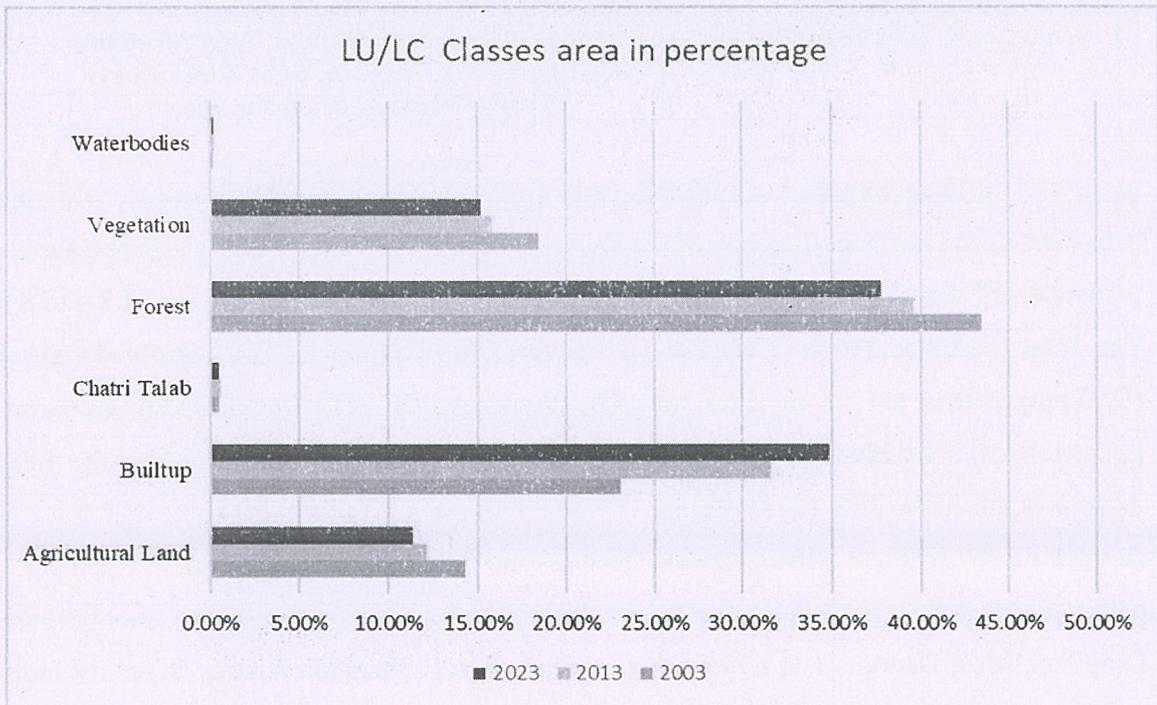


Figure 4.4 Landuse/Landcover (LULC) Comparison chart

4.4 Water Quality

The water samples from various locations in the Talao (Table 4.2) were taken (grab sampling) by using a motor boat. Samples (5 nos) were collected from the Talao for analysis of physico-chemical, demand & microbiological parameters, zooplankton, phytoplankton and heavy metals, while the groundwater samples (Table 4.1) were analysed (Table 4.3) for the physico-chemical and heavy metal parameters (APHA, 2023). After sampling, the samples were preserved in an icebox and transported to CSIR-NEERI laboratory for further processing.

Table 4.2 Details of sampling locations at Chatri Talao, Amravati

Sr. No.	Code	Type of sample	Location Sample	Latitude	Longitude
1	C1	Talao water	Corner point towards entrance gate side	20°53'56.23 N	77°46'19.22 E
2	C2	Talao water	south side of the Talao	20°53'51.08 N	77°46'15.50 E
3	C3	Talao water	Central part of the Talao	20°53'49.66 N	77°46'18.60 E
4	C4	Talao water	South east side of the Talao	20°53'44.50 N	77°46'24.38 E
5	C5	Talao water	North east side of Talao	20°53'49.38 N	77°46'29.21 E

Table 4.3 Water quality parameters analysed for Chatri Talao

Field Parameters	Parameters tested in the Laboratory
pH, Electrical Conductivity/TDS, Dissolved Oxygen	Total Dissolved Solids, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Sulphate, Nitrate, Chloride, COD, BOD, Heavy Metals, Plankton, Microbiological

In view of the developmental activities (laying of pavement and other peripheral construction activities) on the northern direction of the Talao, the quality of Talao water is assessed for key parameters (Table 4.3). The pH of all samples of Chatri Talao was in the range of 8.4 to 8.5. The Total Dissolved Solids (TDS) ranged between 276 - 284 mg/ L. The Dissolved Oxygen (DO) ranged between 7.5 mg/L to 8.2 mg/L (Annexure IV). The Heavy metal parameters (Annexure-V) are within the BIS limit (IS 10500:2015). It is also to mention that the Talao water is not used for drinking at present.

A total of 15 different phytoplankton species were found in Chatri Talao. The overall communities of the phytoplankton were represented mainly by 4 groups i.e., Cyanobacteria, Dinoflagellates, Diatoms and Chlorophyta (green algae). Shannon Wiener Diversity Index (SWI) was observed to be in the range of 0.64-1.65, indicating probable evidence of organic pollution in the water. Presence of *Gleocapsa* and *Microcystis* was dominant. Among the

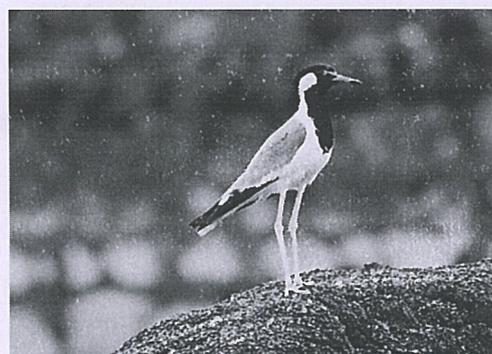
phytoplanktons, *Aphanizomenonflos-aquae*, *Microcystis* sp., *Leptocylindrus* sp., *Oscillatoria* sp., and *Nodularia* sp. are known to potentially produce harmful toxins (Annexure VI-VIII). All samples showed presence of zooplanktons, with C3 showing the highest number of zooplankton/mm³. Diatoms sp. and *Daphnia* sp., both belonging to phylum Arthropod were dominant (Annexure IX & X). Bacteriological analysis using the standard membrane filtration technique reported the presence of total coliforms (TC) and faecal coliforms (FC). A few samples of groundwater and all the Talao water samples had presence of FC representing the contamination of water (Microbial content should be zero as per BIS (10500:2012) for safe drinking water.) (Annexure XI). However, the Talao water quality is suitable for propagation of wildlife and fisheries as per CPCB norms (<https://cpcb.nic.in/>).

4.5 Ecology and Biodiversity

Forest area around Chatri Talao is sub-tropical scrub forest with a biodiversity garden set up by the Amravati Forest Division ahead of the Talao. Common trees observed in the study area are Acacia, Katha, Karanj, Shesham, Neem, Jamun, Ber (*Acacia arabica*, *A. catechu*, *Pongamia pinnata*, *Dalbergia sissu*, *Azadirachta indica*, *Syzygium cumini*, & *Zizyphus jujube* respectively) and invasive species belonging to genera *Eucalyptus*, *Lantana*, *Ipomoea* and, *Cassia* etc. along with many other shrub and herb species. Aquatic plants Hydrila, Nymphae, Lotus (*Hydrilla verticillata*, *Nymphaea guineensis* & *Nelumba nucifera* respectively) etc. were also observed growing in the Talao. During field sampling carried out by CSIR-NEERI reported 27 bird species, 05 fish species and 04 butterfly (Annexure XII). Common birds observed by the CSIR-NEERI team were Eurasian coot, Indian cormorant, Red Wattled Lapwing, Indian Green bee-eater, Indian Silver bill etc. (Plate 4.4). Large scale fishing, boating entry in Talao is prohibited however, small scale fishery was allowed and was also observed during the field work.



a) Laughing Dove



b) Red-Wattled Lapwing



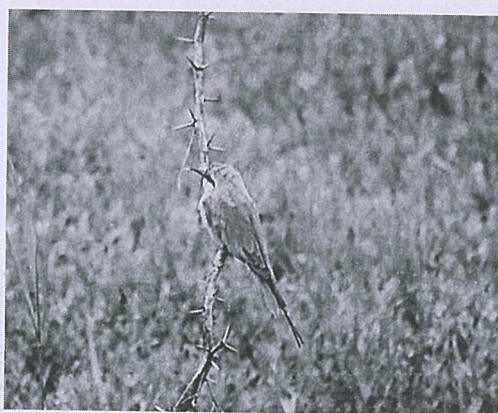
c) Cattle Egret



d) Cormorant



e) Sparrow



f) Green Bee-eater

Plate 4.4 Common birds observed in Chatri Talao by the CSIR-NEERI team

Rutuja (2015) in her study on birds of Chatri Talao reported 138 bird species and 53 birds among them were migratory in nature viz. Great Crested Grebe, European White Stork, Mallard, Spotted Redshank and, Little Ringed Plover. In another study by Pachlore & Chandrakar (2011) 88 bird species were reported from Chatri Talao.

Open source bird websites where bird information is regularly entered by experts as well bird enthusiasts/watchers also provide information in this regard. For e.g. E-bird reports presence of 260 bird species; Avibase 429 bird species and iNaturalist presence of 67 bird species in and around Chatri Talao. This large scale bird database on Chatri Talao also supports the research findings and supports it to be an important roosting, feeding and breeding ground for many native and migratory birds, where few are already threatened under WPA, 1972 and IUCN Red List of species (<https://www.iucnredlist.org/>).

Some birds visiting Talao are under different Schedule categories of Wildlife Protection Act, 1972 as well as IUCN Red List. The Oriental White Ibis a migratory visitor is listed as near threatened under IUCN threat categories whereas, Indian Peafowl is in Schedule I of the

Wildlife Protection Act 1972 (Table 4.4). India being signatory to the Bonn Convention, 1979 for transboundary movement of migratory species especially birds in this case, it is important that Talao character and ecology is protected by ensuring development activities are sustainable and environmentally safe to ensure long term habitat protection to these threatened and high conservation value species.

Table 4.4 Birds reported from Chitari Talao belonging to different schedule categories of WPA, 1972 and IUCN Red List of species

Sr. No.	Birds	WPA, 1972	IUCN Red List
1	Indian Peafowl	I	Least Concern
2	Oriental White Ibis	IV	Near Threatened
3	Red Munia	IV	Least Concern
4	Large Grey Babbler	IV	Least Concern
5	Black Drongo	IV	Least Concern
6	Brahminy Starling	IV	Least Concern
7	Common Myna	IV	Least Concern
8	Little Brown Dove	IV	Least Concern
9	Cattle Egret	IV	Least Concern
10	Indian Cormoront	IV	Least Concern
11	Indian Grebe	IV	Least Concern
12	Grey Heron	IV	Least Concern
13	White-necked Stork	IV	Least Concern
14	Pheasant-tailed Jacana	IV	Least Concern
15	Indian Pitta	IV	Least Concern
16	Comb Duck	IV	Least Concern
17	Osprey	IV	Least Concern
18	Kentish Plover	IV	Least Concern
19	Small Minivet	IV	Least Concern
20	Wood Sandpipe	IV	Least Concern
21	Black-winged Stilt	IV	Least Concern
22	Snipe species	IV	Least Concern
23	Northern Pintail	-	Least Concern
24	Common Teal	-	Least Concern
25	Eurasian Wigeon	-	Least Concern
26	Red-crested Pochard	-	Least Concern
27	Common Pochard	-	Least Concern
28	Garganey	-	Least Concern
29	Western Marsh Harrier	-	Least Concern

Source: <https://www.iucnredlist.org/>

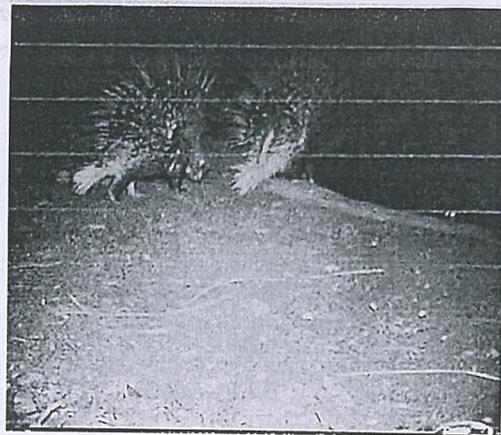
Human-wildlife conflict zone

The beats around Chatri Talao in Amravati Forest Division are reported to be areas of human-wildlife conflicts. Twenty two cases of livestock depredation by leopards in the Wadali round of Amravati range were reported in the last four years (2019-2023) (Annexure XIII). These conflicts are due to movement of large carnivores like leopards in close vicinity of Chatri

Talao.

The joint effort on wildlife monitoring (May 2023-May 2026) in Pohra Malkhed Forest Reserve by the Amravati Forest Division and NGO, Youth for Nature Conservation Organization, Amravati for understanding leopard occupancy in Amravati Forest Division & Pohra Malkhed Reserve Forest was initiated in May, 2023. Camera traps are placed in 48 locations of Amravati Forest Division. Camera traps placed in the forest beat closer to Chatri Talao (Jewad, Badnera, South Wadali, North Wadali and, Bhankheda) have confirmed the wildlife movement (Leopard, Bluebull, Spotted Deer, Wild Boar, Sambar Deer and Peacock) with many of them under various Schedule categories of WPA, 1972 (Plate 4.5; Annexure XIV). Camera trap installed 670 meters from the Chatri Talao boundary (camera number 19) captured the presence of leopard on 30th May 2023 (Plate 4.5). Wildlife movement near Talao was further validated and confirmed by transect surveys and presence of pugmarks, droppings, urination marks, scratch marks and carcass of animals.

Amravati district is at a distance of 114 km from Melghat Tiger Reserve and 144 km from Bor Tiger Reserve. Report on radio collared tigress movement from Bor to Pohara Malkhed Reserve Forest where Chatri Talao is located was reported in March 2015. This further confirms the presence and movement of large mammals including large carnivores using the Reserve Forest as corridor and Chatri Talao as an important water source.¹



¹ <https://timesofindia.indiatimes.com/city/nagpur/tigress-travels-150km-from-bor-to-pohara-malkhed-in-amravati/articleshow/46843460.cms>

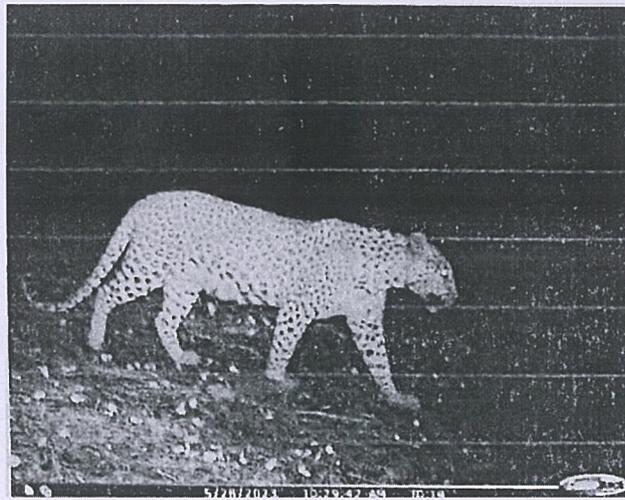


Plate 4.5 Camera trap results from the camera trap fixed closed to Chatri Talao

Table 4.5 Schedule status and IUCN red list status of animal images captured in camera traps

Sr. No.	Animal	Schedule Category (WPA, 1972)	IUCN Red List Status
1	Tiger	I	Endangered
2	Common Leopard	I	Vulnerable
3	Porcupine	II	Least Concern
4	Blue Bull	III	Least Concern
5	Sambar Deer	III	Vulnerable
6	Wild Boar	III	Least Concern
7	Hyena	III	Least Concern
8	Monitor Lizard	I	Least Concern
9	Spotted Deer	III	Least Concern

Chapter 5 Recommendations

- Chatri Talao is included Chaatri Talao was marked as wetland in the Wetland Atlas for Maharashtra (Wetland Code number 16959) as per Wetland Rules, 2010. Hence, considering the relevant national regulatory guidelines like Wetland Conservation and Management Guidelines 2010 & 2017; Wildlife Protection Act, 1972 and international convention on transboundary movement of animals (in this case migratory birds) (Bonn Convention, 1979), construction of pavement may affect and disturb the existing movement of large mammals (as well as other animals) using the habitat during the lean summer period (March-June) for water and roosting, feeding and breeding of birds (especially migratory) during winters (November-March). *Hence, further construction of pavement is not advisable and should not be permitted. Any other concretization or construction activity that may lead to change of the original ecological character of the Talao and further crowding for recreational activities will also lead to enhanced human-wildlife conflicts in and around the Talao area and should not be allowed.*
- The AMC has made provision for diversion of catchment run-off and storm water management at the pavement through 600 and 200 mm diameter pipelines. Regular maintenance has to be done to ensure proper diversion of the run-off and storm water.
- The food courts planned at the constructed site should be shifted to the main entrance to avoid the anthropogenic disturbances due to crowding.
- The visiting hours of the tourists should be regulated to prevent crowding that may adversely affect the faunal movement.
- Proper disposal and management of solid and liquid wastes collected at and near the Talao should be ensured by AMC. This can be implemented by professionally competent service providers.
- The solid waste disposal observed near the road in the catchment area towards north-east of the Talao should be cleaned regularly and further disposal should not be allowed.
- Idol immersion should be regulated and waste generated due to immersion in nearby temporarily constructed tanks should also be appropriately disposed.
- No tourist should be allowed to carry food items (including plastic bottles) to the Talao area.

- An institutional mechanism should be developed to oversee the activities related to protection of the ecology of Talao involving relevant stakeholders from State Wetland Authority, District Forest Department, AMC, Irrigation, Civil Society members, public representatives, local experts from academic institution and reputed national research institute.

Chatri Talao used to be the lifeline of the city of Amravati and it still continues to have that historical legacy and ecological relevance. Protection of the Talao is vital for the fast growing city and being one of the last few remaining connects of historical relevance. Protection of the Talao should be ensured through participation of all the stakeholders.

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<https://earthexplorer.usgs.gov/>

Annexure I Communication from Government of Maharashtra



महाराष्ट्र शासन

पर्यावरण व वातावरणीय बदल विभाग

१५ वा मजला, नवीन प्रशासकीय इमारत
मादाम कामा मार्ग, हुतात्मा राजगुरु चौक

मंत्रालय, मुंबई - ४०० ०३२

दूरध्वनी : ०२२-२२८५५०८२

Email : envmantra-mh@nic.in

क्र. NGT-२०२३/प्र.क्र.१०/तां.क.३

दिनांक:- २२/०६/२०२३.

प्रति,

संचालक,

राष्ट्रीय पर्यावरण अभियांत्रिकी संशोधन संस्था,
नेहरू मार्ग, नागपूर - ४४० ०२०

विषय :- छत्री तलाव, अमरावती परिसरामध्ये करण्यात आलेल्या बांधकामाच्या अनुषंगाने मा. राष्ट्रीय हरित लवाद यांच्याकडे मूळ अर्ज क्र. ९१/२०१९ या प्रकरणी गठीत समितीस पाणथळ जागेच्या अनुषंगाने तांत्रिक सहाय्य उपलब्ध करून देणेबाबत..

संदर्भ :- मा. राष्ट्रीय हरित लवाद यांनी पारित केलेले दिनांक २२/०५/२०२३ रोजीचे आदेश.

महोदय,

नॅशनल वेटलॅंड अॅटलास मध्ये पाणथळ जागा म्हणून समाविष्ट असलेल्या छत्री तलाव, अमरावती परिसरामध्ये करण्यात आलेल्या बांधकामाच्या अनुषंगाने मा. राष्ट्रीय हरित लवाद यांच्याकडे मूळ अर्ज क्र. ९१/२०१९ 'पोहरा बचाव समिती वि. अमरावती महानगरपालिका व इतर' ही याचिका दाखल करण्यात आली आहे. मा. लवादाने दिनांक २९/०३/२०२३ रोजी दिलेल्या आदेशास अनुसरून छत्री तलाव, अमरावती परिसरामध्ये करण्यात आलेल्या बांधकामाच्या अनुषंगाने कार्यवाही करून त्याबाबतचा अहवाल सादर करण्याबाबत खालीलप्रमाणे समिती गठीत करण्यात आली होती -

१.	जिल्हाधिकारी, अमरावती	सदस्य
२.	मा. उप वनसंरक्षक, अमरावती	सदस्य
३.	सदस्य सचिव, महाराष्ट्र राज्य वेटलॅंड प्राधिकरण	समन्वयक तथा राज्य वेटलॅंड प्राधिकरणाचे प्रतिनिधी

सदर प्रकरणी मा. लवादाने दिलेल्या दिनांक २९/०३/२०२३ रोजीच्या आदेशास अनुसरून पर्यावरण व वातावरणीय बदल विभाग / महाराष्ट्र राज्य वेटलॅंड प्राधिकरणाचे प्रतिज्ञापत्र मा. लवादकडे दाखल करण्यात आले होते, ज्यामध्ये उपरोक्त समितीला तांत्रिक संस्थांची मदत घेण्यास अनुमती मागीतली होती.

१. मिदसक
२. B.K.

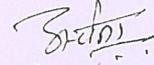
28/6/23

डा. पद्मनाभ शिंदे
पारस १९. २९/६/२३

मा. लवादाने पारित केलेल्या दिनांक २२/०५/२०२३ रोजीच्या आदेशान्वये महाराष्ट्र राज्य वेटलँड प्राधिकरणास आपल्या संस्थेमार्फत तांत्रिक सहाय्य घेण्यास अनुमती दिली आहे.

सबब, आपणास विनंती करण्यात येते की, छत्री तलाव, अमरावती परिसरामध्ये करण्यात आलेल्या बांधकामाच्या अनुषंगाने गठीत समीतीस तांत्रिक सहाय्य करण्यास्तव विशेषज्ञांची नेमणूक करण्यात यावी, तसेच उपरोक्त विषयाच्या अनुषंगाने करण्यात येणाऱ्या नियुक्तीबाबत या विभागास त्वरित कळविण्यात यावे.

आपली,



(अर्चना परशुरामे)

शा.श्रे.२ तथा अवर सचिव

सोबत :- वरिलप्रमाणे.

Annexure II Proposal submitted to Maharashtra Government

सेतवार, पी.एच.डी. (पर्यावरण इंजि.)
मुख्य, जल प्रौद्योगिकी एवं प्रबंधन प्रभाग
Abhasetwar, Ph.D. (Env. Engg.)
Head, Water Technology & Management Division



सी.एस.आई.आर.-राष्ट्रीय पर्यावरण अभियांत्रिकी अनुसंधान संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद, विज्ञान एवं प्रौद्योगिकी मंत्रालय, भारत सरकार)
CSIR-National Environmental Engineering Research Institute
(Council of Scientific & Industrial Research under Ministry of S & T, Govt. of India)



BY SPEED POST

पत्र क्र. डब्ल्यूटीएम/80/2023

दिनांक : 28 जून, 2023

प्रति,

सुश्री अर्चना परशुरामे

शा.श्रे.2 तथा अवर सचिव, महाराष्ट्र शासन

पर्यावरण व वातावरणीय बदल विभाग

15 वा मजला, नवीन प्रशासकीय इमारत

मादाम कोमा मार्ग, हुतात्मा राजगुरु चौक, मंत्रालय

मुंबई - 400 032

महाराष्ट्र

विषय: छत्री तलाव, अमरावती परिसरामध्ये करण्यात आलेल्या बांधकामाच्या अनुषंगाने मा. राष्ट्रीय हरित लवाद यांच्याकडे मूळ अर्ज क्र. 91/2019 या प्रकरणी गठीत समितीस पाणथळ जागेच्या अनुषंगाने तांत्रिक सहाय्य उपलब्ध करून देणेबाबत.

संदर्भ: पत्र क्रमांक NGT- .2023/प्र.क्र.10/तां.क.3 दिनांक 22.06.2023.

महोदया,

हे पत्र वर उल्लेखित विषयाच्या संदर्भात आहे. कृपया छत्री तलाव, अमरावतीच्या पर्यावरण-प्रणालीवरील बांधकाम क्रियाकलापांच्या परिणामांचे मूल्यांकन आणि राष्ट्रीय हरित न्यायाधिकरण (NGT), पश्चिम विभागाच्या निर्देशानुसार सुधारात्मक /उपचारात्मक उपाय सुचवण्यासाठी तपशीलवार तांत्रिक आणि आर्थिक प्रस्ताव आपल्या विचारार्थ संलग्न केले आहे.

छत्री तलावावरील बांधकाम क्रियाकलापांच्या मूल्यांकन करण्यासाठी हा अभ्यास आवश्यक आहे. म्हणून, संलग्न प्रस्तावानुसार अभ्यास करण्यासाठी आम्ही आपल्या मंजूरी आणि निधीसाठी विनंती करतो.

डॉ. पारस रंजन पुजारी, वरिष्ठ मुख्य शास्त्रज्ञ, सी.एस.आई.आर.-नीरी (CSIR-NEERI) यांची तज्ञ समितीचे सदस्य म्हणून नामनिर्देशन करण्यात आले आहे. हे संचालक, सी.एस.आई.आर.-नीरी (CSIR-NEERI), नागपूर यांच्या संमतीने आहे.

धन्यवाद,

भाषदंय,

Sd/-

संलग्न: वरील प्रमाणे

(पवन लामसेटवार)

प्रति:

- ✓ 1. जिल्हाधिकारी, अमरावती
2. महापालिका आयुक्त, अमरावती महानगरपालिका
3. संचालक, सी.एस.आई.आर.-नीरी (CSIR-NEERI), नागपूर

पवन लामसेटवार
28-06-23
(पवन लामसेटवार)

01e

नेहरू मार्ग, नागपूर ४४० ०२० भारत Nehru Marg, Nagpur - 440 020 INDIA

011-712-22437/7 EPABX : 011-712-2249883 (Off. Ext. - 240) Tel/fax : +91-712-2249883 E-mail: pti_lab@neeri.res.in URL: www.neeri.res.in

Annexure III Maharashtra Government communication on Sanction of proposal

Chhatra Kalra



महाराष्ट्र शासन

पर्यावरण व वातावरणीय बदल विभाग

मादाम कामा मार्ग, हुतात्मा राजगुरु चौक

नवीन प्रशासकीय इमारत, मंत्रालय, मुंबई ४०० ०३२

दूरध्वनी : ०२२-२२८५५०८२ Email : envmantra-mh@nic.in

क्रमांक- NGT - २०२३/प्र.क्र.१०/तां.क.३

दिनांक :- २८/०७/२०२३.

प्रति,

संचालक,

राष्ट्रीय पर्यावरण अभियांत्रिकी संशोधन संस्था,

नेहरू मार्ग, नागपूर - ४४० ०२०.

विषय : मा. राष्ट्रीय हरित लवादाकडे दाखल मूळ अर्ज क्र. ११/२०१९ 'पोहरा बचाव समिती वि. अमरावती महानगरपालिका व इतर' मध्ये मा. लवादाने दिलेल्या आदेशास अनुसरून पर्यावरण परिस्थितीकीवर होणाऱ्या परिणामांचे मूल्यांकनाबाबतचा अहवाल सादर करणेबाबत...

संदर्भ : या विभागाचे समक्रमांकाचे दिनांक ०७/०७/२०२३ रोजीचे पत्र.

महोदय,

नॅशनल वेटलँड अॅटलास मध्ये पाणथळ जागा म्हणून समाविष्ट असलेल्या छत्री तलाव, अमरावती परिसरामध्ये करण्यात आलेल्या बांधकामाच्या अनुषंगाने मा. राष्ट्रीय हरित लवादाकडे मूळ अर्ज क्र. ११/२०१९ 'पोहरा बचाव समिती वि. अमरावती महानगरपालिका व इतर' ही याचिका दाखल करण्यात आली आहे. सदरहू प्रकरणी मा. लवादाने दिनांक २९/०३/२०२३ रोजी पारित केलेल्या आदेशास अनुसरून पर्यावरण परिस्थितीकीवर होणाऱ्या परिणामांचे मूल्यांकनाबाबतचा अहवाल तयार करून सादर करण्यास्तव आपल्या संस्थेस संदर्भीय पत्रान्वये नियुक्त करण्यात आले होते. त्यानंतर आपण सादर केलेल्या देयकानुसार रक्कम आपल्या खात्यावर जमा करण्यात आली आहे (याबाबतचा चेक सोबत जोडला आहे).

सदर विषयाच्या अनुषंगाने दिनांक १२/०७/२०२३ रोजी करण्यात आलेल्या स्थळपाहणीवेळी याबाबतचा अहवाल माहे जुलै च्या अंतिम आठवड्यापर्यंत सादर करण्याबाबत आपणास सूचित करण्यात आले होते. तसेच आपल्या दिनांक २६/०७/२०२३ रोजीच्या ई-मेल मध्ये नमूद केल्यानुसार आवश्यक असणारी सर्व माहिती उपलब्ध करून देण्याबाबत आयुक्त, अमरावती महानगरपालिका व उपवनसंरक्षक, अमरावती यांना दिनांक २८/०७/२०२३ रोजीच्या पत्रान्वये कळविण्यात आले आहे. याबाबतचे पत्र यासोबत जोडण्यात आले आहे. तरी छत्री तलाव, अमरावती परिसरामध्ये करण्यात आलेल्या बांधकामाच्या अनुषंगाने पर्यावरण परिस्थितीकीवर होणाऱ्या परिणामांचे मूल्यांकनाबाबतचा अहवाल या विभागास त्वरित सादर करण्यात यावा, ही विनंती.

आपली,

(अचंना परशुरामे)

शा.श्रे.२ तथा अवर सचिव

सोबत :- वरीलप्रमाणे.

डा. पवन भास्कर २५/८
उमित नागवस १०

पाटल/गजानन/शास्त्री
कुप्या देवे एवं उचित
कार्याची करे/ ५/०७/२३

Annexure IV Water samples Physico-chemical Parameters

Parameters	Sample Nos.															
	C1	C2	C3	C4	C5	CGW1	CGW2	CGW3	CGW4	CGW5	CGW6	CGW7	CGW8	CGW9		
pH	8.5	8.4	8.4	8.5	8.5	7.7	7.4	7.7	7.3	7.0	7.6	7.6	7.5	7.5		
EC ($\mu\text{s}/\text{cm}$)	424	426	413	414	424	564	799	564	1191	896	1253	888	627	690		
TDS	284	286	276	277	284	378	535	378	798	600	840	595	420	462		
Turbidity (NTU)	4.2	5.4	6.6	5.8	5.2	3.3	0.6	2.8	0.3	7.8	18	18.6	0.7	0.3		
T. Hardness as CaCO_3	190	180	180	180	190	270	90	80	400	400	170	190	190	80		
Ca	16	20	16	16	16	60	28	24	64	92	48	40	40	24		
Mg	36	31.2	33.6	33.6	36	28.8	4.8	4.8	57.6	40.8	12	21.6	21.6	4.8		
Na	30.1	29.5	30.9	29.9	29.6	19.9	118.3	92.0	89.7	28.8	200.8	166.7	59.5	107.7		
K	1.1	1.1	1.1	1.0	1.1	0.7	1.3	1.1	2.4	4.9	1.6	2.3	0.6	0.8		
T. Alkalinity as CaCO_3	171	170	170	190	170	290	140	120	320	270	230	220	180	110		
Sulphate	22.4	22	21	19.8	20.2	24.6	64.4	74.6	90	110.4	89.8	68	43	83.6		
Chloride	20	15	15	15	15	15	125	95	115	75	160	120	50	115		
Nitrate	0.8	0.4	0.5	0.7	0.7	6.9	23.2	9.2	60.1	0	47.8	38.0	52.6	4.6		
Phosphate	2.3	2.2	6.7	1.6	1.7	2.1	4.1	3.9	6.6	3.5	5.5	1.8	4.3	1.0		
COD	27	20	22	20	24	-	-	-	-	-	-	-	-	-		
BOD 5 at 20° C	0.3	1	1.5	0.6	1	-	-	-	-	-	-	-	-	-		
DO	8.2	8.0	7.5	7.5	8.0	-	-	-	-	-	-	-	-	-		

*Units for water quality parameters (except pH, EC and Turbidity) are in mg/L

Annexure V Water samples Heavy Metals

Sr. No	Metal	ICP-OES detection limit(ppm)	Sample Codes				
			C1	C2	C3	C4	C5
1	Al	0.0001	0.0	0.05	0.0	0.0	0.0
2	Cu	0.0004	0.01	0.01	0.02	0.01	0.01
3	Zn	0.0002	0.4	0.1	0.2	0.1	0.1
4	Ni	0.0004	0	0	0	0	0
5	Co	0.001	0	0	0	0	0
6	Fe	0.0003	0.1	0.1	0.1	0.2	0.1
7	Mn	0.0001	0.03	0.02	0.04	0.02	0.02
8	Cr	0.0002	0.005	0.004	0.002	0.001	0.002
9	Cd	0.0001	0	0	0	0	0
10	B	0.0001	0.03	0.04	0.03	0.03	0.03

*Units for Heavy metals are in mg/L

Annexure VI Water samples Phytoplankton

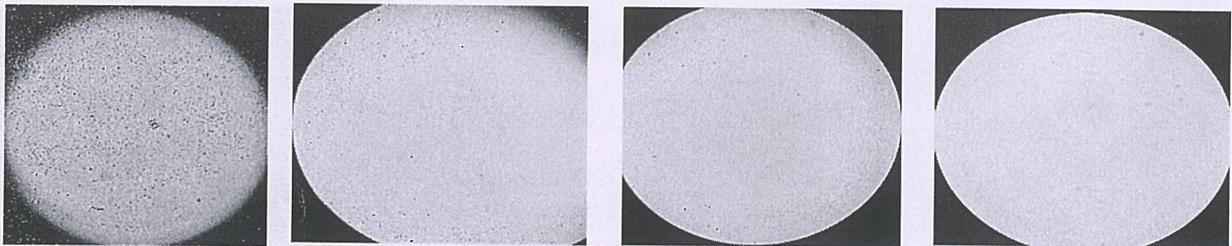
S. No.	Sample Code	Name of Species	Group	No. of organisms	SWI	Pielou's Evenness Index
1.	C1	<i>Aphanizomenonflos-aquae</i>	Cyanobacteria	4	1.55	0.86
		<i>Gleocapsa</i>	Cyanobacteria	8		
		<i>Hemiauleussinesis</i>	Diatom	1		
		<i>Oscillatoria</i>	Cyanobacteria	1		
		<i>Thalassisirasubtilis</i>	Diatom	3		
		<i>Woronchia</i>	Cyanobacteria	3		
2.	C2	<i>Microcystis</i>	Cyanobacteria	40	1.20	0.74
		<i>Gleocapsa</i>	Diatom	24		
		Nodularia sp.	Cyanobacteria	1		
		<i>Thalassisirasubtilis</i>	Diatom	13		
		<i>Chaetoceros</i>	Diatom	4		
3.	C3	<i>Aphanizomenonflos-aquae</i>	Cyanobacteria	10	1.65	0.75
		<i>Gleocapsa</i>	Cyanobacteria	38		
		GuinardiaStriata sp.	Diatom	8		
		Aulacoserira spp.	Diatom	11		
		Spirulina sp.	Cyanobacteria	12		
		<i>Microcystis</i>	Cyanobacteria	2		
		<i>Cylindrotheca</i>	Diatom	1		
		<i>Noctiluca</i>	Dinoflagellate	1		
<i>Staurastrum</i>	Chlorophyta	2				
4.	C4	<i>Aphanizomenonflos-aquae</i>	Cyanobacteria	25	0.64	0.32
		<i>Gleocapsa</i>	Cyanobacteria	28		
		Nodularia sp.	Cyanobacteria	1		
		Aulacoserira spp.	Diatom	22		
		Spirulina sp.	Cyanobacteria	26		
		<i>Microcystis</i>	Cyanobacteria	48		
		<i>Noctiluca</i>	Dinoflagellate	3		
5.	C5	<i>Aphanizomenonflos-aquae</i>	Cyanobacteria	14	0.74	0.45

		<i>Gleocapsa</i>	Cyanobacteria	22		
		<i>Aulacoserira</i> spp.	Diatom	8		
		<i>Spirulina</i> sp.	Cyanobacteria	7		
		<i>Microcystis</i>	Cyanobacteria	7		

Annexure VII Distribution Pattern of Phytoplankton

S. No	Sample Code	Plankters/100ml	Percentage Composition of Group			
			Chlorophyta	Cyanobacteria	Dinoflagellate	Diatoms
1.	C1	5042	0%	66%	0%	33%
2.	C2	20672	0%	40%	0%	60%
3.	C3	21428	11%	44%	11%	33%
4.	C4	38571	0%	71%	14%	14%
5.	C5	14621	0%	80%	0%	20%

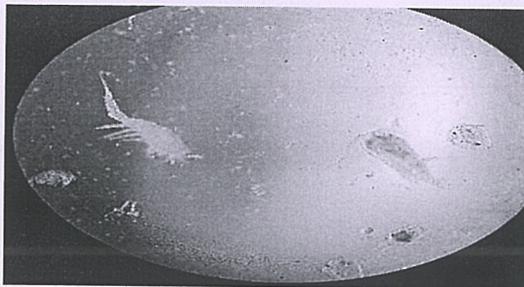
Annexure VIII Phytoplankton *Hemiauleussinesis* and various phytoplankton observed



Annexure IX Water samples Zooplankton

S. No.	Sample Code	Zooplankton Species	No. of Organisms	Zooplanktons/mm ³
1	C1	<i>Keratella</i> sp.	1	35000
		<i>Lecaneleotina</i>	1	
		<i>Mongolodiptomus gladiolus</i>	1	
		<i>Allodiptomusraoi</i>	1	
2	C2	<i>Daphnia</i> sp.	3	65000
		<i>Daphnia</i> sp.	3	
		<i>Euryalanaorientalis</i>	1	
		<i>RotariaNeptuina</i>	1	
		<i>Diaptamus</i> sp.	2	
		<i>Cyclops</i>	1	
		<i>Hexatheramira</i>	2	
3	C3	<i>Moinamarcocapa</i>	3	415000
		<i>Cyclops</i>	2	
		<i>Daphnia</i> sp.	16	
		<i>Branchionusforficula</i>	4	
		<i>Diaptamus</i> sp.	12	
		<i>Eodiptamusdraconisignirami</i>	14	
		<i>Epheroparousbarrosibarrosi</i>	26	
		<i>Keratella</i> sp.	4	
4	C4	<i>Branchionus</i> sp.	5	285000
		<i>Diaptamus</i> sp.	14	
		<i>Daphnia</i> sp.	27	
		<i>Branchionus</i> sp.	10	
		<i>Trichoceracapucina</i>	2	
5	C5	<i>Lecaneleotina</i>	4	305000
		<i>Diaptamus</i>	24	
		<i>Daphnia</i>	13	
		<i>Keratella</i> sp.	8	
		<i>Eodiptamusdraconisignirami</i>	15	
		<i>Cyclops</i>	1	

Annexure X Various Zooplanktons observed in the samples



Annexure XI Bacteriological Parameters

Water samples Bacteriological Parameters			
S.No.	Sample Code	Total Coliforms (CFU/100mL)	Faecal Coliforms (CFU/100mL)
1.	C1	3360	190
2.	C2	930	200
3.	C3	640	120
4.	C4	530	200
5.	C5	870	340
6.	CGW1	200	60
7.	CGW2	140	10
8.	CGW3	0	0
9.	CGW4	0	0
10.	CGW5	90	0
11.	CGW6	310	9
12.	CGW7	50	1
13.	CGW8	10	0
14.	CGW9	180	112

Annexure XII List of Avifaunal

Sr. No	Common Name	Zoological name	Family	IUCN Status
1	Eurasian coot	<i>Fulica atra</i>	Rallidae	Least concern
2	Indian cormorant	<i>Phalacrocorax fuscicollis</i>	Phalacrocoracidae	Least concern
3	Little egret	<i>Egretta garzetta</i>	Ardeidae	Least concern
4	White thorated Kingfisher	<i>Halcyon smyrnensis</i>	Alcedinidae	Least concern
5	Indian pond heron	<i>Ardeola grayii</i>	Ardeidae	Least concern
6	Red Wattled Lapwing	<i>Vanellus indicus</i>	Charadriidae	Least concern
7	Common Myna	<i>Acridotheres tristis</i>	Sturnidae	Least concern
8	White-breasted waterhen	<i>Amaurornis phoenicurus</i>	Rallidae	Least concern
9	Indian Peafowl	<i>Pavo cristatus</i>	Phasianidae	Least concern
10	Coucal	<i>Centropus sinensis</i>	Cuculidae	Least concern
11	House Crow	<i>Corvus splendens</i>	Corvidae	Least concern
12	Red Vented Bulbul	<i>Pycnonotus cafer</i>	Pycnonotidae	Least concern
13	Indian Robin	<i>Saxicoloides fulicatus</i>	Muscicapidae	Least concern
14	Indian Magpie	<i>Copsychus saularis</i>	Muscicapidae	Least concern
15	Laughing Dove	<i>Streptopelia senegalensis</i>	Columbidae	Not Evaluated
16	Black Drongo	<i>Dicrurus macrocercus</i>	Dicruridae	Least concern
17	Sparrow	<i>Passer domesticus</i>	Passeridae	Least concern
18	Green Bee eater	<i>Merops orientalis</i>	Meropidae	Least concern
19	Ashy Prinia	<i>Prinia socialis</i>	Cisticolidae	Least concern
20	Large Grey Babbler	<i>Argya malcolmi</i>	Leiotherichidae	Least concern

21	Baya Weaver	<i>Ploceus philippinus</i>	Ploceidae	Least concern
22	Scaly-breasted Munia	<i>Lonchura punctulata</i>	Estrildidae	Least concern
23	Purple Sunbird	<i>Cinnyris asiaticus</i>	Nectariniidae	Least concern
24	Lesser Whistling Duck	<i>Dendrocygna javanica</i>	Anatidae	Least concern
25	Brahminy Starling	<i>Sturnia pagodarum</i>	Sturnidae	Least concern
26	Wire-tailed Swallow	<i>Hirundo smithii</i>	Hirundinidae	Least concern
27	Indian Silverbill	<i>Euodice malabarica</i>	Estrildidae	Least concern

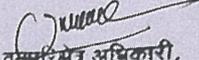
Annexure XIII Reported cases of Leopard attacks

पशुधन हल्ला भानखेडा बिट व जेवड बिट वडाळी राऊंड 2019 ते 2023

अ.क्र.	पशुधन मालकाचे नाव व पत्ता	वर्तुळ	वन्यप्राणी प्रकार	घटनेचा दिनांक	मृत व जखमी पाळीव प्राणी
1	शुभम मारुती नेवारे रा. अम	वडाळी	बिबट	12/08/2019	गाय(1)
2	विनायक आत्माराम बागळे रा.अम	वडाळी	बिबट	24/08/2019	गाय(1)
3	राजू रामनिहोर यादव रा. भानखेडा बु. अम	वडाळी	बिबट	05/10/2019	गाय(1)
4	संजय उत्तमराव चौधरी रा. भानखेडा बु. अम	वडाळी	बिबट	17/10/2019	जर्मी गाय(1)
5	रविंद्र गोपालराम सदार रा. भानखेडा बु. अम.	वडाळी	बिबट	28/10/2019	बकरी(3)
6	केशव मोतीराम स्वर्गीये रा. भानखेडा बु. अम.	वडाळी	बिबट	28/10/2019	बकरी(1)
7	अजय रामभाऊ भुरले रा. महादेवखोरी अम.	वडाळी	बिबट	01/12/2019	गाय(1)
8	अशोक तुळशीराम सदार रा. भानखेडा बु. अम.	वडाळी	बिबट	17/01/2020	गाय(1)
9	केशव मोतीराम स्वर्गीये रा. भानखेडा बु. अम.	वडाळी	बिबट	11/02/2020	बकरी(1)
10	केशव मोतीराम स्वर्गीये रा. भानखेडा बु. अम.	वडाळी	बिबट	11/02/2020	बकरी(1)
11	दिपक मोतीराम स्वर्गीये रा. भानखेडा बु. अम.	वडाळी	बिबट	16/03/2020	काटेवाडी गाय(1)
12	अशोक रामकिशोर यादव रा. शिवगड कॉलनी अम.	वडाळी	बिबट	23/05/2020	वासरू(2)
13	निलेश रतन यादव रा. मंगलधाम कॉलनी अम.	वडाळी	बिबट	17/12/2020	गाय(1)
14	अनुज मोहन यादव रा. भानखेडा बु. अम.	वडाळी	बिबट	04/02/2021	जर्मी गाय(1)
15	नारायण एकनाथ मोहिगे रा. भानखेडा बु. अम.	वडाळी	बिबट	02/03/2021	गाय(1)
16	प्रदिप रमेश कडु रा. भानखेडा बु. अम.	वडाळी	बिबट	06/03/2021	गोरा(1)
17	राजू रामनिहोर यादव रा. रत्नापुर अम.	वडाळी	बिबट	24/04/2021	गाय(1)
18	अजय यादव रा. मंगलधाम कॉलनी अम.	वडाळी	बिबट	11/01/2023	गाय(1)

P.T.O

19	धनराज रा. अमरवंशी रा. भानखेडा बु. अम.	वडाळी	विवट	13/02/2023	कोंवडा, वटक कुत्रा
20	रोशन साहेबराव गजभिये रा. भानखेडा बु. अम.	वडाळी	विवट	15/02/2023	बकरी(1)
21	सुनील रविंद्र कावरे रा. भानखेडा बु. अम.	वडाळी	विवट	04/06/2023	बकरी(1)
22	गजानन लक्ष्मण मिश्रा रा. भानखेडा बु. अम.	वडाळी	विवट	27/07/2023	बकरी(1)


 तहसिलदार अधिकारी,
 (प्रा.) वडाळी परिक्षेत्र, अमरावती

Annexure XIV Camera Trap Information



Reg. No. MH-698/06

Youth For Nature Conservation Organization

B-27, Saturna Industrial Estate, Badnera Road, Amravati, Maharashtra - 444607

To,
Range Forest Officer,
Wadali Range,
Amravati Forest Division.

Subject: Report of Leopard Occupancy Survey, Phase-1, Year-First.

Reference: As per letter number 592.2023-24 dated 21 July 2023 from the Wadali RFO office and directed accordingly to submit data regarding presence of wild fauna in forest area adjoining Chatri Talao lake near Amravati City under Amravati forest division.

Dear Sir/Madam,

Our organization along with Amravati forest division is working on wildlife monitoring in Pohra Malkhed forest reserve. The area mentioned in the subjected letter adjoining Chatri talao lake comes under wadali range of Amravati forest division which is a part of Pohra Malkhed reserve forest. We are working on project entitled as "Leopard occupancy study", which is in progress & phase 1 of First year is completed in association with forest department. Chatri Talav and Forest adjoining to it comes under our study area wherein we observed regular wildlife movement during our study. In this report we have submitted our observations during transect and Camera trap monitoring exercise along with few camera trap images from cameras installed in beats that are adjoining to Chatri Talav. Forest Beats mentioned in the report are 1) Jewad Beat, 2) Badnera Beat, South Wadali, 4) North Wadali, 5) Bhankheda beat.

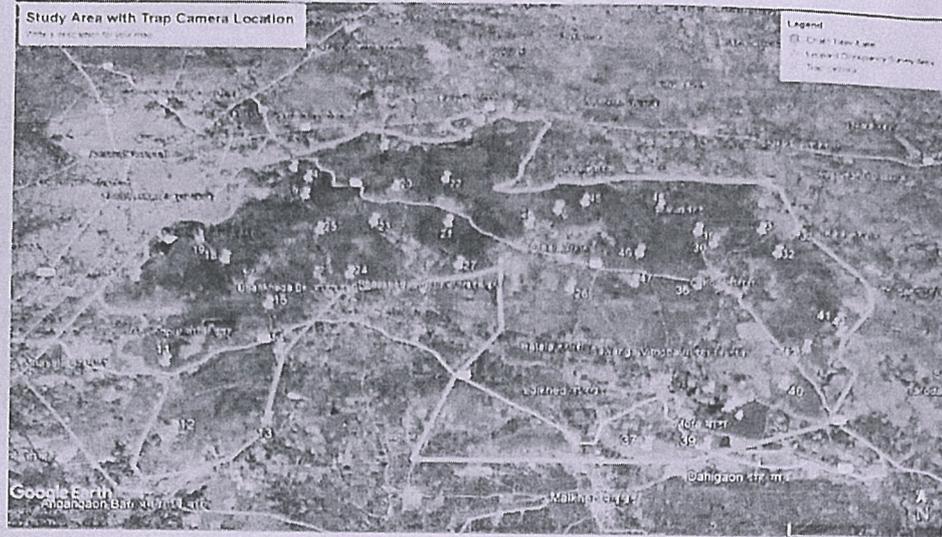
The study area along with other area was divided into grid size of 2x2 sq kilometre and transect line of 1 km was laid on the existing tracks in the grid. Signs of Leopard and other wild animals were noted and further a camera trap study was done by installing one camera in each grid for 30 days. We are submitting beat wise data of above mention forest beats and also the signs recorded in each beat during transect study.

It is our observation that regular movement of Leopard and other wild fauna is recorded either with direct or indirect signs. Any development that will increase human activities in this area (Chatri Talav) will lead to increase in garbage disposal & other associated disturbances. At such site stray dogs and stray pigs will feed, which will attract carnivores like leopards, as stray animals are easy foods for them, which may lead to human wild life negative interface and giving permission to such activities will be an irreversible mistake & may lead to human wildlife conflict resulting in Human casualties.

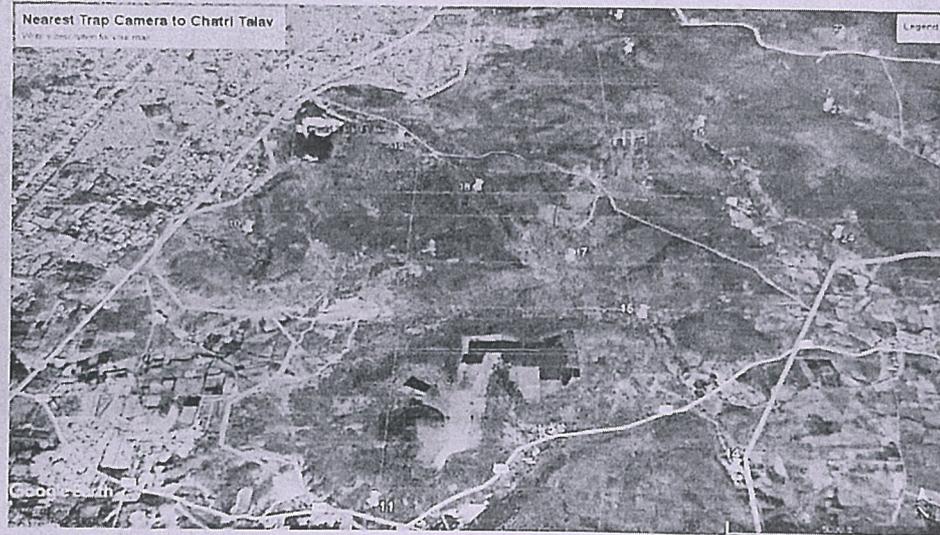
Reports are in the pages below.

1. Chatri Talao adjoining area with Camera Trap Location on Google Earth

1.1 Trap Camera Location in Study Area:



1.2 Trap camera Installed Near to Chatri Talao :



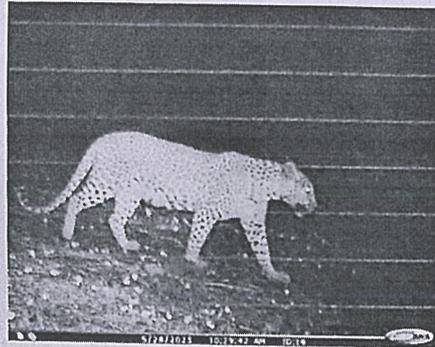
2. Summary of Presence of wild animal in 5 adjoining forest beats to Chatri Talav.

Sr. No	Beat Name	Grid Number Occupied	Camera Id	Wild Animal Recorded in Camera Traps	Signs Recorded during Transact Surveys	Remark
1	Jewad	17	19 (At distance of 670 m from Chatri Talav)	Leopard, Blue Bull, Spotted Deer, Peacock, Wild Boar	Leopard pugmark, Dropping of Blue Bull, Spotted Deer	2 Individual Leopards
		18	18	Spotted Deer, Peacock, Wild Boar,	Scat and Pugmark of Leopard, Dropping of Blue Bull, Spotted Deer	
		19	25	Leopards, Spotted Deer, Peacock, Wild Boar, Porcupine	Leopard Scat, Pugmark, Urination mark, Blue Bull Droppings	1 Individual Leopard
2	Badnera	27	10	No Wild Animals Recorded in cameras	Leopard Pugmark, Scat, Droppings of Blue Bull, Spotted Deer	
		37	11	Leopard	No Sign	1 Individual Leopard
3	North Wadali	7	3	Leopard, Blue Bull, Wild Boar,	Leopard, Blue Bull, Carcass of Langur	1 Individual Leopard
4	South Wadali	9 (2 Cameras)	4,9	Leopard, Blue Bull, Spotted Deer, Peacock, Wild Boar	Leopard, Blue Bull, Spotted Deer, Peacock, Wild Boar	5 Individual Leopards
5	Bhankheda	28	15	Leopard, Peacock, Blue Bull, Wild Boar	Scratch mark of Leopard, Scat of Wildboar	1 Individual Leopard
		29	17	Blue Bull, Sambar Deer, Spotted Deer, Peacock	Scat and Pugmark of Leopard, Dropping of Blue Bull and Peacock	

3. Wildlife Presence in Different Forest Beats Near to Chatri Talav:

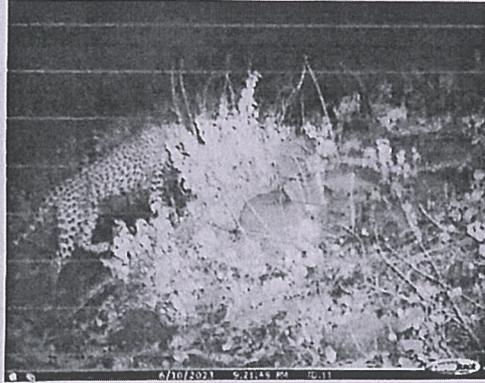
3.1 Jewad Beat

As per Forest beat boundaries Chatri Talav is in Jewad Beat. In Jewad Beat three cameras are installed. Out of which Grid 17 wherein Camera id 19 is installed is the nearest. We found different signs of presence of wildlife during transact survey. Also various animals are recorded in Cameras. Following images are from 19, 18 and 25.Details Below.



3.2 Badnera Beat:

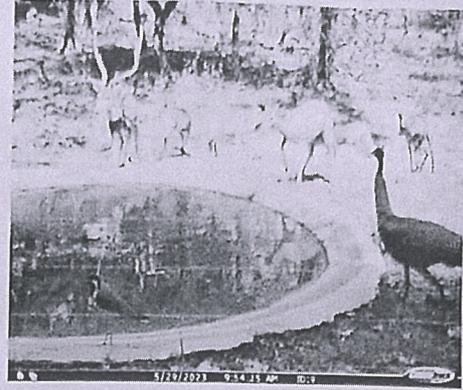
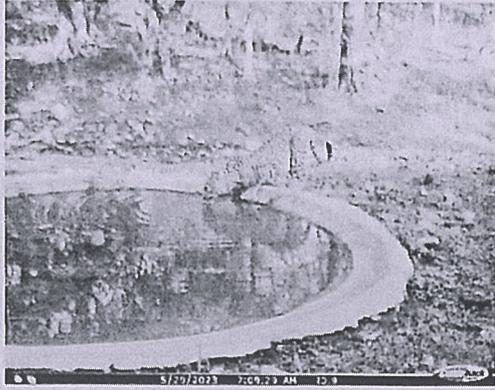
Two cameras are installed in this beat.



3.3 South Wadali

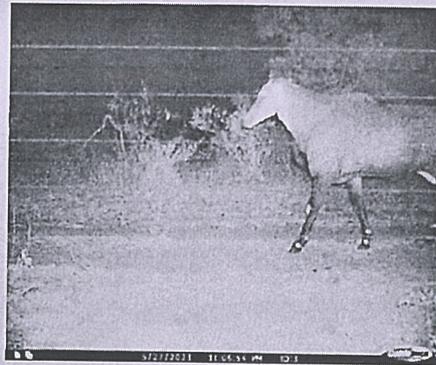
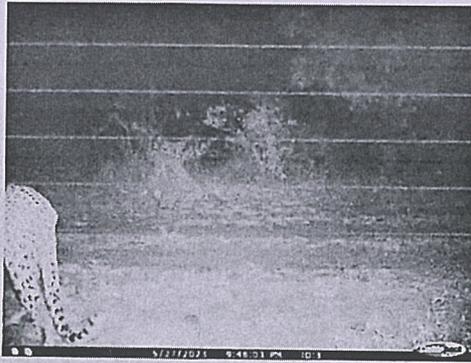
Two cameras are installed in this beat.





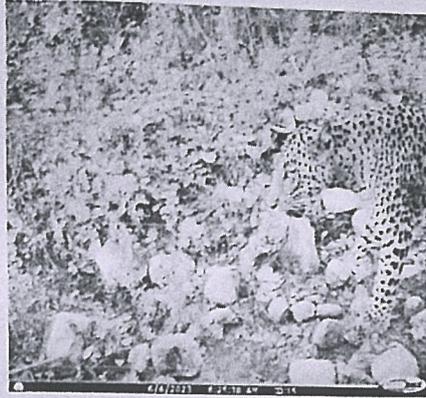
3.4 North Wadali

One camera is installed in this beat.



3.5 Bhankheda Beat

Two Cameras are installed in the beat.



Note: All the data (photos and information) given with this report is the outcome of research project titled 'Leopard Occupancy Survey' conducted by Youth for Nature Conservation organization, Amravati in association with Amravati forest division. This project is for 3 year duration which is started in May 2023. As this data is confidential, this should be used for the subject mentioned in the letter.

Dr Swapnil Sonone
President,
Youth for Nature Conservation Organization, Amt



311

Annexure - III

NATIONAL CENTRE FOR SUSTAINABLE COASTAL MANAGEMENT

Ministry of Environment, Forest & Climate Change, Government of India

No. NCSCM / CZMA / Maharashtra/23 -462/EDC

dated 10/10/2023

TO

The Director Environment & Climate Change,
Environment & Climate Change Department,
Government of Maharashtra,
15th Floor, New Administrative Building,
Mantralaya, Mumbai - 400 032.

MCZMA

लिपिक/सं.क.:-- जो शा-2083-16-10-2023
पर्यावरण व वातावरणीय बदल विभाग
मंत्रालय, मुंबई 400 032

Sir,

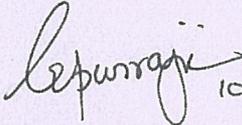
SUB: CONTRACT AGREEMENT FOR PREPARATION OF WETLAND MAPS AND BRIEF DOCUMENTS ALONG WITH ASSESSMENT OF TOURISM POTENTIAL OF WETLANDS FOR THE STATE OF MAHARASHTRA - REG.

Ref: Your letter No. Wetland 2023/CR 29/TC 3 dated 3/10/2023.

With reference to your letter cited above, the Contract Agreement for preparation of wetland maps and brief documents along with assessment of tourism potential of wetlands for the State of Maharashtra, is submitted herewith, after incorporating the revised cost of Rs 23,86,84,028 (Rupees twenty-three crores eighty-six lakh eighty-four thousand and twenty-eight only, inclusive of 18% GST) and other terms and conditions and duly signed at our end, for your kind approval and signatures.

A copy of the Contract Agreement signed at your end may kindly be forwarded to NCSCM for our record.

Yours Sincerely,

 10/10/2023

Dr Purvaja Ramachandran
Director, NCSCM

Encl: Contract Agreement.

Copy to: Manager, Finance, NCSCM

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20/10/23



Anna University Campus, Chennai 600 025. India
Phone (+91) 44 22200600 Fax (+91) 44 22200700

www.ncscm.res.in



தமிழ்நாடு தமில்நாடு TAMIL NADU
20 JUL 2023

24AC 402376

K. SANKAR
STAMP VENDOR
LICENCE No: 1481/94,
No. 2, MADLEY ROAD,
T. NAGAR, CHENNAI-17.

PREPARATION OF WETLAND MAPS & BRIEF DOCUMENTS ALONG WITH
ASSESSMENT OF TOURISM POTENTIAL OF WETLANDS FOR THE STATE OF
MAHARASHTRA

CONTRACT AGREEMENT

This Contract Agreement is made and entered into on this --- day of -----, 2023, between the Principal Secretary to Government (Environment & Climate Change Department), Government of Maharashtra (here in after referred as "the Client") and the Director, National Centre for Sustainable Coastal Management (NCSCM), Chennai (herein after referred as "the Consultant").

1. Background:

Wetlands (Conservation and Management) Rules, 2017 were notified by the Ministry of Environment, Forests, and Climate Change (MoEF&CC) in accordance with the provisions of the Environment (Protection) Act, 1986, to serve as the legal framework for the conservation and management of wetlands in India. This is an important step towards preserving the natural integrity of the wetlands while allowing for wise and

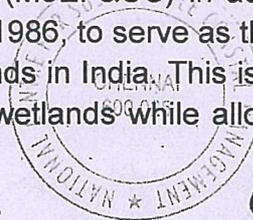
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sustainable use. The Wetland Guidelines were published in the year 2020. The Environment & Climate Change Department, Government of Maharashtra have informed that there are 6 revenue divisions in the State of Maharashtra, in which the primary exercise of identification of wetlands was carried out by the District Authorities. Around 15,918 Nos. of wetlands with area more than 2.5 Ha and 2198 Nos. of wetlands with area less than 2.5 Ha (Total 18,116) have been primarily identified. The State Government has requested NCSCM to demarcate, conduct ground truthing and document the wetlands.

NCSCM is already fully involved as a knowledge partner, in the Wetlands project of the Ministry of Environment, Forest, and Climate Change (MoEF&CC), Government of India.

2. Scope of the contract:

The present consultancy covers:

- 1) Demarcation of wetland boundaries of the identified 15,918 + 2198 wetlands, supported by accurate digital maps with coordinates and validated by ground truthing, in adherence to the Wetlands Conservation and Management-Rules-2017 and Wetland Guidelines, 2020.
- 2) Demarcation of the zones of influence and land use and land cover of the wetlands, thereof indicated in a digital map.
- 3) Description of the ecological character of the wetlands and preparation of Brief documents.
- 4) Assessment of tourism potential of the wetlands.
- 5) Submission of the final deliverables for each of the six Revenue divisions of Maharashtra namely, Konkan Division, Pune Division, Nashik Division, Chatrapati Sambhaji Nagar Division, Amravati Division and Nagpur Division, covering all the 36 districts of Maharashtra.

3. Study Area:

The Study area will be the wetlands and the areas around the 15,918 + 2198 wetlands of Maharashtra, in the 36 districts, including the water bodies and buffer areas such as the zones of influence and land use land cover areas.

As per clause 3 (Applicability of rules) of the Wetlands Conservation and Management Rules, 2017, the wetlands falling in areas covered under the Indian Forest Act, 1927, the Wild Life (Protection) Act, 1972, the Forest (Conservation) Act, 1980, the State Forest Acts, and the Coastal Regulation Zone Notification, 2019 as amended from time to time, are not covered under this proposal/ Contract Agreement.

4. Terms of Reference (ToR) proposed to be undertaken to address the scope of services

Refer Clause 20 of this contract agreement

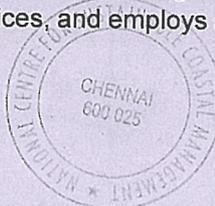
5. Performance of Service:

The Consultant shall perform its services in line with the Scope (as defined in Clause 20.2 of this contract agreement) and shall carry out its obligations hereunder with skill, care, diligence, efficiency and economy, in accordance with generally accepted techniques, prudent practice and with professional scientific and consulting standards. It shall also observe sound management and technical practices, and employs appropriate advanced

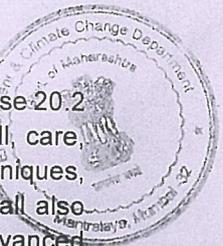
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technology and methods. The Consultant shall always, in respect to any matter relating to this Contract agreement, as faithful advisors/representatives to the Client support and safeguard the legitimate interest in any dealing with sub-contractors or third parties. The Consultant shall use reasonable endeavors to complete the Services within the time or programme agreed upon between the Parties.

6. Period of Consultancy:

- a) The total period of consultancy shall be 24 months. Delay in payment or receipt of Stakeholder data or review of draft maps/documents by the Client will correspondingly increase the project duration. In case the execution of contract involves more time on account of unforeseen conditions, a request in this regard will be made by the Consultant to extend the contract period.
- b) **Start date:** The start date will be the date on which the advance payment will be made by the client as stipulated in clause 14 a) of this agreement.
- c) **Milestones / Priority of completion:**

Milestone #1:

Preparation of wetland maps on 1:4000/1:10,000 scale (as per the Wetlands Conservation and Management Rules, 2017/Guidelines-2020), with the boundaries demarcated for the wetlands of three Revenue Divisions (Konkan, Pune & Nashik Divisions) of Maharashtra and submission of draft pdf maps to the Client: 10 months from start date.

Milestone #2:

Preparation of wetland maps on 1:4000/1:10,000 scale (as per the Wetlands Conservation and Management Rules, 2017/Guidelines-2020), with the boundaries demarcated for the wetlands of the remaining three Revenue Divisions (Chatrapati Sambhaji Nagar, Amravati & Nagpur Divisions) of Maharashtra and submission of draft pdf maps to the Client: 15 months from start date.

Milestone #3:

Demarcation of the Land use, Land cover and Zones of Influence for all the 18,116 wetlands as per the Wetlands Conservation and Management-Rules-2017 and Wetland Guidelines, 2020 and submission of the updated / revised draft pdf maps to the Client: 18 months from start date.

Milestone #4:

Incorporation of the ecological character of the wetlands and preparation of brief documents and assessment of tourism potential for each of the 18,116 wetlands and submission of the updated/ revised final pdf maps and pdf documents to the Client: 24 months from start date.

7. Obligation of Client:

Refer Clause 20.10 of this contract agreement.

8. Consultancy Cost:

The fixed fee/cost of the Consultancy contract for mapping of 18,116 identified wetlands is Rs 23,86,84,028 (Rupees twenty-three crore eighty-six lakh eighty-four thousand

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twenty-eight only, inclusive of 18% GST). Tax Invoice with Bank details will be sent to the client on receipt of work order.

The Revenue Division-wise cost for mapping of wetlands is given below.

Sl. No.	Name of Revenue Division (Headquarter)	Districts	Cost including GST (Rs)
1	<u>Konkan Division</u> (HQ: <u>Mumbai</u>) 7 districts	<u>Mumbai City District, Mumbai Suburban District, Thane, Palghar, Raigad, Ratnagiri, Sindhudurg</u>	1,40,39,028
2	<u>Pune Division</u> (HQ: <u>Pune</u>) 5 districts	<u>Sangli, Satara, Solapur, Kolhapur, Pune</u>	3,39,89,000
3	<u>Nashik Division</u> (HQ: <u>Nashik</u>) 5 districts	<u>Ahmednagar, Dhule, Jalgaon, Nandurbar, Nashik</u>	4,64,89,000
4	<u>Chatrapati Sambhaji Nagar Division</u> (HQ: Chatrapati Sambhaji nagar) 8 districts	<u>Chatrapati Sambhaji Nagar, Beed, Jalna, Nanded, Latur, Parbhani, Hingoli, Dharashiv</u>	5,79,89,000
5	<u>Amravati Division</u> (HQ: <u>Amravati</u>) 5 districts	<u>Akola, Amravati, Buldhana, Yavatmal, Washim</u>	2,29,89,000
6	<u>Nagpur Division</u> (HQ: <u>Nagpur</u>) 6 districts	<u>Bhandara, Chandrapur, Gadchiroli, Gondia Nagpur, Wardha</u>	6,31,89,000

Total cost: Rs 23,86,84,028 (Rupees twenty-three crore eighty-six lakh eighty-four thousand twenty-eight only, inclusive of 18% GST).

The cost quoted above is based on receipt of Cadastral data from the Environment & Climate Change Department, Maharashtra in Shapefiles/GIS/Geodatabase format. In case only hard copies/pdf copies of Cadastral maps are provided to NCSCM and NCSCM is required to Geo-reference, digitize and create Cadastral data in Shapefiles/GIS/Geodatabase format, then additional cost and time will be required to geo-reference and digitize the Cadastral maps, which will be intimated separately.

9. Variation of cost: Taxes are subject to change as per change in the law and the contract price will be adjusted (plus/minus) accordingly due to the impact of such changes in taxes.

10. Force Majeure

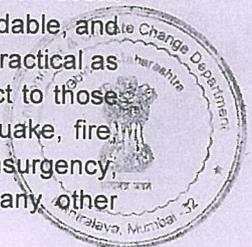
a. **Definition** For the purposes of this Contract, "Force Majeure" means an event which is beyond the reasonable control of a Party, is not foreseeable, is unavoidable, and makes a Party's performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible under the circumstances, and subject to those requirements, includes, but is not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other adverse weather conditions, strikes, protests, insurgency, lockouts, pandemics, lockdowns or other industrial action confiscation or any other action/inaction by Government agencies.

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Force Majeure shall not include (i) any event which is caused by the negligence or intentional action of a Party or such Party's Experts, Sub-consultants or agents or employees, nor (ii) any event which a diligent Party could reasonably have been expected to both take into account at the time of the conclusion of this Contract, and avoid or overcome in the carrying out of its obligations hereunder.

Force Majeure shall not include insufficiency of funds or failure to make any payment required hereunder.

b. **No Breach of Contract** The failure of a Party to fulfill any of its obligations hereunder shall not be considered to be a breach of, or default under, this Contract insofar as such inability arises from an event of Force Majeure, provided that the Party affected by such an event has taken all reasonable precautions, due care and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract.

c. **Measures to be Taken** A Party affected by an event of Force Majeure shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall take all reasonable measures to minimize the consequences of any event of Force Majeure.

A Party affected by an event of Force Majeure shall notify the other Party of such event as soon as possible, and in any case not later than fourteen (14) calendar days following the occurrence of such event, providing evidence of the nature and cause of such event, and shall similarly give written notice of the restoration of normal conditions as soon as possible. Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure. During the period of their inability to perform the Services as a result of an event of Force Majeure, the Consultant, upon instructions by the Client, shall either:

- (a) Demobilize, in which case the Consultant shall be reimbursed for additional costs they reasonably and necessarily incurred, and, if required by the Client, in reactivating the Services; or
- (b) Continue with the Services to the extent reasonably possible, in which case the Consultant shall continue to be paid under the terms of this Contract and be reimbursed for the cost of actual quantity of work completed on pro-rata basis as well as additional costs reasonably and necessarily incurred.
- (c) In the case of disagreement between the Parties as to the existence or extent of Force Majeure, the matter shall be settled according to Clause 17.

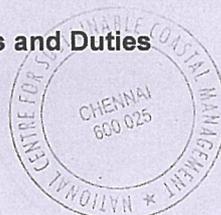
11. Access to Project Site

The Client warrants that the Consultant shall have, free of charge, unimpeded access to the project site in respect of which access is required for the performance of the Services. The Client will be responsible for any damage to the project site or any property thereon resulting from such access and will indemnify the Consultant and each of the experts in respect of liability for any such damage, unless such damage is caused by the willful default or negligence of the Consultant or any Sub-consultants or the Experts of either of them.

12. Change in the Applicable Law Related to Taxes and Duties

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If, after the date of this Contract, there is any change in the applicable law in the Client's country with respect to taxes and duties which increases or decreases the cost incurred by the Consultant in performing the Services, then the remuneration and reimbursable expenses otherwise payable to the Consultant under this Contract shall be increased or decreased accordingly by agreement between the Parties hereto, and corresponding adjustments shall be made to the ceiling amounts specified in Clause 8.

13. Modifications or Variations

Any modification or variation of the terms and conditions of this Contract, including any modification or variation of the scope of the Services, may only be made by written agreement between the Parties. However, each Party shall give due consideration to any proposals for modification or variation made by the other Party.

14. Payment Terms:

- a) 1st Instalment/Advance Payment (50%): Rs 11,93,42,014/= (Rupees eleven crore ninety-three lakh forty-two thousand fourteen only, inclusive of 18% GST), on execution of the contract agreement and on submission of Proforma Invoice by NCSCM.
- b) 2nd Instalment (20%): Rs 4,77,36,805/= (Rupees four crore seventy-seven lakh thirty-six thousand eight hundred and five only, inclusive of 18% GST), on completion of Milestone #1.
- c) 3rd Instalment (10%): Rs 2,38,68,403/= (Rupees two crore thirty-eight lakh sixty-eight thousand four hundred and three only, inclusive of 18% GST), on completion of Milestone #2.
- d) 4th Instalment (10%): Rs 2,38,68,403/= (Rupees two crore thirty-eight lakh sixty-eight thousand four hundred and three only, inclusive of 18% GST), on completion of Milestone #3.
- e) 5th Instalment (10%): Rs 2,38,68,403/= (Rupees two crore thirty-eight lakh sixty-eight thousand four hundred and three only, inclusive of 18% GST), on completion of Milestone #4.

Total cost: Rs 23,86,84,028 (Rupees twenty-three crore eighty-six lakh eighty-four thousand twenty-eight only, inclusive of 18% GST).

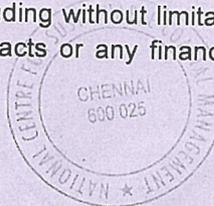
At every stage, the Consultant will raise separate invoice for an equal amount. Payment will be made after deduction of applicable statutory levy on this contract. The amount is to be remitted by Demand Draft drawn on a scheduled Bank in favour of Director, NCSCM, payable at Chennai or by RTGS / NEFT.

15. Limitation of Liability:

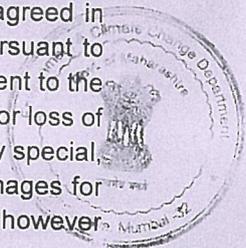
- a. The Consultant undertakes to exercise reasonable skill and care in performing the services, and shall be liable only for negligent failure in performing the Services.
- b. The Client and the Consultant agree that the total liability of the Consultant arising out of, or in connection with this agreement shall not, unless otherwise agreed in writing, exceed the amount of the Consultant's Fees actually realized pursuant to this agreement. Further, notwithstanding anything in this Contract Agreement to the contrary in no event shall the Consultant be liable for any direct damages for loss of profit, loss of production, loss of contracts or for any financial loss or for any special, indirect or consequential loss or damages including without limitation damages for loss of profit, loss of production, loss of contracts or any financial loss however

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caused including without limitation the fault, breach of contract, tort(including the concurrent or sole and exclusive negligence) breach of duty, strict liability or otherwise and whether a claim is based on contract , tort, at law in equity or otherwise.

16. Confidentiality:

The Consultant along with its personnel, employees, management, affiliates, agents, advisors and Consultants shall not disclose any property or confidential information/data relating to Project without the prior written consent of the Client.

17. Dispute Resolution:

17.1 All claims, disputes and other matters in question arising out of or related to this Contract agreement, which cannot be resolved amicably, shall be submitted to final and binding arbitration.

17.2 The arbitration will be conducted and administered in accordance with the Indian Arbitration and Conciliation Act 1996. The arbitral tribunal shall comprise of 3(three) arbitrators nominated as provided hereinafter. The consultant and the client shall each nominate one (1) arbitrator and the third arbitrator shall be selected by mutual agreement of the first two arbitrators.

17.3 All arbitration proceedings shall be conducted in the English language and the place of arbitration shall be Mumbai. The arbitral tribunal shall decide any dispute or claim referred before it, strictly in accordance with the governing law (which shall be Indian law). The arbitral award rendered by the arbitral tribunal shall be in writing and shall set forth in reasonable details the facts of the disputes and the reasons for the arbitrators' decision.

18. Governing Law:

This contact agreement shall be governed by and interpreted in accordance with laws in force in India.

19. General:

19.1 In the event any of the terms stated herein are contrary to any previous understanding, commitments or agreements whether written or oral between the Parties, the terms of this Contract agreement shall prevail.

19.2 Nothing in this contract agreement confers or purports to confer on any third party any benefit or any right to enforce any term of this Contract agreement.

19.3 The Consultant's relationship with the client is that of an independent service provider, and nothing in this Contract agreement is intended to, or should be construed to, create a partnership, agency, joint venture or employment relationship. The Consultant will not be entitled to any of the benefits, which the Client may make available to its employees.

20 TERMS OF REFERENCE

20.1 Background:

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Wetlands (Conservation and Management) Rules, 2017 were notified by the Ministry of Environment, Forest, and Climate Change (MoEF&CC) in accordance with the provisions of the Environment (Protection) Act, 1986, to serve as the legal framework for the conservation and management of wetlands in India. This is an important step towards preserving the natural integrity of the wetlands while allowing for wise and sustainable use. The Wetland Guidelines were published in the year 2020. The Environment & Climate Change Department, Government of Maharashtra have informed that there are 6 revenue divisions in the State of Maharashtra, in which the primary exercise of identification of wetlands was carried out by the District Authorities. A total of 15,918 Nos. of wetlands with area more than 2.5 Ha and 2198 Nos. of wetlands with area less than 2.5 Ha (Total 18,116) have been primarily identified. The State Government has requested NCSCM vide email dated 23/05/2023 to demarcate, conduct ground truthing and document the wetlands.

20.2 Scope of Work:

The present consultancy contract covers:

- 1) Demarcation of wetland boundaries of the identified 18,116 wetlands, supported by accurate digital maps with coordinates and validated by ground truthing.
- 2) Demarcation of the land use and land cover and zones of influence of the wetlands thereof, indicated in a digital map.
- 3) Description of the ecological character of the wetlands and preparation of Brief documents.
- 4) Assessment of tourism potential of the wetlands.
- 5) Submission of the final deliverables for each of the six Revenue divisions of Maharashtra namely, Konkan Division, Pune Division, Nashik Division, Chatrapati Sambhaji Nagar Division, Amravati Division and Nagpur Division, covering all the 36 districts of Maharashtra.

20.3 Approach for demarcation of the wetland boundary:

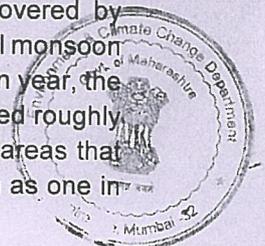
- i. Procurement of Satellite images / Topo sheets of the Survey of India, covering the wetland and the buffer areas around each wetland.
- ii. Procurement of Cadastral data and LIS covering areas of about 10 km around each wetland or covering the concerned village, in GIS/Shapefile format, from the district authorities/Divisional Commissioners/Revenue department/ Survey & Land records department, through the Environment & Climate Change Department, Government of Maharashtra.
- iii. Geo-referencing of Satellite images.
- iv. Demarcation of the wetland boundary as the boundary as the outer envelope of the maximum area under inundation, the area covered by hydrophytes, or saturation of soil near the surface during a normal monsoon year. The boundary should be such that during a normal monsoon year, the entire area is inundated for at least 15 days, or the soil is saturated roughly within one foot from the surface. It may be pertinent to exclude areas that are only intermittently inundated in the case of high floods (such as one in

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100-year floods) or extreme events (such as storm surges of extreme intensity).

- v. Preparation of draft wetland maps using a Geographical Information System (WGS84 datum and UTM projection) and adopting professional cartographic standards. Essential features to be included in the map are:
 - a) Cadastral data with survey plots and survey numbers.
 - b) Wetland boundary.
 - c) Boundary of settlements located within and around the wetland.
 - d) Connecting drainages, streams, inflows and outflows.
 - e) Main roads and railways (if any).
 - f) Major landmarks.
- vi. The scale of wetland maps recommended are:

Below 100 ha 1: 4000
 Between 100 – 500 ha 1: 10,000
 Between 500- 4000 ha 1: 25,000
 4000 ha and above 1: 50,000

However, as per para 31 of the Wetland Guidelines-2020, “...for expedience and cost effectiveness, a lower scale may be sufficient for meeting management needs”.
- vii. Ground truthing.

20.4 Approach for demarcation of the land use and land cover:

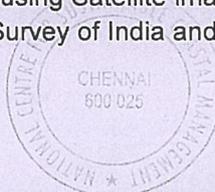
- i. Forests, Plantations, Agriculture, Roads, Railways, Settlements (Rural), Settlements (Urban), Industrial and other land use/land cover categories present in the mapping area (including wetland and catchment areas) will be mapped as per the standard (SAC) classification scheme, using Satellite images followed by field verification.
- ii. Demarcation of the land use and land cover in the wetland map.
- iii. Ground truthing.

20.5 Approach for demarcation of the zone of influence

- i) For each wetland to be notified, a zone of influence is to be defined. As per the Wetland Guidelines-2020, the zone of influence of a wetland is an area, developmental activities wherein, are likely to induce adverse changes in wetland ecosystem structure and (ecological) functioning.
- ii) The boundary of the zone of influence may be defined with due consideration to local hydrology and nature of land use. For wetlands with a well-defined surface drainage system, its directly and freely draining basin should be delineated as the zone of influence. This can be done using a suitable digital elevation model data and validated using toposheets. The basin should encompass all direct inflow as well as outflow areas.
- iii) For wetlands with diffused drainage and where the slope is too gentle leading to large basin area, the zone of influence can be delineated on the basis of features that are likely to influence wetland functioning adversely. These could be based on the outer periphery of adjoining settlements, or peripheral agricultural fields that drain directly into the wetland.
- iv) Determination of the zone of influence using Satellite images / available Digital Elevation Models, Topo sheets of the Survey of India and ground truthing.

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- v) Demarcation of the zone of influence in the wetland map.

20.6 Approach for Ecological character description

Ecological character is "the combination of ecosystem components, processes and services that typify the wetland at a given point in time." Ecosystem components are living (biotic) and non-living (abiotic) constituents of the wetland ecosystem, which include:

- a) Geomorphic setting (landscape, catchment, river basin).
- b) Climate (precipitation, wind, temperature, evaporation, humidity).
- c) Physical setting (area, boundaries, topography, shape, bathymetry, habitat type and connectivity).
- d) Water regime (inflow, outflow, balance, surface-groundwater interactions, inundation regime, tidal regime, quality).
- e) Wetland Soil (texture, chemical and biological properties);
- f) Biota (Plant and animal communities)

20.7 Approach for preparation of Brief document for each wetland

For each wetland proposed to be notified, a 'Brief Document' containing the following information needs to be prepared, as per the format given at Annex 2 of the Wetland Guidelines, 2020.

- a) Demarcation of wetland boundary, supported by accurate digital maps with coordinates and validated by ground truthing.
- b) Demarcation of its zone of influence along with land use and land cover thereof indicated in a digital map.
- c) Description of the wetland Ecological character.
- d) Incorporation of other information provided by the Environment & Climate Change Department, Maharashtra, as per Wetland Guidelines, 2020.

20.8 Approach to Assessment of tourism potential of Wetlands

- i. Assessment of tourism potential will be based on various parameters/indicators and variables:
 - Physical: Geographical terrain, accessibility, regional connectivity, accommodation and food facilities, water quality, other infrastructure facilities, existing tourism facilities.
 - Social: local culture & behaviour, safety and security, compatibility, community willingness, participation & contribution, etc.
 - Environment: Ecologically Sensitive, Pollution, Solid Waste Management, anthropogenic threat etc.
- ii. Assessment of Parameters/Indicators based on the following values:
 - Cultural values:
 - Importance of wetland for local people in their socio-economic setting along with its Heritage value, if any.
 - Necessity and significance of tourism in the area, possible threat to local culture, scope for local tourist circuits covering nearby cultural sites, food tourism, Fair tourism, etc.
 - Physical values:
 - Accessibility of the area, Infrastructure available, potential threats to visitors, aesthetical appeal.
 - Product Value:

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- Market appeal, advertisements, proximity to other tourist sites and potential of the site to engage tourist for longer duration.
 - Experiential values:
 - Worthiness and potential to offer good experience to tourist, capability to provide engaging, participatory and entertaining experience, meeting tourists' expectations.
 - Environmental:
 - Sustainable tourism and destination development, possible negative effects of tourism on the environment, habitat loss, pollution, pressure on flora & fauna, health hazards, etc.
 - Approximate carrying capacity of the wetland for sustainable tourism and mitigation measures for over tourism.
- iii. Tourism Policy of the State of Maharashtra.
- iv. Multi-criteria analysis for site suitability.
- v. Report preparation.

20.9 Study Area:

The Study area will be the wetlands and the areas around the 15,918 + 2198 wetlands of Maharashtra, in the 36 districts, including the water bodies and buffer areas such as the zones of influence and land use land cover areas.

As per clause 3 (Applicability of rules) of the Wetlands Conservation and Management Rules, 2017, the wetlands falling in areas covered under the Indian Forest Act, 1927, the Wild Life (Protection) Act, 1972, the Forest (Conservation) Act, 1980, the State Forest Acts, and the Coastal Regulation Zone Notification, 2011/2019 as amended from time to time, are not covered under this proposal/Contract Agreement.

20.10 Implementation Arrangements:

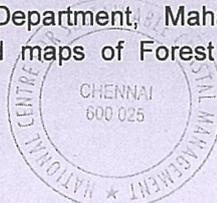
The scope of the work and related in tasks will be implemented by NCSCM.

20.11 Obligations of the Client / Environment & Climate Change Department, Maharashtra

- a) Environment & Climate Change Department, Maharashtra shall provide Cadastral data and LIS covering areas of about 10 km around each wetland or covering the concerned village, in GIS/Shapefile format and assist and facilitate NCSCM in collection of other digital data available with the Divisional Commissioners/Revenue department/ Survey & Land records department/ MRSAC/Environment & Climate Change Department, Maharashtra.
- b) Environment & Climate Change Department, Maharashtra shall permit NCSCM to undertake survey for collection of primary data (where essential) and facilitate NCSCM in providing secondary environmental and ecological data pertaining to all wetlands such as Geomorphic setting (landscape, catchment, river basin), Climate (precipitation, wind, temperature, evaporation, humidity), Physical setting (area, boundaries, topography, shape, bathymetry, habitat type and connectivity), hydrology (inflow, outflow, balance, surface-groundwater interactions, inundation regime, tidal regime, quality), Wetland Soil (texture, chemical and biological properties), Biota (Plant and animal species), etc, available with the Government departments/ agencies of the Government of Maharashtra.
- c) Environment & Climate Change Department, Maharashtra shall provide Shapefiles, Notifications and certified maps of Forest areas in Maharashtra,

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notified under the Indian Forest Act, 1927, the Wild Life (Protection) Act, 1972, the Forest (Conservation) Act, 1980 and the State Forest Acts, to exclude such Forest areas as well as CRZ areas as per clause 3 (Applicability of rules) of the Wetlands Conservation and Management Rules, 2017.

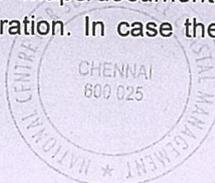
- d) Environment & Climate Change Department, Maharashtra shall provide Stakeholder data required for assessment of tourism potential of Wetlands, which are available with the Tourism Department and other Government departments/agencies of the Government of Maharashtra.
- e) Other Stakeholder data available with Environment & Climate Change Department.
- f) No provision has been made in this proposal towards the cost of such Stakeholder data (Cadastral data and LIS data in GIS/Shapefile format, secondary ecological data and other digital data already available with the Government departments of the State of Maharashtra), since Environment & Climate Change Department, Maharashtra will have free access to such data available with the Government departments of the State of Maharashtra and the same needs to be shared with NCSCM for wetland mapping.
- g) Account of pre-existing rights and privileges and determining 'wise use' of the wetlands.
- h) Developing a list of activities to be regulated and permitted.
- i) Notifying the wetlands under the Wetland Rules-2017.
- j) Developing an Integrated Management Plan.
- k) Constitution and operational matters of the Wetlands Authorities.
- l) Overlapping provisions.
- m) List of site-specific activities, to be permitted within the wetland and its zone of influence
- n) List of site-specific activities, to be regulated within the wetland and its zone of influence
- o) Modalities for enforcement of regulation.
- p) The Environment & Climate Change department, Maharashtra shall convene Stakeholder meetings between the district authorities/Divisional Commissioners/ Revenue department/ Survey & Land records department/MRSAC and other concerned line departments of Govt. of Maharashtra and NCSCM, for the collection of various Stakeholder data such as Cadastral data and LIS covering areas of about 10 km around each wetland or covering the concerned village, in GIS/Shapefile format, other digital data available with the Divisional Commissioners/ Revenue department/ Survey & Land records department/MRSAC, Maharashtra and Stakeholder data required for assessment of tourism potential of Wetlands. In addition, NCSCM will collect field data required for the purpose.
- q) The Environment & Climate Change department, Maharashtra shall facilitate easy access to the wetland sites for NCSCM Scientists/Staff, for ground truthing, by way of liaising with the Revenue/Police authorities of the districts and ensuring security for the NCSCM Scientists/Staff, as required.
- r) In case only hard copies/pdf copies of Cadastral maps are provided to NCSCM and NCSCM is required to Geo-reference, digitize and create Cadastral data in Shapefiles/ GIS/Geodatabase format, then additional cost and time will be required to geo-reference and digitize the Cadastral maps, which will be intimated separately.

20.12 Period of Consultancy:

- a) The total period of consultancy shall be 24 months. Delay in payment or receipt of Stakeholder data or review of draft maps/documents by the Client will correspondingly increase the project duration. In case the execution of contract

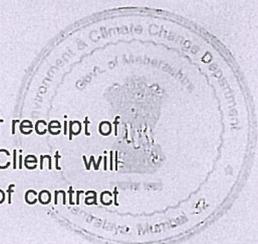
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involves more time on account of unforeseen conditions, a request in this regard will be made by the Consultant to extend the contract period.

- b) **Start date:** The start date will be the date on which the advance payment will be made by the client as stipulated in clause 14 a) of this agreement.
- c) **Milestones / Priority of completion:**

Milestone #1:

Preparation of wetland maps on 1:4000/1:10,000 scale (as per the Wetlands Conservation and Management Rules, 2017/Guidelines-2020), with the boundaries demarcated for the wetlands of three Revenue Divisions (Konkan, Pune & Nashik Divisions) of Maharashtra and submission of pdf maps to the Client: 10 months from start date.

Milestone #2:

Preparation of wetland maps on 1:4000/1:10,000 scale (as per the Wetlands Conservation and Management Rules, 2017/Guidelines-2020), with the boundaries demarcated for the wetlands of the remaining three Revenue Divisions (Chatrapati Sambhaji Nagar, Amravati & Nagpur Divisions) of Maharashtra and submission of pdf maps to the Client: 15 months from start date.

Milestone #3:

Demarcation of the Land use, Land cover and Zones of Influence for all the 18,116 wetlands and submission of the updated / revised pdf maps to the Client: 18 months from start date.

Milestone #4:

Incorporation of the ecological character of the wetlands and preparation of brief documents and assessment of tourism potential for each of the 18,116 wetlands and submission of the updated / revised pdf maps and pdf documents to the Client: 24 months from start date.

20.13 Budget / Cost Estimates:

The fixed fee of the Consultancy is Rs 23,86,84,028 (Rupees twenty-three crore eighty-six lakh eighty-four thousand twenty-eight only, inclusive of 18% GST). Tax Invoice with Bank details will be sent to the client on receipt of work order.

The cost quoted above is based on receipt of Cadastral data from the Environment & Climate Change Department, Maharashtra in Shapefiles/GIS/Geodatabase format. In case only hard copies/pdf copies of Cadastral maps are provided to NCSCM and NCSCM is required to Geo-reference, digitize and create Cadastral data in Shapefiles/GIS/Geodatabase format, then additional cost and time will be required to geo-reference and digitize the Cadastral maps, which will be intimated separately.

20.14 Deliverables for each of the six Revenue Divisions

- i) Wetland maps on 1:4,000/1:10,000 scale in pdf format, incorporating the Cadastral data, survey plots, wetland boundary, drainage, land use, land cover and the zone of influence and other features, as per the Wetland Guidelines-2020.
- ii) 'Brief Document' in pdf format for each wetland as per the format given at Annex 2 of the Wetland Guidelines-2020.
- iii) Reports on assessment of tourism potential for each wetland.

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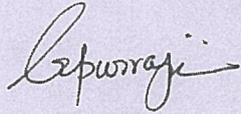
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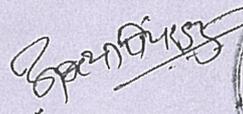


20.15 Guidelines

The "Guidelines for implementing Wetlands (Conservation and Management) Rules, 2017" published by the Ministry of Environment, Forest and Climate Change, Government of India in the year 2020, will be followed for preparation of the Wetland maps & documents.



Dr Purvaja Ramachandran
Director, NCSCM
Authorized Signatory
For and on behalf of Consultant



Authorized Signatory
For and on behalf of Client



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