

**BEFORE THE NATIONAL GREEN TRIBUNAL EASTERN ZONE BENCH,
KOLKATA**

Original Application 109/2024/EZ

IN THE MATTER OF:

Smt. Haripriya Patel.

... Applicant

VERSUS

State of Odisha & Ors.

... Respondent(s)

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**BEFORE THE NATIONAL GREEN TRIBUNAL
EASTERN ZONE BENCH, KOLKATA
ORIGINAL APPLICATION NO. 109/2024/EZ**

IN THE MATTER OF:

Smt. Haripriya Patel

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...Respondents

Manas Kumar Patasani
Notary Khordha
Sl. no. 033

03.1.2025

**AFFIDAVIT FILED BY THE DIVISIONAL FOREST OFFICER,
KHORDHA DIVISION - RESPONDENT NO. 3**

I, Ms. Poornima P aged about 33 years, presently working as Divisional Forest Officer, Khordha Division, Dist. Bhubaneswar, Odisha, do hereby solemnly affirm and state as follows:

1. That I am the Respondent No. 3 in the captioned petition. I have gone through the Original Application as well as the order dated 04.07.2024 passed by this Hon'ble Tribunal in the aforesaid case. I am also well acquainted with the facts of the case to swear this affidavit.
2. That this affidavit has been filed in compliance to the order dated 04.07.2024 of this Hon'ble Tribunal.
3. It is submitted that this Hon'ble Tribunal, vide order dated 04.07.2024, was pleased to direct the constitution of a committee to submit a report regarding the allegations as made in the letter petition. The relevant portion of the said order is extracted below:


 Divisional Forest Officer
 Khordha Division Khordha

Manas Kumar Patasani
Notary, Khordha ✓

"14. Considering the allegations made, we also deem it appropriate to constitute a Committee comprising of the following Members:-

- (i) Senior Scientist, Odisha State Pollution Control Board, and
- (ii) Divisional Forest Officer, Khordha,

15. The Committee shall visit the site in question and submit its Inspection Report with regard to the allegations made.

16. The Divisional Forest Officer, Khordha, shall be the Nodal Office for all logistic purposes and for filing the Report of the Committee on affidavit."

4. The deponent respectfully submits that, in compliance with the order dated 04.07.2024, the committee inspected the Kanjia and Kiakani lakes and the surrounding areas in Nandankanan on 02.08.2024 and 11.09.2024.
5. During the visit, samples were collected from the Kanjia and Kiakani lakes to assess water quality and pollutant levels. Th documents from the Deputy Director, Nandankanan, relating to the extent of the lake area, their inlets and outlets, previous water quality reports, flora and fauna, plantations undertaken in the catchment area, lake improvement measures, and the extent of encroachments were assessed and inspected in the field. Additionally, the Odisha Space Applications Centre was approached to assess changes in the lake area and forest cover.
A true copy of the committee report dated 24/12/2024 is annexed herewith and marked as **ANNEXURE R-3/1**.
6. That the contents of the above paragraphs are true and correct to the best of my knowledge, as derived from the official records, and that nothing material has been concealed therefrom

Basant Kumar Dash

IDENTIFIED BY: (Advocate)

3/1/25



Manas Kumar Patasani
Notary, Khordha

VERIFICATION

I, Ms. Poornima P aged about 33 years, presently working as Divisional Forest Officer, Khordha Division, Dist. Bhubaneshwar, Odisha, do hereby solemnly affirm and state that the contents of the above affidavit are true and correct to the best of my knowledge as derived from official records and that nothing material has been concealed therefrom.

Verified at Khordha on this 03rd day of January 2025

Poornima
Divisional Forest Officer
Khordha Division, Khordha
DEPONENT

Deponent having been identified by Sri. *Basant K. Dash*
Advocate, *Khordha*, on this *3rd*
day of *Jan 25* at *11.00* A.M./P.M.
Solemnly affirmed & stated before me
that the contents mentioned in this
Affidavit/Agreement are true to the
best of his/her knowledge, information
and belief.



Manas Kumar Patasani
Notary, Khordha

BEFORE THE NATIONAL GREEN TRIBUNAL
EASTERN ZONE BENCH, KOLKATA
ORIGINAL APPLICATION NO. 109/2024/EZ



IN THE MATTER OF:

Smt. Haripriya Patel

...Applicant

Versus

State of Odisha & Ors.

...Respondents

AFFIDAVIT

NO. 034/03.1.25

I, Poornima P., Divisional Forest Officer, Khordha, r/o at Divisional Forest Officer, Khordha, Odisha – 752055 do hereby solemnly affirm and state as under:-

1. That I am the Respondent No. 3 in the above noted case and I am well conversant with the facts and circumstances of the present case and therefore competent to depose about the same.
2. That I have read and understood the contents of the accompanying Inspection Report, which has been jointly prepared by me and the Senior Scientist of the Odisha State Pollution Control Board. I state that the contents of the said report are true and correct to the best of my knowledge and belief, based on the inspection carried out of the Kanjia and Kiakani lakes, located between Nandankanan Zoological Park and Nandankanan Botanical Garden.
3. That the Annexures annexed to the present inspection report are the true copies of their respective originals.

Identified by me
Bharat Dash
Advocate, Khordha
3/1/25

Poornima
Divisional Forest Officer
Khordha Division, Khordha
DEPONENT

VERIFICATION:

Verified on this 3rd day of January, 2025 that the contents of aforesaid paras are true and correct to the best of my knowledge and belief, no part of it is false and nothing has been concealed therefrom.

Deponent having been identified by Sri. *Bharat Dash* Advocate, Khordha on this 3rd day of Jan 25 at 1.05 P.M. Solemnly affirmed & stated before me that the contents mentioned in this Affidavit are true to the best of his knowledge & information.



Poornima
Divisional Forest Officer
Khordha Division, Khordha
DEPONENT

ANNEXURE R – 3/1

Committee Report on Kanjia and Kiakani lakes situated between Nandankanan Zoological Park and Nandankanan Botanical Garden as per the Direction of Hon'ble National Green Tribunal in OA 109/2024/EZ-Bench, Kolkata filed by Smt. Haripriya Patel

In compliance with the directions of the National Green Tribunal dated 04.07.2024, the committee consisting of the following members inspected the Kanjia and Kiakani lakes and the surrounding areas in Nandankanan on 02.08.2024 and 11.09.2024.

1. Divisional Forest Officer, Khordha and
2. Senior Scientist, Odisha State Pollution Control Board.

During the visit, samples were collected from Kanjia and Kiakani lakes to assess the water quality and pollutant levels. The documents from Deputy Director, Nandankanan relating to the extent of lake area, their inlets and outlets, previous water quality reports, flora and fauna, plantations undertaken in the catchment area, lake improvement measures, and extent of encroachments were assessed and inspected in the field. Further, Odisha Space Applications Centre was approached to assess the change in lake area and forest cover.

Notification and Area:

Both Kanjia and Kiakani lakes are a part of Nandankanan wildlife sanctuary which was notified by erstwhile Forest, Fisheries and Animal Husbandry Department vide notification No. 20682-8F(WL)-160/78 dtd 03.08.1979. The Eco-sensitive zone of the sanctuary was notified vide SO 4444(E) dtd 10.12.2019 of Ministry of Environment, Forest, and Climate Change. The notifications and maps are enclosed as Annexure 1, 2, 3.

The Kanjia lake measures 66 hectares in area as per the records and was listed as a wetland under the National Wetland Conservation and Management Programme (NWCMP) by the Ministry of Forests, Environment & Climate Change, Government of India in the year 2006. The Kiakani lake measures 25 hectares in area as per the records.

For the latest figures, Odisha Space Applications Centre was approached to provide data on change in the lake area over the past 10 years. Though the GIS area received from ORSAC is different from the recorded area, there has not been a drastic change in the overall lake area over the last 10 years. The map provided by ORSAC is enclosed as Annexure 4.

Change of Water Spread Area in Hectares of Kanjia and Kiakani Lakes		
Lake Name	Kanjia Lake	Kiakani Lake
Year 2014	60.63	20.88
Year 2024	60.80	20.58

Source: Odisha Space Applications Centre

P. S. S. S.
Divisional Forest Officer
Khordha Division

J. S. S.
Sr. Env. Scientist
S.P.C. Board, Odisha

Forest Cover:

The terrestrial vegetation spreads over 321 ha of the Nandankanan Wildlife sanctuary as per the management plan. The Nandankanan wildlife sanctuary is characterized by good forest cover and therefore only enrichments and gap plantations are undertaken. The map showing the forest cover as provided by Dy director Nandankanan is enclosed as annexure no 5. The list of enrichment plantations undertaken in the last 10 years is provided below.

Year of Plantation	No of Seedlings Planted
2014-15	5000
2019-20	1750
2021-22	350
2022-23	817
2023-24	1100
2024-25	3863

For the latest data on forest cover, Odisha Space Applications Centre was approached to provide data on change in forest cover the past 10 years. It is observed that there is an increase of 15.58 Ha of forest cover inside the Nandankanan Sanctuary. The forest cover maps of 2013 and 2024 are enclosed as annexure no. 6A and 6B respectively.

Change in Green Cover / Forest Cover of Nandankanan Wildlife Sanctuary	
YEAR	AREA (Ha)
2013	251.94
2024	267.52
Source: Odisha Space Applications Centre	

To assess whether any change in forest cover has happened in 4 km radius from the boundary of Nandankanan sanctuary, land-use land cover change in the last 10 years was received from ORSAC. It can be seen that there has not been a drastic change in the forest cover with only 5% reduction, and area under plantations-forest have increased by 79 %.

(Annexure 7A and 7B)

LANDUSE/ LANDCOVER CATEGORY OVER 4 KM RADIUS OF NANDANKANAN	AREA (Ha) in 2013	AREA (Ha) in 2024	% change
BUILT UP	784.97	1484.59	89%
PLOTTED LAND	563.75	1229.15	118%
ROAD	199.22	293.38	47%
RAILWAY	56.91	65.89	16%
BRIDGE	1.32	1.48	12%
MINING / DUMP	85.86	118.66	38%
BRICK KILN	133.61	70.49	47%
AGRICULTURE	3148.38	2300.23	27%

[Signature]

Env. Scientist

C. Board, Odisha

[Signature]
Divisional Forest Officer
Khordha Division

NON AGRICULTURAL LAND/ VACANT LAND	337.3	294	13%
FOREST	926.14	875.59	5.50%
PLANTATION - FOREST	63.06	112.75	79%
PLANTATION - HORTICULTURE	93.76	326.41	248%
TREE CLAD	71.47	154.66	54%
SCRUBLAND	1577.06	731.05	54%
MARSHY LAND	238.21	213.16	10.50%
WATERLOGGED	74.37	68.74	7.50%
WATERBODY - PONDS/ RESERVOIR	72.23	92.48	28%
WATERBODY - STREAMS/ RIVER/ CANAL	220.46	215.37	2.30%
TOTAL AREA	8648.08	8648.08	
Source: Odisha Space Applications Centre			

Lake Flora:


The lake vegetation is comprised of 10 species of submerged macrophytes, of which the predominant ones are *Ceratophyllum demersum* and *Hydrilla verticillata*. There are 14 species of free floating and rooted free floating macrophytes. Where there are floating species, the area is free from submerged macrophytes. The deep waters is dominated by *Salvinia cucullate*, *Nelumbo sp.* and *Nymphoids sp* while the shallow waters is dominated by *Euryale ferox* in the western part and *Eichhornia sp.* in the northern part of the lake. There are 24 species of emergent macrophytes that provide habitat for the water birds like Rails and Coots. Some of the tall species are *Typha angustata*, *Ludwigia sp.*, *Adenostemma sp.* and *Aeschynomene sp.* The list of submerged, floating, and emerged macrophytes are enclosed (Annexure -8).

Lake Fauna:

There are 39 species of birds, 14 species of reptiles and 41 species of fish, and 3 species of prawns (Annexure - 9). The result of waterfowl census conducted in January for the last 5 years is provided below.

Year	No of Birds
2020	1594
2021	1184
2022	1658
2023	1100
2024	1204


 Divisional Forest Officer
 Khordha Division


 Sr. Env. Scientist
 S.P.C. Board, Odisha

Water Quality:

Water samples were collected from 8 locations in Kanjia and Kiakani and tested for water quality parameters and pollutant levels. The lake exhibited eutrophic condition with presence of Nitrates, Phosphates and Sulfates and Dissolved Oxygen (DO) concentration of less than the prescribed (> 5 mg/l) in 4 out of 8 locations. Due to sufficient availability of nutrients such as Nitrates, Phosphates, and Sulphates, the lakes possess dense growth of hydrophytes, weeds, and wild grasses. The less exposure of the water to the sunlight due to dense growth might have reduced the DO levels. At all locations, Biological Oxygen Demand (BOD) is well within the prescribed range. The faecal coliform content is beyond the desirable 500 MPN/100 ml in 3 out of 8 locations. The water quality assessment report of scientists from State Pollution Control Board is enclosed as Annexure no.10.

Water quality assessment was also carried out in 2022 with the help of Wetland Research and Training Centre, Chilika Development Authority. The report highlighted that the water quality was good in Kanjia lake with parameters well within the range prescribed by Central Pollution Control Board. However, the DO levels were low in Kiakani lake and the lake was in meso-eutrophic condition. The Kanjia and Kiakani lake survey report is enclosed as annexure no 11.

Water Supply for the Zoo:

The Nandankanan Zoological Park consists of more than 4000 animals belonging to 168 species. Water requirement for the animals is met with water lifted from Kanjia and Kiakani lakes. Water is lifted from 7 different locations, treated through filtration and chlorination, and then provided to the zoo animals.


Effluent Discharge:

Nandankanan zoological park has its own waste management system and no effluents are released into the lakes.

Encroachments:

During inspection, no encroachments were found in the immediate vicinity of the lakes. However, Deputy Director, Nandankanan Zoological Park informed that there are few encroachments around the park area and that a survey will be carried out with the revenue authorities to ascertain the exact extent.


Divisional Forest Officer
Khordha Division


Sr. Env. Scientist
S.P.C. Board, Odisha

Lake Improvement Measures:

The following measures have been undertaken for improving the Kanjia and Kiakani lakes.

De-weeding: De-weeding is undertaken annually to remove the weeds from the surface of the lakes. The information on de-weeding in the last ten years in Kanjia lake is provided below. Dredging and weed removal were executed in the entire Kiakani lake in 2023-24 to excavate the silt accumulated in the lake from surface runoffs.

Years	Area of weed removal in Kanjia Lake in Sq meters
2014-15	-
2015-16	-
2016-17	71429
2017-18	49034
2018-19	-
2019-20	-
2020-21	22727
2021-22	83539 (119700 cum of desilting and dredging was also done)
2022-23	68458
2023-24	162338

Ban on the use of the diesel operating boats: For boating in Kanjia and Kiakani lakes, mechanized and diesel operating boats are banned. Only paddle and manually operated boats are deployed for providing the boating facility to visitors.

Bank Stabilization: Plantations have been carried out as per prescriptions in the management plan along the lake periphery. Stone patching was also executed around lake Kiakani to stabilize its banks.

Drainage Flow: The Kiakani lake water drains to Kanjia lake and Kanjia lake water drained out through the outlets to the private lands depicted as black rectangles in Annexure no 12. However, the outlets are blocked due to developments on those private lands. As the lakes receive water from inlets through surface run-off and there are no outlets to maintain the drainage flow, it results in inundation and flooding. To ensure good drainage flow, the Special Relief Commissioner of Odisha has approved a project for connecting Kanjia and Kiakani lakes to the Buddhi nala through a link drainage channel of 3.1 kms (Annexure- 13). The drainage


Divisional Forest Officer
Khordha Division


Sr. Env. Scientist

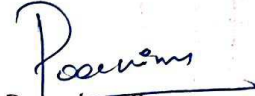
S.P.C. Board, Odisha

channel is 5.2 to 8 meters wide and 2 to 12 meters wide. It is designed to discharge 14.5 to 30 cumecs of water. The DPR of the project is enclosed as Annexure no. 14.

Aeration: As the lakes lack outlets and the existing outlets have been choked, the Nandankanan Zoological Park authority has installed 3 water fountains in Kanjia to provide aeration to the water bodies.



Dr. Sohan Giri
Senior Environmental Scientist,
And Regional Officer, SPCB, Odisha
Sr. Env. Scientist
S.P.C. Board, Odisha



Ms. Poojima P
Divisional Forest Officer,
Div. Khordha Forest Officer,
Khordha Division

Annex-I

FOREST, FISHERIES & A.H. DEPARTMENT

NOTIFICATION

The 3rd August, 1979 .

S.R.O.No.935/79- In exercise of the powers conferred by section 18 of the Wild Life (Protection) Act, 1972(53 of 1972), the State Government do hereby declared that the area, limits of which are specified in details in the schedule below including the entire bed of the Kanjin Lake and the Swamps, private land and Government land contained between the boundary described below situated in Chandaka P.S. and New Capital P.S. of Bhubaneswar Subdivision of Puri district to be a sanctuary to be known as Nandankanan Sanctuary for the purpose of protection, Propagation, development and research on Wild Life with effect from the date of issue of this notification.

SCHEDULE

PURI FOREST DIVISION

PURI DISTRICT

The north eastern boundary of the Sanctuary starts from the Forrest check-gate near Barang on the old Ganjam road and follows the boundary of Krishnagarh P.F. from Pillar No. 7 to 18. Then eastern boundary follows a straight line at a bearing of 1070 from Pillar No.18 and meets the forest road leading to Baranga Railway Station at Pillar No.19. Then it follows the forest road on the outer fringe and meets Nandankanan-Bhubaneswar P.W.D. Road at Pillar No.20. From this point the South-Eastern boundary of the Sanctuary goes in a straight line at a bearing of 2440.30" and meets the boundary Jujhagarh P.F. at Pillar No.22. Then it again follows a straight line at a bearing of 2120.30" and again meets the boundary of Jujhagarh P.F. at Pillar No.23. Then the Southern boundary of the Sanctuary follows the boundary of Jujhagarh P.F. and till meets the old Ganjam road at Pillar No.57. The north west boundary of the Sanctuary follows the Old Ganjam road in the outer fringe till it meets Pillar No.1 at the forest check-gate on old Ganjam road near Barang.

(No (20682)-SP (W) 160/78)
By order of the Governor
N. C. Boharila
Secy. to Govt.

True copy

ANDANKANAN ZOOLOGICAL MUSEUM
JANAPATHI FAHIDNAGAR, BBSR.

J. Mohi
Sr. Env. Scientist
Regional Office
S.P.C. Board

P. Prasad
Divisional Forest Officer
Khordha Division, Khordha

Annexure - II

रजिस्ट्री सं० डी० एल०-33004/99

REGD. NO. D. L.-33004/99



भारत का राजपत्र

The Gazette of India

असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)

PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित

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NEW DELHI, WEDNESDAY, DECEMBER 11, 2019/AGRAHAYANA 20, 1941

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 10 दिसम्बर, 2019

का.आ. 4444(अ).— प्रारूप अधिसूचना भारत के राजपत्र, असाधारण, में भारत सरकार के पर्यावरण, वन और जलवायु परिवर्तन, मंत्रालय की अधिसूचना सं. का.आ. 3263(अ), तारीख 5 जुलाई, 2018, द्वारा प्रकाशित की गई थी जिसमें ऐसे सभी व्यक्तियों से, जिनकी उससे प्रभावित होने की संभावना थी, उस तारीख से, जिसको उक्त अधिसूचना को अन्तर्विष्ट करने वाले राजपत्र की प्रतियां जनता को उपलब्ध करा दी गई थीं, साठ दिन की अवधि के भीतर आक्षेप और सुझाव आमंत्रित किए गए थे;

और, उक्त प्रारूप अधिसूचना को अन्तर्विष्ट करने वाले राजपत्र की प्रतियां जनता को तारीख 5 जुलाई, 2018, को उपलब्ध करा दी गई थी;

और, उक्त प्रारूप अधिसूचना के उत्तर में व्यक्तियों और पणधारियों से प्राप्त आक्षेपों और सुझावों पर केन्द्रीय सरकार द्वारा विचार किया गया था;

और, नंदनकानन वन्यजीव अभयारण्य उड़ीसा के 19 वन्यजीवों अभयारण्यों में से एक है, नंदनकानन प्राणी उद्यान को कंजिया झील और राज्य वनस्पति उद्यान के साथ वन्यजीव (संरक्षण) अधिनियम, 1972 के अन्तर्गत उड़ीसा सरकार द्वारा 3 अगस्त, 1979 को नंदनकानन वन्यजीव अभयारण्य के रूप में अधिसूचित किया गया जिसका क्षेत्रफल 4.37 वर्ग किलोमीटर और इसमें झुझागड और कृष्णानगर संरक्षित वन और प्राकृतिक ताजा जल झील कंजिया, राष्ट्रीय महत्वपूर्ण आर्द्रभूमि शामिल है, और नंदनकानन चंदाका-दम्पारा वन्यजीव अभयारण्य के निकट स्थित है;

और, नंदनकानन वन्यजीव अभयारण्य विभिन्न जंगली वनस्पतियों और जंगली पशुओं के लिए उत्कृष्ट वास प्रदान करता है। यह अभयारण्य का उड़ीसा राज्य की जंगली वनस्पतियों और जीवजंतुओं के वाह्य स्वस्थाने संरक्षण के एकीकरण के लिए विशेष स्थान है और समृद्ध वनस्पति विविधता भी है। यह नंदनकानन के संरक्षित क्षेत्र में लगभग 704 जंगली वनस्पतियों की प्रजातियों में से 142 परिवारों को

6386 GI/2019

(1)

Divisional Forest Officer
Khordha Division, Khordha

Env. Scientist
 Regional Office
 S.P.C. Board
 Bhubaneswar (Odisha)

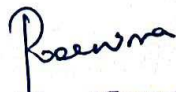
प्रलेखित किया गया है और अभयारण्य से महत्वपूर्ण वनस्पति ओय (वील्लेनिया रंम्दीका), चाम्पका (मिचेइलिया चाम्पका), उहांटी (अल्फोसेअ मादरास्पेइनिया), बरहिल (अन्नोना रेट्टेउइटा), नेउआ (अन्नुमः स्कूअरनोसा), चिनि चम्पा (अरटबोरटराय होकपेइलुस), पोटमोस्सु चम्पटी (पोल्याल्थिया केरासोइदेस), देबदरू (पोल्यालिहिया लोंगिफबल्लिया), गुअकोलि (पोइयाइथिया सुहेरोसा), मुसाकानी, अकांबिंदी (क्रिस्साम्पेलोस पेरइरा), दांदाहीया, दादाया (कोक्कुलुस हीरसुलुस), कालाजाटी नाइ (टीलिइटकोरा अकुमिनाटा), पदमा (नेल्ल-महो नुकिफेरा), अगरा (अर्जेमोने मेक्सिकाना), निफुरा (कप्परिस ब्रेविसपीना), असाधुआ (कप्परिस जेलनिका), बनासोरिसा (भेने विस्कोस), बरुना (क्रातिवा मगना), मदन मस्तक (ह्यबंधुस एनेस्परमुस), सुंदरी (हिकसा ओरेलना), खाकाडा (केसरिया ऐलीपलिका), मिरागु (फोलीगला आरवेंसिस), सुरेटा (पोलीकार्पोन प्रोस्ट्राटरन), बाडबलबलुआ (पोर्तुलाका ओलेराक्रिया), बलबलुका (पोर्तुलाका क्लाडरिफिडा), पौनाना (कैलोफी थुन इनोफीडरहू), चुरिआना (मेम्मिया सुरीगा), नगेसुर (सेसुआ फ्रेआ), वाना भेंडी (अबेरनोस्कोस मनिहोत), बानी, बनिया (हिबिस्कुस तिलिएमुस), बजरंतिलि (सीडा अकुटा) आदि अभिलिखित की गई है। यह वन्यजीव संरक्षण के लिए आगंतुकों के बीच जागरूकता उत्पन्न करने के लिए एक उत्कृष्ट स्थान रहा है और वन्यजीव अनुसंधान और प्रबंधन के लिए महत्वपूर्ण स्थल है;

और, नंदनकानन प्राणी उद्यान, में स्तनधारियों पक्षियों और सरीसृपों की 153 प्रजातियां, और मछलियों की 38 प्रजातियों का वास बढ रहा है। इसके अलावा, नंदनकानन वन्यजीव अभयारण्य मुक्त जंगली पशुओं, की कई प्रजातियों का वास स्थल है। अब तक, नंदनकानन वन्यजीव अभयारण्य के अंतर्गत स्तनधारियों की 13 प्रजातियां, पक्षियों की 71 प्रजातियां, सरीसृपों की 15 प्रजातियां, उभयचरों की 10 प्रजातियां, तितलियों की 85 प्रजातियां, ओडोनेटस की 54 प्रजातियां और मकड़ियों की 51 प्रजातियां प्रलेखित की गई है; अभयारण्य में मुख्य जीवजंतु सामान्य नेवला (हेरपेस्टेस इडवारदसि), सामान्य लंगूर (परेस्वयटीस इन्टेल्लुस), रीसस मैकाक्यू (मैकाका मुलैटा), तीन धारीदार पाम गिलहरी (फुनाम्लुस पलरननारियम), चूहा (रैटस रैटस), हार्स शूड बैट (रहिनोलोफोस लेपिडुस), भारतीय लोमड़ी (बुलपेस वैंगालेसिस), साल (मानिस क्रैसिकाउडाटा), ग्रे तीतर (फरांकोलिनस पोंदीकेरीअनुस), लार्जर गोल्डन वैकेद बुडपेकर (क्रिसोकोलेप्टस लुसिडस), भारतीय नीलकंठ पक्षी (कोरासिस बेंघालेंसिस), रूसेल्स सांप (दबोइआ रस्सेल्लै), कोबरा मोनोसेल्लाटा (नाजा नाजा कौउथिया), सामान्य भारतीय ब्राज वैक और ट्री श्लेक (डेन्ड्रेलाफिस टरिस्टिस), गिरगिट (चमेलेओन जेलानिक्स) आदि पाए जाते हैं; नंदनकानन वन्यजीव अभयारण्य से कुछ दुर्लभ जीवजंतु जंगली सूअर (सस स्कोरोटा), रेटल (मेल्लीवोरा कपेंसिस), भारतीय साही (हिस्ट्रीक्स इंडिका), माउस हिरण या भारतीय शेवरोटैन (ट्ररागुलुस मेमिन्ना), सामान्य एशियन मुसंग (परादाकूरुस हेरमाफरोदीटेस), सियार (कैनिस ऑरियस), बनबिलार (फेल्लस चाओस), छोटा भारतीय गंध बिलाव (विवेररिकुला इंडिका), धारीदार लकड़बग्घा (ह्येना ह्येना), इंडियन फ्लयिग लोमड़ी (पटरोपुस गिगंटूस), लाल जंगली मटरमुर्गा (गल्लुस गल्लुस मुर्गी), छोटी जंगली मुर्गी (गलोपेरडिक्स स्पॉडिसा), सामान्य टील (अनास क्रेक्का), गडवाल (अनास स्ट्रेपेरा), उत्तरी सीखपर (अनास अकुटा), बाररेड बुत्तैक्येइल (टुरनिकस सुसकिटाटोर), पीला मोर्चा चितकबरी और महरत्ता कठफोडवा (डेड्रोकोपोस महाराट्टेंसिस), स्माल ग्रीन वारवेट (मेगलाइमा विरिदिस), कॉपर-स्मिथ वारवेट (मेगाइमा हेमाकेफला), ब्राउन-हेडेड वारवेट (मेगलैमा जेलनिका), सामान्य हुदहुद (उपउपा एपोप्स), ब्लू पतेना (मेरोप्स फिलिप्पिनस), येलो मॉनिटर लिज़ार्ड (वारानुस फल्वेस्केंस), बांडेड करैत (बुंगेरुस फससटस), चैक्रेड कील वैक (क्सेनोक्रोफिस पीसकटोर), सामान्य ग्रीन व्हिप श्लेक (अहैतुल्ला नसुता) आदि अभिलिखित किए गए हैं। यह भारतीय मूल के पक्षियों की संख्या साल भर यहां रहती है और संरक्षित क्षेत्र के अंतर्गत ओपन बिल्ल स्ट्रोक, पर्पल मौरहेन, जकना, रेड जंगली पक्षी, भारतीय मोर, कोइल, बगुला, इगरेटस आदि का प्रजनन अभिलिखित किया गया है;

और, नंदनकानन वन्यजीव अभयारण्य के चारों ओर के क्षेत्र को, जिसका विस्तार और सीमाएं पारिस्थितिकी पर्यावरणीय से पारिस्थितिकी संवेदी जोन के रूप में पैरा 1 में विनिर्दिष्ट हैं, जैव विविधता की दृष्टि सुरक्षित और संरक्षित करना और उक्त पारिस्थितिकी संवेदी जोन में उद्योगों या उद्योगों के वर्गों के प्रचालन और प्रसंस्करण करने को प्रतिषिद्ध करना आवश्यक है;

अतः, अब, केन्द्रीय सरकार, पर्यावरण (संरक्षण) नियम, 1986 के नियम 5 के उपनियम (3) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उपधारा और (1) उपधारा (2) के खंड (v) और खंड (xiv) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, उड़ीसा राज्य के कट्टक और खोरधा जिला में नंदनकानन वन्यजीव अभयारण्य की सीमा के चारों ओर 0 (शून्य) से 340 मीटर तक विस्तारित क्षेत्र को नंदनकानन वन्यजीव अभयारण्य पारिस्थितिकी संवेदी जोन (जिसे इसके पश्चात् इस अधिसूचना में पारिस्थितिकी संवेदी जोन कहा गया है), के रूप में अधिसूचित करती है, जिसके विवरण निम्नानुसार है, अर्थात् :-


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1. पारिस्थितिकी संवेदी जोन का विस्तार और उसकी सीमाएं- (1) पारिस्थितिकी संवेदी जोन का विस्तार नंदनकानन वन्यजीव अभयारण्य की सीमा के चारों ओर 0 (शून्य) से 340 मीटर तक विस्तृत है और पारिस्थितिकी संवेदी जोन का क्षेत्रफल 1.31 वर्ग किलोमीटर है। जिसमें कटुक जिला में 0.18 वर्ग किलोमीटर और खोरधा जिला में 1.13 वर्ग किलोमीटर क्षेत्र आता है। अभयारण्य की उत्तरी सीमा में पारिस्थितिकी संवेदी जोन का विस्तार शून्य मीटर प्रस्तावित है (अर्थात् सीमा स्तंभ सं. 131 से 137) के निकटवर्ती पी.डब्ल्यू. डी सड़क के साथ चंदाका-दम्पारा अभयारण्य के साथ सह-विस्तारी है।

(2) नंदनकानन वन्यजीव अभयारण्य और इसके पारिस्थितिकी संवेदी जोन की सीमा का विवरण उपाबंध-I के रूप में संलग्न है।

(3) सीमा विवरण और अक्षांश और देशांतर के साथ पारिस्थितिकी संवेदी जोन के सीमांकन नंदनकानन वन्यजीव अभयारण्य के मानचित्र उपाबंध-Iक, उपाबंध-IIख और उपाबंध-IIIग के रूप में संलग्न है।

(4) पारिस्थितिकी संवेदी जोन और नंदनकानन वन्यजीव अभयारण्य की सीमा के भू-निर्देशांकों की सूची उपाबंध III की सारणी क और सारणी ख में दी गई है।

(5) मुख्य बिंदुओं के भू-निर्देशांकों के साथ पारिस्थितिकी संवेदी जोन के अंतर्गत आने वाले ग्रामों की सूची उपाबंध IV के रूप में संलग्न है।

2. पारिस्थितिकी संवेदी जोन के लिए आंचलिक महायोजना- (1) राज्य सरकार, पारिस्थितिकी संवेदी जोन के प्रयोजनों के लिए राजपत्र में इस अधिसूचना के प्रकाशन की तारीख से दो वर्ष की अवधि के भीतर, स्थानीय व्यक्तियों के परामर्श से और राज्य के सक्षम प्राधिकारी के अनुमोदन के लिए इस अधिसूचना में दिए गए अनुबंधों का पालन करते हुए आंचलिक महायोजना तैयार करेगी।


(2) राज्य सरकार द्वारा पारिस्थितिकी संवेदी जोन के लिए आंचलिक महायोजना ऐसी रीति से जो इस अधिसूचना में विनिर्दिष्ट किए गए हैं के अनुसार तथा सुसंगत केंद्रीय और राज्य विधियों के अनुरूप और केंद्रीय सरकार द्वारा जारी मार्गनिर्देशों, यदि कोई हों, द्वारा तैयार होगी।

(3) आंचलिक महायोजना, उक्त योजना में पारिस्थितिकी और पर्यावरणीय बातों को समाकलित करने के लिए राज्य सरकार के निम्नलिखित विभागों के परामर्श से तैयार होगी:-

- (i) पर्यावरण;
- (ii) वन और वन्यजीव;
- (iii) कृषि;
- (iv) राजस्व;
- (v) हाउसिंग और शहरी विकास;
- (vi) पर्यटन;
- (vii) ग्रामीण विकास;
- (viii) सिंचाई और बाढ़ नियंत्रण;
- (ix) नगरपालिका;
- (x) उड़ीसा राज्य प्रदूषण नियंत्रण बोर्ड;
- (xi) पंचायती राज; और
- (xii) लोक निर्माण विभाग (भवन और सड़के)।

(4) आंचलिक महायोजना अनुमोदित विद्यमान भू-उपयोग, अवसंरचना और क्रियाकलापों पर कोई निर्बंधन अधिरोपित नहीं करेगी जब तक कि इस अधिसूचना में इस प्रकार विनिर्दिष्ट न हो और आंचलिक महायोजना सभी अवसंरचना और क्रियाकलापों में जो अधिक दक्षता और पारिस्थितिकी अनुकूल हों का संवर्धन करेगी।

(5) आंचलिक महायोजना में अनाच्छादित क्षेत्रों के जीर्णोद्धार, विद्यमान जल निकायों के संरक्षण, आवाह क्षेत्रों के प्रबंधन, जल-संभरों के प्रबंधन, जल संभर प्रबंधन, मृदा और नमी संरक्षण, स्थानीय समुदायों की आवश्यकताओं तथा पारिस्थितिकी और पर्यावरण से संबंधित ऐसे अन्य पहलुओं, जिन पर ध्यान देना आवश्यक है, के लिए उपबंध होंगे।


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(6) आंचलिक महायोजना विद्यमान और प्रस्तावित भूमि उपयोग विशेषताओं के व्यौरों से अनुसूचित मानचित्र के साथ सभी विद्यमान पूजा स्थलों, ग्रामों और नगरीय बस्तियों, वनों के प्रकार और किस्मों, कृषि क्षेत्रों, ऊपजाऊ भूमि, हरित क्षेत्र जैसे उद्यान और उमी प्रकार के स्थान, उद्यान कृषि क्षेत्र, फलोउद्यान, झीलों और अन्य जल निकायों का अभ्यंकन करेगी।

(7) आंचलिक महायोजना पारिस्थितिकी संवेदी जोन में विकास को विनियमित करेगी और सारणी में सूचीबद्ध पैरा-4 में प्रतिषिद्ध और विनियमित क्रियाकलापों का अनुपालन करेगी और स्थानीय समुदायों की जीविका को सुरक्षित करने के लिए पारिस्थितिकी अनुकूल विकास को सुनिश्चित और उसकी अभिवृद्धि भी करेगी।

(8) आंचलिक महायोजना प्रादेशिक विकास योजना की सह-विस्तारी होगी।

(9) इस प्रकार अनुमोदित आंचलिक महायोजना इस अधिसूचना के उपबंधों के अनुसार मानीटरी के अपने कार्यों को करने के लिए मानीटरी समिति के लिए एक संदर्भ दस्तावेज तैयार करेगी।

3. राज्य सरकार द्वारा किए जाने वाले उपाय.- राज्य सरकार इस अधिसूचना के उपबंधों को प्रभावी करने के लिए निम्नलिखित उपाय करेगी, अर्थात्:-

(1) भू-उपयोग.- (क) पारिस्थितिकी संवेदी जोन में वनों, उद्यान कृषि क्षेत्रों, कृषि क्षेत्रों, मनोरंजन के प्रयोजनों के लिए चिन्हित किए गए पार्कों और खुले स्थानों का वाणिज्यिक या आवासीय या औद्योगिक संबद्ध विकास क्रियाकलापों के लिए उपयोग या संपरिवर्तन नहीं होगा:-

परंतु पारिस्थितिकी संवेदी जोन के भीतर भाग (क) में विनिर्दिष्ट प्रयोजनों से भिन्न प्रयोजन के लिए कृषि और अन्य भूमि का संपरिवर्तन मानीटरी समिति की सिफारिश पर और यथा लागू और क्षेत्रीय नगर योजना अधिनियम और केन्द्रीय सरकार या राज्य सरकार के अन्य नियमों तथा विनियमों के अधीन सक्षम प्राधिकारी के पूर्व अनुमोदन से, और इस अधिसूचना के उपबंधों द्वारा स्थानीय निवासियों की निम्नलिखित आवासीय आवश्यकताओं को पूरा करने के लिए अनुज्ञात किया जाएगा, जैसे-

(i) विद्यमान सड़कों को चौड़ा करना और उन्हें सुदृढ़ करना तथा नई सड़कों का संनिर्माण;

(ii) बुनियादी ढांचों और नागरिक सुविधाओं का संनिर्माण और नवीकरण;

(iii) प्रदूषण उत्पन्न न करने वाले लघु उद्योग;

(iv) कुटीर उद्योगों जिनके अंतर्गत ग्रामीण उद्योग भी हैं; सुविधाजनक भण्डार और स्थानीय सुविधाएं सहायक पारिस्थितिकी पर्यटन जिसके अन्तर्गत ग्रह वास सम्मिलित है; और

(v) पैरा 4 के अधीन दिए गए संबन्धित क्रियाकलाप:

परंतु यह और कि प्रादेशिक नगर योजना अधिनियम और राज्य सरकार के अन्य नियमों और विनियमों के अधीन सक्षम प्राधिकारी के पूर्व अनुमोदन और संविधान के अनुच्छेद 244 के उपबंधों या तत्समय प्रवृत्त विधि के उपबंधों के अनुपालन के बिना, जिसके अन्तर्गत अनुसूचित जनजाति और अन्य परंपरागत वन निवासी (वन अधिकारों की मान्यता) अधिनियम, 2006 (2007 का 2) भी है, वाणिज्यिक या औद्योगिक विकास क्रियाकलापों के लिए जनजातीय भूमि का उपयोग अनुज्ञात नहीं होगा:

परंतु यह और भी कि पारिस्थितिकी संवेदी जोन के भीतर भू-अभिलेखों में उपसंजात कोई गलती, मानीटरी समिति के विचार प्राप्त करने के पश्चात् राज्य सरकार द्वारा प्रत्येक मामले में एक बार ठीक होगी और उक्त गलती के सुधार की सूचना केंद्रीय सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को दी जाएगी:

परंतु यह और भी कि गलती के संशोधन में इस उप पैरा के अधीन यथा उपबंधित के सिवाय किसी भी दशा में भू-उपयोग का परिवर्तन सम्मिलित नहीं होगा।

(ख) वनीकरण तथा वास जीर्णोद्धार क्रियाकलापों सहित अनप्रयुक्त या अनुत्पादक कृषि क्षेत्रों में पुनः वनीकरण करने के प्रयास किए जाएंगे।

(2) प्राकृतिक जल स्रोतों.- आंचलिक महायोजना में सभी प्राकृतिक जल स्रोतों नदियों और जलमार्गों के आवाह क्षेत्रों की पहचान की जाएगी और उनके संरक्षण और नवीकरण के लिए योजना सम्मिलित होगी और राज्य सरकार द्वारा ऐसे क्षेत्रों पर या उनके निकट विकास क्रियाकलाप प्रतिषिद्ध करने के बारे में जो ऐसे क्षेत्रों के लिए अहितकर हो ऐसी रीति से मार्गदर्शक सिद्धांत तैयार किए जाएंगे।


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(3) पर्यटन या पारिस्थितिकी पर्यटन.- (क) पारिस्थितिकी संवेदी जोन के भीतर सभी नए पारिस्थितिकी पर्यटन क्रियाकलाप या विद्यमान पर्यटन क्रियाकलापों का विस्तार पर्यटन महायोजना के अनुसार पारिस्थितिकी संवेदी जोन के लिए होगा।

(ख) पर्यटन महायोजना राज्य पर्यटन विभाग द्वारा राज्य पर्यावरण और वन विभाग के परामर्श से तैयार होगी।

(ग) पर्यटन महायोजना आंचलिक महायोजना के एक घटक के रूप में होगी।

(घ) पर्यटन महायोजना पारिस्थितिकी संवेदी जोन की वहन क्षमता के आधार पर तैयार की जाएगी।

(ङ) पारिस्थितिकी पर्यटन संबंधी क्रियाकलाप निम्नानुसार विनियमित होंगे:-

(i) संरक्षित क्षेत्र की सीमा से एक किलोमीटर के भीतर या पारिस्थितिकी संवेदी जोन के विस्तार तक, इनमें जो भी निकट है, नये वाणिज्यिक होटल और सैरगाह के सन्निर्माण अनुज्ञात नहीं होंगे:

परंतु, संरक्षित क्षेत्र की सीमा से एक किलोमीटर की दूरी से परे पारिस्थितिकी संवेदी जोन के विस्तार तक होटलों और रिजॉर्ट का स्थापन केवल पूर्व परिभाषित और नामनिर्दिष्ट क्षेत्रों में पर्यटन महायोजना के अनुसार पारिस्थितिकी पर्यटन सुविधाओं के लिए ही अनुज्ञात होगा;

(ii) पारिस्थितिकी संवेदी जोन के भीतर नए पर्यटन क्रियाकलापों या विद्यमान पर्यटन क्रियाकलापों का विस्तार केंद्रीय सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के मार्गदर्शक सिद्धांतों के द्वारा तथा राष्ट्रीय व्याघ्र संरक्षण प्राधिकरण, द्वारा जारी पारिस्थितिकी-पर्यटन, पारिस्थितिकी-शिक्षा और पारिस्थितिकी-विकास पर बल देते हुए (समय-समय पर यथा संशोधित) जारी मार्गदर्शक सिद्धांतों के अनुसार होगा;

(iii) आंचलिक महायोजना का अनुमोदन किए जाने तक, पर्यटन के लिए विकास और विद्यमान पर्यटन क्रियाकलापों के विस्तार को वास्तविक स्थल विनिर्दिष्ट संवेदी और मानीटरी समिति की सिफारिश पर आधारित संबंधित विनियामक प्राधिकरणों द्वारा अनुज्ञात किया जाएगा और पारिस्थितिकी संवेदी जोन के भीतर किसी नये होटल या रिजॉर्ट या वाणिज्यिक स्थापना का सन्निर्माण अनुज्ञात नहीं किया जायेगा।

(4) नैसर्गिक विरासत.- पारिस्थितिकी संवेदी जोन में महत्वपूर्ण नैसर्गिक विरासत के सभी स्थलों जैसे जीन कोश आरक्षित क्षेत्र, शैल विरचनाएं, जल प्रपातों, झरनों, घाटी मार्गों, उपवनों, गुफाएं, स्थलों, भ्रमण, अश्वरोहण, प्रपातों आदि की पहचान की जाएगी और विरासत संरक्षण योजना आंचलिक महायोजना के भाग के रूप में परिरक्षण और संरक्षण के लिए तैयार की जाएगी।

(5) मानव निर्मित विरासत स्थल.- पारिस्थितिकी संवेदी जोन में भवनों, संरचनाओं, शिल्प-तथ्य, ऐतिहासिक, स्थापत्य, सौंदर्यपूरक और सांस्कृतिक महत्व के क्षेत्रों की और उपक्षेत्रों की पहचान और उनके संरक्षण के लिए विरासत योजना आंचलिक महायोजना के भाग के रूप में तैयार की जाएगी।

(6) ध्वनि प्रदूषण.- पर्यावरण अधिनियम के अधीन ध्वनि प्रदूषण (विनियमन और नियंत्रण) नियम, 2000 में नियत उपबंधों के अनुसार पारिस्थितिकी संवेदी जोन में ध्वनि प्रदूषण के नियंत्रण और निवारण का अनुपालन किया जाएगा।

(7) वायु प्रदूषण.- पारिस्थितिकी संवेदी जोन में, वायु प्रदूषण के निवारण और नियंत्रण का वायु (प्रदूषण निवारण और नियंत्रण) अधिनियम, 1981 (1981 का 14) और उसके अधीन बनाए गए नियमों के उपबंधों के अनुसार अनुपालन किया जाएगा।

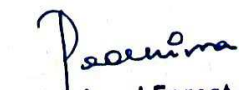
(8) बहिष्कार का निस्सारण.- पारिस्थितिकी संवेदी जोन में उपचारित बहिष्कार का निस्सारण, साधारण मानकों के उपबंधों के अनुसार पर्यावरणीय अधिनियम और उसके अधीन बनाए गए नियमों के अधीन आने वाले पर्यावरणीय प्रदूषण के निस्सारण के लिए साधारण मानकों या राज्य सरकार द्वारा नियत मानकों, जो भी अधिक कठोर हो, के उपबंधों के अनुसार होगा।

(9) टोस अपशिष्ट.- टोस अपशिष्ट का निपटान और प्रबंधन निम्नानुसार किया जाएगा:-

(क) पारिस्थितिकी संवेदी जोन में टोस अपशिष्ट का निपटान और प्रबंधन भारत सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय की अधिमूचना सं. का.शा. 1357(अ), तारीख 8 अप्रैल, 2016 द्वारा प्रकाशित टोस अपशिष्ट प्रबंधन नियम, 2016, के उपबंधों के अनुसार किया जाएगा। अकार्बनिक पदार्थों का निपटान पारिस्थितिकी संवेदी जोन से बाहर चिन्हित किए गए स्थानों पर पर्यावरण-अनुकूल रीति से किया जाएगा;

(ख) पारिस्थितिकी संवेदी जोन में मान्य प्रौद्योगिकियों (ईएसएम) का उपयोग करते हुए विद्यमान नियमों और विनियमों के अनुरूप टोस अपशिष्ट का सुरक्षित और पर्यावरण-अनुकूल प्रबंधन अनुज्ञात किया जा सकेगा।


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(10) **जैव चिकित्सा अपशिष्ट.-** जैव चिकित्सा अपशिष्ट का प्रबंधन निम्नानुसार किया जाएगा:-

(क) पारिस्थितिकी संवेदी जोन में जैव चिकित्सा अपशिष्ट का निपटान भारत सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय की अधिसूचना सं.सा.का.नि 343 (अ), तारीख 28 मार्च, 2016, द्वारा प्रकाशित जैव चिकित्सा अपशिष्ट प्रबंधन नियम, 2016 के उपबंधों के अनुसार किया जाएगा।

(ख) पारिस्थितिकी संवेदी जोन में मान्य प्रौद्योगिकियों का उपयोग करते हुए विद्यमान नियमों और विनियमों के अनुरूप जैव-चिकित्सा अपशिष्ट का सुरक्षित और पर्यावरण-अनुकूल प्रबंधन अनुज्ञात किया जा सकेगा।

(11) **प्लास्टिक अपशिष्ट प्रबंधन.-** पारिस्थितिकी संवेदी जोन में प्लास्टिक अपशिष्ट प्रबंधन का निपटान भारत सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय की समय-समय पर यथासंशोधित अधिसूचना सं.सा.का.नि 340(अ), तारीख 18 मार्च, 2016, द्वारा प्रकाशित प्लास्टिक अपशिष्ट प्रबंधन नियम, 2016 के उपबंधों के अनुसार किया जाएगा।

(12) **निर्माण और विध्वंस अपशिष्ट प्रबंधन.-** पारिस्थितिकी संवेदी जोन में संनिर्माण और विध्वंस अपशिष्ट प्रबंधन का निपटान भारत सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय की समय-समय पर यथासंशोधित अधिसूचना सं.सा.का.नि 317(अ), तारीख 29 मार्च, 2016, द्वारा प्रकाशित संनिर्माण और विध्वंस प्रबंधन नियम, 2016, के उपबंधों के अनुसार किया जाएगा।

(13) **ई-अपशिष्ट.-** पारिस्थितिकी संवेदी जोन में ई-अपशिष्ट प्रबंधन का निपटान भारत सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय द्वारा, समय-समय पर यथासंशोधित, प्रकाशित ई-अपशिष्ट प्रबंधन नियम, 2016, के उपबंधों के अनुसार किया जाएगा।

(14) **यानीय यातायात.-** यातायात की यानीय गतिविधियां आवास के अनुकूल विनियमित होंगी और इस संबंध में आंचलिक महायोजना में विशेष उपबंध सम्मिलित किए जाएंगे और आंचलिक महायोजना के तैयार होने और राज्य सरकार के सक्षम प्राधिकारी द्वारा अनुमोदित होने तक, मानीटरि समिति सुसंगत अधिनियमों और उसके अधीन बनाए गए नियमों और विनियमों के अनुसार यानीय क्रियाकलापों के अनुपालन को मानीटर करेगी।

(15) **यानीय प्रदूषण.-** लागू विधियों के अनुपालन में यानीय प्रदूषण का निवारण और नियंत्रण किया जाएगा और स्वच्छक ईंधन के उपयोग के लिए प्रयास किए जाएंगे।

(16) **औद्योगिक ईकाइयां.-** (i) राजपत्र में इस अधिसूचना के प्रकाशन पर या उसके पश्चात पारिस्थितिकी संवेदी जोन के भीतर किसी नए प्रदूषण करने वाले उद्योगों की स्थापना अनुज्ञात नहीं की जाएगी;


(ii) केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा फरवरी, 2016 में जारी मार्गदर्शक सिद्धान्तों में उद्योगों के वर्गीकरण के अनुसार, जब तक कि अधिसूचना में इस प्रकार विनिर्दिष्ट न हो; पारिस्थितिकी संवेदी जोन के भीतर केवल गैर- प्रदूषणकारी उद्योगों को अनुज्ञात किया जाएगा और इसके अतिरिक्त, गैर प्रदूषणकारी उद्योगों को बढ़ावा दिया जाएगा।

(17) **पहाड़ी ढलानों को संरक्षण.-** पहाड़ी ढलानों का संरक्षण निम्नानुसार होगा:-

(क) आंचलिक महायोजना पहाड़ी ढलानों पर क्षेत्रों का संकेत होगा जहां किसी भी संनिर्माण की अनुमति नहीं दी जाएगी;

(ख) कटाव के एक उच्च डिग्री के साथ विद्यमान खड़ी पहाड़ी ढलानों या ढलानों पर किसी भी संनिर्माण की अनुमति नहीं दी जाएगी।

4. **पारिस्थितिकी संवेदी जोन में प्रतिषिद्ध और विनियमित किए जाने वाले क्रियाकलापों की सूची.-** पारिस्थितिकी संवेदी जोन में सभी क्रियाकलाप पर्यावरण अधिनियम के उपबंधों और उसके अधीन बनाए गए नियमों जिसके अन्तर्गत तटीय विनियमन जोन अधिसूचना 2011 और पर्यावरणीय समाघात निर्धारण अधिसूचना, 2006 और अन्य लागू विधियों के जिसमें वन (संरक्षण) अधिनियम, 1980 (1980 का 69), भारतीय वन अधिनियम, 1927 (1927 का 16), वन्यजीव (संरक्षण) अधिनियम, 1972 (1972 का 53) सम्मिलित हैं और किये गये मंशोधनों द्वारा शासित होंगे और नीचे दी गई सारणी में विनिर्दिष्ट रीति में विनियमित होंगे, अर्थात् :-


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क्रम सं. (1)	क्रियाकलाप (2)	वर्णन (3)
क. प्रतिषिद्ध क्रियाकलाप		
1.	वाणिज्यिक खनन, पत्थर उत्खनन और अपघर्षण इकाईयां।	(क) सभी प्रकार के नए और विद्यमान खनन (लघु और वृहत खनिज), पत्थर की खानों और उनको तोड़ने की इकाइयां वास्तविक स्थानीय निवासियों की घरेलू आवश्यकताओं जिसमें निजी उपयोग के लिए मकानों के संनिर्माण या मरम्मत के लिए धरती को खोदना और मकान बनाने के लिए देशी टाइल्स या ईंटों का निर्माण करना भी सम्मिलित है, के सिवाय तत्काल प्रभाव से प्रतिषिद्ध होगी; (ख) खनन प्रचालन, माननीय उच्चतम न्यायालय की रिट याचिका (सिविल) सं. 1995 का 202 टी.एन. गौडावर्मन थिरूमूलपाद बनाम भारत संघ के मामले में आदेश तारीख 4 अगस्त, 2006 और रिट याचिका (सी) सं. 2012 का 435 गोवा फाउंडेशन बनाम भारत संघ के मामले में तारीख 21 अप्रैल, 2014 के आदेश के अनुसरण में प्रचालित होंगी।
2.	प्रदूषण (जल, वायु, मृदा, ध्वनि आदि) उत्पन्न करने वाले उद्योगों की स्थापना।	पारिस्थितिकी संवेदी जोन में कोई नया उद्योग लगाने और वर्तमान प्रदूषणकारी उद्योगों का विस्तार करने की अनुज्ञा नहीं होगी; परन्तु यह कि केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा फरवरी, 2016 में जारी मार्ग दर्शक सिद्धान्तों में उद्योगों के वर्गीकरण के अनुसार जब तक कि अधिसूचना में ऐसा विनिर्दिष्ट न हों, पारिस्थितिकी संवेदी जोन के भीतर गैर-प्रदूषणकारी उद्योगों को अनुज्ञात किया जाएगा और इसके अतिरिक्त गैर-प्रदूषणकारी कुटीर उद्योगों को बढ़ावा दिया जाएगा।
3.	वृहत जल विद्युत परियोजना की स्थापना।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय) होंगे।
4.	किसी परिसंक्रम्य पदार्थों का उपयोग या उत्पादन या प्रसंस्करण।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय) होंगे।
5.	प्राकृतिक जल निकायों या क्षेत्र भूमि में अनुपचारित बहिर्वाह का निस्सारण।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय) होंगे।
6.	नई आरा मिलों की स्थापना।	पारिस्थितिकी संवेदी जोन के भीतर नई और विद्यमान आरा मिलों का विस्तार अनुज्ञात नहीं होगा।
7.	ईट भट्टों की स्थापना करना।	लागू विधियों के अनुसार प्रतिषिद्ध (अन्यथा उपबंधित के सिवाय) होंगे।
ख. विनियमित क्रियाकलाप		
8.	वाणिज्यिक होटलों और रिसोर्टों की स्थापना।	पारिस्थितिकी पर्यटन क्रियाकलापों के लिए लघु अस्थायी संरचनाओं के सिवाय संरक्षित क्षेत्र की सीमा से एक किलोमीटर के भीतर या पारिस्थितिकी संवेदी जोन के विस्तार तक, इनमें जो भी निकट है, नए वाणिज्यिक होटल और रिसोर्टों को अनुज्ञात नहीं किया जाएगा; परन्तु यह कि संरक्षित क्षेत्र की सीमा से एक किलोमीटर के परे या पारिस्थितिकी संवेदी जोन के विस्तार तक इनमें से जो भी निकट हो

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		सभी नए पर्यटन क्रियाकलाप या विद्यमान क्रियाकलाप का विस्तार पर्यटन महायोजना और यथा लागू मार्गदर्शी सिद्धांतों के अनुकूल होगा।
9.	संनिर्माण क्रियाकलाप।	(क) संरक्षित क्षेत्र की सीमा से एक किलोमीटर के भीतर या पारिस्थितिकी संवेदी जोन के विस्तार तक, इनमें जो भी निकट हो, किसी भी प्रकार के नये वाणिज्यिक संनिर्माण की अनुज्ञा नहीं होगी: परंतु यह कि स्थानीय लोगों को अपनी आवास सम्बन्धी निम्नलिखित आवश्यकताओं को पूरा करने के लिए, पैरा 3 के उप पैरा (1) में सूचीबद्ध क्रियाकलापों सहित अपने उपयोग के लिए, अपनी भूमि में भवन उप-विधियों के अनुसार, संनिर्माण करने की अनुज्ञा होगी, जैसे:- परंतु यह और कि गैर-प्रदूषणकारी लघु उद्योगों से संबंधित संनिर्माण क्रियाकलाप लागू नियमों और विनियमों, यदि कोई हों, के अनुसार सक्षम प्राधिकारी की पूर्व अनुमति से विनियमित किए जाएंगे और वे न्यूनतम होंगे। (ख) एक किलोमीटर क्षेत्र से परे ये आंचलिक महायोजना के अनुसार विनियमित होंगे।
10.	प्रदूषण उत्पन्न न करने वाले लघु उद्योग।	फरवरी, 2016 में केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा जारी उद्योगों में वर्गीकरण के अनुसार गैर-प्रदूषणकारी उद्योग और अपरिसंकटमय में, लघु और सेवा उद्योग, कृषि, पुष्प कृषि, उद्यान कृषि या पारिस्थितिकी संवेदी जोन से देशी सामग्री से उत्पादों को उत्पन्न करने वाले कृषि आधारित उद्योग सक्षम प्राधिकारी द्वारा अनुज्ञात होंगे।
11.	वृक्षों की कटाई।	(क) राज्य सरकार में सक्षम प्राधिकारी की पूर्व अनुमति के बिना वन, सरकारी या राजस्व या निजी भूमि पर या वनों में वृक्षों की कटाई नहीं होगी। (ख) वृक्षों की कटाई संबंधित केन्द्रीय या राज्य अधिनियम या उसके अधीन बनाए गए नियमों के उपबंध के अनुसार विनियमित होंगे।
12.	वन उत्पादों या गैर काष्ठ वन उत्पादों का संग्रहण।	लागू विधियों के अनुसार विनियमित होंगे।
13.	विद्युत और संचार टावरों का परिनिर्माण और केबलों के बिछाए जाने और अन्य बुनियादी ढांचे।	लागू विधियों के अधीन विनियमित होंगे। (भूमिगत केबल के बिछाए जाने को बढ़ावा दिया जाएगा)।
14.	नागरिक सुख सुविधाओं सहित अवसंरचनाएं।	न्यूनीकरण उपायों को लागू विधियों, नियमों और विनियमनों और उपलब्ध मार्गदर्शक सिद्धांतों के अनुसार किया जाना।
15.	विद्यमान सड़कों को चौड़ा करना और उन्हें सुदृढ़ करना तथा नवीन सड़कों का संनिर्माण।	न्यूनीकरण उपायों को लागू विधियों, नियमों और विनियमनों तथा उपलब्ध मार्गदर्शक सिद्धांतों के अनुसार किया जाना।
16.	पर्यटन से संबंधित अन्य क्रियाकलाप जैसे गर्म बायु गुब्बारें, हेलीकाप्टर, ड्रोन, माइक्रोलाइटस आदि द्वारा	लागू विधियों के अनुसार विनियमित होंगे।


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	पारिस्थितिकी संवेदी जोन क्षेत्र के ऊपर से उड़ना जैसे क्रियाकलाप करना।	
17.	पहाड़ी ढालों और नदी तटों का संरक्षण।	लागू विधियों के अधीन विनियमित होंगे।
18.	रात्रि में यानिक यातायात का संचलन।	लागू विधियों के अधीन वाणिज्यिक प्रयोजन के लिए विनियमित होंगे।
19.	स्थानीय समुदायों द्वारा चल रही कृषि और बागवानी प्रथाओं के साथ दुग्धशाला, दुग्ध उद्योग, कृषि और मछली पालन।	स्थानीय लोगों के उपयोग के लिए लागू विधियों के अधीन अनुज्ञात होंगे।
20.	फर्मों, कंपनियों द्वारा बड़े पैमाने पर वाणिज्यिक पशुओं और कुक्कुट पालन का स्थापन।	स्थानीय आवश्यकताओं को पूरा करने के लिए लागू विधियों के अधीन विनियमित (अन्यथा प्रदान किए गए) होंगे।
21.	प्राकृतिक जल निकासों या सतही क्षेत्र में उपचारित बहिर्वाह का निस्तारण।	जल निकासों में उपचारित अपशिष्ट जल या बहिर्वाह के निस्तारण से बचा जाएगा और उपचारित अपशिष्ट जल के पुनःचक्रण और पुनःउपयोग के लिए प्रयास किए जाएंगे। अन्यथा लागू विधियों के अनुसार उपचारित बहिर्वाह के पुनर्चक्रण या प्रवाह के निर्वहन को विनियमित किया जाएगा।
22.	सतह और भूजल का वाणिज्यिक निष्कर्षण।	लागू विधियों के अधीन विनियमित होंगे।
23.	खुले कुंआ, बोर कुंआ, आदि कृषि और अन्य उपयोग के लिए।	लागू विधियों के अनुसार विनियमित होंगे और सम्बद्ध प्राधिकारी द्वारा क्रियाकलापों की सख्ती से मानीटरी की जाएगी।
24.	ठोस अपशिष्ट का प्रबन्धन।	लागू विधियों के अधीन विनियमित होंगे।
25.	विदेशी प्रजातियों को लाना।	लागू विधियों के अधीन विनियमित होंगे।
26.	पारिस्थितिकी-पर्यटन	लागू विधियों के अनुसार विनियमित होंगे।
27.	पोलिथिन थैलों का उपयोग।	लागू विधियों के अधीन विनियमित होंगे।
28.	वाणिज्यिक सूचना पट्ट और होर्डिंग।	लागू विधियों के अधीन विनियमित होंगे।
ग. संवर्धित क्रियाकलाप		
29.	वर्षा जल संचयन।	सक्रिय रूप से बढ़ावा दिया जाएगा।
30.	जैविक खेती।	सक्रिय रूप से बढ़ावा दिया जाएगा।
31.	सभी गतिविधियों के लिए हरित प्रौद्योगिकी को ग्रहण करना।	सक्रिय रूप से बढ़ावा दिया जाएगा।
32.	कुटीर उद्योगों जिसके अंतर्गत ग्रामीण कारीगर भी हैं।	सक्रिय रूप से बढ़ावा दिया जाएगा।
33.	नवीकरणीय ऊर्जा और ईंधन का उपयोग।	बायोगैस, सौर प्रकाश, इत्यादि को बढ़ावा दिया जाएगा।
34.	कृषि वानिकी।	सक्रिय रूप से बढ़ावा दिया जाएगा।
35.	वागान लगाना और जड़ी बूटियों का रोपण।	सक्रिय रूप से बढ़ावा दिया जाएगा।


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36.	पारिस्थितिकी अनुमूल परिवहन का उपयोग ।	सक्रिय रूप से बढ़ावा दिया जाएगा ।
37.	कौशल विकास ।	सक्रिय रूप से बढ़ावा दिया जाएगा ।
38.	निष्कीकृत भूमि/ वन / वास की बहाली ।	सक्रिय रूप से बढ़ावा दिया जाएगा ।
39.	पर्यावरणीय जागरूकता ।	सक्रिय रूप से बढ़ावा दिया जाएगा ।

5. मानीटरी समिति- केंद्रीय सरकार इस अधिसूचना के उपबंधों की प्रभावी मानीटरी के लिए मानीटरी समिति का गठन करती है, जो निम्नलिखित से मिलकर बनेगी अर्थात्:-

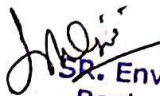
क्र.सं.	मानीटरी समिति का संघटक	पदनाम
(i)	कलेक्टर, खोरधा	अध्यक्ष, पदेन;
(ii)	कलेक्टर, कटक या कलेक्टर के प्रतिनिधि	सदस्य;
(iii)	पुलिस उपायुक्त या पुलिस उपायुक्त, भुवनेश्वर के प्रतिनिधि	सदस्य;
(iv)	केंद्र सरकार द्वारा पर्यावरण के क्षेत्र में काम करने वाले गैर-सरकारी संगठनों के एक प्रतिनिधि को नामित किया जाना है	सदस्य;
(v)	भुवनेश्वर विकास प्राधिकरण के सचिव	सदस्य;
(vi)	राज्य सरकार द्वारा नामित जैव विविधता में एक विशेषज्ञ	सदस्य;
(vii)	राज्य के प्रतिष्ठित संस्थान या विश्वविद्यालय से पारिस्थितिकी में एक विशेषज्ञ	सदस्य;
(viii)	आयुक्त, भुवनेश्वर नगर निगम के प्रतिनिधि	सदस्य;
(ix)	ओडिशा राज्य प्रदूषण नियंत्रण बोर्ड के सदस्य सचिव के प्रतिनिधि	सदस्य;
(x)	उप निदेशक, नंदनकानन जूलॉजिकल पार्क और वन्यजीव वार्डन, नंदनकानन अभयारण्य	सदस्य सचिव।

6. निर्देश-निबंधन:- (1) मानीटरी समिति इस अधिसूचना के उपबंधों के अनुपालन को मानीटरी करेगी।

(2) मानीटरी समिति का कार्यकाल तीन वर्ष तक या राज्य सरकार द्वारा नई समिति के पुनः गठन तक के लिए होगा और तत्पश्चात मानीटरी समिति राज्य सरकार द्वारा गठित की जाएगी।

(3) उन क्रियाकलापों की, जो भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना संख्यांक का.आ. 1533 (अ), तारीख 14 मितम्बर, 2006 की अनुसूची में सम्मिलित हैं, और जो पारिस्थितिकी संवेदी जोन में आते हैं, सिवाय इसके जो पैरा 4 के अधीन सारणी में यथा विनिर्दिष्ट प्रतिपिद्ध क्रियाकलापों के, मानीटरी समिति द्वारा वास्तविक विनिर्दिष्ट स्थलीय दशाओं के आधार पर संवीक्षा की जाएगी और उक्त अधिसूचना के उपबंधों के अधीन पूर्व पर्यावरण अनापत्ति के लिए केंद्रीय सरकार के पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को निर्दिष्ट किया जाएगा।

(4) उन क्रियाकलापों की, जो भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना संख्यांक का. आ. 1533 (अ) तारीख 14 मितम्बर, 2006 की अनुसूची में सम्मिलित नहीं है, और जो पारिस्थितिकी संवेदी जोन में आते हैं, सिवाय इसके पैरा 4 के अधीन सारणी में यथाविनिर्दिष्ट प्रतिपिद्ध क्रियाकलापों के, मानीटरी समिति द्वारा वास्तविक विनिर्दिष्ट स्थलीय दशाओं के आधार पर संवीक्षा की जाएगी और उमें संबद्ध विनियामक प्राधिकरणों को निर्दिष्ट किया जाएगा।


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- (5) मानीटरी समिति का सदस्य-सचिव या संबद्ध उपायुक्त ऐसे व्यक्ति के विरुद्ध, जो इस अधिसूचना के किमी उपबंध का उल्लंघन करता है, पर्यावरण अधिनियम, की धारा 19 के अधीन परिवाद फाइल करने के लिए सक्षम होगा।
- (6) मानीटरी समिति मुद्दा दर मुद्दा के आधार पर अपेक्षाओं पर निर्भर रहते हुए संबद्ध विभागों के प्रतिनिधियों या विशेषज्ञों, औद्योगिक संगमों या संबद्ध पणधारियों के प्रतिनिधियों को अपने विचार-विमर्श में सहायता के लिए आमंत्रित कर सकेगी।
- (7) मानीटरी समिति प्रत्येक वर्ष की 31 मार्च तक के अपने क्रियाकलापों की वार्षिक कार्यवाही रिपोर्ट राज्य के मुख्य वन्यजीव बार्डन को **उपाबंध V** में संलग्न प्रोफार्मा के अनुसार उक्त वर्ष के 30 जून तक प्रस्तुत करेगी।
- (8) केन्द्रीय सरकार का पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय मानीटरी समिति को अपने कृत्यों के प्रभावी निर्वहन के लिए ऐसे निर्देश दे सकेगा, जो वह ठीक समझे।
7. अतिरिक्त उपाय.- इस अधिसूचना के उपबंधों को प्रभाव देने के लिए केन्द्रीय सरकार और राज्य सरकार अतिरिक्त उपाय, यदि कोई हों, विनिर्दिष्ट कर सकेगी।
8. सुप्रीम कोर्ट, आदि के आदेश.- इस अधिसूचना के उपबंध, भारत के माननीय उच्चतम न्यायालय या उच्च न्यायालय या राष्ट्रीय हरित अधिकरण द्वारा पारित कोई आदेश या पारित होने वाले कोई आदेश, यदि कोई हों, के अधीन होंगे।


[फा. सं. 25/49/2017-ईएसजेड]

डॉ. सतीश चन्द्र गढकोटी, वैज्ञानिक 'जी'

उपाबंध-1

उड़ीसा राज्य में नंदनकानन वन्यजीव अभयारण्य के चारों ओर पारिस्थितिकी संवेदी जोन सीमा का विवरण

नंदनकानन अभयारण्य के संबंध में पारिस्थितिकी संवेदी जोन संरक्षित क्षेत्र की सीमा से एक सौ मीटर तक का क्षेत्र है, सीमा स्तंभ 1 से 11 तक 150 मीटर की औसत दूरी के साथ, स्तंभ संख्या 11 से 25 तक स्तंभ संख्या 25 से 32 तक 125 मीटर की औसत दूरी के साथ यह अभयारण्य सीमा के साथ पी.डब्ल्यू.डी. सड़क के साथ मिलती है, स्तंभ संख्या 32 से 51 तक 270 मीटर औसत दूरी के साथ पूर्ण अन्य संक्रांत प्लॉट सं.5 (ग्राम जंगल) आच्छादित है, स्तंभ सं.87 से 112 तक 340 मीटर की औसत दूरी के साथ दलदल क्षेत्र को आच्छादित करता है। चंदाका-दम्पारा अभयारण्य (चुरंग आर. एफ) की सीमा अभयारण्य की उत्तरी सीमा में स्थित है जो कि स्तंभ सं. 131 से 137 के निकटवर्ती है, पारिस्थितिकी संवेदी जोन सीमांकित नहीं की गई है पी.डब्ल्यू.डी सड़क के साथ चंदाका-दम्पारा अभयारण्य के साथ अभयारण्य सीमा स्तंभ सं.131 से 137 के साथ-साथ जाती है।

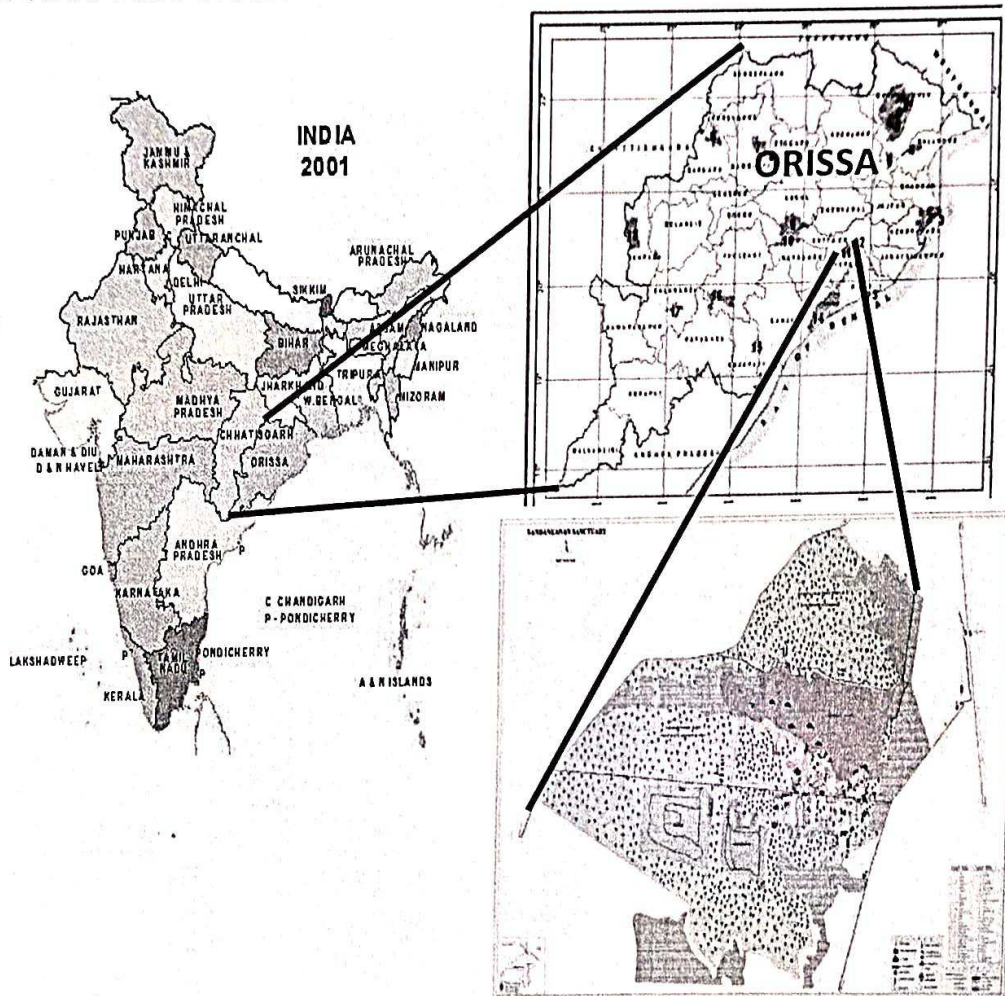

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उपाबंध-IIक

मुख्य अवस्थानों के अक्षांश और देशांतर के साथ पारिस्थितिकी संवेदी जोन और नंदनकानन वन्यजीव अभयारण्य का अवस्थान मानचित्र

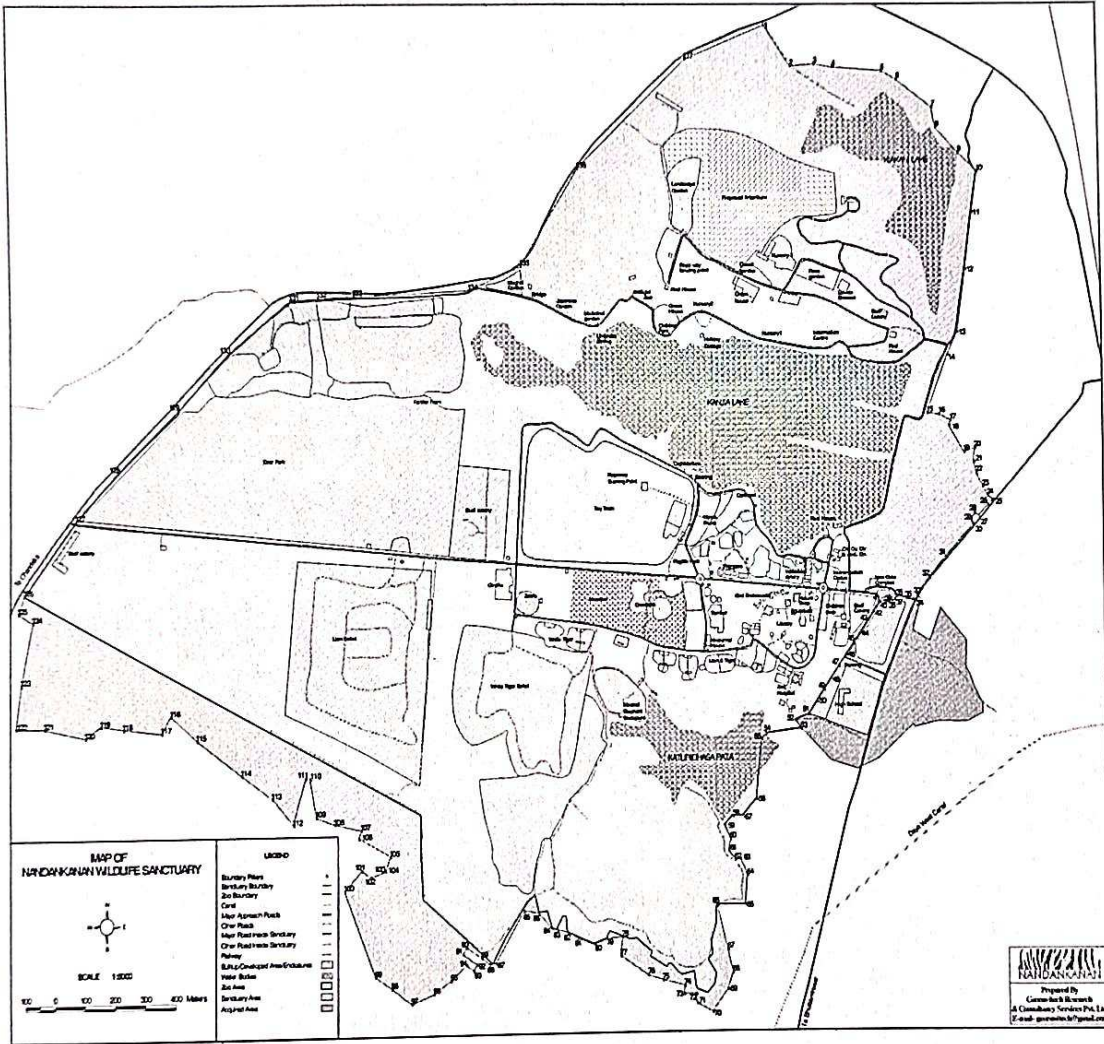


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उपाबंध-II ख

मुख्य अवस्थानों के अक्षांश और देशांतर के साथ नंदनकानन वन्यजीव अभयारण्य के पारिस्थितिकी संवेदी जोन का मानचित्र

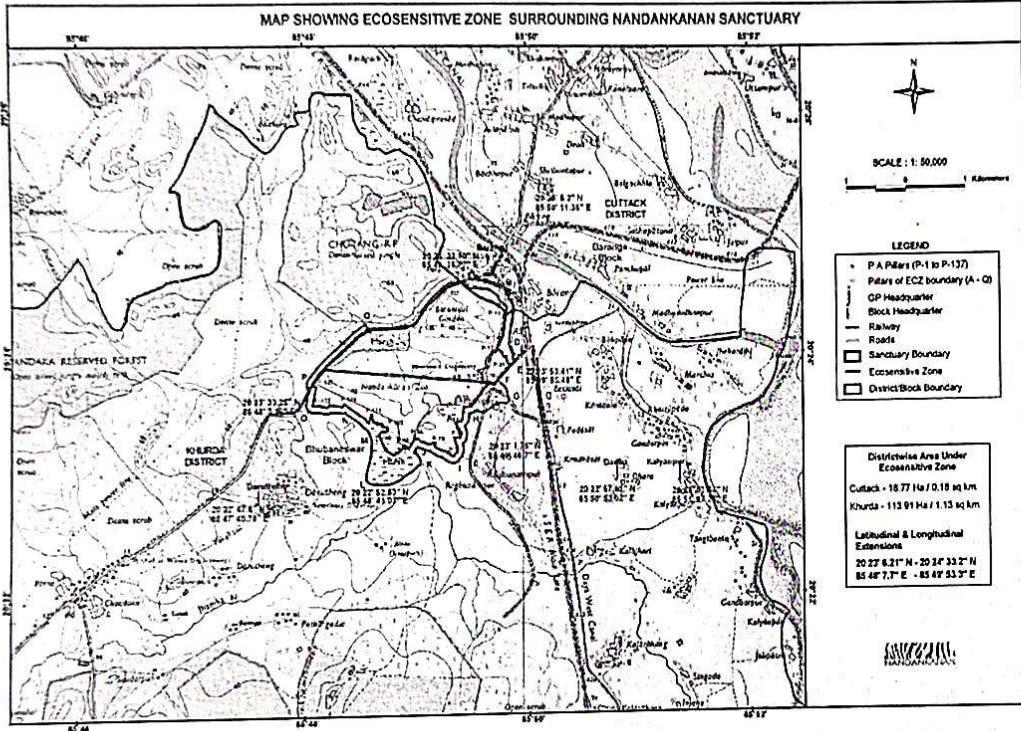


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उपानबंध-II ग

भारतीय सर्वेक्षण (एस ओ आई) टोपोग्राफी पर मुख्य अवस्थानों के अक्षांश और देशांतर के साथ नंदकानन वन्यजीव अभयारण्य के पारिस्थितिकी संवेदी जोन के भूमि उपयोग पैटर्न को दर्शाने वाला मानचित्र



उपानबंध-III

सारणी क: नंदकानन वन्यजीव अभयारण्य के प्रमुख अवस्थानों के भू-निर्देशांक

सीमा स्तंभ	भू-मंडलीय स्थित प्रणाली (जी.पी.एस) अवस्थान					
	उत्तर(अक्षांश)			पूर्व (देशांतर)		
	डिग्री	मिनट	सेकेंड	डिग्री	मिनट	सेकेंड
1	20	24	35.300	85	49	20.700
2	20	24	31.733	85	49	23.543
3	20	24	31.917	85	49	26.136
4	20	24	31.647	85	49	28.141
5	20	24	31.300	85	49	33.447

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6	20	24	30.568	85	49	35.092
7	20	24	28.075	85	49	38.895
8	20	24	26.251	85	49	39.281
9	20	24	24.002	85	49	41.697
10	20	24	22.318	85	49	43.674
11	20	24	18.635	85	49	43.107
12	20	24	13.463	85	49	42.218
13	20	24	07.874	85	49	41.286
14	20	24	05.904	85	49	40.183
15	20	24	00.700	85	49	37.935
16	20	24	00.582	85	49	39.166
17	20	23	59.950	85	49	40.387
18	20	23	59.533	85	49	40.269
19	20	23	57.091	85	49	41.854
20	20	23	57.445	85	49	43.06
21	20	23	56.267	85	49	42.892
22	20	23	55.207	85	49	43.139
23	20	23	54.050	85	49	43.835
24	20	23	53.269	85	49	44.284
25	20	23	52.830	85	49	44.927
26	20	23	52.369	85	49	44.34
27	20	23	51.395	85	49	43.374
28	20	23	51.684	85	49	42.957
29	20	23	50.977	85	49	42.582
30	20	23	50.699	85	49	42.818
31	20	23	47.936	85	49	39.755
32	20	23	46.041	85	49	37.967
33	2	23	44.671	85	49	36.650
34	20	23	44.221	85	49	36.404

Mohi
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Poojina
 Divisional Forest Officer
 Khordha Division, Khordha

35	20	23	44.414	85	49	35.386
36	20	23	44.606	85	49	34.476
37	20	23	44.317	85	49	34.241
38	20	23	44.189	85	49	33.877
39	20	23	44.082	85	49	33.438
40	20	23	44.060	85	49	33.031
41	20	23	44.059	85	49	32.510
42	20	23	43.228	85	49	31.979
43	20	23	42.539	85	49	31.375
44	20	23	41.528	85	49	30.565
45	20	23	40.522	85	49	29.730
46	20	23	39.596	85	49	28.955
47	20	23	38.554	85	49	28.048
48	20	23	37.552	85	49	27.251
49	20	23	36.524	85	49	26.468
50	20	23	35.509	85	49	25.658
51	20	23	34.416	85	49	24.751
52	20	23	34.004	85	49	23.236
53	20	23	33.134	85	49	23.860
54	20	23	32.807	85	49	20.109
55	20	23	32.383	85	49	19.633
56	20	23	27.058	85	49	19.059
57	20	23	25.606	85	49	17.581
58	20	23	25.580	85	49	16.476
59	20	23	24.861	85	49	15.603
60	20	23	23.602	85	49	16.142
61	20	23	22.574	85	49	16.039
62	20	23	21.803	85	49	16.669
63	20	23	21.867	85	49	17.273

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[भाग 11-खण्ड 3(ii)]

भारत का राजपत्र : असाधारण

17

64	20	23	20.402	85	49	17.992
65	20	23	17.832	85	49	17.800
66	20	23	17.807	85	49	14.754
67	20	23	13.939	85	49	15.885
68	20	23	11.896	85	49	16.412
69	20	23	10.431	85	49	15.885
70	20	23	08.388	85	49	14.266
71	20	23	09.224	85	49	12.532
72	20	23	10.046	85	49	12.429
73	20	23	10.046	85	49	11.118
74	20	23	10.778	85	49	11.195
75	20	23	11.292	85	49	08.89
76	20	23	11.781	85	49	07.302
77	20	23	13.502	85	49	04.282
78	20	23	15.134	85	49	04.475
79	20	23	14.993	85	49	02.856
80	20	23	14.517	85	49	01.533
81	20	23	15.070	85	48	59.657
82	20	23	15.622	85	48	58.513
83	20	23	15.867	85	48	57.395
84	20	23	16.008	85	48	56.856
85	20	23	17.306	85	48	55.417
86	20	23	17.537	85	48	53.926
87	20	23	12.988	85	48	50.919
88	20	23	12.911	85	48	50.238
89	20	23	13.489	85	48	49.365
90	20	23	14.415	85	48	47.771
91	20	23	13.862	85	48	47.424
92	20	23	12.886	85	48	48.954

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 Khordha Division, Khordha

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THE GAZETTE OF INDIA : EXTRAORDINARY

[PART II—SEC. 3(ii)]

93	20	23	12.333	85	48	48.555
94	20	23	12.847	85	48	47.810
95	20	23	11.511	85	48	46.140
96	20	23	10.393	85	48	44.328
97	20	23	09.545	85	48	42.002
98	20	23	10.920	85	48	39.831
99	20	23	11.986	85	48	38.083
100	20	23	19.567	85	48	34.832
101	20	23	21.340	85	48	36.618
102	20	23	20.749	85	48	37.544
103	20	23	21.160	85	48	38.738
104	20	23	21.225	85	48	39.098
105	20	23	22.497	85	48	39.625
106	20	23	24.128	85	48	36.297
107	20	23	24.822	85	48	36.516
108	20	23	25.375	85	48	33.766
109	20	23	26.056	85	48	31.826
110	20	23	29.409	85	48	31.145
111	20	23	29.422	85	48	30.669
112	20	23	25.401	85	48	29.449
113	20	23	27.713	85	48	27.174
114	20	23	29.744	85	48	24.013
115	20	23	32.866	85	48	19.285
116	20	23	34.986	85	48	16.561
117	20	23	33.560	85	48	15.623
118	20	23	33.881	85	48	11.537
119	20	23	34.125	85	48	09.160
120	20	23	33.200	85	48	07.554
121	20	23	33.958	85	48	03.108

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[भाग II-खण्ड 3(ii)]

भारत का राजपत्र : असाधारण

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122	20	23	33.984	85	48	00.050
123	20	23	37.761	85	48	00.538
124	20	23	43.132	85	48	01.746
125	20	23	43.980	85	48	00.140
126	20	23	45.574	85	48	00.708
127	20	23	52.053	85	48	06.365
128	20	23	56.191	85	48	10.944
129	20	24	01.566	85	48	17.521
130	20	24	06.530	85	48	23.000
131	20	24	11.190	85	48	29.763
132	20	24	11.426	85	48	32.771
133	20	24	11.533	85	48	36.605
134	20	24	12.117	85	48	49.063
135	20	24	14.247	85	48	54.346
136	20	24	22.761	85	49	00.468
137	20	24	32.623	85	49	12.132

सारणी ख: पारिस्थितिकी संवेदी जोन के प्रमुख अवस्थानों के भू-निर्देशांक

महत्वपूर्ण अवस्थानों के पारिस्थितिकी संवेदी जोन सीमा स्तंभ निर्देशांक		
स्तंभ	देशांतर (पू)	अक्षांश (उ)
ए	85.82496	20.40941
बी	85.83039	20.40817
सी	85.8321	20.40513
डी	85.83134	20.40065
ई	85.83229	20.39799
एफ	85.82972	20.39551
जी	85.83115	20.39256
एच	85.82544	20.39113
आई	85.82316	20.38428

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अ	85.81754	20.38619
क	85.81811	20.38428
एल	85.81031	20.38152
एम	85.81078	20.38761
एन	85.80697	20.39113
ओ	85.80145	20.39152
पी	85.80126	20.39523
क्यू	85.81012	20.40341

उपाबंध -IV

भू-निर्देशांकों के साथ नंदनकानन वन्यजीव अभयारण्य के पारिस्थितिकी संवेदी जोन के अंतर्गत आने वाले ग्रामों की सूची

जिला	ग्राम	क्षेत्र (हेक्टेयर)	देशांतर	अक्षांश	स्तंभ आई.डी
कटुक	दधापटना	18.77	85°49'20.700"	20°24'35.300"	1
			85°49'26.869"	20°24'36.529"	2
			85°49'37.628"	20°24'32.828"	3
			85°49'41.534"	20°24'30.910"	4
			85°49'46.469"	20°24'22.686"	5
			85°49'46.301"	20°24'20.840"	6
			85°49'44.508"	20°24'19.927"	7
			85°49'43.251"	20°24'18.950"	8
			85°49'43.841"	20°24'22.373"	9
			85°49'41.696"	20°24'24.002"	10
			85°49'39.281"	20°24'26.251"	11
			85°49'38.896"	20°24'28.075"	12
			85°49'35.092"	20°24'30.568"	13
			85°49'33.447"	20°24'31.301"	14
			85°49'28.141"	20°24'31.647"	15
			85°49'26.136"	20°24'31.917"	16
			85°49'23.700"	20°24'31.800"	17
खोरधा	दधा	7.678	85°49'46.301"	20°24'20.840"	6
			85°49'44.508"	20°24'19.927"	7
			85°49'43.251"	20°24'18.950"	8
			85°49'45.852"	20°24'15.902"	18

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 Khordha Division, Khordha

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[भाग II-खण्ड 3(ii)]

भारत का राजपत्र : असाधारण

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			85°49'44.139"	20°24'06.582"	19
			85°49'44.070"	20°24'02.744"	20
			85°49'45.852"	20°23'58.359"	21
			85°49'46.126"	20°23'55.686"	22
			85°49'46.743"	20°23'54.384"	23
			85°49'45.768"	20°23'53.754"	24
			85°49'44.535"	20°23'54.902"	25
			85°49'43.884"	20°23'56.067"	26
			85°49'43.558"	20°23'56.992"	27
			85°49'43.764"	20°23'58.208"	28
			85°49'42.428"	20°23'57.848"	29
			85°49'40.851"	20°24'00.178"	30
			85°49'40.868"	20°24'00.572"	31
			85°49'39.669"	20°24'01.155"	32
			85°49'38.444"	20°24'01.258"	33
			85°49'40.586"	20°24'06.397"	34
			85°49'41.656"	20°24'08.196"	35
			85°49'42.428"	20°24'13.636"	36
खोरधा	जुसागडा	60.828	85°48'53.575"	20°23'11.456"	65
			85°48'52.268"	20°23'13.302"	66
			85°48'52.241"	20°23'14.537"	67
			85°48'52.435"	20°23'15.544"	68
			85°48'54.409"	20°23'09.961"	129
			85°48'54.897"	20°23'09.549"	130
			85°48'56.542"	20°23'07.185"	131
			85°48'56.509"	20°23'06.153"	132
			85°48'56.490"	20°23'05.540"	133
			85°48'55.257"	20°23'03.587"	134
			85°48'51.556"	20°23'00.966"	135
			85°48'47.907"	20°22'58.910"	136
			85°48'45.440"	20°22'57.009"	137
			85°48'42.613"	20°22'55.723"	138
			85°48'40.146"	20°22'55.055"	139
			85°48'35.006"	20°22'55.107"	140
			85°48'30.432"	20°22'55.980"	141
			85°48'28.633"	20°22'56.854"	142
			85°48'27.811"	20°22'58.499"	143
			85°48'28.530"	20°23'02.714"	144
			85°48'30.638"	20°23'10.423"	145

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 Bhubaneswar (Odisha)

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 Divisional Forest Officer
 Khordha Division, Khordha

			85°48'30.895"	20°23'13.918"	146
			85°48'30.792"	20°23'17.002"	147
			85°48'30.278"	20°23'20.034"	148
			85°48'28.685"	20°23'22.347"	149
			85°48'26.834"	20°23'23.837"	150
			85°48'24.110"	20°23'26.510"	151
			85°48'16.966"	20°23'31.290"	152
			85°48'10.233"	20°23'31.753"	153
			85°48'07.972"	20°23'30.981"	154
			85°47'58.875"	20°23'32.266"	155
			85°47'57.384"	20°23'33.603"	156
			85°47'56.973"	20°23'35.556"	157
			85°47'57.539"	20°23'40.387"	158
			85°47'58.207"	20°23'43.059"	159
			85°47'58.016"	20°23'43.351"	160
			85°48'28.464"	20°24'10.295"	171
			85°48'23.000"	20°24'06.530"	172
			85°48'17.521"	20°24'01.566"	173
			85°48'10.944"	20°23'56.190"	174
			85°48'06.365"	20°23'52.053"	175
			85°48'00.708"	20°23'45.574"	176
			85°48'00.140"	20°23'43.980"	177
			85°48'01.746"	20°23'43.132"	178
			85°48'00.538"	20°23'37.761"	179
			85°48'00.050"	20°23'33.984"	180
			85°48'03.108"	20°23'33.958"	181
			85°48'07.328"	20°23'33.229"	182
			85°48'09.179"	20°23'34.283"	183
			85°48'15.629"	20°23'33.615"	184
			85°48'16.400"	20°23'35.131"	185
			85°48'19.227"	20°23'32.972"	186
			85°48'23.904"	20°23'29.863"	187
			85°48'27.013"	20°23'27.833"	188
			85°48'29.274"	20°23'25.391"	189
			85°48'30.559"	20°23'29.477"	190
			85°48'31.022"	20°23'29.529"	191
			85°48'31.665"	20°23'26.137"	192
			85°48'33.695"	20°23'25.366"	193
			85°48'36.444"	20°23'24.980"	194

Mini
 SR Env. Scientist
 Regional Office
 S.P.C. Board
 Bhubaneswar (Odisha)

Poornima
 Divisional Forest Officer
 Khordha Division, Khordha

[भाग II-खण्ड 3(ii)]

भारत का राजपत्र : असाधारण

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			85°48'36.264"	20°23'24.184"	195
			85°48'39.502"	20°23'22.693"	196
			85°48'38.988"	20°23'21.331"	197
			85°48'37.344"	20°23'20.843"	198
			85°48'36.444"	20°23'21.434"	199
			85°48'34.645"	20°23'19.584"	200
			85°48'37.781"	20°23'12.054"	201
			85°48'39.631"	20°23'10.949"	202
			85°48'41.687"	20°23'09.613"	203
			85°48'44.025"	20°23'10.384"	204
			85°48'45.927"	20°23'11.514"	205
			85°48'47.546"	20°23'12.928"	206
			85°48'48.265"	20°23'12.388"	207
			85°48'48.728"	20°23'12.928"	208
			85°48'47.186"	20°23'13.879"	209
			85°48'47.649"	20°23'14.521"	210
			85°48'49.113"	20°23'13.467"	211
			85°48'50.090"	20°23'12.902"	212
			85°48'50.809"	20°23'12.953"	213
			85°49'28.084"	20°23'38.549"	111
			85°49'29.374"	20°23'38.755"	112
			85°49'30.693"	20°23'39.380"	113
			85°49'32.011"	20°23'40.417"	114
			85°49'33.110"	20°23'41.653"	115
			85°49'33.082"	20°23'42.896"	116
			85°49'32.839"	20°23'44.355"	117
			85°49'32.127"	20°23'43.576"	124
			85°49'31.506"	20°23'42.848"	125
			85°49'30.702"	20°23'41.830"	126
			85°49'29.910"	20°23'40.771"	127
			85°49'29.075"	20°23'39.839"	128
खोर्धा	रघुनाथपुर	35.470	85°49'38.252"	20°23'46.324"	37
			85°49'39.458"	20°23'43.368"	38
			85°49'42.670"	20°23'40.927"	39
			85°49'44.083"	20°23'34.887"	40
			85°49'42.284"	20°23'33.731"	41
			85°49'37.916"	20°23'34.117"	42
			85°49'34.960"	20°23'32.575"	43
			85°49'30.206"	20°23'29.620"	44

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 Khordha Division, Khordha

			85°49'27.893"	20°23'29.877"	45
			85°49'26.608"	20°23'30.776"	46
			85°49'24.552"	20°23'29.491"	47
			85°49'22.368"	20°23'29.363"	48
			85°49'21.854"	20°23'25.122"	49
			85°49'19.798"	20°23'22.938"	50
			85°49'21.212"	20°23'20.625"	51
			85°49'20.698"	20°23'16.770"	52
			85°49'20.235"	20°23'15.665"	53
			85°49'18.848"	20°23'14.226"	54
			85°49'19.516"	20°23'11.040"	55
			85°49'18.436"	20°23'08.264"	56
			85°49'16.380"	20°23'05.746"	57
			85°49'14.376"	20°23'04.718"	58
			85°49'13.245"	20°23'04.770"	59
			85°49'08.774"	20°23'07.288"	60
			85°49'04.332"	20°23'09.453"	61
			85°49'01.064"	20°23'11.400"	62
			85°48'58.598"	20°23'12.016"	63
			85°48'54.691"	20°23'13.250"	64
			85°48'53.575"	20°23'11.456"	65
			85°48'52.268"	20°23'13.302"	66
			85°48'52.241"	20°23'14.537"	67
			85°48'52.435"	20°23'15.544"	68
			85°48'53.842"	20°23'17.785"	69
			85°48'55.204"	20°23'17.425"	70
			85°48'56.720"	20°23'16.089"	71
			85°48'57.337"	20°23'16.063"	72
			85°48'57.979"	20°23'17.142"	73
			85°48'58.211"	20°23'17.117"	74
			85°48'58.391"	20°23'15.729"	75
			85°48'59.495"	20°23'15.138"	76
			85°49'01.397"	20°23'14.624"	77
			85°49'02.656"	20°23'15.138"	78
			85°49'04.327"	20°23'15.215"	79
			85°49'04.095"	20°23'13.570"	80
			85°49'07.102"	20°23'11.823"	81
			85°49'08.516"	20°23'11.360"	82
			85°49'11.060"	20°23'10.872"	83

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 Divisional Forest Officer
 Khordha Division, Khordha

			85°49'10.931"	20°23'10.101"	84
			85°49'12.242"	20°23'10.127"	85
			85°49'12.345"	20°23'09.227"	86
			85°49'14.066"	20°23'08.379"	87
			85°49'15.685"	20°23'10.487"	88
			85°49'16.217"	20°23'11.964"	89
			85°49'15.729"	20°23'14.007"	90
			85°49'15.125"	20°23'15.948"	91
			85°49'14.663"	20°23'17.939"	92
			85°49'17.721"	20°23'18.029"	93
			85°49'17.913"	20°23'20.586"	94
			85°49'17.220"	20°23'22.051"	95
			85°49'16.603"	20°23'21.935"	96
			85°49'15.973"	20°23'22.719"	97
			85°49'16.166"	20°23'23.747"	98
			85°49'15.678"	20°23'25.057"	99
			85°49'16.474"	20°23'25.751"	100
			85°49'17.656"	20°23'25.833"	101
			85°49'19.121"	20°23'27.272"	102
			85°49'19.558"	20°23'32.310"	103
			85°49'20.213"	20°23'33.042"	104
			85°49'24.068"	20°23'33.389"	105
			85°49'23.259"	20°23'34.198"	106
			85°49'24.878"	20°23'34.648"	107
			85°49'25.867"	20°23'35.817"	108
			85°49'26.651"	20°23'36.807"	109
			85°49'27.512"	20°23'37.860"	110
			85°49'28.084"	20°23'38.549"	111
			85°49'29.374"	20°23'38.755"	112
			85°49'30.693"	20°23'39.380"	113
			85°49'32.011"	20°23'40.417"	114
			85°49'33.110"	20°23'41.653"	115
			85°49'33.082"	20°23'42.896"	116
			85°49'32.839"	20°23'44.355"	117
			85°49'34.054"	20°23'44.443"	118
			85°49'34.322"	20°23'44.561"	119
			85°49'34.771"	20°23'44.904"	120
			85°49'35.617"	20°23'44.754"	121
			85°49'36.710"	20°23'44.491"	122

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			85°49'36.967"	20°23'44.954"	123
			85°49'32.127"	20°23'43.576"	124
			85°48'54.409"	20°23'09.961"	129
			85°48'54.897"	20°23'09.549"	130
			85°48'56.542"	20°23'07.185"	131
			85°48'56.509"	20°23'06.153"	132
			85°48'56.490"	20°23'05.540"	133
खोरधा	कृष्णा नगर	9.934	85°47'58.207"	20°23'43.059"	159
			85°47'58.016"	20°23'43.351"	160
			85°47'59.644"	20°23'46.027"	161
			85°48'03.132"	20°23'50.785"	162
			85°48'08.158"	20°23'55.544"	163
			85°48'11.207"	20°23'58.647"	164
			85°48'16.892"	20°24'04.024"	165
			85°48'21.699"	20°24'07.745"	166
			85°48'25.846"	20°24'10.025"	167
			85°48'29.389"	20°24'11.241"	168
			85°48'29.741"	20°24'11.259"	169
			85°48'29.763"	20°24'11.190"	170
			85°47'57.333"	20°23'44.396"	214
			85°47'57.179"	20°23'45.989"	215
			85°47'57.744"	20°23'47.891"	216
			85°48'02.113"	20°23'53.442"	217
			85°48'05.556"	20°23'56.885"	218
			85°48'10.131"	20°24'01.100"	219
			85°48'16.041"	20°24'05.674"	220
			85°48'21.284"	20°24'10.608"	221
			85°48'27.091"	20°24'14.617"	222
			85°48'28.479"	20°24'15.234"	223

उपाबंध-V

की गई कार्रवाई की रिपोर्ट का प्रपत्र:

1. बैठकों की संख्या और तारीख।
2. बैठकों का कार्यवृत्त: (कृपया मुख्य उल्लेखनीय बिंदुओं का उल्लेख करें। बैठक के कार्यवृत्त को एक पृथक उपाबंध में उपाबद्ध करें)।
3. आंचलिक महायोजना की तैयारी की प्रास्थिति जिसके अंतर्गत पर्यटन महायोजना भी है।
4. भू-अभिलेख में सक्षम वृष्टियों के सुधार के लिए ब्यौहार किए गए मामलों का सार (पारिस्थितिकी संवेदी जोन वार)। ब्यौहरे उपाबंध के रूप में संलग्न किए जाएं।


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5. पर्यावरण समाघात निवारण अधिसूचना, 2006 के अधीन आने वाले क्रियाकलापों की संवीक्षा के मामलों का सारा (ब्यौरे एक पृथक् उपाबंध के रूप में संलग्न किए जाएं)।
6. पर्यावरण समाघात निवारण अधिसूचना, 2006 के अधीन न आने वाले क्रियाकलापों की संवीक्षा के मामलों का सारा (ब्यौरे एक पृथक् उपाबंध के रूप में संलग्न किए जाएं)।
7. पर्यावरण (संरक्षण) अधिनियम, 1986 की धारा 19 के अधीन दर्ज की गई शिकायतों का सार।
8. कोई अन्य महत्वपूर्ण मामला।

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 10th December, 2019

S.O. 4444(E).—WHEREAS, a draft notification was published in the Gazette of India, Extraordinary, vide notification of the Government of India in the Ministry of Environment, Forest and Climate Change number S.O. 3263 (E), dated the 5th July, 2018, inviting objections and suggestions from all persons likely to be affected thereby within the period of sixty days from the date on which copies of the Gazette containing the said notification were made available to the public;


AND WHEREAS, copies of the Gazette containing the said draft notification were made available to the public on the 5th July, 2018;

AND WHEREAS, objections and suggestions received from persons and stakeholders in response to the aforesaid draft notification were duly considered by the Central Government;

AND WHEREAS, Nandankanan Wildlife Sanctuary is one of the 19 (nineteen) Wildlife Sanctuaries of Odisha, Nandankanan Zoological Park together with Kanjia Lake and State Botanical Garden has been notified as Nandankanan Wildlife Sanctuary on the 3rd August, 1979 by the Government of Odisha under Wildlife (Protection) Act, 1972 covering an area of 4.37 square kilometers and it includes Jujhagarh and Krishnanagar protected forest and a natural freshwater lake Kanjia, a wetland of national importance, and Nandankanan is situated adjoining to Chandaka-Dumpara Wildlife Sanctuary;

AND WHEREAS, Nandankanan Wildlife Sanctuary provides an excellent habitat for various wild plants and wild animals and the Sanctuary enjoys a special place in the State of Odisha for integration of *ex-situ* and *in-situ* conservation of wild flora and fauna. It has a rich floral diversity and about 704 species of wild plants belonging to 142 families have been documented in the protected area of Nandankanan and the important flora recorded from the sanctuary are oau (*Dillenia rnmica*), champaka (*Micheilia champaca*), uhanti (*Alphonsea madraspaiana*), barhial (*Annona reiteuiata*), neua (*Annona squarrosa*), chini champka (*Artabotrys hocarpeialus*), potamossu champati (*Polyalthia cerasoides*), debadaru (*Polyalthia longifolia*), guakoli (*Polyalthia suherosa*), musakani, akanbindi (*Cissampelos pareira*), dandahiya, dadaya (*Cocculus hirsulus*), kalajati nai (*Tiliacora acuminata*), padma (*Nell-mho nucifera*), agara (*Argemone Mexicana*), niphura (*Capparis brevispina*), asadhua (*Cpparis zeylanica*), banasorisa (*Menne viscosa*), baruna (*Crateva magna*), madan mastak (*Hybanthus enneaspermus*), sundri (*Hixa orellana*), khakada (*Casearia eiliplica*), miragu (*Folygala arvensis*), sureta (*Polycarpon prostratum*), badabalbalua (*Portulaca oleracea*), balbaluka (*Portulaca quadrifida*), Poonang (*CalophyThun inophydrhun*), Churiana (*Mammea suriga*), nugesur (*Mesua ferrea*), bana Bhandi (*Abeirnoschus manihot*), bani, baniya (*Hibiscus tiliaceus*), bajarmtili (*Sida acuta*), etc, and it has been an outstanding place for creating awareness amongst visitors for wildlife conservation and is an important site for wildlife research and management;

AND WHEREAS, 153 species of mammals, birds and reptiles and 38 species of fishes are being housed in Nandankanan Zoological Park, apart from above, Nandankanan Wildlife Sanctuary is the habitat of many species of free living wild animals, so far, 13 species of mammals, 71 species of birds, 15 species of reptiles, 10 species of amphibians, 85 species of butterflies, 54 species of odonates and 51 species of spiders have been documented inside Nandankanan Wildlife Sanctuary; the major fauna found in the Sanctuary are common mongoose (*Herpestes edwardsi*), common langur (*Presbytis entellus*), Rhesus macaque (*Macaca mulatta*), three striped palm squirrel (*Furcambulus palmarium*), tat (*Ratus ruttus*), horse shoe bat (*Rhinolophus lepidus*), Indian fox (*Vulpes bengalensis*), pangolin (*Mauls crassicaudata*), grey partridge (*Francolinus pondicerianus*), larger golden backed woodpecker (*Chrysocolaptes lucidus*), Indian roller or blue jay (*Coracias benghalensis*), Russels viper (*Daboia russelli*), cobra monocellate (*Naja naja kaouthia*), common Indian braze back or tree snake (*Dendrelaphis tristis*), chameleon (*Chameleone zeylanicus*), etc.; while some rare fauna recorded from the Nandankanan Wildlife Sanctuary are wild boar (*Sus scrota*), ratel (*Mellivora capensis*), Indian popcrupine


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(*Hystrix indica*), mouse deer or Indian chevrotain (*Tragulus memhna*), common palm civet (*Paradoxurus hermaphrodites*), jackal (*Canis aureus*), jungle cat (*Felis chaus*), small Indian civet (*Viverricula indica*), striped hyena (*Hyaena hyaena*), Indian flying fox (*Pteropus giganteus*), red jungle fowl (*Gallus gallus murghi*), red spurfowl (*Galloperdix spadicea*), common teal (*Anas crecca*), cadwall (*Anas strepera*), northern pintail (*Anas acuta*), barred buttonquail (*Turnix suscitator*), yellow fronted pied or mahratta woodpecker (*Dendrocopos mahrattensis*), small green barbet (*Megalaima viridis*), copper-smith barbet (*Megalaima haemacephala*), brown-headed barbet (*Megalaima zeylanica*), common hoopoe (*Upupa epops*), blue bee-eater (*Merops philippinus*), yellow monitor lizard (*Varanus flavescens*), banded krait (*Bungarus fasciatus*), checkered keel back (*Xenochrophis piscator*), common green whip snake (*Ahaetulla nasuta*), etc., and the number of birds of Indian origin stays here round the year and breeding of open bill stork, purple moorhen, jacana, red jungle fowl, Indian peafowl, koel, herons, egrets etc. have been recorded inside the protected area;

AND WHEREAS, it is necessary to conserve and protect the area, the extent and boundaries which are specified in paragraph 1 around the protected area of Nandankanan Wildlife Sanctuary as Eco-Sensitive Zone from ecological, environmental and biodiversity point of view and to prohibit industries or class of industries and their operations and processes in the said Eco-Sensitive Zone;

NOW, THEREFORE, in exercise of the powers conferred by sub-section (1) and clauses (v) and (xiv) of sub-section (2) and sub-section (3) of section 3 of the Environment (Protection) Act 1986 (29 of 1986) (hereafter in this notification referred to as the Environment Act) read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby notifies an area to an extent varying from 0 (zero) to 340 meters around the boundary of the Nandankanan Wildlife Sanctuary, in Cuttack and Khordha districts in the State of Odisha as Nandankanan Wildlife Sanctuary Eco-sensitive Zone (hereafter in this notification referred to as the Eco-sensitive Zone) details of which are as under, namely: -

- I. **Extent and boundaries of Eco-sensitive Zone.** - (1) The Eco-sensitive Zone shall be to an extent of 0 (zero) to 340 meters around the boundary of the Nandankanan Wildlife Sanctuary and the area of the Eco-sensitive Zone is 1.31 square kilometres out of which 0.18 square kilometres comes under Cuttack district and 1.13 square kilometres areas in Khordha district and zero extent of Eco-sensitive Zone at Northern boundary of the Sanctuary is proposed (i.e. adjacent to the pillar No.131 to 137) as boundary is co-terminus with Chandaka-Dampara Sanctuary along the PWD road.
 - (2) The boundary description of Nandankanan Wildlife Sanctuary and its Eco-sensitive Zone is appended as **Annexure-I**.
 - (3) The maps of the Nandankanan Wildlife Sanctuary demarcating Eco-sensitive Zone along with boundary details and latitudes and longitudes are appended as **Annexure-IIA, Annexure-IIB and Annexure-IIC**.
 - (4) List of geo-coordinates of the boundary of Nandankanan Wildlife Sanctuary and Eco-sensitive Zone are given in Table A and Table B of **Annexure-III**.
 - (5) The list of villages falling in the Eco-sensitive Zone along with their geo co-ordinates at prominent points is appended as **Annexure-IV**.
2. **Zonal Master Plan for Eco-sensitive Zone.**- (1) The State Government shall, for the purposes of the Eco-sensitive Zone prepare a Zonal Master Plan within a period of two years from the date of publication of this notification in the Official Gazette, in consultation with local people and adhering to the stipulations given in this notification for approval of the competent authority in the State.
 - (2) The Zonal Master Plan for the Eco-sensitive Zone shall be prepared by the State Government in such manner as is specified in this notification and also in consonance with the relevant Central and State laws and the guidelines issued by the Central Government, if any.
 - (3) The Zonal Master Plan shall be prepared in consultation with the following Departments of the State Government, for integrating the ecological and environmental considerations into the said plan:-
 - (i) Environment;
 - (ii) Forest and Wildlife;
 - (iii) Agriculture;
 - (iv) Revenue;
 - (v) Housing and Urban Development;
 - (vi) Tourism;
 - (vii) Rural Development;


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- (viii) Irrigation and Flood Control;
 (ix) Municipal;
 (x) Odisha State Pollution Control Board;
 (xi) Panchayati Raj; and
 (xii) Public Works Department (Building and Roads).
- (4) The Zonal Master Plan shall not impose any restriction on the approved existing land use, infrastructure and activities, unless so specified in this notification and the Zonal Master Plan shall factor in improvement of all infrastructure and activities to be more efficient and eco-friendly.
- (5) The Zonal Master Plan shall provide for restoration of denuded areas, conservation of existing water bodies, management of catchment areas, watershed management, groundwater management, soil and moisture conservation, needs of local community and such other aspects of the ecology and environment that need attention.
- (6) The Zonal Master Plan shall demarcate all the existing worshipping places, villages and urban settlements, types and kinds of forests, agricultural areas, fertile lands, green area, such as, parks and like places, horticultural areas, orchards, lakes and other water bodies with supporting maps giving details of existing and proposed land use features.
- (7) The Zonal Master Plan shall regulate development in Eco-sensitive Zone and adhere to prohibited and regulated activities listed in the Table in paragraph 4 and also ensure and promote eco-friendly development for security of local communities' livelihood.
- (8) The Zonal Master Plan shall be co-terminus with the Regional Development Plan.
- (9) The Zonal Master Plan so approved shall be the reference document for the Monitoring Committee for carrying out its functions of monitoring in accordance with the provisions of this notification.
- 3. Measures to be taken by State Government.-** The State Government shall take the following measures for giving effect to the provisions of this notification, namely:-

- (1) **Land use.-** (a) Forests, horticulture areas, agricultural areas, parks and open spaces earmarked for recreational purposes in the Eco-sensitive Zone shall not be used or converted into areas for commercial or residential or industrial activities:


Provided that the conversion of agricultural and other lands, for the purpose other than that specified in clause (a) above, within the Eco-sensitive Zone may be permitted on the recommendation of the Monitoring Committee, and with the prior approval of the competent authority under Regional Town Planning Act and other rules and regulations of the Central Government or State Government as applicable and *vide* provisions of this notification, to meet the residential needs of the local residents and for activities such as-

- (i) widening and strengthening of existing roads and construction of new roads;
 (ii) construction and renovation of infrastructure and civic amenities;
 (iii) small scale industries not causing pollution;
 (iv) cottage industries including village industries; convenience stores and local amenities supporting eco-tourism including home stay; and
 (v) promoted activities given in paragraph 4:

Provided further that no use of tribal land shall be permitted for commercial and industrial development activities without the prior approval of the competent authority under Regional Town Planning Act and other rules and regulations of the State Government and without compliance of the provisions of article 244 of the Constitution or the law for the time being in force, including the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007):


Provided also that any error appearing in the land records within the Eco-sensitive Zone shall be corrected by the State Government, after obtaining the views of Monitoring Committee, once in each case and the correction of said error shall be intimated to the Central Government in the Ministry of Environment, Forest and Climate Change:

Provided also that the correction of error shall not include change of land use in any case except as provided under this sub-paragraph.


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- (b) Efforts shall be made to reforest the unused or unproductive agricultural areas with afforestation and habitat restoration activities.
- (2) **Natural water bodies.**-The catchment areas of all natural springs shall be identified and plans for their conservation and rejuvenation shall be incorporated in the Zonal Master Plan and the guidelines shall be drawn up by the State Government in such a manner as to prohibit development activities at or near these areas which are detrimental to such areas.
- (3) **Tourism or eco-tourism.**- (a) All new eco-tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be as per the Tourism Master Plan for the Eco-sensitive Zone.
- (b) The Tourism Master Plan shall be prepared by the State Department of Tourism in consultation with the State Departments of Environment and Forests.
- (c) The Tourism Master Plan shall form a component of the Zonal Master Plan.
- (d) The Tourism Master Plan shall be drawn based on the study of carrying capacity of the Eco-sensitive Zone.
- (e) The activities of eco-tourism shall be regulated as under, namely:-
- (i) new construction of hotels and resorts shall not be allowed within one kilometre from the boundary of the protected area or upto the extent of the Eco-sensitive Zone whichever is nearer:
- Provided that beyond the distance of one kilometre from the boundary of the protected area till the extent of the Eco-sensitive Zone, the establishment of new hotels and resorts shall be allowed only in pre-defined and designated areas for eco-tourism facilities as per Tourism Master Plan;
- (ii) all new tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be in accordance with the guidelines issued by the Central Government in the Ministry of Environment, Forest and Climate Change and the eco-tourism guidelines issued by National Tiger Conservation Authority (as amended from time to time) with emphasis on eco-tourism, eco-education and eco-development;
- (iii) until the Zonal Master Plan is approved, development for tourism and expansion of existing tourism activities shall be permitted by the concerned regulatory authorities based on the actual site specific scrutiny and recommendation of the Monitoring Committee and no new hotel, resort or commercial establishment construction shall be permitted within Eco-sensitive Zone area.
- (4) **Natural heritage.**- All sites of valuable natural heritage in the Eco-sensitive Zone, such as the gene pool reserve areas, rock formations, waterfalls, springs, gorges, groves, caves, points, walks, rides, cliffs, etc. shall be identified and a heritage conservation plan shall be drawn up for their preservation and conservation as a part of the Zonal Master Plan.
- (5) **Man-made heritage sites.**- Buildings, structures, artefacts, areas and precincts of historical, architectural, aesthetic, and cultural significance shall be identified in the Eco-sensitive Zone and heritage conservation plan for their conservation shall be prepared as part of the Zonal Master Plan.
- (6) **Noise pollution.** - Prevention and control of noise pollution in the Eco-sensitive Zone shall be complied in accordance with the provisions of the Noise Pollution (Regulation and Control) Rules, 2000 under the Environment Act.
- (7) **Air pollution.**- Prevention and control of air pollution in the Eco-sensitive Zone shall be compiled in accordance with the provisions of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) and the rules made thereunder.
- (8) **Discharge of effluents.**- Discharge of treated effluent in Eco-sensitive Zone shall be in accordance with the provisions of the General Standards for Discharge of Environmental Pollutants covered under the Environment Act and the rules made thereunder or standards stipulated by State Government whichever is more stringent.
- (9) **Solid wastes.**- Disposal and management of solid wastes shall be as under:-
- (a) the solid waste disposal and management in the Eco-sensitive Zone shall be carried out in accordance with the Solid Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number S.O. 1357 (E), dated the 8th April, 2016; the inorganic material may be disposed in an environmental acceptable manner at site identified outside the Eco-sensitive Zone;


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- (b) safe and Environmentally Sound Management (ESM) of solid wastes in conformity with the existing rules and regulations using identified technologies may be allowed within Eco-sensitive Zone.
- (10) **Bio-Medical Waste.**- Bio- medical waste management shall be as under:-
- (a) the Bio-medical waste disposal in the Eco-sensitive Zone shall be carried out in accordance with the Bio-Medical Waste Management, Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change vide notification number G.S.R 343 (E), dated the 28th March, 2016.
- (b) safe and Environmentally Sound Management of bio-medical wastes in conformity with the existing rules and regulations using identified technologies may be allowed within the Eco-sensitive Zone.
- (11) **Plastic waste management.**- The plastic waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the Plastic Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change vide notification number G.S.R. 340(E), dated the 18th March, 2016, as amended from time to time.
- (12) **Construction and demolition waste management.**- The construction and demolition waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the Construction and Demolition Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change vide notification number G.S.R. 317(E), dated the 29th March, 2016, as amended from time to time.
- (13) **E-waste.**- The e - waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the E-Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change, as amended from time to time.
- (14) **Vehicular traffic.**- The vehicular movement of traffic shall be regulated in a habitat friendly manner and specific provisions in this regard shall be incorporated in the Zonal Master Plan and till such time as the Zonal Master plan is prepared and approved by the Competent Authority in the State Government, the Monitoring Committee shall monitor compliance of vehicular movement under the relevant Acts and the rules and regulations made thereunder.
- (15) **Vehicular pollution.**- Prevention and control of vehicular pollution shall be in compliance with applicable laws and efforts shall be made for use of cleaner fuels.
- (16) **Industrial units.**- (i) On or after the publication of this notification in the Official Gazette, no new polluting industries shall be permitted to be set up within the Eco-sensitive Zone.
- (ii) Only non-polluting industries shall be allowed within Eco-sensitive Zone as per the classification of Industries in the guidelines issued by the Central Pollution Control Board in February, 2016, unless so specified in this notification, and in addition, the non-polluting cottage industries shall be promoted.
- (17) **Protection of hill slopes.**- The protection of hill slopes shall be as under:-
- (a) the Zonal Master Plan shall indicate areas on hill slopes where no construction shall be permitted;
- (b) construction on existing steep hill slopes or slopes with a high degree of erosion shall not be permitted.
4. **List of activities prohibited or to be regulated within Eco-sensitive Zone.**- All activities in the Eco sensitive Zone shall be governed by the provisions of the Environment Act and the rules made there under including the Coastal Regulation Zone, 2011 and the Environmental Impact Assessment Notification, 2006 and other applicable laws including the Forest (Conservation) Act, 1980 (69 of 1980), the Indian Forest Act, 1927 (16 of 1927), the Wildlife (Protection) Act 1972 (53 of 1972), and amendments made thereto and be regulated in the manner specified in the Table below, namely:-


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TABLE

S. No. (1)	Activity (2)	Description (3)
A. Prohibited Activities		
1.	Commercial mining, stone quarrying and crushing units.	(a) All new and existing mining (minor and major minerals), stone quarrying and crushing units shall be prohibited with immediate effect except for meeting the domestic needs of bona fide local residents including digging of earth for construction or repair of houses and for manufacture of country tiles or bricks for housing and for personal consumption; (b) The mining operations shall be carried out in accordance with the order of the Hon'ble Supreme Court dated the 4 th August, 2006 in the matter of T.N. Godavarman Thirumulpad Vs. UOI in W.P.(C) No.202 of 1995 and dated the 21 st April, 2014 in the matter of Goa Foundation Vs. UOI in W.P.(C) No.435 of 2012.
2.	Setting of industries causing pollution (Water, Air, Soil, Noise, etc.).	New industries and expansion of existing polluting industries in the Eco-sensitive Zone shall not be permitted: Provided that non-polluting industries shall be allowed within Eco-sensitive Zone as per classification of Industries in the guidelines issued by the Central Pollution Control Board in February, 2016, unless otherwise specified in this notification and in addition the non-polluting cottage industries shall be promoted.
3.	Establishment of major hydro-electric project.	Prohibited (except as otherwise provided) as per the applicable laws.
4.	Use or production or processing of any hazardous substances.	Prohibited (except as otherwise provided) as per the applicable laws.
5.	Discharge of untreated effluents in natural water bodies or land area.	Prohibited (except as otherwise provided) as per the applicable laws.
6.	Setting up of new saw mills.	New or expansion of existing saw mills shall not be permitted within the Eco-sensitive Zone.
7.	Setting up of brick kilns.	Prohibited (except as otherwise provided) as per the applicable laws.
B. Regulated Activities		
8.	Commercial establishment of hotels and resorts.	No new commercial hotels and resorts shall be permitted within one kilometer of the boundary of the protected area or upto the extent of Eco-sensitive Zone, whichever is nearer, except for small temporary structures for eco-tourism activities: Provided that, beyond one kilometer from the boundary of the protected area or upto the extent of Eco-sensitive Zone whichever is nearer, all new tourist activities or expansion of existing activities shall be in conformity with the Tourism Master Plan and guidelines as applicable.

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S. No. (1)	Activity (2)	Description (3)
9.	Construction activities.	<p>(a) New commercial construction of any kind shall not be permitted within one kilometer from the boundary of the protected area or upto extent of the Eco-sensitive Zone, whichever is nearer:</p> <p>Provided that, local people shall be permitted to undertake construction in their land for their use including the activities mentioned in sub-paragraph (1) of paragraph 3 as per building bye-laws to meet the residential needs of the local residents.</p> <p>Provided further that the construction activity related to small scale industries not causing pollution shall be regulated and kept at the minimum, with the prior permission from the competent authority as per applicable rules and regulations, if any.</p> <p>(b) Beyond one kilometer it shall be regulated as per the Zonal Master Plan.</p>
10.	Small scale non polluting industries.	Non polluting industries as per classification of industries issued by the Central Pollution Control Board in February, 2016 and non-hazardous, small-scale and service industry, agriculture, floriculture, horticulture or agro-based industry producing products from indigenous materials from the Eco-sensitive Zone shall be permitted by the competent Authority.
11.	Felling of trees.	<p>(a) There shall be no felling of trees in the forest or Government or revenue or private lands without prior permission of the Competent Authority in the State Government.</p> <p>(b) The felling of trees shall be regulated in accordance with the provisions of the concerned Central or State Act and the rules made thereunder.</p>
12.	Collection of Forest Produce or Non-Timber Forest Produce.	Regulated as per the applicable laws.
13.	Erection of electrical and communication towers and laying of cables and other infrastructures.	Regulated under applicable laws (underground cabling may be promoted).
14.	Infrastructure including civic amenities.	Taking measures of mitigation as per the applicable laws, rules and regulations available guidelines.
15.	Widening and strengthening of existing roads and construction of new roads.	Taking measures of mitigation as per the applicable laws, rules and regulation and available guidelines.
16.	Undertaking other activities related to tourism like flying over the Eco-sensitive Zone area by hot air balloon, helicopter, drones, microlites, etc.	Regulated as per the applicable laws.
17.	Protection of hill slopes and river banks.	Regulated as per the applicable laws.
18.	Movement of vehicular traffic at night.	Regulated for commercial purpose under applicable laws.


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S. No. (1)	Activity (2)	Description (3)
19.	Ongoing agriculture and horticulture practices by local communities along with dairies, dairy farming, aquaculture and fisheries.	Permitted as per the applicable laws for use of locals.
20.	Establishment of large-scale commercial livestock and poultry farms by firms, corporate and companies.	Regulated (except otherwise provided) as per the applicable laws except for meeting local needs.
21.	Discharge of treated waste water or effluents in natural water bodies or land area.	The discharge of treated waste water or effluents shall be avoided to enter into the water bodies and efforts shall be made for recycle and reuse of treated waste water. Otherwise the discharge of treated waste water or effluent shall be regulated as per the applicable laws.
22.	Commercial extraction of surface and ground water.	Regulated as per the applicable laws.
23.	Open well, bore well, etc. for agriculture or other usage	Regulated as per applicable laws and the activity shall be strictly monitored by the concerned authority.
24.	Solid waste management.	Regulated as per the applicable laws.
25.	Introduction of exotic species.	Regulated as per the applicable laws.
26.	Eco-tourism.	Regulated as per the applicable laws.
27.	Use of polythene bags.	Regulated as per the applicable laws.
28.	Commercial sign boards and hoardings.	Regulated as per the applicable laws.
C. Promoted Activities		
29.	Rain water harvesting.	Shall be actively promoted.
30.	Organic farming.	Shall be actively promoted.
31.	Adoption of green technology for all activities.	Shall be actively promoted.
32.	Cottage industries including village artisans, etc.	Shall be actively promoted.
33.	Use of renewable energy and fuels.	Bio-gas, solar light, etc. shall be actively promoted.
34.	Agro-forestry.	Shall be actively promoted.
35.	Plantation of horticulture and herbals.	Shall be actively promoted.
36.	Use of eco-friendly transport.	Shall be actively promoted.
37.	Skill development.	Shall be actively promoted.
38.	Restoration of degraded land/ forests/ habitat.	Shall be actively promoted.
39.	Environmental awareness.	Shall be actively promoted.

5. **Monitoring Committee.**- For effective monitoring of the provisions of this notification, the Central Government hereby constitutes a Monitoring Committee, comprising of the following, namely:-

S. No.	Constituent of Monitoring Committee	Designation
(i)	Collector, Khordha	Chairman, ex officio;

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(ii)	Collector, Cuttack or Representative of the Collector	Member;
(iii)	Deputy Commissioner of Police or Representative of Deputy Commissioner of Police, Bhubaneswar	Member;
(iv)	One representative of non-Governmental Organisations working in the field of environment to be nominated by the Central Government	Member;
(v)	Secretary, Bhubaneswar Development Authority	Member;
(vi)	An expert in biodiversity nominated by the State Government	Member;
(vii)	One expert in ecology from reputed institution or university of the State	Member;
(viii)	Representative of Commissioner, Bhubaneswar Municipal Corporation	Member;
(ix)	Representative of Member Secretary, Odisha State Pollution Control Board	Member;
(x)	Deputy Director, Nandankanan Zoological Park and Wildlife Warden, Nandankanan Sanctuary	Member-Secretary.

6. **Terms of reference.** – (1) The Monitoring Committee shall monitor the compliance of the provisions of this notification.

- (2) The tenure of the Monitoring committee shall be for three years or till the re-constitution of the new Committee by the State Government and subsequently the Monitoring Committee shall be constituted by the State Government.
- (3) The activities that are covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forests number S.O. 1533 (E), dated the 14th September, 2006, and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the Central Government in the Ministry of Environment, Forest and Climate Change for prior environmental clearances under the provisions of the said notification.
- (4) The activities that are not covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forest number S.O. 1533 (E), dated the 14th September, 2006 and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the concerned regulatory authorities.
- (5) The Member-Secretary of the Monitoring Committee or the concerned Deputy Commissioner(s) shall be competent to file complaints under section 19 of the Environment Act, against any person who contravenes the provisions of this notification.
- (6) The Monitoring Committee may invite representatives or experts from concerned Departments, representatives from industry associations or concerned stakeholders to assist in its deliberations depending on the requirements on issue to issue basis.
- (7) The Monitoring Committee shall submit the annual action taken report of its activities as on the 31st March of every year by the 30th June of that year to the Chief Wildlife Warden in the State as per proforma appended at Annexure V.
- (8) The Central Government in the Ministry of Environment, Forest and Climate Change may give such directions, as it deems fit, to the Monitoring Committee for effective discharge of its functions.

7. **Additional measures.**- The Central Government and State Government may specify additional measures, if any, for giving effect to provisions of this notification.

8. **Supreme Court, etc. order.**-The provisions of this notification shall be subject to the orders, if any passed or to be passed by the Hon'ble Supreme Court of India or High Court or the National Green Tribunal.

[F. No. 25/49/2017-ESZ]

DR. SATISH C. GARKOTI, Scientist 'G'



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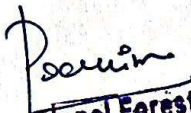

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ANNEXURE- I

BOUNDARY DESCRIPTION OF ECO-SENSITIVE ZONE AROUND NANDANKANAN WILDLIFE
SANCTUARY IN THE STATE OF ODISHA

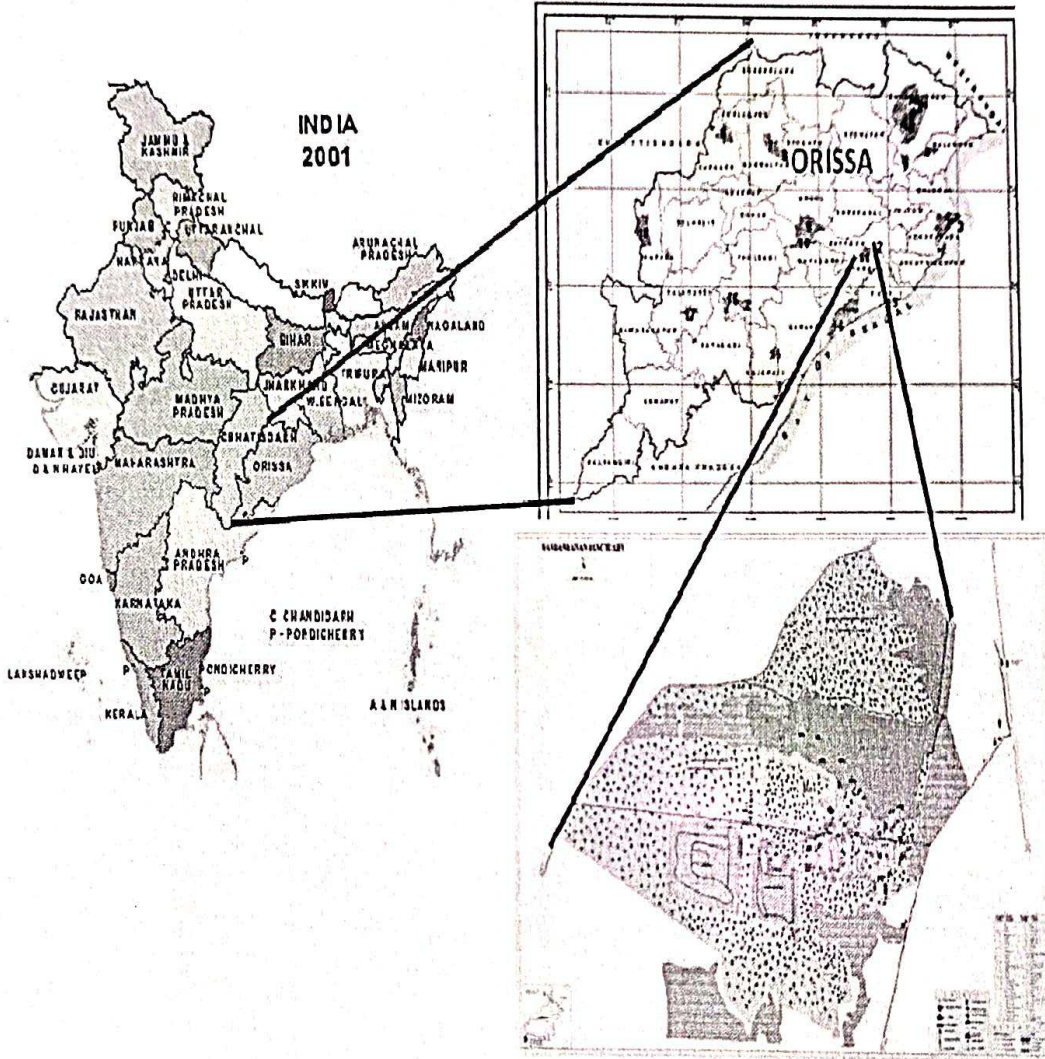
The Eco-sensitive Zone in respect of Nandankanan Sanctuary is the area up to one hundred meters from the boundary of the protected area except from the boundary Pillar No. 1 to 11 with average distance of 150 meters, from pillar No. 11 to 25 with average distance of 125 meters, from pillar No. 25 to 32 it merges with PWD road along the Sanctuary boundary, from pillar No. 32 to 51 with average distance of 270 meters covering entire alienated plot No. 5 (Gramya Jungle), from pillar No. 87 to 112 with average distance of 340 meters covering the swampy area. The boundary of Chandaka-Dampara Sanctuary (Churang R.F.) being located in the Northern boundary of the Sanctuary i.e. adjacent to the pillar No. 131 to 137, the ESZ has not been demarcated as the Sanctuary border pillar No. 131 to 137 goes co-terminus with Chandaka-Dampara Sanctuary along the PWD road.


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ANNEXURE- IIA

LOCATION MAP OF NANDANKANAN WILDLIFE SANCTUARY AND ITS ECO-SENSITIVE ZONE ALONG WITH LATITUDE AND LONGITUDE OF PROMINENT LOCATIONS



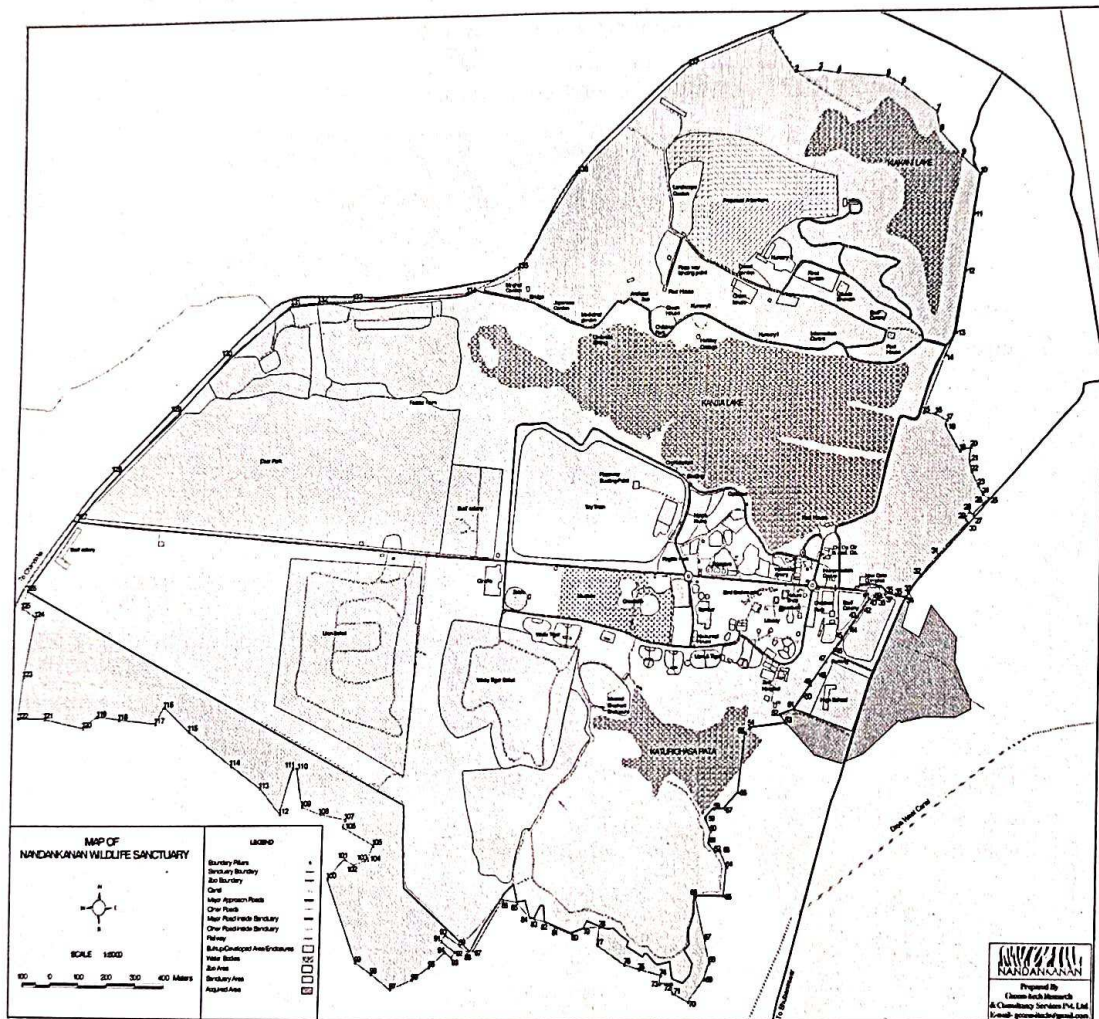
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ANNEXURE- IIB

MAP OF ECO-SENSITIVE ZONE OF NANDANKANAN WILDLIFE SANCTUARY ALONG WITH LATITUDE AND LONGITUDE OF PROMINENT LOCATIONS

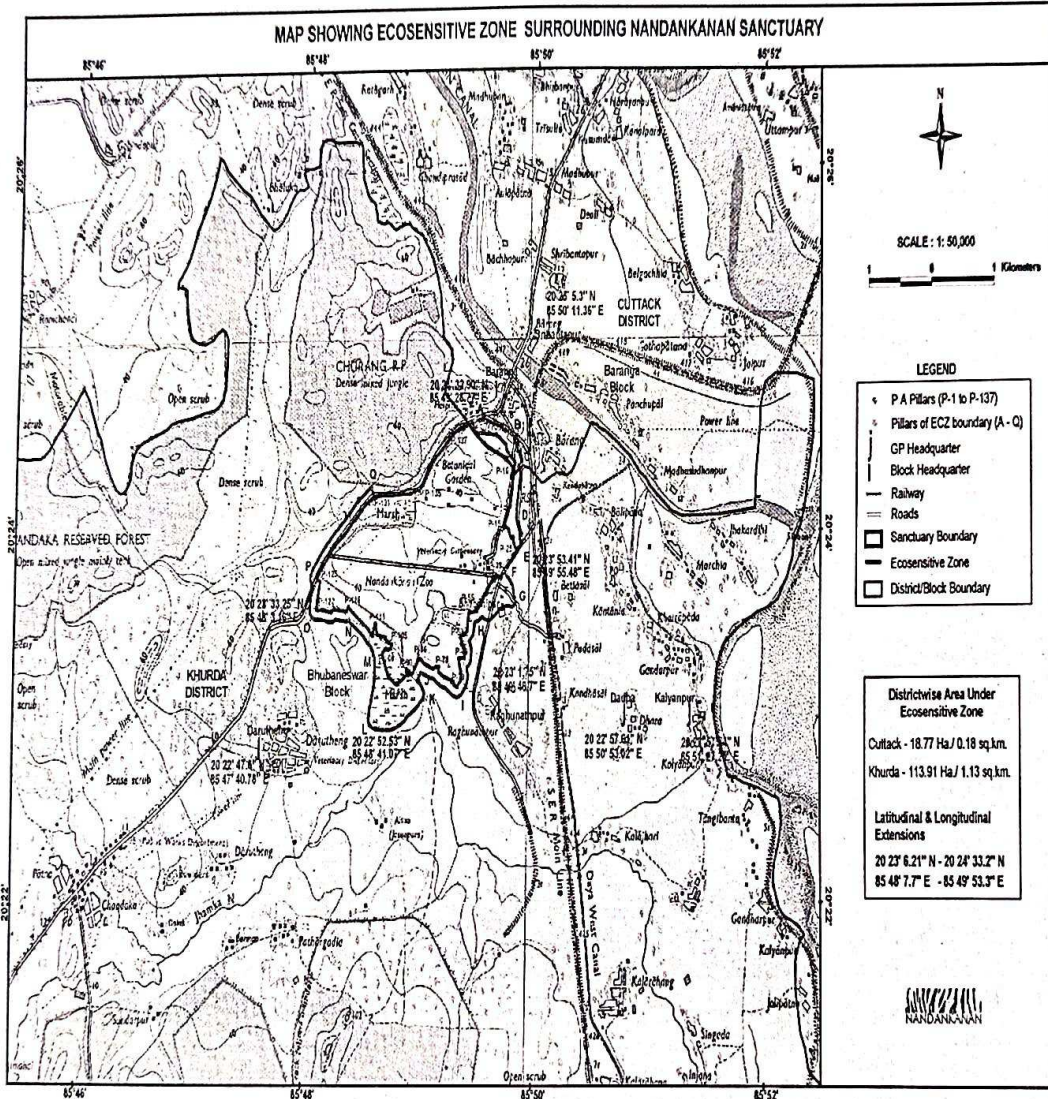


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ANNEXURE- IIC

MAP SHOWING LANDUSE PATTERN OF ECO-SENSITIVE ZONE OF NANDANKANAN WILDLIFE SANCTUARY ALONG WITH LATITUDE AND LONGITUDE OF PROMINENT LOCATIONS ON SURVEY OF INDIA (SOI) TOPOSHEET



ANNEXURE-III

TABLE A: GEO- COORDINATES OF PROMINENT LOCATIONS OF NANDANKANAN WILDLIFE SANCTUARY

Boundary pillar	Global Positioning System (GPS) location					
	North (latitude)			East (longitude)		
	Degree	Minute	Second	Degree	Minute	Second
1	20	24	35.300	85	49	20.700
2	20	24	31.733	85	49	23.543
3	20	24	31.917	85	49	26.136

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THE GAZETTE OF INDIA : EXTRAORDINARY

[PART II—SEC. 3(ii)]

4	20	24	31.647	85	49	28.141
5	20	24	31.300	85	49	33.447
6	20	24	30.568	85	49	35.092
7	20	24	28.075	85	49	38.895
8	20	24	26.251	85	49	39.281
9	20	24	24.002	85	49	41.697
10	20	24	22.318	85	49	43.674
11	20	24	18.635	85	49	43.107
12	20	24	13.463	85	49	42.218
13	20	24	07.874	85	49	41.286
14	20	24	05.904	85	49	40.183
15	20	24	00.700	85	49	37.935
16	20	24	00.582	85	49	39.166
17	20	23	59.950	85	49	40.387
18	20	23	59.533	85	49	40.269
19	20	23	57.091	85	49	41.854
20	20	23	57.445	85	49	43.06
21	20	23	56.267	85	49	42.892
22	20	23	55.207	85	49	43.139
23	20	23	54.050	85	49	43.835
24	20	23	53.269	85	49	44.284
25	20	23	52.830	85	49	44.927
26	20	23	52.369	85	49	44.34
27	20	23	51.395	85	49	43.374
28	20	23	51.684	85	49	42.957
29	20	23	50.977	85	49	42.582
30	20	23	50.699	85	49	42.818
31	20	23	47.936	85	49	39.755
32	20	23	46.041	85	49	37.967
33	2	23	44.671	85	49	36.650
34	20	23	44.221	85	49	36.404
35	20	23	44.414	85	49	35.386
36	20	23	44.606	85	49	34.476
37	20	23	44.317	85	49	34.241
38	20	23	44.189	85	49	33.877
39	20	23	44.082	85	49	33.438
40	20	23	44.060	85	49	33.031
41	20	23	44.059	85	49	32.510
42	20	23	43.228	85	49	31.979
43	20	23	42.539	85	49	31.375
44	20	23	41.528	85	49	30.565
45	20	23	40.522	85	49	29.730
46	20	23	39.596	85	49	28.955
47	20	23	38.554	85	49	28.048
48	20	23	37.552	85	49	27.251
49	20	23	36.524	85	49	26.468
50	20	23	35.509	85	49	25.658
51	20	23	34.416	85	49	24.751

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[भाग II-खण्ड 3(ii)]

भारत का राजपत्र : असाधारण

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52	20	23	34.004	85	49	23.236
53	20	23	33.134	85	49	23.860
54	20	23	32.807	85	49	20.109
55	20	23	32.383	85	49	19.633
56	20	23	27.058	85	49	19.059
57	20	23	25.606	85	49	17.581
58	20	23	25.580	85	49	16.476
59	20	23	24.861	85	49	15.603
60	20	23	23.602	85	49	16.142
61	20	23	22.574	85	49	16.039
62	20	23	21.803	85	49	16.669
63	20	23	21.867	85	49	17.273
64	20	23	20.402	85	49	17.992
65	20	23	17.832	85	49	17.800
66	20	23	17.807	85	49	14.754
67	20	23	13.939	85	49	15.885
68	20	23	11.896	85	49	16.412
69	20	23	10.431	85	49	15.885
70	20	23	08.388	85	49	14.266
71	20	23	09.224	85	49	12.532
72	20	23	10.046	85	49	12.429
73	20	23	10.046	85	49	11.118
74	20	23	10.778	85	49	11.195
75	20	23	11.292	85	49	08.89
76	20	23	11.781	85	49	07.302
77	20	23	13.502	85	49	04.282
78	20	23	15.134	85	49	04.475
79	20	23	14.993	85	49	02.856
80	20	23	14.517	85	49	01.533
81	20	23	15.070	85	48	59.657
82	20	23	15.622	85	48	58.513
83	20	23	15.867	85	48	57.395
84	20	23	16.008	85	48	56.856
85	20	23	17.306	85	48	55.417
86	20	23	17.537	85	48	53.926
87	20	23	12.988	85	48	50.919
88	20	23	12.911	85	48	50.238
89	20	23	13.489	85	48	49.365
90	20	23	14.415	85	48	47.771
91	20	23	13.862	85	48	47.424
92	20	23	12.886	85	48	48.954
93	20	23	12.333	85	48	48.555
94	20	23	12.847	85	48	47.810
95	20	23	11.511	85	48	46.140
96	20	23	10.393	85	48	44.328
97	20	23	09.545	85	48	42.002
98	20	23	10.920	85	48	39.831
99	20	23	11.986	85	48	38.083

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100	20	23	19.567	85	48	34.832
101	20	23	21.340	85	48	36.618
102	20	23	20.749	85	48	37.544
103	20	23	21.160	85	48	38.738
104	20	23	21.225	85	48	39.098
105	20	23	22.497	85	48	39.625
106	20	23	24.128	85	48	36.297
107	20	23	24.822	85	48	36.516
108	20	23	25.375	85	48	33.766
109	20	23	26.056	85	48	31.826
110	20	23	29.409	85	48	31.145
111	20	23	29.422	85	48	30.669
112	20	23	25.401	85	48	29.449
113	20	23	27.713	85	48	27.174
114	20	23	29.744	85	48	24.013
115	20	23	32.866	85	48	19.285
116	20	23	34.986	85	48	16.561
117	20	23	33.560	85	48	15.623
118	20	23	33.881	85	48	11.537
119	20	23	34.125	85	48	09.160
120	20	23	33.200	85	48	07.554
121	20	23	33.958	85	48	03.108
122	20	23	33.984	85	48	00.050
123	20	23	37.761	85	48	00.538
124	20	23	43.132	85	48	01.746
125	20	23	43.980	85	48	00.140
126	20	23	45.574	85	48	00.708
127	20	23	52.053	85	48	06.365
128	20	23	56.191	85	48	10.944
129	20	24	01.566	85	48	17.521
130	20	24	06.530	85	48	23.000
131	20	24	11.190	85	48	29.763
132	20	24	11.426	85	48	32.771
133	20	24	11.533	85	48	36.605
134	20	24	12.117	85	48	49.063
135	20	24	14.247	85	48	54.346
136	20	24	22.761	85	49	00.468
137	20	24	32.623	85	49	12.132

TABLE B: GEO-COORDINATES OF PROMINENT LOCATIONS OF ECO-SENSITIVE ZONE

Eco-sensitive Zone boundary Pillar Coordinate of Important Locations		
Pillar	Longitude (E)	Latitude (N)
A	85.82496	20.40941
B	85.83039	20.40817
C	85.8321	20.40513
D	85.83134	20.40065
E	85.83229	20.39799

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			85°49'44.535"	20°23'54.902"	25
			85°49'43.884"	20°23'56.067"	26
			85°49'43.558"	20°23'56.992"	27
			85°49'43.764"	20°23'58.208"	28
			85°49'42.428"	20°23'57.848"	29
			85°49'40.851"	20°24'00.178"	30
			85°49'40.868"	20°24'00.572"	31
			85°49'39.669"	20°24'01.155"	32
			85°49'38.444"	20°24'01.258"	33
			85°49'40.586"	20°24'06.397"	34
			85°49'41.656"	20°24'08.196"	35
			85°49'42.428"	20°24'13.636"	36
Khordha	Jujhagada	60.828	85°48'53.575"	20°23'11.456"	65
			85°48'52.268"	20°23'13.302"	66
			85°48'52.241"	20°23'14.537"	67
			85°48'52.435"	20°23'15.544"	68
			85°48'54.409"	20°23'09.961"	129
			85°48'54.897"	20°23'09.549"	130
			85°48'56.542"	20°23'07.185"	131
			85°48'56.509"	20°23'06.153"	132
			85°48'56.490"	20°23'05.540"	133
			85°48'55.257"	20°23'03.587"	134
			85°48'51.556"	20°23'00.966"	135
			85°48'47.907"	20°22'58.910"	136
			85°48'45.440"	20°22'57.009"	137
			85°48'42.613"	20°22'55.723"	138
			85°48'40.146"	20°22'55.055"	139
			85°48'35.006"	20°22'55.107"	140
			85°48'30.432"	20°22'55.980"	141
			85°48'28.633"	20°22'56.854"	142
			85°48'27.811"	20°22'58.499"	143
			85°48'28.530"	20°23'02.714"	144
			85°48'30.638"	20°23'10.423"	145
			85°48'30.895"	20°23'13.918"	146
			85°48'30.792"	20°23'17.002"	147
			85°48'30.278"	20°23'20.034"	148
			85°48'28.685"	20°23'22.347"	149
			85°48'26.834"	20°23'23.837"	150
			85°48'24.110"	20°23'26.510"	151
			85°48'16.966"	20°23'31.290"	152
			85°48'10.233"	20°23'31.753"	153
			85°48'07.972"	20°23'30.981"	154
			85°47'58.875"	20°23'32.266"	155
			85°47'57.384"	20°23'33.603"	156
			85°47'56.973"	20°23'35.556"	157
			85°47'57.539"	20°23'40.387"	158
			85°47'58.207"	20°23'43.059"	159
			85°47'58.016"	20°23'43.351"	160

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F	85.82972	20.39551
G	85.83115	20.39256
H	85.82544	20.39113
I	85.82316	20.38428
J	85.81754	20.38619
K	85.81811	20.38428
L	85.81031	20.38152
M	85.81078	20.38761
N	85.80697	20.39113
O	85.80145	20.39152
P	85.80126	20.39523
Q	85.81012	20.40341

ANNEXURE-IV

LIST OF VILLAGES COMING UNDER ECO-SENSITIVE ZONE OF NANDANKANAN WILDLIFE
SANCTUARY ALONG WITH GEO-COORDINATES

District	Village	Area (Ha)	Longitude	Latitude	Pillar ID
Cuttack	Dadhapatna	18.77	85°49'20.700"	20°24'35.300"	1
			85°49'26.869"	20°24'36.529"	2
			85°49'37.628"	20°24'32.828"	3
			85°49'41.534"	20°24'30.910"	4
			85°49'46.469"	20°24'22.686"	5
			85°49'46.301"	20°24'20.840"	6
			85°49'44.508"	20°24'19.927"	7
			85°49'43.251"	20°24'18.950"	8
			85°49'43.841"	20°24'22.373"	9
			85°49'41.696"	20°24'24.002"	10
			85°49'39.281"	20°24'26.251"	11
			85°49'38.896"	20°24'28.075"	12
			85°49'35.092"	20°24'30.568"	13
			85°49'33.447"	20°24'31.301"	14
			85°49'28.141"	20°24'31.647"	15
			85°49'26.136"	20°24'31.917"	16
			85°49'23.700"	20°24'31.800"	17
Khordha	Dadha	7.678	85°49'46.301"	20°24'20.840"	6
			85°49'44.508"	20°24'19.927"	7
			85°49'43.251"	20°24'18.950"	8
			85°49'45.852"	20°24'15.902"	18
			85°49'44.139"	20°24'06.582"	19
			85°49'44.070"	20°24'02.744"	20
			85°49'45.852"	20°23'58.359"	21
			85°49'46.126"	20°23'55.686"	22
85°49'46.743"	20°23'54.384"	23			
85°49'45.768"	20°23'53.754"	24			

J.M.
SR. Env. Scientist
Regional Office
S.P.C. Board
Bhubaneswar (Odisha)

P. Prasad
Divisional Forest Officer
Khordha Division, Khordha

		85°48'28.464"	20°24'10.295"	171
		85°48'23.000"	20°24'06.530"	172
		85°48'17.521"	20°24'01.566"	173
		85°48'10.944"	20°23'56.190"	174
		85°48'06.365"	20°23'52.053"	175
		85°48'00.708"	20°23'45.574"	176
		85°48'00.140"	20°23'43.980"	177
		85°48'01.746"	20°23'43.132"	178
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		85°48'09.179"	20°23'34.283"	183
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		85°48'50.809"	20°23'12.953"	213
		85°49'28.084"	20°23'38.549"	111
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		85°49'30.693"	20°23'39.380"	113
		85°49'32.011"	20°23'40.417"	114
		85°49'33.110"	20°23'41.653"	115


 SR Env. Scientist
 Regional Office
 S.P.C. Board
 Bhubaneswar (Odisha)


 Divisional Forest Officer
 Khordha Division, Khordha

			85°49'33.082"	20°23'42.896"	116
			85°49'32.839"	20°23'44.355"	117
			85°49'32.127"	20°23'43.576"	124
			85°49'31.506"	20°23'42.848"	125
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			85°49'34.960"	20°23'32.575"	43
			85°49'30.206"	20°23'29.620"	44
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			85°49'24.552"	20°23'29.491"	47
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			85°49'13.245"	20°23'04.770"	59
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			85°49'01.064"	20°23'11.400"	62
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			85°48'53.575"	20°23'11.456"	65
			85°48'52.268"	20°23'13.302"	66
			85°48'52.241"	20°23'14.537"	67
			85°48'52.435"	20°23'15.544"	68
			85°48'53.842"	20°23'17.785"	69
			85°48'55.204"	20°23'17.425"	70
			85°48'56.720"	20°23'16.089"	71
			85°48'57.337"	20°23'16.063"	72
			85°48'57.979"	20°23'17.142"	73
			85°48'58.211"	20°23'17.117"	74
			85°48'58.391"	20°23'15.729"	75
			85°48'59.495"	20°23'15.138"	76
			85°49'01.397"	20°23'14.624"	77


 S.P. Env. Scientist
 Regional Office
 S.P.C. Board
 Bhubaneswar (Odisha)


 Divisional Forest Officer
 Khordha Division, Khordha

[भाग II - खण्ड 3(ii)]

भारत का राजपत्र : असाधारण

47

			85°49'02.656"	20°23'15.138"	78
			85°49'04.327"	20°23'15.215"	79
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			85°49'15.685"	20°23'10.487"	88
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			85°49'17.721"	20°23'18.029"	93
			85°49'17.913"	20°23'20.586"	94
			85°49'17.220"	20°23'22.051"	95
			85°49'16.603"	20°23'21.935"	96
			85°49'15.973"	20°23'22.719"	97
			85°49'16.166"	20°23'23.747"	98
			85°49'15.678"	20°23'25.057"	99
			85°49'16.474"	20°23'25.751"	100
			85°49'17.656"	20°23'25.833"	101
			85°49'19.121"	20°23'27.272"	102
			85°49'19.558"	20°23'32.310"	103
			85°49'20.213"	20°23'33.042"	104
			85°49'24.068"	20°23'33.389"	105
			85°49'23.259"	20°23'34.198"	106
			85°49'24.878"	20°23'34.648"	107
			85°49'25.867"	20°23'35.817"	108
			85°49'26.651"	20°23'36.807"	109
			85°49'27.512"	20°23'37.860"	110
			85°49'28.084"	20°23'38.549"	111
			85°49'29.374"	20°23'38.755"	112
			85°49'30.693"	20°23'39.380"	113
			85°49'32.011"	20°23'40.417"	114
			85°49'33.110"	20°23'41.653"	115
			85°49'33.082"	20°23'42.896"	116
			85°49'32.839"	20°23'44.355"	117
			85°49'34.054"	20°23'44.443"	118
			85°49'34.322"	20°23'44.561"	119
			85°49'34.771"	20°23'44.904"	120
			85°49'35.617"	20°23'44.754"	121
			85°49'36.710"	20°23'44.491"	122
			85°49'36.967"	20°23'44.954"	123
			85°49'32.127"	20°23'43.576"	124
			85°48'54.409"	20°23'09.961"	129

M. S. J.
 SR. Env. Scientist
 Regional Office
 S.P.C. Board
 hubaneswar (Odisha)

P. S. J.
 Divisional Forest Officer
 Khordha Division, Khordha

155

			85°48'54.897"	20°23'09.549"	130
			85°48'56.542"	20°23'07.185"	131
			85°48'56.509"	20°23'06.153"	132
			85°48'56.490"	20°23'05.540"	133
Khordha	Krushna nagar	9.934	85°47'58.207"	20°23'43.059"	159
			85°47'58.016"	20°23'43.351"	160
			85°47'59.644"	20°23'46.027"	161
			85°48'03.132"	20°23'50.785"	162
			85°48'08.158"	20°23'55.544"	163
			85°48'11.207"	20°23'58.647"	164
			85°48'16.892"	20°24'04.024"	165
			85°48'21.699"	20°24'07.745"	166
			85°48'25.846"	20°24'10.025"	167
			85°48'29.389"	20°24'11.241"	168
			85°48'29.741"	20°24'11.259"	169
			85°48'29.763"	20°24'11.190"	170
			85°47'57.333"	20°23'44.396"	214
			85°47'57.179"	20°23'45.989"	215
			85°47'57.744"	20°23'47.891"	216
			85°48'02.113"	20°23'53.442"	217
			85°48'05.556"	20°23'56.885"	218
			85°48'10.131"	20°24'01.100"	219
			85°48'16.041"	20°24'05.674"	220
			85°48'21.284"	20°24'10.608"	221
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			85°48'28.479"	20°24'15.234"	223

ANNEXURE - V

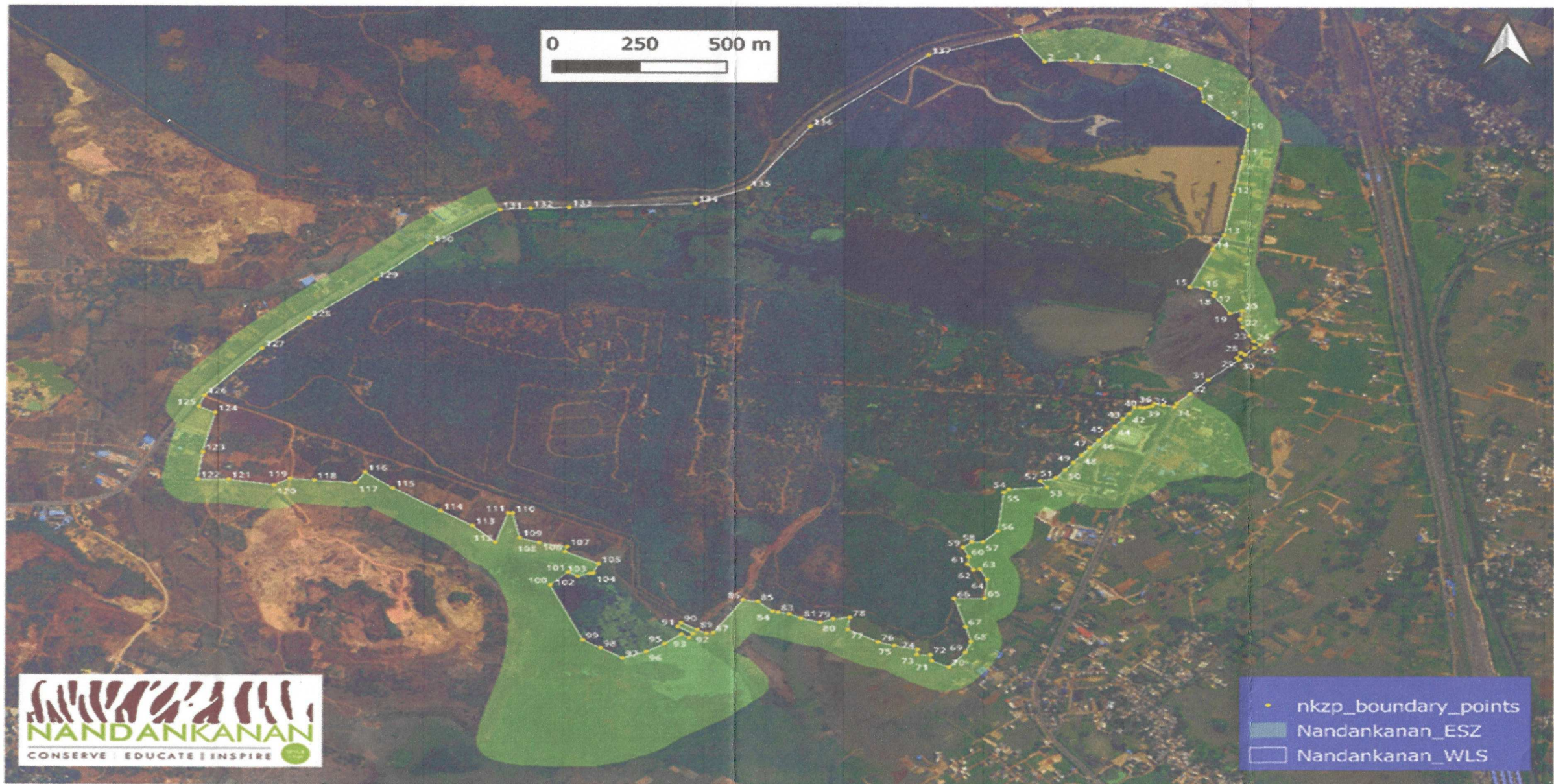
Performa of Action Taken Report:

1. Number and date of meetings.
2. Minutes of the meetings: (Mention noteworthy points. Attach minutes of the meeting as separate Annexure).
3. Status of preparation of Zonal Master Plan including Tourism Master Plan.
4. Summary of cases dealt with rectification of error apparent on face of land record (Eco-sensitive Zone wise). Details may be attached as Annexure.
5. Summary of cases scrutinised for activities covered under the Environment Impact Assessment Notification, 2006 (Details may be attached as separate Annexure).
6. Summary of cases scrutinised for activities not covered under the Environment Impact Assessment Notification, 2006 (Details may be attached as separate Annexure).
7. Summary of complaints lodged under section 19 of the Environment (Protection) Act, 1986.
8. Any other matter of importance.

J. S. Verma
 J.S. Verma, Scientist
 Regional Office
 S.P.C. Board
 Bhubaneswar (Odisha)

P. Verma
 P. Verma, Divisional Forest Officer
 Khordha Division, Khordha

Annexure-IV
Map of Nandankanan Zoological Park

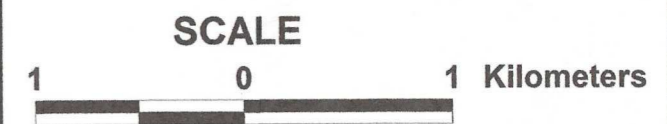
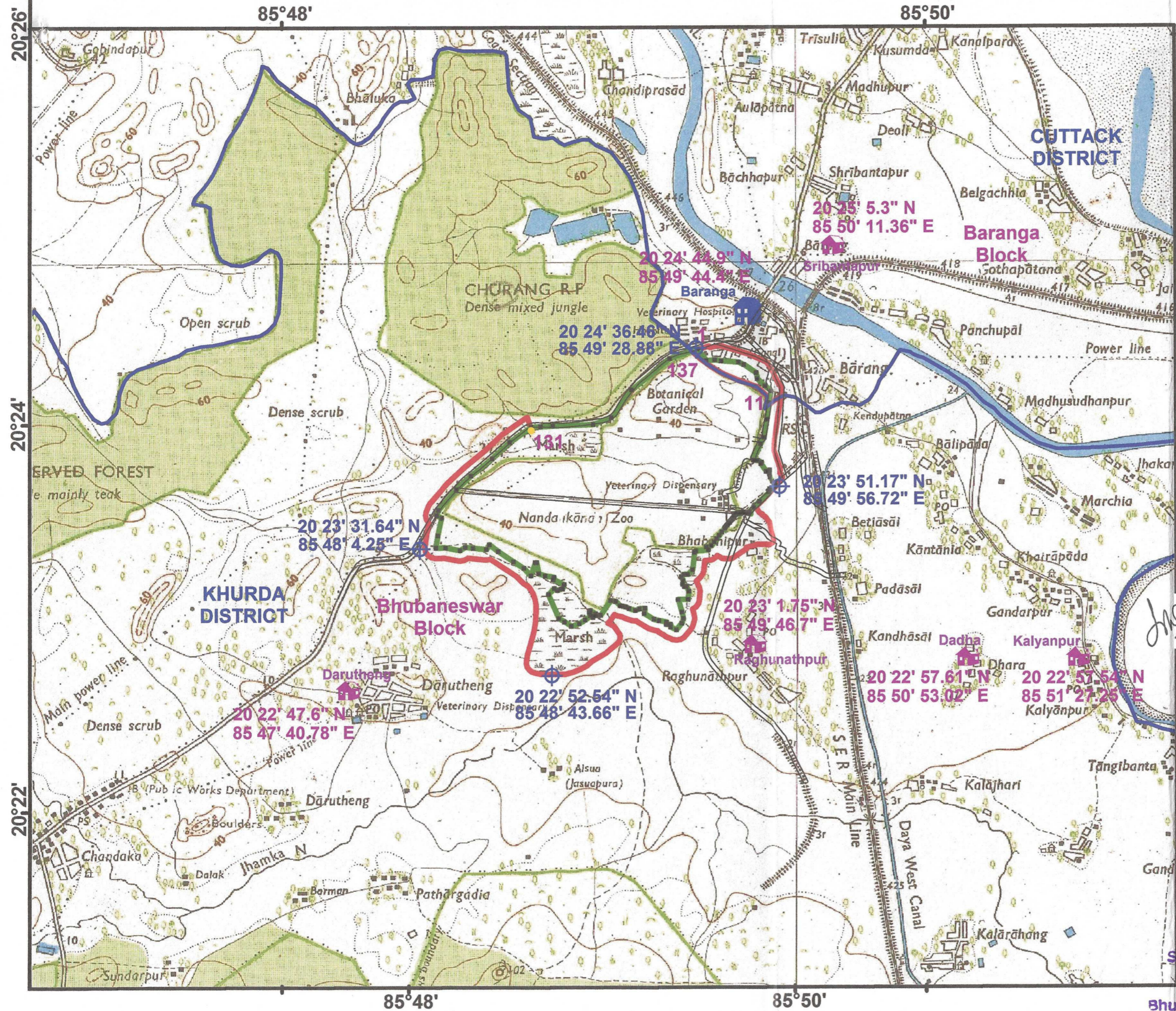


N.B.: - ESZ= Eco-sensitive zone, WLS= Wildlife Sanctuary.

J. Mohi
 SR. Env. Scientist
 Regional Office
 S.P.C. Board
 Bhubaneswar (Odisha)

Poojima
 Divisional Forest Officer
 Khordha Division, Khordha

MAP SHOWING ECOSENSITIVE ZONE SURROUNDING NANDANKANAN SANCTUARY



- LEGEND**
- Pillars
 - 🏠 GP Headquarter
 - 🏢 Block Headquarter
 - 🚊 Railway
 - 🛣️ Roads
 - 🟩 Sanctuary Boundary
 - 🔴 Ecosensitive Zone
 - 🟦 District/Block Boundary

Districtwise Area Under Ecosensitive Zone

Cuttack - 18.77 Ha./ 0.18 sq.km.
 Khurda - 113.91 Ha./ 1.13 sq.km.

Latitudinal & Longitudinal Extensions

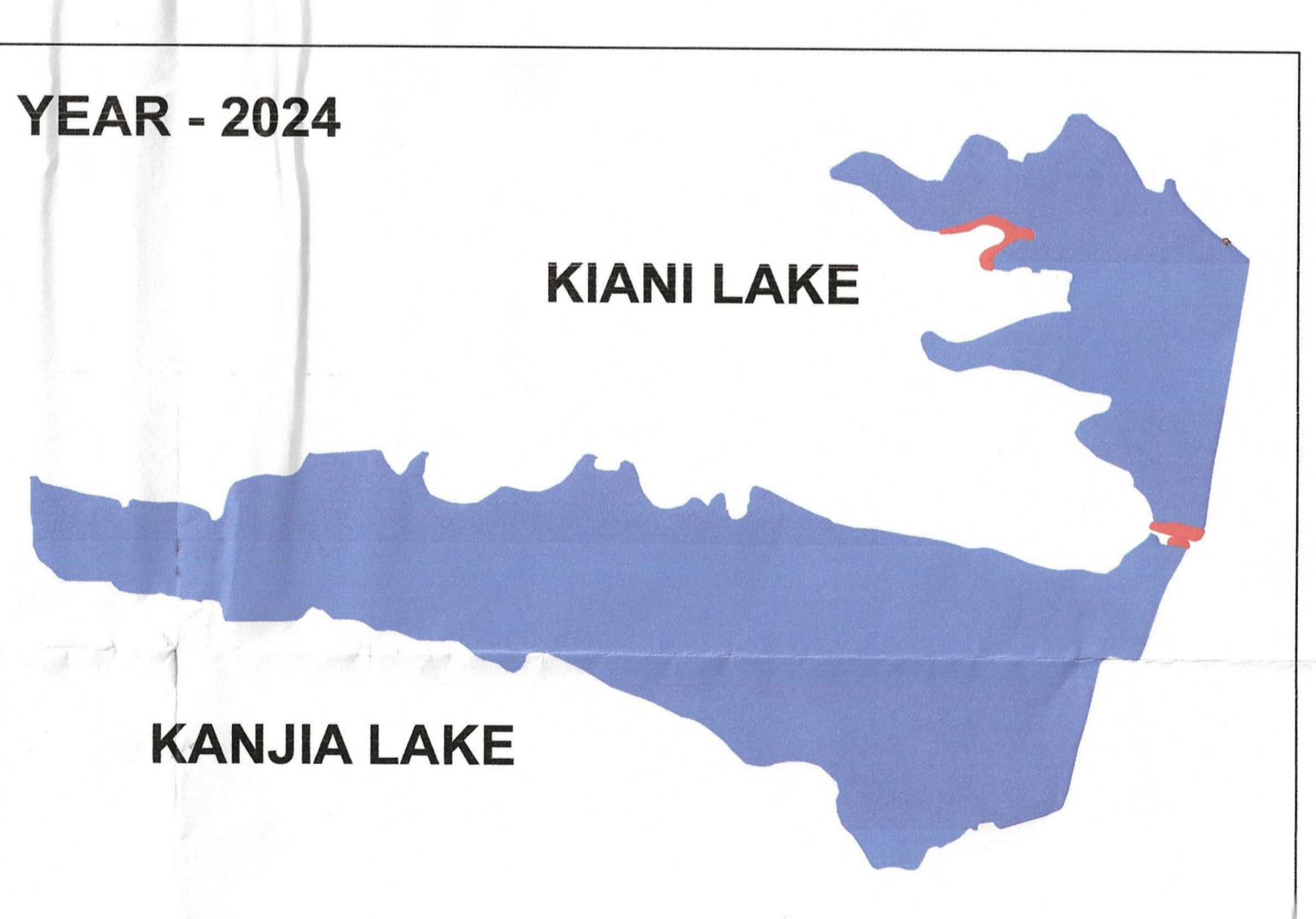
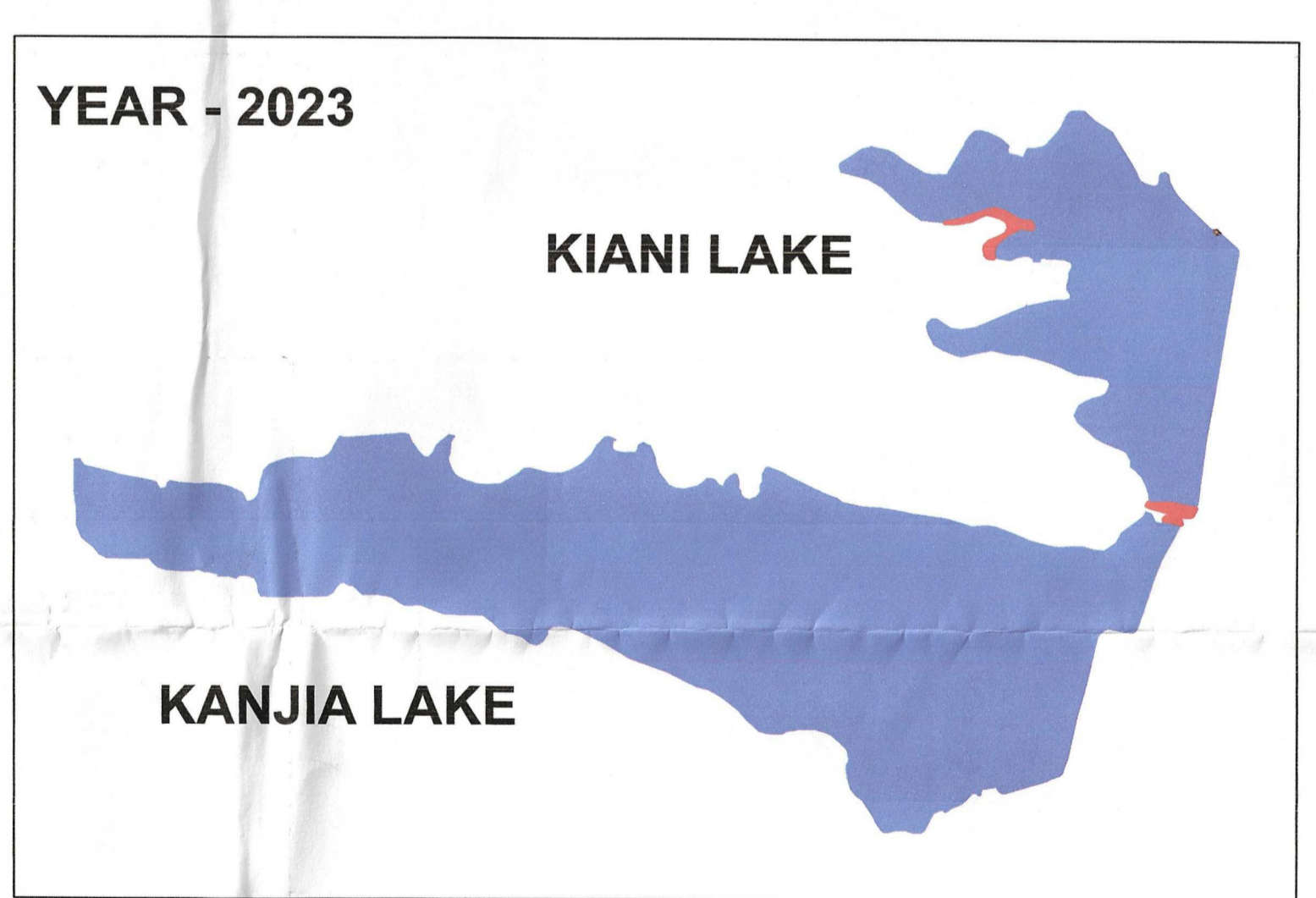
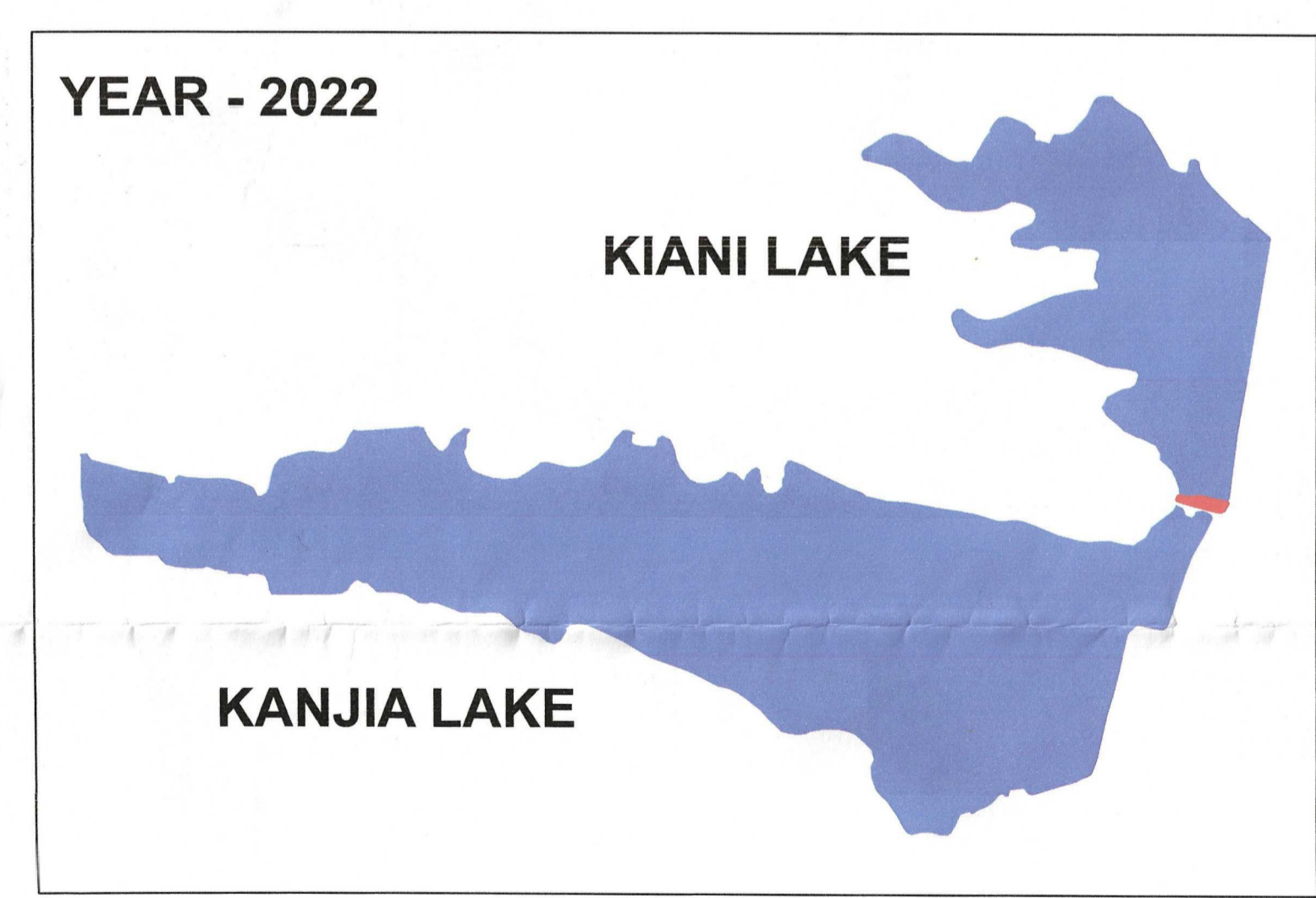
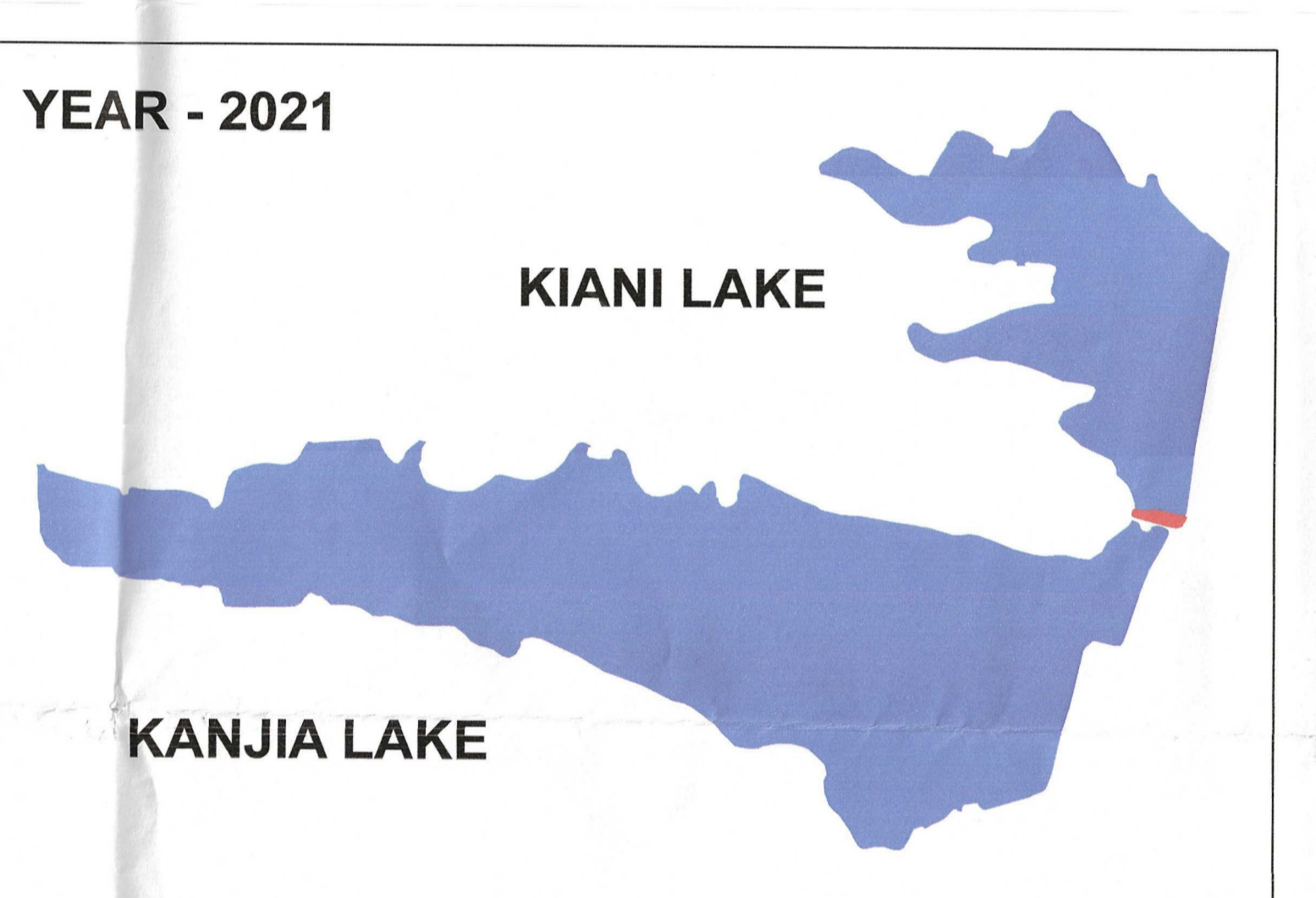
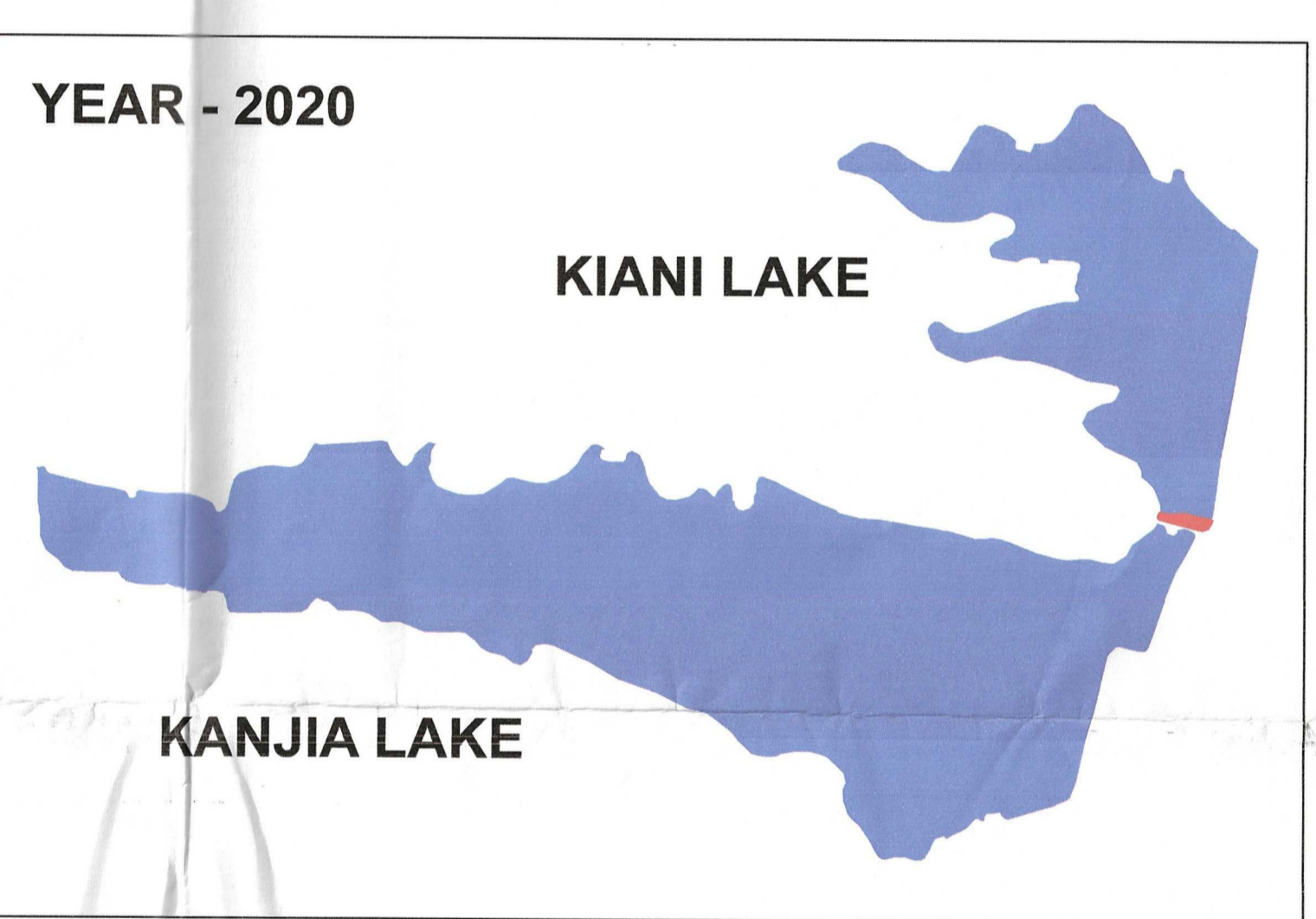
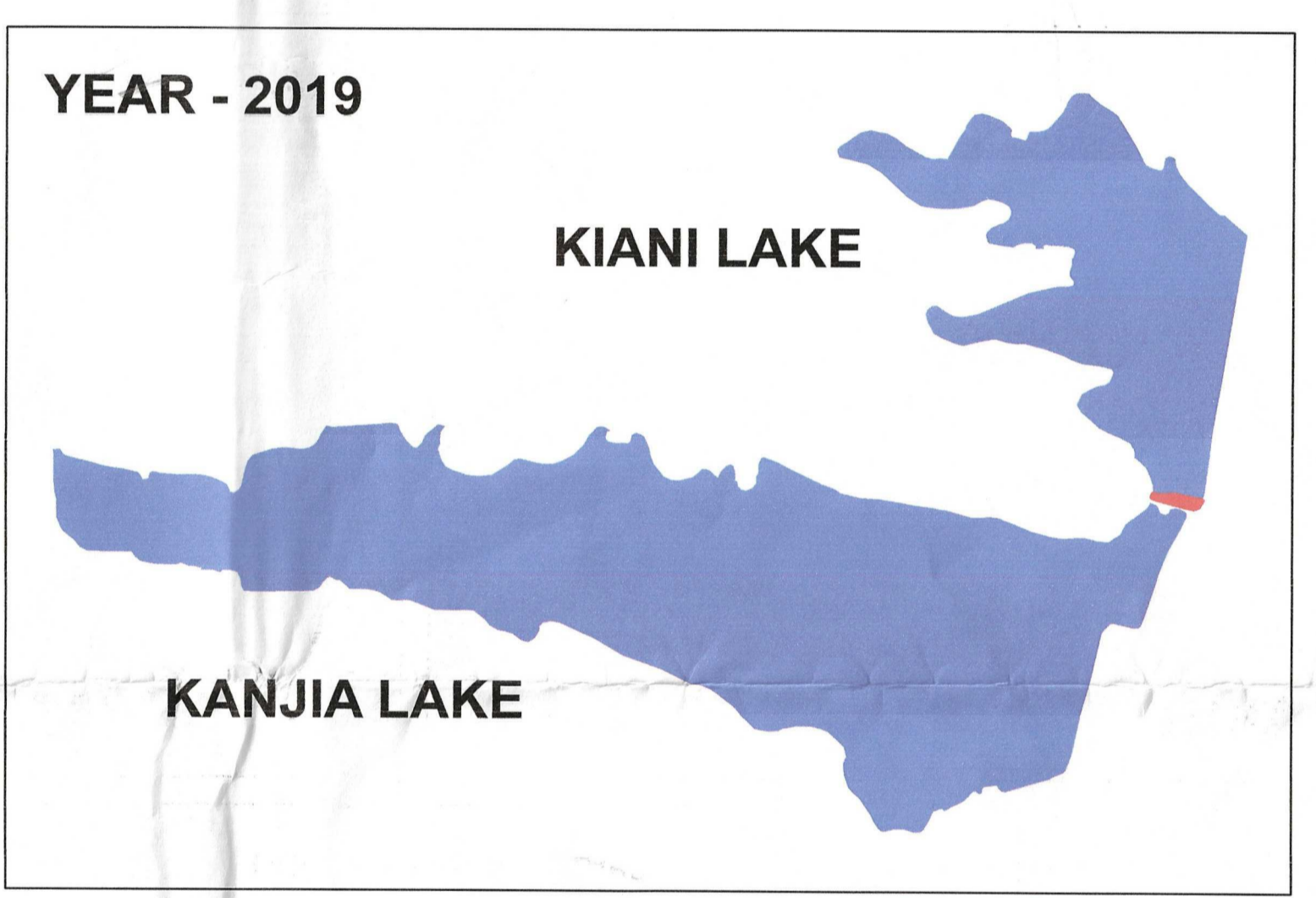
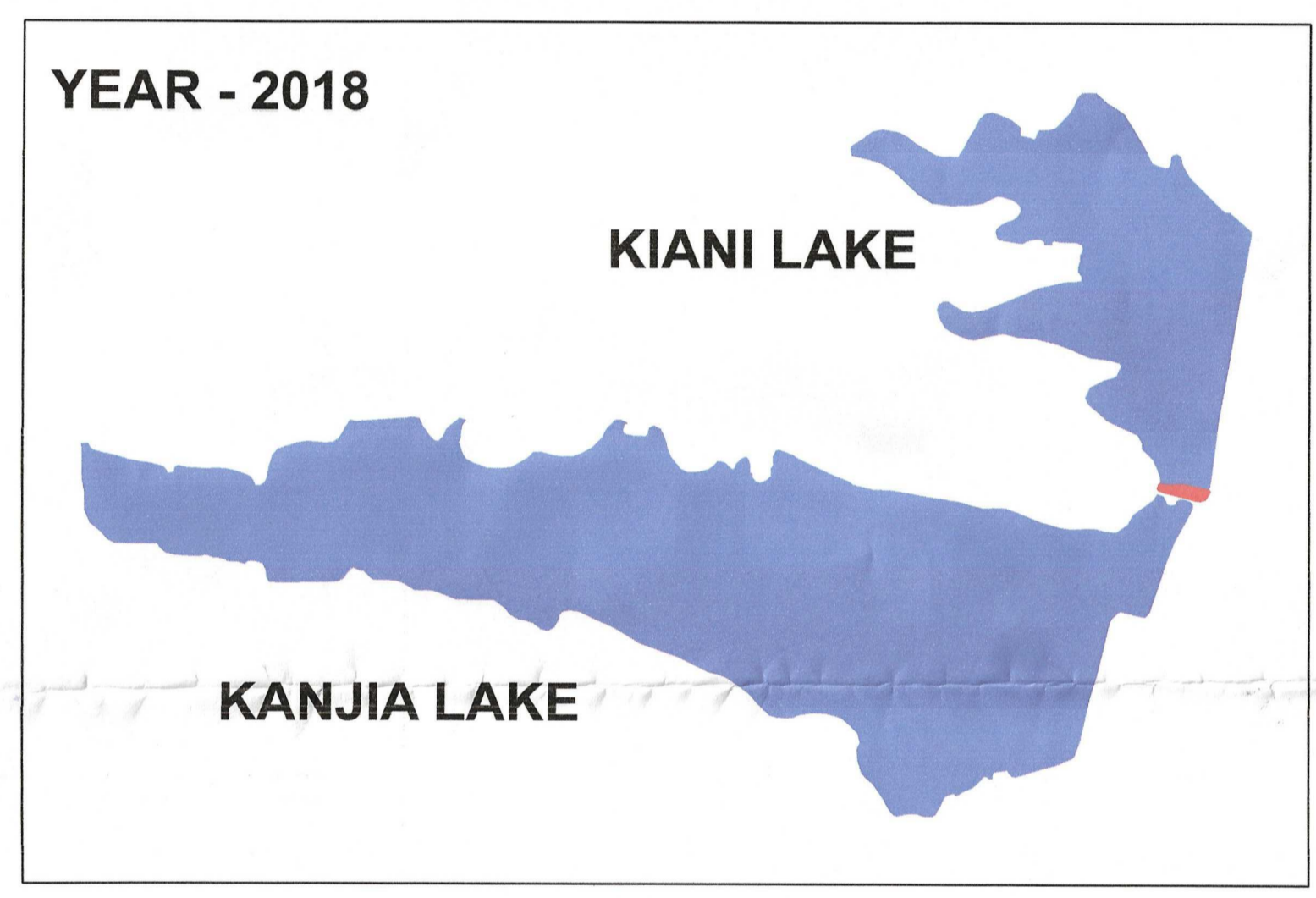
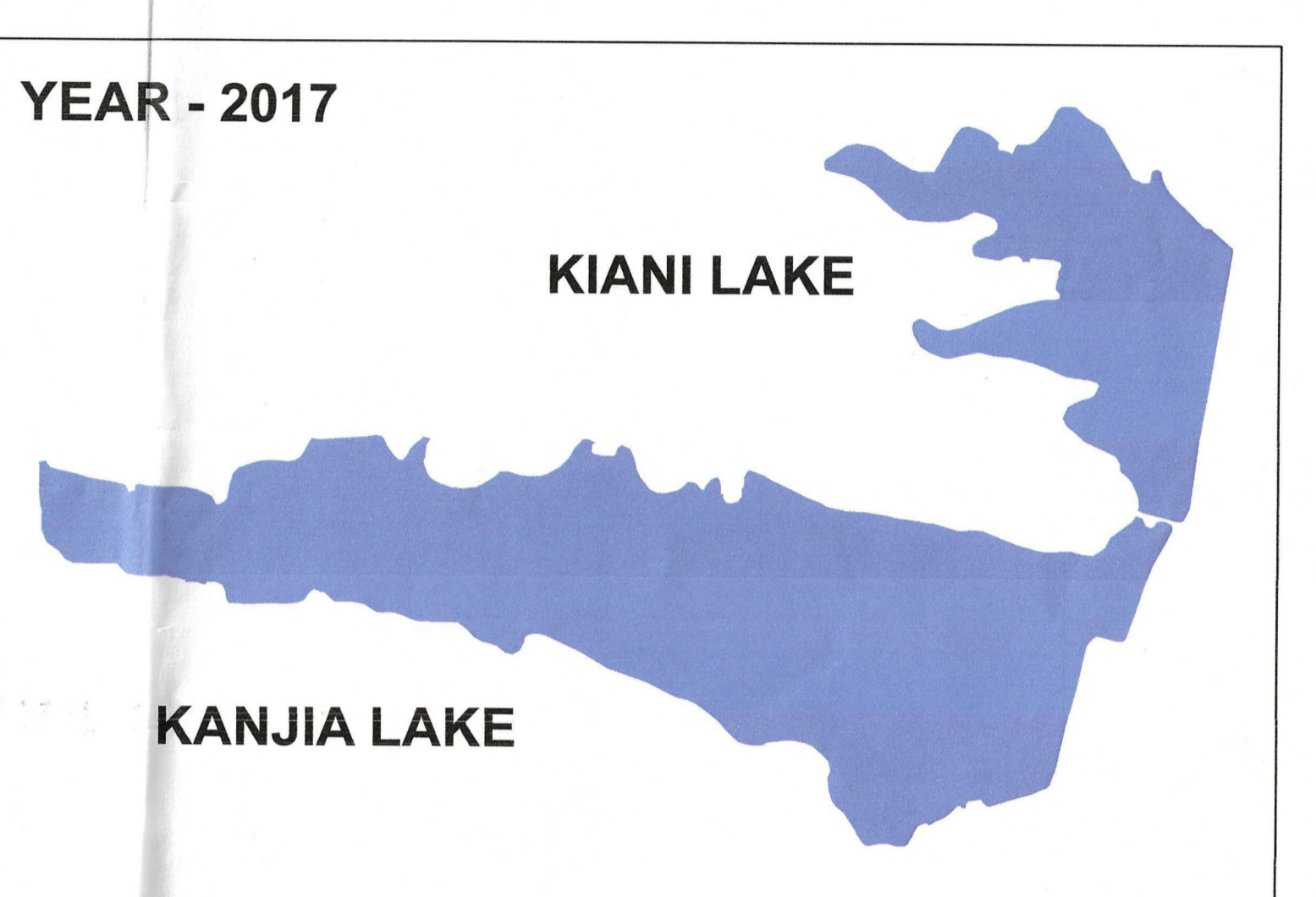
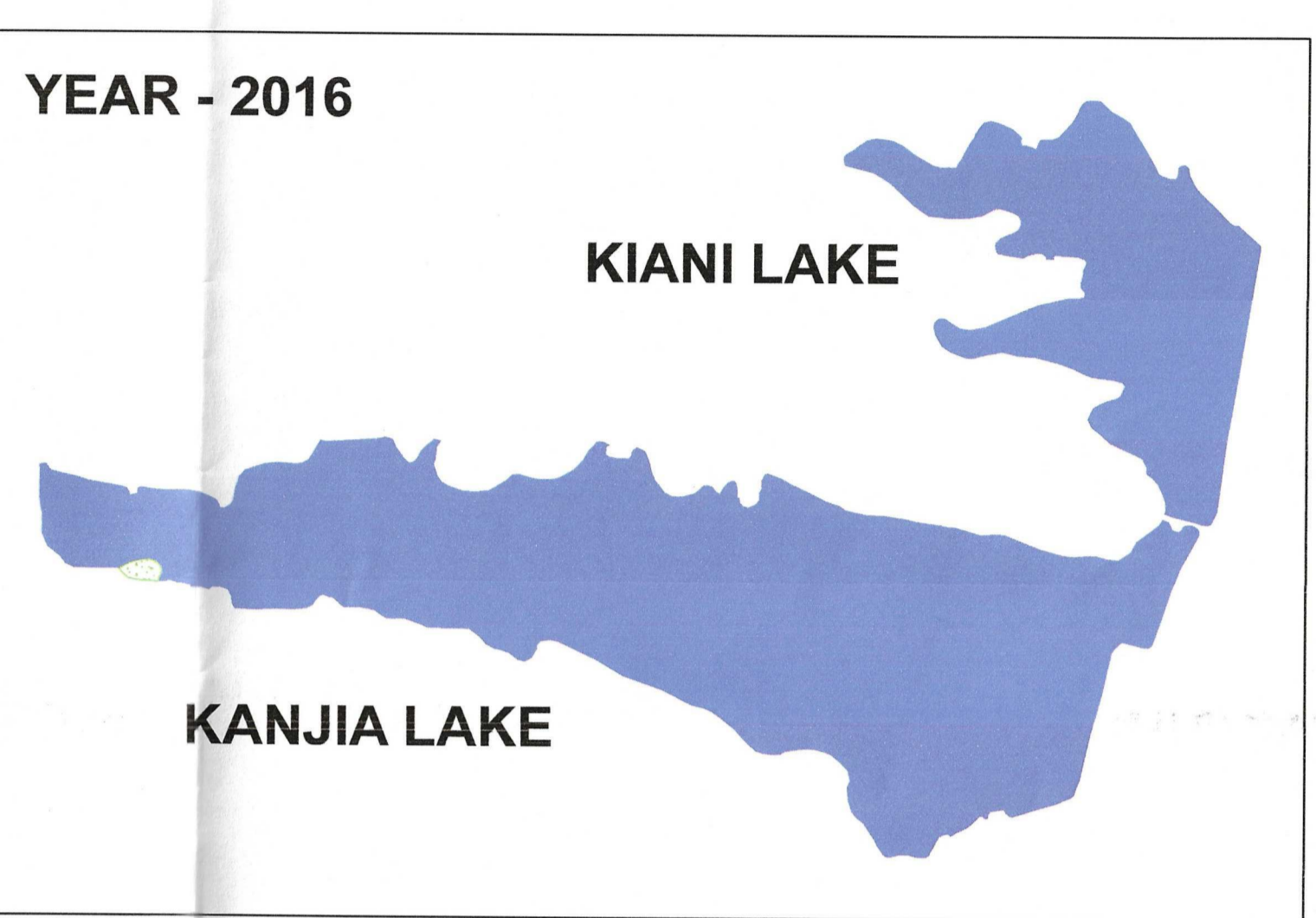
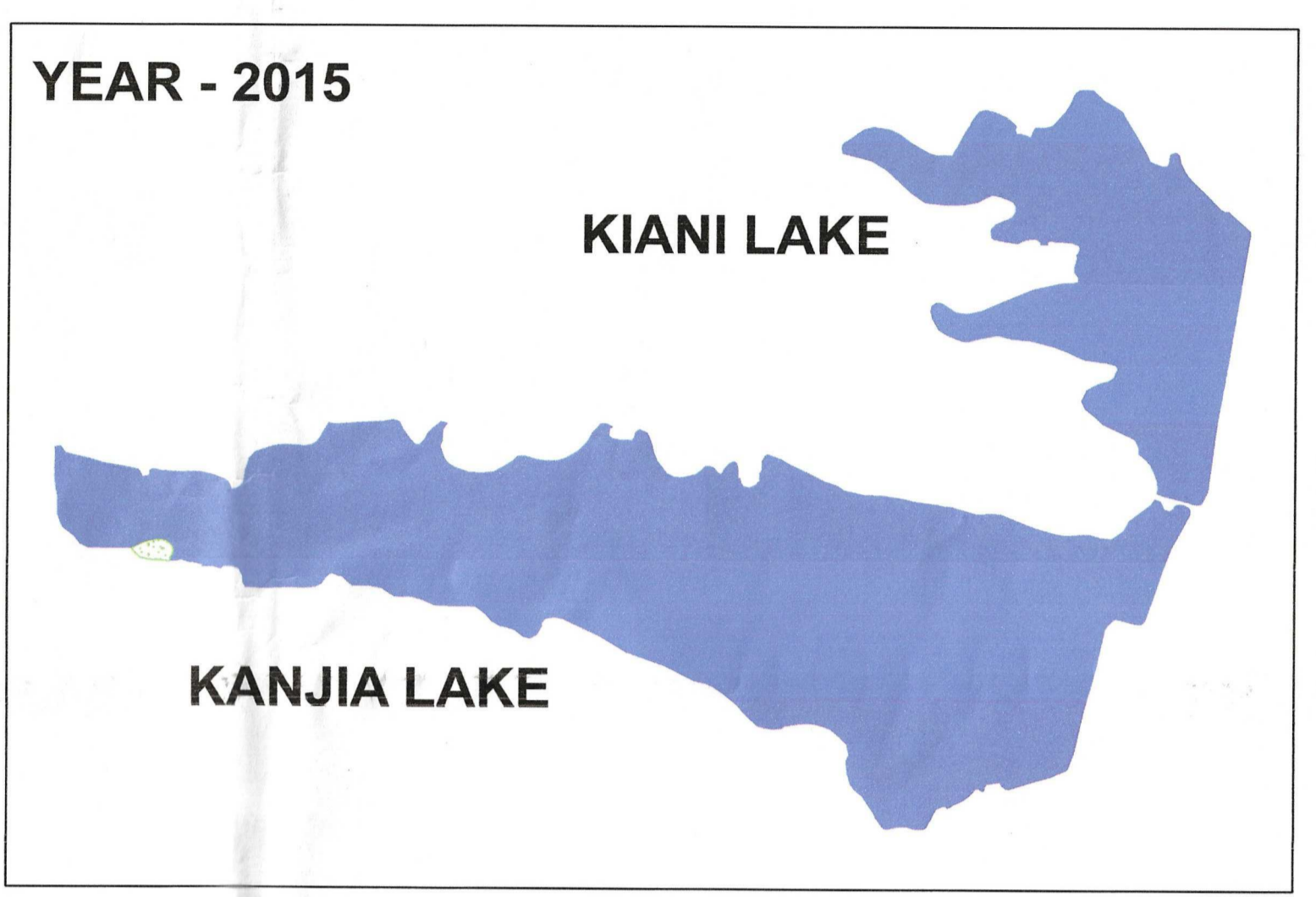
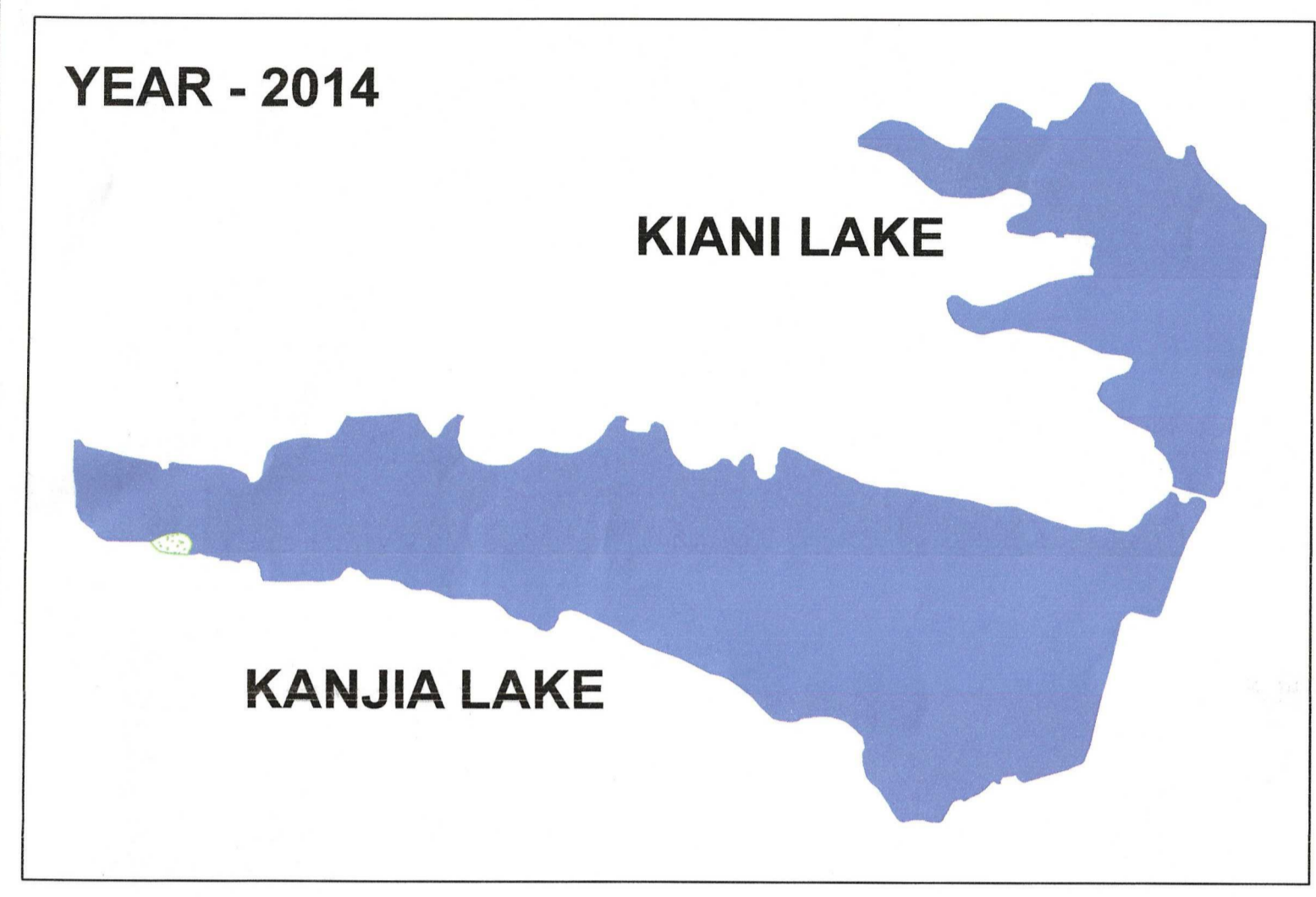
20 23' 6.21" N - 20 24' 33.2" N
 85 48' 7.7" E - 85 49' 53.3" E

M. S. Mohanty
 S.P.C. Board
 Bhubaneswar (Odisha)

Prasanna
 Divisional Forest Officer
 Khordha Division, Kh...

CHNAGE IN AREA OF KANJIA AND KIANI LAKES (YEAR 2014 TO 2024)

1:11,000



CHANGE OF WATER SPREAD AREA IN Hectres OF KANJIA AND KIANI LAKES

LAKE NAME	KANJIA LAKE	KIANI LAKE
YEAR 2014	60.63	20.88
YEAR 2015	60.63	20.88
YEAR 2016	60.63	20.88
YEAR 2017	60.82	20.88
YEAR 2018	60.82	20.77
YEAR 2019	60.82	20.77
YEAR 2020	60.82	20.77
YEAR 2021	60.82	20.77
YEAR 2022	60.82	20.77
YEAR 2023	60.80	20.58
YEAR 2024	60.80	20.58

Legend

- BUILT UP
- KANJIA LAKE
- KIANI LAKE
- ROAD
- SCRUBLAND

YEAR	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Satellite Image Used	LISS IV	LISS IV	LISS IV	PLANET LABS	PLANET LABS	PLANET LABS	PLANET LABS	PLANET LABS	PLANET LABS	WORLD VIEW	WORLD VIEW

Annexure - 4

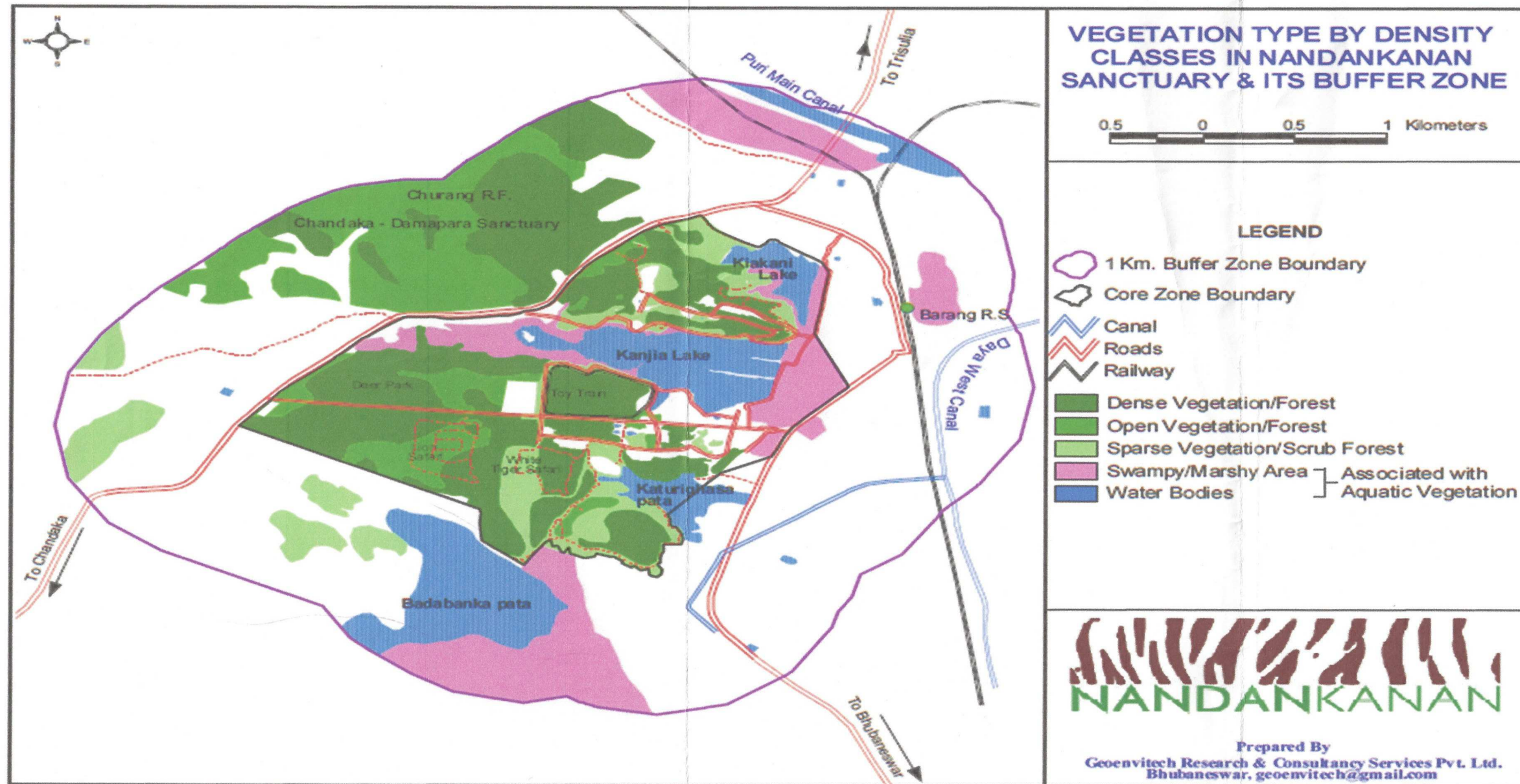
Signature
Sr. Env. Scientist
S.P.C. Board, Odisha

Signature
DIVISIONAL FOREST OFFICER
KHORDHA DIVISION, KHORDHA

ODISHA SPACE APPLICATIONS CENTRE
BHUBANESWAR
MAP NO. 4347/1
DATE: 16/12/2024
AUTHORISED SIGNATORY



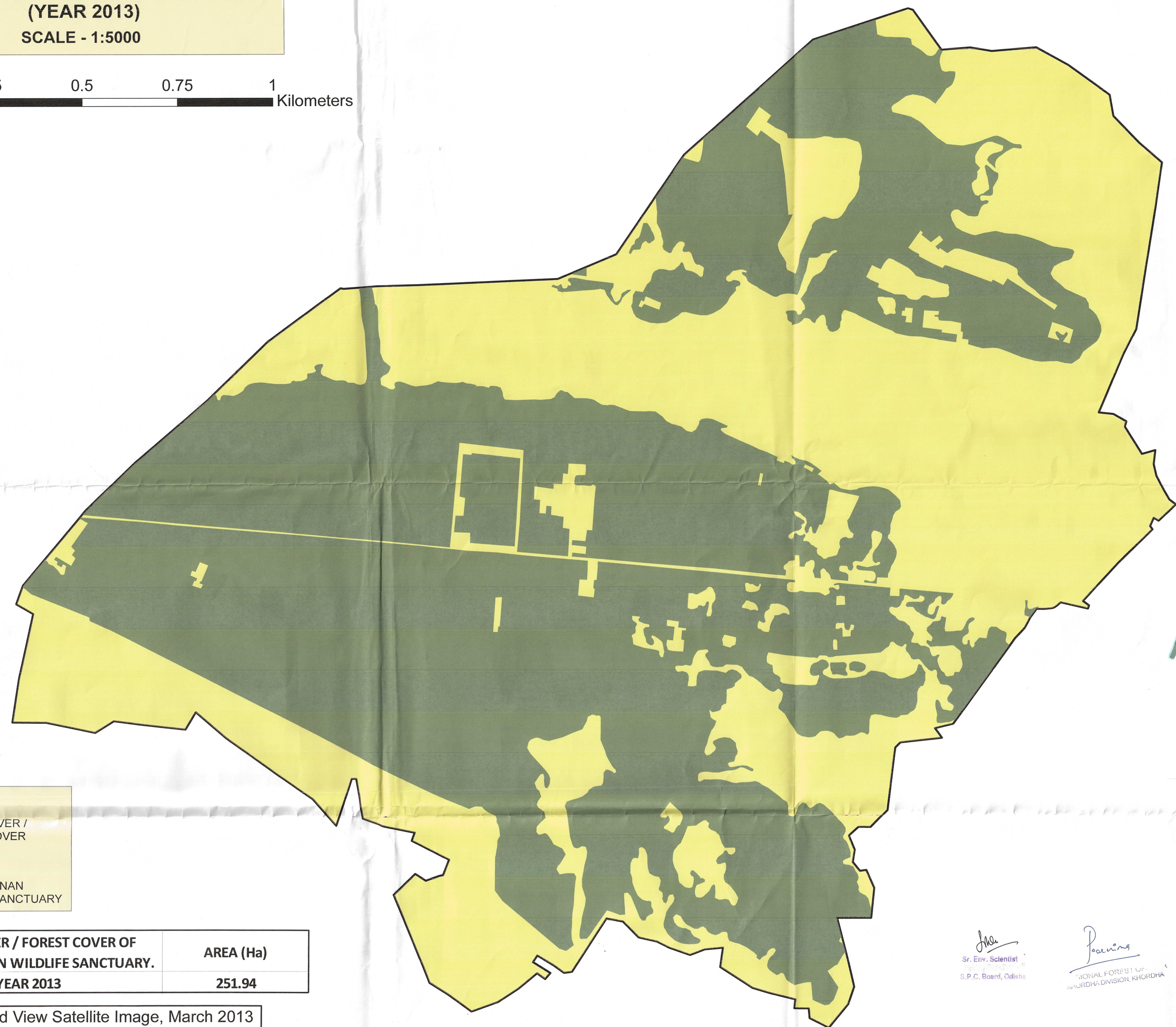
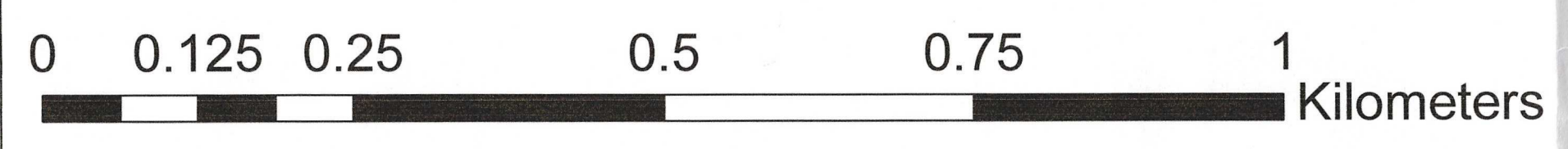
Annexure-V
Forest cover around the lakes



[Signature]
SR. Env. Scientist
Regional Office
S.P.C. Board
Bhubaneswar (Odisha)

[Signature]
Divisional Forest Officer
Khordha Division, Khordha

**GREEN COVER / FOREST COVER OF
NANDANKANAN WILDLIFE SANCTUARY
(YEAR 2013)**
SCALE - 1:5000



Annexure - 6A

Legend

- GREEN COVER / FOREST COVER
- OTHERS
- NANDANKANAN WILDLIFE SANCTUARY

GREEN COVER / FOREST COVER OF NANDANKANAN WILDLIFE SANCTUARY.	AREA (Ha)
YEAR 2013	251.94

Source : World View Satellite Image, March 2013

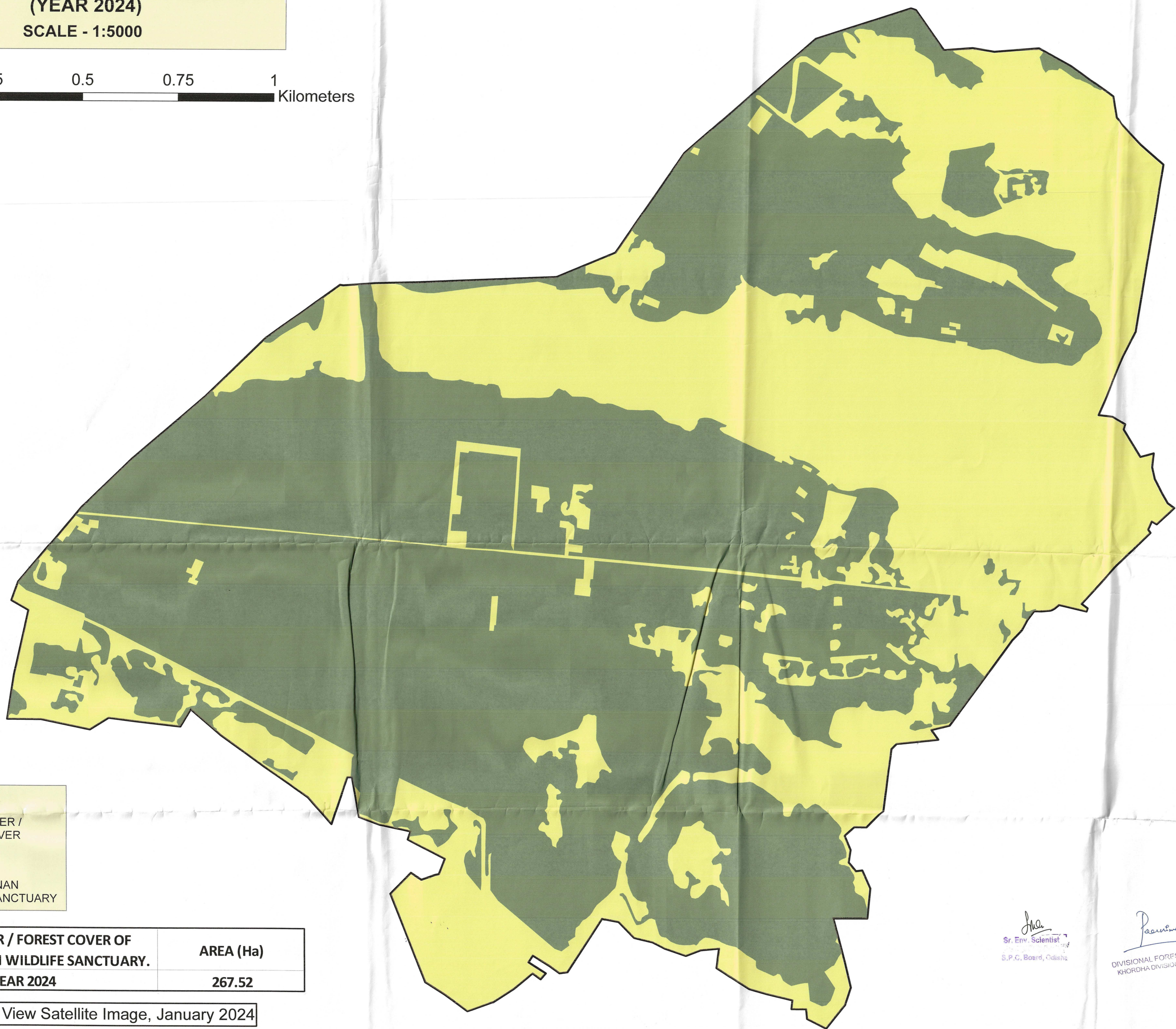
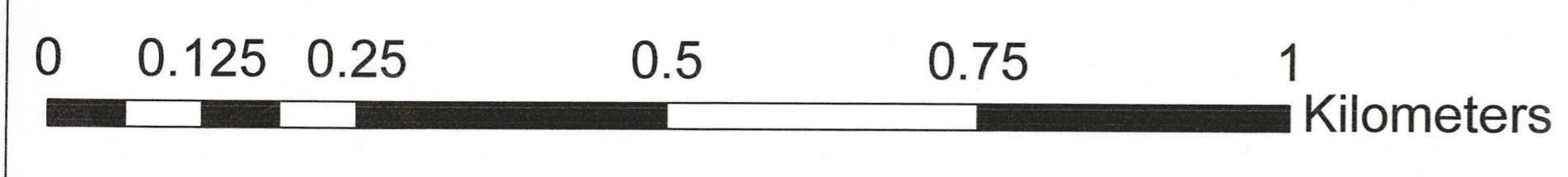
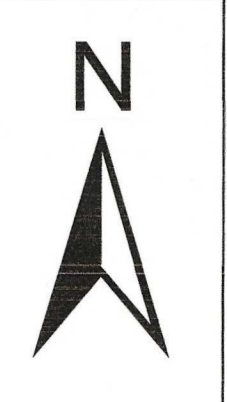
[Signature]
Sr. Env. Scientist
S.P.C. Board, Odisha

[Signature]
REGIONAL FOREST OFFICER
KHURDA DIVISION, KHURDA

ODISHA SPACE APPLICATIONS CENTRE
BHUBANESWAR
MAP NO. 4347/15
DATE: 16/12/2024
[Signature]
AUTHORIZED SIGNATORY



**GREEN COVER / FOREST COVER OF
NANDANKANAN WILDLIFE SANCTUARY
(YEAR 2024)**
SCALE - 1:5000



Annexure -
6B

Legend

- GREEN COVER / FOREST COVER
- OTHERS
- NANDANKANAN WILDLIFE SANCTUARY

GREEN COVER / FOREST COVER OF NANDANKANAN WILDLIFE SANCTUARY. YEAR 2024	AREA (Ha)
	267.52

Source : World View Satellite Image, January 2024

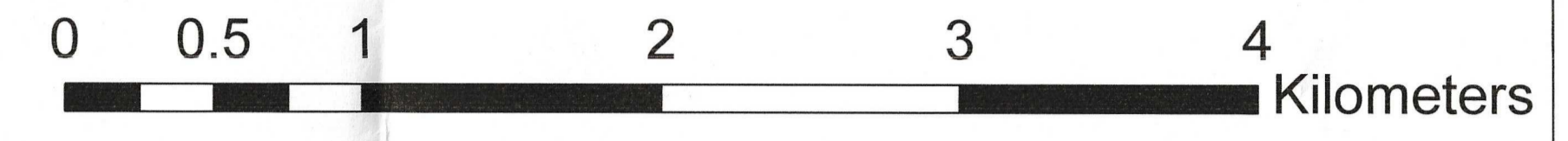
[Signature]
Sr. Env. Scientist
S.P.C. Board, Odisha

[Signature]
DIVISIONAL FOREST OFFICER
KHORDHA DIVISION

ODISHA SPACE APPLICATIONS CENTRE
BHUBANESWAR
MAP NO. 439/14
DATE 16/12/2024
[Signature]
AUTHORISED SIGNATORY

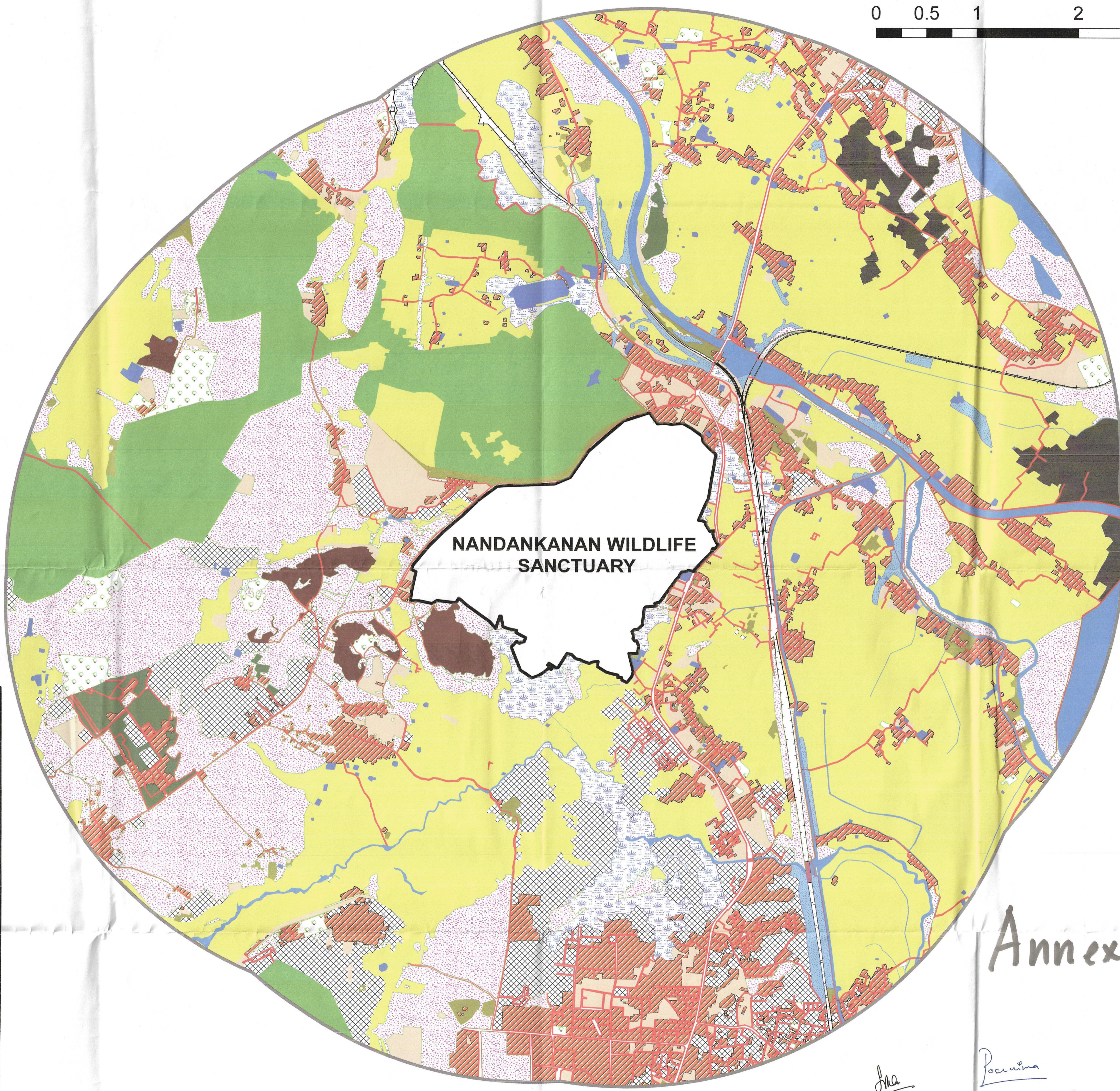


LAND USE / LAND COVER MAP- YEAR 2013
 (4 KM FROM PERIPHERY OF NANDANKANAN WILDLIFE SANCTUARY)
 SCALE- 1:22000



Legend

- BUILT UP
- PLOTTED LAND
- ROAD
- RAILWAY
- BRIDGE
- MINING / DUMP
- BRICKKILN
- AGRICULTURE
- NON AGRICULTURAL LAND/ VACANT LAND
- FOREST
- PLANTATION - FOREST
- PLANTATION - HORTICULTURE
- TREE CLAD
- SCRUBLAND
- MARSHY LAND
- WATERLOGGED
- WATERBODY - PONDS/ RESERVOIR
- WATERBODY - STREAMS/ RIVER/ CANAL
- 4 KM PERIPHERY
- NANDANKANAN WILDLIFE SANCTUARY



LANDUSE/ LANDCOVER CATEGORY (YEAR-2013)	AREA (Ha)
BUILT UP	784.97
PLOTTED LAND	563.75
ROAD	199.22
RAILWAY	56.91
BRIDGE	1.32
MINING / DUMP	85.86
BRICKKILN	133.61
AGRICULTURE	3148.38
NON AGRICULTURAL LAND/ VACANT LAND	337.30
FOREST	926.14
PLANTATION - FOREST	63.06
PLANTATION - HORTICULTURE	93.76
TREE CLAD	71.47
SCRUBLAND	1577.06
MARSHY LAND	238.21
WATERLOGGED	74.37
WATERBODY - PONDS/ RESERVOIR	72.23
WATERBODY - STREAMS/ RIVER/ CANAL	220.46
TOTAL AREA	8648.08

Source : World View Satellite Image, March 2013

Annexure - 7A

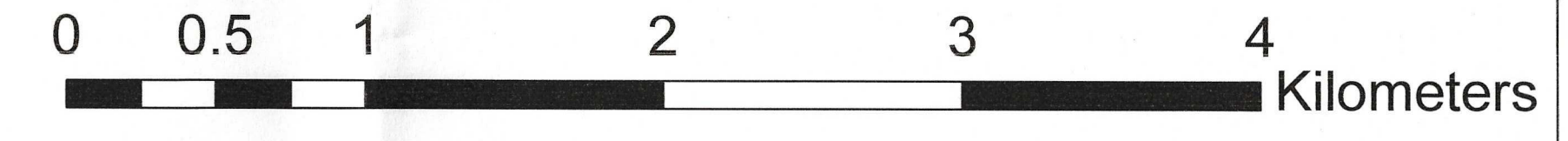
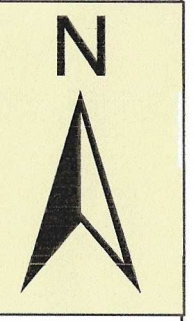
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 KHORDA DIVISION, KHORDA

ODISHA SPACE APPLICATIONS CENTRE
 BHUBANESWAR
 MAP NO. 9347/13
 DATE 16/12/2024
 AUTHORIZED SIGNATORY

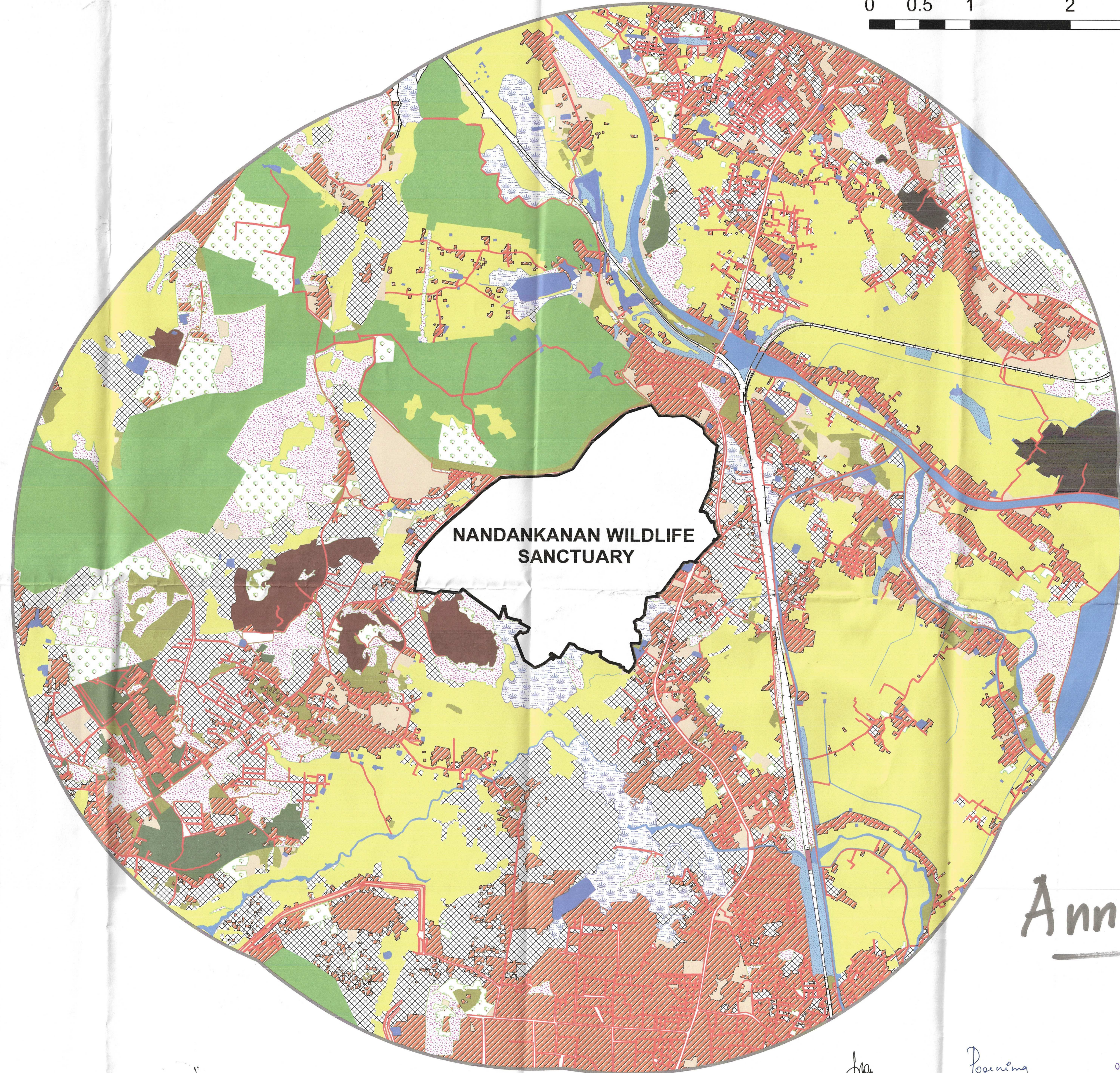


LAND USE / LAND COVER MAP- YEAR 2024 (4 KM FROM PERIPHERY OF NANDANKANAN WILDLIFE SANCTUARY) SCALE- 1:22000



Legend

- BUILT UP
- PLOTTED LAND
- ROAD
- RAILWAY
- BRIDGE
- MINING / DUMP
- BRICKKILN
- AGRICULTURE
- NON AGRICULTURAL LAND/ VACANT LAND
- FOREST
- PLANTATION - FOREST
- PLANTATION - HORTICULTURE
- TREE CLAD
- SCRUBLAND
- MARSHY LAND
- WATERLOGGED
- WATERBODY - PONDS/ RESERVOIR
- WATERBODY - STREAMS/ RIVER/ CANAL
- 4 KM PERIPHERY
- NANDANKANAN WILDLIFE SANCTUARY



LANDUSE/ LANDCOVER CATEGORY (YEAR-2024)	AREA (Ha)
BUILT UP	1484.59
PLOTTED LAND	1229.15
ROAD	293.38
RAILWAY	65.89
BRIDGE	1.48
MINING / DUMP	118.66
BRICKKILN	70.49
AGRICULTURE	2300.23
NON AGRICULTURAL LAND/ VACANT LAND	294.00
FOREST	875.59
PLANTATION - FOREST	112.75
PLANTATION - HORTICULTURE	326.41
TREE CLAD	154.66
SCRUBLAND	731.05
MARSHY LAND	213.16
WATERLOGGED	68.74
WATERBODY - PONDS/ RESERVOIR	92.48
WATERBODY - STREAMS/ RIVER/ CANAL	215.37
TOTAL AREA	8648.08

Source : World View Satellite Image, January 2024

Annexure - 7B

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MAP NO. 4397/2
DATE: 16/12/2024
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Annexure-VIII

Flora of Kanjia and Kiakani lake (Ref: Management Plan of Nandankanan WL Sanctuary)

An extensive study was done on the flora of Kanjia lake and its surroundings. There are two types of vegetation are seen in the area. One is the terrestrial type, which is remaining in the peripheral area of the lake and Nandankanan sanctuary. The second one is aquatic type, which is seen in the expanses of the wetland.

(a) The terrestrial vegetation

The terrestrial vegetation spreads over three fourth of the sanctuary area i.e. 321 ha. The original forest was dry deciduous type. Tree species like *Bridelia sp.*, *Pterospermum xylocarpum*, *Grewia rhamnifolia*, *G. tiliifolia*, *Albizia lebbek* existed in the past. The areas suffered a biotic interference in the form of felling, grazing and fire. The development of new capital at Bhubaneswar had its repercussions on these forests due to the demand for firewood and timber that ultimately resulted in degradation of the vegetation. During the survey 30 species of terrestrial plants were recorded in Nandankanan and Kanjia lake area (Table 1). The dominant tree species, which are presently met with, are *Pterospermum xylocarpum*, *Vitex pinnata*, *Aegle marmelos*, *Barringtonia acutangula*, *Atalantia monophylla* etc. The dominant shrub species are *Chromolaena odorata*, *Allophyllus serratus*, *Cipadessa baccifera*, *Dalbergia rubiginosa*, *Lantana camara* etc.

These species provide congenial habitat for the wild animals of the zoo. A number of climbers and twiners are seen associated with the scrubs and trees being represented by *Combretum ruxburghil*, *Calycopteris floribunda*, *Ichnocarpus frutescens*, *Vigna adenantha*, *Dioscorea belophylla*, *Tinospora cordifolia*, *Hemidesmus Indicus* etc. The ground flora constitutes a major part in the floristic of the sanctuary. A number of these species make their appearance during the onset of monsoon and live up to winter while some xeric elements survive further. These forms are represented by *Crotalaria prostrate*, *Ageratum conyzoides*, *Blepharis maderaspatensis*, *Cleome viscosa*, *Sida acuta*, *Anderographis paniculata*, *Hedyotis corymbosa* etc.

Table 1. List of Terrestrial plants

1.	<i>Aegle marmelos</i> (Linn.) corr.
2.	<i>Ageratum conyzoides</i> Linn.
3.	<i>Albizia lebbek</i> (Linn.) Benth.
4.	<i>Allophyllus serratus</i> (Roxb.) Redlk.
5.	<i>Andrographis paniculata</i> (Burm.f.) wall. ex Ness
6.	<i>Atalantia monophylla</i> (Linn.) Corr.
7.	<i>Barringtonia acutangula</i> (Linn.) Gaertn.
8.	<i>Blepharis maderaspatensis</i> (Linn.) Heyne ex Roth
9.	<i>Bridelia airy</i> Shawl P T LI
10.	<i>Calycopteris floribunda</i> (Roxb.) Poir.
11.	<i>Capparis brevispina</i> DC.
12.	<i>Catunaregam spinosa</i> (Thunb.) Trivendagum
13.	<i>Cipadessa baccifera</i> (Roth) Miq.
14.	<i>Chromolaena odorata</i> (Linn.) King and Robinson
15.	<i>Cleome viscosa</i> Linn.

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16.	<i>Combretum ruxburghii</i> Spreng.
17.	<i>Crotalaria prostrate</i> Rott. ex Willd.
18.	<i>Dalbergia rubiginosa</i> Roxb.
19.	<i>Dioscorea belophylla</i> Volgt.
20.	<i>Grewia rhamnifolia</i> Heyne
21.	<i>G.tiliacfolia</i> Vahl
22.	<i>Hemidesmus indicus</i> (Linn.) Schult.
23.	<i>Ichmocarpus frutescens</i> (Linn.) R. Br.
24.	<i>Lantana camara</i> Linn.
25.	<i>Hedyotis corymbosa</i> (Linn.) Lamk.
26.	<i>Pterospermum xylocarpum</i> (Gaertn.)
27.	<i>Sida acuta</i> Burm.f.
28.	<i>Tinospora cordifolia</i> (Wild.) Hook. F. & Thomson
29.	<i>Vigna adenatha</i> (G.F.W. Meyer) Marechal et al.
30.	<i>Vitex pinnata</i> Linn.

(b) Aquatic vegetation

Kanjia Lake can be divided into four broad groups, i.e. submerged, free floating, emergent and rooted floating-leaved.

These macrophytes are observed in different habitats like deep water, shallow water and marshland as well along the shoreline. During the survey, 10 species of submerged macrophytes were recorded in the Kanjia Lake (Table 2). These submerged macrophytes were found in the deeper as well as shallow zone of the lake. The most dominant submerged species were *Ceratophyllum demersum* and *Hydrilla verticillata*. The other dominant species were *Najas foveolata*, and *Potamogeton pectinatus*. The shallower region represented by *Mariophyllum terandrum*, *Limnophila indica*, *Ottella alismoides*, *Vallisneria natans* and *Aponogeton natans*.

Table 2. List of submerged macrophytes

1. <i>Ceratophyllum demersum</i> Linn.
2. <i>Hydrilla verticillata</i> (Linn. F.) Royle
3. <i>Najas foveolata</i> A. Br. Ex Magam.
4. <i>Potamogeton pectinatus</i> Linn.
5. <i>Aponogeton natans</i> (Linn.) Engl. And Krause
6. <i>Ottella allsmoides</i> (Linn.) Pers.
7. <i>Vallisneria natans</i> (Lour.) Hara
8. <i>Myrlophyllum tetrandrum</i> Roxb.
9. <i>Limnophila heterophyssa</i> (Roxb.) Benth.
10. <i>Limnophila Indica</i> (Linn.) Druce

It was observed that the area covered by the free-floating species is free from submerged macrophytes. Fourteen species of free floating and rooted free floating macrophytes were recorded from the lake during the survey (Table 3). The free-floating species were *Pistia stratiotes*, *Salvinia cucullate*, *Eichhornia crassipes* and *Azolla pinnata*.

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The most dominant free-floating species was *Salvinia cucullata* which occupied most of the deeper zone of the lake. The free-floating species are observed to colonize different parts of the lake and keep on moving as per the direction of the wind. The rooted floating species were represented by *Nelumbo sp.*, *Euryale sp.*, *Nymphae sp.*, *Nymphodes sp.*, *Trapa sp.*, *Ipomea sp.*, *Ipomea sp.*, and *Commelina sp.* The dominant deep water rooted floating species were *Nelumbo sp.* and *Nymphoids sp.* The shallow water and marginal rooted floating plants like *Ipomea sp.* and *Commelina sp.* were recorded from the western part of the lake. *Eichhornia sp.* colonized in the northern part of the lake, *Euryale ferox* is most dominant species in the western part of the lake. 24 species of emergent species of macrophytes were recorded during the survey from the lake (Table 4). Mostly recorded from the shallower zones, shorelines and marshy area of the lake. The emergent macrophytes provide excellent habitat for the water birds like Rails and Coots. The tall species encountered are *Typha angustata*, *Ludwigia sp.*, *Adenostemma sp.* and *Aeschynomene sp.* The other dominant emergent species were *Scirpus sp.*, *Cyperus sp.* and *Polygonum sp.* Free-floating mass of grass dominated by *Hygroryza sp.* was recorded during survey. The roots of this grass have long roots attached to the bottom of the lake. A number of sedges and grasses form a very rich shoreline community in association with *Commelina sp.* *Ipomea sp.* and *Panicum sp.* Rich growth of water ferns such as *Ampelopteris prolifera* and *Ceratopteris thalictroides* were recorded from the western periphery and along the shoreline of the lake.

Table 3. List of Emergent macrophytes

1.	<i>Cyperus platystyllis</i> R. Br
2.	<i>Cyperus iria</i> Linn.
3.	<i>Echinochloa stagnina</i> (Retz.) Beauv.
4.	<i>Hygroryza aristata</i> (Retz.) Nees ex Wt. and Arn.
5.	<i>Panicum repens</i> Linn.
6.	<i>Pistia stratiotes</i> Linn.
7.	<i>Scirpus articulatus</i> Linn.
8.	<i>Scirpus grossus</i> Linn. f.
9.	<i>Salvinia cucullata</i> Roxb.
10.	<i>Typha angustata</i> Bory & Chaub.
11.	<i>Adenostemma lavenia</i> (Linn.) kuntze
12.	<i>Aeschynomene aspera</i> Linn.
13.	<i>Aeschynomene indica</i> Linn.
14.	<i>Ampelopteris prolifera</i> (Retz.) Copel.
15.	<i>Amisophacelus axillaris</i> (Linn.) R. Rao & Kammathy
16.	<i>Brachiaria ramosa</i> (Linn.) Stapf
17.	<i>Ceratopteris thalictroides</i> Brong.
18.	<i>Leersia hexandra</i> Sw.
19.	<i>Ludwigia adscendens</i> (Linn.) Jara
20.	<i>L. octovalvis</i> (Jacq.) Raven
21.	<i>L. perennis</i> Linn.
22.	<i>Oryza rufipogon</i> Griff.
23.	<i>Panicum repens</i> Linn.
24.	<i>Polygonum barbatum</i> Linn.

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1.	<i>Azolla pinnata</i> R. Br.
2.	<i>Elchhornia crassipes</i> (Mart.) Solms.
3.	<i>Nelumbo nucifera</i> Gaertn.
4.	<i>Nymphaea nouchali</i> Burm. f.
5.	<i>Nymphaea pubescens</i> Wild.
6.	<i>Nymphoides hydrophylla</i> (Lour.) kuntze.
7.	<i>Nymphoides Indica</i> (Linn.) kuntze
8.	<i>Pistia stratiotes</i> Linn.
9.	<i>Trapa natana</i> var. <i>bispinosa</i> (Roxb.) Makino
10.	<i>Salvinia cucullata</i> Roxb.)
11.	<i>Ipomoea awuatica</i> Forsk.
12.	<i>Utricularia inflexa</i> var. <i>stellaris</i> (Linn. F.) P. Taylor
13.	<i>Commeling benghalensis</i> Linn.
14.	<i>Euryale ferox</i> Sallsb

The algal species encountered during survey were *Spirogyra sp.*, *Ulothrix sp.*, *Pithophora sp.*, *Chaetomorpha sp.* and *Chera sp.* the algae are growing in the area that are free from macrophytes. The Kanjia Lake is represented by a rich diversified species of macrophytes. But the excessive growth of the marshy plants and floating species need to be managed scientifically.



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Annexure - IX

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Fauna of Kanjia and Klakanl lakes

(a) Avifauna

There were about 39 species of free-living birds found in Kanjia lake and in the nearby trees (Table 5). These birds were found in lake area and in the terrestrial plants of Nandankanan. During the winter very good number of water fowl visits the lake. The lake serves as an important wintering ground for the visiting birds. Some dominant residential birds like white breasted water hen, Grey duck, Night heron and little Cormorant were recorded during the survey.

Table 5. List of Avifauna

1.	<i>Phalacrocorax niger</i> (Little Cormorant)
2.	<i>Ardeola grayii</i> (Pond heron)
3.	<i>Nycticorax nycticorax</i> (Night heron)
4.	<i>Egretta intermedia</i> (Median egret)
5.	<i>Egretta garzetta</i> (Little egret)
6.	<i>Bubulcus ibis</i> (Cattle egret)
7.	<i>Anastomus oscitans</i> (Open bill stork)
8.	<i>Dendrocygna javanica</i> (Lesser whistling teal)
9.	<i>Tadorna ferruginea</i> (Brahmini duck)
10.	<i>Anas crecca</i> (Common teal)
11.	<i>Anas acuta</i> (Pintail)
12.	<i>Anas poecilorhyncha</i> (Spotbilled or Grey duck)
13.	<i>Metopidius indicus</i> (Bronzewinged jacana)
14.	<i>Hydrophasianus chirurgus</i> (Pheasant tailed jacana)
15.	<i>Porphyrio</i> (Indian purple moorhen)
16.	<i>Amaurornis phoenicurus</i> (White breasted water hen)
17.	<i>Milvus migrans</i> (Pariah kite)
18.	<i>Upupa epops</i> (Hoopoe)
19.	<i>Francolinus pondicerianus</i> (Grey partridge)
20.	<i>Pavo cristatus</i> (Peafowl)
21.	<i>Columba livia</i> (Blue rock pigeon)
22.	<i>Streptopelia chinensis</i> (Spotted Dove)
23.	<i>Centropus sinensis</i> (Crow pheasant)
24.	<i>Turdoides striatus</i> (Jungle babbler)
25.	<i>Orthotomus sutorius</i> (Tailor bird)
26.	<i>Acridotheres tristis</i> (Common mynah)
27.	<i>Coracias bengalensis</i> (Indian roller)
28.	<i>Paddy bird-Ardeola grayii</i> (Pond heron)
29.	<i>Nycticorax nycticorax</i> (Night Heron)
30.	<i>Botaurus stellaris</i> (Bittern)
31.	<i>Numenius arguata</i> (Curlew)
32.	<i>Psittacula krameri</i> (Rose ringed parakeet)
33.	<i>Cuculus sp.</i> (The Cuckoo)
34.	<i>Tyto alba</i> (Barn owl)
35.	<i>Caprimulgus sp.</i> (Nightjar)

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36.	<i>Oriolus xanthornus</i> (Black headed Oriole)
37.	<i>Oriolus oriolus</i> (Golden Oriole)
38.	<i>Alcedo atthis</i> (Common Kingfisher)
39.	<i>Cerylerudis sp.</i> (Lesser pied Kingfisher)

(b) Reptiles of Kanjia Lake


There are 14 species of reptiles recorded from the fringe areas of Nanadankanan are in Table 6.

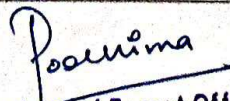
Table 6. List of Reptiles	
1.	<i>Varanus bengalensis</i> (Land Monitor lizard)
2.	<i>Python monurus</i> (Indian Python)
3.	<i>Varanus flavescens</i> (Yellow monitor lizard)
4.	<i>Vipera russelli</i> (Russels Viper)
5.	<i>Bungarus fasciatus</i> (Banded krait)
6.	<i>Naja naja</i> (Indian Cobra (Binocellate))
7.	<i>Naja kaouthia</i> (Monocellate)
8.	<i>Ptyas mucosus</i> (Rat Snake)
9.	<i>Dendrelaphis tristis</i> (Bronze backed or tree snake)
10.	<i>Xenochrophis piscator</i> (Checked keel back)
11.	<i>Bungarus caeruleus</i> (Common Indian Krait)
12.	<i>Chameleon zeylanicus</i> (Chameleon)
13.	<i>Ahaetulla nasutus</i> (Common Green Whop Snake)
14.	<i>Eryx johni</i> (Earth Boa)

(c) Fish fauna


Fish fauna of Kanjia lake is very rich. There were 41 species of fishes and 3 species of prawns recorded from the lake during the survey (Table 7). Due to the riverine influence a number of riverine fishes were recorded from the lake. During monsoon, fishes from Kuakhai river migrate to Kanjia lake for breeding and feeding purpose. Besides, State Fisheries Department introduced Indian Major Carps (IMC) in the lake for pisciculture. Some rare and important species found in the lake are *Notopterus chitala*, *Puntius sarana* and *Ompok pabda*. The economic species of prawn like *Macrobrachium rosenbergii* is found in the lake. Some indigenous species like *Chela bacaila* and *Oxygaster bacaila* are found abundantly during rainy season in the lake with very good market demand. The major carps of the lake are represented by *Labeo rohita*, *L. calbasu*, *Catala catala*, *Cirrhinus mrigala* and *Labeo bata*. The other carps were *cyprinus carpio*, *Ctenopharyngodon idella* and *Labeo gonius*. The air breathing fishes are represented by *Mystus vittatus*, *Clarius batrachus* and *Anabas testudeniis*.

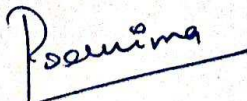
List of fishes		
Sl. No.	Scientific name	Local name
1	<i>Labeo rohita</i>	Rohi
2	<i>Labeo calbasu</i>	Kalabainsi
3	<i>Catala catala</i>	Bhakura
4	<i>Cirrhinus mrigala</i>	Mirikali
5	<i>Labeo gonius</i>	Khursia
6	<i>Labeo bata</i>	Rajapohala
7	<i>Puntius sarana</i>	Serena
8	<i>Puntius ticto</i>	Kerandi


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9	<i>Puntius sophore</i>	Chepta kerandi
10	<i>Puntius chola</i>	Pita kerandi
11	<i>Cirrhinus reba</i>	Chhunchia pohala
12	<i>Wallago attu</i>	Balia
13	<i>Channa striatus</i>	Seula
14	<i>Channa marulius</i>	Sala
15	<i>Channa punctata</i>	Gadisa
16	<i>Channa gachhua</i>	Chenga
17	<i>Notopterus chitala</i>	Chitala
18	<i>Notopterus notopterus</i>	Fali
19	<i>Clarius batrachus</i>	Magura
20	<i>Heteropneustis fossilis</i>	Singhi, Rata
21	<i>Anabas testudeniis</i>	Kau
22	<i>Mystus vittatus</i>	Kantia
23	<i>Ompak pabda</i>	Pobata poba
24	<i>Glossogobius biocellatus</i>	Neuli
25	<i>Glossogobius giuris giuris</i>	Baligarada
26	<i>Mastacembalus armatus</i>	Bommy
27	<i>Mastacembalus pancalus</i>	Todi
28	<i>Cyprinus carpio</i>	Bilatirohi
29	<i>Ctenopharyngodon idella</i>	Grasscarp
30	<i>Anguilla bengalensis</i>	Lamba bommy
31	<i>Xenentodon cancella</i>	Duithantia gania
32	<i>Osteobrama coito</i>	Chandi
33	<i>Nandus nandus</i>	Vutasi/Olua
34	<i>Chela bacaila</i>	Khankarakhai
35	<i>Gadusia chapra</i>	Makandi
36	<i>Ailia coila</i>	Baunsa patri
37	<i>Amblypharyngodon mola</i>	Mahurahi
38	<i>Oxygaster bacaila</i>	Jaradi
39	<i>Esomus danrica</i>	Dandikiri
40	<i>Chanda nama</i>	Guachippi
41	<i>Aplocheilus punchax</i>	Chariakhia
Prawns		
1	<i>Macrobrachium rosenbergii</i>	Golda
2	<i>Macrobrachium malcolmsonii</i>	Nai chingudi
3	<i>Macrobrachium rude</i>	Nai chingudi


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Annexure No. X
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**WATER QUALITY ASSESSMENT-CUM-FACT FINDING REPORT OF KANJIA
AND KIAKANI LAKE OF NANDANKANAN, BHUBANESWAR W.R.T CASE
FILED BY SMT. HARAPRIYA PATEL IN HON'BLE NGT VIDE O.A.
NO.109/2024/EZ-BENCH, KOLKATA**

Prima facie of the Case:

The above cited case has been filed on 25-03-2025 by the applicant Smt. Harapriya Patel -Vrs- State of Odisha & Others w.r.t. the water pollution of Kanjia & Kiakani Lakes that is existed between Nandankanan Zoological Park and Botanical Garden covering an area of 66 ha. which has been declared as "Wetland of National Importance in the year,2006 by the Ministry of Forest, Environment & Climate Change".

⇒ **Order of Hon'ble NGT:-**

Hon'ble Tribunal of EZ- Kolkata on the date of hearing i.e. 04.07.2024 had constituted a committee comprising:- (a) Divisional Forest Officer, Khordha (b) Sr. Scientist of SPC Board and to have a site visit and submit the inspection report w.r.t. the allegation made in the above cited case.

⇒ **Allegations cited by the Applicant:-**

Among all issues cited by the applicant, SPC Board, Bhubaneswar has put its focus on the water pollution index of the cited alleged lakes basing upon the allegation that untreated polluted effluents from the buildings, houses etc are being poured into the lakes through the nallahs which is the main concern of pollution load over the lakes.

⇒ **Thrust Area of Study:-**

As per the direction of Hon'ble NGT, the Regional Officer along with other officials after having discussion with other officials after having discussion with forest department officials of Nandankanan had conducted a site visit around approachable locations of both the lakes and had collected water samples from 08 different locations including midpoint of Kanjia Lake in order to ascertain the mixed water quality of both the lakes up to which the normally the tourists usually cover for boating activities

⇒ **Observation during inspection: -**

- Both the lakes have covered a vast area with heavy eutrophic condition i.e. in different segment of lakes are covered with free floating Algal weeds, different varieties of hydrophytes along with thick wild grasses etc.
- Lake water samples were collected by the Board Official on 02.08.2024 along with the staffs of Nandankanan Zoological Park and Botanical Garden.

⇒ **Parameters selected for the study of both the lake water quality: -**

In order to ascertain the present water quality status of both the lakes w.r.t. pollution Index following parameters have been taken into consideration viz.-PH, TSS, BOD, COD, Chloride, Total Hardness, Nitrate, Phosphate, Sulphate, Ammoniacal Nitrogen Coliform, Bacteria (Total & Faecal) w.r.t. relating the prescribed standard of surface water quality i.e. IS-2296(1982) of Class-B.

⇒ **Different Sampling locations of Kanjia and Kiakani Lake of Nandankanan:-**

- Kanjia Lake near Rest House
- Midpoint of Kanjia lake.
- Near Boating ghat of Kanjia Lake
- Kanjia lake near main gate at Botanical Garden.

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Poanima
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- e) Kanja Lake near Holiday Cottage of Botanical Garden.
- f) Kanja lake near medicinal garden
- g) Kiakant lake opposite site of Hongali sahi near Bougainvillea garden
- h) Kaikani Lake near Picini spot site of Botanical Garden, Nandankanan

BRIEF OUTLINE OF THE ANALYSIS REPORT (Copy of the report Annexed)

Among all the selected parameters the presence of Nitrate, Phosphate, Sulphate, Ammonical, Nitrogen are the main organic load on the natural water bodies like lake where Eutrophic Condition, development/Luxuriant growth of weeds, Submerged/hydrophytic plant species, Wild grasses have been marked during the time of site visit. Looking to the Analysis Report in the present context, it can be concluded that due to this condition perhaps the organic load like Nitrate, Phosphate, Sulphate are being up take for their existence as well as dense growth pattern with massive number. Also in most of the location Dissolved Oxygen (DO) concentration are less than 5 mg/l. The Fecal Coliform Conc. at most of the locations are within prescribed standard i.e. 500 MPN/100 ml excepting 03 locations where there might be more human activity within two lakes which is quite natural.

Remark:-

Following are the points those to be taken into consideration before drawing any clear-cut conclusion w.r.t. attainment of water quality criteria of both the lakes of Nandankanan.

- a) As the said naturally occurring lakes have covered a vast area since years back and the urbanization and development activity at the nearby areas are growing day-by-day so for that reason runoff from various sources are quite natural throughout the year. Due to organic load day-by day, both lakes are exhibiting high Eutrophic condition, Existence of different varieties of submerged hydrophytes, weeds and wild grasses.
- b) During monsoon surface runoff into the lake is a natural process for which in some locations Fecal Coliform conc. are exhibiting high result but not in every sampling location.
- c) At all the location BOD concentration are well within the limit along with Parameter pH.
- d) In four locations the Dissolved Oxygen (DO) concentration has exhibited more than the standard i.e., 3 mg/l the rest part of the locations it has exhibited less concentration that might be due to presence of thick bushes of hydrophytic plant, free floating algae, weeds (where there is less exposure to direct sun light).

Conclusion:-

- a) Further survey and investigation should be carried out to identify that whether there is any existence of some natural/ manmade drains those are falling into lake system which could not be visualized on the day of inspection. If that is the case those domestic waste water discharge should be fully restricted into lake system.
- b) At least the weeds hydrophytes, wild grasses should be cleaned periodically and those green plants should be properly decomposed in a specific location to convert

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- c) into compost form and finally can be used as green manure to the plants existing within the Zoological Park & Botanical Garden.
- d) Further more study may be carried by the concerned authority at lease 3-4 times in different seasons in a year to draw a clear cut conclusion over the issues i.e., water pollution Index of these two Lakes of Nandankanan.
- e) As the nearby area, the development practices w.r.t. construction of buildings, houses etc. at high altitude and Nandankanan natural lake is in low altitude area hence the domestic discharge if any should be completely checked or diverted so as to minimise the water pollution load.



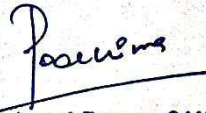
Sri Soumya Ranjan Mallick
(Asst. Env. Scientist)
SPC Board, Bhubaneswar



Dr. Sohan Giri
(Addl. Chief Env. Scientist-cum-Regional Officer)
SPC Board, Bhubaneswar



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Regional Office
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Divisional Forest Officer
Khordha Division, Khordha

Kt



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STATE POLLUTION CONTROL BOARD, ODISHA
 [DEPARTMENT OF FOREST, ENVIRONMENT & CLIMATE CHANGE, GOVERNMENT OF ODISHA]
 Paribesh Bhawan, A/118, Nilakanthanagar, Unit-VIII,
 Bhubaneswar - 751 012
 (CENTRAL LABORATORY)

No. 12596 /

VI-SC (LEM) Misc 38/2024-25

DI. 09/08/2024

To

The Regional Officer,
 State Pollution Control Board, Odisha,
 Bhubaneswar

Sub : Test Report of water samples collected from Kanjia & Kiakani lake of Nanadankanan,
 Bhubaneswar - reg.

Ref : Your Letter No. Nil

Sir,

With reference to the above, please find enclosed herewith the test reports of water samples submitted to the Central Laboratory on dt.02.08.2024 by your office, collected from Kanjia & Kiakani lake of Nanadankanan, Bhubaneswar.

Encl : OS/668/08/2024

Yours faithfully,

U. Mohanty
 Chief Env. Scientist (Lab.)

J. Mohanty
 SR. Env. Scientist
 Regional Office
 S.P.C. Board
 Bhubaneswar (Odisha)

P. Prasad
 Divisional Forest Officer
 Khordha Division, Khordha



**CENTRAL LABORATORY
STATE POLLUTION CONTROL BOARD, ODISHA**

Plot No. B-59/2 & 59/3, Chandaka Industrial Estate, Patia,
Bhubaneswar - 751 024

E-mail: centrallab@spcbboard.org

GSPCB/CHL/0718



TEST REPORT

Page 1 of 2

1. ULR No. : TC127402400000618F
- 2 (i) Report No. : OS/EG/08/2024
- 3 (i) Date : 09.08.2024
4. Sample Submitted By : Sri S.R. Mallick, AES,
(Name and address) Regional Office, SPCB, Odisha, Bhubaneswar
5. Reference Letter No. : Nil
6. Date of sample receipt : 02.08.2024
7. Sample Description :

- 2 (ii) Amendment No : ---
- 3 (ii) Amendment Date : ---

(i) Discipline : Chemical Testing
& Biological testing
(Biological Testing,
Chemical testing)

(ii) Group : Water
(Water/ Pollution and Environment
/ Atmospheric Pollution/ Soil and
Hazardous Waste)

(iii) Sub Group : Surface water
(Surface water/ Ground water/ Drinking
water / Wastewater/ Effluent/ Ambient Air
Stack/ Soil and Hazardous Waste)

8. Analysis Starting Date-Analysis Completion Date : 02.08.2024 – 09.08.2024
9. If uncertainty is desired by Customer : No
10. Analysis Results :

(Attach separate sheet if necessary)

Sl. No.	Parameter, Unit	Standards/ Regulatory Limits		Test Method	Water sample collected from Kanjia & Klakani lake of Nandankanan, Bhubaneswar		
		Applicable for Sl. No. Others/Aug - 24/SW/1185 to Others/Aug -24/SW/1192			Others/Aug - 24/ SW/1185	Others/Aug - 24/ SW/1186	Others/Aug - 24/ SW/1187
		IS : 2286, (1982) Class -B *	G.S.R.742 (E) **		Kanjia lake near rest House	Midpoint of Kanjia lake	Near Boating ghat of Kanjia lake
					Results		
1.	pH	6.5-8.5	6.5-8.5	4500-H ⁺ -B, APHA, 23 rd Edn., 2017	6.7	6.9	6.8
2.	Total Suspended Solids (TSS), mg/L	-	-	2540 D, APHA, 23 rd Edn., 2017	21.0	30.0	18.0
3.	Total Dissolved Solids (TDS), mg/L	-	-	2540 C, APHA, 23 rd Edn., 2017	160.0	156.0	176.0
4.	Dissolved Oxygen (DO), mg/L	5, min	5 mg/L or more	4500-O-C, APHA, 23 rd Edn., 2017	5.8	4.6	4.7
5.	Biochemical Oxygen Demand (BOD, 3 days at 27° C), mg/L	3, max	3 mg/L or less	IS 3025 : Part 44 (1999)	1.6	2.1	1.7
6.	Chemical Oxygen Demand (COD), mg/L	-	-	5220 B, APHA, 23 rd Edn., 2017	11.0	19.0	11.0
7.	Total Hardness (TH), as CaCO ₃ , mg/L	-	-	2340 C, APHA, 23 rd Edn., 2017	72.0	60.0	80.0
8.	Chloride (Cl ⁻), mg/L	-	-	4500 Cl ⁻ B, APHA, 23 rd Edn., 2017	46.0	32.0	56.0
9.	Nitrate (NO ₃), mg/L	-	-	4500 - NO ₃ - E, APHA, 23 rd Edn., 2017	1.865	3.712	3.150
10.	Sulphate (SO ₄ ²⁻), mg/L,	-	-	4500-SO ₄ ²⁻ - E, APHA, 23 rd Edn., 2017	6.2	12.3	12.0
11.	Phosphate (PO ₄ ³⁻ - P), mg/L	-	-	4500-P-D, APHA, 23 rd Edn., 2017	0.058	0.052	0.105
12.	Ammonical Nitrogen as N (NH ₃ -N), mg/L	-	-	4500-NH ₃ -B followed by 4500-NH ₃ -C, APHA 23 rd Edn., 2017	0.56	1.68	2.24
13.	Total Coliform (TC), MPN/100 ml	500, max	-	9221-B, APHA, APHA 23 rd Edn., 2017	3500	5400	16000
14.	Faecal Coliform (FC), MPN/100 ml	-	500 (destrable) 2500 (permissible)	9221-E, APHA, 23 rd Edn., 2017	1300	390	16000

(Cont.)

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Sl. No.	Parameter, Unit	Standards/ Regulatory Limits		Water sample collected from Kanjia & Kiakani lake of Nandankanan, Bhubaneswar				
		IS - 2296 (1982) Class -B *	G.S.R.742 (E) **	Others/Aug - 24/ SW/1188	Others/Aug - 24/ SW/1189	Others/Aug - 24/ SW/1190	Others/Aug - 24/ SW/1191	Others/Aug - 24/ SW/1192
				Kanjia lake near Main Gate of Botanical garden	Kanjia lake near Holiday cottage of Botanical garden	Kanjia lake near Medicinal garden	Kiakani lake opposite of Bangali sahi near Bougain - villa garden	Kiakani lake near Picnic Spot site of Botanical garden, Nandankanan
Results								
1.	pH	6.5-8.5	6.5-8.5	6.9	6.8	6.7	6.7	6.8
2.	Total Suspended Solids (TSS), mg/L	-	-	14.0	21.0	24.0	13.0	17.0
3.	Total Dissolved Solids (TDS), mg/L	-	-	136.0	136.0	140.0	152.0	172.0
4.	Dissolved Oxygen (DO), mg/L	5, max	5 mg/L or more	6.3	5.4	4.7	6.0	4.4
5.	Biochemical Oxygen Demand (BOD, 3 days at 27° C), mg/L	3, max	3 mg/L or less	1.8	2.0	1.9	1.3	2.3
6.	Chemical Oxygen Demand (COD), mg/L	-	-	11.0	15.0	15.0	7.5	26.0
7.	Total Hardness (TH), as CaCO ₃ mg/L	-	-	48.0	48.0	52.0	68.0	72.0
8.	Chloride (Cl ⁻), mg/L	-	-	40.0	40.0	44.0	44.0	46.0
9.	Nitrate (NO ₃), mg/L	-	-	1.790	2.499	1.896	1.878	2.878
10.	Sulphate (SO ₄ ²⁻), mg/L	-	-	5.9	7.1	8.9	10.2	8.4
11.	Phosphate (PO ₄ ³⁻ -P), mg/L	-	-	0.112	0.055	0.073	0.059	0.092
12.	Ammonical Nitrogen as N (NH ₃ -N), mg/L	-	-	2.8	3.92	0.56	2.8	3.36
13.	Total Coliform (TC), MPN/100 ml	500, max	-	490	3500	1700	16000	16000
14.	Faecal Coliform (FC), MPN/100 ml	-	500 (desirable) 2500 (permissible)	130	220	140	16000	400

* Tolerance limit for inland surface water subject to pollution (IS : 2296-1982), for Class 'B' (Outdoor bathing)

** Primary water quality criteria for bathing water (water used for organised outdoor bathing)

11. Deviation from Test Method, if any :
 12. If Sampling Conducted by the Central Laboratory, Yes/ No - No
 If Yes,
 (a) Date of Sampling : (b) Method Used* :
 (c) Name of Sampler with Designation :

-----End of Test Report-----

Atharv
09/08/2024
Authorized Signatory
(Biological)

(Mrs. Nishprava Pattanik, AES)

Usharani
09/08/2024
Authorized Signatory
(Water/Wastewater)

(Dr./Mrs) Usharani Patnaik, Addl. Chief Env. Scientist)

Niranjana
09/08/2024
Board Analyst
(Mr. Niranjana Mallick, Chief Env. Scientist)

Note :

- (i) The results stated above relate only to the items tested.
 (ii) This report shall not be reproduced in full or in part without written approval from the In-charge of the Central Laboratory.
 (iii) The laboratory is not responsible for the authenticity of photocopied Test Reports.
 (iv) The Test Item will not be retained for more than 15 days from the date of issue of Test Report except in case as required by applicable Regulation.

Head Office: State Pollution Control Board, Odisha, Paribesh Bhawan, A/118, Nilakanthnagar, Unit-VIII, Bhubaneswar - 751 012, FAX: 2562822/2560955
 TEL: 2564033/2563294 EPABX: 2561909/2562847, E-mail: paribesh1@ospb.ori.gov Website: www.ospb.ori.gov

Mr. S.R. Env. Scientist
Regional Office
S.P.C. Board
Bhubaneswar (Odisha)

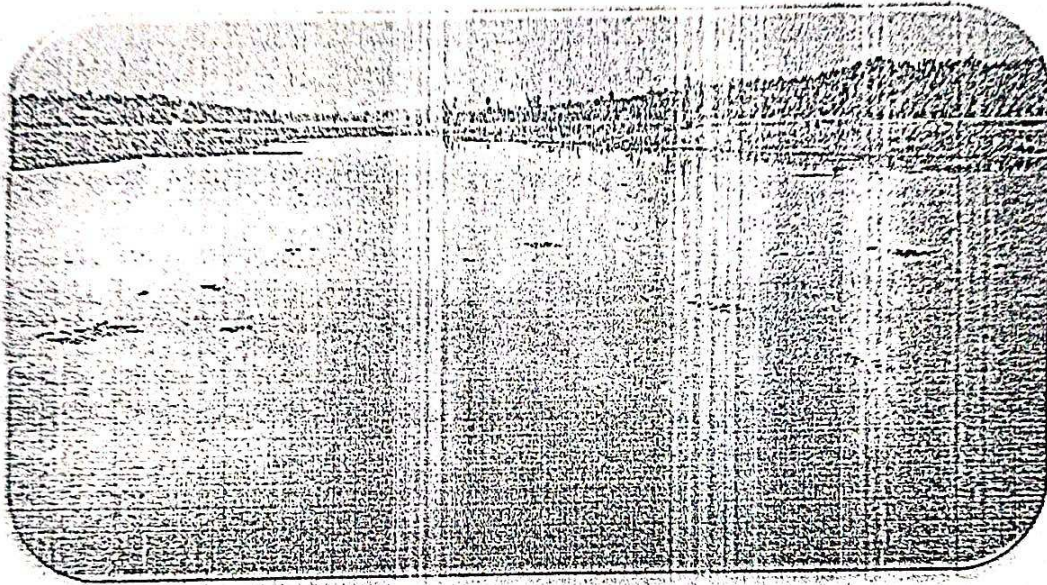
Poseema
Divisional Forest Officer
Khordha Division, Khordha

Annexure No ¹³⁰ -XI

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Kanjia and Kiakani Lake survey report

January 2022



Wetland Research and Training Center

Chilika Development Authority

M. S. Mishra
SR. Env. Scientist
Regional Office
S.P.C. Board
Bhubaneswar (Odisha)

P. S. Mishra
Divisional Forest Officer
Khordha Division, Khordha

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1. Highlights
2. Water quality assessment
3. Macrophyte survey
4. Results of faecal coliform
5. List of contributors

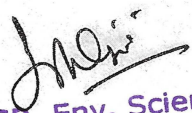


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Bhubaneswar (Odisha)**

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Highlights:

- The water quality of Kanjia Lake was within the range of the threshold prescribed by CPCB, New Delhi for Fisheries and wild life propagation indicated it's good health at present condition.
- However, the water quality of Kiakani Lake found to be deteriorated with alarming level of dissolved oxygen level i.e., 3.3 mg/lit
- The trophic level index calculated considering crucial parameters such as total nitrogen, total phosphorous, chlorophyll-a, transparency indicated that the Kanjia Lake behaved as "mesotrophic" (indicates good health) whereas the Kiakani Lake as "meso-eutrophic" (close to eutrophic) in nature.
- These lakes-maintained depth, transparency, pH and Gross primary productivity of 1.56m, 1.36m, 7.72 and 272.32 ± 178.606 mgC/m³/day respectively. The nutrients, dissolved inorganic nitrogen, phosphorous and silicate recorded 2.3, 0.1, 171 μ mol/l respectively.
- The fecal coliform counts (MPN index per 100 ml) in water samples were within the safe limits according to CPCB guidelines (100 MPN/100 ml) for all the stations, except two (one each in Kanjia and Kiakani).
- One station in Kanjia recorded fecal contamination, but there is still no threat as the MPN Index does not exceed the safe limit which has been set by CPCB.
- Although various type of macrophytes were distributed around the shores of these two lakes but on a majority 14 no. of aquatic macrophytes were observed from the 9 sites.
- The density of free-floating species basically *Salvinia milesta* and *S. cucullata* exhibited maximum inside the Kanjia. *Ampelopteris prolifera*, a fern species was dominant in Kiakani Lake.


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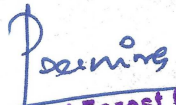
Water quality assessment

Introduction

Information on the variations of water quality have become an important aspect for the implementation of sustainable management strategies for lake ecosystems. The conventional seasonal observation, with one or two-time sampling in a season, does not result sufficient information to evaluate the controlling factors of water quality due to complexity of processes that significantly vary in temporal scale, from daily to intra-seasonal or intra-annual time scale. The water quality variation is mostly attributed to anthropogenic activities as well as natural processes such as hydrological features, precipitation, and river/effluent discharge. Hence seasonal survey of lake ecosystems can provide a better picture of the ecosystem functioning as compared to one time study. In order to understand the health, the aquatic ecosystem, the thresholds described by the local regulating authorities should be used as it may vary on the geographical location of the ecosystem. Thresholds has been prescribed by central pollution control board (CPCB) for Indian water depending on the several purpose of uses such as Drinking Water Source without conventional treatment but after disinfection, Outdoor bathing (Organised), Drinking water source after conventional treatment and disinfection, Propagation of Wild life and Fisheries, Irrigation, Industrial Cooling, Controlled Waste disposal designated as different class of waters (A to E).

Phosphorous and inorganic nitrogen in the form of nitrate (NO_3), nitrite (NO_2), and ammonia (NH_3) are present in water can be readily consumed by the phytoplankton with different degree of preference. Ammonia (NH_3) is formed in the natural environment by the fixation of atmospheric nitrogen and hydrogen by diazotrophic microbes, such as cyanobacteria and decomposition of manure, dead plants and animals by bacteria. However, the excess of ammonia may affect the structural, developmental, changes in tissues of gills, liver, and kidneys of many of the aquatic animal. The elevated concentration of dissolved inorganic nitrogen results in increased phytoplankton production and biomass, which may in turn be followed by increased population of consumer animals. At the same time, excessive nutrient enrichment can be detrimental to the aquatic water bodies. The concentration of these nutrients (nitrogen and phosphorous) along with transparency and chlorophyll-a, in an ecosystem, decides its trophic status. It is much easier to convey to the public the status and nature of the Lake through an



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index (trophic level), which provides the scientific record of nutrient enrichment and Lake Character.

Methodology

Sub-surface water samples were collected from 09 stations (on 29th January 2022) from Kanjia and Kiakani Lake by scientific staffs of Chilika Development Authority with the help of staffs of Nandankanan. The sampling points were named as NK1 to NK9 (NK stands for Nandankanan lakes). Nutrients [nitrate + nitrite (NO₃+NO₂), ammonia (NH₃), phosphate (PO₄), and silicate (Si (OH)₄)] were estimated by nutrient autoanalyzer (SKALAR SANplus ANALYZER) following Grasshoff *et al.* 1999, with precision of ±0.02, 0.01, and 0.02 µM respectively. Temperature, pH, Conductivity, Salinity and turbidity were measured using water quality sensors (pH: Metrohm pH meter with accuracy of ±0.002, Turbidity: thermo scientific Eutech TN-100 & for Conductivity and Salinity: Orion star A212 bench top conductivity meter). Dissolved oxygen (DO) was measured by Winkler's titration method (Carrit and Carpenter 1966). A total of 2 sets of productivity samples were collected from 2 stations in triplicates during the survey period and analyzed by Light and Dark bottle method based on DO analysis by Winkler's titration method. Biochemical oxygen demands (BOD) of the collected samples were done by 3 days' incubation, maintaining a constant temperature at 27°C and then measuring the dissolved oxygen. The chlorophyll-a was estimated by taking 1L of surface water and filtered through GF/F filters, extracted with 90 % acetone and stored for 24 h at 4 °C in the dark. The absorbance was taken at 630 nm using UV-VIS spectrophotometer (Thermo Scientific Evolution 201) following the Strickland and Parsons (1972).


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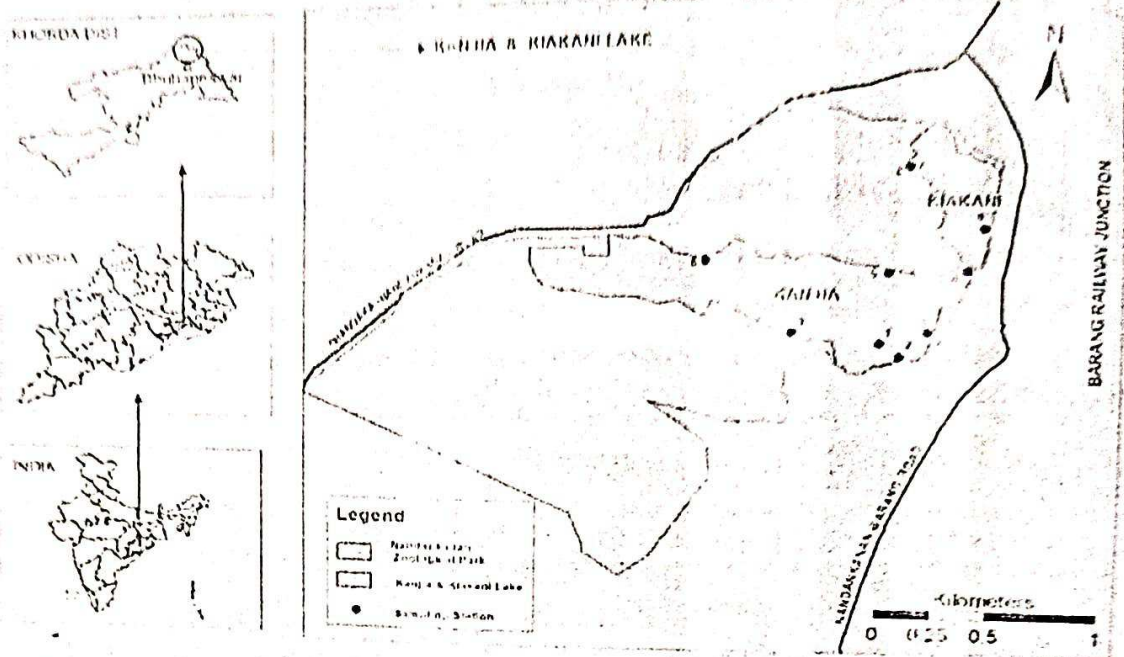


Figure. Sampling locations of Kanjia and Kiakani Lake for water quality survey

RESULTS

Physico-Chemical parameters

Results of Kanjia and Kiakani Lake survey with respect to CPCB guide lines for Fishery and propagation of wild life during January 2022:

ST.NO	pH(6.5-8.5) CPCB Range	DO(\geq 3ppm) CPCB Range	BOD(\leq 3ppm) CPCB Range	TURBIDITY \leq 30 CPCB Range	Remarks
NK1	7.618	6.46	0.38	1.89	Within range
NK2	7.633	7.23	2.84	1.54	Within range
NK3	7.612	5.16	0.62	2.17	Within range
NK4	8.872	7.56	0.61	7.51	pH a bit in range
NK5	7.654	7.46	0.98	1.87	Within range
NK6	7.662	6.24	0.51	2.3	Within range
NK7	7.402	3.04	1.85	5.07	Within range
NK8	7.668	8.47	0.77	2.41	Within range
NK9	7.382	3.55	2.95	5.67	Within range

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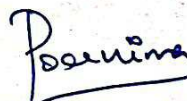
During the sampling period (January 2022) the average air temperature of the Kanjia lake and Kiakani lake was 26.42°C and 27°C respectively. The average water temperature of these two lakes was 24.92°C and 25.5°C respectively during January 2022. The average depth of the Kanjia and Kiakani lake was 1.45 m and 1.92m respectively. The average transparency was 1.34 m and 1.45m. The pH is one of the parameters that regulate carbon and nutrient availability in the aquatic ecosystem and also the organisms in a specific ecosystem. During the survey pH found to be varied in between 7.61-8.87 with an average of 7.81 ± 0.46 in Kanjia lake and 7.38-7.40 with an average 7.39 ± 0.01 in Kiakani lake. During the survey period (January 2022), turbidity was found to be varied in between 1.54-7.51 NTU with an average of 2.81 ± 2.09 NTU in Kanjia lake and 5.07-5.67 NTU with an average 5.37 ± 0.42 NTU in Kiakani lake.

The depleted oxygen levels may lead to fish kills and a range of other effects reducing biodiversity. The Dissolved Oxygen (DO) varied in between 5.16-8.47 mg l^{-1} with an avg. 6.94 ± 1.07 in Kanjia lake and 3.04-3.55 mg l^{-1} with an average 3.29 ± 0.36 in Kiakani lake. Biochemical Oxygen demand (BOD) indicates the pollution status of the ecosystem through the indication of the total organic matter load to the system. It controls the biodiversity of the ecosystem significantly. During study period, the BOD of the Kanjia and Kiakani lake was in threshold limit with an average of 0.95 ± 0.85 and 2.4 ± 0.77 respectively.

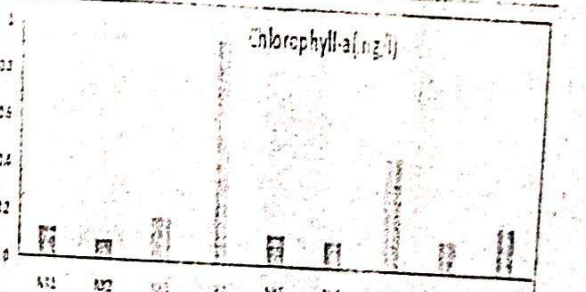
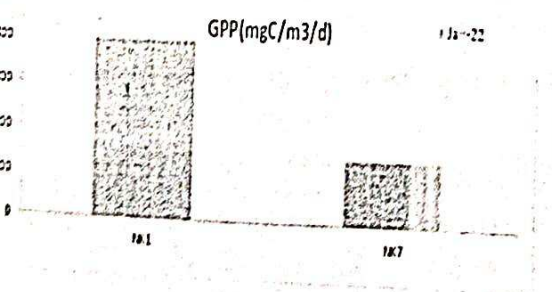
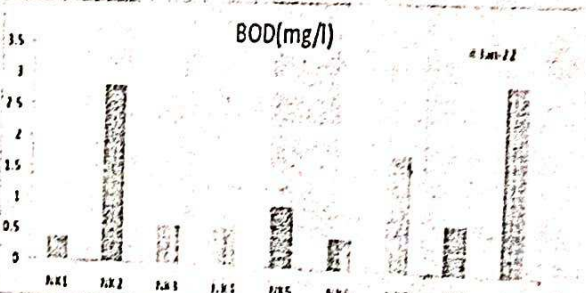
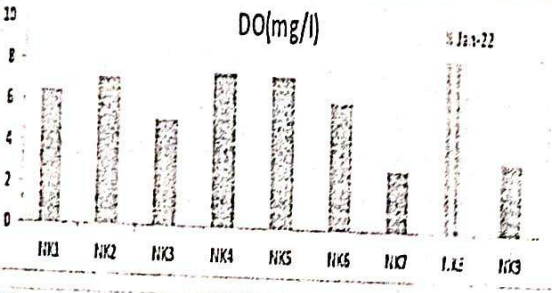
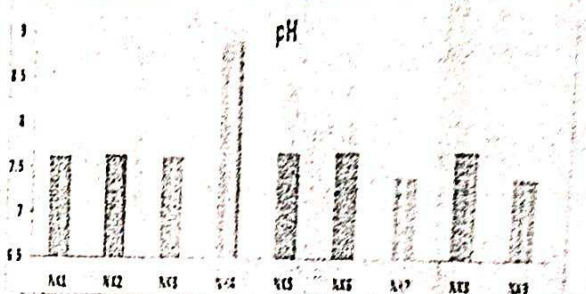
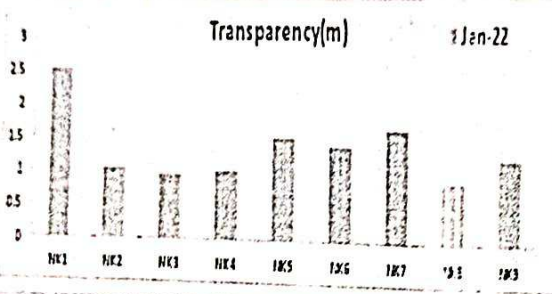
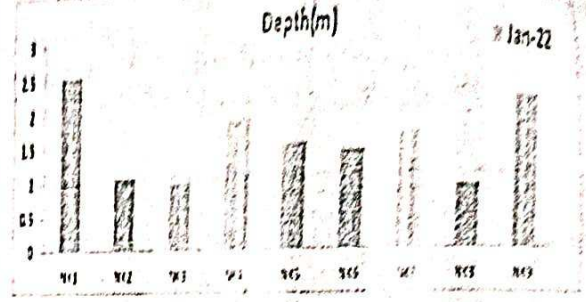
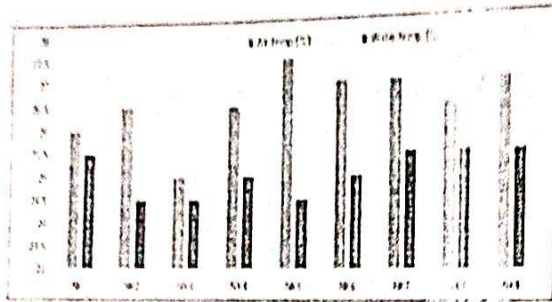
Measurement of chlorophyll-a concentration helps us to understand natural systems & is important in studies aimed at assessing the trophic status of the ecosystem in terms of eutrophication. Chl-a is a measure of the amount of algae growing in a water body. During the sampling period the average chl-a concentration of the Kanjia and Kiakani lake was 0.25 mg/l and 0.35 mg/l respectively. The average GPP of Kanjia and Kiakani Lake was estimated to be 272.32 ± 178.606 $\text{mgC/m}^3/\text{day}$.



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VARIATION OF NUTRIENTS:

Nitrite (NO₂-N) is the one of the form of nitrogen plays an important role for the health of the ecosystem. Its excess concentration creates eutrophication condition for ecosystem. Nitrogen is the source from human made activity and natural process. Nitrogen gas present in water-air surface is dissolved in water, homogenized throughout the system and it flows from point and

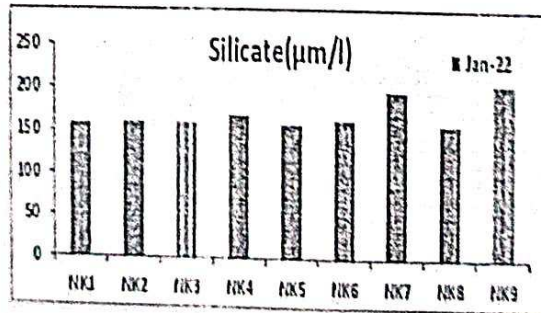
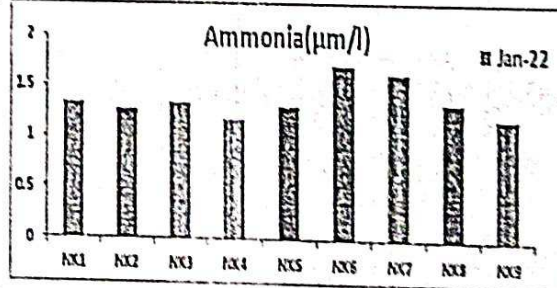
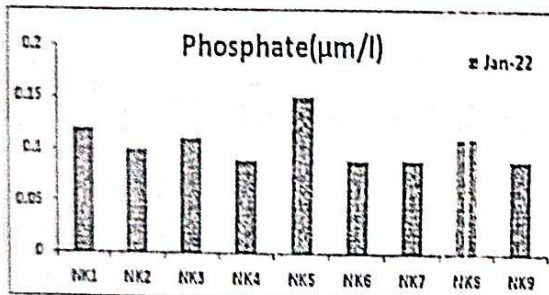
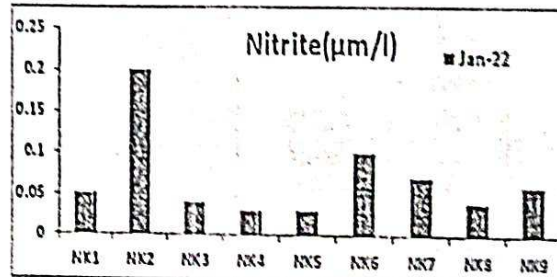
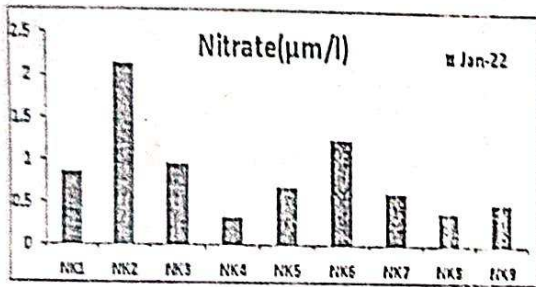
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Khordha Division, Khordha

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non-point sources through the river and rivulets to the system. During the sampling period the nitrite varied from 0.03-0.2 μmol^{-1} with an avg. $0.07 \pm 0.06 \mu\text{mol}^{-1}$ in Kanjia lake and 0.06-0.07 μmol^{-1} with an average 0.06 ± 0.007 in Kiakani lake. Nitrate ($\text{NO}_3\text{-N}$) varied in between 0.33-2.13 μmol^{-1} with an avg. $0.94 \pm 0.61 \mu\text{mol}^{-1}$ in Kanjia and 0.52-0.63 μmol^{-1} with an average $0.57 \pm 0.07 \mu\text{mol}^{-1}$ in Kiakani Lake. Silicate (SiO_2) conc. varied in between 159.02-168.88 μmol^{-1} with an avg. $161.90 \pm 3.50 \mu\text{mol}^{-1}$ in Kanjia and 197.89-207.45 with an average $202.67 \pm 6.75 \mu\text{mol}^{-1}$ in Kiakani Lake. Phosphate (PO_4) conc. varied in between 0.09-0.15 μmol^{-1} with an average $0.11 \pm 0.02 \mu\text{mol}^{-1}$, and 0.09-0.09 with an average $0.09 \pm 0 \mu\text{mol}^{-1}$, Ammonia (NH_3) conc. varied in between 1.17-1.71 μmol^{-1} with an average $1.34 \pm 0.17 \mu\text{mol}^{-1}$ and 1.2-1.64 with an average $1.42 \pm 0.31 \mu\text{mol}^{-1}$ in Kanjia and Kiakani lake respectively.

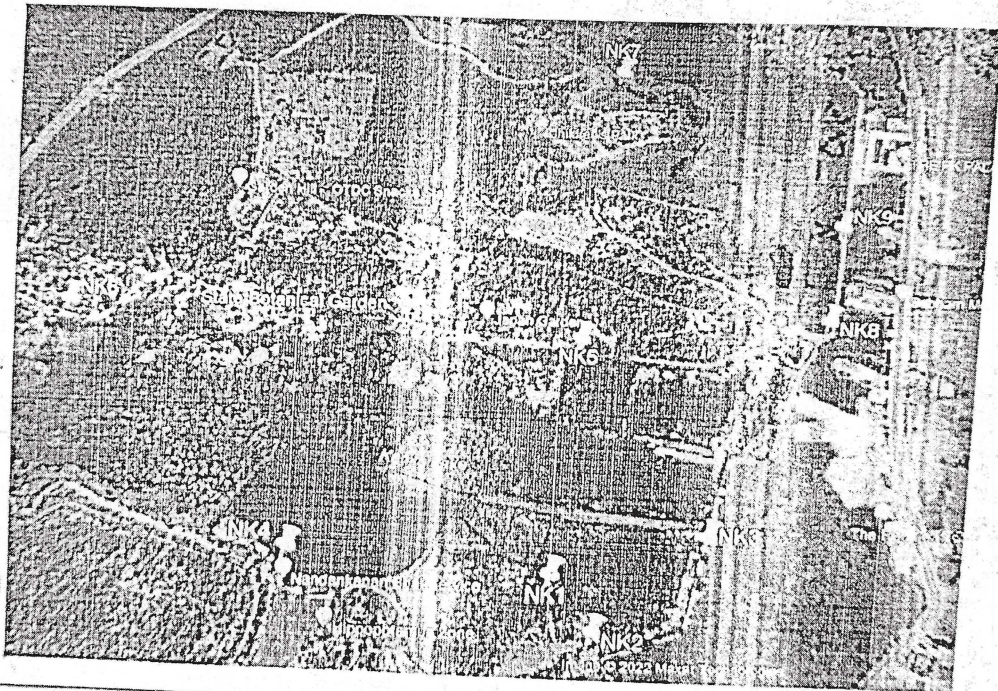


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Macrophytes survey

A survey on macrophyte has been carried out on 29th January, 2022 by the scientific team of Chilika Development Authority from 9 sites of two lakes (Kanjia and Kiakani) of Nandankanan which is depicted in the map below. Four category of plants like- Emergent, Submerged, Rooted with floating leave, and Free-floating were recorded. The detailed distribution of these four categories of macrophyte in the 9 sites and around the shore of the Lake is shown in Table-1. The abundant growth of macrophytes has shown in Figure-1. Some identified fresh water macrophytes are shown in Figure-2.



Map Showing distribution of fresh water macrophytes inside Kanjia and Kiakani Lake

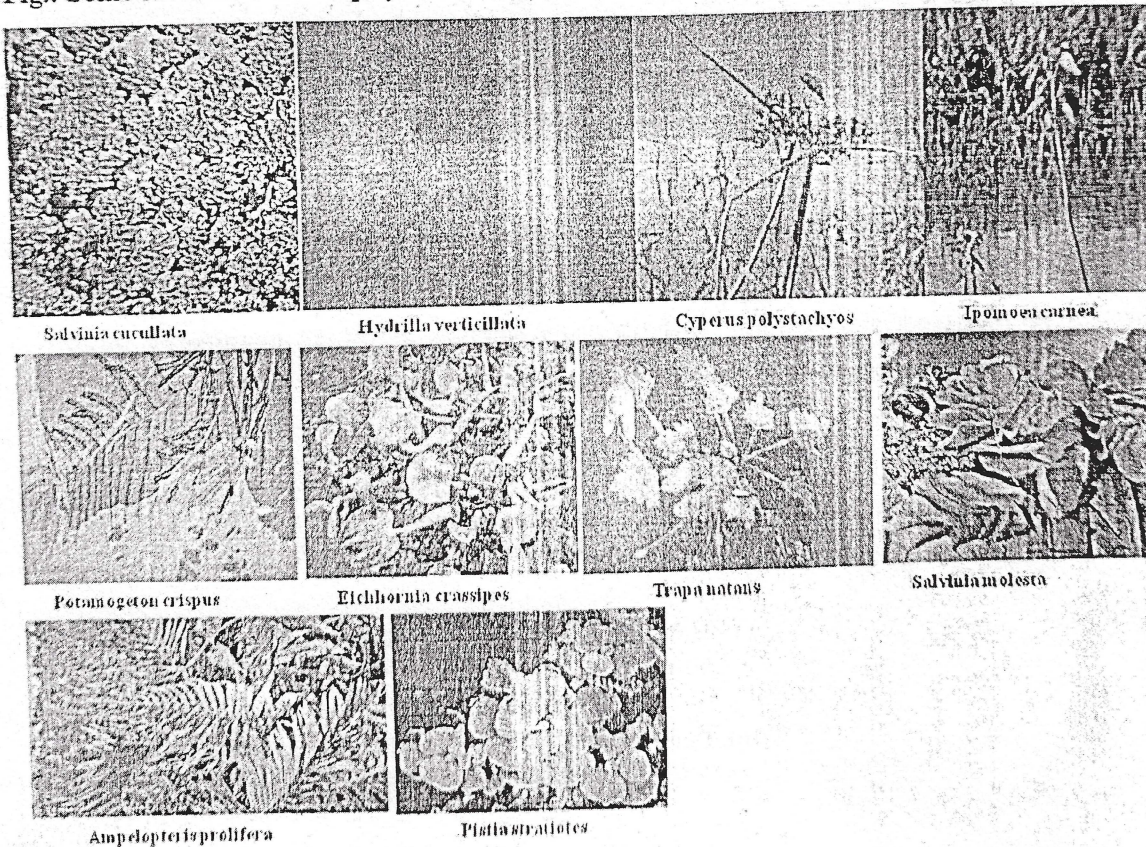
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Table-1: List of macrophytes recorded from 9 sites of Kanjia and Kiakani lake. Sites noted as NK 1, 2, 3, 4, 5, 6 and 9 belongs to Kanjia and NK 7 & 9 are from Kiakani Lake.

Species Name	Habitat Type	Station encountered
<i>Hydrilla verticillata</i>	Submerged	NK 1, 2, 3, 4, 5, 6 & 7
<i>Ceratophyllum demersum</i>		NK 3, 4 & 8
<i>Potamogeton crispus</i>		NK 1, 2, 3 & 4
<i>Vallisneria natans</i>		NK 1 & 2
<i>Nymphaea pubescens</i>	Rooted with floating leave	NK 7
<i>Nymphaea nouchali</i>		NK 1, 2 & 3
<i>Trapa natans</i>		NK 2 & 3
<i>Ipomoea carnea</i>	Emergent	NK 9
<i>Cyperus polystachyos</i>		NK 9
<i>Ampelopteris prolifera</i>		NK 9
<i>Eichhornia crassipes</i>	Free-floating	NK 2, 3 & 6
<i>Salvinia cucullata</i>		NK 1, 2, 3, 6 & 8
<i>Salvinia molesta</i>		NK 1, 2, 3, 4, 5, 6 & 8
<i>Pistia stratiotes</i>		NK 3 & 4

Fig.: Some identified macrophyte of Kanjia and Kiakani Lake



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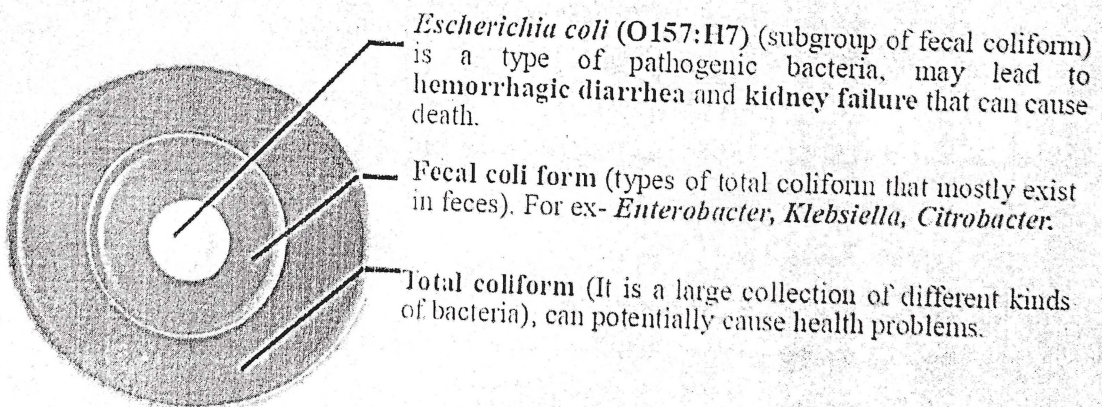
Observation of inventory and distribution status of macrophyte in Kanjia and Kiakani Lake

1. A total of 14 no. of macrophytes were inventorised in Kanjia and Kiakani Lake from 9 sites.
2. Although various type of macrophytes were distributed around the shores of these two lakes but mainly we observed 14 no. of aquatic macrophytes from the 9 sites.
3. The density of free floating species basically *Salvinia mitesta* and *S. cucullata* exhibited maximum inside the Kanjia. *Ampelopteris prolifera*, a fern species was dominant in Kiakani Lake.

Fecal indicator bacteria (FIB) study

1. Introduction:

Coliform bacteria are the Indicator organisms used for monitoring the microbiological safety of water and are an indicator of potential human fecal contamination. These are rod-shaped, gram negative, non-spore forming, and motile or non motile bacteria which can ferment lactose with the production of acid and gas when incubated at 44 °C. There are three different groups of coliform bacteria (Fig. 1). They are (i) Total coliform group is a large collection of different kinds of bacteria, (ii) Fecal coliforms are the types of total coliform that mostly exist in feces). For ex- *Escherichia coli*, *Enterobacter*, *Klebsiella*, *Citrobacter*, (iii) *Escherichia coli* (O157:H7) (subgroup of fecal coliform) can potentially cause health problems. Examining the concentrations of fecal indicator bacteria (FIB) in water samples, allow an opportunity for analysis to be taken of the conditions that support FIB concentration.



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Fig. 1. Subgroups of fecal coliforms

Table 1. PRIMARY WATER QUALITY CRITERIA FOR CLASS SW-II WATERS CPCB
(For Bathing, Contact Water Sports and Commercial Fishing)

Parameter	Standards	Rationale/Remarks
Fecal Coliform	100/100 ml (MPN)	<ol style="list-style-type: none"> 1. The MPN value of each sample not exceeding 100/100 ml 2. The average MPN value not exceeding 200/100 ml in 20 percent of samples in the year 3. The average MPN value not exceeding 200/100 ml in 3 consecutive samples in monsoon months.

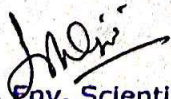
2. Objective:

To monitor the fecal contamination of water samples from the 9 stations of the Nandankanan as shown in water quality section.

4. Study site and sampling procedure:

Nandankanan Zoological Park is a zoo and botanical garden in Bhubaneswar, Odisha, India (Fig. 2). Established in 1960, it is located near Chandaka forest, and includes the 134-acre Kanjia lake. It is rich in biodiversity with large number of animals, birds, insects, and plants. Fecal coliform monitoring has been carried out on 29th January, 2022 by the scientific team of Chilika Development Authority from 9 sampling sites of the lake which is depicted in the map shown in water quality section. For FIB analysis, samples were collected in sterile bottles (500 ml) and were kept in ice boxes, and transferred to laboratory for further analysis.

3.1. Methodology


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FIB analysis was conducted using the multiple tube fermentation method and recorded as the MPN (most probable number) of microorganisms present in 100 ml of the water sample. The MPN method includes 2 tests presumptive, confirmatory test.


The CPCB, New Delhi, has implemented various regulatory guidelines on water quality for different applications to obtain water quality standards. According to the CPCB guidelines for primary water quality criteria for Class SW-II (waters for bathing, contact water sports, and commercial fishing), the permissible level of fecal coliforms load is 100 MPN/100 ml of the sample (Table 2). All samples were compared with the CPCB guidelines for fecal coliforms load risk assessment.

3.1.1. Presumptive test

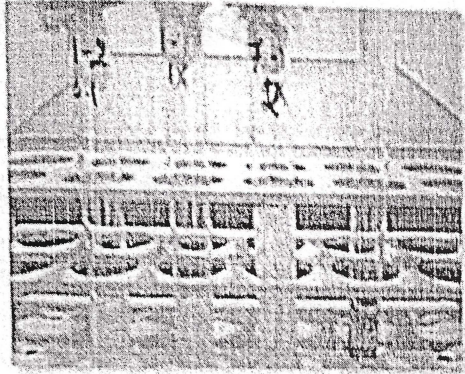
The three-tube procedure using lactose broth was used to detect the coliform and determine MPN of fecal coliforms. 10 ml, 1 ml and 0.1 ml of water samples were inoculated into tubes with 5 ml of lactose broth and incubated at $44 \pm 0.5^\circ\text{C}$ (Fig. 3). After 48 h the tubes were examined carefully for acid-gas production. Acid production was determined by colour change of the both from purple to yellow and gas production was checked by entrapment of gas in the Durham's tube and recorded as positive. Cultures showing no colour change with any production of gas in 48 h were considered negative.

3.1.2. Confirmatory test

The positive tubes were streaked on eosine-methylene-blue (EMB) agar and were incubated for 24 h. After 24 h strong lactose fermenters will appear as dark Blue / purple / black, and *E.coli* (which also ferments lactose) colonies will be appear to have a metallic green sheen (Fig. 3).

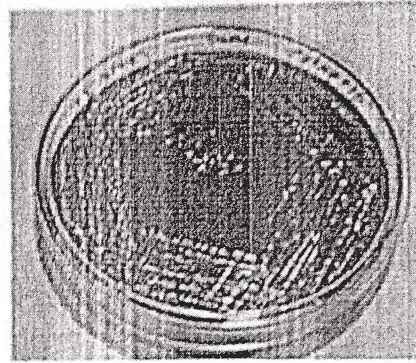
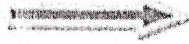

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Presumptive test:

1. 1X tube with 0.1ml sample of St1
2. 1X tube with 1 ml sample of St1.
3. 2X tube of St7
4. Blank



Confirmative test:

St 1 sample showing metallic green sheen colonies on EMB agar plates. Metallic sheen colony is confirmatory test for *E.coli*.



Fig. 3. Fecal coliforms assessment by using MPN method

4. Result

4.1 Fecal coliform assessment

Fecal coliform distribution in terms of MPN index of most of the stations displayed < 100 MPN/100 ml (threshold value according to CPCB guidelines) in presumptive test. Positive presumptive result was found at station no. NK1, NK4, NK5, and NK9 (Table 2; Fig. 4). All other stations showed negative presumptive result. Only station no. NK1 showed positive confirmatory result.

Table 2. Results of fecal coliforms showing the positive/negative presumptive and confirmatory test

Stations	MPN index/100 ml (presumptive test) 	Metallic green sheen colonies (confirmative test) 
NK1	3	Metallic green colony observed
NK2	Negative presumptive test	-
NK3	Negative presumptive test	-
NK4	460	No metallic green colony
NK5	9	No metallic green colony
NK6	Negative presumptive test	-

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NK7	Negative presumptive test	
NK8	Negative presumptive test	No metallic green colony
NK9	150	

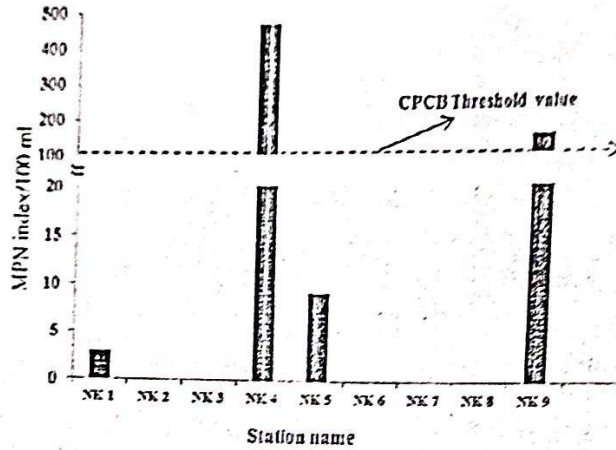


Fig. 4. MPN Index of fecal coliforms

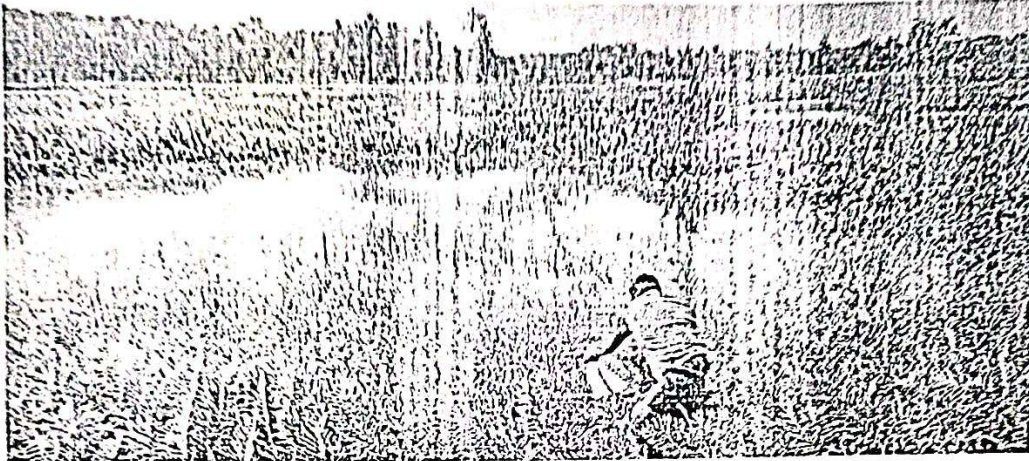
5. Conclusion

The above result revealed that the fecal coliform counts (MPN index per 100 ml) in water samples was within the safe limits according to CPCB guidelines (100 MPN/100 ml) for most of the stations, excluding NK4, NK9. Station NK1, NK4, NK5, and NK9 showed the positive presumptive result. However, only NK1 sample showed positive confirmatory result (presence of metallic green sheen colonies on EMB agar plates). Thus, the results showed that fecal contamination is present in these stations, but there is still no threat as the MPN Index does not exceed the safe limit which has been set by CPCB.

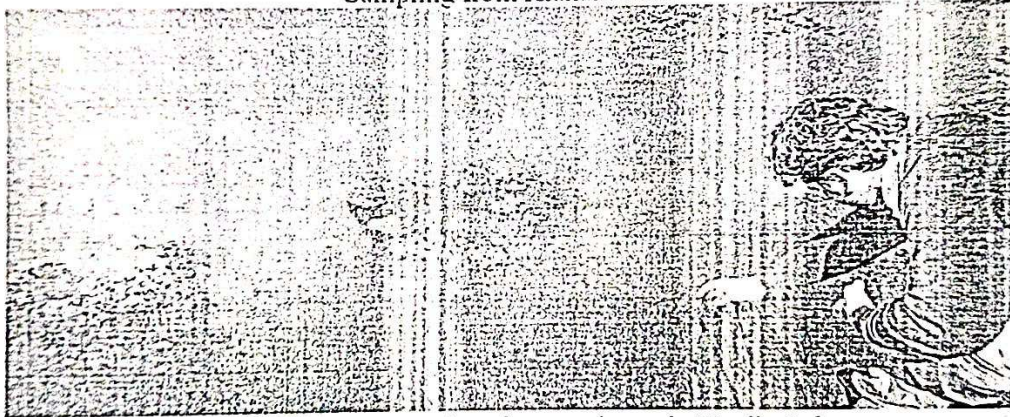
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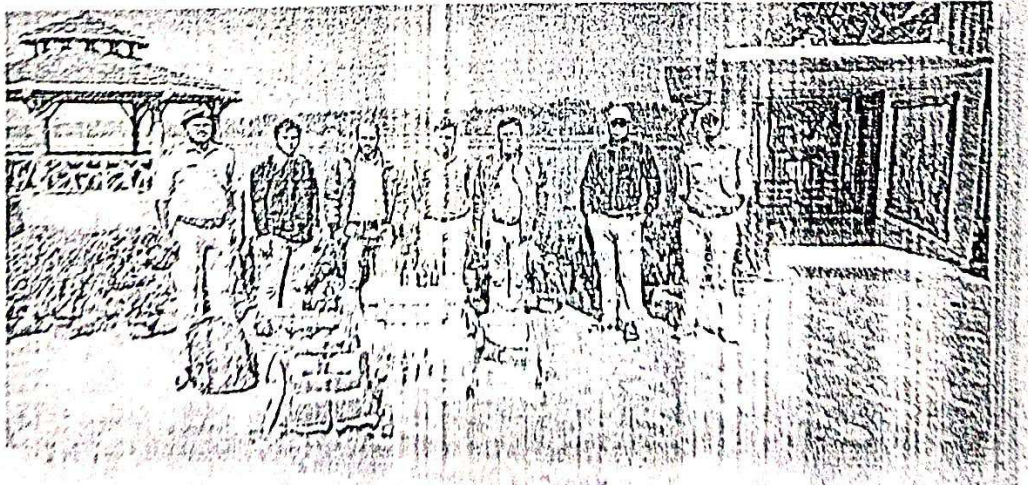
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Sampling from Kiakani Lake



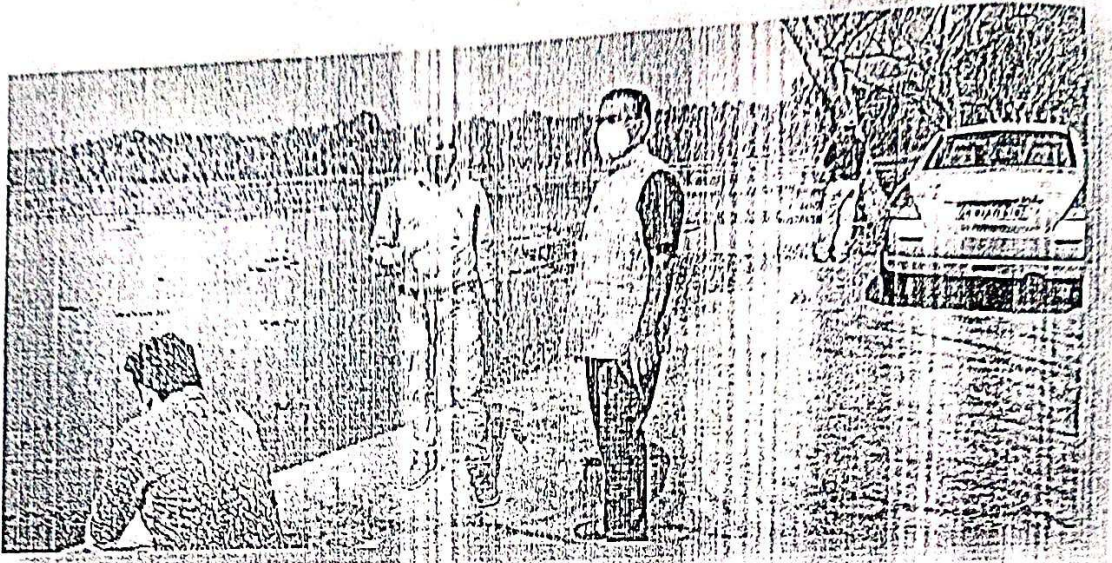
Under-water photography of macrophytes in Kaujia Lake



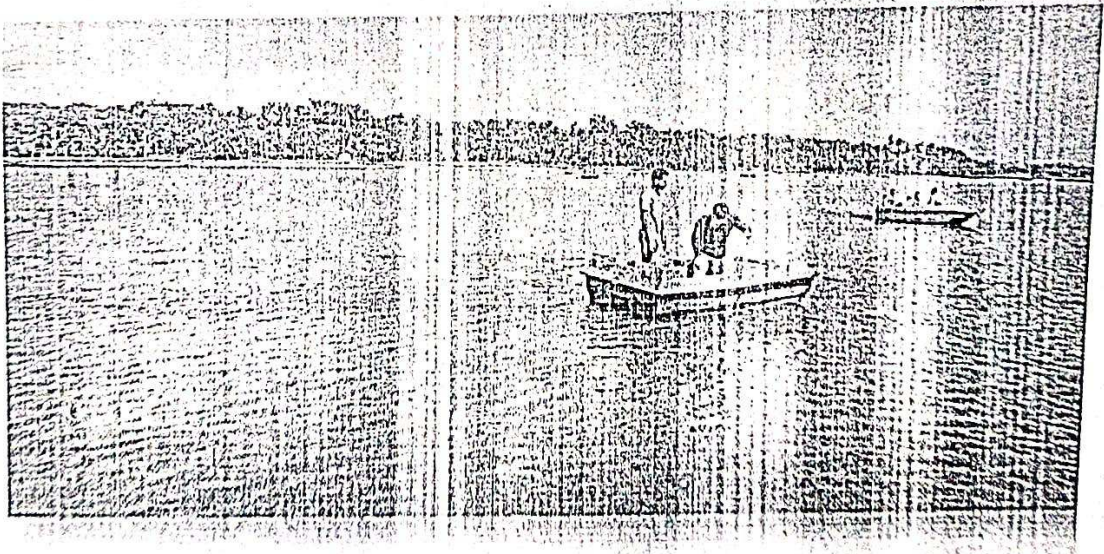
Sampling setup for Nandankanan Lake survey


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Discussion on Lake health status (DD, Nandankanan and SO, CDA)

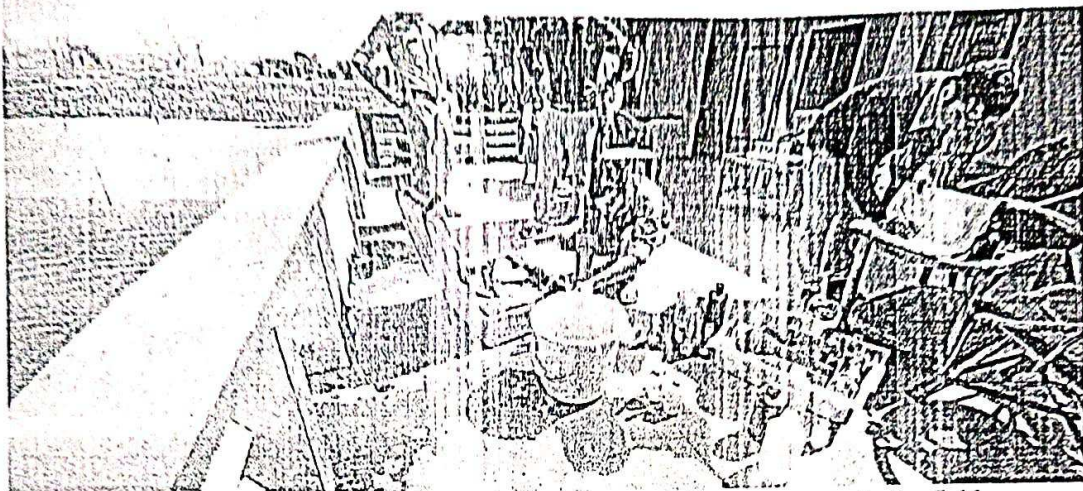


In-situ measurement of WQ parameters of Kanjia Lake

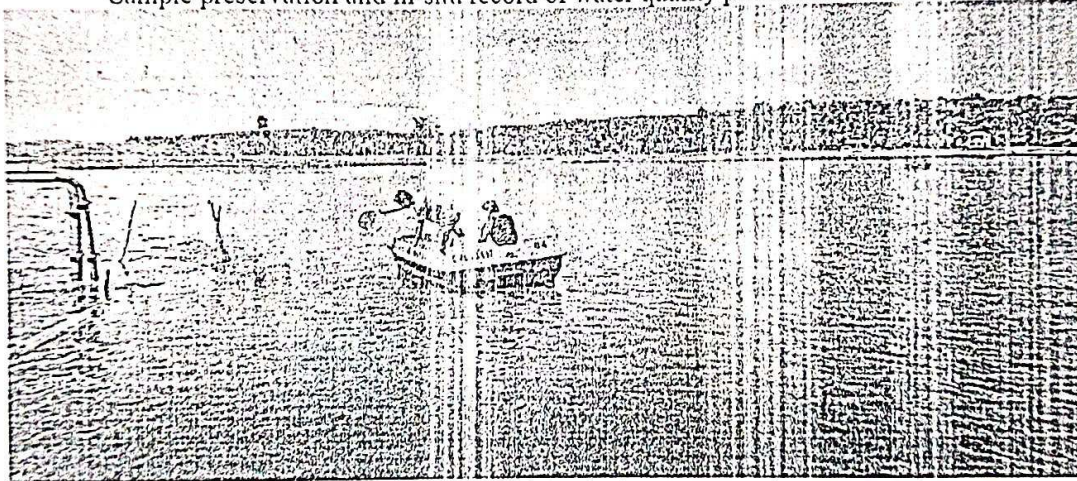
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Divisional Forest Officer
Khordha Division, Khordha

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Sample preservation and in-situ record of water quality parameters in the field



Sampling from Kanjia lake during January 2022

Field figures during collection of water samples, immediate preservation and insitu data collection in Kanjia and Klakani Lake, Nandankanan during January 2022

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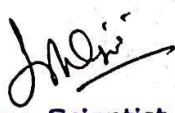
List of contributors for the Kanjla and Klakani Lake monitoring: JANUARY 2022

Research supervisors:

1. Dr. Gurdeep Rastogi, SS
2. Dr. Pradipta R. Muduli, SO

Research fellows:

3. Mr. Ishan Biswajit Sahoo, JRF (water quality)
4. Mr. Manas Barik, JRF (water quality)
5. Mr. Pramod kumar Tripathy, JRF (Macrophyte)
6. Ms. Madhusmita Mohapatra, JRF (Biotechnology)
7. Mr. Bibhuti Dora (GIS map preparation)

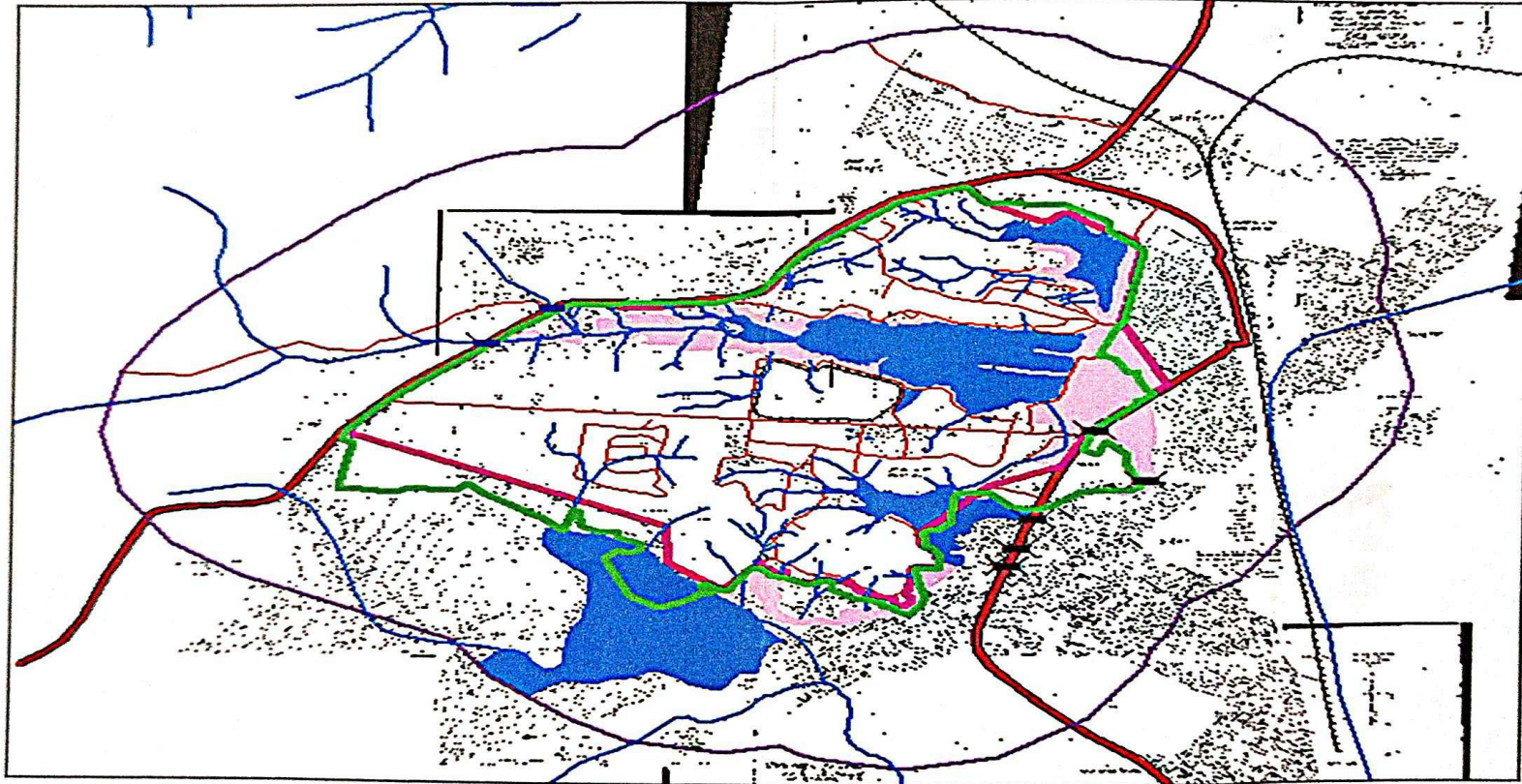

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Annexure ~~XI~~ XII

Map showing blockages of water bodies of Nandankanan sanctuary (blockages shown in black rectangles)

Source: Source-Management Plan of Nandankanan Wildlife Sanctuary for the period 2016-17 to 2025-26



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Annexure - XIII



Government of Odisha
Office of Special Relief Commissioner

No.IV-210/22 - 6509 /R & DM(DM), dt. 18/12/2023

From
Sri Sidhartha Sankar Acharya, OFS (SAG),
FA-cum-Additional Secretary to Government

To
The Additional Chief Secretary to Govt.
Water Resources Department / Forest, Env. & CC Department

11/12/23
11/12
Sub: Release of funds under Demand No.42-2245-RANC-80-General-800-
Other Expenditure-3523-State Disaster Mitigation Fund-78742-State
Contribution to State Disaster Mitigation Fund during the year 2023-24.

Ref: 1. Water Resources Department Letter No. 32835/WR, Dated 24.11.2023
2. Forest, Env. & CC Department Letter No. 25143/FE&CC, Dated 04.12.2023

Madam/Sir,

I am directed to convey the release of **Rs. 15,73,42,000/- (Rupees fifteen crore seventy three lakh forty two thousand)** only out of SDMF in favour of Water Resources Department during the year 2023-24 towards the mitigation project "Improvement of drainage system of Kanjia and Kiakani lakes to prevent flooding in Nandankanan and adjoining area" submitted by your department in the referred letter above.

Further, it is to be mentioned here that, the project will be executed by Water Resources Department in consultation and co-ordination with Forest, Env. & CC Department. As part of this project covers Nandankanan area, any technical assistance may be taken from the Director, Nandankanan so far as execution within Nandankanan area is concerned.

1. The expenditure should be made strictly adhering to the norms and guidelines of SDMF.
2. The following allotment is hereby placed at your disposal under the above head of account during the year 2023-24. **It should not be treated as grant-in-aid.**
3. The above allotment shall not be diverted for any other purpose.
4. No expenditure beyond the allotment shall be incurred. The expenditure statement along-with TV Nos. and date of drawl shall be furnished to this Office regularly in each month by the stipulated date as per provisions contained in Paragraph-265 of the Orissa Relief Code.
5. **No funds shall be drawn in AC Bill or grant-in-aid bill.**
6. A copy of order of distribution of funds to the subordinate offices may please be sent to SRC by return of post.
7. The Utilisation Certificate duly countersigned by the Competent Authority as prescribed in this office circular No.76 dated 16.2.99 shall be furnished to this Office immediately.
8. Receipt of the letter may please be acknowledged.

Yours faithfully,

[Signature]
FA-cum-Additional Secretary to Govt.

[Signature]
Sr. Env. Scientist

S.P.C. Board, Odisha

[Signature]
DIVISIONAL FOREST OFFICER
KHORDHA

Annexure - XIV ¹²⁷

GOVERNMENT OF ODISHA
DEPARTMENT OF WATER RESOURCES ,

DRAINAGE DIVISION, KHURDA

DETAILED PROJECT REPORT

FOR THE WORK

IMPROVEMENT OF DRAINAGE SYSTEM
OF KANTIA & KIAKANI LAKES TO
PREVENT FLOODING IN
NANDANKANAN AND ADJOINING AREAS

ESTIMATED COST Rs.1573.42 LAKHS

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SR. Env. Scientist
Regional Office

S.P.C. Board
Bhubaneswar (Odisha)

P. Prasad
Divisional Forest Officer
Khordha Division, Khordha

EXECUTIVE ENGINEER
DRAINAGE DIVISION
KHURDA


STATE OF ODISHA

NAME OF DIVISION:

NAME OF WORK : Drainage Congestion clearance of Kanjia
& Kiakani Lake in Nandankanan Zoological
Park, Bhubaneswar

HEAD:

AMOUNT OF ESTIMATE: Rs.1573.42 Lakhs


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S.P.C. Board
Bhubaneswar (Odisha)


Divisional Forest Officer
Khordha Division, Khordha

PROVISION SLIP

Major Head :

Name of work : **Name of Work- Improvement of Drainage system of Kanjia & Kiakani Lakes to prevent flooding in Nandanakanan and adjoining areas.**

Sub-Head :

Provision under sub-head : Rs

Up-to date estimate amount


sactioned under the Sub-Head : Rs

Amount of the present estimate: Rs 1573.42

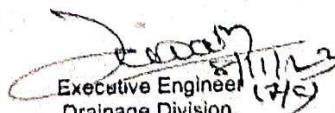
Total estimate amount including

the present estimate : Rs

Balance : Rs


 SR. Env. Scientist
 Regional Office
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 Bhubaneswar (Odisha)


 Divisional Forest Officer
 Khordha Division, Khordha


 Executive Engineer
 Drainage Division,
 Khurda

MEMORANDUM

1. Name of the Project : Improvement of Drainage system of Kanjia & Kiakani lakes to prevent flooding in Nandankanan and adjoining areas.
2. Location : The Drainage System is located in Nandankanan Zoological Park of Bhubaneswar City. This system is located on Lat 20°23'50.67"N, Long 85°49'29.99"E & 20°23'11.01"N, 85°48'46.80"E respectively. This system has catchment area of 680 ha.
3. Present Problem : Channel Abandonment.
4. Historical Background : Nandankanan Zoological Park is a 437-hectare zoo and botanical garden in Bhubaneswar, Odisha, India. Established in 1960, it was opened to the public in 1979 and became the first zoo in India to join World Association of Zoos and Aquariums (WAZA) in 2009. It also contains a botanical garden and part of it has been declared a sanctuary. Nandankanan, literally meaning The Garden of Heaven, is located near the capital city, Bhubaneswar, in the environs of the Chandaka forest, and includes the 134-acre (54 ha) Kanjia lake.

Kanjia Lake is a natural lake on the northern outskirts of Bhubaneswar, Odisha. While the main lake covers 75 hectares (190 acres), the total wetland covers an area of 105 hectares (260 acres) with the scuba diving facility. It has a rich biodiversity and is a wetland of national importance which is helpful for maintaining the city's ecology.

The lake's ecosystem consists of 37 species of birds, 20 species of reptiles, 10 species of amphibians, 46 species of fish and three species of prawns, 10 species of submerged macrophytes, 14 species of floating macrophytes and 24 species of emergent macrophytes.

The lake is facing threat from uncontrolled quarrying, the dumping of solid waste and haphazard real estate construction on its fringe areas.

The lake is a part of the Nandankanan Zoological Park and is used for recreational boating by visitors.

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5. Attempts made if any and experience gained : The site has been inspected several times by Higher Authorities from time to time and it has been proposed to take the renovation work with 2nos of VRB, 1nos Sluice 540mt Cut & Cover & 230m Trough wall.
6. Comparative merit of the problem and justification and giving precedence to the other problem if any of the locality : The locality is facing much difficulty during rainy season and in dry season as well. It is felt very much necessary to address the problem for the greater interest of the public in the locality.
7. Approach : This site is well connected by roads.
8. Design consideration their suitable limitation : The section are prepared as per the design. Standard Specification and Typical drawing are adopted in preparation of project proposal. The approved working drawings will be followed while executing the work.
9. Specification selects suitability of economy : The earthwork and concrete work will be done as per I.S. Specification with current Schedule of rate.
10. Agency of execution : The work will be executed through the registered contractor after calling Tenders observing all the codal procedures.
11. Necessity and desirability of studying the problem as model : Since it is a small work model study may not be economical. It is based on the experience of the locals.
12. Analogy based on similar problems and experience and results noticed : It has been observed since long with if this project will be taken up it will be very much beneficial.
13. Scope of remedy now suggested if permanency : The remedy suggested is expected to provide good effect. The present proposals and made the drain immediate.
14. Maintenance of the work after construction : Maintenance will be made out of normal repair grant of the Drainage Division, Khurda.
15. Cost of the Project : ₹. 1573.42Lakhs

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This estimate is framed by Er. Raghu Nath Swain, Executive Engineer, Drainage Division, Khurda for the work "Improvement of Drainage system of Kanjia & Kiakani lakes to prevent flooding in Nandankanan and adjoining areas".

REPORT


This project cost amounting to Rs.1573.42 Lakhs (Rupees Fifteen Core Seventy Three lakh Forty Two Thousand) only has been framed to meet the probable expenditure & technically sanctioned for the work "Drainage Congestion Clearance of Kanjia & Kiakani Lake in Nandankanan Zoological Park, Bhubaneswar under Drainage Improvement Programme."

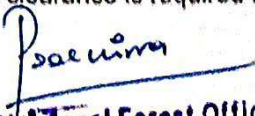
The proposed project is mainly to eradicate the drainage congestion of Kanjia and Kiakani Lake in Nandankanan Zoological Park. The main problem as narrated by Deputy Director, Nandankanan Zoological Park is the excess rain water from the lakes could not be drained out thus inundates the entire park in rainy season. After joint inspection of Additional Chief Secretary to Govt. Forest and Environment Department, Deputy Director, Nandankanan Zoological Park, Chief Engineer, Drainage, Cuttack, Superintending Engineer, Drainage Circle, Bhubaneswar and Executive Engineer, Drainage Division, Khordha, it was decided to select a suitable alignment to connect Kanjia and Kiakani Lake to Budhia Nalla through a link drainage channel. The alignment was fixed by Nandankanan and Drainage officials and detail survey has been conducted. The alignment of the drain located on Topo sheet No-F45T15 (73H/15)

Scope of Work

- i) **Eartwork:-** The drain is required to be excavated for a length of 3.1km to overcome the drainage congestion problem. Embankment filling has been proposed for the water body present in the alignment of the drain.
- ii) **Structure work:-** a) 2 nos of RCC box culverts are to be constructed for communication facilities & smooth conveyance of goods over existing road within Nandankanan. b) Construction of double vented sluice for control & regulation of excess rain water from Kanjia to Budhi Nalla. c) Cut & Cover for a length of 540mtr is to be provided due to heavy cutting area. (300mtr across main gale & 240 mtr along heavy cutting), d) 230mtr Open Trough wall at starting point of channel.

Land Acquisition: No land acquisition & forest clearance is required for the project.


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Climate:

The climate of the project area is tropical with usually three permanent seasons i.e. summer, Rainy & Winter. The maximum temperature is about 42.00 degree Celsius & minimum temperature is about 16.00 degree Celsius. Most of the rainfall is recorded from 15th June to 31st October, The maximum annual rain fall is about 1200mm. and minimum rainfall is about 700mm. Sometimes severe cyclonic storm originates from Bay of Bengal due to depression causes rain.


Estimated Cost: The estimated cost of the Project is around Rs.1573.42 Lakhs.

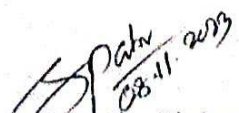
Organization Setup:

The organization is headed by the Govt. of Odisha, Department of Water Resources followed by the technical head i.e. The Chief Engineers, Drainage Cuttack, The project will be under the Supervision, guidance and control of the Superintending Engineer, Drainage Circle, Bhubaneswar. The project will be executed by a team comprising of the Executive Engineer, Drainage Division, Khurda, Asst. Executive Engineer, Drainage Sub-Division No.-II, Bhubaneswar and Asst. Engineer, Drainage Sub-Division. No.-II, Bhubaneswar.


Benefit and Recommendations:

After completion of the project the Nandankanan Zoological Park and Botanical Garden and adjoining areas will be retrieved from water logging. The entire storm water of the Drainage area of 680Ha will be smoothly drained out to Budhi Nalla. The unhygienic conditions of the locality can be removed on completion of the Project.



Ass Engineer
Drainage Sub-Divn No.-II
Bhubaneswar

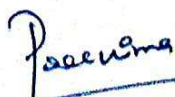

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Drainage Sub-Divn No.-II
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Executive Engineer
Drainage Division
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Additional Chief Engineer
Drainage Circle
Bhubaneswar


Chief Engineer
Drainage, Cuttack


Divisional Forest Officer
Khordha Division, Khordha

SALIENT FEATURES

1. Name of Project : Improvement of Drainage system of kanjia & Klakani lakes to prevent flooding in Nandankanan and adjoining areas.
2. Type : Drain
3. Scheme :
4. Hydraulic Data
Catchment area : 680Ha.
Drain Data
i. Length of Drain : 3.1 Km.
ii. Length of Link Drain :
iii. Bed width of drain : 5.20mtr. to 8.50mtr
iv. Depth of Drain : 2.00 – 12.0mtr.
v. Side slope of drain : 1:1
vi. Water surface slope : 1:1000
vii. Design Discharge : 14.50cumecs to 30.00 cumecs
5. Cost of Estimate : ₹. 1573.42 Lakhs
6. Direct Benefit
Drainage area (Gross Area) :
Drainage area(Gross Area) GCA 820 Ha.
CCA (80% of GCA)
Actual potential due to water logging.
Potential to be achieved after completion of project
7. Benefit : Nandankanan Zoological Park & Botanical Garden and adjoining areas will be benefitted from water logging.

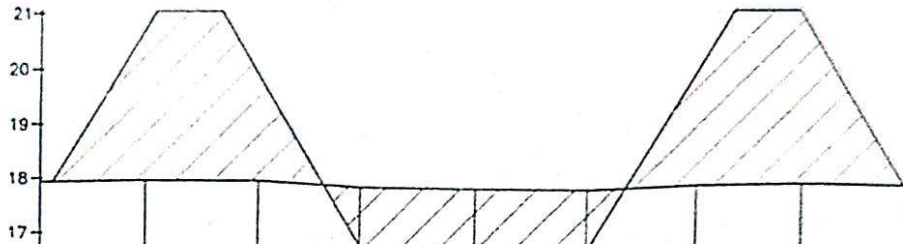
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NANDANKANAN D/C CROSS CESTION AT RD OM



Datum: 16.2

EXISTING LEVEL	17.940	17.980	17.970	17.840	17.790	17.760	17.840	17.870	17.820
DESIGN LEVEL	17.945	21.054	21.054	16.554	16.554	16.554	21.054	21.054	17.822
Offset	-20.00 -19.41	-15.20 -14.75	-11.75 -10.00	-5.30 -5.00	0.00	5.00 5.10	10.10 11.75	14.75 14.90	19.60 19.80

[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (17.945 + 17.980) \times (-19.41 - -15.20)$	= 75.694
$1/2 \times (17.980 + 17.970) \times (-15.200 - -10.000)$	= 93.470
$1/2 \times (17.970 + 17.840) \times (-10.000 - -7.000)$	= 53.765
$1/2 \times (17.840 + 17.840) \times (6.851 - 10.100)$	= 57.878
$1/2 \times (17.840 + 17.870) \times (10.100 - 14.900)$	= 85.704
$1/2 \times (17.870 + 17.822) \times (14.900 - 19.597)$	= 83.823
Total	= 450.355

Final Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (17.945 + 21.054) \times (-19.414 - -14.750)$	= 90.946
$1/2 \times (21.054 + 21.054) \times (-14.750 - -11.750)$	= 63.182
$1/2 \times (21.054 + 17.887) \times (-11.750 - -7.000)$	= 92.485
$1/2 \times (17.768 + 21.054) \times (6.851 - 11.750)$	= 85.143
$1/2 \times (21.054 + 21.054) \times (11.750 - 14.750)$	= 63.182
$1/2 \times (21.054 + 17.822) \times (14.750 - 19.597)$	= 94.216
Total	= 499.114

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (17.827 + 17.840) \times (-7.000 - -5.300)$	= 30.368
$1/2 \times (17.840 + 17.790) \times (-5.300 - 0.000)$	= 94.420
$1/2 \times (17.790 + 17.760) \times (0.000 - 5.100)$	= 90.653
$1/2 \times (17.760 + 17.768) \times (5.100 - 6.851)$	= 31.122
Total	= 246.563

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (17.827 + 16.554) \times (-7.000 - -5.000)$	= 34.441
$1/2 \times (16.554 + 16.554) \times (-5.000 - 0.000)$	= 82.770
$1/2 \times (16.554 + 16.554) \times (0.000 - 5.000)$	= 82.770
$1/2 \times (16.554 + 17.768) \times (5.000 - 6.851)$	= 31.784
Total	= 231.765

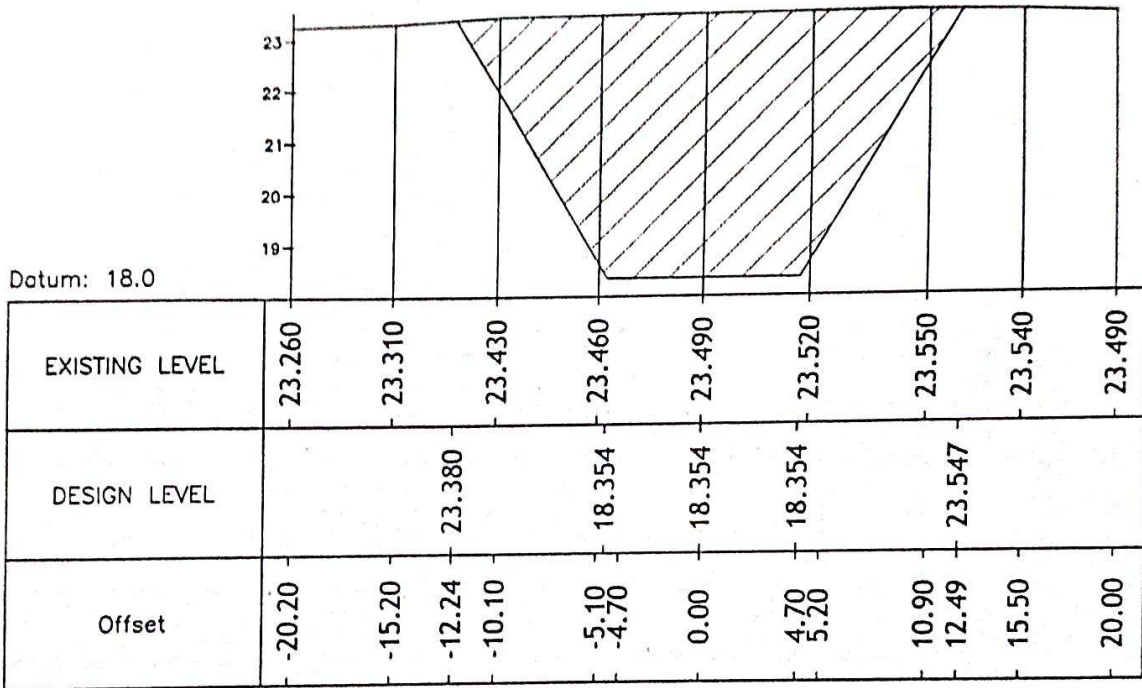
Area	Initial	Final	Net
Filling	450.355	499.114	48.759
Cutting	246.563	231.765	14.798

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NANDANKANAN D/C CROSS CESTION AT RD 1800M



Datum: 18.0

[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (23.380 + 23.430) X (-12.239 - -10.100) = 50.063
- 1/2 X (23.430 + 23.460) X (-10.100 - -5.100) = 117.225
- 1/2 X (23.460 + 23.490) X (-5.100 - 0.000) = 119.723
- 1/2 X (23.490 + 23.520) X (0.000 - 5.200) = 122.226
- 1/2 X (23.520 + 23.550) X (5.200 - 10.900) = 134.150
- 1/2 X (23.550 + 23.547) X (10.900 - 12.489) = 37.419
- Total = 580.806

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

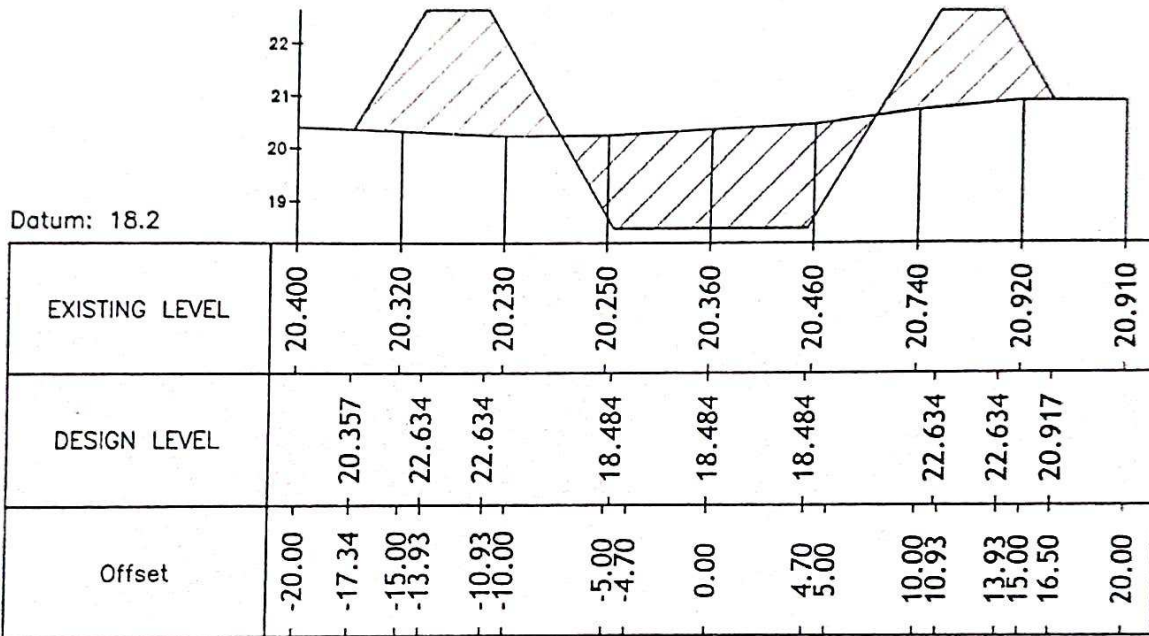
- 1/2 X (23.380 + 18.354) X (-12.239 - -4.700) = 157.316
- 1/2 X (18.354 + 18.354) X (-4.700 - 0.000) = 88.264
- 1/2 X (18.354 + 18.354) X (0.000 - 4.700) = 86.264
- 1/2 X (18.354 + 23.547) X (4.700 - 12.489) = 163.183
- Total = 493.027

Area	Initial	Final	Net
Filling	0.000	0.000	0.000
Cutting	580.806	493.027	87.779

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NANDANKANAN D/C CROSS CESTION AT RD 1930M



[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.357 + 20.320) \times (-17.34 - -15.000)$	= 47.592
$1/2 \times (20.320 + 20.230) \times (-15.000 - -10.000)$	= 101.375
$1/2 \times (20.230 + 20.241) \times (-10.000 - -7.335)$	= 53.928
$1/2 \times (20.623 + 20.740) \times (7.909 - 10.000)$	= 43.245
$1/2 \times (20.740 + 20.920) \times (10.000 - 15.000)$	= 104.150
$1/2 \times (20.920 + 20.917) \times (15.000 - 16.500)$	= 31.378
Total	= 381.668

Final Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.357 + 22.634) \times (-17.340 - -13.925)$	= 73.407
$1/2 \times (22.634 + 22.634) \times (-13.925 - -10.925)$	= 67.902
$1/2 \times (22.634 + 20.241) \times (-10.925 - -7.335)$	= 76.961
$1/2 \times (20.623 + 22.634) \times (7.909 - 10.925)$	= 65.232
$1/2 \times (22.634 + 22.634) \times (10.925 - 13.925)$	= 67.902
$1/2 \times (22.634 + 20.917) \times (13.925 - 16.500)$	= 56.072
Total	= 407.476

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.241 + 20.250) \times (-7.335 - -5.000)$	= 47.273
$1/2 \times (20.250 + 20.360) \times (-5.000 - 0.000)$	= 101.525
$1/2 \times (20.360 + 20.460) \times (0.000 - 5.000)$	= 102.050
$1/2 \times (20.460 + 20.623) \times (5.000 - 7.909)$	= 59.755
Total	= 310.603

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.241 + 18.484) \times (-7.335 - -4.700)$	= 51.020
$1/2 \times (18.484 + 18.484) \times (-4.700 - 0.000)$	= 86.875
$1/2 \times (18.484 + 18.484) \times (0.000 - 4.700)$	= 86.875
$1/2 \times (18.484 + 20.623) \times (4.700 - 7.909)$	= 62.747
Total	= 287.517

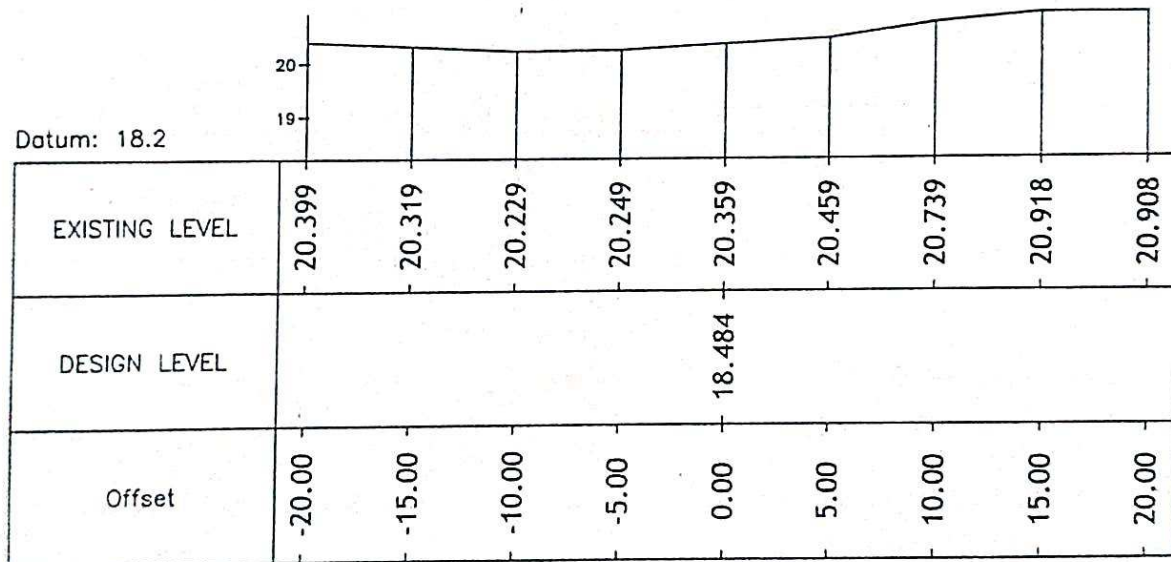
Area	Initial	Final	Net
Filling	381.668	407.476	25.808
Cutting	310.603	287.517	23.086

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NANDANKANAN D/C CROSS SECTION AT RD 1930.1M

Datum: 18.2



[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

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NANDANKANAN D/C CROSS CESTION AT RD 2100M

Datum: 17.8

EXISTING LEVEL	18.170	18.160	18.050	18.180	18.260	18.280	18.370	18.270	18.220
DESIGN LEVEL					18.386				
Offset	-20.00	-15.00	-10.00	-5.00	0.00	4.90	10.10	15.00	20.00

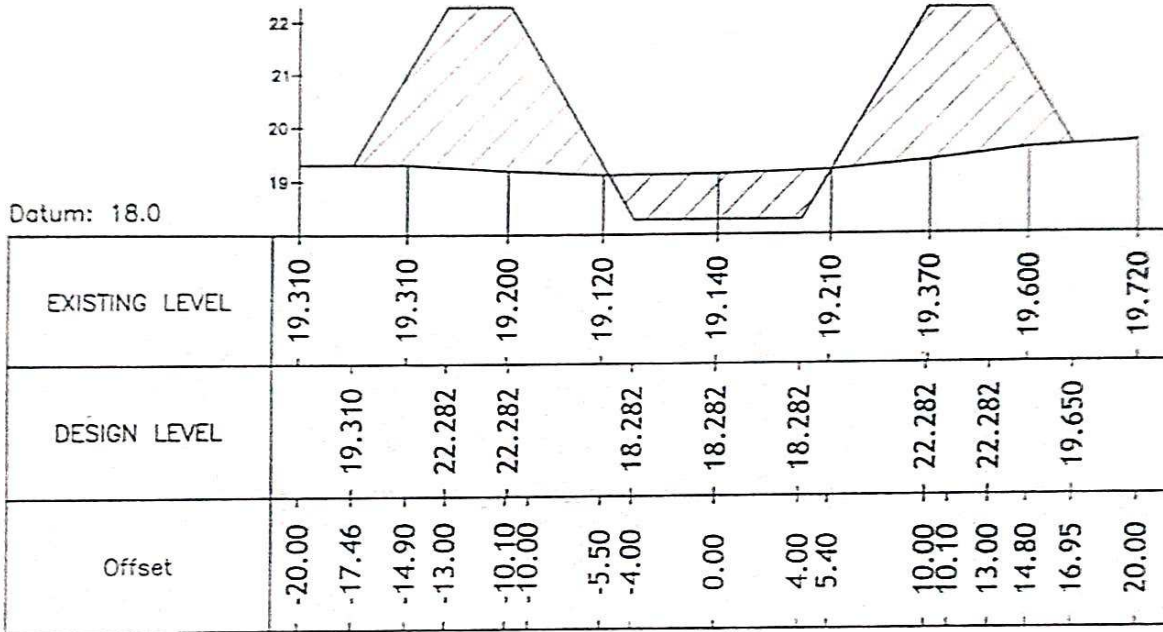
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NANDANKANAN D/C CROSS CESTION AT RD 2280M



[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (19.310 + 19.310) \times (-17.458 - -14.900)$	= 49.395
$1/2 \times (19.310 + 19.200) \times (-14.900 - -10.100)$	= 92.424
$1/2 \times (19.200 + 19.120) \times (-10.100 - -5.500)$	= 88.136
$1/2 \times (19.120 + 19.121) \times (-5.500 - -5.258)$	= 4.627
$1/2 \times (19.210 + 19.210) \times (5.392 - 5.400)$	= 0.154
$1/2 \times (19.210 + 19.370) \times (5.400 - 10.100)$	= 90.563
$1/2 \times (19.370 + 19.600) \times (10.100 - 14.800)$	= 91.580
$1/2 \times (19.600 + 19.650) \times (14.800 - 16.948)$	= 42.155
Total	= 459.134

Final Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (19.310 + 22.282) \times (-17.458 - -13.000)$	= 92.705
$1/2 \times (22.282 + 22.282) \times (-13.000 - -10.000)$	= 66.846
$1/2 \times (22.282 + 19.121) \times (-10.000 - -5.258)$	= 98.167
$1/2 \times (19.210 + 22.282) \times (5.392 - 10.000)$	= 85.588
$1/2 \times (22.282 + 22.282) \times (10.000 - 13.000)$	= 66.846
$1/2 \times (22.282 + 19.650) \times (13.000 - 15.548)$	= 82.774
Total	= 502.940

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (19.121 + 19.140) \times (-5.258 - 0.000)$	= 100.588
$1/2 \times (19.140 + 19.210) \times (0.000 - 5.392)$	= 103.392
Total	= 203.980

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

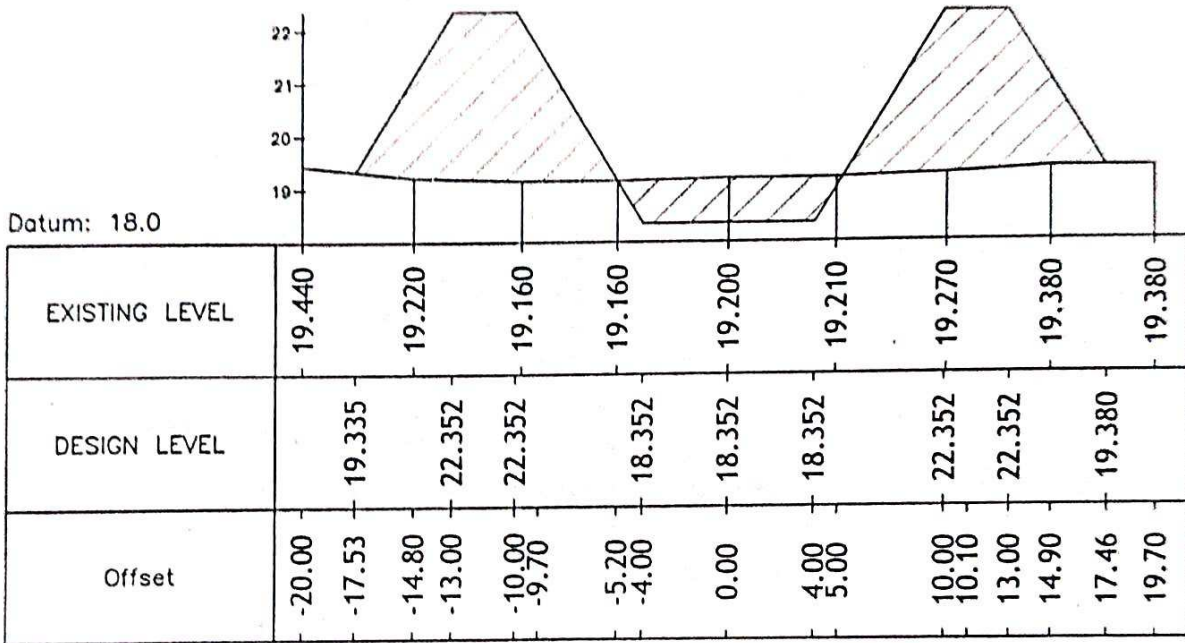
$1/2 \times (19.121 + 18.282) \times (-5.258 - -4.000)$	= 23.526
$1/2 \times (18.282 + 18.282) \times (-4.000 - 0.000)$	= 73.128
$1/2 \times (18.282 + 18.282) \times (0.000 - 4.000)$	= 73.128
$1/2 \times (18.282 + 19.210) \times (4.000 - 5.392)$	= 28.094
Total	= 195.876

Area	Initial	Final	Net
Filling	459.134	502.940	43.806
Cutting	203.980	195.876	8.104

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NANDANKANAN D/C CROSS CESTION AT RD 2350M



[Hor Scale - 1 in 250 ; Ver Scale - 1 in 100]

Initial Filling Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (19.335 + 19.220) X (-17.525 - -14.800) = 52.531
- 1/2 X (19.220 + 19.160) X (-14.800 - -9.700) = 97.869
- 1/2 X (19.160 + 19.160) X (-9.700 - -5.212) = 85.990
- 1/2 X (19.213 + 19.270) X (5.292 - 10.100) = 92.513
- 1/2 X (19.270 + 19.380) X (10.100 - 14.900) = 92.760
- 1/2 X (19.380 + 19.380) X (14.900 - 17.458) = 49.574
- Total = 471.237

Final Filling Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (19.335 + 22.352) X (-17.525 - -13.000) = 94.317
- 1/2 X (22.352 + 22.352) X (-13.000 - -10.000) = 67.056
- 1/2 X (22.352 + 19.160) X (-10.000 - -5.212) = 99.380
- 1/2 X (19.213 + 22.352) X (5.292 - 10.000) = 87.844
- 1/2 X (22.352 + 22.352) X (10.000 - 13.000) = 67.056
- 1/2 X (22.352 + 19.380) X (13.000 - 17.458) = 93.021
- Total = 518.674

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (19.160 + 19.160) X (-5.212 - -5.200) = 0.230
- 1/2 X (19.160 + 19.200) X (-5.200 - 0.000) = 99.736
- 1/2 X (19.200 + 19.210) X (0.000 - 5.000) = 96.025
- 1/2 X (19.210 + 19.213) X (5.000 - 5.292) = 5.610
- Total = 201.601

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (19.160 + 18.352) X (-5.212 - -4.000) = 22.732
- 1/2 X (18.352 + 18.352) X (-4.000 - 0.000) = 73.408
- 1/2 X (18.352 + 18.352) X (0.000 - 4.000) = 73.408
- 1/2 X (18.352 + 19.213) X (4.000 - 5.292) = 24.267
- Total = 193.815

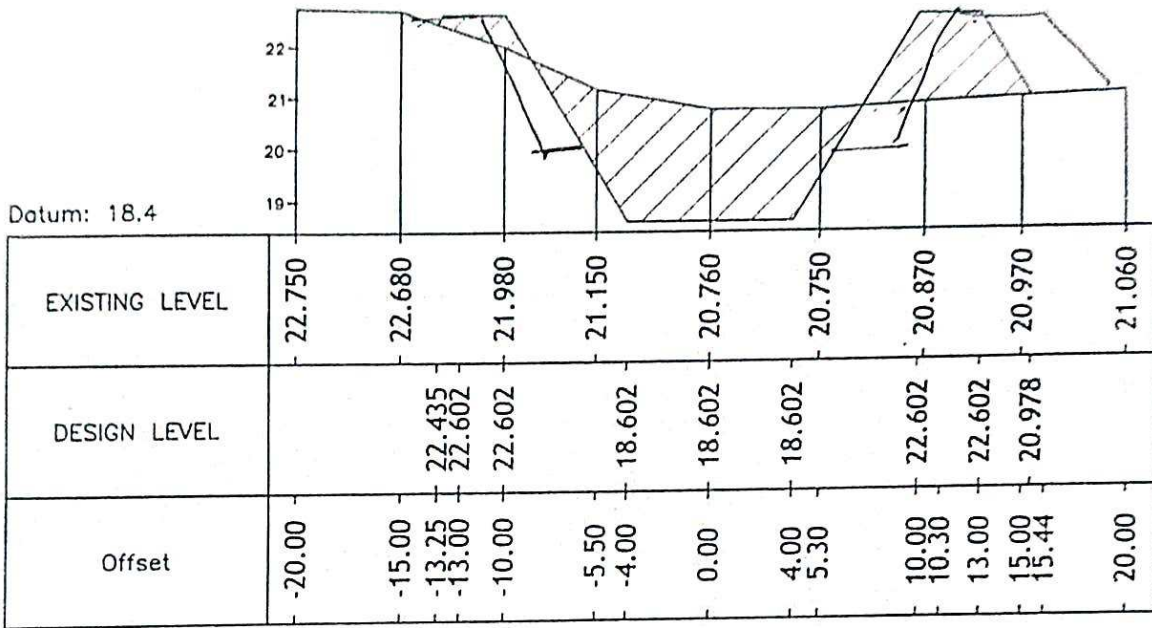
Area	Initial	Final	Net
Filling	471.237	518.674	47.437
Cutting	201.601	193.815	7.786

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 Divisional Forest Officer
 Khordha Division, Khordha

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NANDANKANAN D/C CROSS SECTION AT RD 2600M



[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Filling Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (22.435 + 21.980) \times (-13.250 - -10.000) = 72.174$
- $1/2 \times (21.980 + 21.742) \times (-10.000 - -8.710) = 28.201$
- $1/2 \times (20.798 + 20.870) \times (7.294 - 10.300) = 62.627$
- $1/2 \times (20.870 + 20.970) \times (10.300 - 15.000) = 98.324$
- $1/2 \times (20.970 + 20.978) \times (15.000 - 15.437) = 9.166$
- Total = 270.492**

Final Filling Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (22.435 + 22.602) \times (-13.250 - -13.000) = 5.630$
- $1/2 \times (22.602 + 22.602) \times (-13.000 - -10.000) = 67.806$
- $1/2 \times (22.602 + 21.742) \times (-10.000 - -8.710) = 28.602$
- $1/2 \times (20.798 + 22.602) \times (7.294 - 10.000) = 58.720$
- $1/2 \times (22.602 + 22.602) \times (10.000 - 13.000) = 67.806$
- $1/2 \times (22.602 + 20.978) \times (13.000 - 15.437) = 53.102$
- Total = 281.666**

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (21.742 + 21.150) \times (-8.710 - -5.500) = 68.842$
- $1/2 \times (21.150 + 20.760) \times (-5.500 - 0.000) = 115.253$
- $1/2 \times (20.760 + 20.750) \times (0.000 - 5.300) = 110.002$
- $1/2 \times (20.750 + 20.798) \times (5.300 - 7.294) = 41.423$
- Total = 335.520**

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

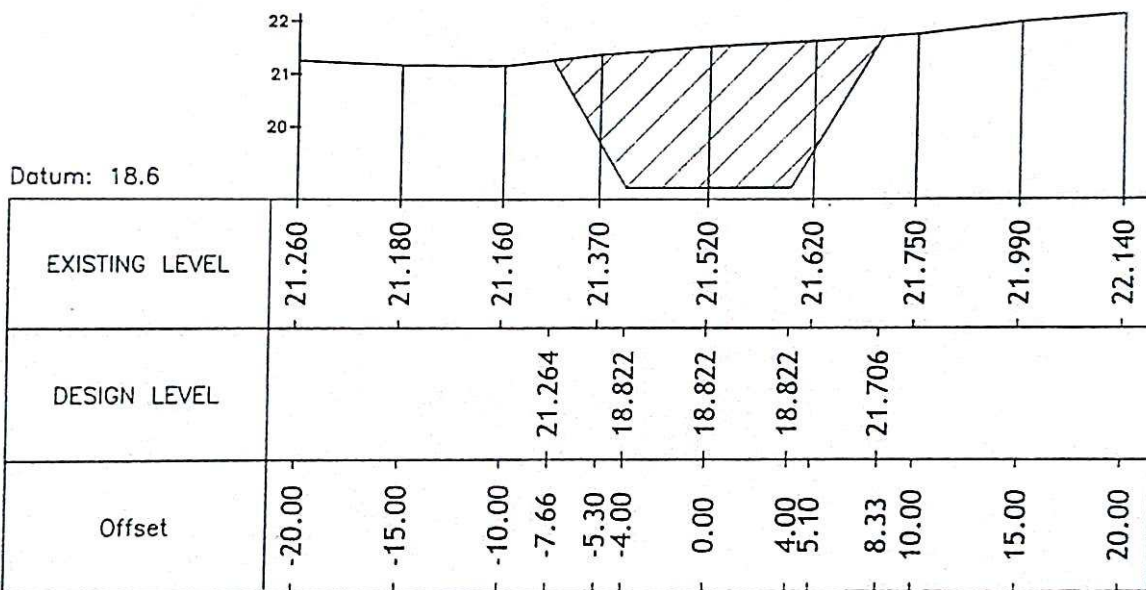
- $1/2 \times (21.742 + 18.602) \times (-8.710 - -4.000) = 95.010$
- $1/2 \times (18.602 + 18.602) \times (-4.000 - 0.000) = 74.408$
- $1/2 \times (18.602 + 18.602) \times (0.000 - 4.000) = 74.408$
- $1/2 \times (18.602 + 20.798) \times (4.000 - 7.294) = 64.892$
- Total = 308.718**

Area	Initial	Final	Net
Filling	270.492	281.666	11.174
Cutting	335.520	308.718	26.802

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NANDANKANAN D/C CROSS SECTION AT RD 2820M



[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (21.264 + 21.370) \times (-7.663 - -5.300)$ = 50.372
- $1/2 \times (21.370 + 21.520) \times (-5.300 - 0.000)$ = 113.659
- $1/2 \times (21.520 + 21.620) \times (0.000 - 5.100)$ = 110.007
- $1/2 \times (21.620 + 21.706) \times (5.100 - 8.326)$ = 69.885
- Total = 343.923

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

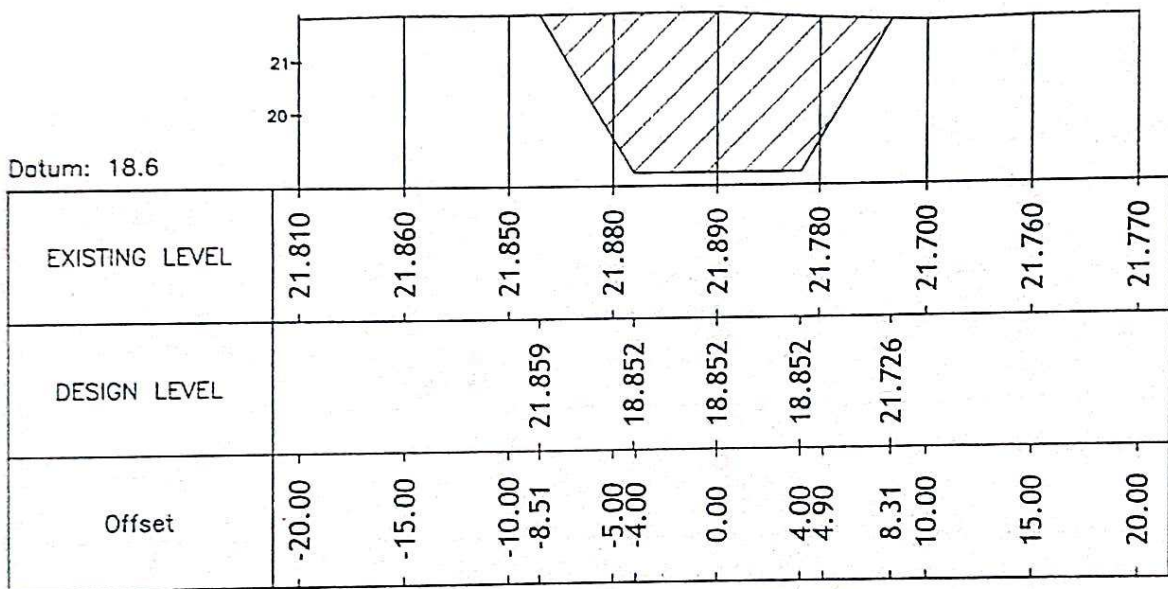
- $1/2 \times (21.264 + 18.822) \times (-7.663 - -4.000)$ = 73.418
- $1/2 \times (18.822 + 18.822) \times (-4.000 - 0.000)$ = 75.288
- $1/2 \times (18.822 + 18.822) \times (0.000 - 4.000)$ = 75.288
- $1/2 \times (18.822 + 21.706) \times (4.000 - 8.326)$ = 67.662
- Total = 311.656

Area	Initial	Final	Net
Filling	0.000	0.000	0.000
Cutting	343.923	311.656	32.267

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NANDANKANAN D/C CROSS CESTION AT RD 2850M



[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (21.859 + 21.880) \times (-8.510 - -5.000) = 76.762$
- $1/2 \times (21.860 + 21.890) \times (-5.000 - 0.000) = 109.425$
- $1/2 \times (21.890 + 21.780) \times (0.000 - 4.900) = 106.992$
- $1/2 \times (21.760 + 21.726) \times (4.900 - 8.312) = 74.221$
- Total = 367.400**

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

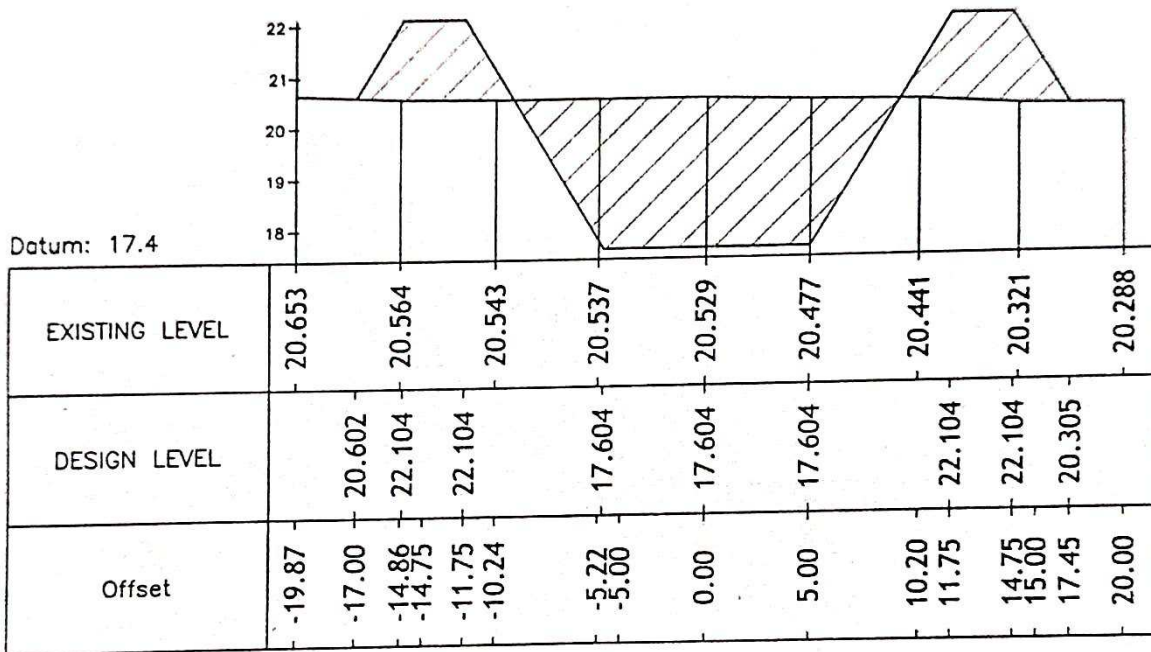
- $1/2 \times (21.859 + 18.852) \times (-8.510 - -4.000) = 91.803$
- $1/2 \times (18.852 + 18.852) \times (-4.000 - 0.000) = 75.408$
- $1/2 \times (18.852 + 18.852) \times (0.000 - 4.000) = 75.408$
- $1/2 \times (18.852 + 21.726) \times (4.000 - 8.312) = 87.486$
- Total = 330.105**

Area	Initial	Final	Net
Filling	0.000	0.000	0.000
Cutting	367.400	330.105	37.295

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NANDANKANAN D/C CROSS SECTION AT RD 1050M



[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.602 + 20.564) \times (-17.003 - -14.855)$	= 44.212
$1/2 \times (20.564 + 20.543) \times (-14.855 - -10.238)$	= 94.896
$1/2 \times (20.543 + 20.542) \times (-10.238 - -9.407)$	= 17.071
$1/2 \times (20.447 + 20.441) \times (9.265 - 10.200)$	= 19.115
$1/2 \times (20.441 + 20.321) \times (10.200 - 15.000)$	= 97.829
$1/2 \times (20.321 + 20.305) \times (15.000 - 17.448)$	= 49.726
Total	= 322.849

Final Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.602 + 22.104) \times (-17.003 - -14.750)$	= 48.108
$1/2 \times (22.104 + 22.104) \times (-14.750 - -11.750)$	= 68.312
$1/2 \times (22.104 + 20.542) \times (-11.750 - -9.407)$	= 49.860
$1/2 \times (20.447 + 22.104) \times (9.265 - 11.750)$	= 52.870
$1/2 \times (22.104 + 22.104) \times (11.750 - 14.750)$	= 66.312
$1/2 \times (22.104 + 20.305) \times (14.750 - 17.448)$	= 57.210
Total	= 340.772

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.542 + 20.537) \times (-9.407 - -5.220)$	= 85.999
$1/2 \times (20.537 + 20.529) \times (-5.220 - 0.000)$	= 107.182
$1/2 \times (20.529 + 20.477) \times (0.000 - 5.000)$	= 102.515
$1/2 \times (20.477 + 20.447) \times (5.000 - 9.265)$	= 87.270
Total	= 382.966

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.542 + 17.604) \times (-9.407 - -5.000)$	= 84.055
$1/2 \times (17.604 + 17.604) \times (-5.000 - 0.000)$	= 88.020
$1/2 \times (17.604 + 17.604) \times (0.000 - 5.000)$	= 88.020
$1/2 \times (17.604 + 20.447) \times (5.000 - 9.265)$	= 81.144
Total	= 341.239

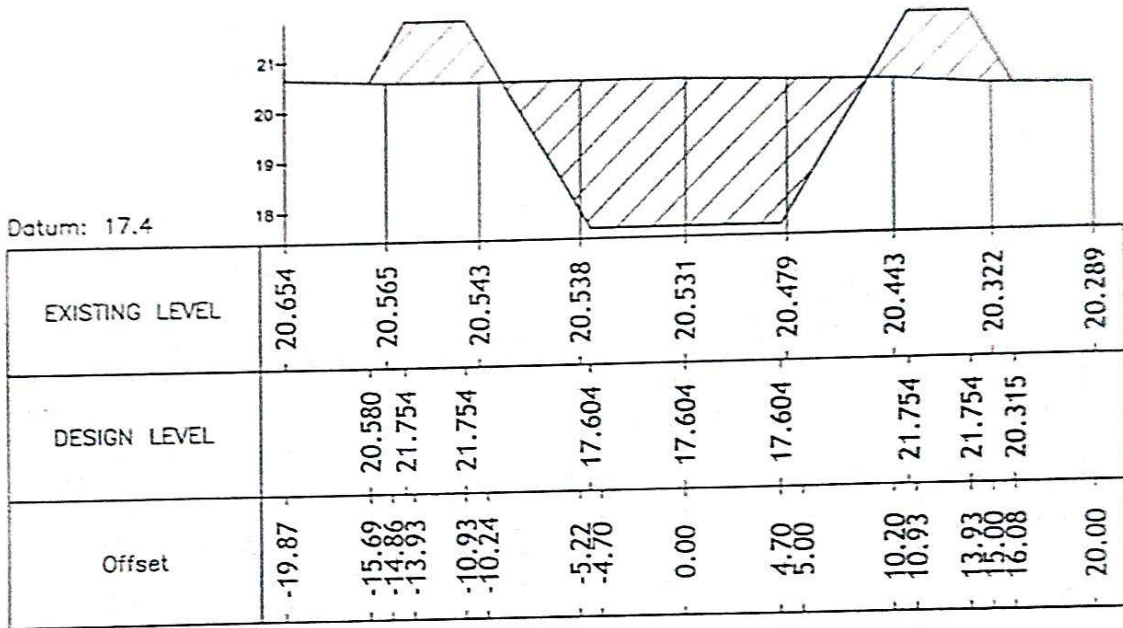
Area	Initial	Final	Net
Filling	322.849	340.772	17.923
Cutting	382.966	341.239	41.727

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NANDANKANAN D/C CROSS SECTION AT RD 1050.1M



[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.580 + 20.565) \times (-15.688 - -14.855)$	= 17.086
$1/2 \times (20.565 + 20.543) \times (-14.855 - -10.238)$	= 94.898
$1/2 \times (20.543 + 20.542) \times (-10.238 - -9.107)$	= 23.234
$1/2 \times (20.452 + 20.443) \times (8.971 - 10.200)$	= 25.130
$1/2 \times (20.443 + 20.322) \times (10.200 - 15.000)$	= 97.836
$1/2 \times (20.322 + 20.315) \times (15.000 - 15.063)$	= 22.005
Total	= 280.199

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.542 + 20.538) \times (-3.107 - -5.220)$	= 79.839
$1/2 \times (20.538 + 20.531) \times (-5.220 - 0.000)$	= 107.190
$1/2 \times (20.531 + 20.479) \times (0.000 - 5.000)$	= 102.525
$1/2 \times (20.479 + 20.452) \times (5.000 - 8.971)$	= 81.269
Total	= 370.823

Final Filling Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (20.580 + 21.754) \times (-15.688 - -13.925)$	= 37.275
$1/2 \times (21.754 + 21.754) \times (-13.925 - -10.925)$	= 85.282
$1/2 \times (21.754 + 20.542) \times (-10.925 - -9.107)$	= 38.447
$1/2 \times (20.452 + 21.754) \times (8.971 - 10.925)$	= 41.235
$1/2 \times (21.754 + 21.754) \times (10.925 - 13.925)$	= 85.282
$1/2 \times (21.754 + 20.315) \times (13.925 - 16.063)$	= 65.282
Total	= 292.873

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

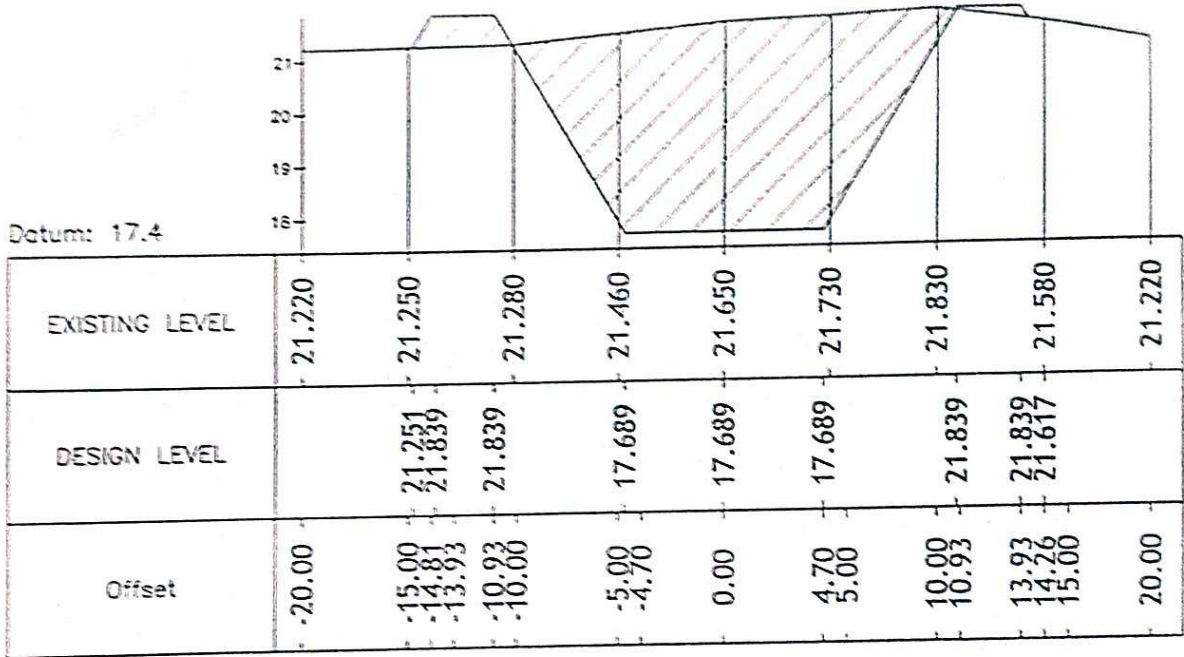
$1/2 \times (20.542 + 17.604) \times (-5.107 - -4.700)$	= 84.055
$1/2 \times (17.604 + 17.604) \times (-4.700 - 0.000)$	= 82.739
$1/2 \times (17.604 + 17.604) \times (0.000 - 4.700)$	= 82.739
$1/2 \times (17.604 + 20.452) \times (4.700 - 8.971)$	= 81.269
Total	= 330.802

Area	Initial	Final	Net
Filling	280.199	292.873	12.674
Cutting	370.823	330.802	40.021

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NANDANKANAN D/C CROSS SECTION AT RD 1135M



Datum: 17.4

[Hor Scale - 1 in 250 ; Ver Scale - 1 in 100]

Initial Filling Area (EXISTING LEVEL OR DESIGN LEVEL)

$$\begin{aligned} & \frac{1}{2} \times (21.220 + 21.250) \times (-14.806 - -10.000) = 120.571 \\ & \frac{1}{2} \times (21.250 + 21.280) \times (12.544 - 14.257) = 13.924 \end{aligned}$$

$$\begin{aligned} & \frac{1}{2} \times (21.251 + 21.839) \times (-14.806 - -13.925) = 18.991 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (-13.925 - -10.000) = 85.517 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (-10.000 - -10.000) = 15.088 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (10.000 - 10.000) = 1.580 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (10.000 - 13.925) = 85.517 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (13.925 - 14.257) = 7.214 \\ & \text{Total} = 174.355 \end{aligned}$$

Initial Cutting Area (EXISTING LEVEL OR DESIGN LEVEL)

$$\begin{aligned} & \frac{1}{2} \times (21.279 + 17.689) \times (-10.088 - -4.700) = 14.330 \\ & \frac{1}{2} \times (17.689 + 17.689) \times (-4.700 - 0.000) = 126.850 \\ & \frac{1}{2} \times (17.689 + 17.689) \times (-3.000 - 0.000) = 127.775 \\ & \frac{1}{2} \times (17.689 + 17.689) \times (2.000 - 5.000) = 128.450 \\ & \frac{1}{2} \times (17.689 + 17.689) \times (5.000 - 10.000) = 128.900 \\ & \frac{1}{2} \times (17.689 + 17.689) \times (12.000 - 12.442) = 15.494 \\ & \text{Total} = 452.299 \end{aligned}$$

Final Filling Area (EXISTING LEVEL OR DESIGN LEVEL)

$$\begin{aligned} & \frac{1}{2} \times (21.251 + 21.839) \times (-14.806 - -13.925) = 18.991 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (-13.925 - -10.000) = 85.517 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (-10.000 - -10.000) = 15.088 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (10.000 - 10.000) = 1.580 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (10.000 - 13.925) = 85.517 \\ & \frac{1}{2} \times (21.839 + 21.839) \times (13.925 - 14.257) = 7.214 \\ & \text{Total} = 176.897 \end{aligned}$$

Final Cutting Area (EXISTING LEVEL OR DESIGN LEVEL)

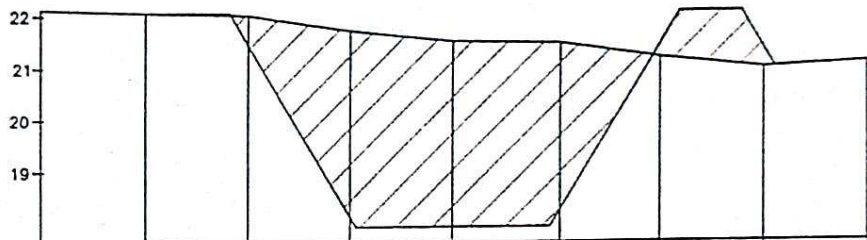
$$\begin{aligned} & \frac{1}{2} \times (21.279 + 17.689) \times (-10.088 - -4.700) = 104.941 \\ & \frac{1}{2} \times (17.689 + 17.689) \times (-4.700 - 0.000) = 83.138 \\ & \frac{1}{2} \times (17.689 + 17.689) \times (2.000 - 4.700) = 83.138 \\ & \frac{1}{2} \times (17.689 + 21.789) \times (4.700 - 10.548) = 121.332 \\ & \text{Total} = 392.549 \end{aligned}$$

Area	Initial	Final	Net
Filling	174.355	176.897	2.542
Cutting	452.299	392.549	59.750

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NANDANKANAN D/C CROSS CESTION AT RD 1350M



Datum: 17.6

EXISTING LEVEL	22.120	22.060	22.010	21.710	21.500	21.460	21.180	20.970	21.070
DESIGN LEVEL		22.049	22.054	17.904	17.904	17.904	22.054	22.054	20.981
Offset	-20.00	-15.00	-13.93	-10.93	-5.00	0.00	4.70	10.00	13.93
		-13.93	-10.00	-4.70		5.20	10.93	15.00	15.54
									20.00

[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Filing Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (22.049 + 22.018) \times (-13.932 - -10.872) = 67.423$
- $1/2 \times (21.201 + 21.180) \times (9.646 - 10.000) = 7.501$
- $1/2 \times (21.180 + 20.970) \times (10.000 - 15.000) = 105.375$
- $1/2 \times (20.970 + 20.981) \times (15.000 - 15.535) = 11.222$

Total

= 191.521

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (22.018 + 22.010) \times (-10.872 - -10.000) = 19.196$
- $1/2 \times (22.010 + 21.710) \times (-10.000 - -5.000) = 109.300$
- $1/2 \times (21.710 + 21.500) \times (-5.000 - 0.000) = 108.025$
- $1/2 \times (21.500 + 21.460) \times (0.000 - 5.200) = 111.696$
- $1/2 \times (21.460 + 21.201) \times (5.200 - 9.646) = 94.835$

Total

= 443.052

Final Filing Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (22.049 + 22.054) \times (-13.932 - -13.925) = 0.154$
- $1/2 \times (22.054 + 22.054) \times (-13.925 - -10.925) = 66.162$
- $1/2 \times (22.054 + 22.018) \times (-10.925 - -10.872) = 1.168$
- $1/2 \times (21.201 + 22.054) \times (9.646 - 10.925) = 27.662$
- $1/2 \times (22.054 + 22.054) \times (10.925 - 13.925) = 66.162$
- $1/2 \times (22.054 + 20.981) \times (13.925 - 15.535) = 34.643$

Total

= 195.951

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- $1/2 \times (22.018 + 17.904) \times (-10.872 - -4.700) = 123.199$
- $1/2 \times (17.904 + 17.904) \times (-4.700 - 0.000) = 84.149$
- $1/2 \times (17.904 + 17.904) \times (0.000 - 4.700) = 84.149$
- $1/2 \times (17.904 + 21.201) \times (4.700 - 9.646) = 96.707$

Total

= 388.204

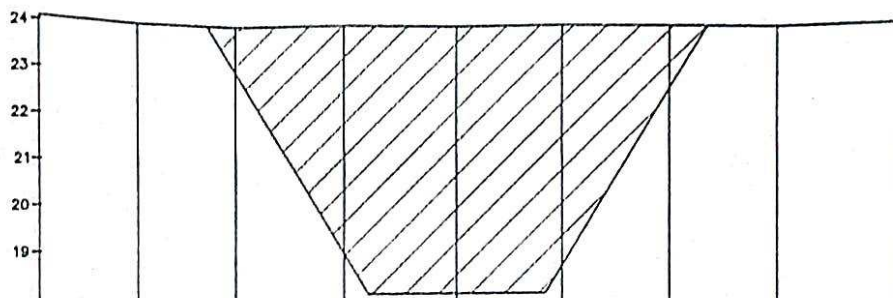
Area	Initial	Final	Net
Filing	191.521	195.951	4.430
Cutting	443.052	388.204	54.848

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NANDANKANAN D/C CROSS SECTION AT RD 1470M



Datum: 17.8

EXISTING LEVEL	24.080	23.860	23.740	23.770	23.720	23.740	23.690	23.640	23.710
DESIGN LEVEL			23.775	18.024	18.024	18.024	23.672		
Offset	-22.20	-17.00	-13.33 -11.80	-6.00 -4.70	0.00	4.70 5.60	11.20 13.17	16.80	23.20

[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (23.775 + 23.740) \times (-13.327 - -11.800)$	= 36.278
$1/2 \times (23.740 + 23.770) \times (-11.800 - -6.000)$	= 137.770
$1/2 \times (23.770 + 23.720) \times (-6.000 - 0.000)$	= 142.470
$1/2 \times (23.720 + 23.740) \times (0.000 - 5.600)$	= 132.868
$1/2 \times (23.740 + 23.690) \times (5.600 - 11.200)$	= 132.804
$1/2 \times (23.690 + 23.672) \times (11.200 - 13.173)$	= 46.723
Total	= 628.942

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

$1/2 \times (23.775 + 18.024) \times (-13.327 - -4.700)$	= 180.300
$1/2 \times (18.024 + 18.024) \times (-4.700 - 0.000)$	= 84.713
$1/2 \times (18.024 + 18.024) \times (0.000 - 4.700)$	= 84.713
$1/2 \times (18.024 + 23.672) \times (4.700 - 13.175)$	= 176.645
Total	= 526.371

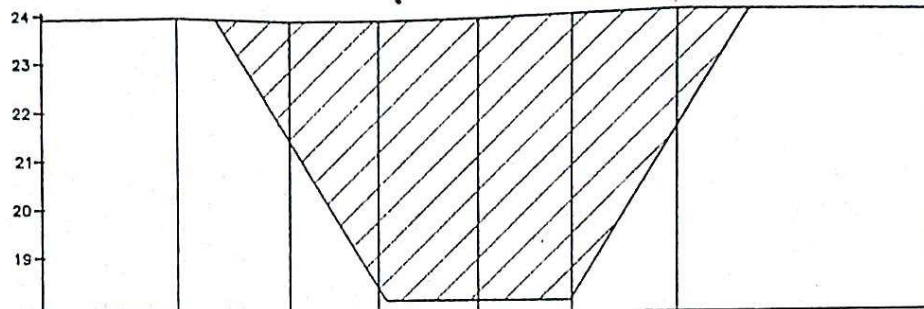
Area	Initial	Final	Net
Filling	0.000	0.000	0.000
Cutting	628.942	526.371	102.571

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 Khordha Division, Khordha

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NANDANKANAN D/C CROSS CESTION AT RD 1500M



Datum: 17.8

EXISTING LEVEL	23.920	23.960	23.860	23.860	23.910	24.000	24.080	24.000				
DESIGN LEVEL		23.926		18.054	18.054	18.054		24.057				
Offset	-22.40	-15.50	-13.51	-9.70	-5.10	-4.70	0.00	4.70	4.80	10.10	13.71	22.90

[Hor Scale - 1 in 250 : Ver Scale - 1 in 100]

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (23.926 + 23.860) X (-13.508 - -9.700) = 90.985
- 1/2 X (23.860 + 23.860) X (-9.700 - -5.100) = 109.756
- 1/2 X (23.860 + 23.910) X (-5.100 - 0.000) = 121.814
- 1/2 X (23.910 + 24.000) X (0.000 - 4.800) = 114.984
- 1/2 X (24.000 + 24.080) X (4.800 - 10.100) = 127.412
- 1/2 X (24.080 + 24.057) X (10.100 - 13.705) = 86.767
- Total = 651.718

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (23.926 + 18.054) X (-13.508 - -4.700) = 184.880
- 1/2 X (18.054 + 18.054) X (-4.700 - 0.000) = 84.854
- 1/2 X (18.054 + 18.054) X (0.000 - 4.700) = 84.854
- 1/2 X (18.054 + 24.057) X (4.700 - 13.705) = 189.608
- Total = 544.193

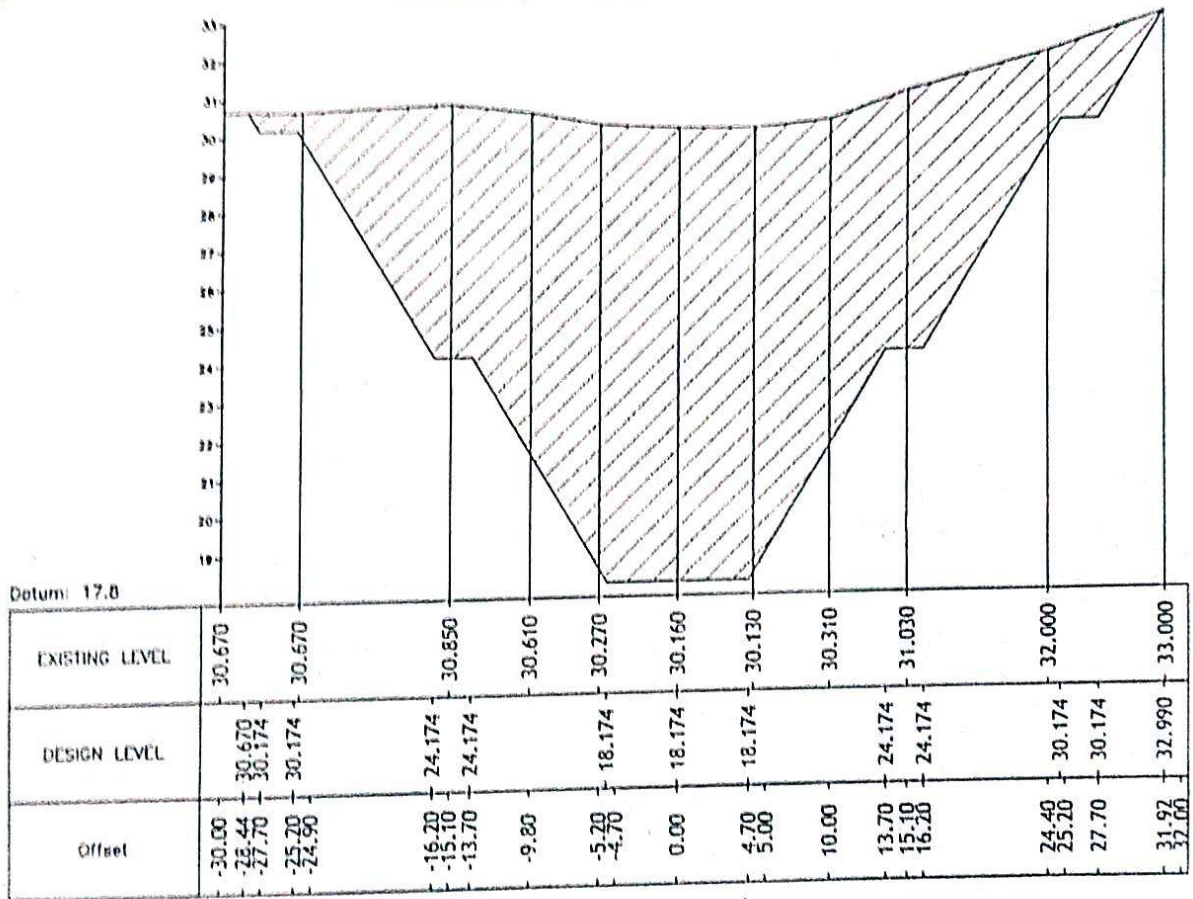
Area	Initial	Final	Net
Filling	0.000	0.000	0.000
Cutting	651.718	544.193	107.525

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 Khordha Division, Khordha

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NANDANKANAN D/C CROSS SECTION AT RD 1620M



Datum: 17.8

(Plan Scale = 1 in 250 ; Vert Scale = 1 in 100)

Initial Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (30.670 + 30.670) X (-20.444 - -24.900) = 108.694
- 1/2 X (30.670 + 30.850) X (-24.900 - -15.100) = 301.448
- 1/2 X (30.850 + 30.610) X (-15.100 - -9.800) = 162.869
- 1/2 X (30.610 + 30.270) X (-9.800 - -5.200) = 140.024
- 1/2 X (30.270 + 30.160) X (-5.200 - 0.000) = 157.118
- 1/2 X (30.160 + 30.130) X (0.000 - 5.000) = 150.725
- 1/2 X (30.130 + 30.310) X (5.000 - 10.000) = 151.100
- 1/2 X (30.310 + 31.030) X (10.000 - 15.100) = 156.417
- 1/2 X (31.030 + 32.000) X (15.100 - 24.400) = 293.090
- 1/2 X (32.000 + 32.990) X (24.400 - 31.923) = 244.460

Total

= 1865.945

Final Cutting Area (EXISTING LEVEL and DESIGN LEVEL)

- 1/2 X (30.670 + 30.174) X (-28.444 - -27.700) = 22.634
- 1/2 X (30.174 + 30.174) X (-27.700 - -25.200) = 75.435
- 1/2 X (30.174 + 24.174) X (-25.200 - -16.200) = 244.566
- 1/2 X (24.174 + 24.174) X (-16.200 - -13.700) = 60.435
- 1/2 X (24.174 + 18.174) X (-13.700 - -4.700) = 190.566
- 1/2 X (18.174 + 18.174) X (-4.700 - 0.000) = 85.418
- 1/2 X (18.174 + 10.174) X (0.000 - 4.700) = 85.418
- 1/2 X (18.174 + 24.174) X (4.700 - 13.700) = 190.566
- 1/2 X (24.174 + 24.174) X (13.700 - 16.200) = 60.435
- 1/2 X (24.174 + 30.174) X (16.200 - 25.200) = 244.566
- 1/2 X (30.174 + 30.174) X (25.200 - 27.700) = 75.435
- 1/2 X (30.174 + 32.990) X (27.700 - 31.923) = 133.371

Total

= 1468.845

Area	Initial	Final	Net
Filling	0.000	0.000	0.000
Cutting	1865.945	1468.845	397.100

J. Mohi
 SR. Env. Scientist
 Regional Office
 S.P.C. Board
 Bhubaneswar (Odisha)

P. Sarma
 Divisional Forest Officer
 Khordha Division, Khordha



Office of Raman Yadav <officeoframanyadav@gmail.com>

Service of Affidavit filed by R3 in the OA No. 109/2024/EZ titled Haripriya Patel Vs State of Odisha & Ors.

1 message

Office of Raman Yadav <officeoframanyadav@gmail.com>

Thu, Jan 9, 2025 at 3:02 PM

To: Haripriya Patel <haripriyapatel@gmail.com>, ddnandankanan@gmail.com

Cc: dfo.khordha@odisha.gov.in

Dear All,

This is to inform you that the Affidavit on behalf of Respondent No. 3 in the captioned matter has been filed before the National Green Tribunal, Kolkata.

A copy of the same is being attached herewith for your reference.

This email serves as an advance service.

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Advocate, Supreme Court of India
C-167, LGF Defence Colony, New Delhi -110024
Mobile: +91 88004 57781



Affidavit filed by Divisional Forest Officer R-3.pdf