

**Annex 2: Format for preparing Brief Document**State / Union Territory: GoaName and address of person(s) compiling this information CSIR-NIO & GSBB**Section 1: Identification, Location and Jurisdiction**

- 1.1 Name of the Wetland (Alternative names, including in local language should be given in parenthesis after official name)

Nanda Lake (नंदा तळे)

- 1.2 Name of the Village(s) , Municipal area(s)

Quepem municipality Village Quepem, Quepem Taluka

- 1.3 Name of the District(s) in which wetland complex is located

South Goa

- 1.4 Geographical coordinates (Latitude and Longitude, to degree, minutes and second)

Latitude: From 15°13'56.55" N to 15°14'28.39" NLongitude: From 74°06'12.02" N to 74°06'39.77"E

- 1.5 Name of the Department/Agency which has jurisdiction over the wetland/wetlands complex

Quepem Village Panchayat**Section 2: Site Characteristics**

- 2.1 Area of wetland/wetlands category(ha): 42.01 ha

- 2.2 Wetland type (Please tick appropriate categories and sub-categories)

Category	Subcategory
✓ Natural(Inland)	<input type="checkbox"/> Permanent lakes <input checked="" type="checkbox"/> Seasonal/intermittent lakes <input type="checkbox"/> Permanent streams/creeks <input type="checkbox"/> Seasonal/ intermittent streams/creeks <input type="checkbox"/> Oxbow <input type="checkbox"/> River floodplain <input type="checkbox"/> Permanent freshwater marshes <input type="checkbox"/> Seasonal/ intermittent freshwater marshes <input type="checkbox"/> Shrub-dominated wetlands <input type="checkbox"/> Tree-dominated wetlands <input type="checkbox"/> Geothermal wetlands <input type="checkbox"/> Karst and other subterranean hydrological systems

<input type="checkbox"/> Natural(Coastal)	<input type="checkbox"/> Coastal lagoon <input type="checkbox"/> Estuary <input type="checkbox"/> Intertidal mud, sand or salt flats <input type="checkbox"/> Mangroves <input type="checkbox"/> Coral reefs
<input type="checkbox"/> Human-made	<input type="checkbox"/> Aquaculture pond <input type="checkbox"/> Tank <input type="checkbox"/> Saltpan <input type="checkbox"/> Dam /Reservoir

2.3 Depth (m)Maximum 1-2m

2.4 Elevation(m above mean sea level)- 7m

2.5 Water regimes

a) Main source of water (tick all applicable)

☒ Rainfall    ☐ Groundwater    ☒ Catchment runoff    ☐ Direct / indirect inflow from river

☐ Others, please specify\_\_\_\_\_

b) Water permanence

☒ Mostly permanent    ☐ Mostly intermittent

c) Destination of water from wetland

☒ Feeds groundwater    ☒ To downstream catchment    ☐ To river    ☐ To sea

d) Water pH

☐ Acid(<5.5)    ☒ Circum neutral (5.5–7.4)    ☐ Alkaline (>7.4)

☐ Not known

e) Water salinity

☒ Fresh (<0.5g/l)    ☐ Brackish (0.5 –30g/l)    ☐ Euhaline (30- 40g/l)

☐ Hypersaline (>40g/l)    ☐ Not known

f) Nutrient in water

☐ Eutrophic    ☒ Mesotrophic    ☐ Oligotrophic

☐ Not known

2.6 Climatic setting

- a) Annual Rainfall(mm) 2918mm
- b) Temperature(°C ) Minimum 33°C Maximum 20°C
- c) Humidity (%) Minimum 67% Maximum 84%

2.7 Area of zone of influence (in ha) 265.09ha [Ref.paras32-34of the guidelines on wetlands]

2.8 Major land use within zone of influence (provide as approximate % of catchment area)

Forests	<u>11.22%</u>
Plantation	<u>1.51%</u>
Agriculture	<u>61.08%</u>
Settlements (Rural)	<u>0%</u>
Settlements (Urban)	<u>0%</u>
Industrial	<u>0%</u>

(Detailed LULC of influence zone and 50m buffer is given in Table-I below)

2.9 Map of wetland complex and zone of influence

(Enclosed as Annex I – V and VI with site photographs to this document)

### Section 3: Biodiversity

3.1 Notable plant species present in wetland

Grasses, *Pistia* sp., *Pandanus* sp.

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3.2 Notable animal species present in wetland

*Threskiornis melanocephalus* (Black headed ibis), *Alcedo atthis* (Common kingfisher), *Hirundo smithii* (Wire tailed swallow), *Metopidius indicus* (Bronze winged jacana), *Haliastur indus* (Brahminy kite), *Ardea intermedia* (Intermediate egret), *Vanellus indicus* (Red wattled lapwing), *Microcarbo niger* (Little cormorant), *Dendrocygna javanica* (Lesser whistling duck)

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3.3 Species of conservation significance (rare, endangered, threatened, endemic species)

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3.4 Major plant invasive alien species

*Pistia* sp.

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3.5 Major animal invasive alien species

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#### Section 4: Ecosystem services

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (upto 50 words for each category)
Source of drinking water for people living and around	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Source of water for agriculture	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Mainly for adjoining paddy field.
Fisheries	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Cultivation of aquatic food plants	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
For buffalo wallowing and use of domesticated animals	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Extensive buffalo wallowing is observed
Medicinal plants	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Pandanus</i> sp.
Is a recreational site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Buffering communities from extreme events as floods and storms	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	During monsoon, water floods into the entire basin of this lake thereby storing all the rain water preventing flooding.
Groundwater recharge	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Water remains throughout the year in one part of the entire basin thereby helping in ground water recharge. The rest of the water is percolated and helps ground water recharge
Water purification	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Natural purification of the water takes place as the water body continuously receives percolated water from the catchment
Acts as a sink for sediments	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sediments and excess nutrients settle in the water body basin
Has significant cultural and religious values	Yes <input checked="" type="checkbox"/> No	
Is a site for recreation and tourism	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Supports noteworthy plants species	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Supports noteworthy animal species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Threskiornis melanocephalus</i> (Black headed ibis)
Site of high congregation of migratory water birds	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Supports life cycle of fish or amphibians	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Mining	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Any other, please list		

### Section 5: Pre-Existing Rights and Privileges

Nature of right and privilege	Relevant for the site (please tick yes or no)	Does this negatively impact the wetland's ecological health?	Brief description (upto 50 words for each category)
Community Fishing (without any lease or permission from government department)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	
Fishing under lease from government department	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	
Harvest of plants(without any lease or permission from government department)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	
Harvest of plants under lease from government department	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	
Agriculture or horticulture within wetland	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Grazing	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	Extensive grazing by buffalo is observed within the water body during dry spell
Religious practices	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	
Withdrawal of water for domestic use	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	Local people use the water for domestic purpose.
Withdrawal of water for agriculture or fisheries	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	Mainly for paddy cultivation in adjoining fields.
Bathing or wallowing of domestic animals	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	Buffalos and cows are observed while bathing and wallowing.
Plying of boats	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	
Any other, please list here	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	

## Section 6: Present and Potential Threats

Threat	Degree	Present or Potential	Additional information, if any
Changes in water inflow and outflow	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	
Pollution	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	
Unsustainable harvest of biological resources	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	
Mining	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	
Siltation	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	
Encroachment	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	
Spread of invasive species	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	
Any other, please list	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	

## Section 7: Activities Proposed to be Prohibited (other than those listed in Rule 4 (2) of Wetland Rules and Regulated

Activity	Whether prohibited or regulated	Regulation within wetlands or zone of influence	If regulated, indicate the level of regulation (in terms of people, restricted area or any other)	Name of department / agency responsible for regulation / prohibition	Additional information, if any
Withdrawal of water / impoundment/diversion or any other hydrological intervention	Regulated	<input checked="" type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	High	Water Resource Department	Statutory approval required for any diversion and or hydrological intervention
Harvesting of resources (living / non-living)	Regulated	<input checked="" type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Mid	State Fishery Department	Only traditional activities to continue Not currently done.
Grazing	Regulated	<input checked="" type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Low	State Forest Department	

Discharge of treated sewage/ effluent / wastewater	Regulated	✓Wetland ✓Zone of influence	High	State Public Works Department	Statutory national and state legislation applicable
Construction of boat jetties, and facilities for temporary use ,as pontoon bridges	Prohibited	✓Wetland ✓Zone of influence	High	State Public Works Department	Statutory approval required for new activities within the wetland boundaries and buffer
Aquaculture, agriculture and horticulture activities within the wetland boundaries.	Regulated	✓Wetland ✓Zone of influence	Mid	Fishery, Agriculture & Horticulture Department	Ongoing Traditional activities may continue
Any other, please list 1. Disposal of solid waste / untreated sewage	Prohibited	✓Wetland ✓Zone of influence		Panchayat/ Corporation/ Municipality	Statutory national and state legislation applicable
2. Construction activities	Prohibited	✓Wetland ✓Zone of influence		Panchayat/ Corporation/ Municipality	Approval required in zone of influence
3. Extraction of soil, mud, rocks for commercial purpose	Prohibited	✓Wetland ✓Zone of influence		Panchayat/ Corporation/ Municipality	Approval required

#### Section 8: Activities Proposed to be permitted

Activity	Place a tick mark if relevant	Within wetlands or zone of influence	Additional information, if any
Traditional Agriculture/ Paddy cultivation	✓	✓Wetland ✓Zone of influence	
As playground	✓	✓Wetland ✓Zone of influence	
Traditional fishery	✓	✓Wetland ✓Zone of influence	



## Section 9: Listing of Available Scientific Resources Used

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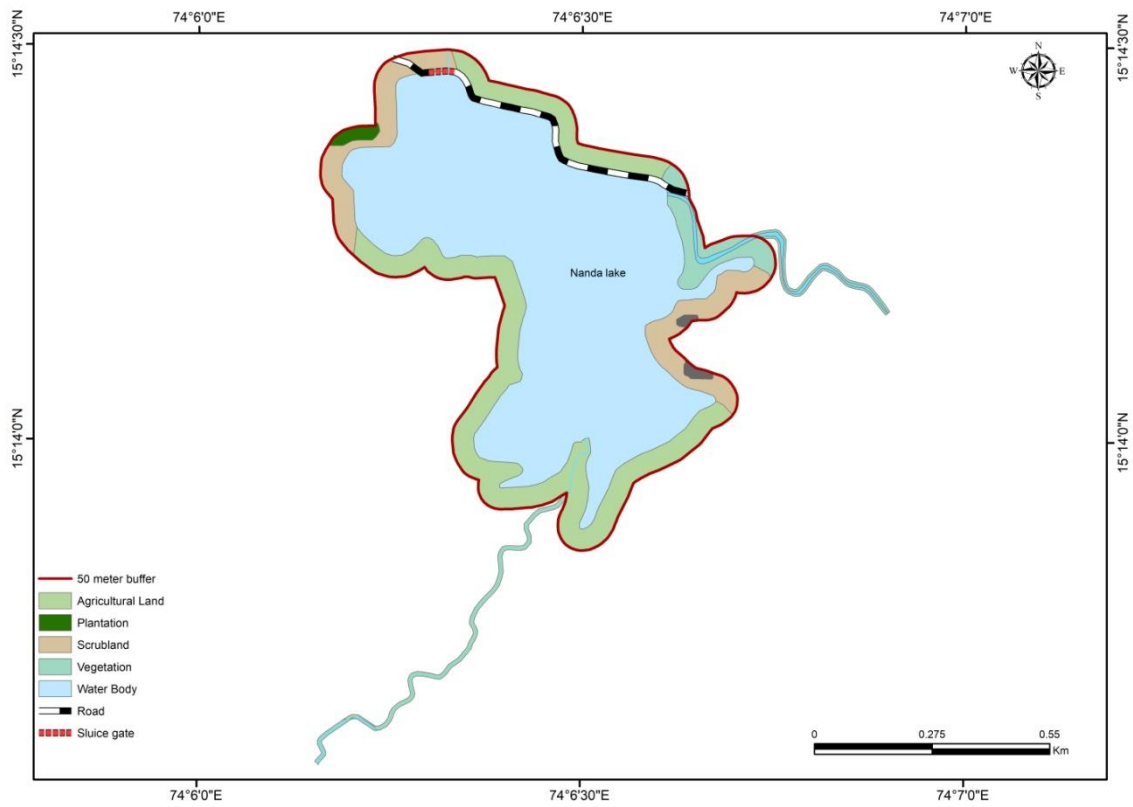
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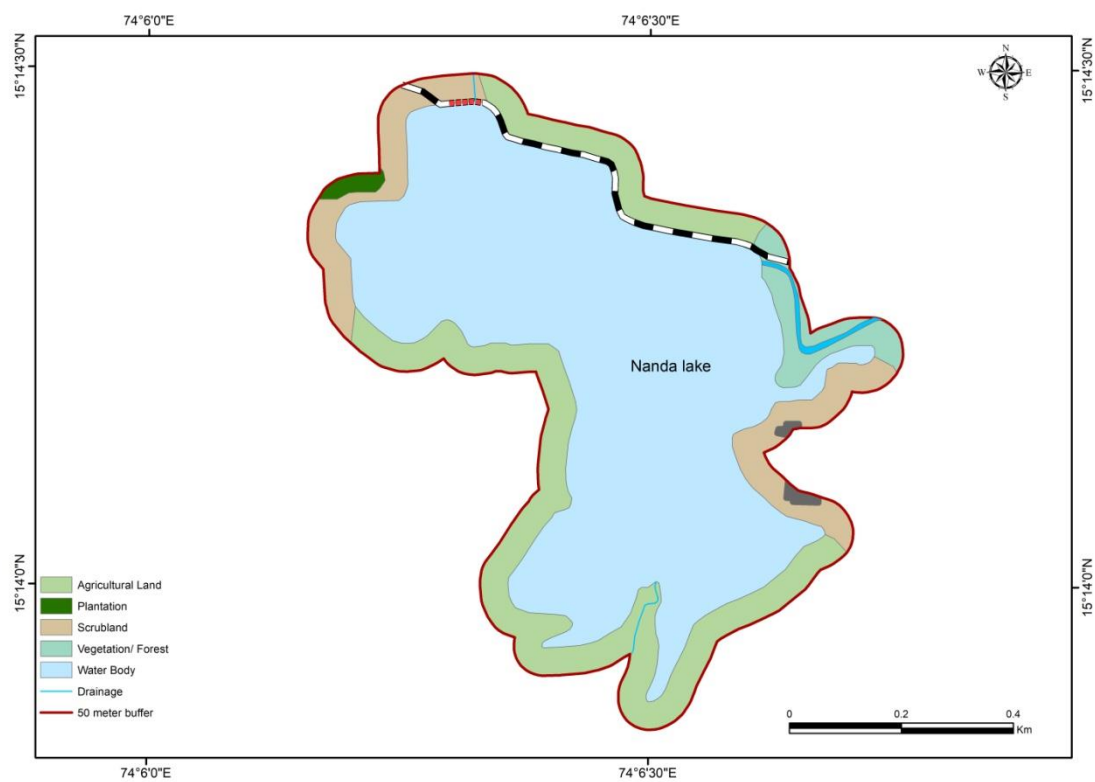
Table-I: Area table of LULC of Nanda Lake

Nanda Lake					
Sl.No:	LULC	Influence Zone		50 meter Buffer	
		Area(Hec)	Percentage Area	Area(Hec)	Percentage Area
1	Agricultural land	13.73	61.08	12.9	61.45
2	Vegetation	2.81	12.5	2.14	10.2
3	Scrubland	5.6	24.91	5.6	26.68
4	Plantation	0.34	1.51	0.35	1.67
	<b>Total Area</b>	<b>22.48</b>	<b>100</b>	<b>20.99</b>	<b>100</b>

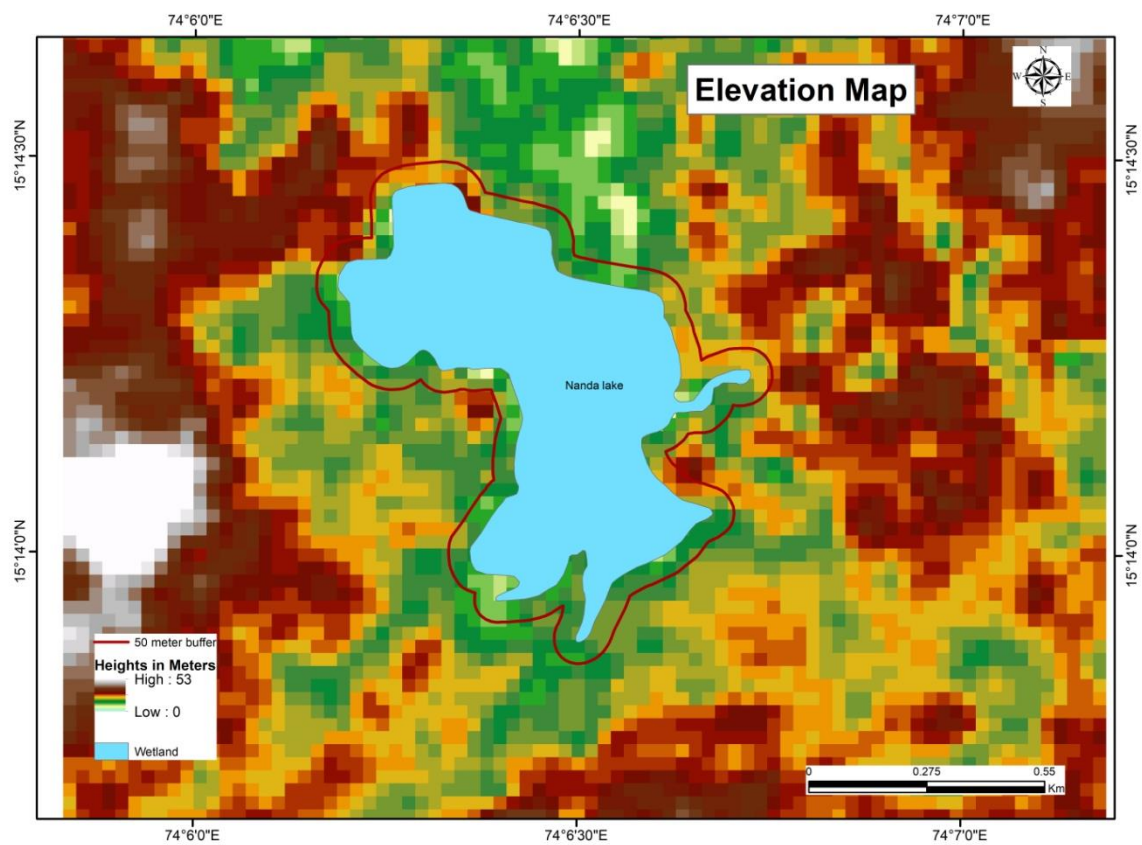
Annexure-I: LULC of the influence zone with elevation contour of Nanda Lake



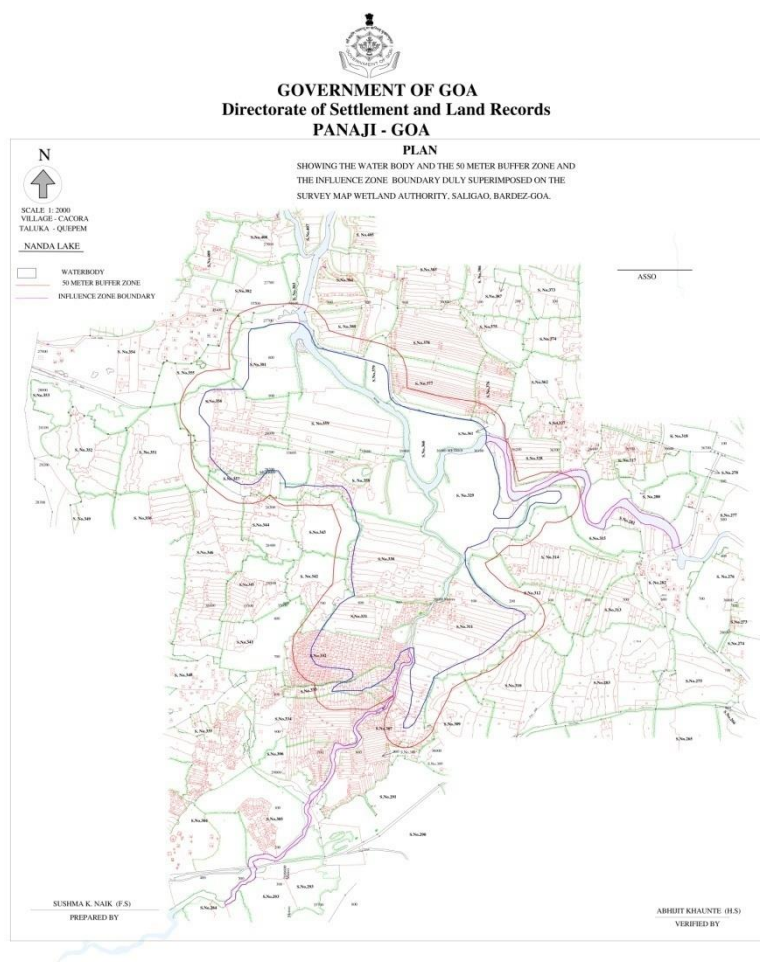
## Annexure-II: LULC of 50m buffer of Nanda Lake



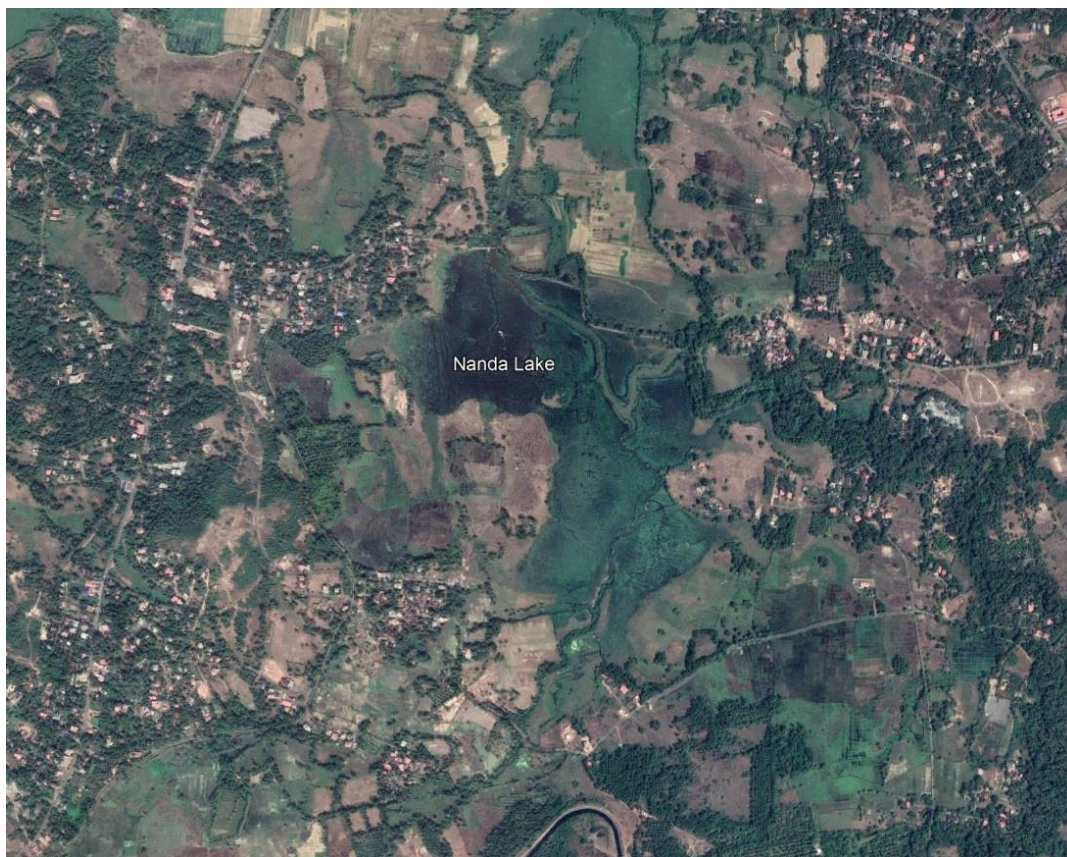
Annexure-III: Elevation (DEM) map of Nanda Lake



Annexure-IV: Survey map of Nanda Lake showing influence zone



Annexure-V: Google image of Nanda Lake





Annexure-VI: Site photographs of Nanda Lake



