

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)

Carambolim Lake, Karmale Lake (कर्मळे तळे)

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

Village Carambolim, Tiswadi Taluka

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

North Goa

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

Latitude: From 15°29'10.67"N to 15°29'43.96"N

Longitude: From 73°55'29.61"E to 73°55'47.25"E

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

Tollem savat Tenants association, Comunidade of Carambolim and Goa Forest Department

Section 2: Site Characteristics

- 2.1 Area of wetland/wetlands category(ha): 74.2 ha (741951 sq. mtrs)

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

Category	Subcategory
✓Natural(Inland)	✓Permanent lakes <input 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 flood plain <input type="checkbox"/> Permanent fresh water 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 6m

2.4 Elevation (above mean sea level) 4 m

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 ground water ☒ 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)

☐ Hyper saline(>40g/l) ☐ Not known

f) Nutrient in water

☐ Eutrophic ☒ Mesotrophic ☐ Oligotrophic

☐ Not known

2.6 Climatic setting

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

2.7 Area of zone of influence (in ha) 137.68 ha (1376841 sq. mtrs) [Ref. paras 32-34 of the guidelines on wetlands]

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

Table-I: Detailed LULC of influence zone and 50m buffer

Sl. No	LULC (Carambolim Lake)	Influence Zone		50m Buffer	
		Area in Hectares	Area in Percentage	Area in Hectares	Area in Percentage
1	Water Body	58	27	58	76
2	Agricultural Land/Paddy Field	3	1	3	4
3	Settlements (with 5m Buffer)	71	33	3	4
4	Vegetation/Forest	86	39	12	16
	Total Area	218	100	76	100

2.9 Map of wetland complex and zone of influence (Enclosed as Annexure I – V and VI with site photographs to this document)

Section 3: Biodiversity

3.1 Notable plant species present in wetland

Salvinia molesta, *Hydrilla* sp., *Chara* sp., *Eichhornia crassipes* (Water hyacinth),
Nymphaea alba (Water lily).

3.2 Notable animal species present in wetland

About 120 species of bird (migratory and local) some of these are as follows:

Phoenicopterus ruber (Flamingo), *Porphyrio porphyrio* (Purple moorhens), *Metopidius indicus* (Bronze winged jacana), *Hydrophasianus chirurgus* (pheasant-tailed jacana), *Cecropis daurica* (Red-rumped swallow), *Dendrocygna javanica* (Lesser whistling teal), *Spatula querquedula* (Garganey), *Crocodylus palustris*, *Anastomus oscitans* (Open-billed storks), *Melanochelys trijuga* (Indian pond terrapin), *Microcabo niger* (Little cormorant), *Ardea purpurea* (Purple heron), *Phalacrocorax fuscicollis* (Great Indian cormorant), *Bubulcus ibis* (Cattle egret), *Corvus splendens* (House crow), *Anhinga melanogaster* (Oriental Darter), *Prinia socialis* (Ashy prinia), *Columba livia* (Rock pigeon), *Meerops orientalis* (Green bee eater) *Neptis hylas* (Common sailor), *Danaus chrysippus* (Plain tiger), *Euploea core* (Common crow),

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

Crocodylus palustris.

3.4 Major plant invasive alien species

Salvinia molesta, *Eichhornia crassipes* (water hyacinth).

3.5 Major animal invasive alien species

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	Vegetables cultivation and paddy fields within the water body by the local people use to be carried out. Water is also used to irrigate adjoining fields.
Fisheries	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Earlier fishing was carried out in the water body.
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	Lake water is used for the buffalo bathing and wallowing by the local people.
Medicinal plants	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is a recreational site	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	According to Forest Department and wetland authority as well. Used as a bird watching site.
Buffering communities from extreme events as floods and storms	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Water flow is controlled by sluice gate during monsoon season.
Groundwater recharge	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	At certain level, water remains throughout the year.
Water purification	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Natural purification of water takes place as the water body continuously receives percolated water.
Acts as a sink for sediments	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sediment and any excess nutrients from landward side settles in the water body.
Has significant cultural and religious values	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Lake is used for Ganpati Visarjan annually.
Is a site for recreation and tourism	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	It is a spot of migratory bird and bird watching point
Supports noteworthy plants species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Chara</i> sp. and <i>Eichhornia crassipes</i> (Water hyacinth)
Supports noteworthy animal species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Phoenicopterus ruber</i> (Flamingo). <i>Porphyrio porphyrio</i> (Purple moorhens) and <i>Crocodylus palustris</i>
Site of high congregation of migratory water birds	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Site of migratory bird like Flamingos
Supports life cycle of fish or amphibians	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Pitol, Catfish, Tigrur, Kharvo, Tokia, Keri, Guppies and frogs are found in this water body
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	Not currently but was used for community fishing
Fishing under lease from government department	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input 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 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 type="checkbox"/> No <input type="checkbox"/> Not assessed	
Agriculture or horticulture within wetland	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	Paddy fields were cultivated within the water body by local community.
Grazing	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	Surrounding lake area is used for the grazing of buffalo by local people.
Religious practices	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	Ganpati Visarjan is carried out in the lake
Withdrawal of water for domestic use	<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 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	Agriculture mainly for paddy fields and vegetables
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	wallowing of buffalo is carried out by the village people.
Plying of boats	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input 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 checked="" type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input checked="" type="checkbox"/> Present <input type="checkbox"/> Potential	In 2004, retaining wall was constructed on one side of the lake.
Pollution	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	Domestic garbage and plastic is observed to be disposed directly in the lake.
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	Lake seems to have silted at the surroundings.
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 checked="" type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input checked="" type="checkbox"/> Potential	The lake is partially eutrophicated.
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 Rule4 (2) of Wetland Rules and Regulated

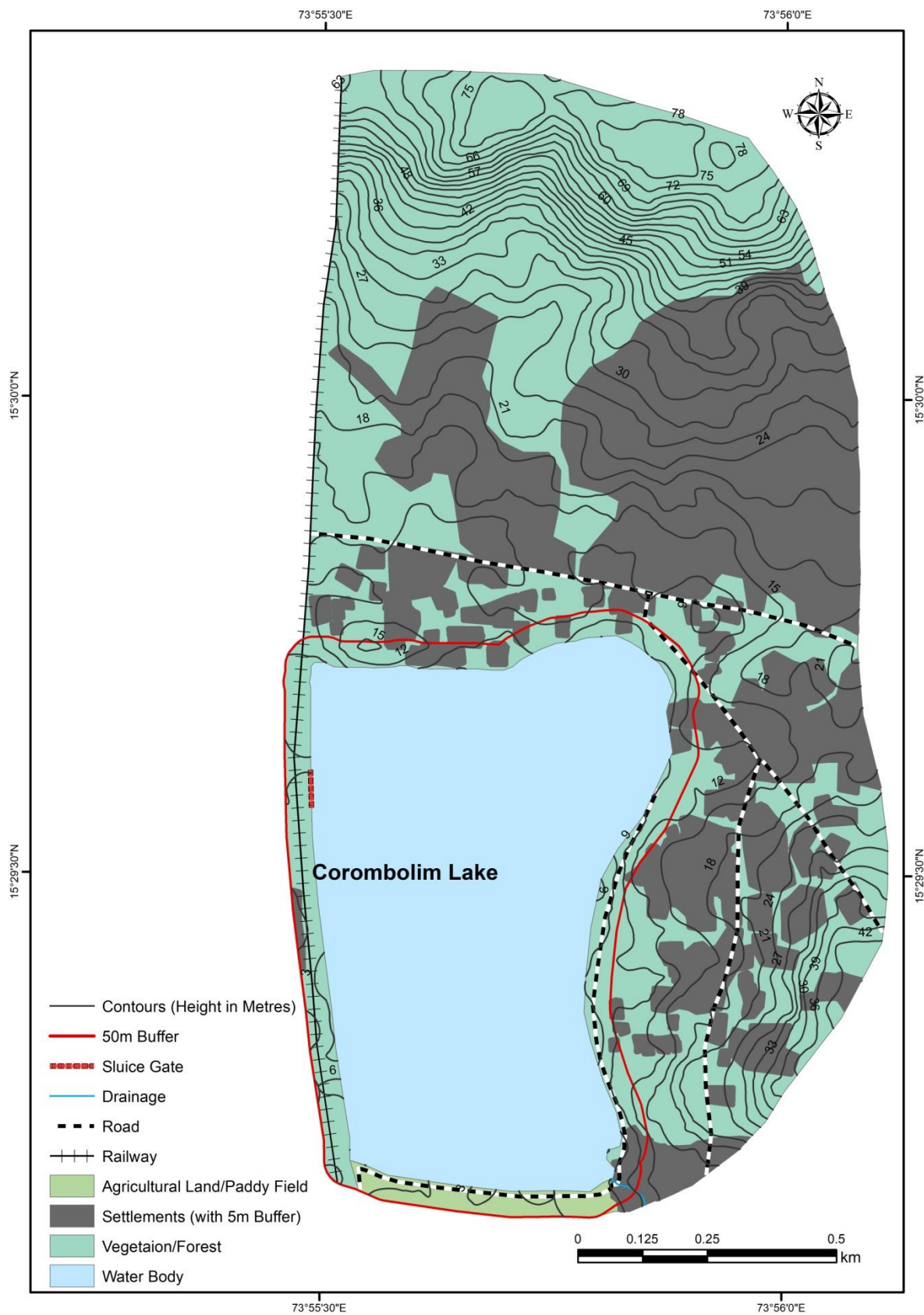
Activity	Whether prohibited or regulated	Regulation within wetlands or zone of influence	If regulated, indicate the level of regulation (in terms of people, restricted area or any other)	Name of department / agency responsible for regulation / prohibition	Additional information, if any
Withdrawal of water / impoundment/diversion or any other hydrological intervention	Regulated	✓Wetland ✓Zone of influence	High	Water Resource Department	Statutory approval required
Harvesting of resources (living / non-living)	Regulated	✓Wetland ✓Zone of influence	Mid	State Fishery Department	Only traditional activities to continue
Grazing	Regulated	✓Wetland ✓Zone of influence	Low	State Forest Department	
Discharge of treated sewage/ effluent / wastewater	Prohibited	✓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	Regulated	✓Wetland ✓Zone of influence	High	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 <input type="checkbox"/> Zone of influence	Mid	Fishery, Agriculture, Horticulture Department	Traditional activities may continue
Any other, please list 1. Disposal of solid waste/ untreated sewage	Prohibited	✓Wetland ✓Zone of influence		Municipality	Statutory national and state legislation applicable
2. Construction activity	Prohibited	✓Wetland ✓Zone of influence		Panchayat/ Corporation/ Municipality	Approval required
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

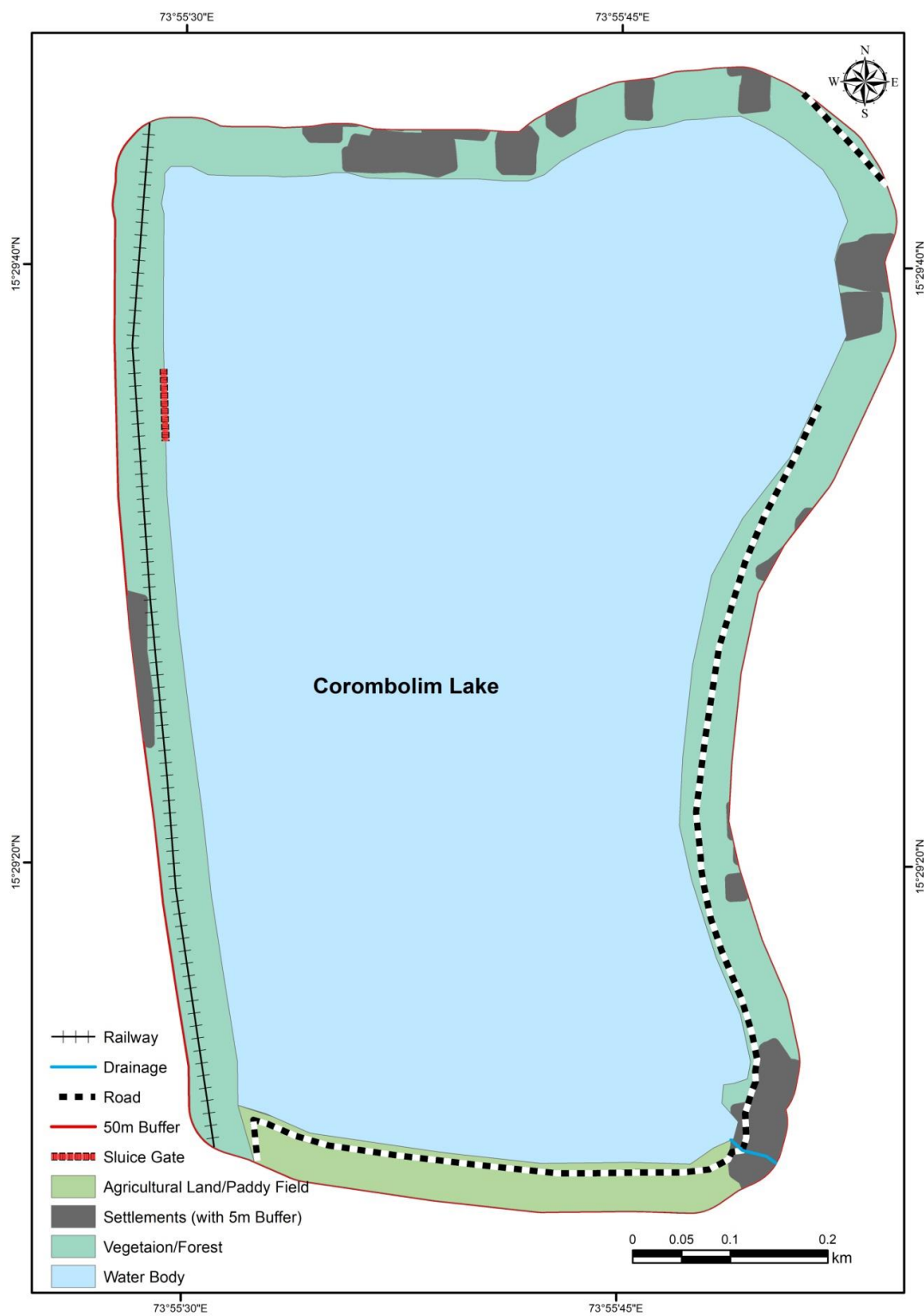
Activity	Place a tick mark if relevant	Within wetlands or zone of influence	Additional information, if any
Traditional Agriculture/ Paddy field cultivation	✓	✓Wetland ✓Zone of influence	
Traditional fishery	✓	✓Wetland ✓Zone of influence	
Traditional Religious activities	✓	✓Wetland ✓Zone of influence	

Section 9: Listing of Available Scientific Resources Used

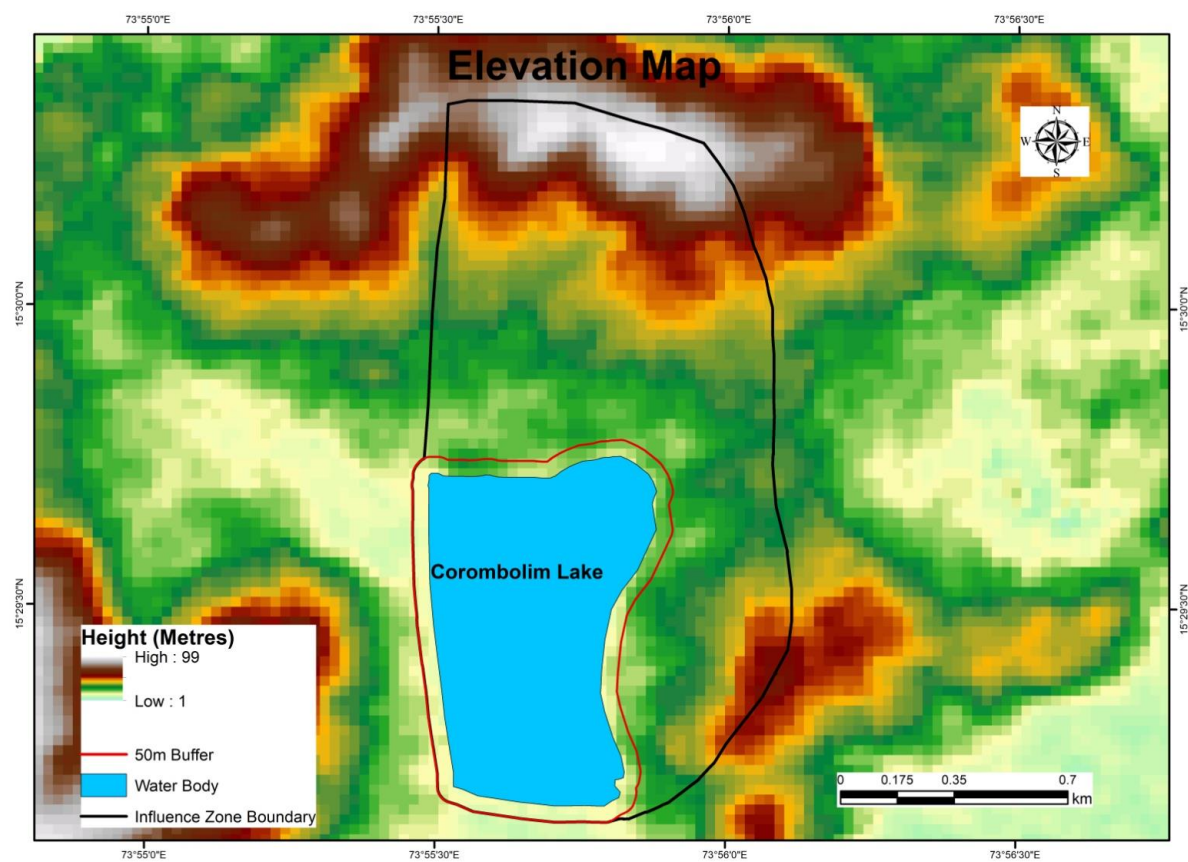
Annexure-I: LULC of the influence zone with elevation contour of Carambolim Lake.



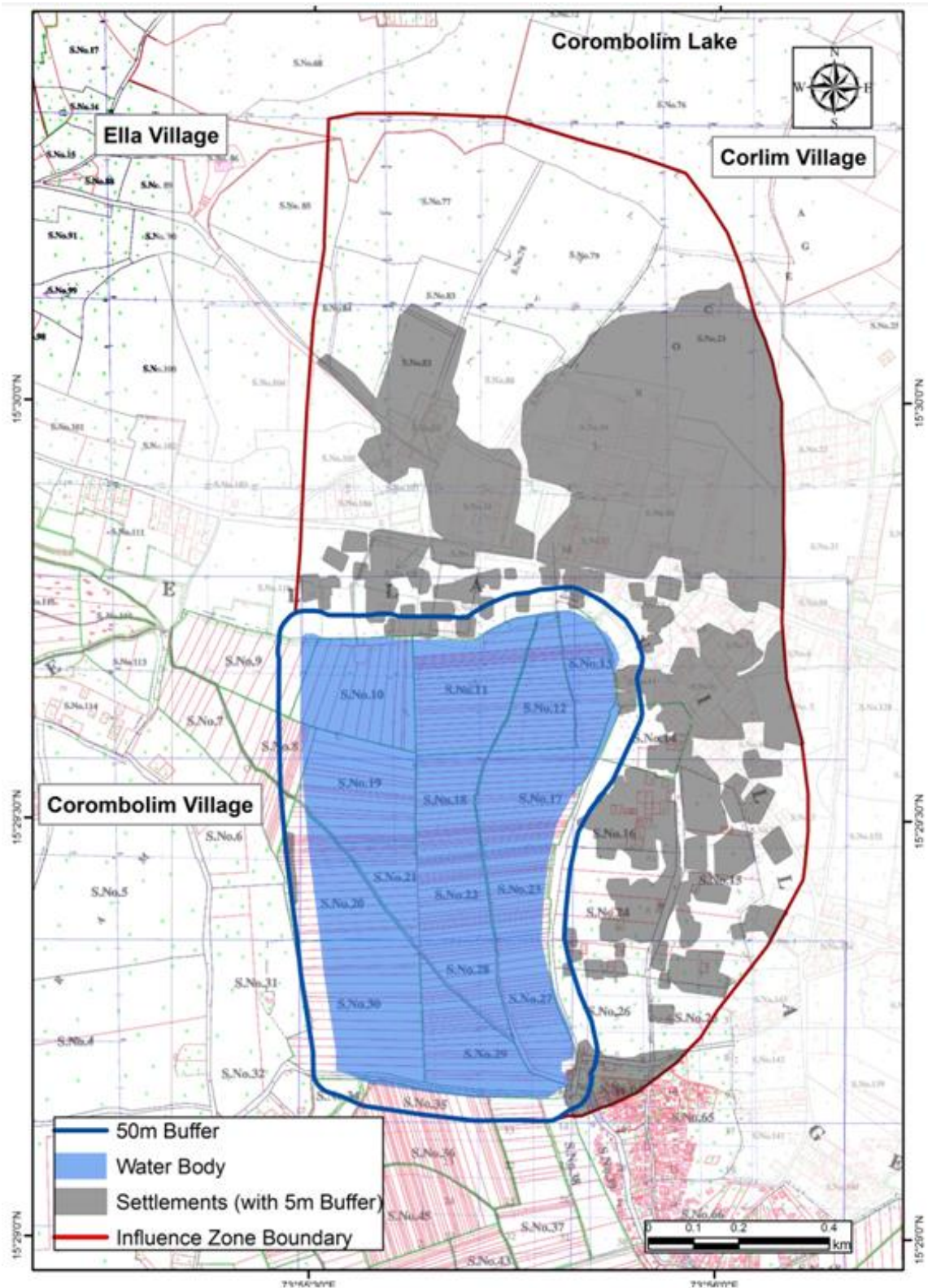
Annexure-II: LULC of 50m buffer of Carambolim Lake.



Annexure-III: Elevation (DEM) map of Carambolim Lake.



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



Annexure-V: Google image of Carambolim Lake.



Annexure-VI: Site photographs of Carambolim Lake

