

Annex 2: Format for preparing Brief Document

State / Union Territory: Goa

Name 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)

Tarvalem Lake (Pagar Tollem, पगार तळे)

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

Shiroda Village, Ponda 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°21'16.30" N to 15°21'04.00" N

Longitude: From 74°01'09.43"E to 74°01'13.94"E

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

Water Resource Department (WRD)

Section 2: Site Characteristics

2.1 Area of wetland/wetlands category(ha): 4.53 ha

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

Category	Subcategory
✓Natural(Inland)	<input checked="" type="checkbox"/> 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 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 10

2.4 Elevation(m above mean sea level) 24 m

2.5 Water regimes

a) Main source of water (tick all applicable)

Rainfall Groundwater Catchment run off Direct / indirect inflow from river

Others please specify Natural springs

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 20°C Maximum 33°C
- c) Humidity (%) Minimum 67% Maximum 84%

2.7 Area of zone of influence(in ha) 84.07 ha [Ref. paras 32-34 of the guidelines on wetlands]

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

Forests/vegetation	<u>92.9</u> %
Plantation	<u>7.1</u> %
Agriculture	<u>0</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

Nymphaea sp.(Water lily), *Cocus* sp. (Coconut), *Musanda frundosa* (Dhobi tree), *Ixora coccinia* (Jungle flame), *Hydrilla* sp. *Najas minor* (Water nymph)

3.2 Notable animal species present in wetland

Sus scrofa (Wild boar), *Bos gauras* (Indian bison), *Hystrix indica*(Porcupine), Canidae (fox), *Pavo cristatus* (Peacock), Viverridae (Civet)

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

Bos gaurus (Indian bison)

3.4 Major plant invasive alien species

Hydrilla sp.

3.5 Major animal invasive alien species

Section 4: Ecosystem services

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (up to 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	Water is used for areca nut, coconut, banana and mango plantation.
Fisheries	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	In month of may, traditional fishery is carried out by the village people
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	Buffalo wallows in the water body when the water level is reduced.
Medicinal plants	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Saton, rungol, satanle, pushiri, yalam are the local names of medicinal plants found along the periphery of water body.
Is a recreational site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Buffering communities from extreme events as floods and storms	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Groundwater recharge	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Helps recharge well water.
Water purification	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Natural purification of water and at certain height, water remains throughout the year.
Acts as a sink for sediments	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Heavy sediment deposition. Natural purification of the water takes place as the water body continuously receives percolated water.
Has significant cultural and religious values	<input type="checkbox"/> 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 checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Nymphaea</i> sp, <i>Ixora coccinia</i>
Supports noteworthy animal species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<i>Bos gauras</i> , <i>Viverridae</i>
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 checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Supports lifecycle of freshwater fishes (catfish, valoi, chiklo, pitlo)
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	Cattles and buffalo graze when the water body dries up
Religious practices	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	
Withdrawal of water for domestic use	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" 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	For paddy and areca nut cultivation.
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	Water body is used for cattle bathing and buffalo wallowing.
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 type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low	<input checked="" type="checkbox"/> Present <input type="checkbox"/> Potential	Locals have requested to build ponds/pits around the water body to enhance ground water recharge.
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 type="checkbox"/> Medium <input checked="" 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 type="checkbox"/> Zone of influence	High	WRD	Locals propose building of pump house to supply water to surrounding area. Statutory approval required.
Harvesting of resources (living / non-living)	Regulated	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence	Medium	WRD	Forest department gives permission to harvest cashew, goduk, bhino, mhai. Only traditional activities to continue.

Grazing	Regulated	<input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Medium	panchayat	
Discharge of treated sewage/ effluent / wastewater	Prohibited	<input checked="" type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Medium	Water Resource Department (WRD)	Statutory national and state legislation applicable.
Construction of boat jetties, and facilities for temporary use ,as pontoon bridges	Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		State Public Works Department	
Aquaculture, agriculture and horticulture activities within the wetland boundaries.	Regulated	<input checked="" type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Medium	Fishery, Agriculture & Horticulture Department	Used for areca nut, excess water can be supplied for other uses at a price.
Any other, please list 1. Disposal of solid waste/untreated sewage	Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		Panchayat	Statutory national and state legislation applicable.
2. Construction activities	Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		Panchayat	Approval required
3. Extraction of soil, mud, rocks for commercial purpose	Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		Panchayat	Approval required

Section 8: Activities Proposed to be permitted

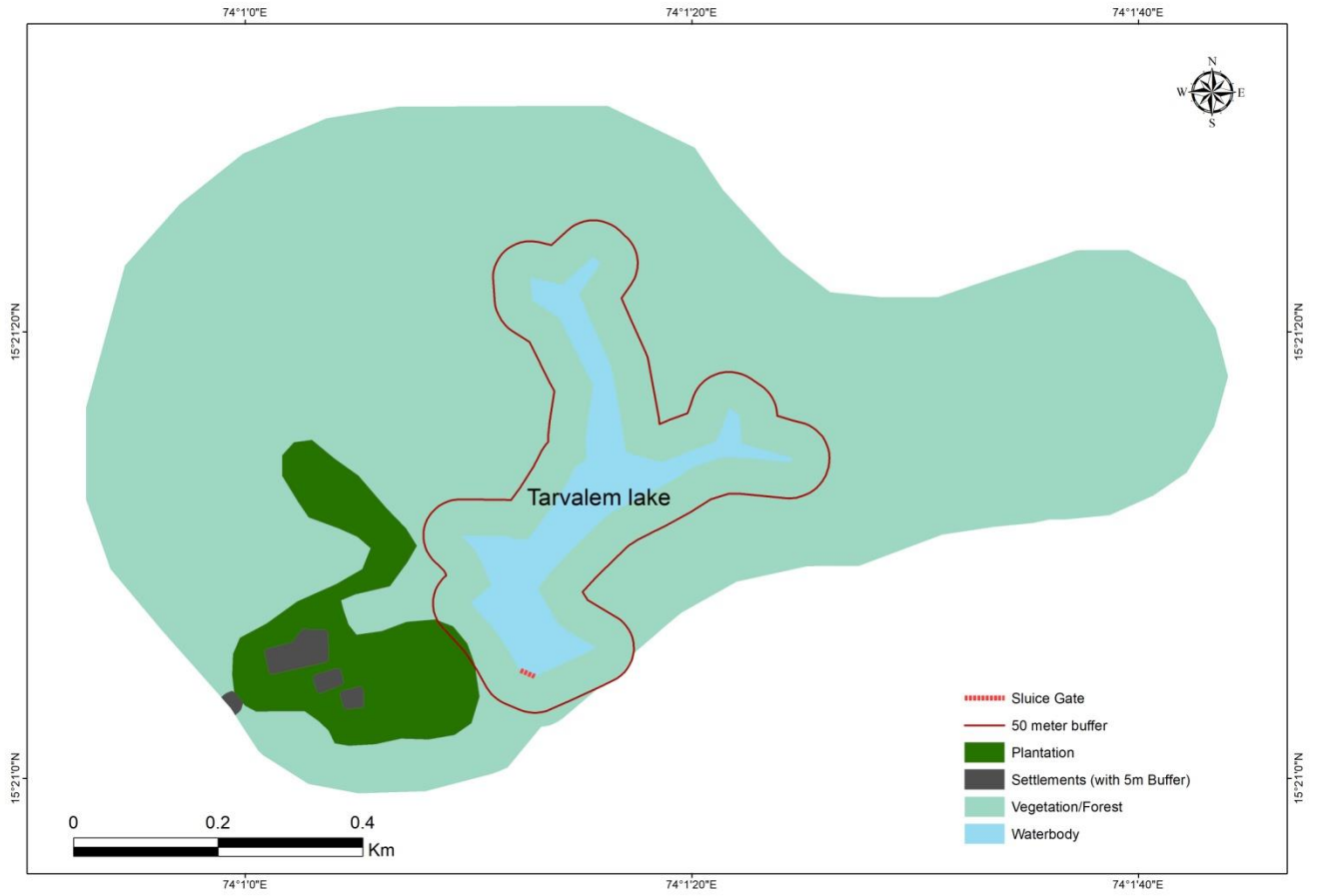
Activity	Place a tick mark if relevant	Within wetlands or zone of influence	Additional information, if any
Traditional Agriculture/ Paddy cultivation	<input checked="" type="checkbox"/>	<input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	
Traditional Religious activities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	

Section 9: Listing of Available Scientific Resources Used

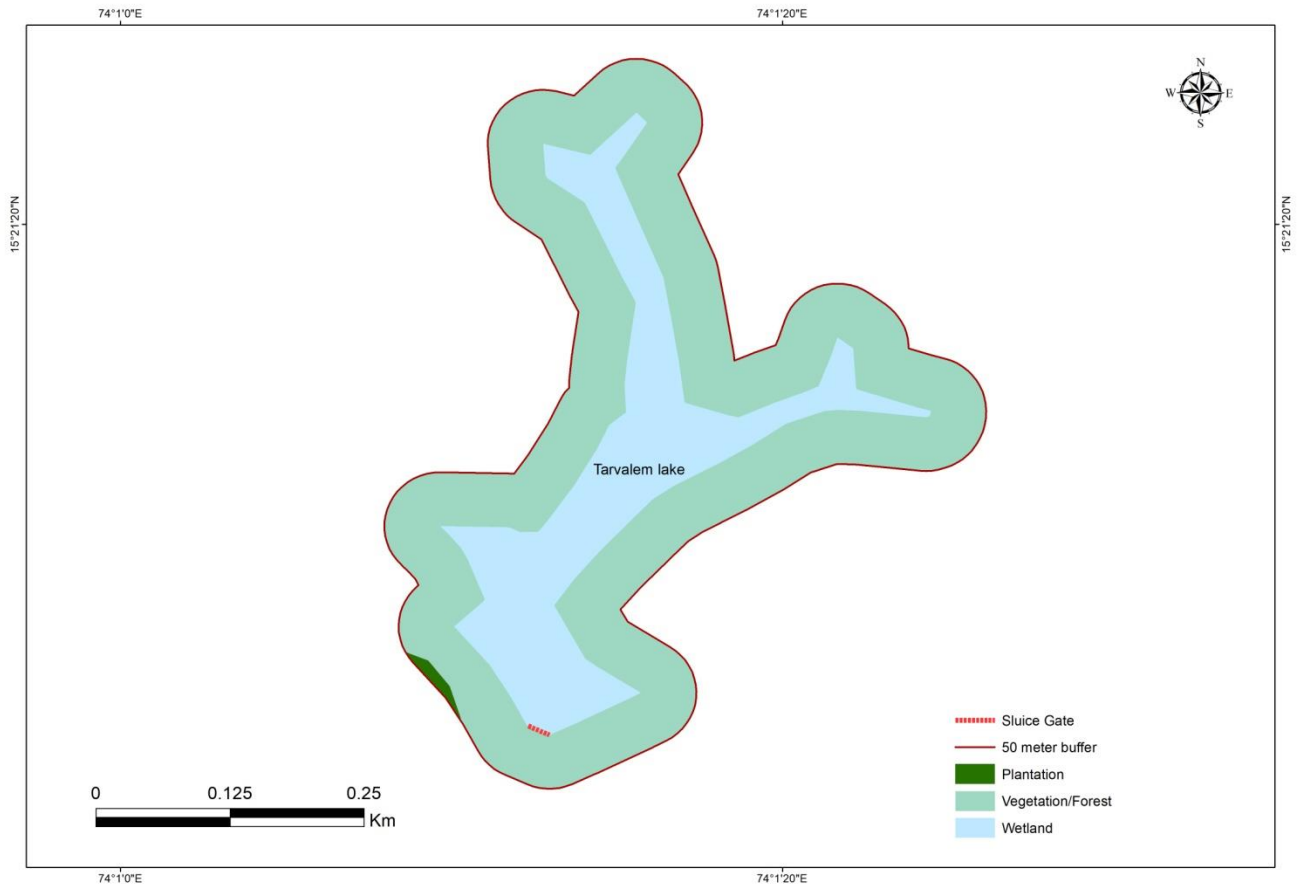
Table-I: LULC of Tarvalem Lake

Tarvalem lake					
Sl:No:	LULC	Influence Zone		50 meter Buffer	
		Area(Hec)	Percentage Area	Area(Hec)	Percentage Area
1	Vegetation	78.12	92.9	10.93	99.5
2	Plantation	5.95	7.1	0.06	0.5
Total Area		84.07	100	10.99	100

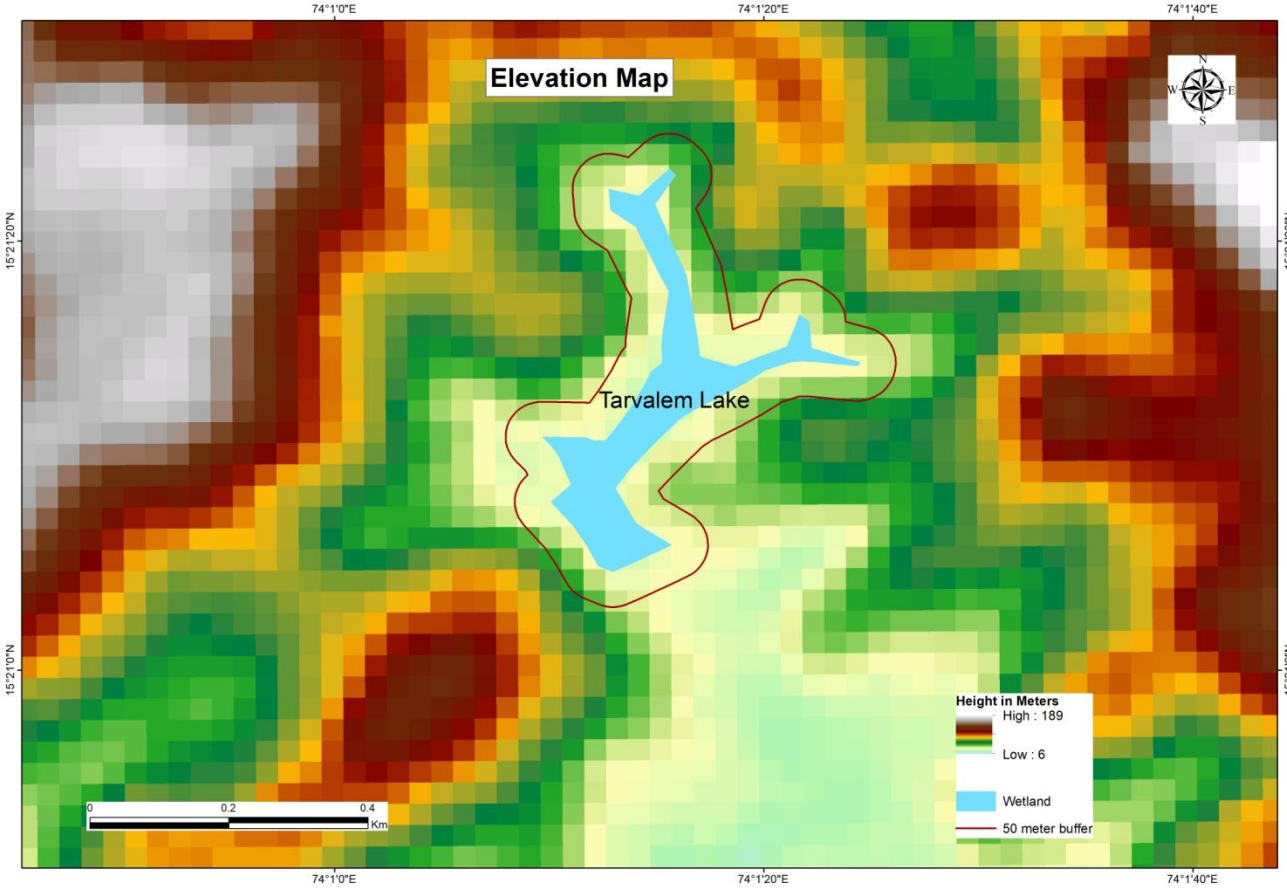
Annexure-I: LULC of the influence zone of Tarvalem Lake



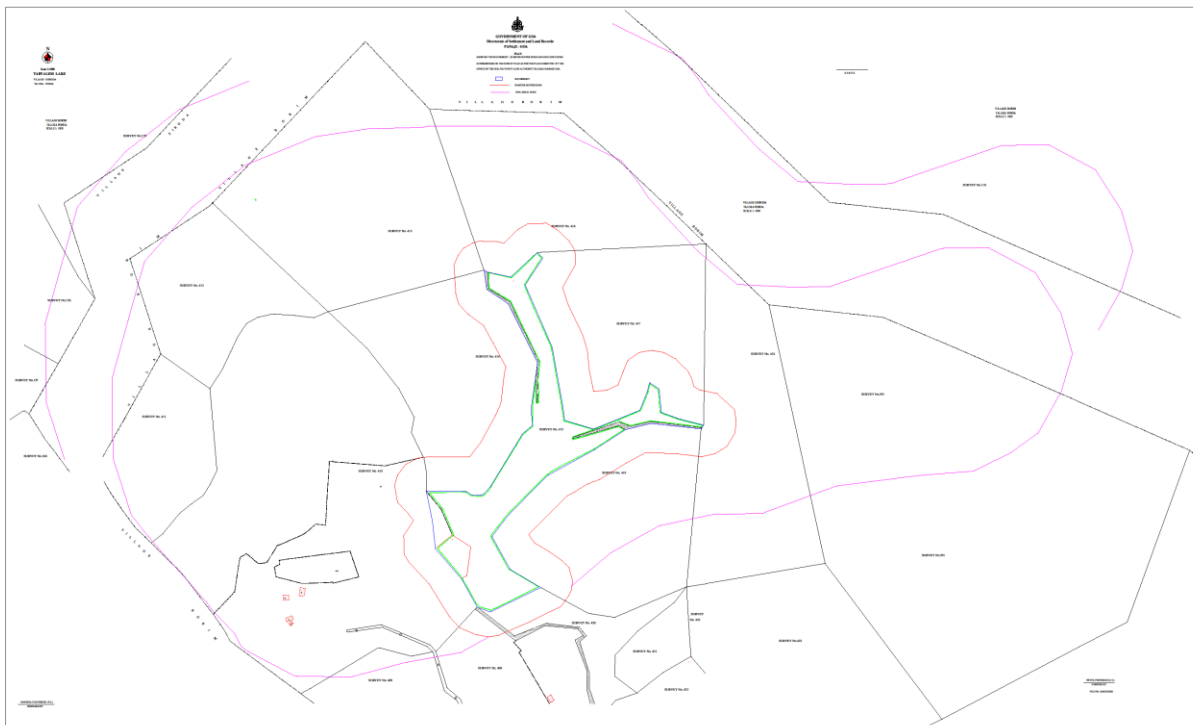
Annexure-II: LULC of 50m buffer of Tarvalem Lake



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



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



Annexure-V: Google image of Tarvalem Lake



Annexure-VI: Site photographs of Tarvalem Lake

