

**Annex 2: Format for preparing Brief Document**

State / Union Territory: Goa

Name and address of person (s) compiling this information CSIR- NIO & GSWA

**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)

Karmale lake (Arla Lake-अर्ल तळे)

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

Village Keri, Taluka Ponda

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

South Goa

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

Latitude: From 15°26'51.01" N to 15°27'09.00" N

Longitude: From 74°00'41.04"E to 74°00'48.02"E

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

Water Resource Department (WRD)

**Section 2: Site Characteristics**

2.1 Area of wetland (ha): 3.7 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 4

2.4 Elevation(m above mean sea level) 93

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) 12.1 ha [Ref.paras32-34of the guidelines on wetlands]

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

Forests/vegetation	<u>69.42</u> %
Plantation	<u>0</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 Annexure I- V and VI as site photographs to this document)

### Section 3: Biodiversity

3.1 Notable plant species present in wetland  
*Areca catechu* (Betel nut), *Mangifera indica* (mango), Banana tree, *Cocos nucifera* (coconut), *Artocarpus heterophyllus* ( jackfruit)

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3.2 Notable animal species present in wetland  
May be identified from the validated PBR

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3.3 Species of conservation significance (rare, endangered, threatened, endemic species)  
May be identified from the validated PBR

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3.4 Major plant invasive alien species  
None

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3.5 Major animal invasive alien species  
None

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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	Water is used for Cashew, betelnut, coconut, banana, jackfruit plantation.
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	Used for buffalo wallowing by locals
Medicinal plants	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is a recreational site	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Spice farm on the periphery of the water body.
Buffering communities from extreme events as floods and storms	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Acts as a large reservoir for runoff water protecting the surrounding from possible floods
Groundwater recharge	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	At certain level, standing water remains throughout the year.
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. Provides de-silting, settling of silt from rainwater runoff
Acts as a sink for sediments	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Provides de-silting, settling of silt from rainwater runoff
Has significant cultural and religious values	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Ram temple is situated on the bank of the water body.
Is a site for recreation and tourism	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Spice farm in vicinity.
Supports noteworthy plants species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Betel nut, coconut, mango, jackfruit
Supports noteworthy animal species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Peacock
Site of high congregation of migratory water birds	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Egret
Supports life cycle of fish or amphibians	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Helps complete life cycle of fishes like tigur, pittol
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 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 checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	
Grazing	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	
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	Ram navami, Keshav temple
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	Used for cultivation of paddy field.
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	Domestic animals wallow in the water body.
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 checked="" type="checkbox"/> Present <input type="checkbox"/> Potential	Silt has been deposited in the water body.
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	<input checked="" type="checkbox"/> Regulated <input type="checkbox"/> Prohibited	<input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Medium	Water Resource Department (WRD)	Statutory national and state legislation applicable.
Harvesting of resources (living / non-living)	<input checked="" type="checkbox"/> Regulated <input type="checkbox"/> Prohibited	<input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Medium	Village Panchayat	
Grazing	<input checked="" type="checkbox"/> Regulated <input type="checkbox"/> Prohibited	<input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Medium	Village Panchayat	
Discharge of treated sewage/ effluent / wastewater	<input checked="" type="checkbox"/> Regulated <input type="checkbox"/> Prohibited	<input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	High	Village Panchayat	Statutory national and state legislation applicable.

Construction of boat jetties, and facilities for temporary use ,as pontoon bridges	<input checked="" type="checkbox"/> Regulated <input type="checkbox"/> Prohibited	<input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Medium	Village Panchayat	
Aquaculture, agriculture and horticulture activities within the wetland boundaries.	<input checked="" type="checkbox"/> Regulated <input type="checkbox"/> Prohibited	<input type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	Medium	Village Panchayat	
Encroachment	<input type="checkbox"/> Regulated <input checked="" type="checkbox"/> Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		Village panchayat	Statutory national and state legislation applicable.
Poaching	<input type="checkbox"/> Regulated <input checked="" type="checkbox"/> Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		Forest Department	Statutory national and state legislation applicable.
Any other, please list 1. Disposal of solid waste/untreated sewage	<input type="checkbox"/> Regulated <input checked="" type="checkbox"/> Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		Goa waste management corporation	Statutory national and state legislation applicable.
2. Construction / development activities (for any purpose)	<input type="checkbox"/> Regulated <input checked="" type="checkbox"/> Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		Village panchayat	Approval required in zone of influence
3. Extraction of soil, mud, rocks for commercial purpose	<input type="checkbox"/> Regulated <input checked="" type="checkbox"/> Prohibited	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence		Village 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 fishery	✓	<input checked="" type="checkbox"/> Wetland <input checked="" type="checkbox"/> Zone of influence	
Tourism	✓	<input checked="" type="checkbox"/> Wetland <input type="checkbox"/> Zone of influence	Locals propose to convert the water body into a tourist spot.

### Section 9: Listing of Available Scientific Resources Used

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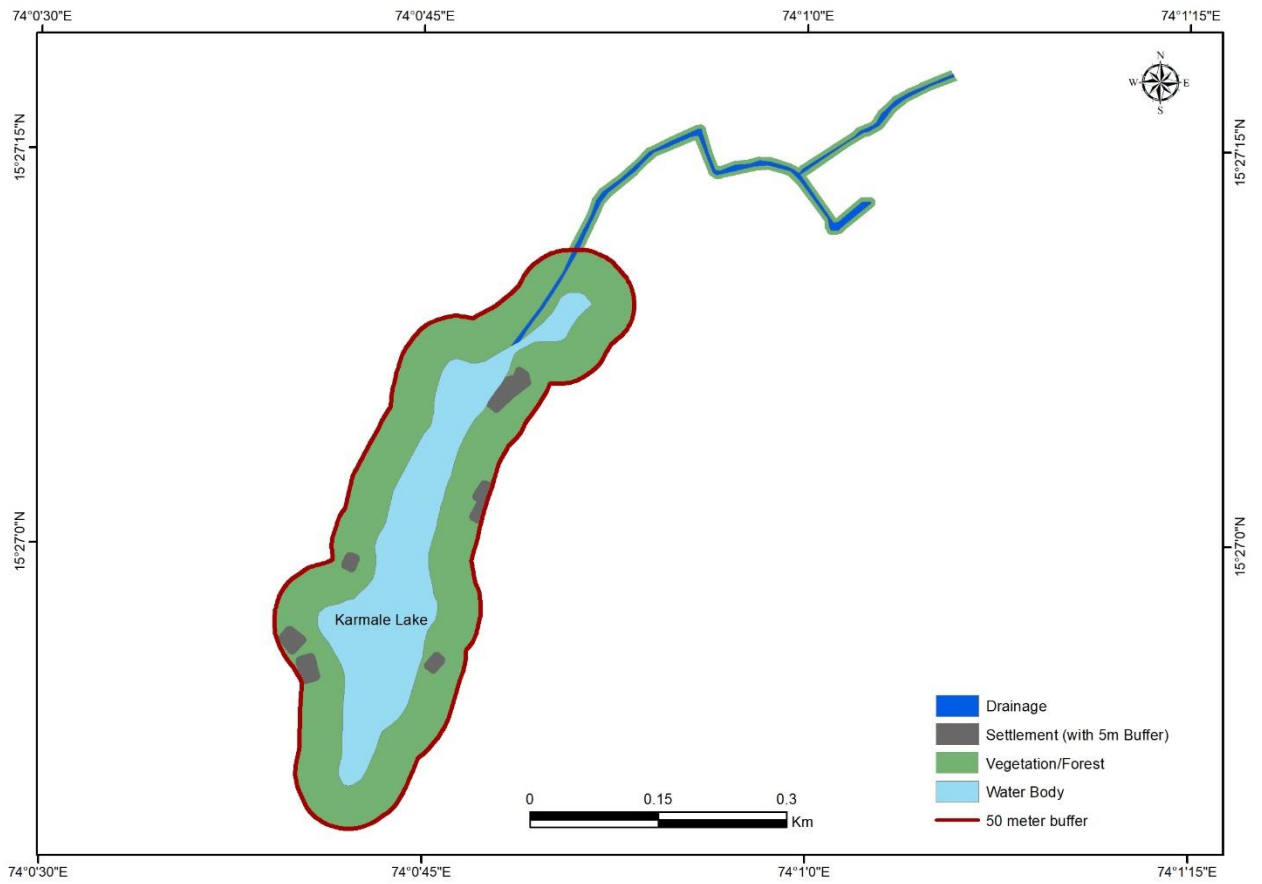


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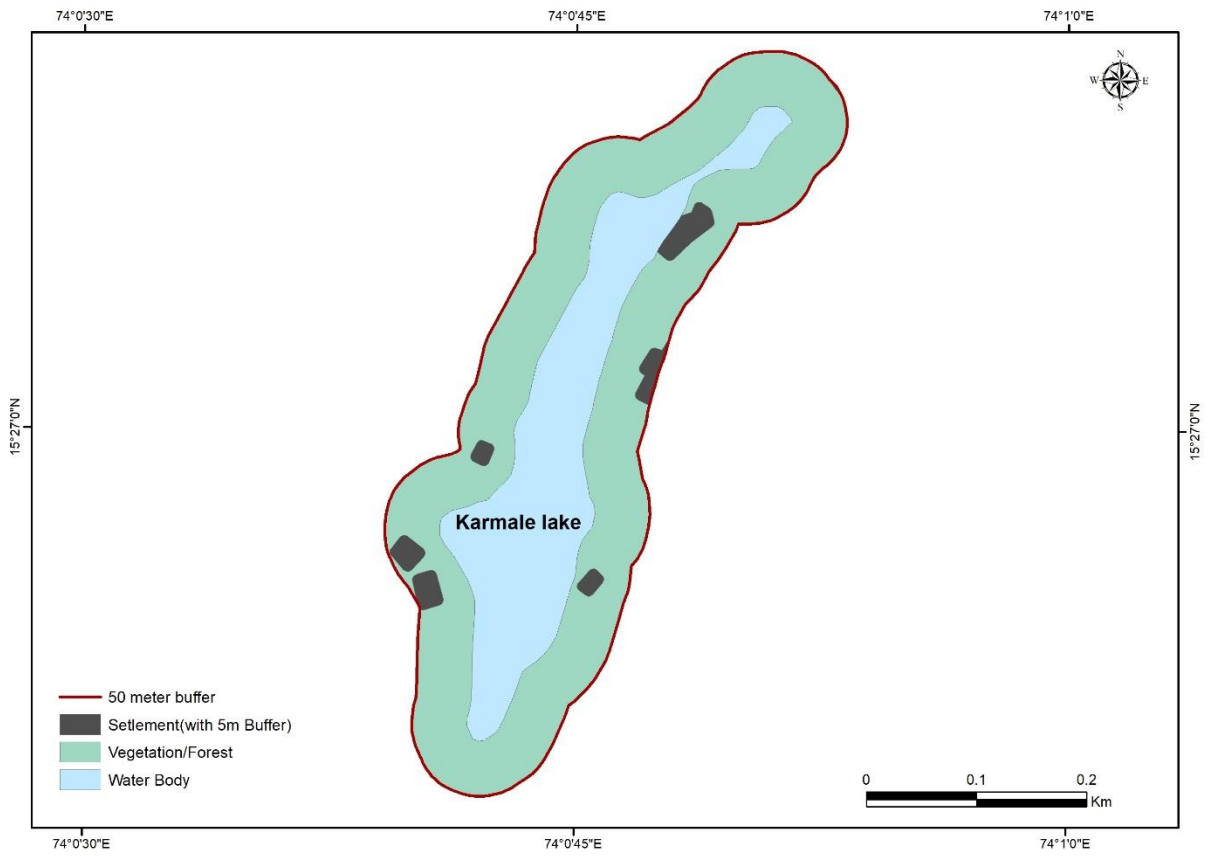
Table-I: Area table of Karmale Lake

<b>Karmale Lake</b>					
<b>Sl:No:</b>	<b>LULC</b>	<b>Influence Zone</b>		<b>50 meter Buffer</b>	
		<b>Area(Hec)</b>	<b>Percentage Area</b>	<b>Area(Hec)</b>	<b>Percentage Area</b>
1	Vegetation	8.4	69.42	7.6	67.26
2	Karmale waterbody	3.7	30.58	3.7	32.74
	<b>Total Area</b>	<b>12.1</b>	<b>100</b>	<b>11.3</b>	<b>100</b>

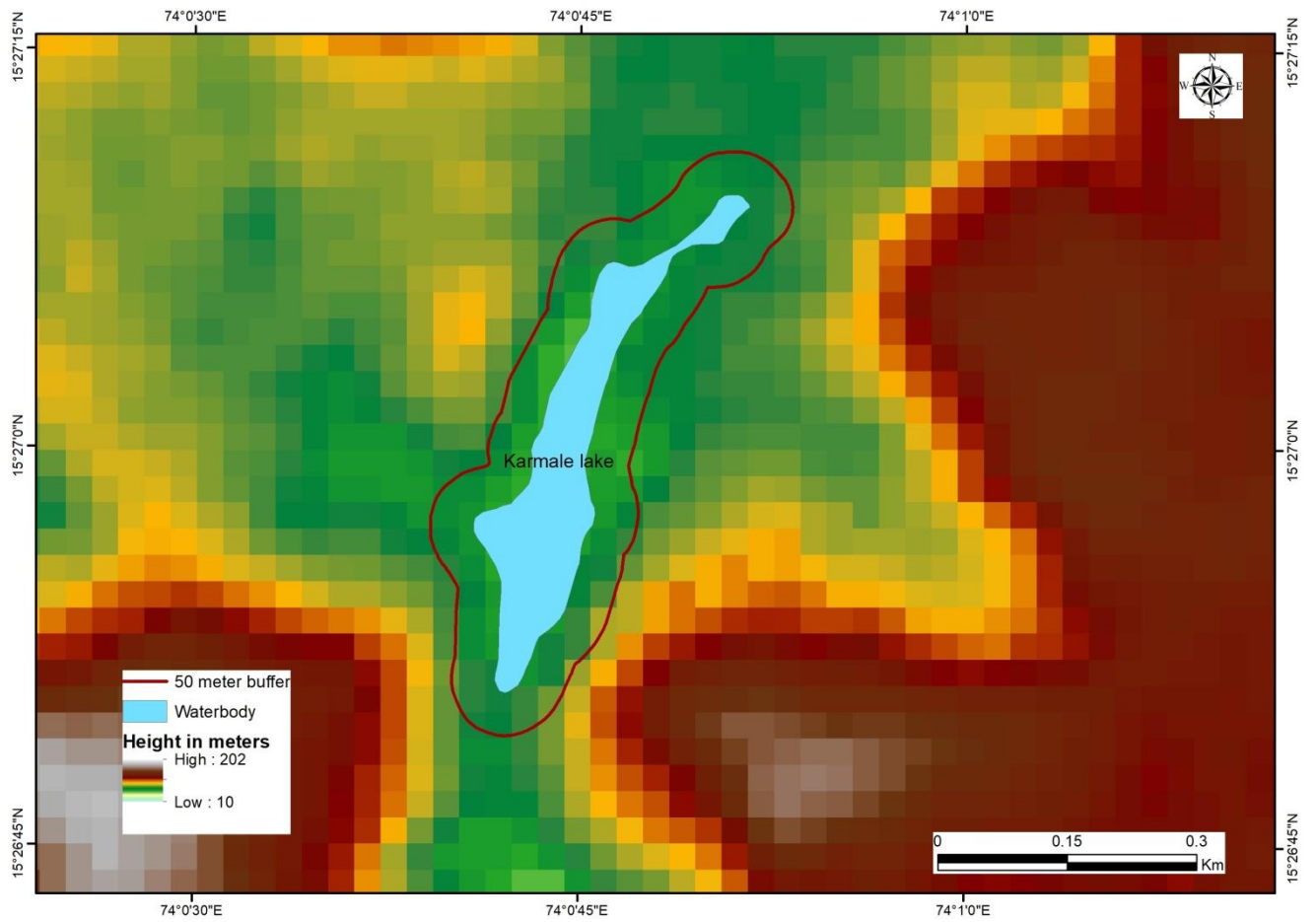
# Annexure-I: LULC of the influence zone of Karmale Lake



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



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



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

Annexure-V: Google image of Karmale Lake



Annexure-VI: Site photographs of Karmale Lake

