

BRIEF DOCUMENT OF
MURAT-POOKKODE-KOZHIKODE WETLAND COMPLEX

State / Union Territory: Kerala

Name and address of person(s) compiling this information:

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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) : **Murat and Pookkode-Kozhikode Wetland Complex**

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

Villages: Iringal, Payyoli, Thurayur, Maniyur, Nadakkkuthazha, Palayad, Thiruvallur and Vadakara

Taluks: Quilandy and Vadakara

Panchayat: Thiruvallur, Maniyur, Thurayur

Municipal areas: Payyoli, Vadakara

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

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

Latitude : From 11°31'33.455" to 11°35'33.301"N

Longitude : From 75°34'50.16" to 75°40'50.507"E

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

Local Self Governments, State Wetland Authority Kerala, Irrigation Department and Kerala Coastal Zone Management Authority.

Section 2: Site Characteristics

2.1 Area of the wetland/wetland complex (ha): 589.96

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

Category	Subcategory
<input type="checkbox"/> Natural (Inland)	<input 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 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 checked="" type="checkbox"/> Natural (Coastal)	<input checked="" type="checkbox"/> Coastal lagoon <input checked="" type="checkbox"/> Estuary <input checked="" 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): Data not available
 Elevation (m): 0 to 1880m (Including Zone of Influence)

2.4 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) Circumneutral (5.5 – 7.4) Alkaline (> 7.4)
 Not known

e) Water salinity

- Fresh (< 0.5 g/l) Brackish (0.5 – 30 g/l) Euhaline (30- 40 g/l)
 Hypersaline (> 40g/l) Not known

f) Nutrient in water

- Eutrophic Mesotrophic Oligotrophic Not known

2.5 Climatic setting

- a) Annual Rainfall (mm): 4500
b) Temperature (°C) : Minimum: 24.0, Maximum: 35.5
c) Humidity (%) : Minimum: 74, Maximum: 89

2.7 Area of zone of influence (in ha): 66794.54

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

Forests	: 26.05
Plantation	: 3.35
Agriculture	: 33.31
Settlements (Rural) and (Urban)	: 34.14
Water body	: 2.86

2.9 Map of wetland complex and zone of influence

Section 3: Biodiversity

3.1 Notable plant species present in wetland:

Dimeria hohenackeri, *Farmeria metzgerioides*, *Limnopoa meeboldii*, *Meteoromyrtus wynaadensis*, *Syzygium stocksii*, *Eugenia argentea*, *Syzygium floccosum*, *Atuna indica*, *Coffea crassifolia*, *Garcinia malabarica*, *Humboldtia brunonis* var. *Rakthapushpa*

Aquatic Ferns: *Acrostichum aureum*, *Ceratopteris thalictroides*, *Marsilea minuta*, *Osmunda regalis*, *Pistia stratiotes*, *Salvinia molesta*.

3.2 Notable animal species present in wetland:

Birds: Eurasian Bittern (*Botaurus stellaris*), Yellow Bittern (*Ixobrychus sinensis*), Cinnamon Bittern (*Ixobrychus cinnamomeus*), Black Bittern (*Ixobrychus flavicollis*), Malaysian Night Heron (*Gorsachius melanolophus*), Black-crowned Night Heron (*Nycticorax nycticorax*), Striated Heron (*Butorides striata*), Indian Pond Heron (*Ardeola grayii*), Cattle Egret (*Bubulcus ibis*), Grey Heron (*Ardea cinerea*), Purple Heron (*Ardea purpurea*), Great Egret (*Ardea alba*), Intermediate Egret (*Ardea intermedia*), Little Egret (*Egretta garzetta*), Western Reef Egret (*Egretta gularis*), Black-headed Ibis (*Threskiornis melanocephalus*), Eurasian Spoonbill (*Platalea leucorodia*), Indian Black Ibis (*Pseudibis papillosa*), Glossy Ibis (*Plegadis falcinellus*), Indian Cormorant (*Phalacrocorax fuscicollis*), Great Knot.

Fishes: *Carinotetraodon travancoricus*, *Monopterus digressus*, *Pangio goaensis*, *Puntius denisonii*, *Puntius mahecola*, *Pterocryptis wynaadensis*, *Monopterus roseni*, *Etroplus maculatus*, *Etroplus suratensis*, *Anabas testudineus*, *Pseudosphromenes eupanus*, *Channa marulius*, *Channa orientalis*, *Tor khudree*, *Puntius melanostigma*, *Puntius bovanicus*

Shrimps: *Caridina chauhani*, *Macrobrachium veliense*

Dragon flies: *Idionyx saffronata*, *Idionyx travancorensis*, *Macrogomphus waynaadicus*, *Melano neurabilineata*, *Microgomphus puteri*, *Phylloneura westermanni*, *Protosticta antelopoides*, *Protosticta sanguinostigm*

Amphibians: *Philautus ponmudi*, *Philautus anili*, *Philautus tuberothumerus*, *Philautus neurostegona*, *Philautus ochlandrae*, *Philautus akroparallagi*, *Philautus chromasyhysi*.

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

Plants: *Farmeria metzgerioides* (VU), *Limnopoia meeboldii*, *Atuna indica*, *Dimeria hohenacker* (EN), *Meteoromyrtus wynaadensis* (CR)

Animals: *Carinotetraodon travancoricus*, *Protosticta sanguinostigma* (VU), Black-headed Ibis (NT), *Puntius denisonii*, Great Knot, *Pterocryptis wynaadensis*(EN), *Philautus ponmudi* (CR)

3.4 Major plant invasive alien species:

Cabomba caroliniana, *Eichhornia crassipes*, *Ageratum conyzoides*, *Alternanthera philoxeroides*, *Ipomoea cairica*, *Mikania micrantha*, *Mimosa diplotricha*, *Wedelia trilobata*

3.5 Major animal invasive alien species:

Data not available

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 type="checkbox"/> Yes <input checked="" type="checkbox"/> No	-
Fisheries	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Fishers used to catch fishes for their livelihood.
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	Not assessed quantitatively
Medicinal plants	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Not assessed quantitatively
Buffering communities from extreme events as floods and storms	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Not assessed quantitatively

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (up to 50 words for each category)
Groundwater recharge	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Not assessed quantitatively
Water purification	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Not assessed quantitatively
Acts as a sink for sediments	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Not assessed quantitatively
Has significant cultural and religious values	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>Kunhali Marakars built a fort on the southern bank of Moorad river which was completely destroyed by Portuguese with the help of Zamorins for various reasons.</p> <p>The decades-old Fathima Matha Catholic Church is also another attraction. Lokanarkavu temple is one of the famous temples in this area.</p> <p>There are a number of temples in Kuttiadi. "Natolthira" and associated carnival along with "Thira" is famous. Kuttiady carnival is also called "Kannukalichanda". Puthiyaveettil Tharavadu conducts an annual fest Thira (which is privately managed) at a place called Mangottu about 2 km from Kuttiady.</p>
Is a site for recreation and tourism	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>There is boating in Peruvannamuzhi artificial lake. Smaraka Thottam-a garden made in the memory of great leaders of the freedom struggle. There is also a crocodile farm and a bird sanctuary situated at Peruvannamuzhi.</p> <ul style="list-style-type: none"> ● Animal rehabilitation centre ● Bathing facility in river ● Bird sanctuary ● Snake park ● Trekking programmes ● Bamboo rafting ● Speedboat and rowboat cruises
Supports noteworthy plants species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Supports many species as mentioned in Section 3.1
Supports noteworthy animal species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Supports many species as mentioned in Section 3.2
Site of high congregation of migratory water birds	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Support various migratory water birds, not assessed quantitatively

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (up to 50 words for each category)
Supports life cycle of fish or amphibians	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Not assessed quantitatively
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 (up to 50 words for each category)
Community fishing (without any lease or permission from government department)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	The local people engaged in, the harvest or processing of fishery resources to meet their dietary needs and daily sustenance.
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 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 type="checkbox"/> No <input checked="" type="checkbox"/> Not assessed	-
Religious practices	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	-

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 (up to 50 words for each category)
		<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 type="checkbox"/> No <input checked="" type="checkbox"/> Not assessed	Not assessed quantitatively
Withdrawal of water for agriculture or fisheries	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not assessed	-
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	Not assessed quantitatively
Plying of boats	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not assessed	Country boats used for fishing & local transport
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 type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	Not assessed
Pollution	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low	<input checked="" type="checkbox"/> Present <input type="checkbox"/> Potential	Agricultural wastes like fertilisers, pesticides, insecticides, herbicides move down, percolating with water and joining the aquifers below posing danger to the ground water. Dumping of solid waste into the water body causes water pollution.
Unsustainable harvest of biological resources	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low	<input checked="" type="checkbox"/> Present <input type="checkbox"/> Potential	Illegal fishing practices pose a serious threat to indigenous biodiversity. The inland open water fisheries is a complex mix of

Threat	Degree	Present or Potential	Additional information, if any
			artisanal fisheries with a highly dispersed and unorganised marketing system.
Mining	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	-
River bank erosion	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	-
Encroachment	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input type="checkbox"/> Present <input type="checkbox"/> Potential	-
Spread of invasive species	<input type="checkbox"/> High <input type="checkbox"/> Medium <input checked="" type="checkbox"/> Low	<input checked="" type="checkbox"/> Present <input type="checkbox"/> Potential	Invasive plant species like <i>Cabomba caroliniana</i> , <i>Eichhornia crassipes</i> , <i>Ageratum conyzoides</i> , <i>Alternanthera philoxeroides</i> , <i>Ipomoea cairica</i> , <i>Mikania micrantha</i> , <i>Mimosa diplotricha</i> , <i>Wedelia trilobata</i> are reported here

Section 7: Activities Proposed to be prohibited (other than those listed in Rule 4(2) of Wetlands Rules

Activity	Prohibited within wetlands or zone of influence	Details of specific area wherein activity is prohibited	Name of department / agency responsible for regulation	Additional information, if any	Activity
	<input type="checkbox"/>	<input type="checkbox"/> Wetland / Wetlands complex boundary <input type="checkbox"/> Zone of influence			

Section 8: Activities Proposed to be regulated

Activity	Place a tick mark if relevant	Regulation within wetlands or zone of influence	Level of regulation (in terms of people, restricted area or any other)	Name of department / agency responsible for regulation	Additional information, if any
Withdrawal of water /impoundment/diversion or any other hydrological intervention	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Wetland/ Wetlands complex boundary <input type="checkbox"/> Zone of influence	Within the wetland	Wetland Management Unit (WMU), SWAK, LSGs, Irrigation Department and Kerala Coastal Zone Management Authority (KCZMA)	Need to take prior permission from the WMU/SWAK and KCZMA
Discharge of treated sewage/ effluent / wastewater	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Wetland/ Wetland complex boundary <input type="checkbox"/> Zone of influence	Within the wetland	Wetland Management Unit, SWAK, LSGs, KSPCB and KCZMA	Need to take prior permission from the WMU/ SWAK and KCZMA
Aquaculture, agriculture and horticulture activities within the wetland boundaries.	<input type="checkbox"/>	<input type="checkbox"/> Wetland/ Wetlands complex boundary <input type="checkbox"/> Zone of influence			
Any other, please list	<input type="checkbox"/>	<input type="checkbox"/> Wetland/ Wetlands			

Activity	Place a tick mark if relevant	Regulation within wetlands or zone of influence	Level of regulation (in terms of people, restricted area or any other)	Name of department / agency responsible for regulation	Additional information, if any
		complex boundary <input type="checkbox"/> Zone of influence			

Section 9: Activities Proposed to be permitted

Activity	Place a tick mark if relevant	Within wetlands or zone of influence	Additional information, if any
	<input type="checkbox"/>	<input type="checkbox"/> Wetland/wetland complex boundary <input type="checkbox"/> Zone of influence	

Section 10: Listing of Available Scientific Resources Used

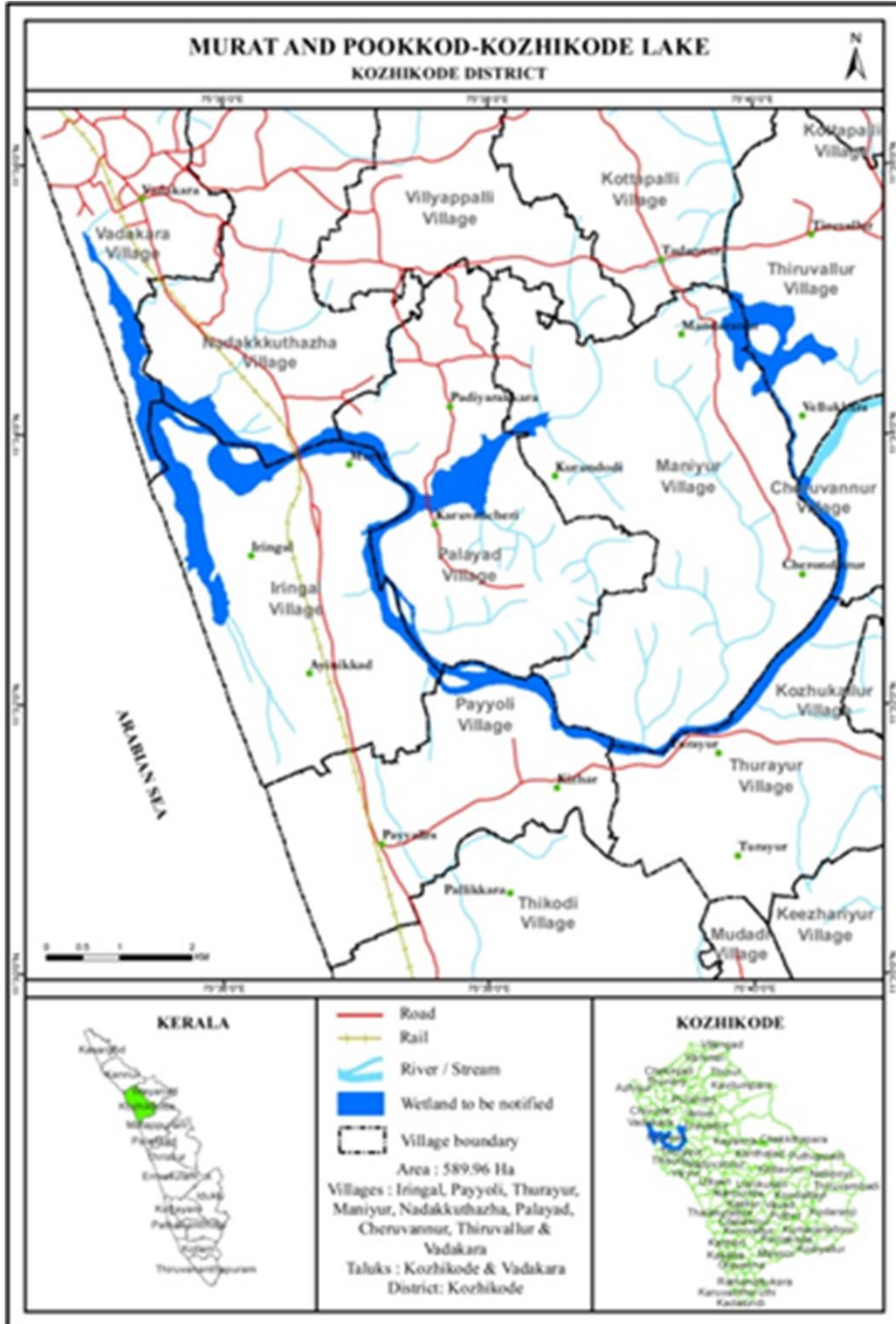
1. Abbasi S. A. , Abbasi N., Rajendra Soni, A. V. M Kunhi and K. Madhavan. 1999. Water quality, flora, and fauna of Kuttiadi river (Kozhikode, Kerala).
2. CWRDM. 2017. Benchmarking of Kuttiyadi Irrigation Project Final Report - Kuttiyadi Irrigation Project funded by Kerala State Council for Science Technology and Environment Government of Kerala. Centre for Water Resources Development and Management, Kozhikode.
3. Kerala State Biodiversity Board, 2018. Impact of Floods/ Landslides on Biodiversity “Assessment of Plant diversity including Aquatic flora, Riparian vegetation etc. in the flood/ Landslides affected areas of Chaliyar, Korapuzha and Kuttiyadi rivers” Final Report Submitted to Kerala State Biodiversity Board.

4. River Research Centre. 2013. Report on Monitoring of Fish Diversity of Rivers in Kerala. Kerala State Biodiversity Board, Thiruvananthapuram. 98 pp.

CHECKLIST

- Responsible agency has been clearly identified and details of contact person included
- Wetland/ wetlands complex boundary has been delineated using GIS and firmed up by adequate ground truthing
- Wetland/ wetlands complex map has been provided at required scale
- Zone of influence has been delineated and included in wetland map or a separate map
- Wetland zone of influence is sufficient to manage all activities
- Site's importance have been listed, and for major categories, justification is provided
- Site's biodiversity values are listed, and for major categories, justification is provided
- List of pre-existing rights and privileges is provided
- Consistency or inconsistency of pre-existing rights and privileges is indicated to be best of available knowledge
- Threats to site are listed, and for major categories details are provided
- Activities prohibited, beyond those already listed in Rule 4(2) have been mentioned
- List of activities to be regulated within wetlands and zone of influence is provided
- List of activities to be permitted is provide

Annexure I



Annexure II

