BRIEF DOCUMENT OF KOTTULI

State / Union Territory: Kerala

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

1. Member Secretary, State Wetland Authority Kerala (Director, Directorate of Environment and Climate Change, Govt. of Kerala), 4th Floor, KSRTC Terminal Complex, Thampanoor, Thiruvananthapuram- 1.
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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): Kottuli

1.2 Name of the Village(s), Tehsil(s), Municipal area (s):
Villages: Chevayur, Kuttuli, Vengeri
Taluks: Kozhikode
Corporation: Kozhikode

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

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

Latitude: From 11°15'56.412" to 11°17'1.796"N
Longitude: From 75°47'22.112" to 75°48'31.231"E

1.5 Name of the Department / Agency which has jurisdiction over the wetland / wetlands complex:
Local Self Governments, Irrigation Department, State Wetland Authority Kerala and Kerala Coastal Zone Management Authority in CRZ area

Section 2: Site Characteristics

2.1 Area of wetland / wetlands category (ha) : 104.43

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

Category	Subcategory
❒Natural (Inland)	❒ Permanent lakes
	❒ Seasonal/ intermittent lakes
	❒Permanent streams/ creeks
	❒ Seasonal/ intermittent streams/ creeks
	❒ Oxbow
	❒ River floodplain
	❒ Permanent freshwater marshes
	❒ Seasonal/ intermittent freshwater marshes
	❒ Shrub-dominated wetlands
	❒ Tree-dominated wetlands
	❒ Geothermal wetlands
	❒ Karst and other subterranean hydrological systems
☑ Natural (Coastal)	❒ Coastal lagoon
	☑ Estuary
	❒ Intertidal mud, sand or salt flats
	☑ Mangroves
	❒Coral reefs
❒Human-made	❒ Aquaculture pond
	❒ Tank
	❒ Saltpan
	❒ Dam / Reservoir

2.3 Depth (m) : Data not available

2.4 Elevation (m above mean sea level): 20 to 40 (Including Zone of Influence)

2.5 Water regimes

a) Main source of water (tick all applicable)

☑ Rainfall ❒ Groundwater ☑ Catchment runoff ☑ Direct / indirect inflow from river ☑ Others, please specify: Due to the tidal influx, the sea water reaches the wetland.

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

2.6 Climatic setting:

a) Annual Rainfall (mm): 3300

b) Temperature (°C): Minimum 25.1, Maximum 32.8

c) Humidity (%): Minimum: 70, Maximum: 90

2.7 Area of zone of influence (in ha) : 1595.25

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

Forests	: 4.18
Plantation	: 0.00
Agriculture	: 07.25

Settlements (Rural) and (Urban)	:	88.24
Water body	:	0.33
Industrial	:	0.00

2.9 Map of wetland complex and zone of influence

Section 3: Biodiversity

3.1 Notable plant species present in wetland

Mangrove & Mangrove associate species: *Acanthus ilicifolius, Aegiceras corniculatum, Avicennia sp.* and *Excoecaria agallocha, Barringtonia acutangula, Brachiaria distachya, Cerbera odollam, Clerodendrum inerme, Crinum defixum, Derris scandens, Derris trifoliata, Dolichandrone spathacea, Fimbristylis cymosa, Fimbristylis ferruginea, Hibiscus tiliaceus, Ipomea pes-caprae, Melastoma malabathricum, Morinda citrifolia, Pandanus odoratissimus, Pongamia pinnata, Premna serratifolia, Sphaeranthus indicus, Terminalia catappa* and *Wedelia chinensis, Acrostichum aureum* and *Stenochlaena palustris,*

Shrub species : *Abutilon sp., Ageratum conyzoides, Antidesma sp., Aristolochia indica, Chasalia ophiolites, Chromolaena odorata, Colocasia esculenta, Duranta repens, Grewia sp., Hibiscus sp., Ixora sp., Lantana camara, Morinda citrifolia, Naregamia alata, Stachytarpheta jamaicensis* and *Ziziphus oenoplia*.

The dominant herb Species: *Alysicarpus sp., Brachiaria sp., Centella asiatica, Cleome sp., Crotalaria sp., Cyperus sp., Desmodium sp., Fimbristylis sp., Mimosa pudica, Scoparia dulcis, Sida sp., Sphaeranthus indicus, Tridax procumbens, Vigna sp.* and *Wedelia chinensis.*

Hydrophytes: *Centella asiatica, Eichhornia crassipes, Hygrophila sp., Ipomoea aquatica, Lemna perpusilla, Nymphaea nouchali, Nymphoides indica, Salvinia molesta, Spirodela polyrhiza* and *Typha angustata, Ceratopteris thalictroides.*

3.2 Notable animal species present in wetland

Birds: Garganey (*Spatula querquedula)*, Northern Pintail (*Anasacuta)*, Grey-bellied Cuckoo *(Cacomantis passerinus)*, Pied Cuckoo (*Clamator jacobinus)*, Drongo Cuckoo (*Surniculus lugubris)*, Common Coot (*Fulica atra*), Glossy Ibis (*Plegadis falcinellus)*, Oriental Darter (*Anhinga melanogaster)*, Woolly-necked Stork *(Ciconia episcopus)*, Indian

Grey Hornbill (*Ocyceros birostris)*, Heart-spotted Woodpecker (*Hemicircus canente)*, Rufous Woodpecker (*Micropternus brachyurus)*, Indian Pitta (*Pitta brachyura)*, Booted Eagle (*Hieraaetus pennatus)*, Brown-breasted Flycatcher (*Muscica pamuttui)* and Booted Warbler (*Iduna caligata)*, Ashy Drongo (*Dicrurus leucophaeus*), Ashy Prinia (*Prinia socialis*), Asian Koel (*Eudynamys scolopacea*), Asian Openbill (*Anastomus oscitans*), Asian Palm Swift (*Cypsiurus balasiensis*), White-throated Kingfisher (*Halcyon smyrnensis*), Asian Paradise-flycatcher (*Terpsiphone paradise*), Black Bittern (*Dupetor flavicollis*), Black Drongo (*Dicrurus macrocercus*), Black Kite (*Milvus migrans*), Black naped Oriole (*Oriolus chinensis*), Black Rumped Flameback Woodpecker (*Dinopium benghalense*), Black-crowned Night Heron (*Nycticorax nycticorax*), Black-headed Ibis (*Threskiornis melanocephalus*), Blue-tailed Bee-eater (*Merops philippinus*), Brahmini Kite (*Haliastur indus*), Bronze-winged Jacana (*Metopidius indicus*), Cattle Egret (*Bubulcus ibis*), Common Kingfisher (*Alcedo atthis*), Common Moorhen (*Gallinula chloropus*), Common Myna (*Acridotheres tristis*), Common Sandpiper (*Actitis hypoleucos*), Crimson-fronted Barbet (*Megalai marubricapilla*), Darter (*Anhinga melanogaster*), Emerald Dove (*Chalcophaps indica*), Eurasian Golden Oriole (*Oriolus oriolus*), Great Egret (*Casmerodius albus*), Greater Coucal (*Centropus sinensis*), Greater Racket tailed Drongo (*Dicrurus paradiseus*), Green Bee-eater (*Merops orientalis*), Grey Heron (*Ardea cinerea*), House Crow (*Corvus splendens*), Indian Pond Heron (*Ardea grayii*), Indian Roller (*Coracias benghalensis*), Large billed Crow (*Corvus macrorhynchos*), Intermediate Egret (*Mesophoyx intermedia*), Jungle Babbler (*Turdoides striatus*), Jungle Myna (*Acridotheres fuscus*), Kentish Plover (*Charadrius alexandrines*), Little Stint (*Calidris minuta*), Little Cormorant (*Phalacrocorax niger*), Little Egret (*Egretta garzetta*), Little Grebe (*Tachybaptus ruficollis*), Little Ringed Plover (*Charadrius dubius*), Malabar Grey Hornbill (*Ocyceros griseus*), Oriental Magpie Robin (*Copsychus saularis*), Painted Stork (*Mycteria leucocephala*), Pheasant-tailed Jacana (*Hydrophasia nuschirurgus*), Pied Kingfisher (*Ceryle rudis*), Purple Heron (*Ardea purpurea*), Purple-rumped Sunbird (*Nectarinia zeylonica*), Purple Swamphen (*Porphyrio porphyrio*), Red-vented Bulbul (*Pycnonotus cafer*), Red-wattled Lapwing (*Vanellus indicus*), Red-whiskered Bulbul (*Pycnonotus jocosus*), River Tern (*Sterna aurantia*), Rock Pigeon (*Columba livia*), Rose-ringed Parakeet (*Psittacu lakrameri*), Rufous Treepie (*Dendrocitta vagabunda*), Scarlet Minivet (*Pericrocotus flammeus*), Shikra (*Accipiter badius*), Spotted Dove (*Streptopelia chinensis*), Thick-billed Flower pecker (*Dicaeum agile*), White-breasted Waterhen (*Amaurornis phoenicurus*), White-browed Wagtail (*Motacilla maderaspatensis*),White-cheeked Barbet (*Megalaima lineate*), Yellow Wagtail (*Motacilla flava*), Yellow-wattled Lapwing (*Vanellus malabaricus*), Yellow-billed Babbler (*Turdoide saffinis*).

Snake Species: Indian Rock Python, Russell's Viper, Indian Cobra, Common Krait, Green Whip Snake, Indian Brownzeback

Mammal species: Smooth coated otter, Jungle cat, Palm civet, Common mongoose, Indian flying Fox, Short-nosed fruit Bat

Turtle: Indian Pond terrapin, Southern Flap Shelled Turtle

Frog: Indian Toad, Indian Tree Frog, Skipper Frog, Bull frog and Paddy Field Frog.

Wasp: *Polistes (Polistella), Stigma tamulus, Ropalidia brevita, Ropalidia jacobsoni,Vespatropica haematodes, Allorhynchium argentatum, Antepipona brunnipes brunnipes, Apodynerus troglodytes troglodytes, Paraleptomenes miniatus mephitis, Ammophila clavus, Sceliphron madraspatanum madraspatanum.*

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

Oriental Darter, Wooly necked Stork, Black–headed Ibis, River Tern (NT); Asian otter (Vulnerable)

3.4 Major plant invasive alien species
Salvinia molesta (African payal), *Eichhornia crassipes* (Kula vaazha), *Sphagneticola trilobata, Lantana camara*

3.5 Major animal invasive alien species
No data available

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	❒Yes ☑No	-
Source of water for agriculture	❒Yes ☑No	-
Fisheries	☑Yes ❒No	Not assessed quantitatively
Cultivation of aquatic food plants	❒Yes ☑No	-

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (upto 50 words for each category)
For buffalo wallowing and use of domesticated animals	☑ Yes ❒ No	Not assessed quantitatively
Medicinal plants	☑ Yes ❒ No	Supports large varieties of medicinal plants like *Evolvulus alsinoides, Centella asiatica, Hygrophila schulli, Bacopa monnieri , Cynodon dactylon , Pteris vittata* and *Mimosa pudica.* Mangrove species in the wetland also possess medicinal properties.
Is a recreational site/ tourism	☑ Yes ❒ No	Sarovaram (also known as Sarovaram Bio Park) is an eco-friendly park near Kottuli. The park is situated adjacent to the Canoly Canal. The project has been developed with an eco-friendly theme and is located in an ecosystem consisting of wetlands and mangrove forests containing bird habitats. People catch fishes using fishing rods, plunge baskets and filter traps.
Buffering communities from extreme events as floods and storms	☑ Yes ❒ No	Not assessed quantitatively
Groundwater recharge	☑ Yes ❒ No	Primary source for wells in the vicinity
Water purification	☑ Yes ❒ No	Not assessed quantitatively
Acts as a sink for sediments	☑ Yes ❒ No	Not assessed quantitatively
Has significant cultural and religious values	☑ Yes ❒ No	Kalarikkal Temple, Madathu Temple, Moonathil Temple, Maladathu Temple, Parambalath Temple, Kanangot Temple, Parambath Temple, Madakunni Temple, Edavalath Temple are some of the popular temples in the vicinity. ‘Kuruthi’ is observed in Madhuravanam Cherukandi Devi Temple, where a cock is killed near

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (upto 50 words for each category)
		the temple' simultaneously coconuts are broken at the banks of wetlands. It is said that the death of cock represents the land being contaminated while the coconut ritual is considered as an act of sanctification of the land. Sacred groves are present in temples near the wetland
Supports noteworthy plants species	☑ Yes ❒ No	Supports plant species as mentioned in section 3.1
Supports noteworthy animal species	☑ Yes ❒ No	Supports animal species as mentioned in section 3.2
Site of high congregation of migratory water birds	☑ Yes ❒ No	Supports migratory birds like Grey Heron (*Ardea cinerea*), Kentish Plover (*Charadrius alexandrinus*), Little Stint (*Calidris minuta*), Common Sandpiper (*Actitis hypoleucos*), Blue-tailed Bee-eater (*Merops philippinus*), Yellow Wagtail (*Motacilla flava*), Eurasian Golden Oriole (*Oriolus oriolus*), Black-naped Oriole (*Oriolus chinensis*), and Ashy Drongo (*Dicrurus leucophaeus*)
Supports life cycle of fish or amphibians	☑ Yes ❒ No	Not assessed quantitatively.
Mining	❒ Yes ☑ 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)	☑ Yes ❒ No	❒ Yes ☑ No ❒ Not assessed	The local people engaged in, the harvest or processing of fishery resources to their dietary needs and sustenance
Fishing under lease from government department	❒ Yes ☑ No	❒ Yes ❒ No ❒ Not assessed	-
Harvest of plants (without any lease or permission from government department)	☑ Yes ❒ No	❒ Yes ❒ No ☑ Not assessed	Herb gatherers venture into the wetland to collect plants demanded by the agents. They submit their collections to the agents for a paltry sum
Harvest of plants under lease from government department	❒ Yes ☑ No	❒ Yes ❒ No ❒ Not assessed	-
Agriculture or horticulture within wetland	❒ Yes ☑ No	❒ Yes ❒ No ❒ Not assessed	-
Grazing	☑ Yes ❒ No	❒ Yes ❒ No ☑ Not assessed	Livestock grazing is common in wetland areas.
Religious practices	☑ Yes ❒ No	❒ Yes ☑ No ❒ Not assessed	Even though there are several temples located near to the wetland premises, no direct religious practice is associated with the wetland.
Withdrawal of water for domestic use	❒ Yes ☑ No	❒ Yes ❒ No ❒ Not assessed	-
Withdrawal of water for agriculture or fisheries	❒ Yes ☑ No	❒ Yes ❒ No ❒ Not assessed	-

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)
Bathing or wallowing of domestic animals	☑ Yes ❒ No	❒ Yes ❒ No ☑ Not assessed	Extensive buffalo bathing and wallowing are observed
Plying of boats	❒ Yes ☑ No	❒ Yes ❒ No ❒ Not assessed	-
Any other, please list here	❒ Yes ❒ No	❒ Yes ❒ No ❒ Not assessed	

Section 6: Present and Potential Threats

Threat	Degree	Present or Potential	Additional information, if any
Changes in water inflow and outflow	❒ High ❒ Medium ☑ Low	❒ Present ☑ Potential	In the wake of climate change, it may be a threat in future
Pollution	☑ High ❒ Medium ❒ Low	☑ Present ❒ Potential	The wetland receives a significant amount of waste containing toxic metals from municipal wastewater through the adjoining Canoli canal. Also the physico-chemical and bacteriological analysis reveals significant organic pollution load from untreated domestic and industrial sources.
Encroachment	❒ High ☑ Medium ❒ Low	☑ Present ❒ Potential	Wetlands and mangrove are facing severe threats due to illegal conversion of

Threat	Degree	Present or Potential	Additional information, if any
			wetland areas for non wetland purposes.
Spread of invasive species	❒High ☑ Medium ❒Low	☑ Present ❒Potential	Spread of invasive plant species like *Salvinia molesta* (African payal) and *Eichhornia crassipes* (Kula vaazha) etc were reported in the wetland area.
Open defecation in the area	❒High ❒Medium ☑ Low	☑ Present ❒Potential	The exposed mangrove patches of Kottuli wetland are currently locations for open defecation by labourers and local deprived families. This practice makes the area unhygienic.

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 /prohibition	Additional information, if any
Any other, please list	❒	❒ Wetland / Wetlands complex boundary ❒ Zone of influence		Any other, please list

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	☑	☑ Wetland / Wetlands complex boundary ❒ Zone of influence	Within the wetland	Wetland Management Unit (WMU), SWAK, Irrigation Department, and KCZMA in CRZ areas	Large scale hydrological interventions need to get prior permission from WMU/SWAK, and KCZMA in CRZ areas.
Discharge of treated sewage/ effluent / wastewater	☑	☑ Wetland / Wetlands complex boundary ❒ Zone of influence	Within the wetland	Wetland Management Unit, SWAK, PCB, KCZMA in CRZ area	Need to take prior permission from WMU/SWAK, KCZMA in CRZ areas.
Aquaculture activities within the wetland boundaries.	☑	☑ Wetland / Wetlands complex boundary ❒ Zone of influence	Within the wetland	LSGs, SWAK/WMU, Fisheries Deparment and KCZMA in CRZ areas	Large scale commercial level aquaculture activities need to get prior permission from WMU/SWAK
Any other, please list	❒	❒ Wetland / Wetlands complex boundary ❒ 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
	❒	❒ Wetland / Wetlands complex boundary ❒ Zone of influence	

Section 10: Listing of Available Scientific Resources Used

1. Badkul, A ., Arumugam, K., Havilah., Anilkumar,M., Rijesh,N.M., & Chandran,V, 2019. Local area mapping and spatial analysis Kottooli wetlands, Project Report Submitted by Department of Architecture & Planning, National Institute of Technology, Calicut.
2. CWRDM, 2016. Detailed project report of Kottuli wetland
3. Kumar, P. G., &Rajmohana, K, 2018. Taxonomic studies on wasps of Kottooli and Thalassery-Dharmadam mangroves of Kerala (Insecta: Hymenoptera). Records of the Zoological Survey of India, 118(4), 337-349.
4. Sálim Ali Centre for Ornithology and Natural History, 2011. ENVIS Newsletter on wetland ecosystems and inland wetlands SarovarSaurabh Vol.7,ISSN: 0972-3153.
5. Zoological Survey of India Western Ghat Regional Centre Kozhikode, 2019. A Preliminary Checklist of Birds of Kottooli Wetlands, Kozhikode, Kerala,

CHECKLIST

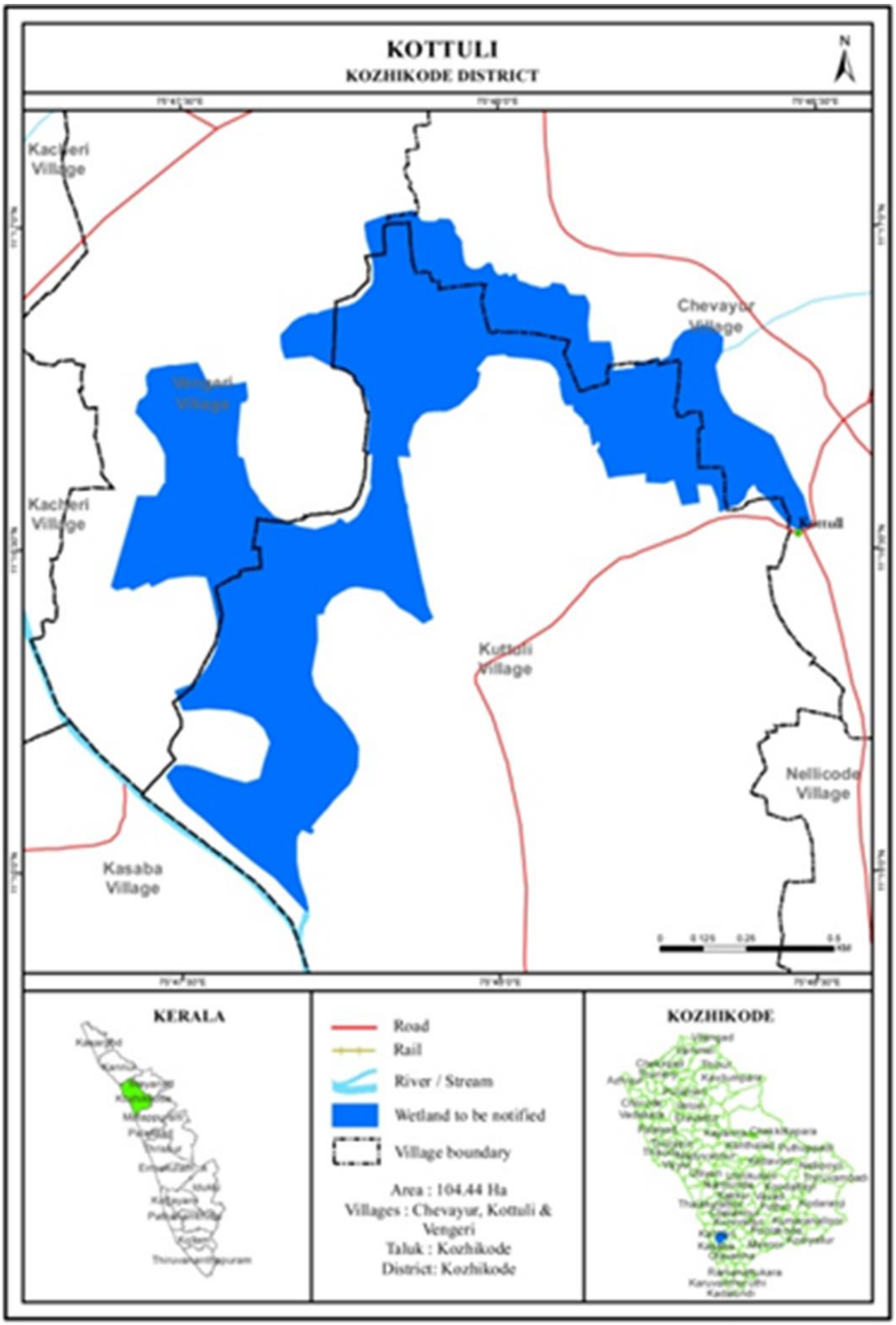
☑ Responsible agency has been clearly identified and details of contact person included

❒ Wetland/ wetlands complex boundary has been delineated using GIS and firmed up by adequate ground truthing

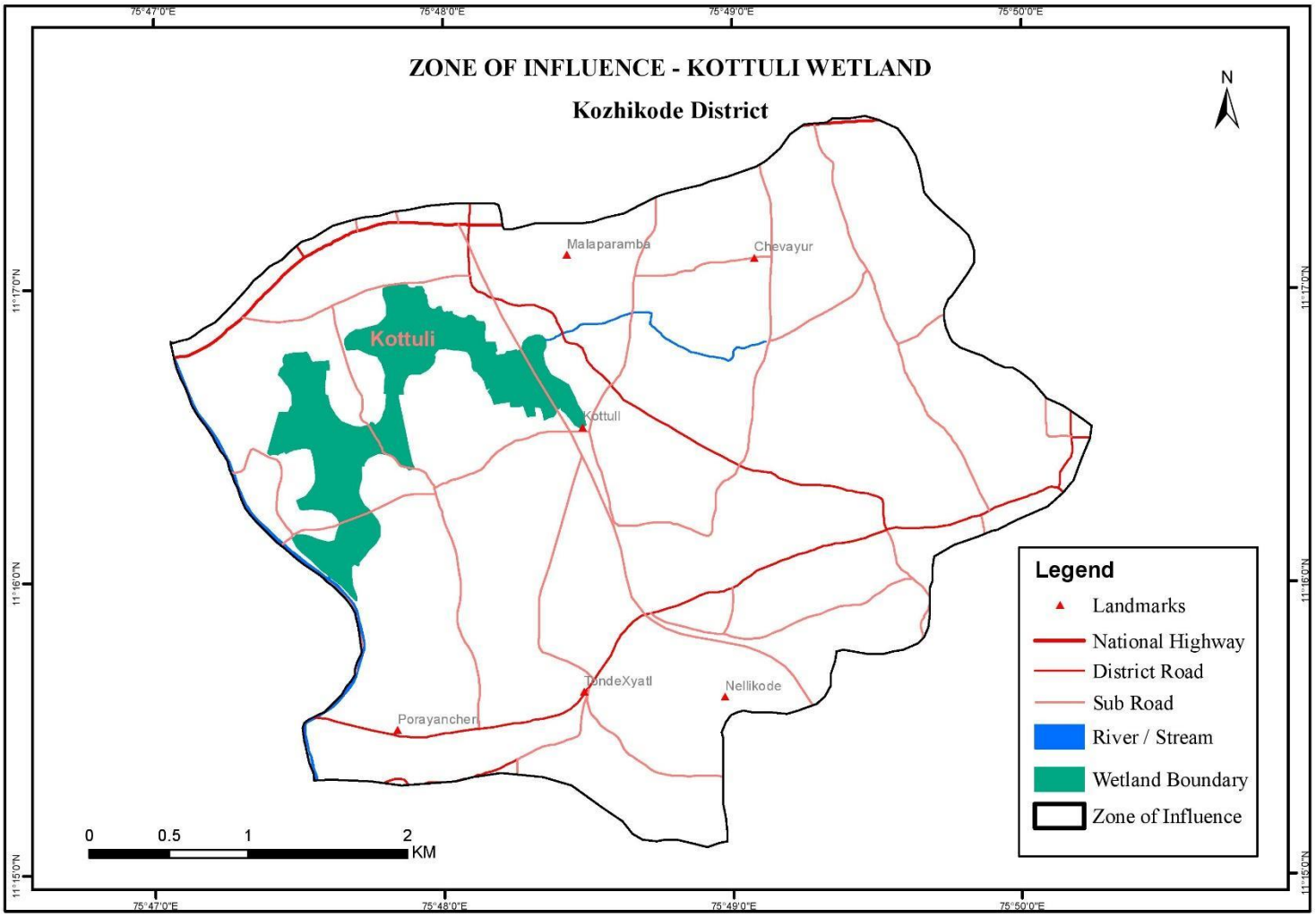
☑ Wetland/ wetlands complex map has been provided at required scale

- [x] Zone of influence has been delineated and included in wetland map or a separate map
- [x] Wetland zone of influence is sufficient to manage all activities
- [x] Site's importance have been listed, and for major categories, justification is provided
- [x] 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
- [x] 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 provided

Annexure I :


KOTTULI
KOZHIKODE DISTRICT
N
Kacheri Village
Chevayur Village
Vengeri Village
Kacheri Village
Kuttuli Village
Nellicode Village
Kasaba Village
KERALA
Road
Rail
River / Stream
Wetland to be notified
Village boundary
Area : 104.44 Ha
Villages : Chevayur, Kottuli & Vengeri
Taluk : Kozhikode
District: Kozhikode
KOZHIKODE

Annexure II :


ZONE OF INFLUENCE - KOTTULI WETLAND
Kozhikode District
N
75°47'0"E
75°48'0"E
75°49'0"E
75°50'0"E
11°17'0"N
11°16'0"N
11°15'0"N
Malaparamba
Chevayur
Kottuli
Kottull
TondeXyatl
Nellikode
Porayancheri
0
0.5
1
2
KM
Legend
Landmarks
National Highway
District Road
Sub Road
River / Stream
Wetland Boundary
Zone of Influence