BRIEF DOCUMENT OF KAVVAI - KARATTUVAYAL - KANIYACHIRA

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): **Kavvai-Karattuvayal-Kaniyachira Wetland Complex**

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

Villages: Kunnimangalam, Madai, Karivellur, Korome, Payyannur, Ramanthali, Cheruvathur, Hosdurg, Kanhangad, Kilakode, Madikai, Neeleswaram, Padne, Peroli, Pudukai, Trikkarippur North, Trikkaripur South and Udinoor

Taluk: Kannur, Taliparamba, Hosdurg

Panchayats: Kunnimangalam, Madai, Karivellur-Peralam, Ramanthali, Cheruvathur, Kayyur-Chimeni, Madikai, Padanna, Trikkarippur

Municipality : Payyannur, Kanhangad, Neeleswaram

1.3 District(s) in which wetland complex is located: Kannur and Kasaragod

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

Latitude: From 12°1'13.292"N to 12°18'54.832"N
Longitude: From 75°6'18.615"E to 75°15'27.569"E

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

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

Section 2: Site Characteristics

2.1 Area of wetland / wetlands category (ha) : 3188. 71 ha.

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) : Maximum : 8.9 m (Kavvai alone)

2.4 Elevation (m above mean sea level) : 0 to 1020m (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_____

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 6g/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) : 3112.2 (Kavvai)

b) Temperature (°C) : No data available

c) Humidity (%) : No data available

2.7 Area of zone of influence (in ha) : 115903.29

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

Forests	: 2.35
Plantation	: 6.00
Agriculture	: 52.91
Settlements (Rural) and (Urban)	: 35.96
Water body	: 2.76
Industrial	: 0.02

2.9 Map of wetland complex and zone of influence

(To be enclosed as Annex I and II to this proposal):

Section 3: Biodiversity

3.1 Notable plant species present in wetland

Nervilia Sp, Acanthus ilicifolius, Aegiceras corniculatum, Avicennia marina, Avicennia officinalis, Bruguiera cylindrica, Excoecaria agallocha, Kandelia candel, Lumnitzera racemosa, Rhizophora apiculata, Rhizophora mucronata, Sonneratia caseolaris

3.2 Notable animal species present in wetland

Haliaeetus leucogaster, Crassostrea, Uca, Sesarma, Gelasims, Rhizostoma, Asterias, Soulla Serrate, Portunus pelagicus, Fenneropenaeus indicus, Penaeus Monodan, Macrobrachium rosenbergii, Pteropus giganteus, Canis aureus, Lutra perspicillata, Lepidochelys olivacea

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

Lepidochelys olivacea (VU), Lutra perspicillata (VU)

3.4 Major plant invasive alien species

Eichhornia crassipes, Salvinia molesta and *Limnocharis flava*

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 (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	Aquaculture is a common livelihood for the natives in this wetland, mainly mussel culture. This pattern of aquaculture was introduced recently and is now one of the preferred occupations of the inhabitants of the Kavvai wetland system.
Cultivation of aquatic food plants	❒ Yes ☑ No	-
For buffalo wallowing and use of domesticated animals	☑ Yes ❒ No	Local people use the wetland for this purpose, but not assessed quantitattively.

Importance	Relevant for the site (please tick yes or no)	If Yes, Details (upto 50 words for each category)
Medicinal plants	❒ Yes ☑ No	-
Buffering communities from extreme events as floods and storms	☑ Yes ❒ No	Not assessed quantitatively
Groundwater recharge	☑ Yes ❒ No	Not assessed quantitatively
Water purification	☑ Yes ❒ No	Not assessed quantitatively
Acts as a sink for sediments	☑ Yes ❒ No	The wetland system includes a basin area of five rivers draining to the wetland. The annual discharge to the wetland from these five rivers is about 4351MCM, of which more than 94% of their annual discharge is during monsoon and remaining 6% only as non-monsoon flows.
Has significant cultural and religious values	❒ Yes ☑ No	-
Is a site for recreation and tourism	☑ Yes ❒ No	Houseboat tourism reported from the wetland. The boat rides help to explore each of the different islands in the wetland and indulge in delicious seafood in the area.
Supports noteworthy plants species	☑ Yes ❒ No	The wetland area is rich in mangroves and mangrove associates including the plants 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	Not assessed quantitatively
Supports life cycle of fish or amphibians	☑ Yes ❒ No	Supports life cycle of several fish species but 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 (upto 50 words for each category)
Community Fishing (without any lease or permission from government department)	☑ Yes ❒ No	❒ Yes ☑ No ❒ Not assessed	The common fishing methods practised here, which provide nutrition and recreation (rarely income generating) for a large number of people residing along the wetland and nearby lands.
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	-
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	-
Religious practices	❒ Yes ☑ No	❒ Yes ❒ No ❒ Not assessed	-
Withdrawal of water for domestic use	☑ Yes ❒ No	❒ Yes ☑ No ❒ Not assessed	Not assessed quantitatively
Withdrawal of water for agriculture or fisheries	☑ Yes ❒ No	❒ Yes ☑ No ❒ Not assessed	Not assessed quantitatively
Bathing or wallowing of domestic animals	☑ Yes ❒ No	❒ Yes ☑ No ❒ Not assessed	Not assessed quantitatively
Plying of boats	☑ Yes ❒ No	❒ Yes ☑ No ❒ Not assessed	Many house boats and country boats plying in the estuary as part of local transport, fishing and tourism.
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	Changes in water inflow has been reported but not assessed quantitatively
Pollution	❒ High ❒ Medium ☑ Low	☑Present ❒ Potential	Kavvai wetlands are the ultimate recipients of untreated sewage from settlements nearby. With an increase in the number of houseboats catering to backwater tourism, a commensurate waste management facility is yet to be developed. Water pollution by release of chemicals (agricultural, urban and industrial runoff) and use of wetlands as landfills/dumpsites are also reported here.
Unsustainable harvest of biological resources	❒ High ❒ Medium ☑ Low	☑ Present ❒ Potential	Over the years, uncontrolled fishing in the unmanaged estuary and rivers has resulted in decline in fish resources.
Mining	❒ High ❒ Medium ❒ Low	❒ Present ❒ Potential	No data available
Siltation	❒ High ❒ Medium ❒ Low	❒ Present ❒ Potential	No data available
Encroachment	❒ High ❒ Medium ☑ Low	☑ Present ❒ Potential	The wetland system has been facing threat for reclamation here and there
Spread of invasive species	❒ High ☑ Medium ❒ Low	☑ Present ❒ Potential	The growth of common weeds like *Salvinia molesta*, *Eichhornia crassipes* and *Limnocharis flava* in certain pockets of the Karattuvayal portions of the wetland complex

Threat	Degree	Present or Potential	Additional information, if any
			exerts great pressure on its biodiversity.
Mangrove deforestation	❒ High ❒ Medium ☑ Low	☑ Present ❒ Potential	Mangrove forest cleared near Ramapuram Bridge was reported by CWRDM
Land use changes in the catchment area	❒ High ☑ Medium ❒ Low	☑ Present ❒ Potential	The unscientific land use and agricultural practices along with forest clearing in the catchment area of the wetland complex exert major pressure on wetlands leading to soil erosion. This causes siltation that leads to vertical shrinkage and related problems like ecosystem change and biodiversity loss. The eroded soil contains a large amount of nutrients which causes eutrophication in some fragmented pockets.
	❒ High ❒ Medium ❒ Low	❒ Present ❒ Potential	

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

Activity	Place a tick mark if relevant	Prohibition within wetlands or zone of influence	Level of Prohibition (in terms of people, restricted area or any other)	Name of department / agency responsible for Prohibition	Additional information, if any
Any other, please list	❒	❒ Wetland / Wetlands complex boundary ❒ 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	☑	☑ Wetland / Wetlands complex boundary ❒ Zone of influence	Within the wetland	SWAK, Wetland Management Unit (WMU), Water Resources Department, and KCZMA in CRZ areas	Large scale hydrological interventions require prior permission from WMU/SWAK
Discharge of treated sewage/ effluent / wastewater	☑	☑ Wetland / Wetlands complex boundary ❒ Zone of influence	Within the wetland	SWAK, WMU, Water Resources Department, KSPCB, LSGs, and KCZMA in CRZ areas	Need to get prior permission from WMU/SWAK
Aquaculture, agriculture and horticulture activities within the wetland boundaries.	☑	☑ Wetland / Wetlands complex boundary ❒ Zone of influence	Within the wetland	SWAK, Wetland Complex Management Unit, Fisheries Department, LSGs, KCZMA in CRZ areas	Large scale commercial level activities need to get prior permission from WMU/SWAK
Sand mining/ silt removal	☑	☑ Wetland / Wetlands complex boundary ❒ Zone of influence	-	SWAK, WMU, Soil Conservation Department, Revenue Department, LSGs, KCZMA in CRZ areas	Large scale removal need prior permission from WMU/SWAK
Any other, please list	❒	❒ Wetland / Wetlands complex boundary			

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
		❒ 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

CWRDM (2018) Preparation of Detailed Project Reports (DPR) of Selected Wetlands of Kerala. Centre for Water Resources Development and Management (CWRDM), Kozhikode.

KFRI Research Project 636/2012 (2013) Inventory of wetlands of Kerala. Kerala Forest Research Institute

Shiji M., A.R. Sabitha, Kavya Prabhakar and P S Harikumar (2016) Water quality assessment of Kavvai Lake of northern Kerala, India using CCME water quality index and biological water quality criteria, Journal of Environmental Biology, Vol. 37, 1265-1272.

Harikumar P. S. (2016) Wetlands of Kerala: Degradation, Restoration and Future Management-A Case Study of Kavvayi Wetland-A Coastal Wetland in Northern Kerala. The 10th Biennial Lake Conference, http://ces.iisc.ernet.in/energy.

CHECKLIST

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

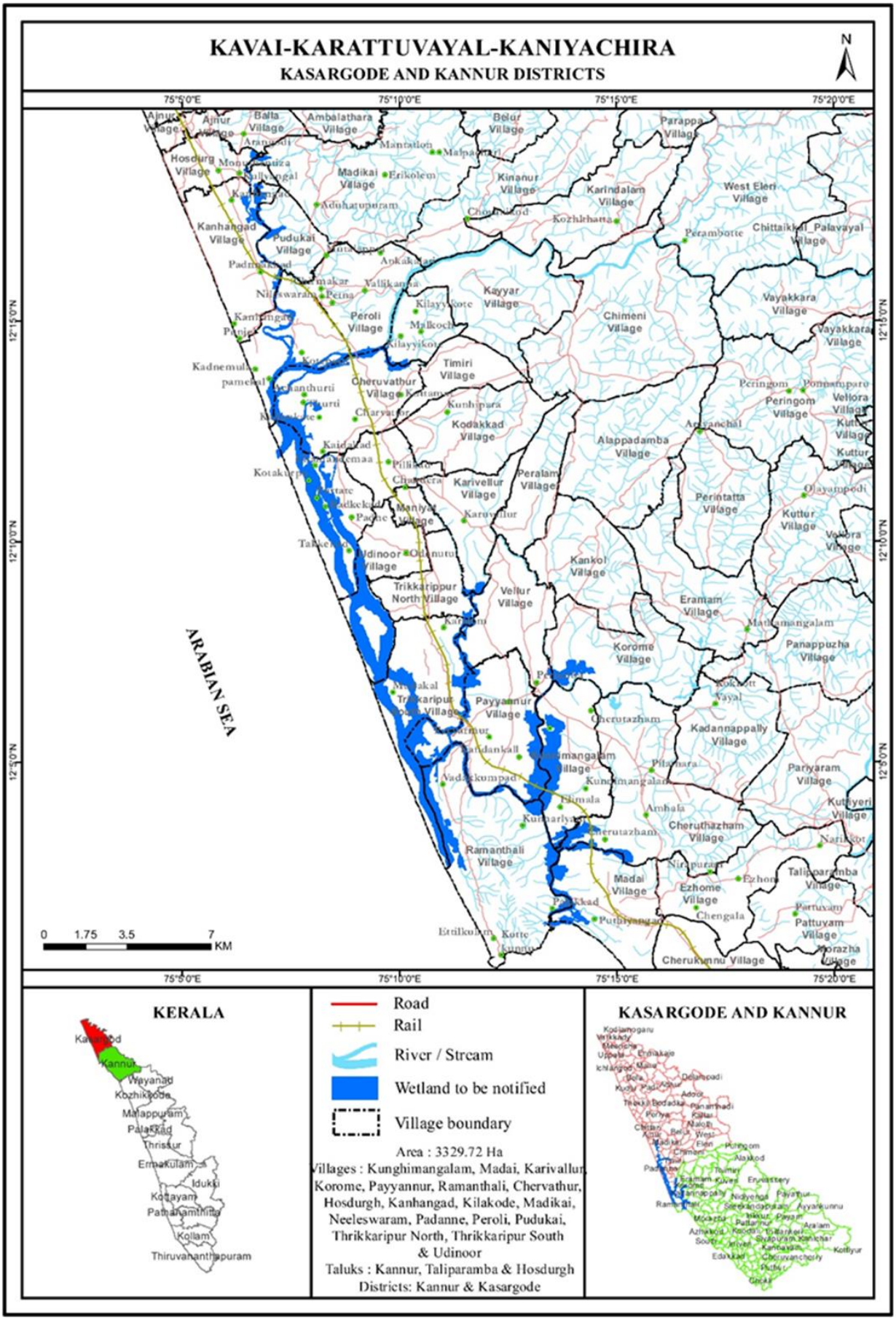
❒ Wetland/ wetlands complex boundary has been delineated using GIS and firmed up by adequate ground truthing

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

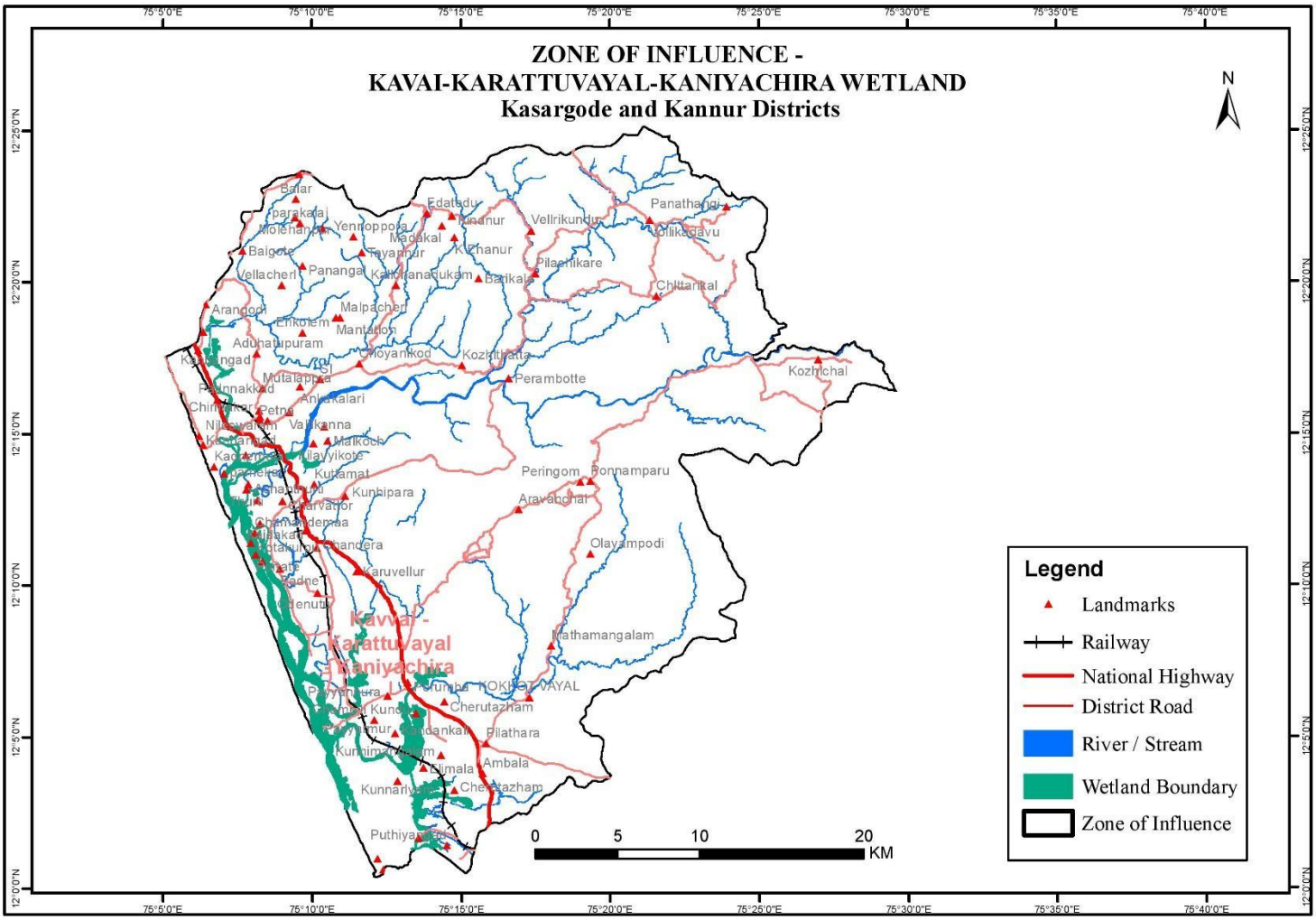
☑ Zone of influence has been delineated and included in wetland map or a separate map

- ☑ 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 provided

Annexure I :


KAVAI-KARATTUVAYAL-KANIYACHIRA
KASARGODE AND KANNUR DISTRICTS
N
75°5'0"E
75°10'0"E
75°15'0"E
75°20'0"E
12°15'0"N
12°10'0"N
12°5'0"N
ARABIAN SEA
0 1.75 3.5 7 KM
KERALA
Kasaragod
Kannur
Wayanad
Kozhikode
Malappuram
Palakkad
Thrissur
Ernakulam
Idukki
Kottayam
Pathanamthitta
Kollam
Thiruvananthapuram
Road
Rail
River / Stream
Wetland to be notified
Village boundary
Area : 3329.72 Ha
Villages : Kunghimangalam, Madai, Karivallur, Korome, Payyannur, Ramanthali, Chervathur, Hosdurgh, Kanhangad, Kilakode, Madikai, Neeleswaram, Padanne, Peroli, Pudukai, Thrikkaripur North, Thrikkaripur South & Udinoor
Taluks : Kannur, Taliparamba & Hosdurgh
Districts: Kannur & Kasargode
KASARGODE AND KANNUR

Annexure II :


ZONE OF INFLUENCE -
KAVAI-KARATTUVAYAL-KANIYACHIRA WETLAND
Kasargode and Kannur Districts
N
Legend
Landmarks
Railway
National Highway
District Road
River / Stream
Wetland Boundary
Zone of Influence
0 5 10 20
KM
Kavvai -
Karattuvayal
Kaniyachira
Bekal
Edatadu
Kunhanur
Vellrikundu
Panathadi
Yennippora
Madakal
Kizhanur
Pilathara
Ambala
Perambotte
Kozhichal
Peringom
Ponnamparu
Aravanchal
Olayampodi
Karuvellur
Irathamangalam
Cherutazham
Kunnariyam
Puthiyapalam