



Ramsar Information Sheet

Published on 25 July 2022

India

Pichavaram Mangrove



Designation date	8 April 2022
Site number	2482
Coordinates	11°26'17"N 79°47'11"E
Area	1 478,64 ha

Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

1 - Summary

Summary

Pichavaram mangrove, spanning 1478 Ha, is located between two prominent estuaries, the Vellar estuary in the north and Coleroon estuary in the south. The Vellar-Coleroon estuarine complex forms the Killai backwater and Pichavaram mangroves. The backwaters are interconnected by the Vellar and Coleroon river systems and offer abundant scope for water sports such as rowing, kayaking, and canoeing. The Pichavaram forest not only offers waterscape and backwater cruises but also another very rare sight – the mangrove forest trees are permanently rooted in a few feet of water. Like other mangrove wetlands in India, Pichavaram mangroves support unique diversity of flora and fauna. Two major rivers viz. Vellar and Coleroon drain into the Bay of Bengal in this area. The area between the two rivers is estuarine having brackish water with mangrove vegetation. The mangrove ecosystem acts as a bio-shield during natural disasters, holds and stabilizes shorelines, retards erosion and acts as a buffer zone between land and sea, and helps in adaptation to climate change. The forest habitat is classified as littoral and swamp forest, habitat. It has a natural hybrid species namely *Rhizophora annamalayana*. It is derived from two species of *Rhizophora*: *R.apiculata* and another natural hybrid *R.mucronata*. This mangrove ecosystem harbors diverse floral and faunal, especially aquatic fauna and wetland birds. The mangroves support several threatened species like Critically Endangered birds like the great white-bellied heron (*Ardea insignis*), spoon billed sandpiper (*Eurynorhynchus pygmeus*), Endangered spotted greenshank (*Tringa guttifer*). The vulnerable Olive ridley turtle lays its eggs every year on the beaches of the Pichavaram coastline. In addition to these 22 species, prawns like *Metapeneausaffinis*, *Metapeneaus brevicornis* are also found in the Pichavaram water. This area supports the livelihoods of 1000 families for fishing around this habitat. The mangroves have a significant degree of spiritual value. According to the Sthala Purana, the Sthala Vriksham in Chidambaram Lord Nataraja Temple was the mangrove species *Excoecaria agallocha* commonly known as Tillai, has been worshipped since the 18th Century. The region used to be called "Tillai Vanam". Therefore these mangroves are also revered by the local communities.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency	Tamil Nadu State Wetland Authority
Postal address	Taminadu State Wetland Authority, Panagal Maligai, No.1, Jeenis Road, Saidapet, Chennai – 600 015 INDIA

National Ramsar Administrative Authority

Institution/agency	Ministry of Environment, Forest and Climate Change
Postal address	Ministry of Environment, Forest and Climate Change Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi 110003 INDIA

2.1.2 - Period of collection of data and information used to compile the RIS

From year	<input type="text" value="2018"/>
To year	<input type="text" value="2021"/>

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	<input type="text" value="Pichavaram Mangrove"/>
Unofficial name (optional)	<input type="text" value="Thillai Vanam"/>

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image
<1 file(s) uploaded>

Former maps	<input type="text" value="0"/>
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Boundaries description

Pichavaram mangrove forest (Lat. 11°29'N; Long. 79°46'E) is located between the Vellar and Coleroon estuaries.

North: Northern most point starts from Cairn No.1, Northern most point of 138 is killai. It runs to Northeast of nearly a mile to the boundary stone of the Northwest corner of Thandavaranyan Sozhan Pettai Village boundary, along the north boundary of the village to the next boundary stone of a distance of two and a half furlongs.

East: Is along the east boundary of the village to the northeast corner of survey no. 138 of the said village.

South: Is along the North side of the 2nd,4th and 5th kandams to the kandam stone of a chain, south of the south west corner of survey No.99. Hence the straight to the angle immediately south west of the eastern most corner of survey No. 113. Hence along the south east, north east and north west side of that number to the Kandam stone near the east corner of No. 112.

West: The straight line to the northmost corner of surveys 1 to 6 along the east side of surveys Nos.127 and 128 to the northeast corner of the latter, all of Thandavaranyan Solagan Pettai. Hence a straight line to the southern most point of survey No. 83 of killai. Hence along the east side to the north east corner.

2.2.2 - General location

a) In which large administrative region does the site lie?	<input type="text" value="The Headquarters of the pichavaram Mangrove is located at Cuddalore town, in Cuddalore district, Tamil Nadu"/>
b) What is the nearest town or population centre?	<input type="text" value="Chidambaram and Cuddalore"/>

2.2.3 - For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries? Yes No

b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes No

2.2.4 - Area of the Site

Official area, in hectares (ha):

Area, in hectares (ha) as calculated from GIS boundaries

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Marine Ecoregions of the World (MEOW)	The Pichavaram mangrove lies in the biogeographical zone namely South India and Sri Lanka (104) under the West and South Indian Shelf Region. The Pichavaram Mangroves Comes under the South India and Sri Lanka regionalisation scheme.

Other biogeographic regionalisation scheme

According to Biogeographic classification of India, Pichavaram mangroves fall under the Coastal Region of India that encompasses sandy beaches, mud flats, coral reefs, mangroves constituting 2.5% of the total geographical area. The coastline from Gujarat to Sundarbans mangroves is estimated to be 5423 km long and the length of Tamil Nadu coastline is 1076 km. Apart from a total of 25 islets constitute the Lakshadweep, which are of coral origin and have a typical reef lagoon system, rich in biodiversity. The fauna includes native crabs, turtles and tunas.

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

Criterion 1: Representative, rare or unique natural or near-natural wetland types

The Pichavaram mangrove wetland is one of the largest mangrove forests in India, covering an area of 1478 ha, and with 51 islets ranging from 10 m² to 2 km² separated by intricate waterways, creeks and channels which connect the Vellar, Uppanar and Coleroon estuaries. The whole wetland complex is in Cauvery river basin and in particular Coleeran, sub-basin. Bay of Bengal in the east and Palk Bay in the South influence the Wetland. Mangroves grow in the intertidal zone of tropical coasts and are nourished by the influence of freshwater and tidal water added to local rainfall.

Hydrological services provided

Ecologically mangroves are important for enhancing the fishery production of the wetland system and also enriching the nearby coastal water by exporting the detritus from the forest through tidal action. The freshwater reaching an estuary fluctuates on many scales and the fluctuation in the flow over a time period, these fluctuations may have profound effects on the estuarine ecosystem, which usually has remarkable biological productivity and diversity. They also play a major role in stabilizing the shoreline and protecting the coastal community from coastal hazards like cyclones and tsunamis. Mangroves are confined in a brackish water environment and adapt to changing environmental conditions including salinity through physiological and biochemical mechanisms. Water transports in mangroves occur for short periods of the tidal cycle and the flow inside the mangroves is slow and sluggish to a maximum velocity of about 5 cm/s and this is the period in which major hydrochemical exchanges take place between soil and water. Ecological patterns and the structural parameters of the mangroves are closely linked to the pattern of hydrology and salinity that is altered by the quantity of freshwater flow and tidal flow. Freshwater also brings the necessary nutrients facilitating the growth of many mangrove species. The nutrient balance of the mangrove ecosystem due to the salinity, inorganic nutrients and chlorophyll-a is also influenced by tidal cycles.

Other ecosystem services provided

Pichavaram Mangroves is a feeding and breeding ground for number of migratory bird species. The habitat supports many threatened species like, Critically Endangered birds like great white bellied heron (*Ardea insignis*), spoon billed sandpiper (*Eurynorhynchus pygmeus*), Endangered spotted greenshank (*Tringa guttifer*), Threatened bird species like spot-billed pelican (*Pelecanus philippensis*), black-necked stork (*Ephippiorhynchus asiaticus*), white necked stork (*Ciconia piscopus*), white ibis (*Threskiornis melanocephalus*), Asian dowitcher (*Limnodromus semipalmatus*) and oriental darter (*Anhinga melanogaster*). These birds along with the painted stork (*Mycteria leucocephala*) and, curlew sandpiper (*Calidris testacea*) feed on this site. Olive Ridley turtle arrives here every year for egg laying in along the Pichavaram coastline. Further, the Pichavaram Mangrove has a uniqueness of *Rhizophora annamalayana* another natural mangrove hybrid with a rare seed set.

Other reasons

The Pichavaram mangrove is an important tourist area, with more than 1 lakh (100'000) tourists visiting every year. The mangrove ecosystem acts as a bio-shield during natural disasters and holds and stabilizes the shoreline and protects the environment from erosion, acting as a buffer zone between land and sea, besides helping in adapting to climate change. Livelihoods of about 1000 fisher families depend on this area.

Criterion 2 : Rare species and threatened ecological communities

Criterion 3 : Biological diversity

Justification

The Pichavaram Mangrove habitat harbors a diverse variety of floral and faunal species. A total of 86 species of plant varieties are recorded here. Of these 14 are mangrove species, Among these 10 are endangered species. It is unique to have a luxuriant growth of Rhizophora species along the waterward side, and an extensive stretch of Avicennia species towards the landward side. It has a natural hybrid species namely Rhizophora annamalayana. It is derived from two species of Rhizophora: R. apiculate and R. mucronate (another natural hybrid). This hybrid species is the first world record only to occur in Pichavaram. However, this species faces a problem of high sterility and the propagules are rarely produced. The wetland supports around 16 species of Mammals, 200 species of fishes, 115 species of birds, 20 species of mollusks, 30 species of crabs, 20 species of prawns, 52 species of bacteria, 23 species of fungi, 82 species of phytoplankton, 22 species of seaweeds, 95 species of zooplankton, 40 species of microbenthos and 52 species of macrobenthos

Criterion 4 : Support during critical life cycle stage or in adverse conditions

Optional text box to provide further information

The wetland supports five species in critical stages of their life cycles including Ditylenchus dipsaci, Limosa limosa, Pelecanus philippensis, Tringa guttifer, Rhizophora annamalayana. R. annamalayana is a mangrove hybrid recorded in Pichavaram and Andaman and Nicobar islands with a rare seed set. Pichavaram, thus is one of the few places with their viable pollens. D. dipsaci is a migratory endoparasite playing an important role in biomass decomposition. The availability of different habitat types within Pichavaram as well as adjoining croplands provide resting, roosting grounds for L. limosa, P. philippensis and T. guttifer.

Criterion 5 : >20,000 waterbirds

Overall waterbird numbers

20100

Start year

2020

Source of data:

Tamil Nadu Forest Department Census

Criterion 6 : >1% waterbird population

Optional text box to provide further information

The Pichavaram mangrove support 1 or more percentage population of four waterbird species namely Limosa limosa, Pelecanus philippensis, Threskiornis melanocephalus, Tringa guttifer.

Criterion 7 : Significant and representative fish

Justification

The four indigenous fish species (Mugil cephalus, Osteomugil cunnesius, Planiliza macrolepis, Planiliza subviridis) are critical to maintaining the coastal ecosystem diversity of the Coromandal coast.

Criterion 8 : Fish spawning grounds, etc.

Justification

The wetland has atleast four indigenous fish species (Mugil cephalus, Osteomugil cunnesius, Planiliza macrolepis, Planiliza subviridis) which use the mangrove habitat as a nursery.

3.2 - Plant species whose presence relates to the international importance of the site

Phylum	Scientific name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
Plantae								
TRACHEOPHYTA / MAGNOLIOPSIDA	<i>Avicennia marina marina</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EN	<input type="checkbox"/>	Endangered as per national records too	Supports rich avifauna, representative of the biodiversity of the realm. Endangered.
TRACHEOPHYTA / MAGNOLIOPSIDA	<i>Rhizophora annamalayana</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	EN	<input type="checkbox"/>	Endemic to Pichavaram	Supports rich avifauna, representative of the biodiversity of the realm. Endangered species. The wetland supports this species at critical stages of its life-cycle.
TRACHEOPHYTA / MAGNOLIOPSIDA	<i>Suaeda aegyptiaca</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EN	<input type="checkbox"/>		Supports rich avifauna, representative of the biodiversity of the realm. Endangered.
TRACHEOPHYTA / MAGNOLIOPSIDA	<i>Suaeda nigra</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	EN	<input type="checkbox"/>		Supports rich avifauna, representative of the biodiversity of the realm. Endangered
TRACHEOPHYTA / MAGNOLIOPSIDA	<i>Tecticornia indica ciliolata</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VU	<input type="checkbox"/>		Supports rich avifauna, representative of the biodiversity of the realm. Vulnerable species.
TRACHEOPHYTA / MAGNOLIOPSIDA	<i>Tecticornia indica indica</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VU	<input type="checkbox"/>	VU	Supports rich avifauna, representative of the biodiversity of the realm. Vulnerable species.

The Pichavaram mangrove habitat has overcome with 87 plant species. In which 14 mangrove species are dominated this habitat includes 10 threatened category under IUCN (International Union for Conservation of Nature), CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) and CMS (Conservation of Migratory Species on Wild Animals).

3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
Others																	
NEMATODA/ SECERNENTEA	<i>Ditylenchus dipsaci</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Vulnerable species. Contributes to maintaining the biodiversity of the biogeographic realm. The wetland supports this species during important life-cycle stages.
CHORDATA/ MAMMALIA	<i>Lutrogale perspicillata</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Vulnerable species. Contributes to maintaining the biodiversity of the biogeographic realm
CHORDATA/ MAMMALIA	<i>Macaca radiata</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Vulnerable species. Contributes to maintaining the biodiversity of the biogeographic realm
Fish, Mollusc and Crustacea																	
CHORDATA/ ACTINOPTERYGII	<i>Mugil cephalus</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Uses the wetland as a nursery.
CHORDATA/ ACTINOPTERYGII	<i>Osteomugil cunnesius</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		Uses the wetland as a nursery.
CHORDATA/ ACTINOPTERYGII	<i>Planiliza macrolepis</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Uses the wetland as a nursery.
CHORDATA/ ACTINOPTERYGII	<i>Planiliza subviridis</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		Uses the wetland as a nursery.
Birds																	
CHORDATA/ AVES	<i>Limnodromus semipalmatus</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2100	2021		NT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NT	Contributes to maintaining the biodiversity of the biogeographic realm. Contributes to the wetland supporting more than 20000 waterbirds.
CHORDATA/ AVES	<i>Limosa limosa</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2300	2021	1.5	NT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NT	Contributes to maintaining the biodiversity of the biogeographic realm. The wetland supports this species during important life-cycle stages. Contributes to the wetland supporting more than 20000 waterbirds. The wetland supports 1.5% of the known South Asian population.
CHORDATA/ AVES	<i>Mycteria leucocephala</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3400	2021		NT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NT	Contributes to maintaining the biodiversity of the biogeographic realm. The wetland supports this species during important life-cycle stages. Contributes to the wetland supporting more than 20000 waterbirds.
CHORDATA/ AVES	<i>Numenius arquata</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	700	2021		NT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NT	Contributes to maintaining the biodiversity of the biogeographic realm. Contributes to the wetland supporting more than 20000 waterbirds.
CHORDATA/ AVES	<i>Threskiornis melanocephalus</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1700	2021	7	NT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NT	Contributes to maintaining the biodiversity of the biogeographic realm. Contributes to the wetland supporting more than 20000 waterbirds. The wetland supports 7% of known South Asian population.
CHORDATA/ AVES	<i>Tringa guttifer</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	500	2021	10	EN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Endangered Species. Contributes to maintaining the biodiversity of the biogeographic realm. The wetland supports this species during important life-cycle stages. Contributes to the wetland supporting more than 20000 waterbirds. The wetland supports over 10% of the known population.

1) Percentage of the total biogeographic population at the site

The population figure of 137 (0.7%) is based on Care Earth Trust and a study conducted at Cauvery/ Kollidam region that has connectivity to Pichavaram mangroves. However robust data on Pichavaram population estimates are not available.

Smooth coated otters are facing a high risk of extinction, due to the fact that they are severely-affected by poaching, habitat loss, fishing and conflict with fishermen. For instance, overfishing and sand mining has killed otters in the Cauvery, and hunting by nomads for its meat and skin has further worsened the situation.

Pichavaram forming the southern Indian mangroves linked to Cauvery supports significant population of smooth coated otters. With Smooth-Coated otters getting the highest protection under CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), these riverine species need much more protective measures for its survival in the days to come, experts opine. India's proposal for the highest level of protection under CITES was accepted, with 50 per cent of the global otter pelt seizures occurring in India. At the recently concluded CITES conference at Geneva, the species is moved from Appendix II to I. With this, any commercial global trading of these species is now prohibited. However, sounding caution, wildlife officials and otter experts say that not just these, it is the loss of its habitat to farming and illegal fishing that is threatening the existence of the species.

3.4 - Ecological communities whose presence relates to the international importance of the site

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
Tidal Swamp Forests	<input checked="" type="checkbox"/>		This rare and unique Tidal Swamp Forest type as per Champion and Seth Classification is present in the Pichavaram Mangroves area of the Wetland Complex which is the old existing stretch in India.

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

Pichavaram Mangrove Forest is located between the Vellar in the North, the Coleroon in the South, and the Uppanar in the West. It is one of the largest mangrove ecosystems in India. It communicates with the sea by a shallow passage which is the only opening in the sandy littoral stand. There are numerous channels in the mangroves linked with the sea on one hand and the rivers Vellar, Coleroon, and Uppanar on the other hand. The mangrove cover in Pichavaram can be grouped with coastal forests of Cuddalore Forest Division spread over 1478.642 ha. Due to the diversity of habitats, the vegetation of the Pichavaram Mangrove Forest is equally diverse, ranging from Dry Evergreen Forests, mangrove vegetation, and salt marsh.

The wetland supports at least 200 species of fishes, 115 species of birds, 20 species of molluscs, 30 species of crabs, 20 species of prawns, 86 species of plants, 52 species of bacteria, 23 species of fungi, 82 species of phytoplankton, 22 species of seaweeds, 95 species of zooplankton, 40 species of micro benthos and 52 species of macro benthos. The forest area has also been a regular nesting site of the endangered Olive Ridley turtle. The site is the spawning and/or nursing ground for commercially important prawns, mainly white prawn (*Penaeus indicus*) and tiger prawn (*P. monodon*), crabs, and fishes. A total of 200 waterbird have been recorded from the area. Some of the major water bird species are the spot-billed pelican (*Pelecanus philippensis*), spoon billed sandpiper (*Calidris pygmeus*), and Asian Dowitcher (*Limnodromus semipalmatus*), white-bellied sea-eagle (*Haliaeetus leucogaster*), Brahminy Kite (*Haliaeetus turindus*) and osprey (*Pandion haliaetus*). The site harbors about 200-300 individuals of grey pelican, which is under the endangered category. The livelihoods of the local communities are intrinsically linked to the forest area. The locals accrue their revenue from its natural resources, especially fish, firewood, forest produce, and grazing lands for livestock. The mangroves have a significant degree of spiritual value. According to the Sthala Purana, the Sthala Vriksham in Chidambaram Lord Nataraja Temple was the mangrove species *Excoecaria agallocha* commonly known as Tillai, has been worshipped since the 18th Century. The region used to be called "Tillai Vanam". Therefore these mangroves are also revered by the local communities.

4.2 - What wetland type(s) are in the site?

Marine or coastal wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
I: Intertidal forested wetlands	Pichavaram Mangrove	1	1478	Representative

(ECD) Habitat connectivity

Vegetation classified into-Mangroves & Tidal swamps. Mangrove forest area of 51 islets separated by complex network of creeks; *Rhizophora* belt-in frequently inundated areas, followed by wide *Avicennia* belts-on submerged terrains during equinoctial tides

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Acanthus ebracteatus</i>	IUCN (LC) and Supports rich avifauna, representative of the biodiversity of the realm.
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Aegiceras corniculatum</i>	IUCN (LC) and Supports rich avifauna, representative of the biodiversity of the realm
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Bruguiera cylindrica</i>	IUCN (LC)
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Excoecaria agallocha</i>	IUCN (LC)
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Lumnitzera racemosa</i>	IUCN (LC)
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Rhizophora apiculata</i>	IUCN (LC)
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Rhizophora mucronata</i>	IUCN (LC)

Invasive alien plant species

Phylum	Scientific name	Impacts
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Prosopis juliflora</i>	Actual (major impacts)

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Pop. size	Period of pop. est.	% occurrence	Position in range /endemism/other
CHORDATA/AVES	<i>Anhinga melanogaster</i>	1600	2021		IUCN (NT). Contributes to maintaining the biodiversity of the biogeographic realm. Contributes to the wetland supporting more than 20000 waterbirds.
CHORDATA/AVES	<i>Pelecanus philippensis</i>	2800	2021	28	IUCN (NT) Contributes to the wetland supporting more than 20000 waterbirds. The wetland supports over 20% of the known South Asian population.
CHORDATA/AVES	<i>Podiceps cristatus</i>	3300	2021		IUCN (LC). Contributes to the wetland supporting more than 20000 waterbirds
CHORDATA/AVES	<i>Tadorna ferruginea</i>	1700	2021		IUCN (LC). Contributes to the wetland supporting more than 20000 waterbirds

Invasive alien animal species

Phylum	Scientific name	Impacts
CHORDATA/MAMMALIA	<i>Equus caballus</i>	Potential

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
A: Tropical humid climate	Aw: Tropical savanna (Winter dry season)

The climate is monsoonal, but is not typical of monsoonal climates due to its asymmetrical rainfall regime. An unique feature is that though the coastal Tamil Nadu is also categorized under Tropical Savanna Climate, but the area has typical climate of Winter Rainfall through North-East Monsoon Winds. The main contribution to the rainfall is from the North-East Monsoon (October - December), and to considerably lesser degree, the South-West Monsoon (June - September). There is much variation in the quantum of rainfall from year to year, as the area is vulnerable to cyclonic storms that influence the distribution and quantum of rainfall considerably. The average rainfall ranges from 1000-1500 mm (Meher-Homji 1984). The highest temperatures (ca 34°C) are recorded in May, and the minimum (ca 25°C) in January and February. Humidity remains relatively high and constant throughout the year.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

- Entire river basin
- Upper part of river basin
- Middle part of river basin
- Lower part of river basin
- More than one river basin
- Not in river basin
- Coastal

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

The Whole Wetland Complex is in Cauvery River Basin and in particular coleroon, Sub-Basin. Bay of Bengal in the East and Palk Bay in South influences the Wetland.

4.4.3 - Soil

- Mineral
- Organic
- No available information

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes No

Please provide further information on the soil (optional)

The soil present Pichavaram Mangroves areas in is clayey due to the estuarine nature of the area and consequent successive deposits of alluvial silt brought down by the River Vellar and Coleroon

4.4.4 - Water regime

Water permanence

Presence?	
Usually permanent water present	No change
Usually seasonal, ephemeral or intermittent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	
Water inputs from precipitation	<input checked="" type="checkbox"/>	No change
Water inputs from surface water	<input checked="" type="checkbox"/>	No change
Water inputs from groundwater	<input checked="" type="checkbox"/>	No change
Marine water	<input checked="" type="checkbox"/>	No change

Water destination

Presence?	
Marine	No change

Stability of water regime

Presence?	
Water levels fluctuating (including tidal)	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology.

The fresh water reaching an estuary fluctuates on many scales and the fluctuation in the flow over a time period ,these fluctuations may have profound effects on the estuarine ecosystem, which usually has remarkable biological productivity and diversity. They also play a major role in stabilizing the shoreline and protecting the coastal community from the coastal hazards like cyclone and tsunami. Mangroves are confined in brackish water environment and adapt to changing environmental condition including salinity through a physiological and biochemical mechanisms.

4.4.5 - Sediment regime

Significant erosion of sediments occurs on the site

Significant accretion or deposition of sediments occurs on the site

Significant transportation of sediments occurs on or through the site

Sediment regime is highly variable, either seasonally or inter-annually

Sediment regime unknown

Please provide further information on sediment (optional):

The soil present Pichavaram Mangroves areas in is clayey due to the estuarine nature of the area and consequent successive deposits of alluvial silt brought down by the River Vellar and Coleroon.

(ECD) Water temperature

Water temperature are varied from 22oC to 34oC

4.4.6 - Water pH

Acid (pH<5.5)

Circumneutral (pH: 5.5-7.4)

Alkaline (pH>7.4)

Unknown

4.4.7 - Water salinity

Fresh (<0.5 g/l)

Mixohaline (brackish)/Mixosaline (0.5-30 g/l)

Euhaline/Eusaline (30-40 g/l)

Hyperhaline/Hypersaline (>40 g/l)

Unknown

Please provide further information on salinity (optional):

Pichavaram Mangroves Forest: Salinity from 5-15 ppt (gm/liter) during the monsoon to about 35 ppt during summer.

Killai: Salinity varies from 10 ppt (monsoon) to 50 ppt (summer)

4.4.8 - Dissolved or suspended nutrients in water

Eutrophic

Mesotrophic

Oligotrophic

Dystrophic

Unknown

(ECD) Dissolved organic carbon	DOC varie from 51.59 (µM) to 87.05 (µM)
(ECD) Redox potential of water and sediments	Redox potential of water and sediments (ECD) Sediment varied from 1.9 Φ to 3.0 (Avg 2.38 Φ)

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the i) broadly similar ii) significantly different site itself:

Surrounding area has greater urbanisation or development

Surrounding area has higher human population density

Surrounding area has more intensive agricultural use

Surrounding area has significantly different land cover or habitat types

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	High
Fresh water	Drinking water for humans and/or livestock	High
Fresh water	Water for irrigated agriculture	High

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Erosion protection	Soil, sediment and nutrient retention	High
Hazard reduction	Flood control, flood storage	High
Hazard reduction	Coastal shoreline and river bank stabilization and storm protection	High

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Picnics, outings, touring	High
Recreation and tourism	Nature observation and nature-based tourism	High
Spiritual and inspirational	Spiritual and religious values	High
Spiritual and inspirational	Cultural heritage (historical and archaeological)	High
Scientific and educational	Long-term monitoring site	High

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	High
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	High
Nutrient cycling	Carbon storage/sequestration	High

Other ecosystem service(s) not included above:

Especially during December to March about 85% people come for recreation purpose, as well as for pilgrimage. During the months of January - April the frequency of people visiting is high.

Within the site: 15000

Outside the site: 10000

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes No Unknown

4.5.2 - Social and cultural values

i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland

ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland

iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples

Description if applicable

The local fisher communities comprising of about 1000 families are dependent on this wetland for their livelihood. Furthermore, fisheries are predominantly single caste hamlets. Panchayat system in fishing villages seems to be an integral part of the social life of fisher folk. Apart from the Panchayat Raj institutions (PRI) established by the government after 73rd Constitutional Amendment Act. The fishers do have parallel Traditional Panchayat system which is more powerful than the elected PRIs as far as fishing hamlets are concerned. In Cuddalore district, about three villages have dissolved the Traditional Panchayat. The Panchayat team will be elected once in a year. They look after the conflicts between and within the villages and sort out the issue amicably. The traditional Panchayat will have common fund for the emergency need and temple functions.

iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland

4.6 - Ecological processes

<no data available>

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
Provincial/region/state government	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Other

Category	Within the Ramsar Site	In the surrounding area
Commoners/customary rights	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Provide further information on the land tenure / ownership regime (optional):

The entire forest of Pichavaram was notified as reserve forest in two stages, in 1893 Pichavaram Reserve Forests), and 1892 Killai RF.

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

Cuddalore District

Local Office : Forest Range Office, Pichavaram Range, Chidambaram

Control Office : District forest Officer, Cuddalore Division, Cuddalore district

Provide the name and/or title of the person or people with responsibility for the wetland:

District Collector, Cuddalore District, District forest Officer, Cuddalore Division, Cuddalore district

Postal address:

District Forest Office,
Cuddalore Division
Old Collectorate Building
Manjakuppam
Cuddalore District - 607001
Tamil Nadu
INDIA

E-mail address:

dfocud@yahoo.com

5.2 - Ecological character threats and responses (Management)

5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Housing and urban areas	Medium impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Commercial and industrial areas	Medium impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Salinisation	Medium impact		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Livestock farming and ranching	Medium impact		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Mining and quarrying	Medium impact		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Gathering terrestrial plants	Medium impact	Medium impact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Logging and wood harvesting	Medium impact		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fishing and harvesting aquatic resources	Medium impact		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Hunting and collecting terrestrial animals	Medium impact		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Unspecified/others	Medium impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vegetation clearance/ land conversion	Medium impact		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Invasive non-native/ alien species	Medium impact		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Agricultural and forestry effluents	Medium impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Household sewage, urban waste water	Medium impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Industrial and military effluents	Medium impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
The mangrove was declared as a Reserve forest on 11 th February 1893 (Government notification B.P. No. 98 and 430)	Pichavaram Mangrove		whole

5.2.3 - IUCN protected areas categories (2008)

- Ia Strict Nature Reserve
- Ib Wilderness Area: protected area managed mainly for wilderness protection
- II National Park: protected area managed mainly for ecosystem protection and recreation
- III Natural Monument: protected area managed mainly for conservation of specific natural features
- IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention
- V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation
- VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Partially implemented

Habitat

Measures	Status
Hydrology management/restoration	Implemented
Re-vegetation	Partially implemented
Improvement of water quality	Proposed

Species

Measures	Status
Threatened/rare species management programmes	Partially implemented
Control of invasive alien animals	Partially implemented
Control of invasive alien plants	Partially implemented

Human Activities

Measures	Status
Regulation/management of wastes	Implemented
Livestock management/exclusion (excluding fisheries)	Partially implemented

5.2.5 - Management planning

Is there a site-specific management plan for the site? No

Has a management effectiveness assessment been undertaken for the site? Yes No

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes No

Please indicate if a Ramsar centre, other educational or visitor facility, or an educational or visitor programme is associated with the site:

AVC College of Institution, CAS Marine biology, Annamalai University and Madras University visit the site for educational tours.

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No need identified

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Birds	Implemented

Many research studies are conducted on ecological aspects and Bird community. The forest department conducts annual censusing of Bird Population for understanding the migratory and residential bird population status. Further ecological aspects and physico-chemical parameters need to be studied. Monitoring should be focused on threatened species of floral and fauna.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

<no data available>

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

<4 file(s) uploaded>

ii. a detailed Ecological Character Description (ECD) (in a national format)

<no file available>

iii. a description of the site in a national or regional wetland inventory

<no file available>

iv. relevant Article 3.2 reports

<no file available>

v. site management plan

<no file available>

vi. other published literature

<no file available>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Striated Heron (Tamil Nadu State Wetland Authority, 02-11-2021)



Panoramic view of Pichavaram Mangrove (Tamil Nadu State Wetland Authority, 02-11-2021)



Panoramic view of Pichavaram Mangrove (Harsh Ganapathi, 10-05-2022)

6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation