REPORT

VEMBANAD FISH COUNT 2024

Submitted to

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Executive Summary:

The 17th edition of Vembanad Fish Count 2024 was conducted on 26/09/2024 to 27/09/2024 to assess the fishery and ecological dynamics of Vembanad Estuary, the largest tropical wetland ecosystem on the southwest coast of India. Fisherfolk, students and experts actively participated in comprehensive surveys, data collection, and analysis, leading to crucial findings and recommendations for sustainable fishery in the region. The Vembanad Fish Count (VFC) 2024 revealed a total of 85 recorded species, consisting of 74 finfish and 11 shellfish, indicating a notable increase in species diversity compared to previous assessments. However, this rise in diversity is accompanied by concerning trends, including low overall abundance and decreased levels of dissolved oxygen, both of which pose significant risks to the ecosystem's health. A particularly alarming finding is the substantial decline in the weight of *Macrobrachium rosenbergii*, commonly known as the giant freshwater prawn. This species, which typically weighs between 500-600 grams, was found to have an average weight below 300 grams this year, raising urgent concerns for the sustainability of the local prawn fishery. Potential contributing factors to these trends include pollution, disturbances from houseboat tourism, and inadequate salinity levels, especially in the southern regions of Vembanad. Among the species surveyed, *Parambassis* and *Labeo dussumieri* emerged as the most abundant. Addressing these environmental challenges is crucial for ensuring the continued viability of both biodiversity and local fisheries in the Vembanad estuary. Effective management and conservation strategies are essential for restoring balance and promoting ecological health in this vital aquatic ecosystem.

Background

Vembanad Lake, located in Alappuzha, Kerala, is the largest tropical wetland ecosystem on the southwest coast of India. It covers an area of 1,512 km^2 (Ramsar, 2002) and has been designated as a Ramsar site due to its global importance for biodiversity. Four rivers, namely Pampa, Meenachil, Achankovil, and Manimala, originate from the Western Ghats and converge in the southern part of Vembanad. These rivers bring water and rich sediments, ultimately draining into the Arabian Sea (Padmalal et al., 2008). As a result, Vembanad is known as the "inland fish basket" of Kerala (Padmakumar, 2003; Mayaja & Srinivasa, 2014). Besides its significance for fisheries, the lake also serves as a habitat for various migratory and resident birds (Kumar, 2006; S. P. Narayanan, Thomas, & Sreekumar, 2011).

Following the Second World War, the demand for food security was high due to poverty and malnourishment. Kuttanad, being a fertile region, faced pressure to intensify paddy cultivation. However, the main Punja crop season was affected by high tidal influxes, leading to the intrusion of salinity and rendering some areas uncultivable. To address this issue and enable a second cropping season, the Thannermukkom barrage was constructed and commissioned in 1976 (Asha, Cleetus, Suson, & Nandan, 2015). This barrage, measuring 1.4 km in length, aimed to prevent saltwater incursions into the paddy fields of Kuttanad and promote the main crop (Geetha, Chandramohan Kumar, & Mathews, 2007). It represents the most significant human intervention in Vembanad Lake. The closure of the barrage obstructs tidal effects and the flow of water to the south, thus impeding the natural flushing of contaminants. The deterioration of water quality in the lake can be directly attributed to the construction of the Thannermukkom barrage (Geetha et al., 2007). Additionally, the barrage has disrupted the reproduction patterns of fishery and clam resources, as certain fish species need to migrate to the northern part for spawning and vice versa (Kurup & Harikrishnan, 2000). The operation of the barrage during the summer season, when it remains closed, prevents saltwater from entering the low-lying paddy fields upstream (Sathyanathan, 2010), resulting in a decline in fishery resources, water stagnation, and the growth of water hyacinth (Suseelan, 1987; Commission, 2008; MSSRF, 2007; Manorama & Agricultural, 2013).

Since the commissioning of the Thannermukkom barrage, there has been a significant decline in the diversity and population of fishes (Kurup & Samuel, 1985; Kurup et al., 1993; Padmakumar, 2003). The fishery sector has been particularly affected by the barrage's construction, with the annual fish landing from Vembanad Lake dropping from approximately 16,000 tonnes in the late seventies to about 7,200 tonnes in 2000 (Unnithan, Bijoy, & Vava, 2001). Kurup et al. (1993) have reported reductions in the migration of marine fish and prawns to the lake for breeding. Despite the legal ban on fishing gear that leads to mass destruction and premature catching of inland fish, such practices persist due to livelihood needs (CERC ATREE, 2013). Even though many of the studies (Kannan 1979; Kurup & Samuel 1985; Laxmilatha & Appukuttan 2002; Krishna Kumar & Rajan 2012) have pointed out the decline in fishery resources, still the government hasn’t taken any major efforts to revive the fishery.

Vembanad Fish Count (VFC)

The Ashoka Trust for Research in Ecology and the Environment (ATREE) initiated the Vembanad Fish Count (VFC) in May 2008 as an annual participatory fish assessment event. The main objective of the event is to understand the fishery and ecological trends in Vembanad, a transitional ecotone between sea and land and the largest humid tropical wetland on the west coast of India. The event is organized in collaboration with several academic institutions, government departments and civil society organizations. VFC 2023 was made possible with the support of State Wetland Authority, Kerala, Kerala University of Fisheries and Ocean Sciences (KUFOS), Kerala University, Department of Fisheries, Alappuzha, Vembanad Nature Club, Vembanad Lake Protection Forums, S B College Changanassery, CUSAT, Amrita University Kollam, and St Albert's College Ernakulam.

VFC follows a democratic approach in resource monitoring, involving the participation of targeted groups such as fisher folk from Vembanad. The event aims to facilitate dialogue, knowledge sharing, and decision-making among stakeholders to address the issues related to the fishery resources and development opportunities in the region. Through the VFC, the fisher community has also organized as the Lake Protection Forum (LPF) to take a leading role in organizing conservation programs, including the establishment of fish sanctuaries.

The event brings together researchers, NGOs, environmentalists, students, and media from Southern India, as well as fishers, local self-governments, and schools from around the lake. The event serves as a platform for learning about the status of fishery resources in Vembanad and has helped in consolidating views on the issues and the need for immediate interventions.

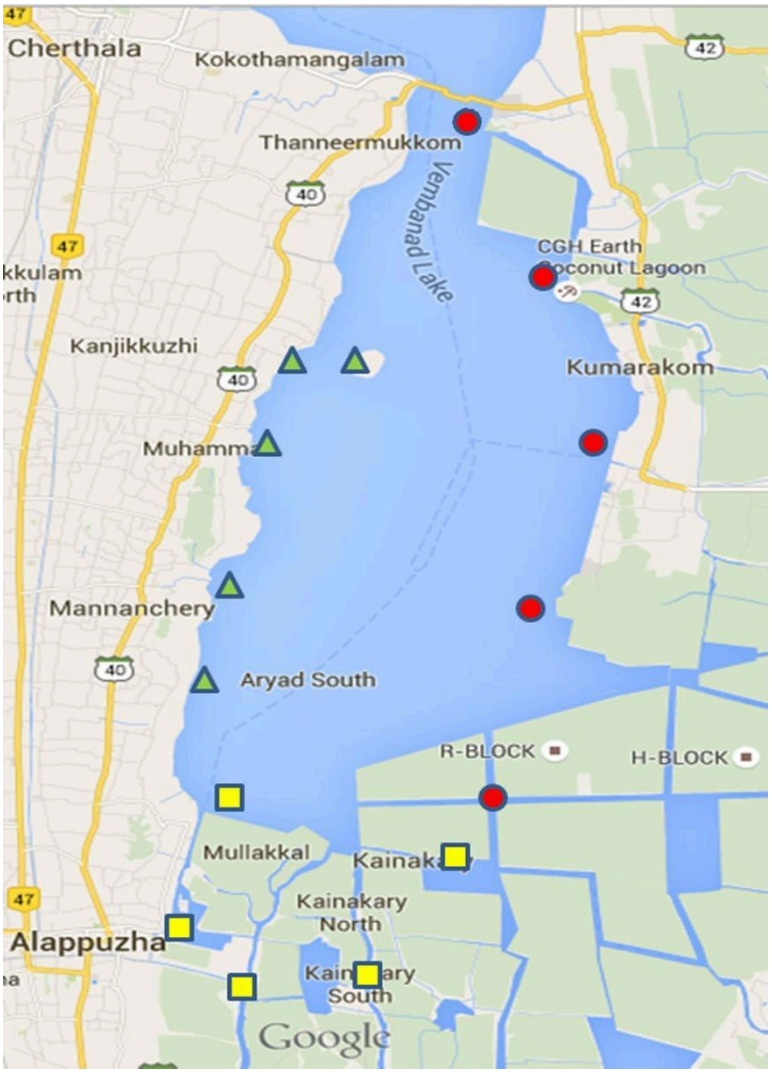
Objectives:

1. To carry out an extensive survey on the fish diversity of the southern sector of Vembanad Lake.
2. To focus attention on issues of lake deterioration and biodiversity decline through capacity building and public awareness.

Study Area:

Vembanad Lake is a Ramsar site and the largest humid tropical wetland on the west coast of India. It is a transitional ecotone between sea and land, with a length of 96 km and a surface area of 1512 km2. The lake is fed by seven rivers originating from the Western Ghats Biodiversity Hotspot and is known for its rich biodiversity, including fish, clams, shrimps, crabs, aquatic insects, and other aquatic organisms. However, the lake is facing ecological problems due to water hyacinth proliferation, eutrophication, unmanaged tourism, and unethical fishery practices. VFC covering the southern part of the Vembanad by three cruises.

- East Cruise
- West Cruise
- Riverine Cruise



Methodology:

The VFC 2024 involved the participation of 100 volunteers from local stakeholders, colleges, universities, research institutes, and non-governmental agencies. The entire team was divided into three cruise groups: The Kumarakom Cruise (East Bank), Kuttanad (Riverine Sector) Cruise and Pathiramanal Cruise (West Bank) with 30-35 members in each team. Each cruise team was further subdivided into four to assign responsibilities for 1) experimental fishing, 2) collecting data from landing centers, 3) collecting data from fishers in the lake and 4) water quality monitoring. The cruise teams conducted experiments at 15 (5X3) previously identified sampling points.

'East Bank' cruise covered Ambika Market, Kumarakom, Nazreth, Chithira Kayal and R Block. 'Riverine cruise covered Punnamada, Chungam, Kainakary, Aarayiram Kayal and Sai. 'West Bank cruise covered Kayippuram, Pathiramanal, Muhamma, Mannamcheri and Aryad sampling points. The program commenced from 6 am and extended till 3 pm on 27th of May 2024.

A week before the survey, an expert team of fish taxonomists explored around the lake for fish landing centre inventory and collected the data from Vaikom and Pallom and Murinjapuzha landing centres during the early morning hours.

As part of capacity building an orientation workshop (participatory workshop) was arranged on the day before fish count in order to capacitate the participants on their duties and responsibilities and etiquettes to be followed during fish count. A fish identification guide, water quality analysis and collection kit were provided to carry out the exercise.

Experimental Fishing

This was facilitated with the help of local fishers who accompanied the cruise at all different stations using three major fishing gears, namely:

1. **Gill Net**: Gillnetting is a typical fishing method utilized by commercial and artisanal anglers. Gill nets are vertical panels of mesh commonly set in a straight line. Fish be caught by gill nets in 3 ways: (1) Wedged – held by the mesh around the body (2) Gilled – held by mesh slipping behind the opercula, or (3) Tangled – held by teeth, spines, maxillaries, or different distensions without the body entering the mesh. Usually, fish are gilled. One gill net each was laid at six locations, i.e., at two sites for each cruise. The nets were laid by around 2am and was retrieved by 6am. The collection was ice preserved till each team arrived for inspection. All entries were made on to the survey forms distributed to the participants
2. **Cast Net**: The net is cast or tossed by hand in such a way, to the point that it spreads out on the water and sinks. Entries were made as mentioned above. The specimens obtained were either left back after successful identification and counting or collected in alcohol/formalin depending upon the use to be carried out later on. Alcohol preservation was preferred in case of DNA analysis and formalin in case of further morphological lab examination.
3. **Scoop Net**: Scoop net, additionally called a hand net or plunge net, is a net or mesh basket held open by a loop. It might be on the end of a handle. Scoop

nets have been utilized since artifact and can be utilized for scooping fish close to the surface of the water. The basket is made of wire or nylon work, as opposed to fabric work, since crabs/fish fight, chomp, wander aimlessly when they are caught. Scoop net was also carried out five times at each at all five sites of each cruise and the following activities were done as the same as above.

The abundance (number of individuals at each sampling point) and diversity (type of each species) data had been recorded on the respective survey forms provided to the participants. An additional replicate data was also collected this year in order to maintain track of the number of individuals obtained per each netting.

Inventory made from Fishers

This was carried out with the due participation of local fishers who allowed us to check the species, which contributed to their catch on the count day. Enquiries were also made on the fishing methods and socio-economic information of the fishers. The obtained information was recorded to the respective survey forms.

Inventory made from Landing-centers

The major landing centers around the sampling sites viz. Murinjapuzha, Pallom and Vaikom were visited on the two consecutive days prior to fish count and the species diversity were recorded. The type of gear used and the percentage of commercially important fishes to the catches were recorded in consultation with the fishers.

Water Quality Parameters

Water quality parameters were tested onsite as well as offsite.

Onsite*:*

- **pH**: pH is a numeric scale used to specify the acidity or basicity of an aqueous solution. pH was measured using standard pH solution marketed by C.P.R. Environmental Education Centre, Chennai (CPREC). Water samples were collected and analyzed 3 times each to arrive at concordant values. In addition, samples were also taken aboard for confirmatory lab analysis.
- **Transparency**: Transparency of water relates to the depth that light penetrates water. The transmission of light into a body of water is critical since the sun is the essential wellspring of vitality for all organic phenomena. Light is vital for photosynthesis, a procedure that produces oxygen and food for consumers. It is a regular practice for researchers to consider the depth of the euphotic zone (the upper layers of a body of water into which adequate light penetrates to allow development of green plants) to be 2.7 times (approximately 3 times) the limit of visibility. As light penetrates water, it becomes attenuated and altered in its spectral composition. The change that occurs is from predominantly yellow light at the surface to blue-green at depth in clear water or yellow-green in waters having a high concentration of dissolved organic material. Secchi disk is a simple device used to measure the transparency of water bodies. Water clarity is related to amounts of suspended particles

(turbidity) as well as amounts of phytoplankton and zooplankton. Secchi readings were carried out at all sites and valued were recorded on to survey forms.

- **Temperature (atmospheric/water)**: Most aquatic organisms are largely cold-blooded (poikilothermic), meaning they are unable to internally regulate their core body temperature. Therefore, temperature exerts a major influence on the biological activity and growth of aquatic organisms. To a point, the higher the water temperature, the greater the biological activity. Fish, insects, zooplankton, phytoplankton, and other aquatic species all have preferred temperature ranges. Both water and atmospheric temperatures were measured at all sites using alcohol-based laboratory thermometers. Results were recorded on to survey forms.
- **Salinity**: Salinity is the amount of dissolved salt substance of the water. Salts are compounds like sodium chloride, magnesium sulfate, potassium nitrate, and sodium bicarbonate which dissolve into ions. Salinity was measured at all sites using a salinometer and the readings were recorded on to survey forms.

Offsite: Water samples were collected in 500ml water bottles to be analyzed at Kerala State Pollution Control Board (KSPCB) affiliated labs. Water samples for estimation of dissolved oxygen was fixed in field using Winkler A and B respectively after which all samples were preserved in ice boxes.

- **Total Hardness**: Total hardness is defined as the sum of calcium and magnesium hardness (Even though Fe^{2+}, Fe^{3+}, Sr^{2+}, Zn^{2+}, and Mn^{2+} may contribute to water hardness, their levels are typically much less than Ca^{2+} and Mg^{2+}. Their levels are not usually included in total hardness measurements) in mg/L as $CaCO_3$. Ideal quality water should not contain more than 80 mg/L of total hardness as CaCO3. (Vernier). High levels of total hardness are not considered a health concern. On the contrary, calcium is an important component of cell walls of aquatic plants, and of the bones or shells of aquatic organisms. Magnesium is an essential nutrient for plants and is a component of chlorophyll.
- **Dissolved Oxygen (DO)**: Dissolved oxygen (DO) is the amount of oxygen that is present in the water. It is measured in milligrams per liter (mg/L), or the number of milligrams of oxygen dissolved in a liter of water. Samples to be analyzed was collected using Winkler method.
- **Chloride**: Chloride (Cl^-) is regularly analyzed in water quality monitoring and research programs to help inform the stewardship of water resources.
- **Nitrite**: Nitrites occur in water as an intermediate product in the biological breakdown of organic nitrogen, being produced either through the oxidation of ammonia or the reduction of nitrate. The presence of large quantities of nitrites is indicative of wastewater pollution. Levels

exceeding 0.55 mg/L (ppm) nitrite-nitrogen can cause 'brown-blood' disease in finfish.

- **Phosphate**: A phosphate (PO_4^{3-}) is an inorganic chemical and a salt of phosphoric acid. Organic phosphates are important in biochemistry and biogeochemistry (ecology), and inorganic phosphates are mined to obtain phosphorus for use in agriculture and industry. (Headley et al., 1982). High phosphate concentrations in surface waters may indicate fertilizer runoff, domestic waste discharge, or the presence of industrial effluents or detergents. If high phosphate levels persist, algae and other aquatic life will flourish, eventually decreasing the level of dissolved oxygen due to the accelerated decay of organic matter. Algae blooms are encouraged by levels of phosphate greater than 25 micrograms/L.

Orientation Program

The orientation workshop for participants was held on September 26, 2024, at Karmasadan, Alappuzha Convent Square, starting at 6 PM. The session began with a welcome address delivered by Shri. Jojo T. D, Project Manager of ATREE-CERC. Dr. Priyadarsanan Dharma Rajan, Senior Fellow at ATREE, Bangalore, chaired the inaugural session. Dr. Bijukumar, Professor and Head of the Department of Aquatic Biology and Fisheries at the University of Kerala, presented a session on the "Impact of Climate Change on Fish Migration". Maneeja Murali, Senior Programme Officer at ATREE-CERC, then provided orientation for the 100 volunteers participating in the Vembanad Fish Count. She discussed the history of Vembanad, the activities of CERC, and the objectives of the Vembanad Fish Count. Participants were briefed on the methodology for data collection, as well as essential etiquettes and safety measures to be observed during the cruise. To facilitate effective survey conduct, participants were divided into three teams: East Bank, West Bank, and Riverine. A cruise leader was selected for each team, responsible for organizing group functions. Fishing gear, resource materials, and survey forms were distributed to each team before they dispersed for dinner.


VEMBANAD
FISH COUNT

The Survey:

On 27th September, 2024, the Fish Count event was initiated by Dr. Priyadarsanan Dharmarajan, at Punnamada Jetty in Alappuzha. The event included three cruise routes. At each site, the teams conducted experimental fishing using various gears such as gill nets, cast nets, and scoop nets. They also collected on-site water quality data and samples for off-site analysis, along with data on fish habitats. The collected data was discussed and compiled by each cruise team for presentation during the concluding session.

Valedictory Function:

The concluding session was held at KTDC Thanneermukkam returning cruise teams were received and valedictory session was inaugurated by Dr. Priyadarsanan Dharma Rajan (Senior Fellow, ATREE). Shri. Jojo T.D (Project Manager, ATREE-CERC) delivered the welcome address. The program was felicitated by Dr. M Sajeevan, Associate Professor, KUFOS.

Fish Count Findings:

The Vembanad Fish Count (VFC) 2024 revealed significant findings regarding the aquatic biodiversity of the Vembanad estuary. Key highlights include:

Species Diversity: A total of 85 species were recorded, consisting of 74 finfish and 11 shellfish species. This indicates a notable increase in species diversity compared to previous years, suggesting a potentially healthy ecological presence despite other concerning trends.

Overall Abundance: Despite the high diversity, the overall abundance of species was notably low. This disparity raises questions about the ecological balance in the estuary, where a rich variety of species does not equate to robust population numbers.

Dissolved Oxygen Levels: Measurements indicated lower levels of dissolved oxygen compared to prior counts, a critical factor for aquatic life health. Low oxygen levels can stress aquatic organisms, leading to reduced survival rates and population declines.

Decline in Giant Freshwater Prawn Weight: A particularly alarming finding was the reduced weight of *Macrobrachium rosenbergii*, with adult prawns averaging below 300 grams this year, a significant drop from the usual 500-600 grams. This decline poses a threat to the local prawn fishery and could have economic implications for fishermen reliant on this species.

Potential Causes for Declines: The report highlights possible contributing factors to these concerning trends, including pollution, disturbances from houseboat tourism, and inadequate salinity levels in the southern region of Vembanad. These factors may interact to create an unfavorable environment for many species, particularly the giant freshwater prawn.

Abundant Species: Among the species observed, Parambassis and *Labeo dussumieri* were identified as the most abundant this year.

Overall, while the Vembanad Fish Count 2024 showcases an encouraging diversity of

species, it also emphasizes critical environmental challenges that threaten the health of the estuarine ecosystem and the livelihoods dependent on it. Addressing these issues will be vital for sustaining both biodiversity and local fisheries in the Vembanad region.

Suggestions and Recommendations:

1. The state and central governments should adopt a holistic approach to sustain the fisheries sector. This includes measures such as habitat protection, enforcement of regulations, and the adoption of co-management strategies to improve the livelihoods of fishers and preserve the ecosystem's habitat quality.
2. Instead of using exotic species, indigenous insectivorous fish species such as *Pseudosphromenus cupanus*, *Pseudosphromenus dayi*, and *Aplocheilus lineatus* should be utilized for vector control, as they are natural feeders of insects and larvae.
3. Conduct a systematic analysis of the feeding guilds in the ecosystem to understand the energy flow within the ecosystem.
4. Regular fish surveys and water quality analysis should be conducted during all three seasons (Monsoon, Post-Monsoon, and Pre-Monsoon) for a minimum of three years to obtain a better estimation of fish diversity and the overall health of the lake's ecosystem. Collaborative projects involving various research organizations should be undertaken to study the declining fish species and the impact of the Thannermukkom Bund on migratory fishes.
5. Develop an Index of Biotic Integrity (IBI) specifically for the Vembanad Lake ecosystem to monitor and ensure its sustainable health.
6. Raise awareness among the local community and tourists about the global importance of the ecosystem, its role in sustainable living, and its potential in mitigating climate change.
7. Seek assistance from fisheries institutes and research organizations for large-scale seed production and ranching programs of commercially important indigenous fish species.
8. Preserve undisturbed areas of the lake to maintain their pristine nature, which can serve as a reference point for the health levels of other areas.
9. Develop and implement strict pollution control policies in compliance with the Wetland and Paddy Conservation Act 2008.
10. Formulate a fishing policy that promotes sustainable fishing practices in the lake by analyzing and selecting the most environmentally friendly methods.
11. Declare existing natural habitats and native vegetation, such as those surrounding Pathiramanal Islands, the reclaimed portions of the lake at Chithira, and Rani Block of kayals, as No Take Zones.
12. Establish breeding and hatchery protocols for fishes used in ranching and stock enhancement programs.

13. Take measures to protect riparian zones and the indigenous macrophytes that inhabit the lake.
14. Temporarily ban monsoon flood plain fishery (Ootha piditham) during the spawning season to protect the spawning individuals.
15. Implement a democratic management system for fisheries in the Vembanad Lake, focusing on a bottom-up approach rather than top-down schemes.
16. Foster collaborations between government organizations, research institutes, universities, colleges, non-governmental organizations, cooperatives, and local stakeholders to develop effective programs for protecting the lake and sustaining the livelihoods of fishers.
17. Ensure that all houseboats are equipped with eco-friendly green toilets to prevent human waste pollution in the lake.
18. Municipal drains should only discharge water into the lake after proper treatment, meeting the ideal standards of estuarine lake water or freshwater systems.

Conclusion:

In conclusion, the Vembanad Fish Count (VFC) 2024 has recorded a total of 85 species, including 74 finfish and 11 shellfish, reflecting a significant increase in species diversity compared to previous years. However, this diversity is tempered by notably low overall abundance and reduced dissolved oxygen levels, which pose serious concerns for the ecosystem. A critical issue highlighted is the alarming decline in the weight of Macrobrachium rosenbergii, or giant freshwater prawn, which has fallen below 300 grams, well below its typical weight range of 500-600 grams. This decline raises urgent alarms for the local prawn fishery. Contributing factors may include pollution, disturbances from houseboat tourism, and inadequate salinity levels in the southern part of Vembanad. Notably, Parambassis and Labeo dussumieri were observed as the most abundant species this year. Addressing these environmental challenges is essential for the sustainability of both biodiversity and local fisheries in the Vembanad estuary.

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ANNEXURE – I

Check List VFC 2024

South of Thannermukkom Bund
Fin Fish
1. *Ambassis ambassis*
2. *Ambassis gymnocephalus*
3. *Amblypharyngodon melettinus*
4. *Anabas testudineus*
5. *Anodontostoma chacunda*
6. *Aplocheilus blochii*
7. *Aplocheilus panchax*
8. *Arius subrostratus*
9. *Brachirus orientalis*
10. *Caranx ignobilis*
11. *Carinotetraodon travancoricus*
12. *Channa diplogramma*
13. *Channa pseudomarulius*
14. *Channa striata*
15. *Chelonodontops patoca*
16. *Cynogolossus macrostomus*
17. *Dawkinsia filamentosa*
18. *Dayella malabarica*
19. *Etroplus suratensis*
20. *Glossogobius giuris*
21. *Heteropneustes fossilis*
22. *Horadandia britani*
23. *Horbagrus brachysoma*
24. *Hyporamphus xanthopterus*
25. *Labeo dussumieri*
26. *Macrognathus guentheri*
27. *Mystus armatus*
28. *Mystus gulio*

29. *Mystus occulatus*
30. *Neochela dadyburjori*
31. *Parambassis dayi*
32. *Parambassis thomassi*
33. *Photopectoralis bindus*
34. *Pseudetroplus maculatus*
35. *Pseudosphromenus cupanus*
36. *Pseudosphromenus dayi*
37. *Puntius vittatus*
38. *Scatophagus argus*
39. *Siganus javus*
40. *Stenogobius sps.*
41. *Xenentodon cancila*
42. *Rasbora duniconius*
43. *Hrporhamphus limbatus*
44. *Johnius dussumieri*
45. *Ompok malubaricus*
46. *Butis butis*
47. *Puntius mahecola*
48. *Systomus sarana*
49. *Nandus nandus*
50. *Eubleekeria splendens*
51. *Chanos chanos*
Shellfish
1. *Macrobrachium rosenbergii*
2. *Macrobrachium idella*
3. *Metapenaeus dobsoni*
4. *Fenneropenaeus indicus*
5. *Scylla serrata*
6. *Scylla tranquebarica*
7. *Caridina sps*

8. Caridina naderjoni
9. *Caridina pseudo-gracilirostris*
10. *Villorita cyprinoides*
11. *Pila globosa*

List of fishes from Market and landing center

1.	*Amblypharyngodon melettinus*
2.	*Anabas testudineus*
3.	*Arius arius*
4.	*Arius subrostratus*
5.	*Brachirus orientalis*
6.	*Channa diplogramma*
7.	*Channa pseudomarulius*
8.	*Channa striatus*
9.	*Cynoglossus bilineatus*
10.	*Dawkinsia filamentosa*
11.	*Daysciaena albida*
12.	*Ehirava fluviatilis*
13.	*Elops machnata*
14.	*Etroplus suratensis*
15.	*Gerres filamentosus*
16.	*Glossogobius giuris*
17.	*Heteropneustes fossilis*
18.	*Horabagrus brachysoma*
19.	*Hyporhamphus xanthopterus*
20.	*Hyporhamphus limbatus*
21.	*Labeo dussumieri*
22.	*Lates calcarifer*
23.	*Liza sp*
24.	*Lutjanus argentimaculatus*
25.	*Macrognathus guentheri*
26.	*Mastacembelus armatus*
27.	*Megalops cyprinoides*
28.	*Mugil cephalus*
29.	*Nuchequula nuchalis*
30.	*Oreochromis niloticus*
31.	*Pangasianodon hypophthalmus*

32.	*Parambassis dayi*
33.	*Parambassis thomassi*
34.	*Pastinachus sephen*
35.	*Platycephalus indicus*
36.	*Pristolepis rubripinnis*
37.	*Pseudetroplus maculatus*
38.	*Pterygoplichthys multiradiutus*
39.	*Scatophagus argus*
40.	*Sillago sihama*
41.	*Siganus javus*
42.	*Stolephorus sp*
43.	*Strongylura strongylura*
44.	*Systomus subnasutus*
45.	*Thryssa mystax*
46.	*Wallago attu*
47.	*Xenentodon cancila*

ANNEXURE – II

ATREE VEMBANAD FISH COUNT -2024WATER QUALITY ANALYSIS RESULTS

Date of Sample collection:30-05-2023

Name	**Site**	**Name**	**Latitude**	**Longitude**	**Water Temp.** (^{0}C)	**pH**	**EC** (micro mhos/cm)	**Hardness** (mg $CaCO_3$/L)	**Chloride** (mg/L)	**DO** (mg/L)	**Nitrite** (µg/L)	**Phosphate** (µg/L)
Western Cruise	1	Aryad	9°33.317'	76°21.425'	26°	6.05	2	40	468.6	2.45	0.02	0.01
	2	Manancheri	9°34.755'	76°21.895'	26°	4.2	4.2	85	923	2.08	0.05	0.02
	3	Muhamma	9°37.193'	76°22.980'	28°	6.24	6	85	1235.4	3.15	0.01	0.01
	4	Pathiramanal	9°37.191'	76°22.978'	29°	6.18	6.6	90	1334.8	2.86	0.02	0.02
	5	Kayippuram	9°37.334'	76°22.579'	29°	6.4	5.2	65	1221.2	1.84	0.01	BDL
Eastern Cruise	1	Rani Kayal	9°31'23.15"	76°23'9.51"	26°	6.06	2.1	25	298.2	1.02	0.01	0.01
	2	Nazrath	9°35'51.44"	76°25'30.39"	27°	6.33	2	70	482.8	1.94	0.02	0.01
	3	Kavanattinkara	9°37'58.23"	76°25'7"	28°	3.6	2	40	454.4	1.82	0.01	BDL
	4	Thaneermukkam	9°39'50.96"	76°23'2.34"	28°	6.1	8.1	90	880.2	2.2	0.02	0.02
Riverine Cruise	1	Punnamada	9°30'0.77"	76°21'53.98"	28°	6.33	0.8	10	156.2	3.04	0.01	0.02
	2	Chungam	9°28'29.29"	76°22'27.84"	28°	5.84	0.3	20	171	2.85	0.2	0.01
	3	Kainakary	9°31'41.69"	76°24'21.69"	27°	6.32	1.3	10	284	2.52	0.01	0.01
	4	Kizhakke vattakayal	9°28'43.842"	76°19'42.7512"	29°	5.89	1.7	25	426	2.81	0.01	BDL

	5	Kuppapuram	9°34'29.81"	76°20'57.98"	29°	5.53	1.6	30	326.6	2.79	0.02	0.01

*BDL- Below Detection Limit

ATREE VEMBANAD FISH COUNT -2024WATER QUALITY ANALYSIS RESULTS

Date of Sample collection:27-08-2024

Name	**Site**	**Name**	**Latitude**	**Longitude**	**Water Temp.** (^{0}C)	**pH**	**EC** (micro mhos/cm)	**Hardness** (mg $CaCO_3$/L)	**Chloride** (mg/L)	**DO** (mg/L)	**Nitrite** (µg/L)	**Phosphate** (µg/L)
Western Cruise	1	Aryad	9°33.317'	76°21.425'	26°	6.01	2.5	400	284	2.65	0.02	0.01
	2	Manancheri	9°.605'	76°.365'	26°	6.00	4.5	120	284	3.87	0.05	0.02
	3	Muhamma	9°.605'	76°.365'	28°	6.00	6.5	180	355	2.46	0.01	0.01
	4	Pathiramanal	9°.620'	76°.382'	30°	6.02	6.7	50	249	2.69	0.02	0.02
	5	Kayippuram	9°37.334'	76°22.579'	29°	6.00	5.5	170	533	2.98	0.01	BDL
Eastern Cruise	1	Chitira Kayal	9°32'.828"	76°23'.362"	28°	5.99	2.3	90	604	1.22	0.01	0.01
	2	Nazrath	9°34'.882"	76°25'.284"	28°	5.85	1.8	150	391	2.71	0.02	0.01
	3	Kavanattinkara	9°35'.862"	76°25'.512"	30°	6.01	1.9	150	320	2.41	0.01	BDL
	4	Kumarakam Jetty	9°35'.862"	76°25'.512"	29°	6.02	8.1	140	394	2.27	0.02	0.02
	5	Thaneermukkam	9°40.195"	76°24.104"	30°	6.5	0.9	160	288	2.21	0.01	0.02
Riverine Cruise	1	Punnamada	9°29' 55"	76°21'45"	29°	5.96	1.2	120	302	3.6	0.2	0.01
	2	Chungam	9°28' 39"	76°20 54"	28°	5.94	1.5	30	296	3.1	0.01	0.01
	3	Kainakary	9°29'22"	76°22'3"	30°	5.99	1.9	90	249	2.02	0.01	BDL

	4	Kizhakke vattakayal	9°32'39"	76°20'39"	29°	6.2	1.0	100	568	2.28	0.02	0.01
	5	Kuppapuram	9°31’.23"	76°21'16"	29°	6.2	1.1	110	213	2.58	0.01	0.02

*BDL-Below Detection Limit

ANNEXURE – III

Participants list of VFC 2023

A. KUFOS

B. ATREE

ANNEXURE – IV

Figure 2 Participants in Cruise

Figure 3 Paticipants & Experts examining the species

Figure 4 Participants engaged in counting fish from cast net sampling

Figure 5 Participants engaged in counting fish from gill net sampling

Figure 6 Vembanad Fish Count Invitation 2024

Figure 7 Vembanad Fish Count 2024 Certificate of participation

ANNEXURE 5

Media coverage

വേമ്പനാട്ട് കായൽ ഫിഷ് കൗണ്ട്

മത്സ്യയിനങ്ങൾ ഇരട്ടിയായി, ലഭ്യത കുറഞ്ഞു

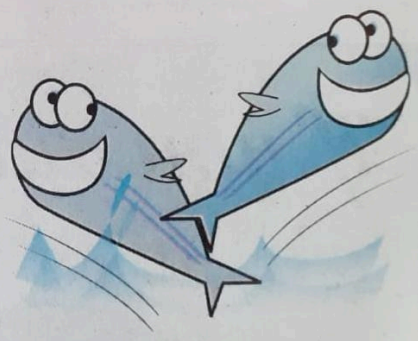
ആറ്റുകൊഞ്ചിന്റെ തൂക്കം കുറയുന്നതിൽ ആശങ്ക; പഠനം വേണമെന്നു ശുപാർശ

ആലപ്പുഴ ● വേമ്പനാട്ട് കായലിൽ മത്സ്യ ഇനങ്ങളുടെ എണ്ണം വർധിച്ചതായി ഈ വർഷത്തെ വേമ്പനാട് ഫിഷ് കൗണ്ടിൽ കണ്ടെത്തി. കഴിഞ്ഞ വർഷം നടത്തിയ കണക്കെടുപ്പിൽ 41 ഇനം മത്സ്യങ്ങൾ കണ്ടെത്തിയ സ്ഥാനത്ത് ഇത്തവണ 85 ഇനം മത്സ്യങ്ങളെ കണ്ടെത്തി. ഇവയിൽ 71 ഇനം ചിറകുമത്സ്യങ്ങളും 11 ഇനം തോടുമത്സ്യങ്ങളുമുണ്ട്. അതേ സമയം മത്സ്യലഭ്യതയിലും മത്സ്യങ്ങളുടെ തൂക്കത്തിലും കുറവുവന്നിട്ടുണ്ട്. 500-600 ഗ്രാം തൂക്കം ലഭിച്ചിരുന്ന ആറ്റുകൊഞ്ചിന്റെ ശരാശരി തൂക്കം 300 ഗ്രാമിലും കുറഞ്ഞു. കായൽ മലിനീകരണമാണു മത്സ്യങ്ങളുടെ തൂക്കവും ലഭ്യതയും കുറയുന്നതിന്റെ കാരണമെന്നാണു പ്രാഥമിക വിലയിരുത്തൽ. തൂക്കം കുറയുന്നതിന്റെ കാരണമറിയാൻ കൂടുതൽ ഗവേഷണം വേണമെന്നാണ് ഫിഷ് കൗണ്ട് സംഘത്തിന്റെ ശുപാർശ. ആലപ്പുഴ ഫിനിഷിങ് പോയിന്റ് മുതൽ വട്ടക്കായൽ വരെയുള്ള പ്രദേശങ്ങളിൽ മത്സ്യവൈവിധ്യം കുറവാണ്. ഹൗസ്ബോട്ടിന്റെ സഞ്ചാരപാതയായതും മലിനീകരണവുമാണ് കാരണമെന്നാണു നിഗമനം.

അശോക ട്രസ്റ്റ് ഫോർ റിസർച് ഇൻ ഇക്കോളജി ആൻഡ് എൻവയൺമെന്റ് കമ്യൂണിറ്റി എൻവയൺമെന്റൽ റിസർച് എന്നിവ സംസ്ഥാന തണ്ണീർത്തട അതോറിറ്റിയുടെ ധനസഹായത്തോടെയാണു വേമ്പനാട്ട് കായലിലെ മത്സ്യങ്ങളുടെ കണക്കെടുപ്പായ ഫിഷ് കൗണ്ട് നടത്തിയത്.

കണക്കിൽ മുന്നിൽ അറിഞ്ഞിലും പരലും

കായലിൽ ശുദ്ധജലസാന്നിധ്യമുള്ള തെക്കൻ ഭാഗങ്ങളിൽ നദിമുഖത്തോടു ചേർന്ന് മത്സ്യവൈവിധ്യം കൂടുതലായുണ്ട്. അതേ സമയം ഉപ്പിന്റെ സാന്നിധ്യമില്ലാത്തതിനാൽ ഈ പ്രദേശങ്ങളിൽ വിപണിമൂല്യം കൂടുതലുള്ള ഓരുജലമത്സ്യങ്ങൾ കുറവാണ്. ഈ വർഷത്തെ കണക്കെടുപ്പിൽ ഏറ്റവും ഇനങ്ങൾ ലഭിച്ചത് അറിഞ്ഞിൽ, പരൽ മത്സ്യങ്ങളാണ്. കുട്ടനാട് ആർ ബ്ലോക്ക് പ്രദേശങ്ങളിൽ പുല്ലൻ ഇനത്തിൽപെട്ട മത്സ്യവും കൂടുതലായി കണ്ടെത്തി. മത്സ്യത്തൊഴിലാളികൾ, ഗവേഷകർ, ഫിഷറീസ് വിദ്യാർഥികൾ എന്നിവരടങ്ങിയ നൂറോളം പേരുടെ സംഘമാണ് 3 ദിവസം നീണ്ട കണക്കെടുപ്പ് നടത്തിയത്. സമാപന ചടങ്ങ് ഡോ.പ്രിയദർശനൻ ധർമരാജൻ ഉദ്ഘാടനം ചെയ്തു.



വേമ്പനാട്ടു കായലിൽ 74 ഇനം ചിറക് മത്സ്യങ്ങൾ

മുഹമ്മ ▸ വേമ്പനാട്ടുകായലിൽ 74 ഇനം ചിറകുള്ള മത്സ്യങ്ങളെയും 11 ഇനം തോടുള്ള മത്സ്യങ്ങളെയും കണ്ടെത്തി.

അശോക ട്രസ്റ്റ് ഫോർ റിസർച്ച് ഇൻ ഇക്കോളജി ആൻഡ് ദി എൻവയൺമെന്റ്, കമ്യൂണിറ്റി എൻവയൺമെന്റൽ റിസോഴ്സ് സെന്ററിന്റെ നേതൃത്വത്തിൽ സംസ്ഥാന തണ്ണീർത്തട അതോറിറ്റിയുടെ സഹായധനത്തോടെയായിരുന്നു കണക്കെടുപ്പു നടത്തിയത്. തണ്ണീർമുക്കം ബണ്ടിന്റെ തെക്കൻപ്രദേശത്തായിരുന്നിത്.

വിവിധയിനങ്ങളെ കണ്ടെത്തിയെങ്കിലും മത്സ്യയിനങ്ങളുടെ ലഭ്യത കുറവായിരുന്നു. പരൽ ഇനത്തിൽപ്പെട്ടവയെയാണ് കൂടുതലായും കണ്ടെത്തിയത്. കുട്ടനാട്, ആർ. ബ്ലോക്ക് ഭാഗങ്ങളിൽ പുല്ലൻ ഇനത്തിൽപ്പെട്ടവയുമുണ്ടായിരുന്നു. നൂറോളം വിദ്യാർഥികളുടെ നേതൃത്വത്തിലായിരുന്നു കണക്കെടുപ്പ്. സമാപനചടങ്ങ് ഡോ. പ്രിയദർശനൻ ധർമരാജൻ ഉദ്ഘാടനം ചെയ്തു.

Mathrubhumi

Vembanad fish count records 50 species

The Hindu Bureau
ALAPPUZHA

The 16th edition of the Vembanad fish count has recorded 50 species. A survey was conducted in the southern parts of the lake under the aegis of the Community Environment Resource Centre (CERC), a field unit of the Ashoka Trust for Research in Ecology and Environment (ATREE), on Tuesday.

As many as 110 volunteers, including academics, researchers and fishermen from across the region, recorded 41 finfish species and nine shellfish species in the survey. Last year, the survey recorded 48 species, including 43 finfish species and five shellfish species.

In a statement, Maneeja Murali, senior programme officer, ATREE- CERC, said that Attu Konju (Macrobrachium rosenbergii, giant freshwater prawn) was fast disappearing from the lake due to biodiversity loss.

Citing four years of data, Ms. Murali said the annual production of Attu Konju had dwindled to 100 tonnes from 300 tonnes. Reduced salinity in the water, caused by the construction of Thanneermukkom Bund, has adversely affected its breeding. Attu Konju needs saline water for breeding and travel to the northern part of the lake to lay eggs, she said.

The fish count was conducted with financial assistance from the State Wetland Authority Kerala.