REPORT

VEMBANAD FISH COUNT 2023

Submitted to

State Wetland Authority Kerala
(SWAK)
Thiruvananthapuram

Community Environmental Resource Centre
Ashoka Trust For Research In Ecology And The EnvironmentAmmankovil Street,
Mullackal, Alappuzha 688001
PH: 0477-2251818
www.vembanad.org
Email: vembanad@atree.org

Contents

Executive Summary:

The 16th edition of Vembanad Fish Count 2023 was conducted on 29/05/2023 to 30/05/2023 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 Fish Count identified 41 fish species and nine shellfish species, reflecting a decline from the previous year. Notably, the population of the Giant freshwater prawn (Macrobrachium rosenbergii) significantly decreased, impacting the overall biodiversity of Vembanad Estuary. Elevated salinity levels were observed, affecting fish distribution and abundance, particularly in the southern sector, where inadequate salinity adversely impacted fish biodiversity. The Vembanad Fish Count 2023 report highlights the urgency of sustainable fishery management in response to the decline in fish and shellfish species in Vembanad estuary, and calls for actionable steps to protect and revitalize fishery resources while conserving the estuary's ecosystem. The report serves as a valuable resource for decision-makers and stakeholders in making informed choices for the conservation and restoration of the Vembanad Estuary's fisheries. To address these challenges, a holistic approach is recommended, advocating for state and central governments to adopt measures such as habitat protection, strict regulation enforcement, and co-management strategies. A systematic analysis of feeding guilds within the ecosystem is proposed to understand energy flow, with calls for regular fish surveys and water quality analysis throughout all three seasons for a minimum of three years.

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, Chandramohankumar, & 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 acacdemic 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, AmritaUniversity 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 fisheryresources in Vembanad and has helped in consolidating views on the issues and the need for immediate interventions.

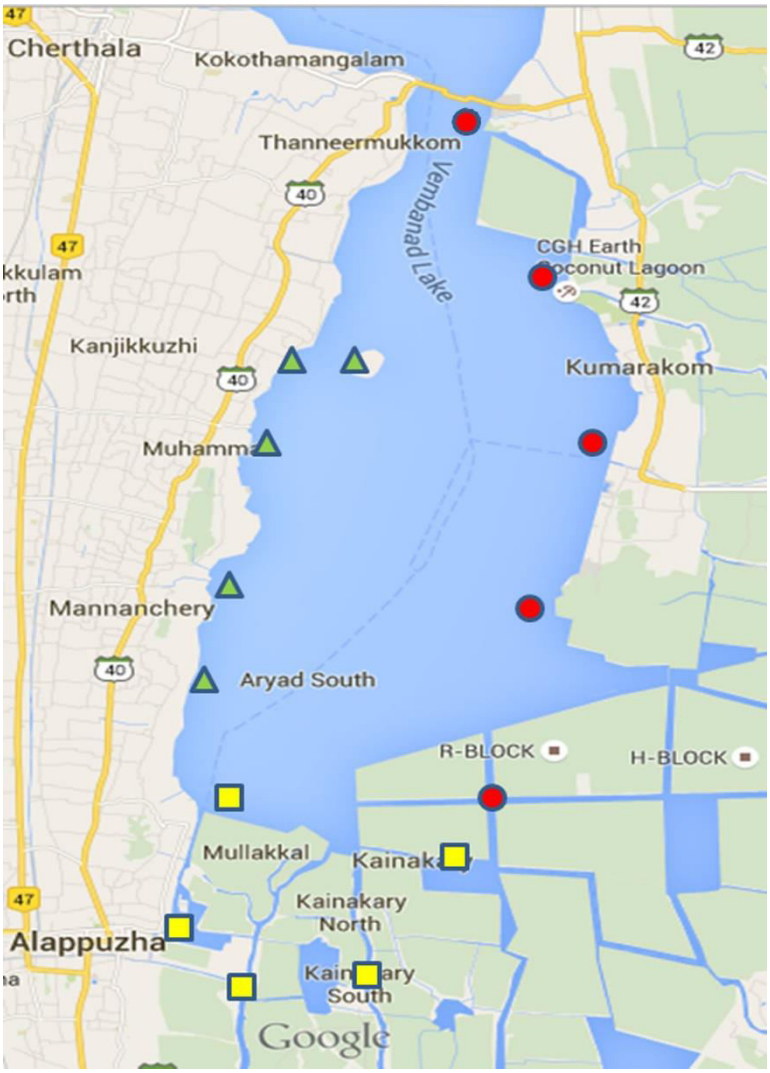
Objectives:

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 2023 involved the participation of 120 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 35 -40 members in each team. Each cruise team was further subdivided into four in order 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 30th of May 2023.

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 phenomenon. 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. Seechi 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 waste water 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

Orientation workshop for the participants was conducted on 29th May 2023 at Karmasadan, Alappuzha Convent Square at 6 pm. Shri. Jojo T. D (Project Manager, ATREE-CERC) delivered the welcome address. Dr. Priyadarsanan Dharma Rajan, Senior Fellow, ATREE, Bangalore chaired the inaugural session. Prof. K.V. Jayachandran (Former Director of Research, KUFOS) inaugurated the function. The orientation for 120 volunteers of Vembanad fish count was given by Maneeja Murali, Senior Programme Officer, ATREE CERC where she discussed a brief history of Vembanad and CERC's activities, and the objectives of Vembanad Fish Count. Methodology used for data collection and the basic etiquettes and discipline/safety measures to be followed during the cruise. Participants for the program were divided into three teams. For each team, a cruise leader was selected, who were assigned the task of making the organizational groups and functional groups for effective conduct of the survey. Fishing gears, resource materials and survey forms were distributed to each team before dispersing for dinner. The three designated teams were East bank , West Bank and Riverine.

Book Release: "Fishes of Vembanad - A Photographic Field Guide"

This comprehensive field guide aims to bridge the gap between scientific taxonomy and the understanding of the general public, empowering citizens with valuable knowledge about the diverse fish species inhabiting the Vembanad region. It has been developed by four esteemed fish taxonomy experts: Mr. Anu Radhakrishnan, Ms. Maneeja Murali, Mr. Bibin Xavier, and Dr. Priyadarsanan Dharma Rajan. "Fishes of Vembanad" serves as a vital resource for scientific enthusiasts and the general public alike. By presenting complex taxonomic information in accessible terms, this guide enables citizen scientists and nature enthusiasts to engage with the scientific world and understand the significance of conserving fish biodiversity.

The field guide "Fishes of Vembanad" exemplifies ATREE-CERC's commitment to promoting inclusive knowledge-sharing and environmental awareness. The author firmly believe that by simplifying scientific taxonomy and making it more approachable, we can foster a better understanding of our natural environment and encourage informed decision-making for a sustainable future.


KARMASADAN
PASTORAL CENTRE

The Survey:

On May 30th 2023, the Fish Count event was initiated by Mr. K. V. Dayal, a renowned environmentalist, at Punnamada Jetty in Alappuzha. The event included three cruise routes. At each site, the teams conductedexperimental 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, alongwith 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. Dr.Benno Pereira, Assistant Professor, University College, Thiruvananthapuram summed up the report during the function, he said this year 41 fish species, nine shell fish species were found from the fish count. It was less than the last year's fish count. It was also noted that the decline of Giant fresh water prawn *Macrobrachium rosenbergii*. The participants also recorded 30 species water birds during this Fish Count. The salinity marked around 0.5-2 ppt last year has increased up to 6 ppt this year. Eastern cruise marked the largest diversity in VFC 2023 and most of the species are coming under the category of Brackish and Marine. Based on the landing center data from Pallom the *Labeo dussumieri* (Thooli) is the most abundant species found during the season followed by *Etroplus suratensis, Heteropneutes fossilis*. The declining biodiversity is mainly due to the inadequate salinity in the southern region. The summer shower and the river draining water turns the southern sector as a fresh water zone.

Fish Count Findings:

The Fish Count recorded a total of 41 fish species and nine shellfish species, indicatinga decline compared to the previous year. Notably, there was a significant decline in the population of the Giant freshwater prawn (*Macrobrachium rosenbergii*). Additionally, 30 species of water birds were observed during the event. The salinity levels in the lake increased from 0.5-2 ppt last year to 6 ppt this year. The Eastern cruise demonstrated the highest diversity in the VFC 2023, with most of the species falling under the Brackish and Marine categories. Based on landing center data from Pallom, the most abundant species found during the season were *Labeo dussumieri* (Thooli), followed by *Etroplus suratensis* and *Heteropneutes fossilis*. The declining biodiversity is mainly attributed to inadequate salinity in the southern region, where summer showers and river drainage turn the sector into a freshwater zone.

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.

The Decline in the Fishery of *Macrobrachium rosenbergii* (Giant Prawn) in Vembanad Estuary.

The Vembanad Estuary, nestled along the southwest coast of India, has long been a vital habitat for the Giant Prawn, Macrobrachium rosenbergii, a commercially prized freshwater species. However, recent years have witnessed a palpable decline in its fishery, prompting concern among local fisherfolk and fisheries experts alike.A pivotal environmental factor influencing the life cycle of M. rosenbergii is salinity. The species, known for its adaptability to brackish water areas and tolerance to turbid conditions, relies on specific salinity levels for crucial stages like egg, embryo, and larval development. In its natural habitat, gravid females traditionally migrate across saline gradients to estuarine areas downstream for optimal hatching conditions.

The region's estuarine dynamics, governed by the seasonal southwest monsoon, dictate the delicate balance between freshwater dominance and limited saltwater intrusion. However, the delicate equilibrium has been disrupted in recent years, primarily attributed to climate variability.The aftermath of the 2018 flood appears to be a turning point for the Giant Prawn fishery in Vembanad Estuary. Local fisherfolk surveys and data from inland fishery societies surrounding the lake collectively point to a significant decline in Giant Prawn catches. The VFC 2023 results further underscore this trend, with only two specimens reported from the Punnamada area during gill net operations.

Understanding and addressing the multifaceted causes behind this decline are critical for the sustainable management of the estuarine ecosystem. Long-term data collection and analysis will play a pivotal role in unraveling the intricate interplay between environmental stressors and the dwindling Giant Prawn fishery, guiding future conservation efforts and policy decisions.

Conclusion:

VFC has revealed a decline in fish and shellfish species compared to the previous year, including a significant decrease in the population of the Giant freshwater prawn. Salinity levels have increased, impacting the ecosystem and fish habitats. To addressthese issues and sustain the fisheries sector, a holistic approach is recommended, including habitat protection, regulation enforcement, and co-management strategies. Utilizing indigenous insectivorous fish species for vector control, conducting feeding guild analysis, and regular surveys and water quality analysis are suggested. Collaboration between stakeholders and the implementation of conservation measures such as No Take Zones and eco-friendly practices are crucial for the lake's health and the livelihoods of fishers.

Reference

1. Radhakrishnan, Anu; Maneeja, Murali; Bibin, X. V.F; Priyadarsanan, Dharma Rajan; (2022). A field guide to fishes of Vembanad (Anwar, A., Raghavan, R) Alappuzha, ATREE-CERC Ed:1, 245pp
2. Asha, C. V, Cleetus, R. I., Suson, P. S., & Nandan, S. B. (2015). Environmental factors structuring the Fish assemblage distribution and Production potential in Vembanad estuarine system, India. International Journal of Marine Science, 5.
3. Bates, Roger G. Determination of pH: theory and practice. Wiley, 1973.
4. CERC ATREE. (2013). Participatory Mapping of Natural Resources in Vembanad Lake. Retrieved from www.vembanad.org
5. Commission, P. (2008). Report on Visit to Vembanad Kol, Kerala, a Wetland Included Under the National Wetland Conservation and Management Programme of the Ministry of Environment and Forests. Retrieved from http://203.200.22.249:8080/jspui/handle/123456789/4074.
6. Dunbar, Jeffery A (2001) Casting net NC Coastal fishing. Retrieved 25 August2008.
7. Florence, M. A. (2012). Sustainability and livelihood issues of Vembanad Ecosystem fisherfolk communities with special reference to Muhamma and Thanneermukkom villages.
8. Fondriest Environmental, Inc. “Dissolved Oxygen.” Fundamentals of Environmental Measurements. 19 Nov. 2013. Web. <http://www.fondriest.com/environmental-measurements/parameters/water-quality/dissolved-oxygen/>
9. Geetha, R., Chandramohankumar, N., & Mathews, L. (2007). Distribution of total reactive fluoride in sediments of Kuttanad waters. INDIAN JOURNAL OF ENVIRONMENTAL PROTECTION, 27(11), 1001.
10. Hedley, M. J., Stewart, J. W. B., & Chauhan, B. (1982). Changes in inorganic and organic soil phosphorus fractions induced by cultivation practices and by laboratory incubations. Soil Science Society of America Journal, 46(5), 970- 976.
11. Kannan, K. (1979). Ecological and socio-economic consequences of water- control projects in the Kuttanad region of Kerala. Proceedings of the Indian Academy of Sciences Section C: Engineering Sciences, 2(4), 417–433.
12. Kannan, K. P. (1979). Ecological and socio-economic consequences of water-control projects in the Kuttanad region of Kerala. Proceedings of the Indian Academy of Sciences Section C: Engineering Sciences, 2(4), 417–433.
13. KrishnaKumar, K., & Dharmarajan, P. (2012). Fish and Fisheries in Vembanad Lake Consolidated Report of Vemband Fish Count 2008-2011.
14. Kumar, A. B. (2006). A checklist of avifauna of the Bharathapuzha river basin, Kerala. Zoo Print, 21(8), 2350–2355.

15. Kurup, B., & Harikrishnan, M. (2000). Reviving the *Macrobrachium rosenbergii* (de Man) fishery in Vembanad lake, India. Naga, The ICLARM Quarterly, 23(2),4–9.
16. Kurup, B. M., & Samuel, C. T. (1985). Fish and fishery resources of Vembanad Lake. Harvest and Post-Harvest Technology of Fishes. Central Institute of Fisheries Technology (CIFT) & Society of Fisheries Technologists (SOFTI), Kochi, India, 77–82.
17. Kurup, B. M., Sebastian, M. J., Sankaran, T. M., & Rabindranath, P. (1993). Exploited fishery resources of the Vembanad Lake. Indian Journal of Fisheries,40(4), 199–206.
18. Laxmilatha, P., & Appukuttan, K. K. (2002). A review of the black clam (Villorita cyprinoides) fishery of the Vembanad Lake. Indian Journal of Fisheries, 49(1),85–92.
19. M.S. Swaminathan Research, F. (2007). Measures to Mitigate Agrarian Distress in Alappuzha and Kuttanad Wetland Ecosystem.
20. Manorama, K. C., & Agricultural, K. (n.d.). Nature Watch.
21. Mayaja, N. A., & Srinivasa, C. V. (2014). Rainfall characteristics of Pampa river basin, Kerala: A time series analysis.
22. Michaud, J.P. 1991. A citizen's guide to understanding and monitoring lakes and streams. Publ. #94-149. Washington State Dept. of Ecology, Publications Office, Olympia, WA, USA (360) 407-7472. Moore, M.L. 1989.
23. Murphy, B. R., & Willis, D. W. (Eds.). (1996). Fisheries techniques (2nd ed., p. 732). Bethesda, Maryland: American fisheries society.
24. Narayanan, N. C. (2003). Against the grain: the political ecology of land use ina Kerala region, India.
25. Narayanan, S. P., Thomas, A. P., & Sreekumar, B. (2011). Ornithofauna and its conservation in the Kuttanad wetlands, southern portion of Vembanad-Kole Ramsar site, India. Journal of Threatened Taxa, 3(4), 1663–1676.
26. Padmakumar, K. G. (2003). Open water fish sanctuaries. Kerala Calling, 23(6),34–36.
27. Padmalal, D., Maya, K., Sreebha, S., & Sreeja, R. (2008). Environmental effects of river sand mining: a case from the river catchments of Vembanad lake, Southwest coast of India. Environmental Geology, 54(4), 879–889.
28. Ramsar. (2002). VEMBANAD-KOL WETLAND. Retrieved from https://rsis.ramsar.org/ris/1214
29. Samuel, C. T. (2014). Studies on systematic and biology of the fishes of Vemabanad lake.
30. Sathyanathan, N. (2010). Overview of farming practices in the water-logged areas of Kerala, India. International Journal of Agricultural and Biological Engineering, 3(4), 28–43.
31. Suseelan, C. (1987). Impact of environmental changes and human interference on the prawn fishery resources. Marine Fisheries Information Service, Technicaland Extension Series, 73, 1–5.

ANNEXURE 1

Check List VFC 2023

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*
Shell Fish
1. *Macrobrachium rosenbergii*
2. *Metapenaeus dobsoni*
3. *Fenneropenaeus indicus*
4. *Scylla serrata*
5. *S.tranquebarica*
6. *Caridina sps*
7. *Caridina pseudo-gracilirostris*
8. *Villorita cyprinoides*
9. *Pila globosa*

ANNEXURE 2

ATREE VEMBANAD FISH COUNT -2023
WATER QUALITY ANALYSIS RESULTS

Date of Sample collection:30-05-2023

*BDL- Below Detection Limit

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

ANNEXURE 3

Participants list of VFC 2023

A. KUFOS

1 Dr. M K Sajeevan
2 Dr Safeena
3 Abinaya R
4 Bincy M Raj
5 Chitra M C
6 Aathira.S
7 Dinesh M
8 Gurugubelli Muraliksrishna
9 Keerthana PS
10 Stephy Terry
11 Anisha NA
12 Haritha MA
13 Deepthi KS
14 Asmiya C Jamal
15 Akhil A
16 Manthankumar Amruthlal Tandel
17 Parmar Bindiya Kirtikumar
18 Rayees Mohammed E K
19 Athul S
20 Reena PG
21 Amjad Hakim
22 Abin Yesudas

23 Jagadeesan G
24 Deepaklal T S
25 Rudra Krishnan
26 Akshay BK
27 Akhisha S
28 Blessymol Thomas
29 Muhammed Ramees P R
30 Noorjahan BK
31 Nasifa Naizam
32 Juberiah
33 Christy K F
34 Dhaya K
35 Sana Farvin F
36 Priya Maria Vinesh
37 Fathimathu Raniya
38 Pragathi Kumari
39 Chelsa Cleetus
40 Ngilyang Kanya
41 Alan Ben Shah Y
42 Mahira BP
43 Farzeena TB
44 Vinitha Mary V
45 Shambu S

B. University College, Thiruvananthapuram

1 Geo Ben kuriakose
2 Alve Maryam Abraham
3 Adhithya J

4 suvarnakavya P
5 aiswarya M G
6 Liyakath Ali
7 Muhammed Sabeel
8 Adithya V R
9 Kiran Thomas mathew
10 Gayathri S
11 Vishnu
12 Dr Smrithi

C. St. Albert's College, Ernakulam

1. Christin John
2. Vishnu
3. Navaneeth Francis
4. Vivek Chandrashekharan
5. Adarsh Sebastian
6. Akash Sebastian
7. Robin
8. Akshay
9. Alex K Baiju
10. C Shyam Sundhar
11. Dr. Jithu Paul Jacob
12. Dr. Radhika
13. Dr.Santu K.S

D. AMRITA VISHWA VIDYAPEETHAM LIST OF STUDENTS

1 Chandana T R
2 Kavya V Gopal
3 Niranjana B
4 Niranjani T B
5 Sreemayi M
6 Shalu Lal S
7 Shantanou Madhav
8 Parvathy Santhosh
9 Dr. Smitha

CUSAT

1. Sruthi Vijay
2. Sreekripa P S
3. Aneena Xavier
4. Mary Teena

KANNUR

1. Sreebin P

ATREE

1. Ryan Satish
2. Naveen M
3. Rohan Sharma
4. Zoha Mahdi
5. Harsh

ANNEXURE 4

Figure 1 Orientation program held at Karmasadan, Alappuzha.

Figure 2 Book release of "Fishes of Vembanad"

Figure 3 Vembanad Fish Count team at Pathiramanal Island

Figure 4 Participants are counting the fish caught in the cast net fishing.

Figure 5 Macrobrachium rosenbergii caught in the gill net fishing

Figure 6: Vembanad Fish Count Invitation 2023

15/05/2023
Alappuzha

Dear All,

It is our pleasure to announce the Vembanad Fish Count 2023. The Vembanad lake, a wetland of international significance, fosters high biodiversity and substantially supports rural livelihoods. The environmental conditions of this lake are in steady decline due to current and past interventions for the development and agriculture which have led to a crisis in livelihoods for dependent communities. With the intention of creating awareness about the state of fishery resources of the lake and to institute a deliberative democratic governance system for the Vembanad Lake by enhancing cooperation between various stakeholders, Govt. Departments, NGOs and academic institutions, Ashoka Trust for Research in Ecology and the Environment [ATREE] has initiated the annual Vembanad Fish Count in May 2008. The 16th edition of the fish count, has been scheduled for 29th and 30th of May 2023. The orientation programme for the volunteers will be inaugurated by **Sri. Suneel Pamidi IFS,** Member Secretary, SWAK. The closing ceremony will be held at KTDC Thannermukkam at 3 pm. **Dr. M. Rosalind George**, the Honorable Vice Chancellor of KUFOS has kindly agreed to receive the survey teams and inaugurate the function. On behalf of the organizing committee, we invite you all to participate in this event and lend your support in protecting this great natural heritage.

Jojo T.D
Project Manager, ATREE-CERC

Dr. Priyadarsanan Dharma Rajan
Senior Fellow, ATREE

Programme Schedule

29.05.2023 • ORIENTATION

05:00 PM - 05:30 PM	• **Registration of Volunteers**
Welcome	• **Dr. Priyadarsanan Dharma Rajan**, Senior Fellow, ATREE
Inaugural address and Fish book launch	• **Sri. Suneel Pamidi IFS**, Member Secretary, SWAK
Presidential address	• **Dr. K V Jayachandran**, Former Director of Research, KUFOS
Orientation	• **Maneeja Murali**, Senior Programme Officer, ATREE CERC
8:00 PM	• **Dinner**

30.05.2023 • VEMBANAD FISH COUNT 2023

06.00 AM Flag Off	• **Sri. K.V. Dayal**, Environmentalist
02.00 PM	• **VFC Team Reaches**, KTDC Thannermukkam
03:00 PM	• **Valedictory Function**
Welcome	• **Sri. Jojo T D**, Project Manager, ATREE-CERC, Alappuzha
Presidential address	• **Dr. Priyadarsanan Dharma Rajan**, Senior Fellow, ATREE Bangalore
Inaugural Address	• **Dr. M. Rosalind George**, Honorable Vice Chancellor, KUFOS
Report Presentation	• **VFC Team Captains**
Felicitation	• **Dr. Benno Pereira P. G.**, Assistant Professor, Dept. of Zoology, University of Kerala
	• **Dr. Sajeevan M**, Associate Professor, HOD of FRM, KUFOS
Certificate Distribution	• **Sri. Ramesh Sasidharan**, Deputy Director of Fisheries, Alappuzha
Vote of Thanks	• **Sri. K. M. Poovu**, Secretary, Lake Protection Forum

FOR REGISTRATION CONTACT

Maneeja Murali
Senior Program officer, ATREE-CERC, Alappuzha
8547080139 maneeja.murali@atree.org

PARTICIPATING ORGANIZATIONS AND INSTITUTIONS

COMMUNITY ENVIRONMENTAL RESOURCE CENTRE
ASHOKA TRUST FOR RESEARCH IN ECOLOGY AND THE ENVIRONMENT
KERALA UNIVERSITY OF FISHERIES AND OCEAN STUDIES
SAMYUKTHA KAYAL SAMRAKSHANA SAMITHI
DEPARTMENT OF AQUATIC BIOLOGY AND FISHERIES, UNIVERSITY OF KERALA
DEPARTMENT OF FISHERIES ALAPPUZHA
DEPARTMENT OF CHEMISTRY AMRITHA VIDYAPEETHAM, KOLLAM

SUPPORTED BY

STATE WETLAND AUTHORITY KERALA (SWAK)
Sarojini Damodaran Foundation

ORGANIZING SECRETARIAT

Community Environmental Resource Center(CERC)
Ashoka Trust for Research in Ecology and the Environment (ATREE)
Ammankovil Street, Mullakkal, Alappuzha cerc@atree.org

koral

Figure 7: Vembanad Fish Count 2023 Certificate for the participation

ANNEXURE 5

Media coverage

വേമ്പനാട് ഫിഷ് കൗണ്ട് 29 മുതൽ

മലയാളമനോരമ

ആലപ്പുഴ • സംസ്ഥാന തണ്ണീർത്തട അതോറിറ്റിയുടെ ധനസഹായത്തോടെ എട്രീ സംഘടിപ്പിക്കുന്ന വേമ്പനാട് ഫിഷ് കൗണ്ട് 29, 30 തീയതികളിൽ നടക്കും.

29ന് രാവിലെ 10ന് കർമസദനിൽ നടക്കുന്ന ഓറിയന്റേഷൻ പരിപാടി തണ്ണീർത്തട അതോറിറ്റി സെക്രട്ടറി സുനിൽ പാമിടി ഉദ്ഘാടനം ചെയ്യും. കേരളത്തിനകത്തും പുറത്തുനിന്നുമുള്ള വിവിധ സർവകലാശാലകളിലെ ഗവേഷണ സ്ഥാപനങ്ങളിൽ നിന്നുള്ള നൂറോളം പേർ പങ്കെടുക്കും. 30ന് രാവിലെ 6ന് പുന്നമടയിൽ നിന്നാരംഭിക്കുന്ന ഫിഷ് കൗണ്ട് 3 മേഖലകളായി തിരിച്ച് 3 ബോട്ടുകളിലാണ് നടക്കുക. 2ന് തണ്ണീർമുക്കം കെടിഡിസി ഹാളിൽ സമാപന സമ്മേളനം കുഫോസ് വൈസ് ചാൻസലർ ഡോ. എം. റോസലിൻഡ് ജോർജ് ഉദ്ഘാടനം ചെയ്യും. കഴിഞ്ഞ വർഷം ഫിഷ് കൗണ്ടിൽ 48 ഇനം മത്സ്യങ്ങളെയാണ് കണ്ടെത്തിയത്.

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.

കേരള കൗമുദി

അകന്നകന്ന് ആറ്റുകൊഞ്ച്

വേമ്പനാട് കായലിൽ കുറഞ്ഞത് 300 ടണ്ണിൽ നിന്ന് 100 ടണ്ണിലേക്ക്

ആലപ്പുഴ : വേമ്പനാട് കായലിൽ ആറ്റുകൊഞ്ച് കുറഞ്ഞു വരുന്നതായി പഠന റിപ്പോർട്ട്. തണ്ണീർമുക്കം ബണ്ടിന്റെ പുനർനിർമ്മാണത്തോടെ കായലിന്റെ തെക്കൻ പ്രദേശങ്ങളിലേക്ക് ഓരുവെള്ളം എത്താതായപ്പോൾ, 300 ടൺ ലഭ്യതയുണ്ടായിരുന്ന ആറ്റുകൊഞ്ച് 100 ടണ്ണായി.

എ ടിയുടെ നേതൃത്വത്തിൽ തണ്ണീർത്തട അതോറിറ്റിയുടെ സഹകരണത്തോടെ നടത്തിയ വേമ്പനാട് ഫിഷ് കൗണ്ടിലെ കണ്ടെത്തൽ. 41 ഇനം ചിറകുമത്സ്യങ്ങളെയും ഒൻപത് ഇനം തോട്മത്സ്യങ്ങളെയും കണക്കെടുപ്പിൽ കണ്ടെത്തി.

കഴിഞ്ഞ വർഷം 48 ഇനം ചിറകുമത്സ്യങ്ങളെ കണ്ടെത്തിയിരുന്നു. തണ്ണീർമുക്കം കെ. ടി. ഡി. സി ഹാളിൽ നടന്ന സമാപന ചടങ്ങ് എ ടി സീനിയർ ഫെല്ലോ ഡോ. പ്രിയദർശൻ ധർമ്മരാജൻ ഉദ്ഘാടനം ചെയ്തു. കേരള യൂണിവേഴ്സിറ്റി ഓഫ് ഫിഷറീസ്, പനങ്ങാട് അമൃതവിശ്വവിദ്യാപീഠം, എറണാകുളം സെന്റ് ആൽബർട്ട്സ് കോളേജ്, എസ്. ബി കോളേജ് അക്വാക്കൾച്ചർ വിഭാഗം വിദ്യാർത്ഥികൾ, ഗവേഷകർ, മത്സ്യത്തൊഴിലാളികൾ എന്നിവർ മത്സ്യങ്ങളുടെ കണക്കെടുപ്പിൽ പങ്കാളികളായി.

ത്തിന് രാജ്യ
ന്തുണ പ്രഖ്യാ
ടനം. ജില്ലാ

ടത്തിയ പ്രകടനം
സുരേഷ്കുമാർ രാമപു
ശ്യാംകുമാർ ചേർത്ത
പങ്കെടുത്തു.

യതിക്ക് അന്തിമ അംഗീകാരം
നൽകേണ്ടത് സംസ്ഥാന സർ
ക്കാരാണ്.

ദേശാഭിമാനി

ആറ്റുകൊഞ്ച് ഉൽപ്പാദനം 100 ടണ്ണിലേക്ക് ഇടിഞ്ഞു

ആലപ്പുഴ

മത്സ്യത്തൊഴിലാളികൾക്ക് വരുമാനമായിരുന്ന ആറ്റുകൊഞ്ച് കായലിൽ നാമാവശേഷമാകുന്നു. ആറ്റുകൊഞ്ചിന്റെ ഉൽപ്പാദനം 300 ടണ്ണിൽനിന്ന് 100 ടണ്ണിലേക്ക് കുറഞ്ഞു. അശോക ട്രസ്റ്റ് ഫോർ റിസർച്ച് ഇൻ ഇക്കോളജി ആൻഡ് ദി എൻവയൺമെന്റ്, കമ്മ്യൂണിറ്റി എൻവയൺമെന്റൽ റിസോഴ്സ് സെന്റർ നേതൃത്വത്തിൽ സംസ്ഥാന തണ്ണീർത്തട അതോറിറ്റിയുടെ സഹായത്തോടെ നടത്തിയ ഫിഷ്കൗണ്ടിലാണ് കണ്ടെത്തൽ.

ജീവിതചക്രത്തിന്റെ ഭൂരിഭാഗവും ശുദ്ധജലത്തിൽ ചെലവഴിക്കുന്ന ആറ്റുകൊഞ്ച് മുട്ടയിടാൻ കായലിന്റെ വടക്കൻ പ്രദേശങ്ങളിലേക്ക് പ്രയാണം നടത്തും. ഓരുവെള്ളത്തിന്റെ അസാന്നിധ്യത്തിൽ മുട്ടവിരിയൽ പ്രക്രിയ ശരിയായ രീതിയിൽ നടക്കാതെവരുന്നു. തണ്ണീർമുക്കം ബണ്ടിന്റെ അശാസ്ത്രീയ പ്രവർത്തനവും വേനൽമഴയുടെ ഏറ്റക്കുറച്ചിലുകളും തെക്കൻ പ്രദേശങ്ങളെ ശുദ്ധജല സ്വഭാവമുള്ളതാക്കി മാറ്റുന്നതായി ഫിഷ്കൗണ്ടിൽ വിലയിരുത്തി.

നാലുവർഷത്തെ ഉൾനാടൻ മത്സ്യ സൊസൈറ്റികളുടെയും മാർക്കറ്റ്, ലാൻഡിങ് സെന്ററുകളിലെയും ഡാറ്റയും ആറ്റുകൊഞ്ചിന്റെ ഇടിവ് വ്യക്തമാക്കുന്നു. കായലിന്റെ തെക്കൻ പ്രദേശങ്ങളിലെ കണക്കെടുപ്പ് കഴിയുമ്പോൾ 41 ഇനം ചിറകുമത്സ്യങ്ങളും ഒമ്പതിനം തോടുമത്സ്യങ്ങളും കണ്ടെത്തി. കഴിഞ്ഞവർഷം 48 ഇനം ചിറകുമത്സ്യങ്ങൾ ലഭിച്ചിരുന്നു. തണ്ണീർമുക്കം കെടിഡിസി ഹാളിൽ സമാപനച്ചടങ്ങ് ഡോ. പ്രിയദർശൻ ധർമരാജൻ ഉദ്ഘാടനംചെയ്തു.

മാതൃഭൂമി

ഓരുവെള്ളം കുറഞ്ഞു

വേമ്പനാട്ടുകായലിൽ ആറ്റുകൊഞ്ചും കരിമീനും കക്കയും ഇല്ലാതാകുന്നു

കോട്ടയം ▸ തണ്ണീർമുക്കം ബണ്ട് വന്നശേഷം ഉപ്പുവെള്ളം കുറഞ്ഞതിനാൽ വേമ്പനാട്ട് കായലിൽ ആറ്റുകൊഞ്ചും ഇല്ലാതാകുന്നെന്ന് പഠനം. ആലപ്പുഴയിലെ അശോക ട്രസ്റ്റ് ഫോർ റിസർച്ച് ഇൻ ഇക്കോളജി ആൻഡ് ദി എൻവയൺമെന്റ്, കമ്യൂണിറ്റി എൻവയൺമെന്റൽ റിസോഴ്സ് സെന്റർ എന്നിവ സംസ്ഥാന തണ്ണീർത്തട അതോറിറ്റിയുടെ സഹായത്തോടെ മീനുകളുടെ വംശനാശത്തെക്കുറിച്ച് നടത്തിയ സർവേയിലാണ് ഇത് കണ്ടെത്തിയത്.

തണ്ണീർമുക്കം ബണ്ട് കമ്മിഷൻ ചെയ്ത 1976-ന് ശേഷമാണ് കൊഞ്ച് വൻതോതിൽ കുറഞ്ഞത്. 1960-കളിൽ പ്രതിവർഷം 300 ടൺ കൊഞ്ച് കിട്ടിയിരുന്നു. 1990-ൽ 100 ടണ്ണായി കുറഞ്ഞു.

തണ്ണീർമുക്കം ബണ്ട് കടന്ന് ഓരുവെള്ളം എത്താത്തതിനാൽ കൊഞ്ചിന്റെ മുട്ടവിരിയാത്തതാണ് എണ്ണം കുറയാൻ പ്രധാന കാരണം. കൂടുതൽ സമയവും ശുദ്ധജലത്തിൽ കഴിയുന്ന ആറ്റുകൊഞ്ച് പ്രജനനകാലത്ത് ഓരുവെള്ളം തേടും. ഓരുവെള്ളം ഇല്ലെങ്കിൽ മുട്ട വൻതോതിൽ വിരിയില്ല. തണ്ണീർമുക്കം ബണ്ടും വേനൽമഴയുടെ ഏറ്റക്കുറച്ചിലുകളും തെക്കൻപ്രദേശങ്ങളെ ശുദ്ധജലമുള്ളതാക്കി. കറുത്ത കക്ക, കരിമീൻ തുടങ്ങിയവയും കുറഞ്ഞു.

ഉപ്പിന്റെ അംശമുള്ളതിനാൽ കൊച്ചിക്കായലിനോട്ചേർന്നുള്ള വൈക്കം, മുറിഞ്ഞപുഴ, അരൂർ, അരൂക്കുറ്റി ഭാഗങ്ങളിലാണ് നിലവിൽ ഇത്തരം മീനുകൾ കുറച്ചെങ്കിലും ഉള്ളത്. കുമരകം, തണ്ണീർമുക്കം, കായിപ്പുറം, മുഹമ്മ, മണ്ണഞ്ചേരി, പുന്നമട ഭാഗങ്ങൾ പലപ്പോഴും ശുദ്ധജലതടാകം പോലെയാകുന്നത് മീനിന്റെ അളവും കുറയ്ക്കുന്നു.

> **തണ്ണീർമുക്കം ബണ്ട് പ്രവർത്തനം ക്രമീകരിക്കണം**
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> കാർഷികാവശ്യത്തിന് മാത്രമല്ല മത്സ്യത്തൊഴിലാളികളുടെ ആവശ്യംകൂടി മനസ്സിലാക്കി വേണം തണ്ണീർമുക്കം ബണ്ടിന്റെ പ്രവർത്തനം. നിലവിൽ കരിമീൻ കുഞ്ഞുങ്ങളെ നിക്ഷേപിക്കുന്ന മാതൃകയിൽ ആറ്റുകൊഞ്ചിന്റെ കുഞ്ഞുങ്ങളേയും നിക്ഷേപിക്കണം.
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> **-മനീജാ മുരളി, സീനിയർ പ്രോഗ്രാം ഓഫീസർ അശോക ട്രസ്റ്റ് ഫോർ റിസർച്ച് ഇൻ ഇക്കോളജി ആൻഡ് ദി എൻവയൺമെന്റ്.**

Prawns rapidly perishing from Vembanad lake

EXPRESS NEWS SERVICE
@Alappuzha

ATTUKONJU, a giant freshwater prawn, is rapidly disappearing from Vembanad lake due to biodiversity loss, according to a report prepared by the 16th edition of the Vembanad fish count.

The survey was carried out in the southern parts of the lake by the Community Environment Resource Centre under the Ashoka Trust for Research in Ecology and Environment.

The fish count recorded a total of 50 fish species in the lake. A team of 110 volunteers, including academics, researchers, and fishermen from the region, identified 41 finfish and nine shellfish species during the survey.