National River Conservation Directorate
Ministry of Jal Shakti,
Department of Water Resources,
River Development & Ganga Rejuvenation
Government of India

APPROACHES AND ACTIVITIES FOR RIVER - PEOPLE CONNECT

Periyar River Basin

July 2025

cGanga

IIT PALAKKAD

Approaches and Activities for River - People Connect

National River Conservation Directorate (NRCD)

The National River Conservation Directorate, functioning under the Department of Water Resources, River Development & Ganga Rejuvenation, and Ministry of Jal Shakti providing financial assistance to the State Government for conservation of rivers under the Centrally Sponsored Schemes of 'National River Conservation Plan (NRCP)'. National River Conservation Plan to the State Governments/ local bodies to set up infrastructure for pollution abatement of rivers in identified polluted river stretches based on proposals received from the State Governments/ local bodies.
www.nrcd.nic.in

Centres for Periyar River Basin Management and Studies (cPeriyar)

The Center for Periyar River Basin Management and Studies (cPeriyar) is a Brain Trust dedicated to River Science and River Basin Management. Established in 2024 by IIT Palakkad and NIT Calicut, under the supervision of cGanga at IIT Kanpur, the center serves as a knowledge wing of the National River Conservation Directorate (NRCD). cPeriyar is committed to restoring and conserving the Periyar River and its resources through the collation of information and knowledge, research and development, planning, monitoring, education, advocacy, and stakeholder engagement.
www.cPeriyar.org

Centres for Ganga River Basin Management and Studies (cGanga)

cGanga is a think tank formed under the aegis of NMCG, and one of its stated objectives is to make India a world leader in river and water science. The Centre is headquartered at IIT Kanpur and has representation from most leading science and technological institutes of the country. cGanga's mandate is to serve as think-tank in implementation and dynamic evolution of Ganga River Basin Management Plan (GRBMP) prepared by the Consortium of 7 IITs. In addition to this, it is also responsible for introducing new technologies, innovations, and solutions into India.
www.cganga.org

Acknowledgment

This report is a comprehensive outcome of the project jointly executed by IIT Palakkad (Lead Institute) and NIT Calicut (Fellow Institute) under the supervision of cGanga at IIT Kanpur. It was submitted to the National River Conservation Directorate (NRCD) in 2024. We gratefully acknowledge the individuals who provided information and photographs for this report.

Team Members

Dr. Santosh G Thampi, cPeriyar, NITC
Dr. Pramada S K, cPeriyar, NITC
Dr. Athira P, cPeriyar, IIT PKD
Mr. Mridul K, cPeriyar, NITC
Mr. Jishnu M, cPeriyar, NITC

Preface

Rivers have a very major environmental and societal role on this planet as they provide water, the elixir of life and render incredibly invaluable ecosystem services including facilitating production of food and nutrients, mitigation of floods and droughts, transport, power generation, recreation etc as well as providing habitat and supporting biodiversity. The Periyar River is more than a stream of water flowing through the State of Kerala. It is the lifeline of a major part of the State, a cultural symbol and a source of livelihood for many.

The report titled "Approaches and Activities for River-People Connect" aims to document and reflect upon the diverse ways in which people, particularly those living near the course of the Periyar River and in the Periyar River Basin, interact with, depend on and shape the river. From common people including farmers, fisherfolk, tribal communities etc. to commercial establishments and industries, as well as conservationists, the river touches the lives of many in countless ways. The Periyar River is not merely a geographic entity; it is an active participant in the spiritual, economic and social narratives of the region.

The insights presented in this report are derived from our interactions with local stakeholders, including the general public, entrepreneurs in the tourism sector, and environmental activists. Their narratives reveal the changing dynamics of river-people relationships. This diversity of perspectives helps to enrich our understanding of how cultural values, livelihood needs, and ecological realities co-exist and interact in the river basin and shape the lives of the people living around the river.

Centres for Periyar River Basin Management and Studies (cPeriyar)
IIT Palakkad & NIT Calicut

Contents

List of Figures

Abbreviations and Acronyms

CMRL	Cochin Minerals and Rutile Ltd
CORL	Collective for Right to Live
CPCB	Central Pollution Control Board
EDC	Eco-Development Committees
FACT	Fertilisers and Chemicals Travancore Ltd
KSEBL	Kerala State Electricity Board Ltd
LAEC	Local Area Environment Committee
NGO	Non - Governmental Organisation
PFM	Participatory Forest Management
PMVS	Periyar Malineekarana Viruddha Samithi
PTR	Periyar Tiger Reserve
PVIP	Periyar Valley Irrigation Project
SHEP	Small Hydroelectric Projects
SOPMA	Sawmill Owners and Plywood Manufactures Association
TCC	Travancore Cochin Chemicals Ltd
VSS	Vana Samrakshana Samithis

1. Introduction

Freshwater is one of the basic necessities for the survival of mankind and all forms of life on Earth. Rivers are one of the major sources of freshwater on this Planet. The close connect between rivers and people is clearly evident in recorded history. All the major human civilizations such as the Egyptian civilization, Indus Valley civilization etc developed and flourished near rivers. Rivers connect people, places, and various forms of life, sustains and promotes diverse religious and cultural beliefs, values, and ways of life is essential for maintaining ecosystems in good health and (UN Environment, 2017; WWAP, 2018; Anderson et. al., 2019).

Rivers and people share a deep connect between them. The way people connect with rivers express their understanding of rivers and approaches to river management. The ways in which communities interact with rivers result in complex social-ecological interdependencies (Allan et. al., 2024). To understand this and address related issues, a more inclusive and pluralistic approach which values diverse ways of thinking about and engaging with rivers is to be adopted.

The Periyar River, often referred to as the lifeline of a major part of the State of Kerala, flows not only through the land but also through the traditions, histories and livelihoods of the people who live along its course. Stretching over 244 kilometers, it is the longest river in Kerala, originating from the remote forests of the Periyar Tiger Reserve (PTR) known as Sivagiri group of hills. It traverses through rich forests, tribal settlements, agricultural lands and urban centres before emptying into the Arabian Sea. More than just a waterway, the Periyar sustains a complex web of ecological systems and cultural traditions.

Human interactions with the Periyar River are diverse and deeply rooted in the daily life of people residing along its course as well as connected with the river in one way or the other. Communities living along its banks depend on the river for essential needs such as drinking water, irrigation for agriculture and fishing. Its fertile banks nurture a wide range of crops. Tourism activities, particularly eco-tourism in areas like the Periyar Tiger Reserve and Thattekad has created new modes of interaction, generating income for the local people while promoting awareness on conservation of the river and the forests nearby. Indigenous tribal groups have traditionally relied on the river for fishing and gathering various resources. These activities of humans, centred around the river, has helped to develop a deeper understanding of the importance of river in their daily lives and livelihood. The river also holds spiritual significance by serving as a site for religious rituals, festivals and pilgrimages, resulting in the nourishment and growth of a rich culture and tradition. The human-river interactions focussing on the Periyar reflect a dynamic relationship with the river shaping human life and human activities.

As the pressures exerted by urbanisation, pollution, ecological degradation etc continues to increase, the need for a clear and deep understanding of river-people interactions and preservation of a healthy human-river connect becomes all the more significant. This report brings together narratives, practices and experiences of the general public as well as those of a few resource persons representing various sectors of the civil society having close interaction with the Periyar. The report highlights how the Periyar River continues to shape and be shaped by the people who live along its banks and who interact with the river in some way or the other.

2. Current Nature of River-People Interaction in the Periyar River Basin

"Who hears the rippling of rivers will not utterly despair of anything." - Henry David Thoreau. This profound reflection captures the essence of the deep, enduring connection between people and rivers, a relationship clearly visible in the context of the Periyar River Basin. As the lifeline of central Kerala, the Periyar has long shaped and sustained the lives of those who dwell along its banks. From traditional fishing and agriculture to spiritual practices and festivals, the river is intricately woven into the social, cultural and economic fabric of the region. Communities have developed unique systems of water management, temple rituals and livelihoods that reflect a deep devotion for the river.

Despite increasing pressures from urbanization, pollution and infrastructural development, the bond between people and the Periyar continues to be a source of resilience and identity, echoing Thoreau's belief in the restorative and grounding power of rivers. For any river to be called the lifeline of a region, it must be so vital that life without it becomes unimaginable. There are different dimensions to this interaction: economic, socio-cultural, recreational ecological and spiritual. The following sections explore these dimensions and provide an idea of how the Periyar is influencing a large community around the river.

2.1. Reliance on the Periyar River for Livelihood

Dependence on a river for one's livelihood is perhaps the strongest and most direct form of human-river interaction. In the case of the Periyar, this is most evident among the farmers and fishermen - those engaged in primary sector activities directly linked to the river. Farmers rely on the river for satisfying crop water requirements through irrigation - either using surface water stored in reservoirs and conveyed through channels or directly diverted from the river via canals or using groundwater recharged by the river system. Fisherfolk, on the other hand, depend on the aquatic life the river supports, which forms the basis of both subsistence and commercial fishing.

In the secondary sector, though the role of the river is not immediately visible, it remains crucial. The Eloor-Edayar industrial belt, one of the most prominent industrial zones in Kerala, is heavily reliant on the Periyar for water. Nearly all industries in this area use river water as a raw material in their production processes. The livelihoods of thousands of workers and the economic benefits enjoyed by consumers of these industrial goods are indirectly tied to the flow of the Periyar.

Moreover, the Periyar River hosts several major infrastructure projects, primarily for irrigation and hydropower generation, that significantly contribute to economic development and employment generation. There are 17 major hydraulic structures across the river including dams, and barrages/ diversion weirs managed by the Department of Water Resources/ Irrigation, Govt. of Kerala, and the Kerala State Electricity Board Limited (KSEBL). In addition to the above, there are a few small hydroelectric power projects (SHEPs) which have been already commissioned and are in operation/ under construction/ under consideration. The project proponents are the KSEBL and private enterpreuners. These projects not only play a vital role primarily in power generation and irrigation as well as in flood control but also support the livelihoods of hundreds of people employed directly or indirectly during operation, maintenance, and allied services. The long-term employment provided by these river-based projects underscores the enduring economic importance of the Periyar and the deep interdependence between the river and the people who rely on it.

2.1.1. Agriculture

Agriculture in the Periyar River Basin is predominantly rain-fed, but irrigation from the Periyar River and its tributaries plays a critical supplementary role. Recent block-level data highlights the agricultural diversity of the river basin, with major crops including paddy, coconut, banana, pepper, cardamom, ginger and various vegetables including Amaranthus, Brinjal, Ladies Finger, Bitter Gourd, Snake Gourd, Little Gourd, Ash Gourd, Payar, Pumpkin, Cucumber, Bottle Gourd, Green Chilli, Cabbage, Tomato, Cauliflower, Beans, Other Vegetables, Elephant Foot Yam, Colocasia, Yam, Koorka, Sweet Potato, Cherukizhangu (Department of Economics & Statistics Kerala, 2025). In the high-range Blocks including Adimali, Devikulam and Nedumkandam, plantation crops like Tea, Cardamom, Pepper and Ginger dominate due to favourable agro-climatic conditions. Cardamom cultivation alone spans thousands of hectares, underlining the economic and agricultural importance of these high-altitude zones. Some of the major agricultural crops cultivated in the river basin is depicted in Figure 1.

In contrast, the midland and lowland areas - particularly Blocks, namely, Aluva, Koovappady and Perumbavoor - are characterized by extensive coconut and paddy cultivation, with paddy remaining the traditional staple crop. Coconut occupies more than 2,000 ha, spread over many blocks, while banana cultivation is widespread across the basin, often practiced as an intercrop with coconut and

pepper. The spatial distribution of crops is largely influenced by variations in elevation, soil type and microclimate. This diversity supports both subsistence farming and commercial agriculture, making the Periyar River Basin one of Kerala's most agriculturally significant regions.

Paddy

Coconut

Banana

Black Pepper

Cardamom

Ginger

Fig.1 Major agricultural crops in the Periyar River Basin

Among the Districts, Idukki stands out with a net cultivated area exceeding 2,56,000 hectares in 2021–2022. This District is the leading producer of cardamom in the State, contributing nearly 90%

of Kerala's total production. It also holds significant shares in Coffee, Pepper and Rubber cultivation. Ernakulam and Thrissur Districts also play vital roles, contributing to the State's output of Paddy, Tapioca, Banana, Coconut and Arecanut. Although canal irrigation is limited in the High Ranges, the network of lined and unlined canals under the Periyar Valley Irrigation Project (PVIP) has become indispensable for sustaining agriculture.

With changing climatic patterns marked by increasing temperatures and extended drought periods, the significance of the irrigation infrastructure in the Periyar River Basin has considerably increased. While initially designed to support agriculture, the canals - especially the unlined ones - now serve a broader hydrological role. They recharge aquifers and sustain drinking water supplies, especially in the midland and lowland regions. Degradation of these canals over the years has reduced its efficiency. However, continued reliance of the community on them underscores the urgent need for revitalization.

2.1.2. Industrial Activities

The industrialization of the Periyar River Basin began during the mid-20th century as part of broader State-driven efforts to promote economic development. In Travancore, industrial initiatives were supported by the then ruler, Sri Chithira Thirunal Balarama Varma and Diwan Sir C.P. Ramaswamy Ayyar. Eloor, located along the lower reaches of the Periyar, was identified as a strategic location for developing large-scale industries. This led to the establishment of the Eloor-Edayar Industrial Development Area in the early 1960s, spanning 376 acres and hosting chemical, rubber and allied industries.

Today, the Eloor–Edayar belt forms the most heavily industrialized zone along the Periyar River, with over 336 industries. Among these, 201 are classified as Red category (high pollution potential), 46 as Orange and 89 as Green (lower pollution potential). These classifications are based on a Pollution Index which is a function of the emissions, effluents released, hazardous waste generated and consumption of resources (Kerala Water Authority, 2021). Major industries include Fertilisers and Chemicals Travancore Ltd. (FACT), Travancore Cochin Chemicals Ltd. (TCC), and Cochin Minerals and Rutile Ltd (CMRL), Sud-Chemie India Ltd, Arjuna Natural Extracts and TMS Leathers. Effluent discharge from these industries, though regulated through treatment plants, remains a major concern, especially where treated discharges occur downstream of the Pathalam Regulator-cum-Bridge. The concentration of industries within a narrow 5 km stretch reflects the heavy economic dependence of the region on industrial production. Employment, small business opportunities, and local livelihoods are intricately tied to these industries, at the cost of increasing environmental stress on the Periyar, especially through contamination by heavy metals, chemicals and untreated domestic waste.

Moving upstream, the nature of industrialization shifts notably in places like Perumbavoor. Here, the industrial base is centered around smaller and medium-scale units, predominantly wood-based industries such as sawmills, plywood manufacturing, furniture manufacturing and small-scale agro-processing. The Perumbavoor industrial belt, while less intensive in chemical pollution compared to Eloor-Edayar belt, has its own environmental pressures, particularly resulting from deforestation and localized water pollution from timber processing. Economically, these industries provide employment to a large section of the local population as well as migrant workers and contribute to regional economies differently through decentralized, labour-intensive sectors rather than capital-intensive large industries. The dependence of the general public on the Periyar in this region remains strong both for industrial processes (like wood seasoning) and for daily water needs; but pollution levels are typically more diffuse and less toxic compared to the heavy contamination zones downstream. These industries rely heavily on the Periyar for processing needs and daily sustenance. The economic importance of this sector can be inferred from the losses incurred during the devastating 2018 floods which severely impacted this region, damaging around 70 small-scale mills/ industries and causing losses estimated at over ₹100 crore. Stockpiled timber worth ₹50–60 lakh per load and machinery were washed away, drastically reducing production from wood based industries. The daily intake of about 600 timber loads from four Districts, namely, Idukki, Kottayam, Pathanamthitta and Malappuram dropped to around 100 loads. Despite these challenges, the sector, which contributes about ₹2.50 crore daily in taxes, displayed resilience, with industry associations like SOPMA (Sawmill Owners and Plywood Manufactures Association) stepping in to support local communities (The New Indian Express, 2018).

In the High-Range regions like Munnar, industrial activities are more agrobased in nature, with the focus on plantation industries such as tea processing, cardamom curing and spice extraction. The relationship between people, the river and the industries take a different form in this region. Plantations not only support thousands of livelihoods but also depend heavily on the tributaries of Periyar for irrigation, processing and domestic water supply. Water demand from these industries directly affects streamflows, especially during the dry months. While chemical toxicity is generally lower when compared to the industrial belts of Eloor and Perumbavoor, concerns exist regarding runoff from plantations (including pesticide residues) affecting water quality.

Another major dimension related to industrialization in the Periyar River Basin is the developments in the hydroelectric power generation sector. The Idukki Hydroelectric Project which harnesses the waters of the Periyar by construction of a massive arch dam has fundamentally changed both the physical and economic landscape of the basin. Hydropower stations in the Periyar River Basin such as Idukki, Idamalayar, and Lower Periyar, play a major role in satisfying the demand for electricity,

powering homes, industries and services across the State. During the summer months, reduced river flows, combined with a sharp rise in electricity demand due to heat, often strain the system. As a result, the State is forced to resort to load shedding/ power cuts and buy electricity from other States through the national power grid. The onset of summer showers brings relief to the people as it cools down the overall environment and reduces consumption of power, although it does not immediately translate to higher water levels in the reservoirs. Sustained rainfall over the catchments is needed for effective power generation. Thus, a delicate balance between the pattern of rainfall, reservoir inflow and consumer demand govern the stability of electricity supply. People's dependency on the river through these hydroelectric projects is immense as electricity generated these projects fuels urban centers, industries and rural households alike, linking the health of the river ecosystem directly to the stability of energy supply. However, construction of dams and reservoirs has altered river flows, affected aquatic habitats and displaced communities - a trade-off that continues to shape environmental and social debates around river management. To summarise, the Periyar, across its course, links people to industries in a variety of ways: from providing raw material and processing water, to industrial waste disposal, to electricity generation. Economic patterns shift from the high-capital, heavy industries of the Eloor-Edayar belt to the labour-driven, small-to-medium scale industries of Perumbavoor and to agro-industrial economies in the hill regions.At every stage, the river remains a lifeline that supports livelihoods, enabling industries and sustaining communities even as it suffers from the cumulative impacts of these diverse human activities.

2.1.3. Fish and Fisheries

Fishing and fisheries constitute a vital source of livelihood for many communities residing along the Periyar River and its estuarine stretches. A number of inland villages within the basin rely directly on the Periyar for freshwater fish catch. These include Vazhathoppu in Idukki Dstrict; Kadamakkudi, Ezhikkara, Mulavukadavu, Cheranelloor, Vadakkekkara and Puthenvelikkara in Ernakulam District; and Anapuzha (near Kodungalloor), Pullut, Poyya and Puthenchira in Thrissur District. These areas are typically located close to the main river channel, distributaries, or backwaters where seasonal and perennial fish availability supports small-scale and subsistence fishing.

In addition to inland fishing, the coastal stretches of Ernakulam and Thrissur Districts - where the Periyar River meets the Arabian Sea - host a number of marine fishing villages. These include Azheekal, Ochenthuruth, Malipuram, Elamkunnappuzha, Njarakkal, Nayarambalam, Edavanakkad, Ayyampilli, Kuzhipilli, Pallippuram and Cherai in Ernakulam District and Azhikode, Eriyad, Edavilangu, Vemballoor, Koolimuttam, Perinjanam, Kaipamangalam and Chendrappini in Thrissur District(Fisheries Hand Book, Government of Kerala, 2020). These communities engage in both inland and marine fishing, often relying on estuarine dynamics and tidal exchanges that bring in

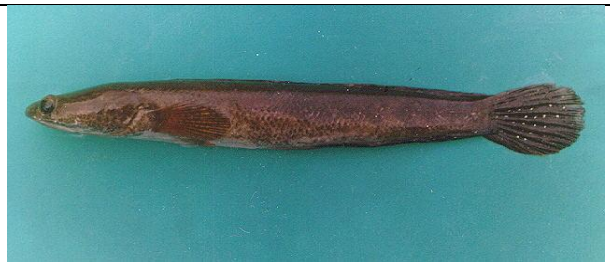
diverse fish species. Fishing activities in these areas are not only critical for household income but also for food security, traditional practices and the local economy. Seasonal variations in river flow, pollution, sand mining and operation of dams located upstream, have however**,** increasingly affected the volume of fish catch, with communities facing fluctuating incomes. In addition to reduction in fish catch, declining fish diversity is also observed. This underscores the delicate link between river health and the livelihoods of people who depend on its aquatic resources across the Periyar River Basin.

Fishing practices in the Periyar River Basin are diverse, with fishers employing traditional gear such as gill nets, cast nets and hook-and-line methods. Gill nets remain the most common among full-time fishers, while hook-and-line fishing is increasingly practiced by part-time and seasonal fishers. A wide variety of fish species are targeted using these methods, including both native species like *Wallago attu*, *Channa marulius*, *Dawkinsia filamentosa*, *Glossogobius giuris* and *Hyselobarbus curmuca* and exotic species such as *Pangasianodon hypophthalmus* (striped catfish), *Piaractus brachypomus* (red belly), *Clarias gariepinus* (African catfish) and *Oreochromis mossambicus* (tilapia), (ICAR-CIFRI, 2018). Images of the fish species mentioned above are shown in Figure 2.

A variety of fishing crafts are employed depending on the region: tyre tubes and bamboo rafts dominate in the upper reaches (Vandi Periyar, Ayyappan Kovil and Cheruthoni whereas in the mid to lower stretches, dugout canoes, fibre boats and plank-built canoes are more common. In the estuarine reaches such as in Munambam, a larger setup like Chinese dip nets are used. While some gear like stake nets are technically illegal, they are still in use (ICAR-CIFRI, 2018). The effort involved in fishing is closely linked to local river morphology, flow variability and access to distributaries or reservoir outflows.

In the upper reaches of the Periyar River, particularly around Thekkady in Idukki District, fishing remains an integral part of the local tribal communities' livelihoods. Tribes such as the Mannar, Paliyan and Ooral have exclusive rights to fish in the reservoir (Shahul, 2020). Figure 3 depicts the fishing activities of the local tribes at Periyar lake. These communities employ traditional methods, using bamboo rafts to navigate the lake and set nets along its shores. The Idukki reservoir is home to 37 varieties of fish, some of which have migrated downstream to the Vembanad Lake and further into canals, paddy fields and ponds.

Wallago attu



Channa marulius

Dawkinsia filamentosa

Glossogobius giuris

Hyselobarbus curmuca

Pangasianodon hypophthalmus

Piaractus brachypomus

Clarias gariepinus

Oreochromis mossambicus

Fig. 2 Major fish species (*Source: ICAR-CIFRI, Fishbase*)

Seasonal flooding events in the Periyar significantly impact fishing livelihoods, often in complex ways. While initial floods may temporarily increase fish availability - especially escapees from reservoirs and culture farms - long-term impacts include damage to gear, displacement of native species and reduced fish catch due to sedimentation, disrupted flow and water quality deterioration.

For instance, flooding has led to the introduction of non-native species like arapaima, koi carp and African catfish into the river system, affecting native biodiversity and fisheries balance. The decline in native species post-flood has been a major concern among traditional fishers.

Fig. 3 Local tribes engaged in fishing at Periyar lake, Thekkady (*Source: on Manorama, 2020*)

In response to the changing dynamics, some fishermen groups have begun to adopt practices such as cage culture, particularly in estuarine zones such as Munambam. Fishers here stock cages with commercially valuable species like tilapia and *Lutjanus sp.*, fetching high market prices (up to ₹400/kg) (ICAR-CIFRI, 2018). However, the expansion of such aquaculture is limited by flood risks, infrastructure costs and ecological constraints. Overall, these shifts highlight both the vulnerability and resilience of riverine fishing communities and the need for better integration of ecological flow management, disaster preparedness and sustainable fisheries policy to secure their future.

2.2. Role of Periyar River as a Part of Cultural Practices

More than a lifeline of water, the Periyar River acts as a cultural artery that nourishes heritage, local traditions, human settlements and sustains the cultural continuity of the people. Historically, human settlements around water bodies have flourished, due to easy availability of water for drinking, irrigation and agricultural needs. This played a key role in its growth and overall development (Bindu and Mohamed, 2016).

Archaeological investigations in the Periyar River Basin dating to the Megalithic and Early Historic periods confirm that the region has been continuously inhabited from around the 5th century BCE to the 5th century CE. The presence of urn burials and megalithic monuments in the midland and lowland regions indicates that the river was central to early ritualistic and community practices (Chedambath, 1998). These findings suggest that Periyar played a significant role in the spiritual and cultural expressions of ancient communities. Historical pottery and iron instruments dating back to this period suggests a rich ceramic typology and metallurgical tradition, likely supported by the proximity to the river (Chedambath, 1998).

The Aluva Palace, located on the banks of the Periyar River in Ernakulam District has considerable historical and cultural significance in association with the river. Historically, it served as the summer retreat of the Travancore royal family. Its location beside the Periyar River made it a serene and suitable spot, offering cool breeze, scenic views and access to water routes that were vital before the dominance of road transport. The palace is situated close to the Aluva Manalpuram, the famous sandbank where the Aluva Sivarathri Festival is celebrated annually. The traditional Kerala style architecture of the palace was designed to blend with the the riverine environment (Kerala Tourism, n.d).

A key site of cultural importance is Kalady, situated on the banks of the Periyar River. It is the birthplace of Adi Shankara, the great Indian Philosopher and Vedic Scholar who established the school of Advaita Vedanta. Kalady Kadavu, the place where the river changes course, remains a sacred site as Adi Shankara had first performed cultural rituals such as the Aarattu (a river bath of an idol), preserving a living connection to philosophical heritage of Kerala. “Muthala Kadavu” or Crocodile Ghat, is also a sacred site as it is the location where Adi Shankara embraced sannyasa.

Aluva, another town on the banks of the Periyar River is the venue of the Aluva Sivarathri Festival. It is a major public celebration held every year in the Malayalam month of Kumbham. The event draws thousands of people and showcases traditional arts, rituals, and communal gatherings. The festival is closely tied to the myth of Lord Shiva consuming the poison "Kalakoodam" to save the universe, an event symbolized in the name "Aluva" ('Alam' meaning poison and 'Vaa' meaning mouth). In addition to religious festivals, Aluva was also a favoured summer retreat for the royal family of Travancore and even hosted Jewish holiday homes from Cochin, reflecting the cultural and multi religious appeal.

Many early trade routes passed along the Periyar and sites such as Kurumassery in Ernakulam District served as an important exchange centre between ancient cities such as Madurai and Kodungallur. Trade activity enabled cultural intermingling and circulation of goods, ideas and practices. The discovery of Roman coins and punch-marked coins in the river basin further supports the role of the river as a cultural and commercial hub (Mohamed, 2016).

The Chendamangalam Synagogue, located near the banks of the Periyar River, is a remarkable symbol of the Jewish heritage of Kerala. It reflects centuries of cultural integration and historical co-existence between the river and the humans. The Periyar River, flowing near Chendamangalam, historically facilitated trade and transport, connecting the region to ancient port towns such as Kodungallur. As a waterway, the river linked Chendamangalam town with other Jewish settlements in Kerala, enabling cultural exchange and community interdependence. It enabled the movement of goods and people, and established connections between Jewish settlers and the local community. The

synagogue, with its distinct Kerala-Jewish architectural blend, stands as a living reminder of how the river shaped the social and economic landscape of the region. The Chendamangalam Synagogue has been renovated recently as part of the Muziris Heritage Project and it continues to attract visitors who are drawn not only to its unique architectural features but also to its cultural legacy (Waronker J, 2010).

The Periyar River plays a vital role in preserving oral traditions, as many legends and myths associated with the river have been passed down through generations, weaving the river deeply into the cultural identity of Kerala. Preserving the cultural heritage of the Periyar River is very important since it maintains the identity and vibrancy of the communities of Kerala for future generations.

2.3. Role of Periyar River as a Part of Religious Practices

The rivers in India are considered sacred and personified as Goddesses (Ganga). It holds a high degree of respect and unique status. Their presence has mythological and religious connotations (Bindu and Mohamed, 2016). In India, most of the religious structures are built close to water bodies due to their spiritual importance. The Periyar River with its continuous flow is associated with numerous religious practices and rituals. The banks of the Periyar River is home to historically and religiously significant sites, including Aluva Shri Mahadeva Temple, St. Thomas Church Malayattoor, Chelamattom Shree Krishna Swami Temple, Thiruvairanikulam Shri Mahadeva Temple, Chendamangalam Synagogue and Alangad Juma Masjid (Fig. 4). At many places, temples are located on or near the banks of rivers, since the presence of a river is seen as essential for completion of ceremonies such as birth and death rites.

The famous Aluva Sivarathri festival is celebrated on the banks of the Periyar River. The festival at the Aluva Shri Mahadeva Temple is held annually on Maha Shivaratri, which falls in the month of “Kumbham” in the Malayalam calendar. On this day, the Shiva temple situated on the sandy banks (Manalppuram) of the Periyar River draws thousands of devotees. The Mahadeva Temple is located about 1 km from the Marthanda Varma Bridge on National Highway 544 connecting Kochi in Kerala with Salem in Tamil Nadu. Near the Aluva railway bridge, the Periyar River splits into two, of which one branch is called Mangalappuzha and the other one is called Marthandavarma branch. The Aluva Shri Mahadeva Temple stands on the sand bank between the Periyar River and the Mangalappuzha branch. Devotees gather on the sand banks (Manalppuram) for the Sivarathri festival to perform “Bali” (ritual offerings) for their ancestors on the holy night (Sivarathri) on the banks of the Periyar River (Fig. 5). It is believed that, Lord Parasurama installed a “Swayambhoo Shivalinga” rising directly out of the sandbanks and this was worshipped by Lord Sree Rama. This temple is unique in

that the Shivalinga is not housed within a traditional sanctum (Sreekovil), symbolizing the raw and divine connection of nature with the religion.

Aluva Shri Mahadeva Temple

St. Thomas Church, Malayattoor

Chelamattom Sree Krishna Temple

Thiruvairanikulam Shri Mahadeva Temple

Chendamangalam Synagogue

Alangad Juma Masjid

Fig. 4 Prominent religious sites in the Periyar River Basin (*Source: Kerala Tourism; Wikipedia*)

Religious practices of the Christian community are also tied to the river. The Malayattoor Church, located at the top of the Kurisumudi Hill, is situated on the north of Periyar River (Varghese, 2023). It is dedicated to St. Thomas, the Apostle, who is believed to have prayed there. The Church, partially girdled by the Periyar River, has been declared an international shrine and draws thousands of pilgrims during its annual festival. Devotees climb the Malayattoor Hill, especially around Easter enacting the believed journey of St. Thomas in AD 52 to establish Christianity in Kerala (Varghese, 2023).

Fig. 5 Crowd at Aluva Manalppuram during a Sivarathiri night (*Source: The New Indian Express, 2024*)

In Hinduism, especially in Kerala, the ritual of "Bali" (ritual offerings) is performed to provide salvation to the souls of deceased ancestors. These rituals are commonly conducted near sacred rivers. The act of offering Bali by the riverside allows devotees to symbolically release the souls of their ancestors into divine care. The Chelamattom Sri Krishna Temple, located between Perumbavoor and Kalady, the birthplace of Adi Shankaracharya, holds great religious importance due to the ancestral ritual of "Bali". Since the temple is situated on the banks of Periyar River, it has become an important spiritual gathering place for devotees during auspicious days like "Karkidaka Vavu". Interestingly, the river flows eastward at this place, unlike its usual westward flow. Fig. 6 shows devotees offering "bali". These types of rituals and customs of the temple strengthen the religious identity of the Periyar River as a holy river where divine intervention and devotion of the humans meet.

The Thiruvairanikulam Shri. Mahadeva Temple, situated on the banks of the Periyar River in Ernakulam District of Kerala, is a major pilgrimage centre. During the annual "Nadathurappu Festival", when the sanctum of Goddess Parvati is opened for only 12 days in a year, thousands of devotees gather in the temple. During this festival, devotees take ritual baths in the river before offering prayers. This practice symbolizes spiritual purification and reinforces the belief that water in the river purifies the soul and neutralize sins (Mathew B, 2013). Through these traditions, the temple continues to shape and preserve the role of river as a holy entity in local religious life.

The Chendamangalam Synagogue located near the banks of the Periyar River in Ernakulam District of Kerala, reflects the historical, religious and cultural interplay between the river and the Jewish community of Kerala. The Periyar River flowing through this region facilitated the movement of goods and people, thereby establishing connections between Jewish settlers and the other local

communities including Hindus, Christians and Muslims (Waronker, 2010). During festivals in the Synagogue, the riverbanks become part of community life with gatherings and interactions among the people from different communities.

Fig. 6 Devotees offering "bali" at the Chelamattom Sri Krishna Temple (*Source: keralamythology.blogspot.com, 2015)*

These sacred spaces, myths and rituals along the Periyar River represents its status not just as a geographical entity but as a sacred companion in the spiritual journey of humans. Some of the important religious sites in the Periyar River Basin are presented in Fig. 6. As modern challenges like urbanization and pollution threaten its existence, it becomes increasingly important to preserve the river not just for its ecological and economic value but for its irreplaceable role in upholding the rich cultural and religious legacy of Kerala.

2.4. Tourism, Leisure and Recreational Activities

Tourism is one of the most vital pillars of Kerala's economy, contributing around 12% to the state's GDP in 2023 (IBEF, 2025). The natural charm of the state, combined with its rich biodiversity, cultural heritage and serene landscapes, makes it a globally sought-after travel destination. The Alappuzha–Munnar belt is particularly significant, drawing tourists from across the world by seamlessly blending coastal beauty with mist-clad highlands. This region showcases a remarkable transition from tranquil beaches and intricate backwaters in the West to cool hill stations, tea estates and forested mountains in the East.

The Periyar River Basin plays a central role in shaping the tourism profile of the region. Its diverse geography supports a wide array of destinations, especially those based on riverine and forest ecosystems. Among the most iconic ones is Thekkady, home to the Periyar National Park, where boat rides through the reservoir formed by the Mullaperiyar Dam offer encounters with elephants, bisons and a multitude of bird species. Equally important is the Thattekkad Bird Sanctuary, located along the banks of the Periyar upstream of the Bhoothathankettu Barrage. In an interaction with renowned ornithologist Dr. R. Sugathan - popularly known as the Birdman of Kerala – he stated that this area is unique because the Periyar River, unlike most others in Kerala, has multiple and wide outlet points. These wide estuarine mouths channel strong wind currents inland, a phenomenon referred to as wind-blown migration, which helps guide migratory birds as far upstream as Thekkady. This makes the Periyar River Basin an exceptional corridor for avian movement and a paradise for bird watchers.

Other notable river-dependent destinations include Panamkuzhi Eco-Tourism, Paniyeli Poru and Abhayaranyam Eco-Tourism near Perumbavoor, which capitalises on the scenic banks and forests in the vicinity of the Periyar for low-impact, nature-based tourism. These sites highlight the ecological richness and tranquility offered by the river and play a growing role in Kerala's sustainable tourism framework.

High-range destinations including Munnar, Echo Point, Eravikulam National Park, Attukad Waterfalls, Mattupetty, Kolukkumalai, Vandanmedu, Paruthumpara Pothamedu View Point etc also contribute immensely to the tourism appeal of the Periyar River Basin. While not all these are directly on the Periyar, they are influenced by the climatic and ecological conditions shaped by the presence of the river.

In the downstream and coastal stretches, places like Cherai Beach, Aluva Manalppuram and Mangalavanam Bird Sanctuary present the estuarine beauty and river-sea interaction zones, appealing to both leisure seekers and wildlife enthusiasts. The blend of beach tourism with river ecology in these locations is particularly unique to the morphology of the Periyar. Fig. 7 is a map showing some important tourism destinations in the Periyar River Basin. Together, these diverse tourist spots - spread across the river's highland, midland and coastal zones - not only strengthen local economies but also emphasize the need for preserving the ecological health of the Periyar River. The river's contribution to Kerala's tourism is not just on account of its aesthetic beauty, but also due to its function as a living, breathing ecological entity. To get an idea about grassroot level percpetions of people in this sector, we interacted with a couple of people from the tourism and environmental sectors.

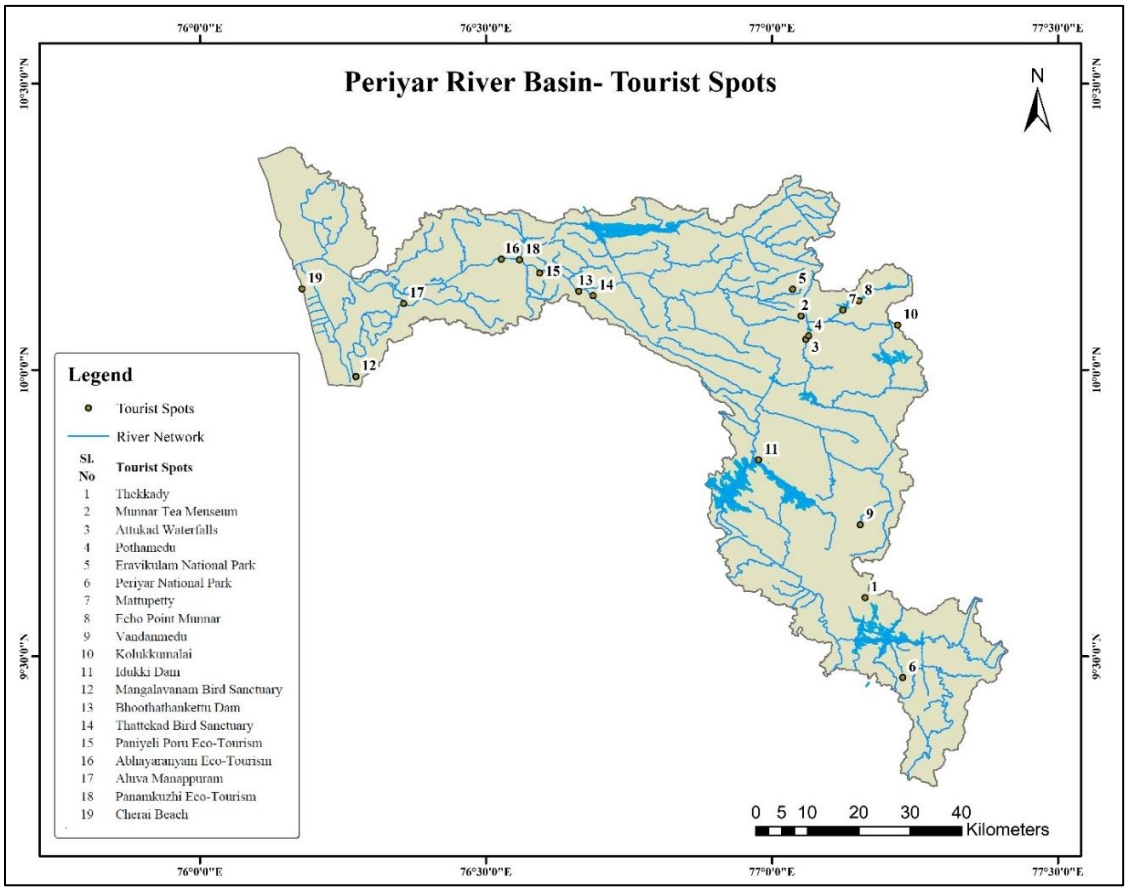


Fig. 7 Map showing some important tourist spots in the Periyar River Basin

In a conversation with Mr. Jose Mattamana, an enterpeuner in the tourism industry operating a resort in the Panamkuzhy village in Ernakulam District, and a social worker, he eloquently narrated the unexplored tourism potential of the Periyar River Basin. With his resort located on the riverbank, Mr. Mattamana has spent a lifetime observing the beauty and possibilities of the Periyar River and its river basin. Drawing from his experience in both local tourism and developments in this sector at the international level, he stated that Kerala is yet to explore the full potential of the Periyar as a sustainable tourism destination. He mentioned about several destinations in the river basin with very good potential for developing sustainable tourism.

According to Mr. Jose, the scenic landscapes of the river, biodiversity and cultural richness offer ideal conditions for nature based and water focused tourism activities. Yet, tourism development remains fragmented and possibilities underutilized in this region. He proposed a well-planned tourism circuit connecting the Bhoothathankettu Barrage to the Mahagonythottam Eco-Tourism Centre, which could serve as a model for integrating natural beauty with tourist engagement. He suggested, this route could feature eco-friendly initiatives such as water metro services, kayaking and dinky boat safaris. These activities are not only cost-effective but also environmentally sustainable and could accelerate the overall development of the local community.

A significant point in his vision is the Vembooram Island on the banks of the Periyar River. A couple of photographs taken during an interaction with Mr. Jose Mattamana is presented (Fig. 8). According to him, in spite of its stunning natural features, this island remains largely unrecognized by the Dept. of Tourism, Govt. of Kerala. Based on his lifelong familiarity with the island, Mr. Mattamana believes it has the potential to attract visitors from around the world. He recommends that the Kerala Forest Department could develop the site as a model eco-tourism destination, where tourism and conservation co-exist, generating income while preserving nature.

To turn these ideas into action, Mr. Jose Mattamana co-founded the Periyar Tourism Co-operative Development Society, headquartered in Kunnathunad, to plan and implement innovative tourism projects along the Periyar River, focusing on sustainability, community participation, and conservation. In support of this initiative, a tourism club with over 80 active members was also constituted. The club works in association with the society to promote responsible tourism practices, develop new tourism projects, identify new sites, and build partnerships with local stakeholders.

His efforts highlight how tourism can become a powerful tool to connect people with the river. Through immersive experiences and environmental awareness, visitors gain a deeper understanding of the ecological and cultural value of the Periyar River (or of any other river). Moreover, such initiatives offer economic opportunities for the local community, especially the youth and marginalized groups which encourages them to take up the responsibility of protecting the river and the environment. Periyar River holds vast potential as a sustainable tourism corridor and a number of entrepreneurs like Mr. Jose Mattamana are taking initiatives to transform this potential into reality. With the right support and planning, these initiatives can strengthen river-people relationships while promoting environmentalconservation, preservation of culture and sustainable development.

2.5. The Role of Tribals

Kerala is home to numerous indigenous tribal communities. Majority of the tribal population reside along the western slopes of the Western Ghats(Kakkoth, 2005). These communities are known collectively as “Adivasis”, who represent some of the most ancient inhabitants of the region. They maintain a strong and close relationship with nature, particularly with the forests that surround their settlements and rivers in their neighborhood. Generally, these communities live in very remote areas inside the forests and make their livelihoods through shifting agriculture, fishing, collection of honey and other non-timber forest products etc.

Fig. 8 (**a**) Vembooram Island

Fig. 8 (**b**) Conversation with Mr. Jose Mattamana

The Periyar River Basin is inhabited by several tribal communities, especially the Mannans, Palians, Uralis, Mala Arayas, and Malampandarams(Arun, 2001). These communities are primarily concentrated in the Periyar Tiger Reserve, Idamalayar, Kumili and Thattekad. To support their forest based livelihoods and promote conservation, the National Forest Policy of 1988 introduced the concept of Participatory Forest Management (PFM). It envisages measures to ensure participation of the local people, especially the tribes, for protecting the forests. In Kerala, the "Vana Samrakshana Samithis" (VSS) constituted for this purpose include tribals and function under the Forest Development Agency. They receive livelihood support and environmental training from the Dept. of

Forests and Wildlife. These groups engage in forest produce collection, fire prevention and wildlife protection (Kuttencherry and Arunachalam, 2020). The Periyar Vana Samrakshana Samithi plays a major role in the conservation of forests and promoting eco-tourism in the Periyar River Basin.

Eco-Development Committees (EDCs) have also been formed in the villages to encourage local participation and to reduce the harmful practice of collecting and selling firewood by tribal communities. Many locals who were once involved in activities like smuggling, poaching and cinnamon tree debarking have now abandoned these practices and committed themselves to conserve their natural surroundings (Kerala Tourism, n.d.). Today, they actively support the Department of Forests and Wildlife by performing patrolling duty and helping to catch hold of poachers and illegal loggers. Some of them also serve as guides for tourists, leading them on treks, night camps and nature tours in remote forest areas (Kerala Tourism, n.d.). Bamboo rafting in the Periyar River, initiated as part of eco-tourism activities, has facilitated upliftment of the tribal community involved.

As part of the Eco-Development Project, two key Committees were established: the Tribal Trekker's Eco-Development Committee and the Periyar Tiger Samrakshana Eco-Development Committee (Kerala Tourism, n.d.). These Committees work closely with the Department of Forests and Wildlife, helping them in tasks such as census data collection. Local community members also support research activities related to the biodiversity of the region, including the documentation of flora and fauna. Instances of unrecorded bird species being identified by the local people and these being officially added to the checklist of the reserve later have been reported. Such activities of the local people including the tribes promote protection of the flora and fauna of the river basin, which, in turn, facilitates conservation of the natural flow of the river. Besides, self-help groups (SHGs) of tribal women in the river basin organised under the banner of "Vasantha Sena'', play a vital role in conservation efforts (Kerala Tourism, n.d.). These women patrol the Reserve Forest, monitor the daily activities, and report incidents of encroachment or poaching to the Authorities. The Eco-Development Committees also have promoted improved agricultural practices in the tribal settlements located along the periphery of the Periyar Tiger Reserve (Kerala Tourism, n.d.).

The "Mannan" tribe is one of the major indigenous communities in the Periyar River Basin. They are traditionally known for their deep connection with riverine ecosystems and are considered as the primary tribal fishing community (Arun, 2001). Due to this, the Department of Forests and Wildlife has officially granted them limited fishing rights in the forest areas to ensure both resource access and community participation in conservation activities. To regulate fishing activities and prevent unauthorized access by non-tribal individuals, identity cards have been issued to the tribal fishermen. These types of activities are coordinated by a Co-operative Society. To protect the rich and endemic fish biodiversity of the river, the Department of Forests and Wildlife enforced restrictions on fishing.

Additionally, restrictions on large mesh nets are occasionally enforced to prevent overharvesting of fishes. Due to the strong rapport between the Officials of the Department of Forests and Wildlife and the tribal community, these types of conservation activities could be implemented smoothly and with minimal objections. Each year, prior to the onset of the monsoon, the Department of Forests and Wildlife holds meetings with registered tribal fishermen to discuss conservation strategies. These sessions focus on the importance of sustainable fisheries management and the protection of endemic fish species like the Mahseer, which breeds during the June–August period (Arun, 2001). The activities mentioned above, involving the local community, demonstrate how traditional knowledge, when combined with ecological regulations can significantly contribute to conservation of river ecosystems.

Another important tribal group inhabiting the basin is “Paliyans”. In 1935, they were relocated from some areas in Idukki District including Mangaladevi, Methkannam, Poovarasu and Mullakudi on the northern boundary of the Periyar Tiger Reserve. Today, it is known as “Paliyakudi” which is a dedicated “Paliyan” settlement, that is part of the “Labbakkandam” region. The settlement comprises of 101 families living in approximately 62 hectares of forestland. The primary livelihood of the Paliyan community includes firewood collection and casual labour within and around the forests (Arun, 2001).

The establishment of the Periyar Tiger Reserve adversely affected the lives of the indigenous tribal community who had traditionally inhabited the deep forest interiors. These groups were relocated to the buffer zone boundaries of the reserve. Today, they are settled in three main locations: the “Mannans” and “Paliyans” live in “Labbakkandam” near Kumily in Idukki District, the “Malaarayans” inhabit the Moozhikkal area within the Reserve Forest and the “Uralis” are settled in “Vanchivayal” settlement (Arun, 2001). The “Labbakkandam” colony is situated close to the Periyar lake. It is one of the primary resettlement areas of the tribal community.

Various community-led conservation efforts such as participation in Vana Samrakshana Samithis (VSS), involvement in Eco-Development Committees (EDCs) and adoption of alternative livelihoods through eco-tourism and forest protection have significant positive impacts on the Periyar River and its ecosystem. Efforts involving the local tribal population for preventing deforestation, illegal logging, and poaching directly contributed to preservation of the forest cover, which in turn benefitted efforts towards conservation of the river. The forests in the Periyar River Basin, in general, act as natural buffers, thereby preventing soil erosion, limiting runoff, and facilitating groundwater recharge - all of these are essential for sustaining the quality of water in the Periyar River. Moreover, eco-tourism activities jointly supported by the tribal community, promotes awareness among the

visitors about the fragile ecology of the region and the need to protect both the forest and the river. The spiritual and cultural connection of the tribal community reinforces their commitment to protect the river. For them, the Periyar River is not just a water source but a life giving entity which provide them an identity and facilitate the evolution of traditional wisdom and knowledge. The tribal communities of the Periyar River Basin serve as custodians of the land and water. The sustainable practices that they put forward along with the activities of several Government Organisations and Departments form the foundation for long term conservation of the Periyar River.

2.6. River - People Disconnect

The phenomenon of disconnection between human beings and natural resources is not unique to any one region or resource - it is a global trend. In the context of the Periyar River Basin, this disconnect has become increasingly apparent over time. As the visible dependence of people on the river diminishes, so too does their emotional attachment. This weakened bond has significant implications for how the society responds to activities that harm or exploit the river. Historically, the culture of not only the Periyar River, but also of all the rivers in Kerala, has been deeply intertwined with its water bodies. Rivers and ponds served as the lifeline of villages and towns, providing freshwater for drinking and domestic use, bathing and religious rituals. Generations grew up in close contact with these ecosystems and any threat to these was addressed immediately. The older generation among the civil society, who relied on the river directly for their daily chores and survival, were deeply unsettled by changes in the river health and/ or flow conditions – for e.g., the drying up of the river, affecting their household wells and thereby their entire way of life. In contrast, the younger generation often views the river from a distance - literally and metaphorically. They may see it while crossing a bridge, or appreciate its scenic beauty and the breeze it offers, but they do not necessarily associate with it in their day to day life. For instance, a person in his/ her twenties today may live in an apartment complex where water is supplied through pipes by a centralized water supply agency. Their concern about water availability surfaces only when the taps run dry - not when reservoir levels fall or river flows reduce. The responsibility of securing the water required to satisfy their demands lies with the utility provider, and not with the individual. In essence, many today are buying their way out of environmental concerns that should really matter to them.

Even in rivers like the Periyar, where floods caused massive destruction and devastation in recent times, the reconnection sparked by such events is often reactive and negative. Unlike the enduring and holistic relationship that earlier generations had with the river, the current emotional responses are often momentary and shaped by specific events such as natural disasters and not by a sustained interaction with or reliance on the river. This growing detachment dents public sensitivity, resulting in slow degradation of the river. Without a strong sense of connection, collective action, and

resistance to ecologically harmful decisions, river conservation becomes less likely. Re-establishing the emotional and functional ties between the people and the river is essential - not just for cultural preservation, but for environmental sustainability and community resilience.

The only remaining form of interaction or emotional attachment that many people now exhibit towards the river is often "second-hand-filtered through media" coverage of disasters or crisis. Cases of heavy pollution in industrial belts like Eloor–Edayar, frequent fish kills, or catastrophic flood events elicit temporary reactions from the public. These stories are widely circulated in newspapers, television and online platforms. In general, such stories may stir brief emotional discomfort even in areas that are not inside the river basin. However, public response tends to remain superficial - limited to sharing the news clipping as a WhatsApp status or Instagram story and moving on. The engagement is transient and distanced, rarely prompting lasting concern or action.

Environmental activists like Mr. Jose Peruvanthanam, who was part of Kerala's early environmental movements including the historic protests against the Silent Valley and the Pooyamkutty Hydroelectric Projects have voiced their concern about this drastic change of attitude among the public. Mr. Jose believes that the new generation is largely indifferent to the degrading state of natural resources. He points out that while the youth are increasingly future-focused - concerned about careers, lifestyle and opportunities focusing on their white-collar job dreams - the health of a river like the Periyar rarely figures into the vision of their future. He calls for a renewed sense of urgency among young people to recognize the significance of natural resources, not only as part of their ecological surroundings but as essential elements of their own future.

In our interaction with Mr. Jose Peruvanthanam, he further echoed his grave concern on the current state of affairs of the Periyar River Basin by drawing attention to a fact which, according to him, challenges/ questions the very existence of the Periyar River in its true sense today. Drawing from historical geography, he pointed out that the original Periyar River - formed from the confluence of the Mullayar and Muthirapuzha near the Sivagiri Hills - ceased to function as a river following the construction of the Idukki Arch Dam. With the dam in place, the natural downstream flow of the river has been cut off and water is now being released to the downstream from the Cheruthoni dam, a component of the Idukki Hydroelectric Project, only during episodes of extreme rainfall or floods. As a result, an approximately 17 km stretch of the original Periyar River from Cheruthoni to Panamkutty remains dry for most of the year and in years when there is no release from the Cheruthoni. In fact, he noted with dismay that in Cheruthoni town, football matches are now being organized on the dried-up riverbed - a symbolic and stark indicator that the river cease to exist in this stretch. According to Mr. Jose, what now flows downstream of Panamkutty and continues to be called

"Periyar" is not the original river at all, but rather a trickle from the tributaries that once joined a mightier main channel.

During our interaction, Mr. Jose also highlighted persistent negligence in environmental impact studies conducted prior to launching large-scale infrastructure projects in river basins. Most major interventions in the Periyar river basin, he argues, have lacked adequate foresight, especially in evaluating ecological consequences. This short-sightedness, he says, is now manifesting in the form of emerging challenges such as increase in human-wildlife conflict. With a substantial part of Kerala's forests lying within the Periyar River Basin, disruptions to the riverine and forest ecosystems, like those caused by fragmented water flows and altered landscapes, are likely to influence the behavior of wildlife such as elephants (straying into human settlements) and increase human-animal conflicts. Mr. Jose warned that without learning from the past and demanding accountability for environmental stewardship, the disconnect between rivers, people and the larger ecosystem will only deepen.

2.6.1. Pollution

The Eloor region of the Periyar River Basin has long been a critical zone of concern in terms of pollution and environmental degradation. Situated along the industrial belt near Kochi, Eloor is home to numerous large and medium-scale industries, including chemical, fertilizer and petrochemical units. Over the years, the concentration of industrial activity in this area has contributed significantly to the degradation of river water quality. Toxic effluents and persistent organic pollutants have reportedly entered the river system, leading to long-standing ecological impacts and health concerns for communities residing along the riverbanks. While regulatory mechanisms have been instituted and monitoring efforts are in place, the magnitude of pollution indicates a complex interplay of legacy contamination, industrial practices and infrastructural limitations.

Over the years, the Eloor region has witnessed several grassroots-level movements and public interventions aimed at combating pollution and safeguarding the Periyar River. Local communities, particularly those directly affected by industrial pollution, have played a crucial role in bringing environmental issues to the forefront. One of the most notable aspects of environmental activism in Eloor is the strong presence of community-led awareness campaigns, legal interventions, and sustained resistance against unchecked industrial pollution.

Mr. Kunjappan, a social activist and a committed leader of conservation activities for the Periyar River since the 1970s has been fighting industrial pollution in the Eloor region. He played a significant role in highlighting environmental degradation by initiating a series of one-man protests that effectively raised public awareness about the ongoing industrial pollution. One of his most

striking acts was placing a handwritten sign at the Eloor junction that read, “Welcome to the Eloor Gas Chamber,” a powerful message that captured the status of pollution in the area (John & Varier, 2017). The lifelong commitment of Kunjappan to the Periyar River continues to inspire environmental activism and encourage greater public involvement in its conservation.

Another activist, Dr. C.M. Joy, has also been actively involved in efforts to protect the Periyar River. Emphasizing a holistic approach, he advocates that the river must be conserved from its origin to its end, rather than focusing only on specific stretches such as the industrial belt of Eloor to Edayar. Dr. Joy strongly argues for the establishment of a dedicated River Protection Force, which he believes is essential for the effective and long term conservation of the river (Times of India, 2016). He also highlights that industrial pollution can be significantly reduced if industries strictly adhere to the environmental regulations laid out by the Central Pollution Control Board (CPCB).

In the early 2000s, widespread concern over the deteriorating health of the Periyar River and its impact on residents led to the formation of local groups and coalitions. Among the most vocal were fisherfolk, farmers and residents who depended on the river for their livelihood and daily needs. These groups often collaborated with environmental NGOs and research organizations to document pollution levels, conduct community health surveys and push for stricter enforcement of environmental norms.

The Local Area Environment Committee (LAEC) of Eloor, formed under the direction of the Supreme Court Monitoring Committee on Hazardous Wastes, played a significant role in involving citizens in environmental governance. The LAEC brought together local residents, environmentalists, scientists and representatives from regulatory bodies. It worked as a platform for dialogue, grievance redressal, and periodic monitoring of industrial compliance. The Committee’s work was instrumental in bringing transparency with regard to data pertaining to pollution and amplifying the voices of the affected communities. Protests in Eloor have ranged from peaceful rallies and hunger strikes to legal options. For instance, during periods of acute fish kills or foul odour from the river, the local population staged demonstrations demanding accountability and immediate action. There have also been instances where school children, youth groups and women’s collectives joined hands in awareness programs and campaigns, symbolizing the depth of community involvement.

Environmental movements in Eloor have also found space in national and international forums. Documentaries, independent research studies and media reports have highlighted the environmental injustice in the region, earning solidarity from activists across the country. These collective efforts have helped in keeping the spotlight on Eloor’s environmental issues.

The Edayar segment of the Periyar, closely linked with the industrial estate in that region, is also a pollution hotspot. The stretch of the river in this area receives a huge volume of industrial effluents, affecting the physical, chemical and biological water quality parameters of the river water. Aquatic life in this stretch has been severely impacted and communities have raised concerns about the long-term sustainability of fisheries and agriculture in the area. While efforts have been made in certain periods to improve monitoring and enforce compliance, the situation remains one that requires sustained, integrated river basin management including monitoring, and community participation.

Upstream in the highland regions, particularly around Munnar which is the flagship tourism destination of Kerala, increasing influx of tourists has led to large scale development of tourism dependent services like Hotels and Resorts. However improper treatment/ lack of treatment of wastewater, its clandestine discharge into waterbodies and unscientific handling and management of the solid waste generated have degraded the tributaries of Periyar in this region. In addition to this, agricultural runoff adds another dimension to the pollution profile of the Periyar River in this high ranges. The area is known for its extensive tea, cardamom and vegetable plantations. These agricultural activities rely heavily on fertilizers, pesticides and herbicides, which are often washed into the river system during monsoon or irrigation cycles. This runoff leads to enrichment of nutrients in the river water, contributing to eutrophication and altering aquatic habitats. It also poses a threat to both drinking water sources and downstream biodiversity, especially in sensitive zones of the river basin. Further downstream, in areas like Perumbavoor, small-scale industries such as wood processing units, tanneries and metal workshops contribute to the cumulative pollution load. While these industries are vital to local economies, they often lack adequate waste treatment infrastructure, resulting in the release of untreated or partially treated waste into nearby water channels feeding into the Periyar. The issue is compounded by the informal nature of many operations, which makes consistent environmental monitoring challenging. Considering these issues, the Honorable High Court of Kerala suggested to constitute an Exclusive Authority to establish monitoring stations along the river, from the source to the mouth, to identify polluted areas and initiate corrective measures.

3. Efforts by NGOs, local governments, or other groups/organizations in influencing river-people connect

Efforts to strengthen the river-people connect in the Periyar River Basin, particularly in the Eloor region, have been shaped by a blend of community activism, NGO involvement, legal interventions and the initiatives of various oversight Committees. These collective actions have aimed not only at addressing pollution but also at restoring the socio-ecological relationship between the local community and the river.

One of the most prominent grassroots organizations in this context is the Periyar Malineekarana Viruddha Samithi (PMVS) formed by working-class groups of fisherfloks, farmworkers and daily wage earners in response to escalating industrial pollution. Their first protest was on 1st August 1998, creating a human chain across the polluted stretch of the River Periyar, circling the Eloor- Edayar industrial belt (Satheesh, 2021). PMVS has been instrumental in organizing protests, raising public awareness and engaging in legal actions against violation of environmental guidelines and safeguards. PMVS has consistently worked to empower residents, particularly those in pollution-affected regions like Eloor, by informing them about environmental hazards and their rights. Mr. Purushan Eloor, the research coordinator of the PMVS is a dedicated social and environmental activist who has been actively working for the revitalisation of the Periyar River. Under his leadership, on April 22, 2020, the Earth Day, PMVS organized a symbolic protest in the Eloor–Edayar industrial belt to highlight the ongoing pollution of the Periyar River, even during the COVID-19 lockdown (Satheesh, 2020). A small group of environmental activists stood on the Pathalam regulator-cum-bridge across the river, holding placards while wearing masks and maintaining proper social distancing. Moreover, the protest was live-streamed on Facebook, allowing people from around the world to witness the protest virtually. This digital outreach helped draw significant media attention and public awareness, turning a physically limited protest into a powerful act of environmental conservation. Such activities, ranging from street campaigns and public hearings to fact-finding missions have played a crucial role in reviving the idea of community stewardship over the Periyar River.

Fig.9 Earth Day Protest organised by *Periyar Malineekarana Virudha Samithi (Source: Satheesh, 2020)*

At the local level, the Local Area Environmental Committee (LAEC) played a pivotal role in bridging the gap between scientific assessment and the concerns of the community. The LAEC conducted thorough environmental studies in the Eloor industrial belt, revealing alarming levels of toxic

substances such as cadmium, lead, zinc, chromium and even persistent organic pollutants like DDT in the river and its adjoining ecosystems. Although implementation gaps persisted, LAEC's detailed documentation provided evidence that further empowered local campaigns and legal interventions.

Efforts to highlight the socio-economic dimensions of river pollution were championed by the Collective for Right to Live (CORL). CORL focused on the lives and livelihoods of fisherfolk, farmers and daily-wage laborers who were disproportionately impacted by contamination and declining river health. By documenting health problems such as respiratory illnesses, and congenital anomalies as well as economic losses due to reduced fish catch and crop failures, CORL emphasized the need for compensation, rehabilitation and sustainable policy reforms. Their advocacy helped position river conservation not just as an ecological concern but also as a social justice issue.

Since the environmental pollution in Eloor- Edayar Industrial belt is one of the most prominent issues in the State of Kerala, much attention has been focussed in this region, overshadowing the problems faced and protests by people in other parts of the river basin. In fact, the basin has a legacy of people-led movements which played a crucial role in resisting ecologically damaging development projects and asserting the rights of local communities and ecosystems. One of the most prominent among them is the movement against the Pooyamkutty hydroelectric project in Idukki District. Initially proposed as an alternative to the Silent Valley Project, the Pooyamkutty Project faced strong resistance from environmentalists, local communities and organizations such as the Kerala Shastra Sahitya Parishad and the Save Pooyamkutty Campaign Committee. These groups highlighted the ecological uniqueness of the Pooyamkutty forests - home to endangered flora, and fauna, as well as a vital elephant corridor - and questioned the wisdom of submerging thousands of hectares of dense forest for a relatively modest energy output. The project also threatened the livelihoods of over 3,00,000 traditional mat and basket weavers in the area (Down To Earth, 1994). Scientific studies by the Kerala Forest Research Institute and the Botanical Survey of India further reinforced the ecological importance of the area (KFRI, 1990). Despite political lobbying and periodic government approvals, sustained public protests, awareness campaigns and data-driven advocacy has kept the Project in check for decades. The Pooyamkutty resistance remains a significant chapter in Kerala’s environmental history, embodying the collective voice of river-dependent communities in protecting their land, water and heritage.

Together, such efforts have helped build a deeper, more responsive river-people connect in the Periyar River Basin. The collaboration between the local community, scientific bodies, NGOs and Committees appointed by the various Courts has contributed to raising environmental consciousness and asserting the rights of communities over natural resources. These movements continue to serve

as models for participatory environmental governance, demonstrating that restoring river health is inseparable from restoring the dignity and well-being of the people who live alongside it.

4. Closure

The Periyar River Basin is more than just a drainage system - it is a living, breathing part of the landscape and culture of Kerala. From its misty origins in the Western Ghats to its wide mouth at the Arabian Sea, the river supports farming, industry, traditions, wildlife and spiritual life. It truly acts as an economic powerhouse, a cultural symbol, a biodiversity hotspot and the lifeline of the communities along its banks - rightly earning the title - "Lifeline of Kerala."

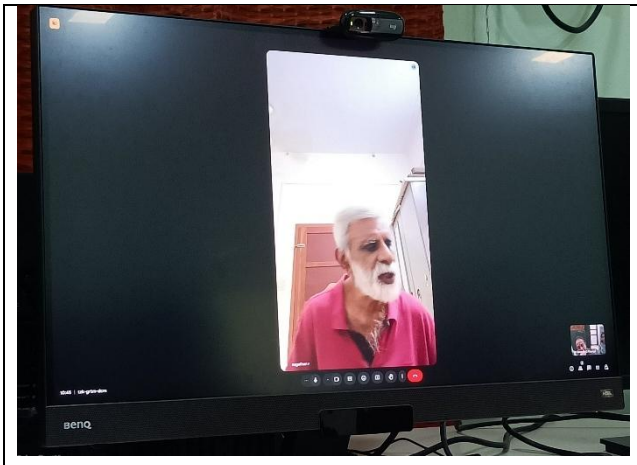
This report explored how people and the Periyar River are closely linked - how the river shapes the lives of people and how people, in turn, impact the river and its ecosystem. It looked into both the positive and negative sides of this connection. Many of the problems facing the river today, like pollution or overuse, are not just technical issues - they are deeply connected to the attitudes and actions of people. The place that the river holds in the heart of the people influences their action. This is evident from the activities of the older generation who was much more directly connected to the river than the present generation. When people feel a strong connection with the river, they are would care for it and protect it from pollution and harm. One of the best ways to do this is by helping people build an emotional connection with the river. Schools and colleges can teach students about the importance of rivers. Events like river walks, cultural festivals and storytelling can help people to learn and feel proud about the history and importance of the river. Along with invoking emotional connection in citizens, the policy framework also need to evolve to supplement these changes. Some policy change suggestions are mentioned below:

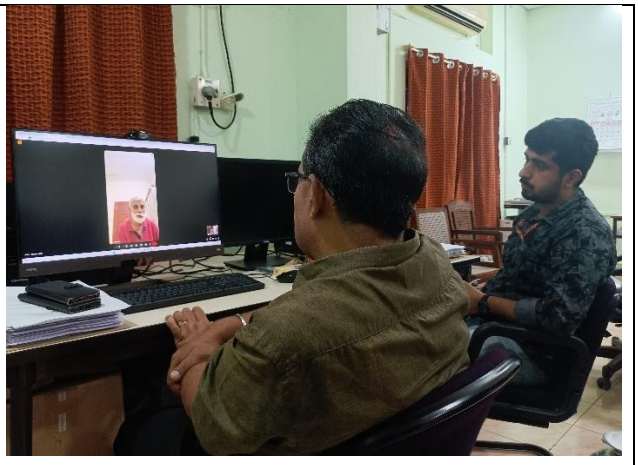
- Creating a River Management Council that brings together various Departments - Water Resources/ Irrigation, Forests and Wildlife, Fisheries, Local Self Government, Industries, Social Welfare, Tribal Welfare and Development etc and Organisations which are directly connected to the river - Kerala State Electricity Board Ltd, Kerala Water Authority, Tribal Council, Civil Society Groups etc to formulate and manage river related activities so as to achieve water quality goals, catchment restoration, conflict resolution etc.
- Adopt a "River-Friendly Industry" standard in the Eloor–Edayar belt, in particular, and in other areas: zero-liquid discharge incentives, independent audits, real-time disclosure of effluent data. Non-compliant units should face a graduated penalty regime, including water-use curbs.

- Introduce Payment for Ecosystem Services: farmers who maintain organic or low-chemical paddy belts along the midlands and tribals who patrol headwater forests, should receive water-quality or carbon credits financed by downstream municipalities and industries.
- Invest in river-literacy campaigns by ensuring the active participation of youth through social media and other online platforms to evoke awareness and clarity about the role of a river like Periyar in their daily life.
- Projects that focus only on one sector and that fail to address the overall impact on the river should be limited or restricted.
- Cultivating responsible tourism by campaigns and having the infrastructure to facilitate such tourism should be prioritized.

Protecting the river is not just the job of the Government or officials. People have a major role to play in this noble exercise. Everyone can contribute in small but meaningful ways like keeping the river clean, joining local clean-up drives, avoiding dumping plastic and waste near the river as well as here and there, supporting eco-friendly tourism, and actively participating in community programs. When people start to see the river as part of their life and culture, and not just as a source of water, they will naturally protect it. To save the Periyar River for the future, we must grow this love, respect, and responsibility in every heart.

Appendix





Online meeting with Dr. R Sugathan, Birdman of Kerala

Interaction with Mr. Jose Peruvanthanam, Environmental Activist

Meeting with Stakeholders of Periyar River Basin

References

Anderson et. al., (2019), Understanding rivers and their social relations: A critical step to advance environmental water management, WIREs Water, 6 (6),

Arun, L. K. (2001). Biodiversity conservation and livelihood issues of tribesfolk : a case study of Periyar Tiger Reserve. Kerala Research Programme on Local Level Development, Centre for Development Studies.

Bindu, C. A., & Mohamed, A. R. (2016). Water bodies as a catalyst to growth and development-The case of Kodungallur town, Kerala. Procedia Technology, 24, 1790-1800.

Department of Economics & Statistics Kerala. (2025). Annual Review of Crop Statistics System in Kerala 2023-24 (ANNUAL REVIEW OF CROP STATISTICS SYSTEM IN KERALA THROUGH THE SCHEME FOR IMPROVEMENT OF CROP STATISTICS, p. 154) [Annual Review Report]. Department of Economics & Statistics Kerala. https://www.ecostat.kerala.gov.in/storage/publications/1765.pdf

Down To Earth. (1994, June 15). Power peril. Down To Earth. https://www.downtoearth.org.in/environment/power-peril-32060

FISHERIES HAND BOOK 2020 Government of Kerala. (n.d.). Retrieved May 25, 2025, from https://fisheries.kerala.gov.in/sites/default/files/inline-files/FISHERIES%20HAND%20BOOK%202020_2.pdf

Govorushko, S. (n.d.-a). Effect of Human Activity on Rivers. https://www.researchgate.net/publication/228474581

Govorushko, S. (n.d.-b). Effect of Human Activity on Rivers. https://www.researchgate.net/publication/228474581

Grill, G., Lehner, B., Thieme, M., Geenen, B., Tickner, D., Antonelli, F., Babu, S., Borrelli, P., Cheng, L., Crochetiere, H., Ehalt Macedo, H., Filgueiras, R., Goichot, M., Higgins, J., Hogan, Z., Lip, B., McClain, M. E., Meng, J., Mulligan, M., … Zarfl, C. (2019). Mapping the world's free-flowing rivers. Nature, 569(7755), 215–221. https://doi.org/10.1038/s41586-019-1111-9

IBEF. (2025, February 5). How Kerala's Cultural Tourism & Industries Boost Its Economy | IBEF. India Brand Equity Foundation. https://www.ibef.org/blogs/how-kerala-s-rich-cultural-tourism-and-thriving-industries-boost-its-economy

ICAR-CIFRI. (2018, November). FLOOD IMPACT ON MAINSTREAM ECOLOGY AND FISHERIES OF RIVERS PERIYAR AND PAMPA, KERALA. ICAR.

John, H., & Varier, M. (2017, June 30). *Meet Kunjappan, the former Naxalite spending his life to save the Periyar from dying*. *The News Minute*. Retrieved July 16, 2025, from https://www.thenewsminute.com/delve/meet-kunjappan-former-naxalite-spending-his-life-save-periyar-dying-64438

Kerala Water Authority. (2021, August). Detailed engineering report: Common effluent treatment plant at Edayar in Ernakulam district. Sewerage Circle, Kochi-11.

KFRI. (1990). Annual Report 1989-90 [Annual Report]. Kerala Forest Research Institute.

K, N. K. (2022a). Pollution status of river Periyar. International Research Journal of Engineering and Technology. www.irjet.net

K, N. K. (2022b). Pollution status of river Periyar. International Research Journal of Engineering and Technology. www.irjet.net

Kakkoth, S. (2005). The Primitive Tribal Groups of Kerala: A Situational Appraisal. Studies of Tribes and Tribals, 3(1), 47–55. https://doi.org/10.1080/0972639x.2005.11886519

Kerala Tourism. (n.d.). *Kerala tourism – God's own country*. Retrieved July 16, 2025, from https://www.keralatourism.org

Krishnakumar, A. (2021). Soil geochemistry of Periyar river basin. https://www.researchgate.net/publication/354236376

Kuttencherry, A. J., & Arunachalam, P. (2020). ROLE OF TRIBAL VANA SAMRAKSHANA SAMITHI (VSS) MEMBERS IN BUILDING FOREST PROTECTION AND ECO-TOURISM AT VAZHACHAL ECO-TOURISM AREA IN THRISSUR DISTRICT OF KERALA. EPRA International Journal of Multidisciplinary Research (IJMR)-Peer Reviewed Journal, 10. https://doi.org/10.36713/epra2013

Shahul, R. (2020, December 16). Fishing tales from high up in the Idukki hills. Fishing Tales from High up in the Idukki Hills. https://www.onmanorama.com/travel/kerala/2018/12/03/fishing-tales-from-idukki.html

Satheesh,S. (2020, May 17). *The pandemic does not stop the pollution in River Periyar*. *Interface: A journal for and about social movements, 12*(1), 250–257. https://www.interfacejournal.net/wp-content/uploads/2020/05/Satheesh.pdf

Satheesh,S. (2021). Environmental Movements of Global South. In Diversity and Inclusion in Environmentalism. Routledge.

Su, G., Logez, M., Xu, J., Tao, S., Villéger, S., & Brosse, S. (n.d.). Human impacts on global freshwater fish biodiversity. https://www.science.org

The New Indian Express. (2018, September 13). Perumbavoor wood industries incur loss worth F100 crore in deluge. The New Indian Express.

https://www.newindianexpress.com/cities/kochi/2018/Sep/13/perumbavoor-wood-industries-incur-loss-worth-rs-100-crore-in-deluge-1871283.html

Venter, O., Sanderson, E. W., Magrach, A., Allan, J. R., Beher, J., Jones, K. R., Possingham, H. P., Laurance, W. F., Wood, P., Fekete, B. M., Levy, M. A., & Watson, J. E. M. (2016). Sixteen years of change in the global terrestrial human footprint and implications for biodiversity conservation. Nature Communications, 7. https://doi.org/10.1038/ncomms12558

Vörösmarty, C. J., McIntyre, P. B., Gessner, M. O., Dudgeon, D., Prusevich, A., Green, P., Glidden, S., Bunn, S. E., Sullivan, C. A., Liermann, C. R., & Davies, P. M. (2010). Global threats to human water security and river biodiversity. Nature, 467(7315), 555–561. https://doi.org/10.1038/nature09440