

ANNUAL REPORT 2022-2023

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ABOUT CARE EARTH TRUST

Care Earth Trust, established in the year 2000, is engaged in biodiversity conservation for human wellbeing through research, advocacy and capacity building. Since its inception, it has evolved to be an equal opportunity, non-discriminating organisation with a pan India presence.

In addition to assessing human impact on the environment, the organisation recommends evidencebased strategies and action for the mitigation of adverse impacts and increasing ecosystem resilience. It also provides technical services in areas such as biodiversity inventorying and monitoring and in developing training and capacity building initiatives on conservation.

Care Earth Trust was awarded the Indira Gandhi Paryavaran Puraskar in 2009 by the Union Ministry of Environment, Forest and Climate Change for its pioneering work on conserving the Pallikaranai Marsh and the Nanmangalam Forest.

The institution is registered as a Trust under the Tamil Nadu Societies Act and holds the required statutory approvals of the Government of India for accepting project grants in Indian rupees (INR) as well as Foreign Currency. Care Earth Trust is an empanelled organisation of the State Planning Commission, Tamil Nadu.

MILESTONES



POLICY RESEARCH

Integrated Management Plan for Pulicat wetland and Pallikaranai Marsh

Implemented for the Tamilnadu State Wetland Authority

Preparation of integrated management plan for Pulicat -Zone of Influence" was carried out in 2022, focusing on the Pulicat bird sanctuary located in Tiruvallur District. The main objective of this project was to comprehensive develop а management plan for the sanctuary. This involved the preparation of a brief document followed by an integrated management plan, taking into consideration the major biotic and abiotic factors that influence the wetland and its biodiversity.

The zone of influence around the wetland and its associated land uses were analysed and mapped to understand the ecological interactions and impacts. Based on proximity and direction, factors such as drainage, urbanisation, and land-use change were identified as significant influencing factors. Further, the project estimated the land use and land cover in the wetland's multiple buffer regions to ensure sustainable management practices.

Wetlands of international importance - the Ramsar list

Implemented for the Tamilnadu State Wetland Authority

The project focused on the preparation of applications for proposing new Ramsar sites of international importance. The specific locations were Kodaikanal, Coutralam waterfalls complex in Tirunelveli and the Aagayagangai falls (Kolli hills, Namakkal).

To support this, data collection was conducted by a team consisting of biologists, hydrologists, and engineers to identify its unique ecological significance. This data collection process involved gathering information on landscape characteristics, hydrology, density, including and vegetation specifically identifying globally significant plant species and their details. Physical mapping techniques employed were to create а comprehensive understanding of the selected sites and their ecological value. Interaction with local communities and with interviews the respective department officials and frontline staff were an integral part of this process.

Biodiversity Assessment and proposal for declaration of the Allikuzhi and Nanmangalam forests as Conservation Reserves

Implemented for the Tamilnadu Forest Department

The landscape has been thoroughly assessed using a rapid assessment method. The study period coincided with the monsoon season. Flowers and fruits of herbaceous flora and grasses were recorded, which helped higher accuracy in identification in the field itself. The assessment included survey and identification of herbs, grasses, trees, shrubs, climbers, hydrophytes and creepers. The Allikuzhi RF biodiversity survey reveals that the dominant life form in the area is herbaceous plants, with a total of 151 species identified. In the Nanmangalam RF, the habitat type with the highest number of species richness is Herb with 207 species. We surveyed various animal groups, such as mammals, birds, reptiles, amphibians and invertebrates like butterflies and dragonflies. Our assessment found 121 species in total, including 62 birds, 7 reptiles, 4 amphibians, 43 invertebrates and 7 mammals. Out of these, 35 species are protected by the Indian Wildlife Protection Act of 1972, including five Sch-II species and two Sch-I species.

ECOLOGICAL RESEARCH

The Odiyur lagoon as Biodiversity Heritage Site

Implemented for the Tamil Nadu Forest Department

The Odiyur wetland is categorised as a lagoon system with seasonal water retention. The lagoon's water is brackish and primarily comes from the sea, with tidal influences causing daily fluctuations in water levels. The wetland's complex ecosystem makes it a hub of biodiversity, with marine organisms such as Molluscs and Copepods breeding in the lagoon. Seagrasses are also present in the lagoon, indicating a healthy ecosystem.

During a biodiversity survey, it was found that the herbaceous plants were the most abundant, constituting 96% of the total plant population. Additionally, climbers, shrubs, and trees make up 24, 27, and 21 species respectively. Grasses and sedges are present in smaller numbers with 17 and 5 species respectively. The majority of these species have their origins in the native regions, with 165 specimens found to be indigenous to the area. This region's diversity and large number of monotypic genera and families make it a special and unique habitat.

We recorded major animals in our faunal assessment to show the habitat changes in that area. We found 124 bird species, 47 insect species, 8 mammals and 10 herpetofaunal species. We also observed 6 major raptor species and 51 migrant bird species during the survey.

Assessment of the impact of fly ash leakage and pollution in Ennore backwaters

Report submitted to Joint Expert Committee, National Green Tribunal

The project focused on assessing the damages caused by fly ash in the Ennore backwaters of Tiruvallur district. The main objective was to evaluate whether the deposition of fly ash in the Kosasthalaiyar River basin had caused any harm to the soil, water, and associated flora and fauna.

To gather the necessary information, data collection was conducted in the field using equipment like GPS, binoculars and camera. Ph and TDS of water were tested and recorded using simple handheld devices. Secondary data, such as Google Earth images were also collated to support the assessment. Additionally, the project involved the preparation of maps to identify land use and land cover changes. Zone of influence was identified to foresee the future impact of the fly ash pollution. The detailed report with status of biodiversity, threats and restoration strategy has been submitted to the NGT Committee

Rapid biodiversity assessment of Alamparai ecotourism site

Implemented for the Tamil Nadu Forest Department

A survey has been conducted to assess the biodiversity and landscape features of a proposed location for constructing an ecotourism facility near the historically significant Alamparai Fort. The site is situated in the Cheyyur Taluk of the Chengalpattu district. The location is positioned to the west of the coast, behind a lagoon that is situated south of the Paalar estuary.

A rapid assessment survey of the area was conducted to evaluate its ecology and landscape. The region is primarily coastal and comprises littoral bushes of trees and sturdy shrubs. Herbaceous flora dominates the terrain, with a significant number of psammophytic species found on the ground. The survey identified a total of 143 species of Angiosperms and of these, 124 are indigenous to the region. The faunal survey identified 79 species of fauna, including 48 bird species, 20 butterfly and dragonfly species, and mammals, reptiles, and amphibians (5,4,2). Overall, the survey provides valuable insights into the biodiversity and landscape features of the proposed ecotourism facility's location, which can help inform decision-making and conservation efforts in the area.

Dravidacris Annamalaica – A new member to the Grasshopper family from Tamil Nadu

A new genus of grasshopper Dravidacris has been described in Tamilnadu by the team composed of Dr. Dhaneesh Baskar, a research consultant of Care Earth Trust. The specimen of the species was collected from Annamalai Nagar near Chidambaram in Cuddalore district in December 2020, leading to its name - *Dravidacris annamalaica*. This genus represents the rare horned grasshoppers within the grasshopper subfamily Metrodorinae. Their unique morphology with long and dorsally extended head portions is not typical among other grasshoppers genera.

Assessment of invasive species in Srivilliputhur Megamalai Tiger Reserve

The forest terrain of Megamalai forest Range has been affected by Lantana camara and other invasive species encroachment. With the help of the local forest department, the areas were identified for the project intervention. The field team surveyed the area using geo-referencing and satellite imageries, and then ground verified the density of invasive plants. The species diversity, density and abundance were recorded from the field during the months of February and May, 2022. The data was analysed and collated for the results. With the primary data, locales of sense or denser Lantana presence was observed and geo-tagged, the portions have been earmarked for invasive plants removal and afforestation by native species.

WETLAND RESTORATION

Eco-restoration of Veinthankulam Wetland, Tirunelveli

Supported by Hinduja Leyland Finance, co-leveraged by Indian Oil Corporation Limited and executed under the guidance of District Administration Tirunelveli

Veinthankulam is a wetland situated in the Tirunelveli district of Tamil Nadu and it is of crucial importance in flood regulation and mitigation for the Tirunelveli town. Eco-restoration of Veinthankulam was launched on 31st July 2021 by Thiru Thangam Thennarasu, Minister for Department of Industries, as part of the District Administration's Nellai Neer Valam initiative.

The restoration activities included a comprehensive topographic survey, removal of invasive alien species from the water spread area, dredging and desilting of earth, formation and strengthening of a bund and bioremediation of the water. This is an increase of capacity by approximately 1.5 mcft. The impact of this restoration was evident during the heavy rains at the end of 2021, when there was no waterlogging in the area. In addition, Veinthankulam reached Full Tank Level (FTL) and the surplus weir overflowed for the first time since 1992. A public space has been developed with the aim of increasing wetland literacy.

The Eco-restoration of Veinthankulam has received the first runner-up prize in the Madras Chamber of Commerce and Industry (MCCI) CSR Awards 2023

You can catch the project summary on <u>Youtube</u> and <u>Instagram</u>

Eco-restoration of Madambakkam Wetland, Chennai

Supported by Rotary Club of Chennai Coastal Charitable Trust

Madambakkam sitteri, located in the southern part of Chennai, Tamil Nadu, is situated within the Kovalam minor basin. The area has been grappling with challenges such as sewage pollution and garbage dumping around its periphery.

The restoration efforts included a comprehensive topographic survey, the removal of invasive alien species from the water spread area, dredging and desilting of the soil, the construction and reinforcement of a bund, bioremediation of the water, and the planting of trees. Additionally, a socio-economic survey was conducted to gather important data.

On February 8th, a wetland cleanup was organised in Madambakkam, with enthusiastic participation from local residents, ward members, members of the Rotary Club association, and the 5th zone chairman, Tambaram Corporation.

Eco-restoration of Vengapakkam Wetland, Chennai

Supported by Rotary Club of Chennai Coastal Charitable Trust

The Vengambakkam Tank, situated 400 meters southwest of Vengambakkam village, is facing several challenges in its current state. The bund, measuring 1215 meters in length, is in poor condition with numerous areas not meeting the required standards. It is also heavily infested with the invasive species *Prosopis juliflora*.

The Eco-restoration of Vengambakkam is currently underway and various restoration activities are being carried out to address the issues faced by the tank. These include the removal of invasive alien species from the water spread area, dredging and desilting of the soil, construction, and reinforcement of the bund, and bioremediation of the water. Through these efforts, the aim is to restore the ecological balance and enhance the overall health of the Vengambakkam Tank.

The biodiversity of the Vengambakkam lake has been studied with the method of rapid assessment. Vengambakkam lake is located closer to the reserve forests of Unamancheri and also shares a boundary with another wetland called Nedungundram. The survey yielded 199 species of Angiosperms belonging to 155 genera and 58 families.

Ecological Restoration of Unamancheri Wetland Chennai

Supported by Natwest India

The Unamancheri wetland restoration project aims to restore the water-holding capacity and biodiversity of the 72-acre Unamancheri wetland.

In this ongoing project, a baseline survey was conducted, including landscape mapping, topography survey, pollution monitoring, biodiversity assessments, and agro-socioeconomic surveys. The biodiversity assessment revealed 220 floral species, 49 bird species, and 14 butterfly species, including near-threatened birds such as the Oriental darter, White ibis, and Open billed stork. The agro-socio-economic Survey provided insights into local agricultural practices and community conditions, guiding project planning and implementation. Community engagement and outreach as part of the project has been conducted with the support of Natwest India employees engaging in volunteering activities.

PROTECTED AREAS AND LIVELIHOODS

Care Earth has been working in the Sathyamangalam decade for over a decade including a study of the river Moyar, an assessment of the invasive species in the landscape and detailed studies about NTFP dynamics and use. Currently we have two livelihood intervention projects ongoing.

Supporting Enterprises Supported by Natwest India Foundation

The Supporting Enterprises project has been progressing on-ground for four years in the Sathyamangalam Tiger Reserve, across 15 hamlets with varied interventions depending on socio-economic conditions and feasibility. A summary of the key interventions in 2022-23 are provided below

Supply chain assistance for organic mustard Vermi-composting to reduce input costs vermi-compost beds set up for 20 farmers in 5 hamlets Three enterprises formed for tailoring trainees Thenmalai enterprise, Hill Queen enterprise and Vinayaka enterprise for 3 batches of trainees A community seed bank established in Kallampalayam in June 2022 It is functioning as a centre point to save native seeds and provide seeds to farmers in 9 selected hamlets Training on value addition to seemar for 18 women in Bejaletti

Value addition centre for tamarind and turkey berry in Kallampalayam

Value Addition Training

Tailoring enterprise

Livelihood Improvement Project in Sathyamangalam

Supported by Small Industries Development Bank of India (SIDBI)

The Livelihood Improvement Project, a combination of capacity building and market analysis of products, has an outreach to 11 villages of the Sathyamangalam Tiger Reserve (STR)

Four hamlets provided training in tailoring for 6 months and provided with merit certificates by the Tamilnadu Forest Department

Training for 55 tribal seemaru entrepreneurs of Badripadugai and 68 from Attanai, on seemaru– broomstick making with a seemaru softening machine

Demonstration and training for 90 beneficiaries from Ugginiam and 63 beneficiaries from Nagalur on tamarind processing with a bulk tamarind deseeder and a press machine

To enhance net income from jackfruits, training provided to 45 beneficiaries on jackfruit chips production

EDUCATION, TRAINING AND CAPACITY BUILDING

Youth-Led Nature Culture Living Labs in India

Supported by SwedBio, a programme at the Stockholm Resilience Centre

The project seeks to build capacities of children and young adults in ecology and environmental education in the Chennai and Chengalpattu districts. In the first phase, we curated a teaching-learning module on wetland ecology titled "Home of the Blue Lily: A manual on wetland ecology". The illustrated module covers key topics related to ecology, ecosystem services, biodiversity and wetland systems reflecting local sensibilities and traditional knowledge processes.

In the second phase, we seek to make ecology and environment education experiential by working with children and educators as strategic partners through capacity building workshops. Currently, we are working with children from 2 schools in West Tambaram namely Tambaram Municipal High School, and MCCRSL Higher Secondary School. Incorporating nature elements to the existing curriculum to cultivate a sense of scientific curiosity and appreciation of biodiversity is at the core of the engagement.

The Urban Water Bootcamp

Supported by Wipro Foundation

The Urban Water Bootcamp is an intensive, short term training session, which is intended to introduce the participants to various topics in the theme of 'Urban Water' and 'Urban Ecology' and to give them an insight of how to advance with practical proposals for the Wipro Urban Ecology Small Grant. Conducted for 20 participants in March 2023, the program included both classroom lectures and field visits. The 2023 edition of the Bootcamp consisted of topics such as Introduction to Chennai's Urban Ecology and Urban Water; Chennai's water supply, demand and wastewater treatment; Rain Water Harvesting; Tank restoration, Proposal writing, GIS Mapping, and Field based session to the two different urban farms.

TechCamp Thoothukudi and Tirunelveli

Supported by US Consulate General Chennai

TechCamp Thoothukudi and Tirunelveli was a one-day tech-based workshop that focused on riverine and ocean issues. The workshop was held on April 11, 2023, in Thoothukudi and was organised by Care Earth with the support of the US Consulate General in Chennai and Centre for Public Policy Research (CPPR) Kochi. The event was part of the 2022 TechCamp Kochi Waves of Change. The primary objective of the workshop was to promote digital literacy and technology adoption among 20 selected participants with backgrounds in local issues, community volunteering, and education. During the workshop, participants attended a lecture on marine biodiversity and were introduced to plastic mapping exercises, and tools that could help them address local issues in their communities. Additionally, the participants were provided with bilingual resources on oceans to enable them to use in their community outreach efforts.

URBAN STUDIES CHENNAI

Water as Leverage - City of 1000 Tanks

Water as Leverage for Resilient Cities Asia (WaL) is an initiative of the Netherlands Government to bridge innovative financing, inclusive design, and government collaboration in the development and implementation of projects that mitigate the impacts and adapt to the effects of climate change. Care Earth is a part of the two WaL consortium projects in Chennai - the City of 1000 Tanks and Rise Chennai. As part of the City of 1000 Tanks project, a water balance pilot has been executed at the Little Flower Convent - you can view a glimpse into the project here.

GCC Sponge City Park Project

In collaboration with SPONGE Collaborative, Chennai

The project aims to build a rain garden, infiltration basins and bioswales in a flood prone zone in north Chennai. Maathur has been chosen as the site for flood mitigation. A thorough field survey has been carried out in this region for ecological audit through enumerating and identifying tree and shrub species present. Based on the available data, rain garden and bioswales were designed for a particular OSR land in Maathur. Compilation of suitable species for this purpose was done meticulously, after visiting local nurseries raising indigenous species. The report suggested all the required ecological characteristics and expected biodiversity in the region, once flood mitigation through the sponge concept has been achieved. Meetings with officials of GCC parks and SWD departments were conducted regularly in the course of the project.

Climate and Archeological Interpretation Park, Kilambakkam

In collaboration with SPONGE Collaborative, Chennai

The upcoming Kilambakkam bus terminus has an open space of 6 acres which is a proposed site for a climate awareness park. This is located near an archaeologically important site. Detailed drawings have been prepared for the plantation scheme and it has been proposed to conduct phased plantations in the earmarked area. A detailed project report has been submitted with the Chennai Metropolitan Development Authority. The park has been differentiated into three different zones based on themes related to climate change, whilst factoring in infiltration basins and bioswales for handling flood water. For all the area, suitable species have been recommended after meticulous consideration of its availability locally and its presence in the nearby forests.

Wipro Urban Ecology Small Grants Program

Care Earth Trust has been collaborating with Wipro Foundation as a knowledge partner and program management organisation for Chennai's Urban Ecology Small Grants Program. The Urban Ecology Small Grants Program supports organisations working on urban water and urban ecology challenges. We collaborate with capable and committed individuals and teams to help them implement on-ground community initiatives in water management in urban areas. Since its inception, the program has supported 6 projects in Chennai.

Establishment of Biodiversity Tree Park at Koyambedu Flower Market

Implemented for the Chennai Metropolitan Development Authority

The project aimed to enhance the greenery of the Koyambedu market area through the development and execution of an innovative plantation plan. The greening focused on a linear portion of the buffer parking area adjacent to Kaliamman Koil Street and Koyambedu Market Road over an area of 2.8 acre.

A novel colour-coordinated plantation design was developed, which included the planting 295 tall tree saplings, spanning 6 to 8 feet in height and from 12 different species of trees. In the central row between two trees, a total of 54 rectangular boxes were constructed. Out of these, 40 boxes were used to cultivate 1000 ornamental shrubs. In the second phase of the project, 150 small trees and bamboo were planted between the larger trees to develop the second storey. A study of natural regeneration of herbs and shrubs in the site showed that the area strewn with garbage prior to planting demonstrated remarkable resilience.

Additionally, a circular concentric bouquet garden was created with the planting of 135 ornamental trees and shrubs. The project also yielded natural regeneration of 141 higher plants belonging to 39 families and 106 genera of Angiosperms. In addition to the diverse plant life, the site also attracts a variety of birds and butterflies. After the plantation, 35 bird species and 27 butterfly species have been observed at the site. This plantation is expected to develop akin to a three storied natural forest, illustrating an alternative model to Miyawaki forests.

The Chennai Resilience Centre

The Chennai Resilience Centre (CRC) is a unit of Care Earth Trust, fostered by the Adrienne Arsht-Rockefeller Foundation Resilience Center. A flagship project of the CRC is the Chennai Urban Horticulture Initiative aiming to actively transform Chennai's urban spaces, communities, and neighbourhoods. In 2022, the initiative has set up four model farms (Anbagam Homeless Shelter Otteri, Andhra Mahila Sabha Adyar, Chennai High School Adyar, and Perumbakkam Resettlement Colony) and following an MoU with the Tamil Nadu Urban Livelihoods Mission, 171 women SHG members have been trained in Rooftop Vegetable Farming.

You can check out CRC <u>website</u> for further information on the Chennai Resilience Centre. The complete annual report of CRC for 2022-23 is open-access available <u>here</u>.

CONFERENCES

United Nations Water Conference 2023

The United Nations Water Conference convened after over four decades at a momentous time in the history of global water management. Care Earth was a specially accredited organisation and attended the Conference in New York from 22-24 March

New York Water Week

Parallel to the United Nations Water Conference was the New York Water Week from 18-24 March 2023 - a staggering array of water related events happening all over New York with hundreds assembled from around the world. As one of the partner organisations of Water as Leverage, Care Earth participated in two side events - the "Cities Solve, Cities Deliver – Accelerating Water Action for Resilient Cities" event organised by the Kingdom of Netherlands and Resilient Cities Network, and the "Cities-Design-Water Innovation Lab" Co-hosted by the Columbia Climate School, Columbia GSAPP, Urban Design, Columbia World Projects, the Government of the Netherlands, and Deltares.

9th International Conference on Flood Management (ICFM9)

The ICFM9 International Conference on Flood Management took place in Tsukuba, Japan from 18-22 February 2023. The theme for this year was "River Basin Disaster Resilience and Sustainability by All - Integrated Flood Management in the Post COVID-19 Era". Care Earth presented two research papers at ICFM9 - "Flood Risk Mapping Using Multi-Data Integration: A Case Study of the Adyar River Basin, Chennai" by Stephen Jayaseelan and Anjana Vencatesan, and "Flood Forecasting and Early Warning in the Adyar Minor Basin of Chennai, Tamil Nadu, India" by Thirunavukkarasu.

1000+ people engagement

PUBLICATIONS

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Together with the Ministry of Environment, Forests & Climate Change, Government of India and GIZ India, Care Earth Trust authored and launched 'Cultural Significance of Indian Wetlands'.

The publication takes a closer look at the natural and cultural linkages of Indian wetlands and documents some of the approaches communities have used to sustainably interact with wetlands. Divided into thematic sections on **livelihoods**, **conservation**, traditional knowledge, faith and wise use, the compendium is a repository of case studies from across India.

A short film based on the book illustrates the key findings. It was first screened at the '75 at 75' side event of the **#CoP14 Ramsar Convention.**

You can view the video at <u>https://bit.ly/3Bcv9Z7</u> The complete publication is available for download at <u>https://bit.ly/41l0bHe</u>

MAY 26, 2022

MONGABAY [Commentary] The shrinking habitats of blackbucks in Chennai LINK

NOV 01, 2022

THE TROUBLE
The Value of a Swale: Reclaiming Adaptation
LINK

APR 27, 2023

JOURNAL OF THREATENED TAXA

Plant species diversity in the riparian forests of the Moyar River in southern India $\underline{\text{LINK}}$

August 27, 2022

MEDIA MENTIONS

TRUSTEES

DR. P S EASA

Former Director, Kerala Forest Research Institute, Thrissur, Kerala, Dr. Easa is a Wildlife Biologist with over 35 years of research experience. Member of the State Wildlife Boards of Kerala and Chhattisgarh, Dr Easa also serves on the Project Elephant Steering Committee, Ministry of Environment and Forests, Government of India. He has to his credit 42 research reports, 41 research papers and 10 books.

DR. N V JOSHI

Formerly with the Center for Ecological Sciences, Indian Institute of Science, Bangalore, Dr. Joshi's research interests are mainly in the application of mathematical modeling and statistical analysis of life sciences. He has published more than 50 scientific publications covering diverse areas such as biophysics, meteorology, evolutionary biology and climate change. Prof. Joshi also serves as one of the Associate Editors of Current Science.

DR. R J RANJIT DANIELS

Dr Ranjit Daniels is a PhD in Ecology from the Indian Institute of Science, Bangalore. His primary interest is in the conservation of biodiversity. He has authored 12 books and published over 50 peer-reviewed scientific papers. Other interests include rehabilitation of stray animals and nature art.

DR. JAYSHREE VENCATESAN

Dr Vencatesan works on issues of conservation and sustainable use of biodiversity and ecological restoration, with a special interest in wetlands. She has to her credit 45 scientific publications, 24 technical reports, 3 book chapters, 2 books edited and 2 books co-authored. She currently serves as Care Earth's Managing Trustee.

ADVISORS

DR. S. BALAJI

Former Principal Chief Conservator of Forests, Government of Tamil Nadu

Dr. S. Balaji serves as Care Earth Trust's Scientific Advisor. Dr. Balaji led Care Earth's research team that worked to augment green cover in Greater Chennai Corporation. He now guides the Trust's efforts to reconcile conservation and livelihood issues in the Moyar Landscape, specifically working to support enterprises in Sathyamangalam.

ER. S. THIRUNAVUKKARASU

Rtd. Assistant Executive Engineer, Public Works Department, Tamil Nadu

He is an expert on hydrology and irrigation management, he now serves as an Advisor, assisting the Trust in evaluation, monitoring and wetland restoration projects.

