



RIVER HEALTH

•Protect •Preserve •Perpetuate

A Photo Report on the progress of a training project in building stakeholders' capacity in the health & restoration of economically and culturally important rivers of India using Biological Indicators



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The participants were trained intensely for the critical river health assessment parameters like catchment health, Biota health, Flood plain health, Flow health, and River channel health. The sustainability of the activities will be followed-up by MSSRF faculty through technical support and by linking participants to India's Long-Term Ecological Observatory (I-LTEO) program launched at the 'Paris Climate Conference 2015.

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The hands-on activities included transect studies of the Kerala river, Pampa, starting from its hilly watershed, populated mid-plains and the lower Kuttanad and the Vembanad lake in the backwaters of the Arabian sea.

PROJECT SUMMARY

Monitoring rivers using bio-indicators provide the most integrative view of river health. With increasing industrialization, population growth, land-use changes and developmental challenges, the natural ability of rivers to provide goods and services has been severely curtailed.

A project designed jointly by the M. S. Swaminathan Research Foundation (MSSRF) and the Asia Pacific Network of Global Change Research (APN) has taken up this issue and trained a cohort of 41 Indian stakeholders consisting of educationists, policymakers, scientists and practitioners and members of Biodiversity Management Committees (BMC) in a comprehensive assessment of River health

using Bio Indicators- the aquatic and benthic macroinvertebrates, fish, algae, diatoms and macrophytes including riparian vegetation. An 8-day use-inspired theory and solution-oriented river expedition were the prime features of the training which was conducted in two cohorts in 2022 March 14 to 16 and 18-22, April. The hands-on activities included transect studies of the Kerala river, Pampa, starting from its hilly watershed, populated mid-plains and the lower Kuttanad and the Vembanad lake in the backwaters of the Arabian sea.



PROJECT AT A GLANCE

Project title

The Health & Restoration of Economically & Culturally important Rivers of India using Biological Indicators found in Kerala Streams, within the context of Climate Change Impacts & Sustainable Development

Project reference:

CAPaBLE_CRRP20187-10SY-Kumar

Old Contract Period:

1 January 2021 to 31 December 2021

New Contract Period:

1 January 2022 - 30 June 2022 (Reference: CovEx3-CBA15-1)

PROGRESS BY OBJECTIVES

OBJECTIVE 1

AWARENESS, EDUCATION & CAPACITY BUILDING (AECB) IN RHA THROUGH TRAINING

01 An active project implementation team and an Academic team are in place

02 Brochures, Web pages, Short Videos and a WhatsApp Group on the project are available

03 Field exploration reports at the Pampa river basin are presented

04 Successfully conducted the targeted training in RHA at two levels- one at Technical and officials' level on a national basis, and another at the Local community and their representatives' level.. 41 People have been trained in various aspects of river health assessment

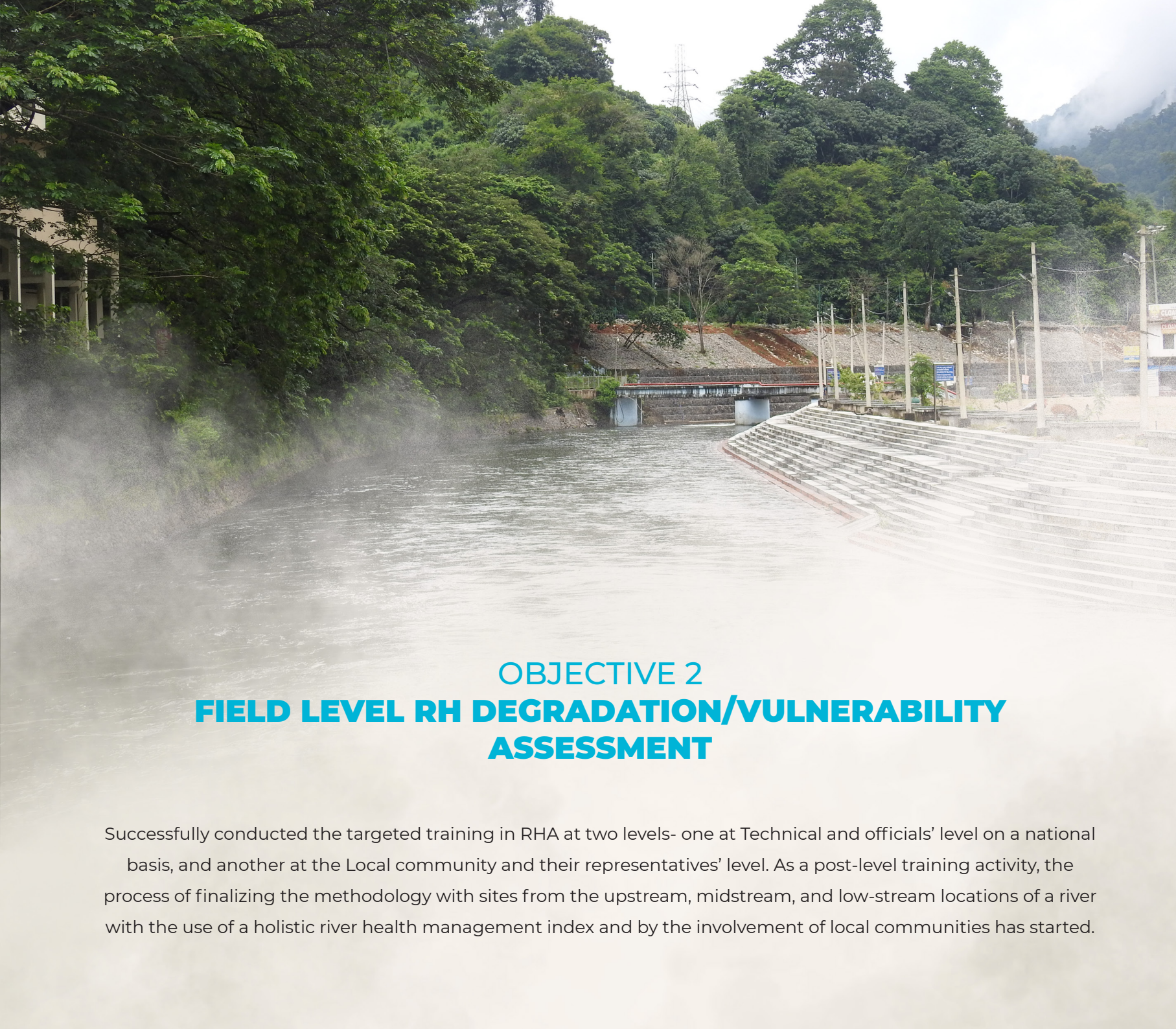


05 A comprehensive literature pack on River Health Management is ready

06 First draft of a comprehensive Training Manual with detailed module descriptions for River Health Monitoring and Restoration is getting ready. The Module is divided into six components of integrated aspects of River Health management viz. (i) River Catchment Area Health (ii) River Channel Health; (iii) River Flow Health; (iv) River Flood Plain Health; (v) River Water Quality Health and (vi) River Biodiversity Health.

07 A Network of the trainees (at two levels, national and state of Kerala-around 40 to 60 trainers) as well as a few proposals from the trainees in RHA and river restoration in their respective states are targeted.





OBJECTIVE 2

FIELD LEVEL RH DEGRADATION/VULNERABILITY ASSESSMENT

Successfully conducted the targeted training in RHA at two levels- one at Technical and officials' level on a national basis, and another at the Local community and their representatives' level. As a post-level training activity, the process of finalizing the methodology with sites from the upstream, midstream, and low-stream locations of a river with the use of a holistic river health management index and by the involvement of local communities has started.



Glimpses of the Training Sessions



OBJECTIVE 3

RESTORATION OF PILOT SITES WITH HELP AND SUPPORT OF LOCAL PEOPLE

Two rounds of physical discussions were held with local leaders in two key Pampa River passing locations in Pathanamthitta district. Partnership being established with the key persons, including the Chair of Pampa River Basin Authority and institutions like Kerala State Biodiversity Board, Centre for Water Resources Development and Management, and National Centre for Earth Science Studies. The formation of a Pampa River Action Committee and a restoration project proposal are the targeted outcome/outputs.

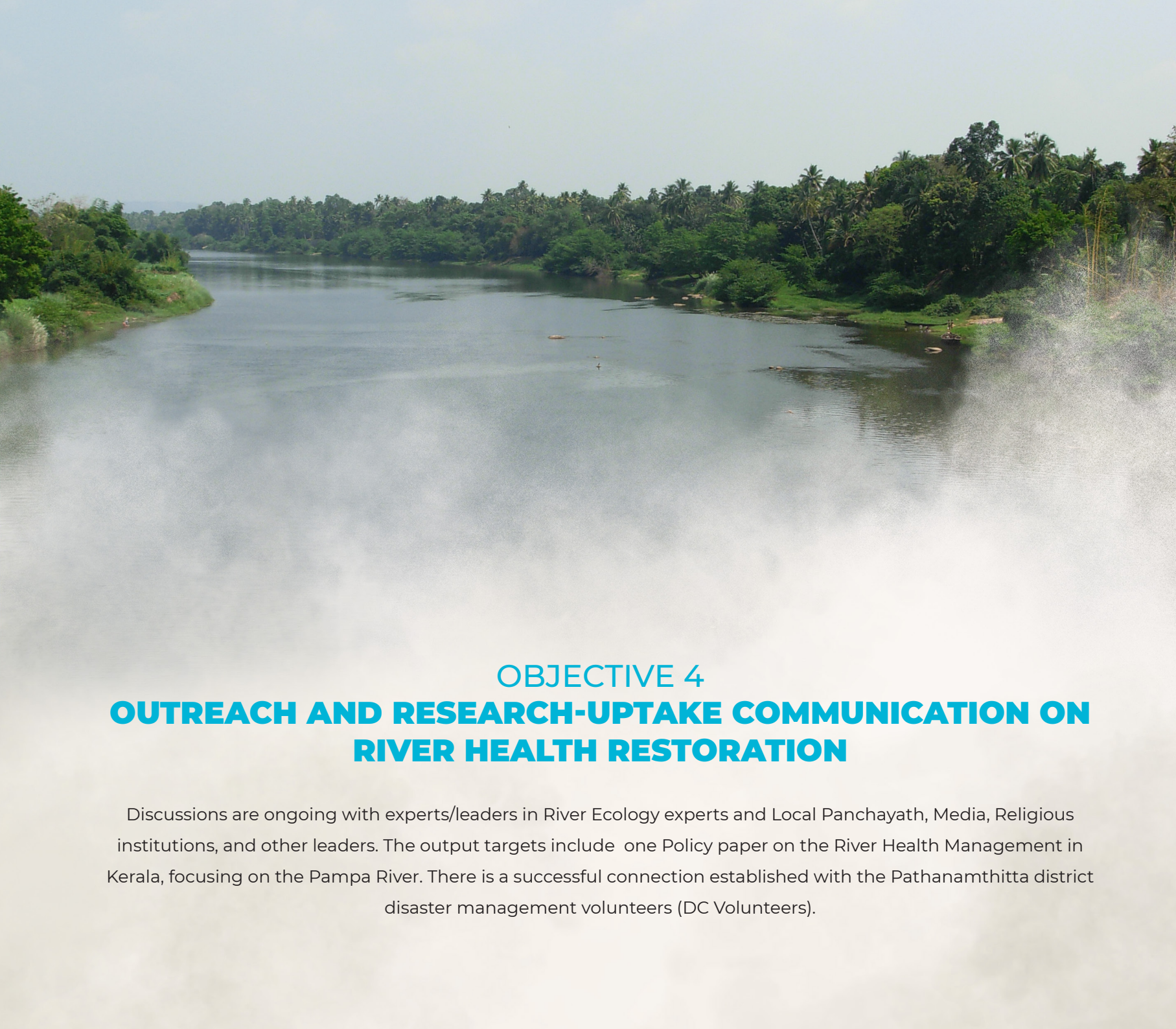


Glimpses of The Field Observations: Pampa Upstream





Glimpses of the Field Observations: Pampa Midstream



OBJECTIVE 4

OUTREACH AND RESEARCH-UPTAKE COMMUNICATION ON RIVER HEALTH RESTORATION

Discussions are ongoing with experts/leaders in River Ecology experts and Local Panchayath, Media, Religious institutions, and other leaders. The output targets include one Policy paper on the River Health Management in Kerala, focusing on the Pampa River. There is a successful connection established with the Pathanamthitta district disaster management volunteers (DC Volunteers).



**Glimpses of the Training Sessions.
Inaugural Address and Felicitations**



OBJECTIVE 5

AN INTERACTIVE KNOWLEDGE PORTAL IN RHA

A good amount of literature has been collected. Discussions with the Open Street Mappers group in Kerala has been done to prepare the entire Map of the Pampa river and its tributaries. This group will be engaged in helping the training to map correctly the rivers in their respective states of the trainees. The expected Output is a web Knowledge Portal maintained by active River Watch Groups.



Giving Away The Certificates To The Participants.



OBJECTIVE 6

SCIENTIFIC PUBLICATIONS AND REPORTING

- Discussions are on the way with M.G. University to involve their students to undertake some specific studies as part of the Project.
- Proposed at university researchers and students' level one or two awareness classes on River health management.
- One or two peer-reviewed publications and the final project report will be the output here.
- The project also could harvest potential addition to the native flora & fauna. The intense field works, aid in exploring the indigenous species richness and thus by opening the doors to the discovery/rediscovery of rare endangered flora/ fauna, which can be emphasized in a peer-reviewed research journal



Glimpses of the training sessions: Resource Persons and Experts In Action



EARTH DAY OBSERVATION

The participants were observed the Earth Day at St. George UP School, Kadappa. The authorities of the school including teaching staff and administrative staff along with the members of the local self government from Niranam Grama Panchayath attended the function. The Earth Day message was given Dr. Sanjay Deshmukh (Former Vice Chancellor, University Of Mumbai). In his message he urged the school students should be modelled to protect the environment because the future depends on the actions of today's children. Former president of the Niranam Grama Panchayath Ms. Latha Prasad in her presiding address briefed the activities taken up by the Grama Panchayath towards the environmental protection and awareness generation. She gently reminded the participants on the massive floods happened in the year 2018 and mentioned that the sitting school was submerged on the deluge. The participants interacted with the school authorities and learnt the support services provided to the natives by the school at the time of flood.

Participants Attended The Training Programme





THE TRAINING RESOURCE PERSONS



Dr Varma had a long-term successful career with the National Centre for Earth Science Studies, Thiruvananthapuram. He has also served in several govt bodies and missions in various positions such as the Member Secretary of Kerala State Council for Science Technology & Environment and Kerala Coastal Zone Management Authority; as the Executive Director of Suchitwa Mission, and as the Director of Clean Kerala Mission. His expertise is in Environmental management planning, Sustainable development and Geophysical explorations. He is acting as the Chair of the Academic Committee constituted for conducting the training programme in River Health Management.



Dr Jayanta Bandyopadhyay had retired as Professor from IIM Calcutta in 2012 and now a visiting distinguished fellow at the Observer Research Foundation, New Delhi. He is a researcher and author on science and the natural environment. He has been a Coordinating Lead Author for the global document Millennium Ecosystems Assessment. He has been an adviser to the International Union for Conservation of Nature (IUCN) New Delhi, Water Diplomacy Program at Tufts University in USA. He has been a Fellow of the India China Institute at the New School in New York (2010-2013). His research has promoted several important public interest litigation in India. Prof. Bandyopadhyay has authored fourteen critically acclaimed books and monographs, in addition to 140 research papers and popular articles



Dr E. J. James is a member of the Governing Body of Wetlands International South Asia. He is presently the Professor Emeritus and Director, Research and Consultancy&Pro Vice Chancellor(Strategy and Operations), at the Karunya University, (Coimbatore), Tamil Nadu. Dr James is a renowned wetland hydrologist specialized in Hydrology, Integrated Water Resources Management and Irrigation Engineering. He has worked as Scientist for 30 years in the Center for Water Resources Development and Management (CWRDM) at Calicut, retiring as Scientist-G and Executive Director of CWRDM and the Director of Irrigation Management Training Institute of Kerala.



Prof. T. Jayaraman has a long-term association with Tata Institute of Social Sciences, Mumbai as a faculty and now with MSSRF as a Senior Fellow in Climate Change.



Dr. Mathew Koshy Punnakadu is a noted Environmental Scientist, Environmental writer and Environmental activist. He is now discharging his duties as the Honorable Director of the Department of Ecological Concerns of Church of South India (CSI). He was also a member of the Pampa River Basin Authority, constituted by Govt of Kerala. He was a former faculty of Chemistry and the Principal at Bishop Moore College, Mavelikkara. He has been actively involving in many issues related to environmental conservation. In 1990's, he initiated the Green Church Movement in India. He considers caring for life on Earth is a spiritual commitment. As a socially committed person, he started working as an environmental activist besides his teaching career and was also associated with the Kerala Sastra Sahitya Parishad, a People's Science Forum. While he was in charge of the Ecological wing of CSI, United Nations Development Programme (UNDP) and Alliance for Religions and Conservation (ARC) has honoured the ecological contributions and long-term commitment of CSI in protecting the life in this planet.



Dr. Anil Kumar is an Agrobiodiversity management practitioner at M. S. Swaminathan Research Foundation (MSSRF) based at its regional station- Community Agrobiodiversity Centre in Kerala. He leads the Community Biodiversity Management programme of MSSRF that focuses on synergized actions in conservation, cultivation, consumption, and commerce elements in sustainable plant genetic resource management in the biodiversity hotspots of southern India. He is an expert with over 25 years of experience in the area of Biodiversity mainstreaming in food, nutrition, health and agricultural production and consumption. He has been engaged with Prof. M. S. Swaminathan in Policy advocacy& partnership and education & awareness building for achieving SDGs.



Dr. G.N. Hariharan is the Executive Director (In-charge) of MSSRF and the head of its Biotechnology wing. His scientific contributions in lichen research have opened up new avenues to explore the potentialities of the much-neglected lichens of our country and also to link the ecological security of lichen-rich locations with the livelihood security of the rural communities, who depend on lichen collections as Non-Timber Forest Produce.



Dr Morse is a Professor Emeritus of Entomology at the Agricultural and Environmental Science Department of Clemson University, SC, USA. His research interests are in Trichoptera systematics and historical biogeography, Aquatic insect faunistics and biology, Use of insects for water quality biomonitoring, Insect species diversity, and endangered species.



Dr T. Sabu is with Centre for Environment and Development, Thiruvananthapuram as its Program Director. He has over 37 Years of experience in the NRM and Environment Management sector. His areas of expertise include Natural Resources and Environment Management, Biodiversity Conservation, Wetland Management, Urban Environment Management, Climate Change, Energy Conservation, Environmental Impact Assessment etc



Richard Storey is a Postdoctoral Researcher at the Aquatic Ecology Centre, Kathmandu University. Had a long term successful career as Fresh water scientist at National Institute of Water and Atmospheric Research, experienced in biological monitoring of rivers; ecology and hydrology of intermittent and headwater streams; citizen science; ecology of urban streams; nitrogen cycling and emissions in streams and wetlands. His Expertise is in Groundwater, Freshwater Ecology, Rivers, Water Resources Management, Water Analysis, Environmental Impact Assessment, Biodiversity, Ecosystem Ecology, Water Quality Monitoring, Water Quality Analysis



Dr. Priyadarsanan Dharmarajan is a Senior Fellow & Program Leader at Ashoka Trust for Research in Ecology and the Environment (ATREE). His expertise is in Biodiversity Monitoring and Conservation Planning.



Dr. Syllas V.P. is an Assistant Professor at School of Environmental Sciences, Mahatma Gandhi University, Kottayam. He has nearly 15 years of research and teaching experience in various fields of Environmental Science. His research interests include Wetland Ecology, Biodiversity, Bioenergy, Bio-nanomaterials, Environmental Microbiology, Pollution Studies, and Water Quality.



Dr. Joby Paul is an Assistant Professor and Research Guide at St. Thomas College, Thissur. His expertise is in Plant Taxonomy and Ecology. He has extensively worked on the distribution and ecology of the riparian flora of pamba river basin.





Dr. Bijukumar is Professor and Head of the Department of Aquatic Biology and Fisheries, University of Kerala, Thiruvananthapuram. He has got nearly 30 years of research and teaching experience in the areas of taxonomy of fishes, Crustacea and Mollusca, biodiversity documentation, aquatic ecology and fisheries. He has described several new genera and about 50 species of aquatic organisms from Kerala coast, with his colleagues and students. Three species are named after him- *Thyoninabijui* Thandar, 2017 (Sea cucumber: Echinodermata: Holothuroidea: Thyonidae); *Leptarmabiju* Devi and Ng, 2020 (Mangrove crab: Brachyura, Sesarmidae); *Renocilabijui* (Isopod fish parasite: Isopoda: Cymothoidae).



Dr. D. Padmalal is with National Centre for Earth Science Studies. His area of Expertise is in Quaternary Geology, Environmental Geology & Paleoclimate studies.



Dr. N. Unnikrishnan is a botanist and bamboo specialist, retired as Professor from SVR NSS College, Pathanamthitta. He is with Kottayam Natural Society as its secretary. His expertise is in Botany and Ecology.



Dr. Harikumar is with Centre for Water Resources Development and Management, Kozhikkode as a Senior Principal Scientist. His area of expertise spans from Water Quality Management, Environmental Monitoring, Wetland Management, and Nanotechnology to Urban Water Management.



Mr. Joy is with Society for Promoting Participative Ecosystem Management (SOPPECOM), Pune, as a Senior Fellow. He has been an activist-researcher for more than 30 years in the development sector, especially in water management. He has been coordinating the work of the Forum for Policy Dialogue on Water Conflicts in India, a loose network of people who want to engage with issues related to water conflicts in India. He has a special interest in people's institutions for natural resource management both at the grassroots and policy levels. His other areas of interest include water conflicts, drought and drought proofing, participatory irrigation management, river basin management, and multi-stakeholder processes, watershed-based development, resource literacy, right to water and sanitation, water ethics, and people's movements



Dr Ramachandra leads the Energy and Wetlands Research Group at the Centre for Ecological Sciences, Indian Institute of Science, Bangalore. His expertise is in Environmental Sciences Energy, Renewable Energy, Integrated Energy Planning, Conservation of Terrestrial and Aquatic Ecosystems, Biodiversity-Ecology-Hydrology linkages, Ecological modelling, Wetlands, Soil and Water Pollution, Bioremediation, and Municipal Solid Waste Management.



PROJECT IMPLEMENTATION TEAM



Dr Anil Kumar Nadesapanicker, Senior Director of M. S. Swaminathan Research Foundation is a scientist cum practitioner in the area of Community Biodiversity Management. Dr Kumar leads for the last 25 years, many action projects that synergize conservation, cultivation, consumption, and the commerce elements of sustainable Plant Genetic Resource and Ecosystems management in the biodiversity hotspots of southern India. He was the recipient of Watson International Scholarship on Environment in 2006 and the Alcoa-IUCN fellowship on conservation in 2008. He serves in various committees which included the Steering Committee of the International Partnership on Satoyama Initiative (IPSI). His PhD degree is in Plant Systematics.



Dr. Shakeela V. is attached to the Community Agrobiodiversity Centre of M.S.Swaminathan Research Foundation in the capacity of Director for the last three years. She is an expert in the field of integrated pest management and worked in various capacities in Biocontrol Research Institution, Bangalore for the last 25 years. Her contributions in the field of pest management shed light on the control of dominant pests affecting major crops in the state. Dr. Shakeela at present focuses on how agriculture technologies could transform the lives of the rural communities especially the tribes and marginalised people in the state.



Prajeesh Parameswaran is a botanist having Grassroot level interdisciplinary work experience as a development practitioner, focusing on participatory biodiversity governance and management. He has research interests in the conservation of plant genetic resources, Farmers' Rights, and Intellectual Property Rights. He has also demonstrated capability in planning and implementing rural development programs, linking science to society.



Mr. Joseph John attached to CAbC MSSRF in the capacity of scientist and is a practitioner of science for sustainable development. He has strong background in the field of watershed based rural development in the river basins of Kabani in Wayanad district. Interdisciplinary and people centric action research programmes in the area of natural resource management (NRM), microorganism based soil management through promotion of bio-inputs and agriculture technologies for village level income generation are his the prime attention areas. He is the Executive Member of Kerala Sasthra Sahithya Pairshat (KSSP) Kalpetta, Essence Global Wayanad and various bodies that are actively engaged in promotion and popularization of science to the society.



Ms. Parvathy Radhakrishnan, Project Fellow at M.S. Swaminathan Research Foundation. She has a Masters' Degree in the area of Disaster Management from the Kerala University of Fisheries and Ocean Studies and graduated in Botany from Sacred Heart College. She has worked as a Project Assistant at University of Kerala on a major research project Vulnerability and Adaptive Capacity to Flood and Landslide in Kerala. She is currently engaged in building capacity of local community men and women in the sustainable management of the Socio Ecological Production Landscapes of the Kuttanad region, a GIAHS site.



Dr. Joice K Joseph, Faculty of MSW Disaster Management department at Loyola College of social sciences Trivandrum, is an academic in the area of disaster management, environmental science and social work. He done his PhD research on socio-ecology of mass gatherings with a focus on river Pampa and published the findings in reputed international journals. He holds a double masters in disaster management and social work. He was the recipient of Paristhithi Poshini fellowship, by the department of environment and climatic change, government of Kerala and a member of Indian Arctic Expedition. His current research focus on ecosystem-based disaster risk reduction and community resilience.

THE PROJECT IMPLEMENTING INSTITUTIONS



M S SWAMINATHAN RESEARCH FOUNDATION

MSSRF is a non-profit research institution founded by Prof MS Swaminathan. The core aim of the institution is to use contemporary science for sustainable agriculture & rural development. MSSBG at Puthoorvayal, Wayanad, Kerala is an initiative of the M S Swaminathan Research Foundation (MSSRF) to save, study and sustainably use the biodiversity of the Malabar region of India



ASIA PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

Project Funding Partner

Asia-Pacific Network for Global Change Research is an intergovernmental network of 22 countries working towards an Asia-Pacific region, with special emphasis on recent trends in global change and sustainable solutions.

NATIONAL AND STATE LEVEL TRAINING

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