

# FINAL REPORT

The health and restoration of economically and culturally important rivers using biological indicators found in Kerala streams, within the context of climate change impacts and sustainable development.



# 2023

CBA2018-10SY-Kumar



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#### **Project Leader and Contact Details:**

• Dr Nadesapanicker Anil Kumar (anilmaruthur@gmail.com)

#### **Collaborators and Contact Details:**

- Prajeesh Parameswaran (prajeesh@mssrf.res.in)
- Joice K. Joseph (joicejosephk@mssrf.res.in)
- John Morse (jmorse@clemson.edu)
- Richard Storey (<u>Richard.g.storey@gmail.com</u>)

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#### 1. Summary

This report highlights the results of a training project on RIVER HEALTH assessment by using Bio Indicators. The project was implemented by the M. S. Swaminathan Research Foundation (MSSRF) in India with the funding support of the Asia Pacific Network of Global Change Research (APN). A group of 41 stakeholders consisting of educationists, scientists, practitioners, and members of Biodiversity Management Committees, representing different river basins of the country were trained. The river Pampa in Kerala has been taken as a case in the entity for field observations and hands-on training. Pampa is the third-longest river (176 km) in Kerala, enriched by 13 tributaries, and known for its sacredness and pollution aspects associated with the world-famous Sabarimala, Maramon, and Cherukolpuzha pilgrimages.

The training was conducted in two cohorts-one from 2022 March 14 to 16, and another from 2022 April 18-22, covering a total of 8-day theory classes and field visits to three hotspots of the Pampa River basin followed by the formation of an active WhatsApp discussion group. The participants were given lecture classes covering the river health assessment parameters focusing on the health of catchment, biota, flood plains, environmental flow, and channel. And they were imparted with the theoretical framework and field-level methodologies for assessing river health with a system perspective, and evolving location-specific strategies in partnership with the local community user groups for river health research, rejuvenation, reporting, and management. The hands-on activities included transect studies in the hilly watershed, populated mid-plains, and the lower Kuttanad including the Vembanad lake basin.

The sustainability aspect of the training was followed up by the formation of a river protection platform called the *Kerala River System Health Needs Assessment and Action Alliance* (Krishna3). The Krishna3 is initiated by the trainees from Kerala and it is envisaged as an open platform consisting of multi-stakeholders who are committed to undertaking need-based action steps using science-based tools and skills in river health management. A Training Manual with detailed module descriptions for River Health Monitoring and Restoration is ready for publication. A Plan of Action Framework for the rejuvenation of the Pampa River has been prepared in partnership with the local community leaders and brought to the attention of the Kerala state government. Further, a good amount of literature and field-level stories have been collected, which resulted in the development of a Web Portal for River Health Assessment -science, innovations, and techniques. The Portal will be maintained by the Krishna3 team with the support of MSSRF. A set of 22 riparian tree species were multiplied and 1000 plus saplings were distributed to the groups involved in the pampa river restoration for planting in the degraded riparian locations.

It is expected the training delivered will help improve stakeholder skills, awareness, and commitment, of those who associate with the River Health Assessment, monitoring, and restoration. It is also expected more rational decision comes from on the part of policymakers and enforcement officials in holistic river health management and conservation of river biodiversity for improving water security and resilience to climate vulnerabilities.

# 2. Objectives

Objective 1: Awareness, Education & Capacity Building in RHA through training

Objective 2: Field level RH degradation/Vulnerability Assessment

Objective 3: Restoration of pilot sites with the help and support of local people Objective 4: Outreach and research-uptake communication on river health restoration Objective 5: An interactive Knowledge Portal in RHA Objective 6: Scientific publications and Reporting

# 3. Outputs, Outcomes and Impacts

Outputs	Outcomes	Impacts
<b>Training of 41 individuals</b> completed in all aspects of River Health Assessment and Monitoring (RHA&M) and some of them are started engaging in follow-up actions	A WhatsApp discussion group and further a wider stakeholder forum of Trainees for River Health Action have emerged.	Improved stakeholder skills, awareness, and commitment, especially of those who associate with the Pampa River Health Assessment.
The collation of content and first-hand knowledge documentation pertains to river health assessment, monitoring, and restoration science, techniques, and tools	<b>A Guide Book</b> for River Health Assessment and Restoration is ready for publication	<b>More training</b> for new people who are interested in river health management is expected
Identified and collected mother plant materials of 22 riparian tree species apart from documentation of species of instream river biota	A Plant Nursery to raise and distribute riparian tree species established	Community effort in the restoration of a degraded riparian patch of the pampa river
A WhatsApp discussion group has been formed for follow-up discussions and monitoring of River health aspects	Established a broader Platform for RHA of Kerala Rivers and a Plan of Action Framework for the rejuvenation of the Pampa River has been prepared and circulated	Effective pressure from citizen groups and detailed Project Proposals are expected from the part of sub-national, and local governments for RHA&M
<b>Stories</b> emerged from the follow-up on the ground action activities and discussions	<b>A WEB Portal</b> on River Health Management & Restoration is launched	A campaign mode science-based action is expected in river health assessment and rejuvenation action
Manuscripts for two publications	The expected Peer-reviewed	More rational decisions are

publications increase the	expected on the part of
self-esteem of the team and	policymakers and enforcement
help to sensitize people widely	officials in river health
on the holistic River health	management and climate resilience
assessment.	building.
	<b>publications</b> increase the self-esteem of the team and help to sensitize people widely on the holistic River health assessment.

# 4. Key facts/figures

- 1. The project has trained a cohort of 41 stakeholders consisting of educationists, scientists, practitioners, and members of Biodiversity Management Committees, representing different river basins of the country to use various tools in river health assessment (Details with **ANNEXURES 1-7**).
- 2. Facilitated the formation of a river protection platform called *Kerala River System Health Needs Assessment and Action Alliance* (Krishna3) consisting of the trainees of the training project from Kerala to undertake need-based action steps using science-based tools and skills in river health management (Details with **ANNEXURE 8**).
- A Plan of Action Framework for rejuvenating the Pampa River has been prepared in partnership with the local community leaders and circulated (Details with ANNEXURE 9).
- 4. Developed a <u>Web Portal for River Health Assessment</u> science, innovations, and techniques covering a good amount of scientific content and rejuvenating stories.
- 5. Produced <u>Six short videos</u> and uploaded them covering expert interviews on the importance of RHA&M.
- 6. 22 species of riparian trees have been identified, multiplied, and distributed for planting along the degraded location of the Pampa River (Details with **ANNEXURE 10**).
- 7. A Training Manual with detailed module descriptions for River Health Monitoring and Restoration is ready for publication (Details with **ANNEXURE 11**).
- 8. Manuscripts for two publications are ready including the RHA&M Training Handbook (Details with **ANNEXURE 12**).
- 9. Follow-up action projects held from the part of two of the trainees in river health protection (Details with **ANNEXURE 13 & 14**).
- 10. Five institutions -the locally elected governments of Pathanamthitta district and Aranmula grama (village) panchayath, Kerala Sasthra Sahithya Parishad, SB College, Changanacherry, and the School of Environment Science of the Mahatma Gandhi University have joined for the follow-up action for Pampa river.

# 5. Publications

- 1. Manuscript on the research publication, Paper Working title: Managing Common Pool Resources in Local Governments: A Role of Deliberation and Public Participation (ANNEXURE 12)
- Manuscript on the River Health Assessment and Monitoring Hand Book (ANNEXURE 11).

# 6. Media reports, videos and other digital content

- 1. Using science, local people will keep an eye on rivers
- 2. Rescuing & reviving Indian rivers
- 3. <u>Unique workshop in Kerala puts the spotlight on dying rivers</u>
- <u>10 states 24 changemakers 1 mission: A unique initiative to skill citizens in assessing</u> <u>a river's health</u>
- 5. <u>Committed approach needed for nature conservation: State-level Training on assessing</u> <u>the health of the Pampa river</u>
- 6. <u>Biological Indicators Are The Best Tools To Assess The River Health: National-Level</u> <u>Training</u>
- 7. Workshop to assess Pampa's health through bioindicators
- 8. <u>പമ്പാ നദിയിലെ ജലത്തിൽ അമലതെ കട്ടതലെന്ന് പഠനം...</u>

# **Digital Contents**

- 1. <u>Project Webpage</u>
- 2. <u>Project Brochure</u>
- 3. <u>Trainers' Training Programme on River Health Assessment</u>
- 4. <u>National Level Trainers' Training Programme</u>
- 5. <u>Pampa River: The case study River for the training</u>
- 6. Major River basins of India
- M S Swaminathan Research Foundation. (2022). 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.
- 8. <u>River Health Monitoring and Restoration</u>

#### 7. Pull quotes

This project trained me that people are basically "Rivero philic", but unfortunately this love gets pushed behind due to ignorance about the intricacies of river health system functions and lack of skills in integrated river system management. What is critical is to provide them with evidence-based knowledge, technology-based skills, and innovative strategic approaches in river health management. They will do the rest!

#### - N. Anil Kumar, Project Leader

The project has influenced people. Let them try, and let them feel a river moving in them; People-centered actions will always be winning.' (Rumi said, "When you do things from your soul, you feel a river moving in you, a joy.")

#### - Prajeesh Parameswaran, Project Collaborator

This flow should not stop, let it reach to the authorities - T. K. Balakrishnan Nair, Trainee

#### 8. Acknowledgments

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- 10. Arnmula Gramapanchayath (for regional support)
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- 20. Chairperson, Executive Director, and all administration staff, MSSRF, Chennai (for all support to the smooth implementation of the project)
- 21. Mr Milan Jose, Former team member, MSSRF (for initial efforts in implementing the project)
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- 24. All the participants of the two-tier training
- 25. Community members and leaders of Attathode, Vadasserikkara, Veeyapuram (for the smooth conduct of field trips and for logistic arrangements).

# 9. Appendices

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- 3. ANNEXURE 3\_PROFILE OF TRAINERS\_State
- 4. ANNEXURE 4\_PROFILE OF PARTICIPANTS\_State
- 5. ANNEXURE 5\_ACADEMIC SCHEDULE\_National
- 6. ANNEXURE 6\_PROFILE OF TRAINERS\_National
- 7. ANNEXURE 7\_PROFILE OF PARTICIPANTS\_National
- 8. ANNEXURE 8\_KRISHNA
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- 10. ANNEXURE 10\_RESTORATION OF PILOT SITE
- 11. ANNEXURE 11\_MANUSCRIPT DRAFT 1
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- 13. ANNEXURE 13\_FOLLOW UP ACTION REPORT 1
- 14. ANNEXURE 14\_FOLLOW UP ACTION REPORT 2
- 15. ANNEXURE 15\_FINANCIAL REPORT