

Charter

To establish Centres for Cauvery River Basin Management Studies in the states of Karnataka & Tamil Nadu with mandate of preparing Cauvery River Basin Management Plan (CRBMP)

1. Introduction

This Memorandum of Agreement (herein after referred to as MoA) is signed between Department of Water Resources, River Development and Ganga Rejuvenation (D/o WR, RD & GR), Ministry of Jal Shakti, Government of India (through National River Conservation Directorate; hereinafter referred to as NRCD), IIT Kanpur, and Consortium of Indian Institute of Science, Bengaluru (herein after referred to as IISc Bengaluru or Consortium Institute, CI) having its registered office at Bengaluru, Karnataka & National Institute of Technology, Tiruchirappalli (herein after referred to as NIT Tiruchirappalli or Consortium Institute, CI) having its registered office at Thuvakudi, Tamil Nadu to establish Centres for Cauvery River Basin Management Studies in the states of Karnataka & Tamil Nadu with mandate of preparing Cauvery River Basin Management Plan (CRBMP) and providing continual support in implementation and dynamic evolution of the Plan. IISc Bengaluru & NIT Tiruchirappalli shall be responsible for managing centres at Karnataka and Tamil Nadu respectively. For the consortium, IISc Bengaluru shall act as Lead Institute and NIT Tiruchirappalli shall be the Fellow Institute. IIT Kanpur shall participate through Centre for Ganga River Basin Management and Studies (herein after referred to as cGanga). Each of the consortium institutes will nominate a Faculty Member as Coordinator for the institute.

Whereas Head cGanga, IIT Kanpur or his/her nominee will execute the activities assigned to cGanga in this MoA. Team at IITK will execute the obligations of non-disclosure of Confidential Information received from NRCD and Consortium Institutes.

Whereas Coordinator of the Lead Institute will prepare and submit to cGanga and NRCD the responsibilities assigned to each CI in the first fortnight of every year.

Whereas Coordinator, IISc Bengaluru will be responsible for delivering and reporting on the activities assigned to IISc Bengaluru in this MoA. Team at IISc Bengaluru will execute the obligations of non-disclosure of Confidential Information received from NRCD and Consortium Institutes.

Whereas Coordinator, NIT Tiruchirappalli will be responsible for delivering and reporting on the activities assigned to NIT Tiruchirappalli in this MoA. Team at NIT Tiruchirappalli will execute the obligations of non-disclosure of Confidential Information received from NRCD and Consortium Institutes.

2. Purpose or Justification

The river Cauvery is of unique importance to India for geographical, historical, socio-cultural, and economic reasons. She has been facing serious threat due to discharge of increasing quantities of sewage, trade effluents and other pollutants largely on account of rapid urbanization, industrialization and agricultural growth. The challenge is compounded by competing demands of river water and other river resources needed for healthy functioning of rivers on the one hand, and for irrigation, industrial usage, power generation, and domestic needs on the other hand.

There is, therefore, a need to ensure effective abatement of pollution and conservation of the river Cauvery by adopting a river basin approach to promote inter-sectoral coordination for comprehensive planning and management. It is equally important to maintain adequate flows of water, sediments and nutrients, stream power, and river space in river Cauvery and its tributaries with the dual objectives of preserving natural ecosystems and achieving sustainable development. The issues of concern and challenges are similar to those faced by the National River Ganga for which the collective efforts of the Central and State Government for effective abatement of pollution and conservation of the river Ganga were necessary, and a cogent management plan had to be evolved. Hence, a Consortium of 7 Indian Institute of Technology's (IITC) led by IIT Kanpur was tasked with the preparation of the Ganga River Basin Management Plan.

The Ganga River Basin Management Plan (GRBMP-2015) was thus prepared by IITC in 2015, enabling the government to launch a systematic approach to restore and conserve River Ganga. Furthermore, in order to advice and provide continual scientific input to the government, IIT Kanpur was assigned the responsibility of identifying relevant persons from premier and national scientific and technology institutes and creating a Consortium of such institutes to

provide continual scientific input for implementation and dynamic evolution of GRBMP through the Centre for Ganga River Basin Management and Studies. In select cases, international experts and organizations were also allowed to be invited on a case-to-case basis to contribute to the enhancement of the plan and its implementation. Given the unqualified success of this approach, a similar methodology is now being adopted to restore and conserve River Cauvery.

3. Objectives of the Cauvery River Basin Management

The objective of the integrated river basin management of River Cauvery is the restoration and maintenance of wholesomeness of the river system and improvement of its ecological health with due regard to resolution of conflict of interest in anthropogenic land and water uses in the entire river basin. This entails adequate provision for natural resources (e.g. soil, water, energy, flora and fauna) conservation and accommodating the requirements of increasing urbanization, infrastructure development, industrialization and agriculture while ensuring that the following fundamental aspects of the river system are protected:

- a) Continuous river flow (Aviral Dhara)
- b) Unpolluted river flow (Nirmal Dhara)
- c) Longitudinal and lateral connectivity
- d) Adequate space for all essential river functions
- e) Functioning of the river as an ecological entity

4. Mandate

The mandate of the Centers for Cauvery River Basin Management Studies is to collate and gather knowledge for preparing and dynamically evolving the Cauvery River Basin Management Plan that should provide Action Plans with specific projects to be taken up at different levels of priority, policy interventions and management actions along with financial implications. The Action Plans should include interventions for implementation in a phased manner delineating short term, medium term and long-term measures. The plan should contain financial, social, economic and environmental implications including measurable and verifiable indicators for ascertaining beneficial and positive impact on the river system. The Action Plans will consist of many reports and database management system as per the Framework Document in Annexure-I. In addition, the Consortium Institutes may also be

required to advise and assist the government in technical issues related to the particular river and in overcoming unforeseen difficulties in implementing the recommendations of the Plan.

The overall task will involve certain core activities given in Annexure-II for which the Consortium Institutes would be required to maintain a minimum infrastructure to meet assigned responsibilities. This will be supported by NRCD through a fixed annual grant for a period of 3 years. Certain other activities as given in Annexure-III may emerge on a need basis for which no financial support shall be provided by NRCD.

5. Scope Statement

Major rivers and their tributaries need to be holistically studied adopting a basin- wide approach considering the major human activities that have been affecting the river ecosystems such as industrialization, urbanization, lifestyle changes, agricultural & other rural activities, deforestation/ denudation, dams/ barrages, engineering flood control measures, infrastructural developments, etc. The Consortium should comprehensively assess all such factors to identify the existing conditions affecting the river ecosystem and suggest future course of actions for their remediation. For each major river and its tributaries, an assessment of its ecological status is to be carried out with verifiable ecological, hydrological, and geomorphological indicators/ parameters (quantitative and qualitative). Spatial and temporal inter-connections between surface waters, groundwater, soil/ sediment, and terrestrial flora and fauna as well as biodiversity of the different ecosystems in the river basin and their eventual contribution to the natural resource base of the river network should be established to evaluate the goods and services expected from hypothetically (or previously) un-impacted (reference state) state of rivers. For resources that mainly come into the river from the larger basin (such as water and sediment) a mass balance (water balance, sediment budget, etc.) over the entire basin and over sufficiently long duration is needed. The impact of human activities in the basin and of direct human interventions in the river networks may then be assessed to evaluate the anthropogenic effects on the river ecosystems and their goods and services in different stretches and at different times. The results may be further qualified by any natural or global factors (e.g. climate change, plate tectonics) that are found to affect the rivers. The role of different stakeholders of the rivers and their importance and roles in reviving and conserving the rivers need to be identified. Along with any additional factors that may be relevant, these findings may be synthesized to formulate a cohesive action plan for integrated basin management of each river.

6. Key Stakeholders

The key stakeholders involved in the management of the Cauvery River Basin are diverse and encompass various government entities, civil society organizations, local communities, and other interested parties. The main stakeholders typically involved in the governance and management of the Cauvery River Basin are:

- **Government Entities**

- A. **Central Government**

- **Ministry of Jal Shakti** (Department of Water Resources, River Development & Ganga Rejuvenation) is responsible for formulating policies and overseeing water resources management at the national level.
 - **Central Water Commission (CWC):** Monitors water resources and provides technical guidance on river basin management.
 - **Ministry of Environment, Forest and Climate Change (MoEFCC):** Ensures environmental sustainability and compliance with regulations.

- B. **State Governments**

- Government of Karnataka
 - Government of Tamil Nadu
 - Government of Kerala
 - Government of Puducherry

- **Inter-State Regulatory Bodies**

- A. **Cauvery Water Management Authority (CWMA):** The CWMA is responsible for implementing decisions related to water sharing among basin states and monitoring water release and utilization.
 - B. **Cauvery Water Regulation Committee (CWRC):** Supports the CWMA by providing technical inputs and operational guidelines.

- **Local Government and Panchayati Raj Institutions**

Municipalities, Panchayats, and other local governing bodies have a crucial role in managing water resources at the local level, implementing conservation initiatives, and ensuring community participation.

- **Farmers and Agricultural Associations**

Farmers are the primary stakeholders, as agriculture is a major user of water from the Cauvery basin. Farmer associations from Karnataka and Tamil Nadu are often vocal and active in matters of water-sharing agreements and basin management policies.

- **Industrial and Urban Users**

- A. Industries relying on the Cauvery's water for manufacturing, processing, and other operations.
- B. Urban municipalities like Bengaluru, Mysuru, Chennai, and other cities and towns depend on the river for drinking water and sanitation.

- **Environmental and Civil Society Organizations**

- A. NGOs and environmental groups engaged in water conservation, ecological preservation, and sustainable management of river basins.
- B. Research institutions conducting studies on water resources, river ecology, and sustainable management practices.

- **Local Communities and Tribal Groups**

Communities living along the river basin, including tribal groups, rely on the river for fishing, agriculture, and other livelihoods. Their participation is vital for effective resource management and conservation efforts.

- **Judicial Bodies**

- A. **Supreme Court of India:** Has played a significant role in adjudicating disputes related to water sharing in the Cauvery basin.
- B. **Cauvery Water Disputes Tribunal (CWDT):** Was established to adjudicate disputes between the basin states and provide an equitable solution for water sharing.

- **International Organizations and Research Institutions:**

Organizations like the World Bank or Asian Development Bank (ADB) may be involved in funding projects or providing technical assistance for water management, infrastructure development, and sustainability initiatives.

7. Key Deliverables

- a. Inception Report identifying the substantive issues of the study, proposed methodology, perceived constraints, specific river stretches, tributaries and ecosystems to be

quantitatively assessed, and proposed timeline (with milestones giving verifiable and measurable indicators).

- b. Comprehensive assessment of the hydrological, geomorphological and ecological status of the river, river basin and its main ecosystems.
- c. Maps, tables, illustrations, etc. delimitating river resources and ecosystem goods and services available from different stretches of the main-stem river and its major tributaries, indicating stretches with significantly affected resources and diminished ecosystem goods and services.
- d. Scientific assessment of environmental flows (flow quantities with depths, widths, etc. as relevant) for different river stretches and major tributaries.
- e. Estimating sustainable river resource uses for both the renewable resources that come mainly from the basin such as water, sediment, and nutrients and those generated within or intrinsic to the river such as kinetic energy (stream power), river space (including flow channel, riverbanks, floodplains and hyporheic zone), flora, fauna and biodiversity, and genetic resources.
- f. Formulation of measures to conserve and/or moderate key ecosystems in the river basin such as wetlands, forests, and agro-ecosystems.
- g. Formulation of measures to contain or nullify the negative impacts of ongoing or pre-existing anthropogenic activities in the basin, and also of any non-local or natural adversities as a Strategic Plan for implementation.
- h. URMP, Urban River Management Plans (i.e. how to manage rivers in various Urban Centers), and RRMP, Rural River Management Plans (i.e. how to manage rivers in various Rural clusters) delineating how various central, state, and local governments policies and programmes could be better coordinated and optimally utilized to manage rivers in Urban and Rural areas.
- i. A time-bound Strategic Plan for implementation of the measures along with measurable and verifiable indicators for monitoring, evaluation, and feedback control through a well-defined mechanism of participation by all key shareholders for rejuvenation and conservation of rivers.
- j. Identification of key shareholders (Central Govt., State Govt., Local Bodies, local communities, civil society organisations, businesses, and citizens, etc.) of the rivers and their roles in river restoration and conservation, and the Desired Institutional Framework and any Policy and/or Legislative changes desired for successful implementation of the Strategic Plan.

8. Assumptions and Constraints

The proposed study involves two implicit assumptions, namely:

- a) Healthy ecosystems within the river basin have positive impacts on rivers through a naturally balanced supply of renewable resources and moderation of harmful inputs, but disturbed/ impacted ecosystems have limited ability to carry out these functions, and hence can affect rivers adversely.
- b) Anthropogenic activity generally impacts rivers negatively or neutrally. However, it is possible for anthropogenic interventions to also have positive impacts on river ecosystems hence interventions can be designed to meet this target.

The work of preparing river basin management plan is envisaged to have the following main constraints:

- a) The work is intended to be carried out primarily by analyzing secondary data. However, requisite secondary data may not exist in sufficient detail for all river resources, status of ecosystems, diverse human impacts, evaluation of ecosystem services, and historical information about the rivers and their basins. Hence, wherever necessary, and feasible within the given timeframe, primary data may be collected for which the additional expenses will be borne by NRCD provided prior approval is taken. As far as possible, the need for such data collection should be communicated to NRCD within the First Year of commencement of the work.
- b) The legal and institutional framework and financial constraints within which the river restorations can be carried out may be complex and difficult to fully assess. Hence different technological intervention options may be considered and compared with respect to their relative merits and demerits.

9. Approval and Authorization

- Ministry of Jal Shakti, Government of India
- Secretary, D/o WR, RD&GR
- Director, IIT Kanpur
- Director, IISc Bengaluru - Lead Institute
- Director, NIT Tiruchirappalli - Fellow Institute