

MEMORANDUM OF UNDERSTANDING
BETWEEN
INLAND WATERWAYS AUTHORITY OF INDIA (IWAI)
(Ministry of Ports, Shipping and Waterways, Government of India)
AND
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE (IIT ROORKEE)
FOR
COLLABORATIVE RESEARCH, TECHNICAL CONSULTANCY, AND CAPACITY
BUILDING IN RIVER CONSERVANCY & TRAINING WORKS, HYDRAULIC
MODELLING, AND WATERWAY MANAGEMENT ON NATIONAL WATERWAY-1 (NW-
1)

This Memorandum of Understanding (hereinafter referred to as "MoU") is made and entered into on this 13 day of October, 2025

BY AND BETWEEN:

- I. **INLAND WATERWAYS AUTHORITY OF INDIA (IWAI)**, an autonomous body under the Ministry of Ports, Shipping and Waterways, Government of India, established under the Inland Waterways Authority of India Act, 1985, having its Head Office at A-13, Sector-1, Noida – 201301, Uttar Pradesh (hereinafter referred to as "**IWAI**", which expression shall, unless repugnant to the context or meaning thereof, include its successors and assigns);

AND

- II. **INDIAN INSTITUTE OF TECHNOLOGY ROORKEE (IIT ROORKEE)**, a statutory institute of national importance established under the Institutes of Technology Act, 1961, having its campus at Roorkee – 247667, Uttarakhand, renowned for its expertise in engineering, particularly in water resources, hydraulic engineering, and environmental science (hereinafter referred to as "**IIT Roorkee**", which expression shall, unless repugnant to the context or meaning thereof, include its successors and assigns).

(IWAI and IIT Roorkee are hereinafter collectively referred to as "the Parties" and individually as "Party").

WHEREAS:

- A. IWAI is the statutory body responsible for the development, maintenance, and regulation of inland waterways for shipping and navigation in India, with a mandate to ensure adequate navigational depths and safe passage on National Waterways.
- B. The Ganga River (from Haldia to Prayagraj) has been declared as National Waterway-1 (NW-1), which is a key infrastructure artery requiring sophisticated river engineering, robust conservancy measures, and scientific waterway management for sustainable navigability.
- C. IIT Roorkee possesses significant academic and research expertise, advanced laboratory facilities (e.g., Hydraulic Engineering Lab, Water Resources Development Centre), computational modeling capabilities, and highly qualified faculty in areas directly relevant to river engineering, hydraulics, sediment transport, and water resources management.
- D. Both Parties recognize the need to leverage scientific knowledge, cutting-edge research, and modern technological tools to address the complex challenges posed by the dynamic riverine environment of NW-1, such as sedimentation, bank erosion, and maintenance of fairway.
- E. The Parties desire to enter into this MoU to establish a collaborative framework to harness IIT Roorkee's specialized research and technical capabilities to support IWAI's mission on NW-1, leading to more efficient, economical, and environmentally sustainable waterway management.

NOW, THEREFORE, THE PARTIES HEREBY AGREE AS FOLLOWS:

1. **PURPOSE AND OBJECTIVES** - The primary purpose of this MoU is to foster a strategic partnership between IWAI and IIT Roorkee for collaborative research, technical consultancy, and capacity building in critical areas concerning the management of National Waterway-1 (NW-1). The key objectives are:
 - a) To leverage academic expertise and advanced research to develop innovative, sustainable, and cost-effective solutions for challenging riverine issues on NW-1.

- b) To enhance IWA's capabilities in river conservancy, river training works, hydraulic modeling, and comprehensive waterway management through scientific inputs.
- c) To facilitate the adoption of best engineering practices and advanced technologies for the maintenance and development of NW-1.
- d) To build and strengthen technical competence and human resources within IWA through specialized training and knowledge transfer.
- e) To contribute to the long-term ecological health and navigability of NW-1 through scientific and data-driven approaches.

2. SCOPE OF THE MoU: This MoU outlines the framework for collaboration between IWA and IIT Roorkee on various aspects related to the management of NW-1. The scope includes, but is not limited to, the following areas:

a) River Conservancy & Training Works:

- i. Research on effective and sustainable river training structures (e.g., spurs, guide bunds, groynes) for channel stabilization and erosion control.
- ii. Studies on bank protection measures, bio-engineering solutions, and their impact on river morphology and navigability.
- iii. Optimization of existing river training works and design of new structures.

b) Hydraulic Modelling:

- i. Development and application of 1D, 2D, and 3D numerical models for hydrodynamics, sediment transport, and morphological evolution of NW-1.
- ii. Physical modeling studies for complex hydraulic problems, design of navigation locks, barrages, and specific river training structures.
- iii. Predictive modeling for water levels, flow regimes, and dredging requirements.

c) Waterway Management:

- i. Research and consultancy on optimizing dredging operations, including selection of dredging methodology, disposal strategies, and beneficial use of dredged material.
- ii. Studies on navigability maintenance, fairway demarcation, and design of navigation aids.
- iii. Integrated river basin management approaches considering navigation, water resources, and ecological aspects.

- iv. Development of decision support systems for waterway management.
- d) **Research & Development:** Collaborative and sponsored research projects addressing specific challenges on NW-1.
- e) **Technical Consultancy & Advisory Services:** Providing expert opinions, feasibility studies, design reviews, and problem-solving support.
- f) **Capacity Building:** Conducting customized training programs, workshops, short courses, and exchange programs for IWA/ personnel on advanced river engineering techniques, modeling, and waterway management practices.
- g) **Data Analysis & Scientific Interpretation:** Joint analysis of field data (hydrographic surveys, bathymetry, current data, sediment samples) for scientific interpretation and practical application.

3. TERM AND REVIEW

- a) This MoU shall come into effect from the date of its signing and shall remain in force for a period of **five (5)** years, unless terminated earlier in accordance with the provisions herein.
- b) The MoU may be extended for further periods upon mutual written agreement of both Parties, based on a review of its effectiveness and continued relevance.
- c) The Parties shall review the progress and implementation of this MoU annually through the Joint Working Group.

- 4. **AMENDMENT:** This MoU may be amended or modified at any time by mutual written agreement of both Parties. Any such amendment or modification shall form an integral part of this MoU.

5. TERMINATION:

- a) This MoU may be terminated by either Party by giving six (6) months' prior written notice to the other Party, without assigning any reason.
- b) This MoU may be terminated by either Party immediately if the other Party commits a material breach of any of the terms and conditions of this MoU and fails to remedy such breach within ninety (90) days of receiving written notice of such breach.
- c) Notwithstanding termination, any liabilities or obligations incurred prior to the effective date of termination shall remain binding on the respective Parties.

6. DISPUTE RESOLUTION: Any dispute, difference, or question which may arise between the Parties concerning the construction, meaning, or effect of this MoU, or the rights or liabilities of the Parties hereunder, shall be resolved amicably through mutual discussions and negotiations. If no amicable resolution is reached within sixty (60) days, the dispute shall be referred to the Chairman, IWAI, and the Director, IIT Roorkee, for their joint intervention and resolution.

7. GOVERNING LAW AND JURISDICTION This MoU shall be governed by and construed in accordance with the laws of India. The Courts in New Delhi shall have exclusive jurisdiction to entertain any suit or proceeding arising out of this MoU.

8. GENERAL PROVISIONS

- a) **Non-Binding Nature:** This MoU represents the mutual understanding and intent of the Parties and is not intended to create any legally binding financial obligations beyond the express provisions outlined herein. It serves as a framework for a more detailed agreement or project-specific contracts if required.
- b) **Confidentiality:** Both Parties agree to maintain confidentiality of any proprietary or sensitive information shared during the course of this collaboration.
- c) **Severability:** If any provision of this MoU is held to be invalid or unenforceable, the remaining provisions shall remain in full force and effect.
- d) **Force Majeure:** Neither Party shall be held liable for non-fulfillment of their obligations under this MoU if such non-fulfillment is due to a Force Majeure event (acts of God, war, natural calamities, pandemic, etc.), provided prompt notice is given to the other Party.

IN WITNESS WHEREOF, the Parties hereto have executed this Memorandum of Understanding on the date first above written.

<p>For & on behalf of Inland Waterways Authority of India (IWAI):</p> <p></p> <p>A.K. Mishra Chief Engineer (JMVP) Inland Waterways Authority of India (Ministry of Port, Shipping & Waterways, Govt. of India) A-13, Sector-1, Noida-201301 (U.P.)</p>	<p>For & on behalf of Indian Institute of Technology Roorkee:</p> <p> Dean Sponsored Research & Industrial Consultancy Indian Institute of Technology Roorkee Roorkee-247667 (INDIA)</p> <p>Prof. Vivek Kumar Malik Dean, Sponsored Research and Industrial Consultancy (SRIC)</p>
<p><u>Witness:</u></p> <p>1.  KAROR SINGH DY. DIRECTOR, IWAI</p> <p>2.  DR. PRAKRITIK MISHRA SR. CONSULTANT (JMVP)</p>	<p><u>Witness:</u></p> <p>Prof. Sai Ramudu Meka Associate Dean (Innovation and Incubation)</p> <p>1. </p> <p>Prof. Amit Agarwal Associate Dean (Corporate Interaction)</p> <p>2. </p>