

RRI Newsletter

Issue-26 A quarterly Newsletter of RRI June 2025

PROMOTION TO DIFFERENT LEVELS IN RRI

Recently, a number of officers/employees have been promoted to various levels in the River Research Institute. For this, everyone expressed their gratitude to the DG, RRI and the committee members. It is undeniable that the current

DG has been working tirelessly on recruitment and promotion with great sincerity since coming to RRI. In this issue, a brief description of the officers who have been promoted recently to various posts is presented below.

PROMOTION FROM SCIENTIFIC OFFICER TO SENIOR SCIENTIFIC OFFICER



RRI has immense pleasure and pride to congratulate Mr. Engr. Emran Ali Mondal and Mr. Engr. Bikash Roy (from left to right respectively) for their promotion to Senior Scientific Officer from Scientific Officer on 20th and 19th May 2025

respectively. Mr. Mondal graduated in B. Sc. Engg. (EEE) from DUET, Gazipur in 2014 & started his career in RRI on 22th June, 2017. He is from Naogaon district and Mr. Roy graduated in B. Sc. Engg. (Mechanical) from DUET, Gazipur in 2013 & started his career in RRI on 22th June, 2017. He is from Dinajpur district. RRI wishes them the best for their future endeavors.

PROMOTION FROM SENIOR SCIENTIFIC OFFICER TO PRINCIPAL SCIENTIFIC OFFICER



RRI has immense pleasure and pride to congratulate Mr. Engr. Shailen Kumer Ghosh and Mr. Engr. Md. Johurul Islam (from left to right respectively) for their promotion to Principal Scientific Officer from Senior

Scientific Officer on 19th and 20th May 2025 respectively. Mr. Ghosh graduated in B. Sc. Engg. (Mechanical) from BIT, Gazipur in 1994 and he is from Kushtia district. Mr. Johurul Islam graduated in B. Sc. Engg. (Civil) from BUET, Dhaka in 2006 and he is from Chuadanga district. RRI wishes them the best for their future endeavors.

PROMOTION FROM PRINCIPAL SCIENTIFIC OFFICER TO CHIEF SCIENTIFIC OFFICER



RRI has immense pleasure and pride to congratulate Mr. Engr. Md. Matiar Rahman Mondol and Dr. Engr. Md. Alauddin Hossain

(from left to right respectively) for their promotion to Chief Scientific Officer from Principal Scientific Officer on 20th April 2025. In academic career, Mr. Mondol graduated in B. Sc. Engg. (Civil) and did M. Sc. Engg. (Civil & Environmental Engg.) degree both from BUET in 1992 and 2009 respectively. He is from Gaibandha district and

Dr. Hossain graduated in B. Sc. Engg. (Agril) major in Irrigation and Water Management (IWM) from BAU, Mymensingh in 1990 and did M. Engg. (Water Resources Management) degree from UNESCO-IHE, Institute for Water Education, Delft, The Netherlands in 2004. Dr. Hossain also achieved Ph. D. degree from Rajshahi University in 2019. He is from Pabna district. Moreover, Dr. Hossain has been appointed as Director (In charge) for Geotechnical Research Directorate in addition to his regular duties. Each of them demonstrated remarkable expertise and leadership in their respective fields. Their innovative

thinking, rigorous research, and collaborative spirit have consistently driven the organization towards new heights of scientific excellence. Whether through groundbreaking discoveries, successful project completions, or effective team leadership, their efforts have made a profound impact on our collective mission. RRI expects them to continue to take on challenges with the same enthusiasm and resilience that has brought them this far, while also mentoring and guiding the next generation of scientists, and fostering an environment where creativity and innovation can flourish. RRI wishes them the best for their future endeavors.

FAREWELL CEREMONY



Fig: Farewell ceremony of Mr. Md. Azizul Haque Podder, Director (A.C.), Geotechnical Research Directorate.

River Research Institute (RRI) organized a heartfelt farewell ceremony on 16th June, 2025 to honor Engr. Mr. Azizul Haque Podder's retirement. Mr. Azizul Haque Podder started his journey at RRI in April 21, 1991 as a Scientific Officer. Then he promoted to Senior Scientific Officer, Principal Scientific Officer and Chief Scientific Officer on 25th September 2004, 5th November 2014 and 09th May 2024 respectively. At last, recently he takes off as

Director (in charge) of Geotechnical Research Directorate of RRI on 5th September, 2024. In his academic career, he completed Bachelor's degree in Agricultural Engineering in Major Irrigation & Water Management from Bangladesh Agricultural University (BAU). He also completed Master's degree in Watershed Management and Conservation in September 1998 from University of Twente's former ITC (International Institute for Earth sciences), The Netherlands. Mr. Podder was a dynamic scientist who implemented a number of research project and model studies in his career as a team leader. He was one of the longest serving professional and contributed a lot to RRI. He enriched the River Research Institute with new ideas and innovations. He demonstrated remarkable expertise and leadership in his respective fields specially in physical modelling. RRI family will remember him for a long time for his contribution to RRI. Besides this, he is also a very religious person and is engaged in religious work. After a very successful career, his post-retirement leave (PRL) has been started from 09 June 2025 and due to unavoidable reasons, the farewell ceremony organized later on 16th June, 2025. RRI family wishes his good health, good time and all the success in the future.



Fig: Farewell ceremony of Mr. Md. Liakat Ali khan, Soil Technician-B.



Fig: Farewell ceremony of Mr. Md. Azizul Haque Podder, Director

In favor of the GR Directorate, Mr. Md. Liakat Ali khan, Soil Technician-B and Mr. Md. Azizul Haque Podder, Director, Geotechnical Research welcomed and honored their last working day of the service life. DG, RRI S M Abu Horayra was present this event as a chief guest and bid them farewell along with Geotechnical Research Officials.

RIVER RESEARCH INSTITUTE (RRI): A SILENT GUARDIAN OF BANGLADESH'S RIVER AND WATER RESOURCES MANAGEMENT

-Md. Nuruzzaman, Soil Technician, RRI & Dr. Moniruzzaman Khan Eusufzai CSO, RRI



Bangladesh is a riverine country. The nation's livelihood, agriculture, commerce, environment, and culture are deeply rooted in its rivers. While rivers are a blessing, they can also become sources of destruction when uncontrolled. The

River Research Institute (RRI) was established as a research and pioneer institution by an Act 53 of 1990 aimed to support the design and plan regarding the river flow, bank erosion, sediment transport, tidal actions, and coastal degradation scientifically. RRI has been providing consultancy services for viable technical solutions to the problems related to riverbank erosion, flooding, drainage and irrigation. RRI also conducts testing and assessment of quality of soil, sediment, water as well as materials used for construction of water infrastructures for water resources development and river management.

Actually, RRI's journey was started from 1948 with the creation of the Hydraulic Research Laboratory (HRL) in Dhaka, aimed to support the Karnaphuli Hydroelectric Project. This was the first step towards institutionalized river and water resources research in the region. Mr. M. A. Rahman, the founding officer, led the lab until 1974 and laid the foundation for experimental and model-based hydraulic research in East Bengal. In 1952, physical modeling of rivers began, which helped in the design, planning, and cost-saving of river-related projects. Following a visit by Sir Claude Inglis King, Director of the Hydraulic Research Station in the UK, efforts were taken to expand the HRL. Gradually, additional research sections such as soil mechanics, sediment analysis, and materials testing were included. On 29 August 1978, the HRL was fully merged into the River Research Institute, marking a new chapter in advanced, multidisciplinary river research. Today, RRI operates as an autonomous body under the Ministry of Water Resources as

per Act 53 of 1990. The activities of RRI are conducted by three directorates namely, Hydraulic Research Directorate, Geotechnical Research Directorate, and Administration and Finance Directorate. The first two directorates operate the research activities while the last is responsible for the overall administration and financial activities of RRI and works for its development.

These directorates collectively support major national river and infrastructure projects including the Padma Bridge, Jamuna Bridge, Teesta Barrage, and coastal embankment improvements. The institute also plays a key role in verifying designs and offering scientific support (data, information, design parameter, alignment, orientation, location etc) in river training and erosion control works. RRI conducts both physical and mathematical modeling and geotechnical testing using advanced software & instruments for simulating river behavior, tide actions, pumping systems, and soil mechanics. It is also integrating modern technologies like GIS (Geographic Information Systems), remote sensing, and drone mapping to enhance precision and efficiency.

As climate change continues to affect river patterns through increased floods, bank erosion, salinity intrusion, and coastal vulnerability, RRI has become more vital than ever. Its contributions are crucial in waterlogging management, flood forecasting, embankment safety, and sustainable river basin planning. The River Research Institute is more than a scientific center-it's the backbone of Bangladesh's river and water resources management. Through modernization, skilled manpower, and relevant research, RRI is leading the country toward sustainable, river-friendly development. With proper planning, resource allocation, and innovation, RRI is set to play an even greater role in shaping a resilient and environmentally balanced Bangladesh.

NEW RESEARCH WORK

Assessment of Water Quality of the Kumar River in Faridpur District Using the Water Quality Index

River Research Institute's ongoing research project "Assessment of Water Quality of the Kumar River in Faridpur District Using the Water Quality Index" was started on 27/04/2025 and will be finished on 26/07/2025 (three months duration). The total cost estimate is 7.80 lac, and the performance of works is 65% up to June 2025.

The objectives of the research are:

- To assess the physicochemical properties of the Kumar River's water: Evaluate key water quality parameters, such as pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), nitrate, phosphate, turbidity, Arsenic (As), Lead (Pb), Cadmium (Cd), Chromium (Cr), Nickel (Ni), Manganese (Mn), Iron (Fe), and Zinc (Zn) across different locations.

- To calculate the Water Quality Index (WQI): Determination of the WQI for the Kumar River at various sampling points to provide a comprehensive measure of water quality in numerical and categorical terms.
- To identify and analyze sources of pollution: Investigation of the primary contributors to water quality degradation, such as industrial discharge, agricultural runoff, untreated sewage, and solid waste, and their geographical variations.
- To evaluate the ecological health of the Kumar River: Assessment of the impact of pollution and other stressors on aquatic ecosystems and biodiversity in the river.

These objectives aim to provide a comprehensive understanding of the Kumar River's water quality and its relationship with ecological and anthropogenic factors.

Assessment of spatio-temporal variability of soil and water salinity and their impact in Shatkhira District of Bangladesh

There is a lack of comprehensive data and understanding regarding the patterns and drivers of salinity in the Satkhira region. Existing assessments are often limited in spatial scope and temporal resolution, hindering effective management strategies. Farmers in Shatkhira, who heavily depend on agriculture, are facing declining crop yields and economic instability due to salinity stress, yet there is insufficient information on the specific areas and seasons most affected. Thus, assessing the present spatial and temporal variability of soil and water salinity levels in the Shatkhira District is imperative for water management and agricultural sustainability. RRI has taken the initiative to fill the void and find out a comprehensive salinity status of the Satkhira district under the funding of Ministry of Water Resources (MoWR). The total cost of the research is 17.0 lac and duration is 13 months.

Objectives:

- To evaluate the extent and severity of salinity intrusion in surface water and soil in the study region.
- To determine the primary sources and driving factors contributing to salinity intrusion in the study area.

- To assess the seasonal and spatial variability of salinity levels in surface and groundwater.
- To assess the impact of salinity intrusion on soil salinity and its implications for agriculture and crop productivity.

Methodology:

The study will be conducted across the entire Satkhira district. Approximately 26 sampling points have been preliminarily selected for in-situ salinity measurements and the collection of surface water, groundwater, and soil samples. In addition to primary data, various secondary data sources will be utilized. Both types of data will be analyzed using advanced software tools to meet the research objectives.

Progress:

The research team has completed an initial field visit. Preliminary findings indicate that salinity has intruded approximately 100–120 km northward into the Satkhira district from the Bay of Bengal coastline. Further field investigations are planned soon.

ONGOING RESEARCH WORKS

Performance evaluation of some magnetically responsive nanoparticles (NPs) and metal-organic frameworks (MOFs) for heavy metals removal and organic dye degradation in polluted water.

Rapid industrialization, urbanization, and agricultural runoff have severely degraded freshwater resources in Bangladesh. Surface water, particularly rivers around Dhaka—exhibit near-zero dissolved oxygen and elevated concentrations of heavy metals and dyes, posing serious ecological and human-health risks. Conventional treatment methods are often cost-prohibitive; thus, there is an urgent need for low-cost, efficient, and reusable adsorbent technologies.

Tailored MOFs exhibiting semiconductor-like behavior, when integrated with superparamagnetic cores (e.g., Fe₃O₄ nanoparticles), will combine high surface area, photocatalytic activity under visible light, and magnetic separability—enabling efficient removal of heavy metals and degradation of organic dyes, with facile recovery and negligible secondary contamination. Research on the above mentioned titled is ongoing at RRI with the GoB fund to find out the suitable materials for heavy metal removal and organic dye degradation from polluted water.

Progress

A field investigation was conducted on May 16 and 17 to evaluate the water quality of inland surface water bodies in and around Dhaka city, with a primary focus on assessing the performance of water treatment processes. As part of this initiative, water samples were systematically collected from multiple locations across both the eastern and western reach of the river system traversing Dhaka. Each sampling site was analyzed for a set of key physicochemical parameters, including pH, chloride concentration, electrical conductivity (EC), resistivity, salinity, total hardness (TH), total alkalinity (TA), total dissolved solids (TDS), and dissolved oxygen (DO). Heavy metals concentration determination is in processing at the Soil Resource Development Institute (SRDI) laboratory.

Among these, dissolved oxygen (DO) emerged as a critical parameter of concern due to its significant deviation from the acceptable standard set by the Department of Environment (DOE), which prescribes a minimum DO concentration of 6 mg/L to ensure the ecological health of aquatic systems. The DO values recorded at all surveyed sites fell short of this critical value, as visually illustrated in the accompanying bar graph.

A comparative analysis between the eastern and western sampling locations reveals a marked spatial disparity in DO

concentrations. Sites on the western side—including Ashulia, Panchabati, Botanical Garden, Amin Bazar, Basila, Babu Bazar, Pagla and Muktarpur—exhibited relatively elevated DO levels. Notably, Ashulia and Panchabati recorded the highest values at approximately 3.6 mg/L and 2.6 mg/L respectively. Despite these comparatively better readings, none of the western sites achieved compliance with the DOE standard, and several sites—particularly Amin Bazar, Basila, Babu Bazar, and Pagla—registered critically low DO levels (below 1 mg/L), indicating potential point-source pollution or limited water aeration in these regions.

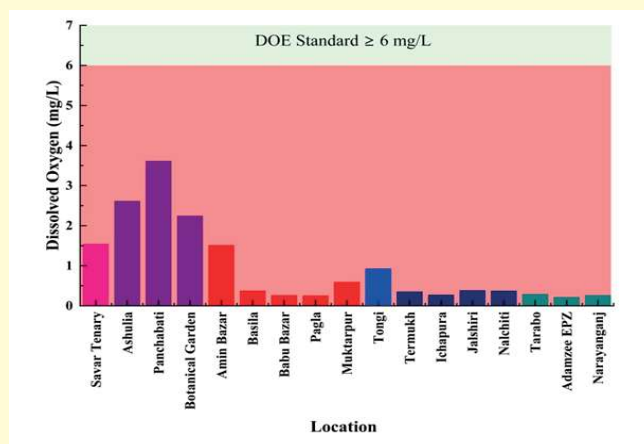


Fig: Variation of Dissolved Oxygen

In contrast, the eastern locations—comprising Tongi, Termukh, Ichapura, Jalshiri, Nalchiti, Tarabo, Adamjee EPZ, and Narayanganj—demonstrated a consistently alarming trend, with DO concentrations uniformly below 1 mg/L. This pervasive oxygen deficiency suggests a more acute level of environmental degradation on the eastern flank, likely exacerbated by high organic pollutant loads, industrial effluents, and reduced hydrological flushing capacity.

Conclusion

The results underscore a widespread deficit in dissolved oxygen across both regions of the river system, with the western zone displaying significantly more severe impairment. The observed patterns necessitate immediate attention from environmental regulatory bodies and stakeholders, urging the implementation of targeted pollution control strategies, enhanced wastewater treatment measures, and regular monitoring programs to restore and preserve the ecological balance of the affected water bodies.

YOUTH FESTIVAL, JUNE 2025



The present government has taken a nationwide initiative program entitled "Youth Festival" and organized by the present government "Youth Festival-2025" aimed at engaging and empowering young people. It includes various activities like youth entrepreneur fairs, cultural events, sports competitions, and discussions on relevant topics. The festival also focuses on promoting environmental awareness

and ICT skills among the youth. The aim is to foster a sense of national unity, encourage participation in nation-building, and create a platform for young people to showcase their talents. RRI is not out of this program. Recently, RRI organized on 17 and 18 June, 2025 such type of sports tournament (Football match) under "Youth Festival-2025" taking three directorates or team namely 1) Administration and Finance, 2) Hydraulic Research and 3) Geotechnical Research. RRI employees enjoyed a lot it and they hope it will continue. Administration and Finance directorate won as Champion and Hydraulic Research Runner up in this tournament.



Bangla Noboborsho 1432 Celebration in RRI



The River Research Institute (RRI) celebrated শুভ নববর্ষ ১৪৩২ with great enthusiasm and cultural vibrancy, bringing

together officers, staff, and their families in a joyous occasion to welcome the Bengali New Year. The celebration featured traditional music, dance, poetry recitations, and a colorful display of Bengali heritage through dress and decoration. A highlight of the event was the arrangement of a পাস্তা-ইলিশ feast, symbolizing the rich culinary traditions of the region. The premises of RRI were adorned with আলপনা and festive banners, creating a lively and festive atmosphere. Speeches by senior officials emphasized the importance of cultural identity, unity, and collective progress. The event concluded with heartfelt greetings among colleagues and a shared commitment to a prosperous and harmonious new year.

VISITED RRI



Fig: Ms. Mahfuza Akter, Joint Secretary of MoWR and Director General (Additional Charge) of RRI has visited Dhaka Office of RRI.

Joint Secretary Ms. Mahfuza Akter of MoWR has been appointed Director General (A.C.) due to S M Abu Horayra, DG, RRI's participation to the Foreign Training Program at UTMSPACE, Malaysia. She visited the Dhaka Office of RRI and conveyed important instructions to the officers and staff of RRI.

A group of representatives of the National Institute of Mass Communication (NIMC) has visited RRI to film a short documentary on RRI. The documentary will be used for the archive of NIMC as well as for the publicity of RRI

Md. Aminul Islam, Director General of Directorate of Works Audit has visited RRI on May 2025. He was welcomed by the Director General of RRI S M Abu Horayra and other senior officials of RRI.



Fig: Representatives of the National Institute of Mass Communication.



Fig: DG, Directorate of Works Audit Md. Aminul Islam was welcomed by the DG, RRI and other officials.

NEW EQUIPMENT ACQUIRED BY RRI

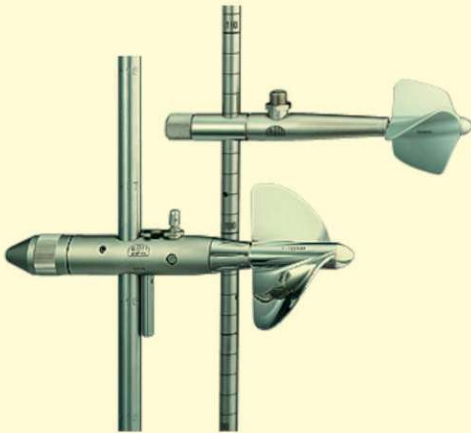


Fig: OTT C2 propeller type current meter.

The propeller type current meter is a widely used instrument in hydraulic and hydrological studies to measure the velocity of flowing water in rivers, canals, streams, and open channels. It operates based on the principle that the speed of water flow causes a propeller to rotate, and the rate of rotation is directly proportional to the velocity of the water. This device is essential for conducting flow measurements, discharge calculations, and velocity profiling in water bodies. In research and water resource management institutions like the River Research Institute (RRI), the propeller type current meter plays a crucial role in calibrating hydraulic models, validating simulation results, and designing hydraulic structures by providing accurate field data on water movement. It is also useful in sediment transport studies, flood forecasting, and irrigation planning, making it a vital tool for ensuring the sustainable and efficient use of water resources. Recently RRI has acquired this current meter.



Fig: DJI Mavic 3 Pro.

Drones, or unmanned aerial vehicles (UAVs), have become valuable tools in hydrology due to their ability to collect high-resolution spatial and temporal data efficiently and cost-effectively. In hydrological studies, drones are used for monitoring river morphology, mapping floodplains, and assessing watershed characteristics. They can capture real-time aerial imagery and generate digital elevation models (DEMs), orthophotos, and 3D terrain maps, which are essential for analyzing surface runoff, erosion patterns, and catchment hydrodynamics. Drones are also employed to monitor water quality, detect sedimentation, and track changes in land use and land cover that influence hydrological processes. During flood events, drones assist in rapid damage assessment, flood extent mapping, and rescue planning. Their ability to access remote or hazardous areas makes them particularly useful for field data collection where traditional surveying methods are difficult or dangerous. Overall, drones enhance the accuracy, efficiency, and safety of hydrological research and water resource management. Recently RRI has acquired this drone.

Editorial Committee

Chief Advisor

S M Abu Horayra, Director General

Advisor

Engr. Pintu Kanungo, Director (Admin and Finance) & Director (Hydraulic Research)

Dr. Engr. Md. Alauddin Hossain, Chief Scientific Officer & Director (In charge), Geotechnical Research

Executive Editor

Nayan Chandra Ghosh, M.Phil., Senior Scientific Officer

Member

Engr. Md. Zubayerul Islam, Senior Scientific Officer

Engr. Omar Al Maimun, Senior Scientific Officer

Engr. Sumiya Ferdous, Scientific Officer

Engr. Md. Masuduzzaman, Assistant Programmer

Tarik Jamil Tamim, Store Officer

Shamima Akter, Librarian

Contact

RIVER RESEARCH INSTITUTE

Head Office: Faridpur-7800, Bangladesh; Dhaka Office: 72, Green Road, Dhaka-1205, Bangladesh

Telephone: +880 2478803007, Fax: +880 2478863065

Website : www.rri.gov.bd; Email: dx@rri.gov.bd; Facebook: <https://www.facebook.com/rribd>