River Research Institute
Ministry of Water Resources
Govt. of the People's Republic of Bangladesh

RRI should be an International Standard Research Organization-Hon'ble State Minister, MoWR

RRI Newsletter

Issue-19 A quarterly Newsletter of RRI September 2023

53rd **Board of Governors (BoG)** meeting of RRI was held at Pani Bhaban, 72 Green Road in Dhaka on 18 September 2023. Mr. Zaheed Farooque MP, Hon'ble State Minister, Ministry of Water Resources and the Chairman of BoG, Chaired the meeting. Mr. AKM Enamul Haque Shameem, MP, Hon'ble Deputy Minister of Water Resources & the member of BoG and other members of BoG were present in this meeting. This is the apex board of RRI that makes the decisions on different issues that arises from time to time. Some of the important decisions were taken in the meeting.

RRI's journey towards sustainable water resources development in Bangladesh

-S M Abu Horayra, Director General, RRI

River Research Institute (RRI), Faridpur was established by the Government of Bangladesh as a Statutory Public Authority under the Ministry of Water Resources (MoWR) by an Ordinance (Act 53) in 1990. Flooding and River bank erosion is a major and recurring problem of the country like a natural disaster. Increase of landless people due to bank erosion is one of the main reasons of poverty in Bangladesh. Since its establishment, RRI has been successfully conducted more than 200 physical model studies under different water resources development projects related to river bank erosion, irrigation, drainage, and navigation system development. In addition, different types of construction material, soil, sediment, and water samples have been tested in RRI. The modelling and sample test results have played an important role for sustainable design and planning of the allied projects.

The world is on the shores of the 4th Industrial and Technological Revolutions that will fundamentally change how the peoples live, work and interact. Government intension is to promote the development of new technologies in all engineering and business management areas. Considering this, with a view to enhancing RRI activities and to lift up the standard of service in international level in the field of *(Cont'd on page 2)*

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	**: dg@rri.gov.bd**
Facebook	**: https://www.facebook.com/rribd**

RRI's Journey towards….. (Cont'd from page 1)

water resources engineering; RRI has been providing design support to the planners and designers of hydraulic structures [like bridge, barrage, spur, groynes, revetment, sluice gate, culvert, etc.) through performing both Physical and Mathematical Model study to make the project sustainable and cost effective.

What type of structural measures [such as groyne/spur (permeable or impermeable), block dumping, revetment (C.C. block, sand bag/geobag or brick mattress), etc] or what type of non-structural measures (diversion of water through bypass channel, increasing river section etc) is effective & efficient to protect the affected area from bank erosion; that is determined through physical and mathematical model study with required type of structure (best option) and its design parameter (such as length, alignment, orientation, shape, scour depth, design velocity etc). RRI is the only Government research organization in Bangladesh where both physical and mathematical modelling facilities are available. So, it is possible to receive a specialized services from a single source organization at low cost and less time for making a project sustainable and cost effective through hybrid modelling approach. RRI has been travelling towards sustainable water resources development in Bangladesh since it's established.

COLLABORATIVE MEETING BETWEEN RRI & BWDB

On September 10, 2023, an important meeting took place between the River Research Institute (RRI) and the Bangladesh Water Development Board (BWDB). This meeting was presided over by Mr. Mallik Saeed Mahbub, Additional Secretary (Development), Ministry of Water Resources. The meeting was held within the confines of the Director General's Conference room at Pani Bhaban 72, Green Road, Panthapath in Dhaka. The attendees at this meeting were comprised the Director General of RRI & prominent scientists affiliated with the institute and the Director General of BWDB along with high officials, all came together to engage in productive discussions and collaborative efforts for making solutions of important arising issues.

MOU SIGNING CEREMONY BETWEEN RRI AND IWM

S M Abu Horayra, DG, RRI and Md. Zahirul Haque Khan, ED, IWM along with other officials were present in the MoU Signing Ceremony

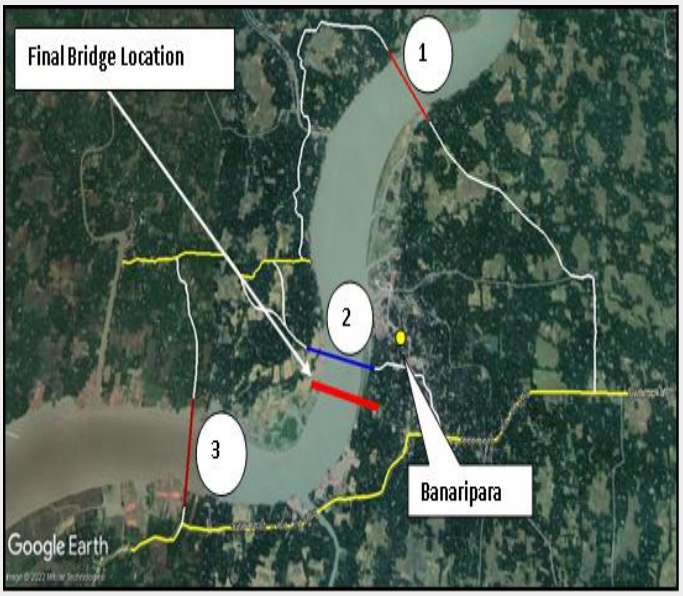
Memorandum of Understanding (MoU) was signed between River Research Institute (RRI) and Institute of Water Modelling (IWM) on 9th July 2023 at IWM BHABAN, Uttara, Dhaka. S M Abu Horayra, Director General of RRI, and Md. Zahirul Haque Khan, Executive Director of IWM, signed the MoU on their behalf.

The signing ceremony was conducted for exchanging idea, technologies, lab facilities and for working collaborative study and research between two organizations to promote sustainable water resources development.

Recently Completed Projects

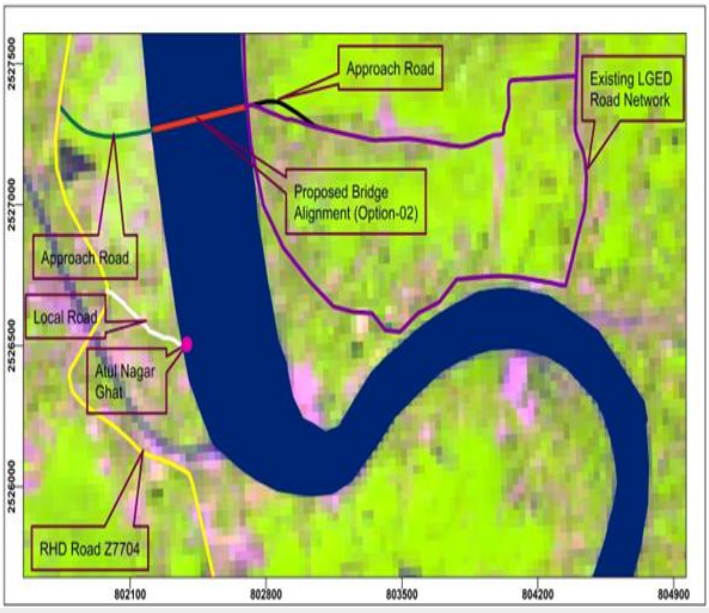
Hydro-Morphological Study for the proposed Banaripara Bridge at 2nd km of Banaripara-Najirpur Highway (Z-7710) on the Sandha River under RHD

Construction of Banaripara Bridge is a shortlisted task for the Roads and High Ways Department (RHD) to construct over the Sandha river at 2nd Km of Banaripara - Najirpur Highway (7710) for uninterrupted road communication between Banaripara upazila of Barishal district and Najirpur upazila of Pirojpur district as a part of the 5-year plan of the Roads and Highways Department (RHD) for the construction of bridges/culverts of 37,500 meters in length, reconstruction of bridges/culverts of 4100 meters in length, etc. The new targets will ensure an uninterrupted highway network by identifying and connecting the missing links of the road network. For the implementation of the aforementioned program, RHD has taken up a few consultancy services for feasibility studies and detailed designs of many bridges under different zones. The Bridge Construction and Maintenance circle of RHD has prepared a shortlist of bridges needing replacement and reconstruction. Among these bridges, feasibility studies of two proposed bridges under the Barishal zone, one is the Banaripara bridge over the Sandha River, have been started. Considering the channel gap, the Banaripara Bridge of 700 meters long.



Hydrological and Morphological Study for Atul Nagar Ghat Bridge at 28th K.M. of Pirojpur – Nazirpur – Matibhanga – Patgati - Gonapara Highway (Z-7704) on the Kaliganga River under RHD

The study area is located in the South Central Region (SCR) and coastal zone of Bangladesh. The tentative site of the proposed bridge over the Kaliganga River is located at 28th K.M. of the Pirojpur – Nazirpur – Matibhanga – Patgati - Gonapara Highway (Z-7704). The Kaliganga River is a meandering, dynamic, and tidally affected river. Kaliganga River originates from the Arial Khan River, a distributary of the river Padma, and meets with the Sandha River near Pirojpur Sadar. The Kaliganga River discharges directly to the Bay of Bengal naming the Katcha River in its lower end. Like other coastal rivers, river Kaliganga is associated with strong tidal currents and waves. Fine sediment is transported by tidal currents into the sea. It is probable that the sediment originated from the Padma discharge during the wet season and is carried westwards by near-shore currents created by the North-East monsoon in the period July to November. The river falls within the coastal boundary of the country which comprises extensive flat coastal and deltaic land of the Ganges delta and crossed by large tidal rivers discharging into the Bay of Bengal. Therefore, the selection of a suitable bridge location and bridge waterway opening requires detailed verification of likely hydrological scenarios and the present erosion trend as well as future likely river planform development. On the other hand, due to tidal influence determining hydraulics of scour depths and river training works would require special consideration of the steepest recession of flood.



Physical Modelling Component for Feasibility Study for the Management of the Brahmaputra and Jinjiram River Basins through Flood Control, Drainage Facility and Bank Protection in Kurigram District

The main objective of the study was to the management of the Brahmaputra and Jinjiram river basins in Kurigram district through flood control, drainage facility and river bank protection. In order to support the feasibility study to meet the above-mentioned objectives morphological physical modelling was setting the following objectives:

- To identify the erosion prone areas within the study reach;
- To establish baseline hydro-morphological conditions;
- To develop options for erosion management measures;
- To assess the efficacy of the developed options in arresting erosion;
- To assess the effects of the developed options on river hydraulics and morphology in the upstream and downstream of the same; and
- To determine the hydraulic design parameters of the suitable bank protection works.

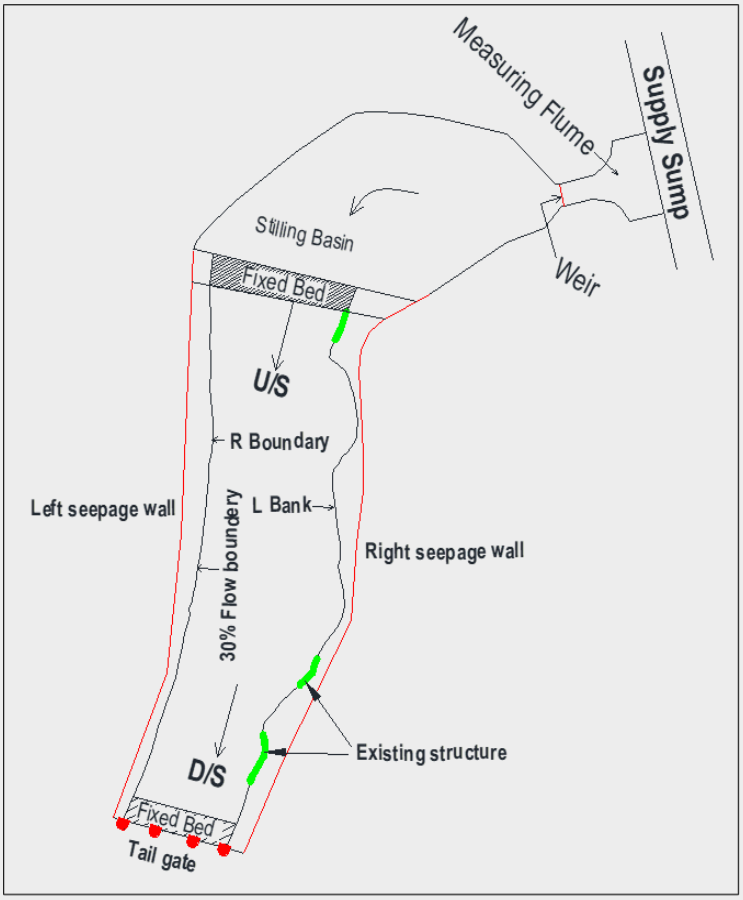


Figure 1: Layout of the Brahmaputra Model

Suitable Option

The study evaluates the effectiveness of existing and proposed protective works at various points along the river. Different options (T1, T2, T3, T4) are tested for their impact on flow velocity and scour depth.

Bank protection and char stabilization considered under Option-3 appear to be beneficial in terms of erosion protection and land reclamation. Char stabilization in the Brahmaputra River may occur naturally. However, stabilization of Char Dighla Para to make it a part of the main land will require structural measures under Option-3. However, implementation of suggested protective works (21.654km long) is likely to be a challenging task as the protective works will come under high flow attack of a major channel of the Brahmaputra River. In the past the river has shown a trend of increase in braiding intensity and width leading to large scale bank erosion in the project area. It is believed that this trend no more exists now. It creates an opportunity to go for narrowing the river and reclaim valuable floodplain. However, response of the Brahmaputra River to human interventions still remains unpredictable. Under this circumstance, it would be wise to implement the proposed protective works following an adaptive approach keeping scope for improving and optimizing the designs for systematic stabilization measures to be implemented.

Since interventions considered under Option-3 provide left bank erosion protection of the Brahmaputra River covering a long stretch and facilitates regaining of lost land it could be a suitable option that may be considered.

Recommendations

- It is revealed from the examination of historical satellite images that over the last four decades the Brahmaputra River has shown an overall widening trend due to increase in the braiding intensity leading to widespread bank erosion in the project area and elsewhere. Due to left bank erosion of the Brahmaputra River in the project area numerous people have lost their homesteads and valuable lands. Many infrastructures are also swallowed up by the river. At present the widening trend of the Brahmaputra River is reversing. Therefore, emphasis should be put on reclamation of lost land in all river stabilization projects concerning the Brahmaputra River;

- Interventions considered under Option-3 may be implemented in the field in order to meet the project objectives despite the fact that it entails massive construction and huge cost. The implementation of the proposed protective works should be adaptive;

- Systematic construction techniques as outlined under **Adaptive Approach for Implementation** may be followed;

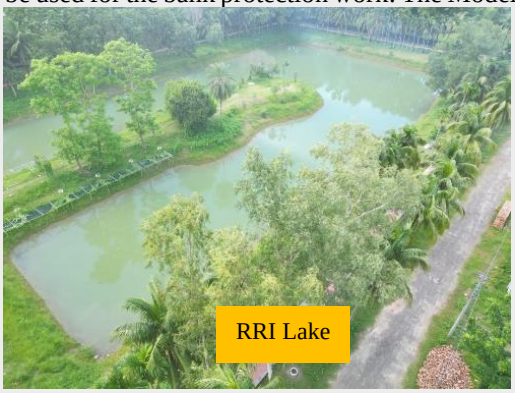
- Monitoring and assessing the river behavior in response to phased construction should form the basis for improving and optimizing the design of proposed protective works; and

- There should be a concrete plan for beneficial use of the reclaimed land including resettlement of displaced people.

Figure 2: Model bed scenarios of Brahmaputra and Jinjiram River Basins: (a) during test run and (b) after test run.

New Attachment in the Survey Section of RRI

Recently RRI has purchased a Quadcopter Drone for the Survey Section from Bamboo Bandalling project. It is to be used for the bank protection work. The Model is DJI Mini 3 Pro. This drone is already used to capture the aerial view of study area and physical modelling area to get the real view at a glance. It will helpful to upgrade the research studies as well as modelling activities. This is a part of 4th Industrial Revolution application in RRI. Through this drone it is possible to capture sky view as per desire.



NATIONAL MOURNING DAY, 2023 OBSERVED IN RIVER RESEARCH INSTITUTE

RRI rally and paying homage to Bangabandhu, Father of the Nation by placing wreath.

River Research Institute, both Dhaka and Faridpur office observed National Mourning Day 2023 and 48th martyrdom anniversary of Bangabandhu Sheikh Mujibur Rahman with due respect and solemnity on 15th August, 2023. The August 15 is the darkest day in the history of independent Bangladesh as the architect of the country's independence and Father of the Nation Bangabandhu Sheikh Mujibur Rahman and most of his family members were brutally gunned down by some disgruntled army men on this day in 1975.

Mr. S M Abu Horayra, Director General, RRI along with a number of professionals participated on the rally from Pani Bhaban ground to Bangabandhu Memorial Museum at Dhanmondi. The professionals stood in solemn silence for a minute as a mark of profound respect to the memory of father of the nation after placing the wreath. On 17th August, the discussion meeting and doa mahfil were held at Pani Bhaban and the professionals of Dhaka office participated. The discussion meeting and doa mahfil at Faridpur Office took place on 15th August after Johor prayers. The participants offered Sura Fateha and munajat seeking eternal peace for the departed soul of Bangabandhu with those martyred on 15th August 1975. It is noticed that RRI celebrated the birthday of martyred Captain Sheikh Kamal, son of Father of the Nation Bangabandhu Sheikh Mujibur Rahman and Bangamata Begum Fazilatunnesa on 5th August, 2023. The RRI professionals participated in a rally from Pani Bhaban ground to Sheikh Kamal Park at Dhanmondi and placed the wreath with due respect through fanfare and gaiety.

THE STAFF OF THE MONTH Program, Inspiration and Recognition

Present DG of RRI, S M Abu Horayra started "THE STAFF OF THE MONTH Program" declaration from January 2023 based on the performance of each employee. Then he awards the best of the best performer for the month for encouraging the employees for the betterment of the institution. In this context, Mr. Md. Sha Alam, ST-B was declared as STAFF OF THE MONTH for July, 2023. He presently serves at the Dhaka office. Not yet declared for the month of August and September, 2023.

WE DEEPLY MOURN

With deepest sorrow, sharing you all that **Mr. Md. Badrul Islam**, Soil Technician-A, Geotechnical Research Directorate of RRI (son of Late Md. Najrul Islam, Village/P.O: Ratoil, Upazila: kashiani, District: Gopalganj) has passed away (Inna lillahi wa inna ilaihi rajeun) on 03 September, 2023 at around 8.00 PM due to cancer. He was a very honest, sincere and dedicated staff of RRI and contributed a lot in RRI. He was only 52. He left behind his beloved wife, only son and daughter. His funeral was arranged at his hometown Gopalganj. All the members of RRI are heartbroken at the sad demise of Md. Badrul Islam. RRI family extremely grieving for his immature and sudden departure. Heartiest condolence and sincere sympathy to the bereaved family members on this difficult time. RRI's thoughts and prayers are forever for his work and active contribution.

'Death brings pain that time can only heal, no words could ease what we truly feel'

May his soul rest in eternal peace and may Allah grant him a place in the paradise.

Update of Bamboo Bandalling project of RRI

Protection of Islampur, Melandaha Upazila of Jamalpur District from the erosion of Old Brahmaputra River, Alaikhal and branch of Jamuna using Bamboo Bundling Structures.

Prevention of river bank erosion through bamboo banding structures is effective in small and medium river bank erosion-prone areas. 9 km of riverbank conservation work has been included in the DPP through bamboo banding at 8 places to protect the banks of the old Brahmaputra River and Jamuna branches of Islampur and Melandah Upazilas of Jamalpur district. The objectives of the project are the following:

- To protect various structures/wealth including houses, roads, markets, and croplands located in the project area by preventing the erosion of the old Brahmaputra River and Jamuna River in the Jamalpur district.
- To improve the socio-economic condition of the project area and protect the natural balance.
- To maintain river flow and main channel flow by increasing navigability.

The duration of the project is July 2022 to June 2024. The estimated cost of the project is 492.50 lac taka. Allocation of the budget in the 2022-2023 fiscal year is 100 lac taka. The work order of all the eight packages is awarded. Physical works have been ongoing for the last six months under careful observation. The progress of physical work up to now is 44% of the total works of the project while the financial progress is 19%.

Celebrated Tree Plantation Program 2023 in RRI

A tree plantation program 2023 is celebrated in RRI by all Officers and Staff of RRI. Mr. S M Abu Horayra, DG of RRI inaugurated of this program on 25 September, 2023 and different types of fruit, forest and medicinal trees have been planted in RRI campus. Mr. Horayra mentioned that tree plantation is one of the best activities for making the planet greener, livelier and healthier. He added that planted trees help our biodiversity, ensure the supply of oxygen for the next generations and provide us with various resources. Without trees, the existence of human life as well as other species on earth, is impossible. So, we should plant more and more trees.

Appointment as Director from Chief Scientific Officer (CSO)

Mr. Engr. Pintu Kanungoe, CSO and Mr. Engr. Kazi Rezaul Karim, CSO have been appointed as a Director through recently held 53rd BoG meeting of RRI. They started their career in RRI as Scientific Officer in 1990. Both of them graduated from Bangladesh University of Engineering and Technology (BUET). Mr. Pintu Kanungoe is renowned both physical and mathematical modeller and Mr. Kazi Rezaul karim is a dynamic Scientist who has implemented a number of development projects as well as research studies in his career. After a very successful career in RRI, they achieved this appointment (padayan). From RRI family they are welcome for achieving this dignity.

Engr. Pintu Kanungoe

Engr. Kazi Rezaul Karim

HISTOTY OF RIVER RESEARCH INSTITUTE, FARIDPUR

-Dr. Engr. Md. Alauddin Hossain

Today's River Research Institute (RRI), Faridpur was established by the Government of Bangladesh as a Statutory Public Authority under the Ministry of Water Resources (MoWR) by an ordinance (Act 53) in 1990. Actually, RRI's journey was started a long days ago and by the course of time, present RRI is situated at Harukandi, Faridpur, 140 km away from the capital city Dhaka. So, it has a long past history. RRI's journey was started in 1948 named as Hydraulic Research Laboratory (HRL) at Kuli Road (at present Green Road) of Tejkunipara Mouza in Dhaka city under Irrigation Directorate. Due to separation of the country from the British Government based on two-nation theory in August 14, 1947, the then River Research Institute of Kolkata established in 1943 under goes to West Bengal. In that context, the then Pakisthan Government felt to establish a laboratory for making scientific research on river and it's all matters. In that context HRL was established under Irrigation Directorate over an area of 12 acre land at Kuli road (at present Green Road), Dhaka in 1948 with the realization of necessity for conducting tests & research in a scientific manner. About 30 years i.e., up to1978, physical model studies for different hydraulic structures along with determination of physical and engineering properties of soil, sand, concrete, sediment, water quality were done in that laboratory in a small scale aiming to support the design work of different water resources development projects

Here it is noticed that after independence of the country in 1972, the facilities developed in the laboratory were not quite sufficient to accommodate ever-increasing tests & studies in the field of civil and hydraulic engineering. Father of the Nation Bangabandhu Sheikh Muzibur Rahman established Bangladesh Water Development Board (BWDB) from East Pakisthan Water and Power Development Authority (EPWAPDA) and took many projects related water resources development such as irrigation and drainage project, flood control project, river bank erosion project, river dredging and management project etc.. To make these projects sustainable and cost-effective, Bangabandhu took initiative a project "River Research Institute" in 1973 and approved it in ECNEC in July, 1975. After the death of Bangabandhu, implementation of that project was delayed. Following the decision, the then government merged HRL with RRI in 1978 and founded as River Research Institute (RRI) in 1979 at Harukandi, Faridpur. Its premises cover an area of about 39 ha. At the end of the RRI project works in Faridpur, RRI was shifted from Green Road, Dhaka to Faridpur in July, 1989. Later on, the government of Bangladesh approved RRI as a Statutory Public Authority by an ordinance of Act No. 53, July 1990 and had placed directly under the Ministry of Water Resources with a view to enhancing its activities and to lift up the standard of service in international level in the field of water resources engineering.

At a glance chronology of RRI as per following:

1948-1959-HRL, under Irrigation Directorate
1959-1978- HRL, under EPWAPDA following BWDB
1978-1990-RRI, under BWDB
1990-till-RRI, under Irrigation Water development and Flood control Ministry/Ministry of Water Resources (Statutory Public Authority by an ordinance 53 Act, 1990)