



Hon'ble State Minister and Deputy Minister, MoWR addressed the 53rd BoG meeting of RRI

RRI Newsletter

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Success and Achievement of RRI's Journey

-S M Abu Horayra, Director General, RRI



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 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. Before that 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. For this long time, RRI has successfully conducted about more than 200 physical model studies under different water resources development projects related to river bank erosion projects, irrigation and drainage development projects, communication system development projects and river restoration projects. The results of such studies are playing a vital role in providing information and recommendations regarding different water resources development plans and interventions.

The world is on the shores of the 4th Industrial 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

areas. To meet the new changes, the Government of the People's Republic of Bangladesh embarked in 2009 with the initiative '**Digital Bangladesh**' as the first implementation of the 4th Industrial Revolutions. As a part of that initiative, RRI had Started Mathematical Modelling in 2009 at the present Government time which is a Software based approach for the solution of many water resources engineering problems. Besides this, recently RRI has purchased modern and sophisticated equipment, machine and software which are a potent tool for achieving the objectives of the **4th Industrial Revolution (4IR)**. Presently, RRI has adopted hybrid-modelling approach by using physical and Mathematical modelling to improve the understanding of different water systems, which may lead to **SMART BANGLADESH** through safe, sustainable, efficient and cost effective solutions for engineering problems in water resources development.

In the past, many important physical model studies have been successfully conducted at RRI for town/infrastructure/agricultural land protection projects (from river bank erosion), irrigation and drainage system development projects (barrage or dam), communication development projects (bridge along with road/embankment), river dredging projects (to increase river capacity and to maintain river navigability as well as bypass flow to protect the specific area) and river restoration projects (dredging with structural measures). A few important physical model studies of that are summarized below which lead to **RRI's success and achievement**.

Name of Project	Year of completion	Name of Project	Year of completion
Padma Multipurpose Bridge Project	2013	Buriganga River Restoration Project	2019
Padma River Dredging Management Project	2019	3 rd Karnaphully bridge project	2006
Bangabandhu Multipurpose Bridge Project	2000	Gorai river restoration project	2001
Bangabandhu Railway Bridge Project	2018	Paksey roadway bridge project	1996
Pairst Bridge Project	2016	Silt trap model for Teesta barrage project	1994
Ganges Barrage Project	2013	Kaptai Hydro-electric Power Plant Project	1978

RRI's Initiative: Ensuring Access of Safe Drinking Water for the Local People

Access to clean and safe drinking water is a fundamental human right, essential for maintaining good health and well-being. Unfortunately, many areas of Bangladesh is still facing challenges in securing this vital resource "Safe drinking water". Like that Harukandi is a village on the western side of River Research Institute (RRI). There is a widespread problem of iron, arsenic and manganese contamination in the groundwater exists in the large scale around RRI. There is a lack of safe drinking water for the people living in these areas. This minor issue conceals a large danger to the community's health and welfare. To address this issue and to ensure that everyone in the community has access to safe drinking water, on behalf of RRI, S M Abu Horayra, Director General has taken necessary steps. The authority of RRI has invested in water purification system, storage facilities, and a well-organized distribution network to ensure a seamless supply chain of water to the local people. Through this initiative, the positive impact has been observed in the lives of the local residents. Families those previously struggled to access Safe drinking water, now they have a reliable source at their disposal. This not only improves their overall health but also enhance their quality of life. Local people including officials & employees of RRI at all levels have welcomed this nice initiative taken by RRI authority.



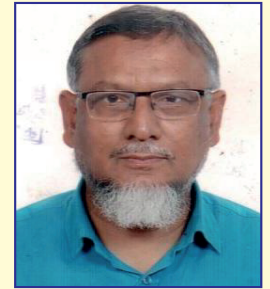
Farewell Ceremony



Mr. Md. Bakahid Husain, Deputy Secretary of the people's Republic of Bangladesh was given a farewell by RRI with a grand ceremony on 20th November, 2023. Mr. Husain is a cadre officer of 25th batch. It is noticed that, Mr. Husain had been deputed in RRI on 10th June 2021 as

Director (Admin & Finance). During his service in RRI, Mr. Husain was also responsible in charge of Director General from 15th August, 2022 to 24th November 2022. Mr. Husain is an honest and dynamic official of the Government of Bangladesh. He completed his B.S.S (Hons) and M.S.S (Sociology) from University of Dhaka. Recently he has been deputed to Faridpur Zila Parishad as Chief Executive Officer on 14th November 2023. In accordance, Mr. Husain was warmly greeted by the DG, RRI S M Abu Horayra along with RRI's professionals. On behalf of RRI family, we wish him good health, long life and all the success in future.

Engr. Kazi Rezaul Karim, Director of Geotechnical Research Directorate of the River Research Institute was given a farewell by RRI with a grand ceremony on 01st October, 2023. He was a dynamic Scientist who has implemented a number of



pilot project, capacity building project, development projects and research studies in his career along with Team leader and Project Director. Mr. Karim joined River Research Institute in December 1990 as Scientific Officer. In his academic career, he completed Bachelor's degree in Civil Engineering from Bangladesh University of Engineering and Technology (BUET). He completed also his Post Graduate Diploma (PGD) from Belgium. Mr. Karim was a longest serving professional and contributed a lot to RRI. After a very successful career, his post retirement leave (PRL) has been started from 02 October 2023. RRI family wish him good health, good time and all the success in the future.



Activities of RRI

There are some research projects, model studies and few development projects ongoing in RRI. In addition, few Memorandum of Understanding (MoU) are waiting with different relevant organizations or institutions. It is noticed that recently three research project proposals have been submitted to the Ministry of Water Resources (MoWR) for approval and few model studies proposals are in pipeline for providing

consultancy services to the design support of development plan and interventions in water sector. Recently, the model study “Physical Modelling Study for Feasibility Study for the Management of Karatoa River System and Rehabilitation of FCD Projects on Both Bank of Nagar River in Bogura District” has been completed at RRI.

Main Objectives of the Study were:

- Improvement of water retention capacity of Karatoa River system;
- Flood and erosion risk management of Karatoa River basin;
- Review and revisit the proposed interventions of “Karatoa River Improvement Project”;
- Rehabilitation of existing flood embankment, drainage and irrigation structures along Nagar River;
- Design of proposed interventions;
- Environmental and Social Impact Assessment;
- Preparation of DPP of the subsequent investment project.

The Study Outcomes were:

- The existing 3-vent Khulshi regulator is functioning as the inlet of flow into the Lower Karatoa river and due to relatively higher elevation (16.2mPWD) of its sill level flow of the Upper Karatoa river cannot enter into the Lower Karatoa river for 8 to 9 months of a year;
- In order to augment Lower Karatoa discharge a new regulator in the immediate downstream of the existing Khulshi regulator is needed;
- Maintenance dredging over 1 km stretch (starting from the off-take) of the Lower Karatoa is needed at an interval of two years to prevent progressive siltation of the dredged channel with time and consequent reduction in its conveyance capacity;

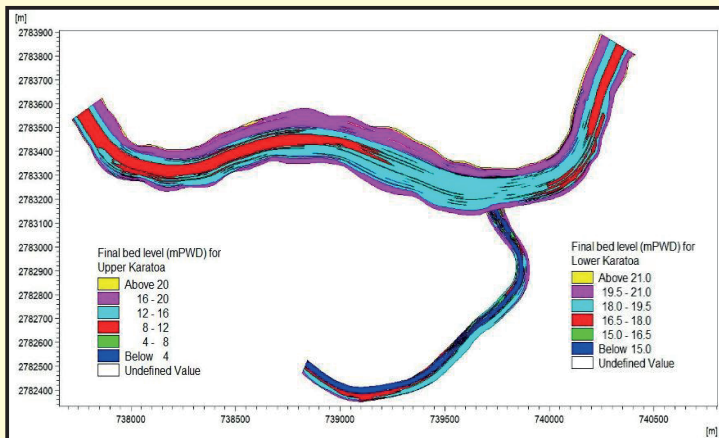


Figure (a) Final (after run) bed level in test T6 for design discharge

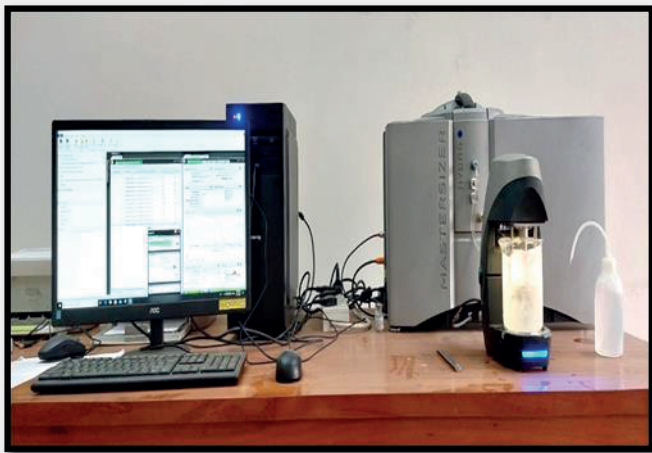
Figure (b) Flow condition at and around the regulators in test T7 for design discharge

Laboratory Equipment: Laser Diffraction Based Particle Size Analyzer with wet Dispersion Unit

Recently, River Research Institute (RRI) has purchased the Malvern Laser Diffraction Based Particle Size Analyzer (Brand– Malvern, Model- Mastersizer 3000, Country of Origin: UK) under the Institutional Development and Capacity Building (IDCB) Project (phase-II). It is a versatile and powerful tool for measuring the size of particles present in sediment and soil samples, which is mostly used in Geotechnical Research Directorate of RRI. Its non-invasive nature, speed, and accuracy make it an essential instrument for River Research Institute especially for research and study purposes. The instrument is also widely used for the environmental monitoring and research study to analyze the size distribution of particles in air, water, and soil samples. Engineers and designer can get better result of particle size required for engineering construction.

The Malvern Laser Diffraction Based Particle Size Analyzer is a cutting-edge instrument designed to

measure the size of the soil or sediment particles in a wide range (0.001mm to 3.5mm). It utilizes the principle of laser diffraction to determine accurately the size distribution of particles suspended in a liquid. The instrument operates by directing a focused laser beam through the sample, and the scattered light is collected and analyzed to determine the particle size. The intensity of the scattered light is measured at various angles, and this information is used to calculate the size distribution of the particles. The Malvern Laser Diffraction Based Particle Size Analyzer offers several advantages over traditional methods of particle size measurement. It provides rapid and accurate measurements, making it suitable for both research and industrial applications.



Event Outline (October-December 2023)

October 04, 2023: RRI monthly coordination meeting

November 01, 2023: RRI monthly coordination meeting

November 18, 2023: Discussion meeting with KUET regarding collaboration work

November 21, 2023: Second Steering Committee meeting of bamboo bandalling project

November 28, 2023: Discussion meeting with Celestial Technology regarding collaboration work

November 29, 2023: Meeting with research management committee of Ministry of Water Resources

December 06, 2023: RRI monthly coordination meeting

December 12, 2023: Meeting for promotion (Evaluation Committee 01).

December 18, 2023: Learning session: Role of artificial intelligence for building Smart Bangladesh

December 18, 2023: Preparatory discussion meeting with EcoSURV for signing MoU

National Victory Day, 2023 observed by River Research Institute

Bangladesh was born as an independent country on 16th December 1971, under the leadership of the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, at the cost of the supreme sacrifice of millions of martyrs. In this day in 1971 the Pakistan Army surrendered and the people of Bangladesh swept to victory after 9-month long war of liberation to achieve independence under the leadership of the father of the Nation. From declaring independence on 26 March 1971 till the victory won on 16 December, 3 million people sacrificed their lives for the sake of independence. Every year, the people of Bangladesh celebrates this Victory Day by recalling the sacrifices and triumphs of the 1971 independence warriors. Accordingly, River Research Institute, both Faridpur and Dhaka office observed 53rd National Victory Day following different programs with due

respect and solemnity on 16th December, 2023. S M Abu Horayra, Director General, RRI along with a number of professionals participated on the rally. After the rally Director General of RRI along with other officials paid respect by placing wreaths in front of a portrait of Bangabandhu Sheikh Mujibur Rahman. The discussion meeting at Faridpur Head Quarter and doa mahfil at Jame Masjid took place on 16th December after Johor prayer. The participants offered Sura Fateha and munajat seeking eternal peace for the departed souls of Freedom Fighter those were the greatest sons of Bangladesh. On this day, RRI is decorated with lights of different colors. Dhaka office placed the wreath at the National Memorial at Savar to pay humble respect to all Martyrs on Victory day.



RRI rally and wreaths are placed on the portrait of Bangabandhu at RRI Campus

Colorful light decoration at RRI on Victory day



Officers/Employees of Dhaka office to pay humble respect to all Martyrs on Victory day at National memorial, Savar along with Secretary, Mr. Nazmul Ahsan and Additional Secretary, Mr. Mallik Sayeed Mahub (right picture) of Ministry of Water Resources (MoWR), Government of the People's Republic of Bangladesh

Cleanliness Campaign in RRI: Milestone Initiative

Cleanliness is the part of human life. Considering it, the Director General of the River Research Institute has undertaken a significant initiative “Cleanliness Campaign in RRI Campus” followed by the monthly coordination meeting held in October, 2023. Such a program is a first and milestone example in the history of the RRI. This endeavor focuses on maintaining cleanliness within the premises of RRI. The DG, RRI, emphasized that visitors come to the institute for leisure in the morning and evening, often leave behind litter and debris, that contributing to the untidiness of the place. Therefore, he stressed the importance of maintaining a clean environment and urged everyone to be responsible for keeping our surroundings pristine. DG of RRI urged the active participation of all staff members and officers

in the Cleanliness Program. Responding to DG’s call, all the directorates of RRI have decided on a weekly cleanliness program in their respective areas and a monthly cleaning program on a large scale in the presence of DG on the next day of every coordination meeting. Accordingly, each directorate and RRI Rest-house are conducting regularly cleanliness program as a routine work in one specific day of each week. This marks a significant transformation in the RRI premises. The aim of this practice is to prevent the spread of germs and promote individual health and well-being and making the clean environment. RRI officials & employees at all levels including local people have welcomed this nice initiatives taken by RRI authority. Such programs may be followed by other Government and Non-government office.



Joining as a new Director

Mrs. Uma Saha, Principal Scientific Officer took over as a Director (In charge), Geotechnical Research Directorate (GRD) of RRI in October 2023. In her career life, Mrs. Saha joined in RRI in 1990 as a Scientific Officer. She completed her B.Sc.(Hons) and M.Sc.(Physics) from Jahangirnagar University in 1986 & 1987 respectively. She has also completed MBA in Management Information System from Prime University, Dhaka in 2009. She took participation on PGT program in The Netherlands, Malaysia and India. Her interest area of research is Soil mechanics and Soil physics. She has so many publications in National and International journals. Due to PRL of Engr. Kazi Rezaul Karim, Mrs. Uma Saha joined as a director (In charge) of GRD.



Importance of Geotechnical Investigation for River Bank Erosion and Flood Management

-Uma Saha, Director (In charge) & S M Abu Horayra, DG, RRI

Bangladesh has a complex river system where numerous rivers are playing vital role to create a giant network of the rivers. The major part of Bangladesh is on the delta formed by three major rivers Brahmaputra, Ganges and Meghna. The sediments carried by the huge discharges of these rivers have built a broad delta. These sediments are the major sources of formation of 80% soils of the country. The remaining 20% of soils have been formed in Tertiary and Quaternary sediments.

Flood in monsoon is very natural in Bangladesh every year and river bank failure is a common scenario in pre-monsoon, monsoon and post monsoon in all over the Bangladesh. Almost all low lying area is inundated due to flooding and destroys agriculture, homestead, livestock, environment, social bondage etc. which seriously

devastated livelihood of people and make poverty. Flood management and river bank protection are therefore, one of the prime necessities for poverty alleviation and national growth. It is concerned for engineers that river bank fails mainly due to hydraulic and geotechnical reasons. River bank fails depends on a number of factors predominating the geotechnical characteristics. The most of the bank erosion occurred during the monsoon due to hydraulic stress and during post monsoon (recession period) due to lack of confining lateral pressure. Devastative situation of the river bank erosion during pre-monsoon, monsoon and post monsoon have been shown in the following figures.



In this situation, it would be highly desired to take remedial measures for protecting homestead, agriculture, low lying area and river bank. As a protection measures for bank erosion and flood management, generally embankment, groyene, revetment, dam, dike, retaining wall, sluice gate, culvert and different hydraulic structures are built on the affected areas. As geotechnical failure is one of the main reasons for bank erosion, it is utmost important to analyze seepage, soil strata and its density, settlement, soil strength, slope stability of the river bank soil. These analyses are involved with geotechnical properties which is essential for the design of bank protection structures.

Recently it is observed that the rivers are silted up and char is being developed here and there in the rivers after monsoon and these areas are inundated and bank failure phenomena is occurring eventually. Adjacent people are opined that these are happening due to build up giant water control structures on the rivers and their effect. In a beneficiary sense, it is needed to build structures on the river and it is also needed to maintain rivers through river training, dredging and other maintaining techniques. Moreover, geotechnical investigation is needed for

dredging the river as bed and bank materials of the rivers are involved with slope, shape and composition of the river and its bank where dredging agitate the river as well as bank and side. However, dredging may possible without interruption through prior geotechnical investigation of bed and bank as well as geomorphology. Indeed, geotechnical investigation is needed before, during and after the construction of important water management structures.

Over the last few decades, a numbers of river bank are protected through many engineering ways. In this regard, it is often noticed that conventional designs are adapted to protect the river bank and there is lack of geotechnical investigations. Such protecting works are failed before the return period. As a result, government has to finance huge amount of money than required amount. So, appropriate measures should be adopted through geotechnical investigation with other engineering solutions for constructing any water control structures. This is an attempt to disseminate the messages to the relevant organizations about the necessity of geotechnical investigation for protecting the lives, land and sustainability of the infrastructures against the forces acting in the rivers.

Indoor and Outdoor Games

On the occasion of Victory Day 2023, Table Tennis and Inter-Directorate Volley Ball Tournament were held at River Research Institute. The Institute's dynamic Director General along with officers and staff joined the matches and Tournament enthusiastically. As a result after a long time a vibrant and spirited atmosphere created in RRI campus. All of officers and staff enjoyed a lot through this Tournament. Geotechnical Research Directorate becomes the Champion of the Volley Ball Tournament whereas Admin and Finance Directorate becomes the runner up. Beside this, badminton, football and cricket games is being held regularly at RRI campus with the inspiration of Director General of RRI.



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Discussion Meeting:

Recently Khulna University of Engineering and Technology (KUET), Celestial Technology (River survey and modelling technologies service provider) and EcoSURV visited the River Research Institute (RRI) respectively and held a discussion meeting separately in pursuit of Memorandum of Understanding (MoU) for collaboration work with RRI through research, survey and study.



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