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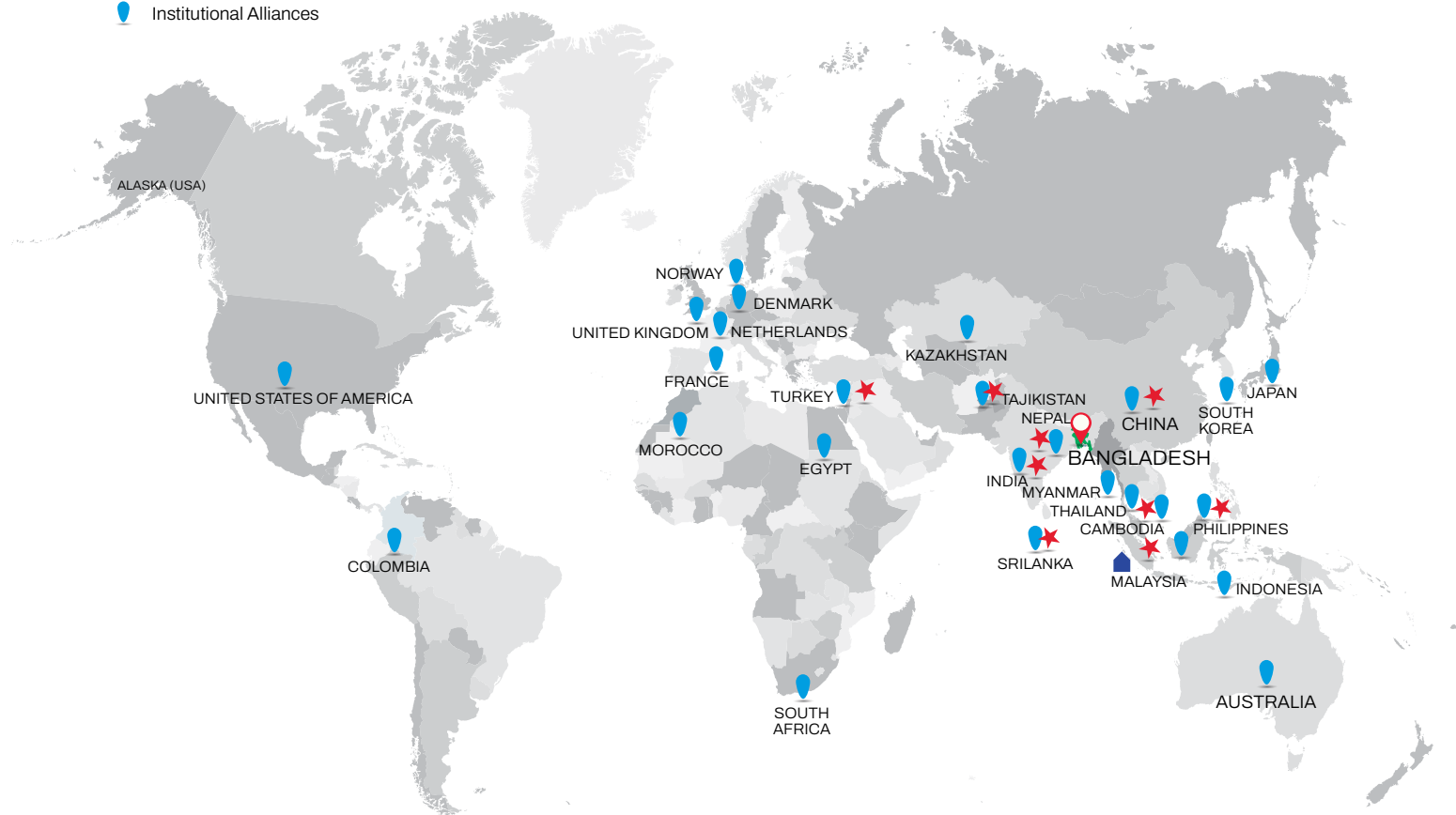
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-  Head Office
-  Regional Office
-  Geographical Working Experience
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IWM Global Work Experience and Alliances



Areas of IWM Services

- a) Integrated Water Resource Management (IWRM)
- b) Wetland and Lakes Management (WeLkM)
- c) Irrigation Management (IrriM)
- d) Ground Water Management (GWM)
- e) Urban Water Management (UWM)
- f) Water Supply & Sanitatrion
- g) Water Quality & Ecology (WQ&Ec)
- h) Fluvial Hydraulics and River Morphology (FHRM)
- i) River Engineering (RIEngg)
- j) Bridge Hydraulics
- k) Flood Management (FldM)
- l) Integrated Coastal Zone Management (ICZM)
- m) Coastal Hydraulics and Morphology (CHMor)
- n) Port and Coastal Structure Management (PCSM)
- o) Estuary and Marine System Management (EMSM)
- p) Offshore Structure and Pipelines (OfS&PI)
- q) Water Quality Investigation (WQI)
- r) Software Management and IT Solutions (SMIT)
- s) Geographic Information System and Remote Sensing (GIS&RS)
- t) Topographic, Hydrographic, Hydrometric Data Collection
- u) Environmental/Social Impact Assessment (ESIA/EIA)
- v) Any other relevant field

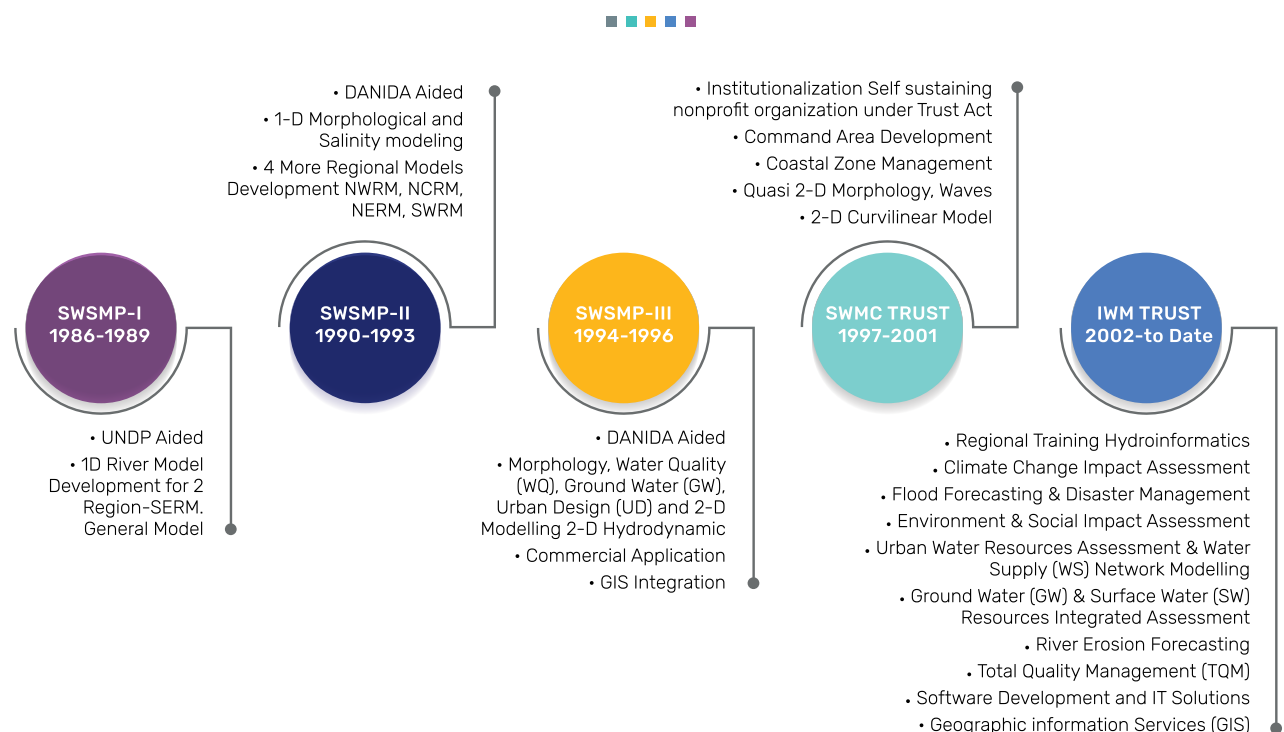
About IWM

IWM was established in December 1996 as a Trust through a Cabinet decision by the **Honourable Prime Minister Sheikh Hasina**. The geographical location of Bangladesh at the tail end of three great river basins has compelled it to develop high level analytical capabilities in the state-of-the-art mathematical water modelling to support its water resources management. To function as a Centre of Excellence and learning in the field of Computational Hydraulics, Water Modelling and Allied Sciences, IWM owes its genesis to the three phases of UNDP-DANIDA aided Surface Water Simulation Modelling Programme (SWSMP) carried out during 1986-1996.

IWM offers a wide range of specialist services in the fields of water resources planning and management as well as hydrometric measurements, hydrographic bathymetric & topographic surveys and monitoring, Environmental Impact Assessment (EIA) & Social Impact Assessment (SIA) and Detail Design.

IWM functions as a non-profit organisation on cost recovery basis.

Historical Development of IWM



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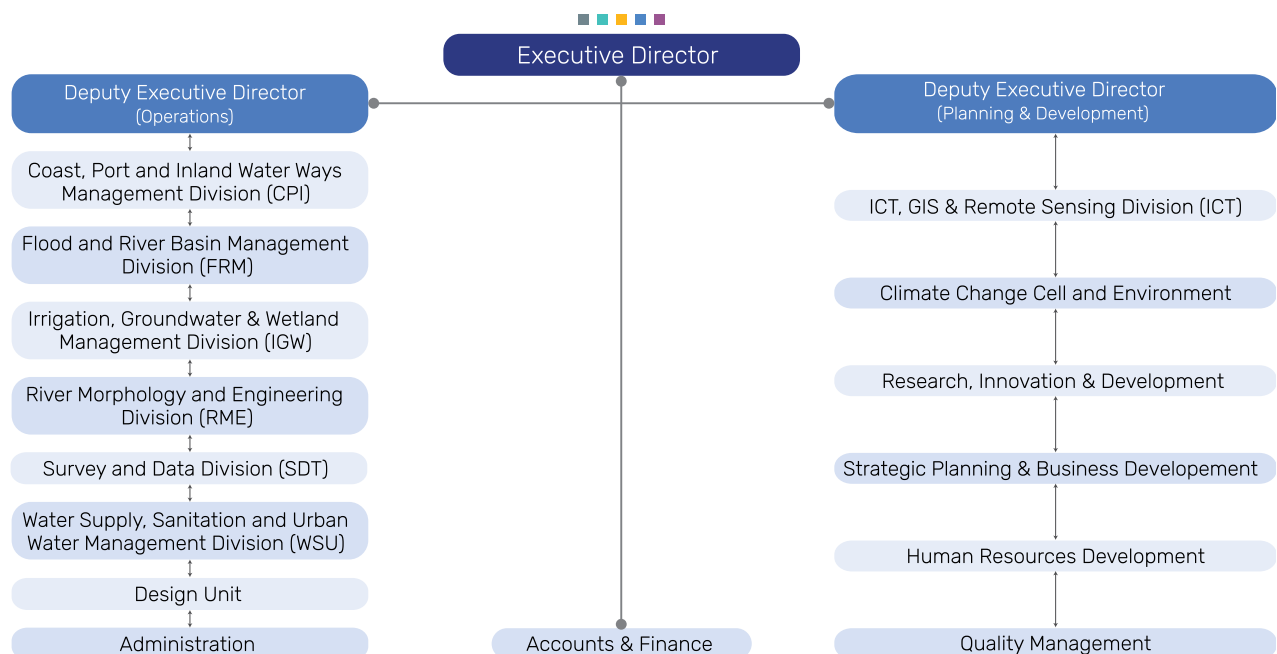


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Messages From CHAIRPERSON



Mr. Nazmul Ahsan

Secretary

Ministry of Water Resources
Government of the People's
Republic of Bangladesh

It is my pleasure to convey my best wishes to the Institute of Water Modelling (IWM) on the publication of its Annual Report 2021-22. As the chairperson of the Board of trustees, I have been observing with keen interest the activities and development of this organization from the day I took the charge of the Board. It has come a long way to establish itself as a Center of Excellence in Asia, dealing with the complex technology of mathematical modelling, computational hydraulics climate, environmental management and allied sciences and addressing in the field of integrated water resources management.

IWM was established in December 1996 as a Trust through a Cabinet decision chaired by the Honorable Prime Minister Sheikh Hasina. Since then, the Institute is contributing to the journey of Bangladesh towards a prosperous nation by delivering world-class solutions in water, environment and climate-related fields by efficient and effective planning, design and implementation of infrastructure projects of different ministries. They have the most sophisticated state-of-the-art survey equipment and skilled professionals to undertake any complex survey projects.

IWM has been addressing numerous water-related

problems not only in Bangladesh but also in other countries. I am happy to know that it is widely acknowledged that IWM's linkage with other educational and research institutions in the country and abroad has expanded in an exponential manner opening new frontiers of collaboration in South and East Asia, North America and Europe.

The long shadow of the COVID pandemic seems to be retreating, IWM strived to continue its advancement. Its dedicated workforce continued to support the organization by working in the office & in the field which kept the pace of development unhindered. Thus, IWM has successfully witnessed years of challenging growth in attaining great heights of accomplishment through dynamic business strategies, technological capabilities and better organizational strength.

As the Chairperson of the Trust, I would like to thank the members of the Board of Trustees of IWM for their generous contribution and continuous support over the years. I also extend my best wishes to the committed professionals of IWM for their untiring efforts in enhancing the image of the institution and country. I wish IWM a prosperous bright future.

Mr. Nazmul Ahsan

Secretary
Ministry of Water Resources
Government of the People's Republic of Bangladesh
& Chairperson, IWM Board of Trustees (BoT)

Messages From EXECUTIVE DIRECTOR



Md. Zahirul Haque Khan

Executive Director
Institute of Water Modelling (IWM)

It is my pleasure to introduce the Annual Report 2021-22 of Institute of Water Modelling (IWM) to our valued clients, partners and well-wishers. This report presents a consolidated picture of our services and operations in 2021-22.

The year 2021 was a year to turn around from challenges and disruption caused by the pandemic; while the organization is facing such an uphill struggle caused by post-Covid challenges and the recent global economic turmoil caused by the Russia-Ukraine war. Though we have been quite successful in dealing with the situation, yet challenges kept emerging with new forms and realities. I wish to take this opportunity to highly appreciate all staff of IWM for their dedicated and sincere efforts during the crisis who have shown their prudence and resilience. I also thank the Chairperson of IWM BOT and other Board members for their continued support and patronage in the advancement of IWM.

In 2021 a number of accomplishments are added to the success list, both in the national and international context. This year we have provided our services to around 39 different clients and the number of projects was about 82. Some of the notable achievements of IWM in 2021-22 are as follows. **Coast, Port & Inland Water Ways Management (CPI)** has been involved in several diversified projects in 2021-22. Some of them are Polder of the future, **BWDB**; Consultancy service for the development of Ferry Ghats at Sariakandi, Bogura and at Madarganj, Jamalpur for introducing ferry service between those places, **BIWTA**; Surface water hydrology study to select probable sites of Nuclear Power Plant in the Southern Part of Bangladesh for Bangladesh Atomic Energy Commission (**BAEC**) etc.

Flood & River Basin Management Division (FRM) has been involved in a few projects, Increased Flash Flood Forecast Coverage through Operational Forecast System, **BWDB**; Management Support to the Mathematical Modelling Centre (MMC) for Water Resources Research & Development under the Water Resources Department, **Government of Bihar, India**; Detailed Feasibility Study for Flood Control, Drainage, Irrigation and Dredging of Bakkhali River in Cox's Bazar District (Phase-1), **BWDB**;

ICT, GIS & Remote Sensing Division (ICT) is involved in several projects such as Mouza & Plot Based National Digital Land Zoning Project, **Ministry of Land**; Development of Upazila Land Suitability Assessment and Crop Zoning System of Bangladesh, **BARC**; Developing Site Specific Planning with Index Maps for Bangladesh Forest Department (**DoF**), etc.

Irrigation, Groundwater & Wetland Management Division (IGW) completed the projects on Comprehensive Feasibility Study for Sustainable Restoration and Protection of Wetlands (Haor, baor, beel, and connected rivers etc.) in different Hydrological Regions of Bangladesh, **DBHWD**; Supporting WARPO in Operationalizing IWRM in Barind area as per the Bangladesh Water Rules, etc.

River Morphology & Engineering Division (RME) was involved in many projects during 2021-22, some notable projects are: Morphological Study of Different River Crossing (Padma River for one line and Jamuna River for two lines) for Infrastructure Development for Power Evacuation Facilities of Rooppur Nuclear Power Plant, **PGCB**; Monitoring of Hydraulic & Morphological Conditions of the Jamuna River for the safety of the River Training Works of the Bangabandhu Bridge during the year 2018 to 2022 (Five Years), **BBA**; Hydrological/Morphological Survey and Modelling for Proposed Bangabandhu Rail Bridge, **Bangladesh Railway** etc.

Survey and Data Division (SDT) always plays a significant role in IWM. The survey and data acquisition capacity of IWM has greatly enhanced by the acquisition of advanced equipment like Multi-beam eco-sounders with motion sensors, 3D Terrestrial Laser Scanners, UAV (Drone), ADCP Profiler, Survey vessels etc. in line with current practice worldwide. IWM also enhanced the capacity of its environmental and sediment labs.

Water Supply, Sanitation and Urban Water Management Division (WSU) provided expert services for feasibility study of Water Supply system development project in Naf & Sabrang Economic Zone, **BEZA**; Updating of Environmental & Social Impact Assessment and Preparing a Resettlement Action Plan of BSEZ, **Japanese Economic Zone**; Water Network Analysis and Optimization of Chattogram City Water Supply System – Study, Design and Construction Supervision under Chattogram Water Supply Improvement & Sanitation Project (CWSISP), **CWASA**; etc.

In addition to MIKE ECO Lab, IWM acquired noise and air quality modeling systems that are now being routinely used in environmental assessment. IWM has been working with climate projections and scenarios for different projects in collaboration with government and international organizations. One of them is Understanding the Sea Level Rise Dynamics along Bangladesh Coast funded by **UK Met**.

IWM must keep and continue all those transformations and momentum that we have achieved, but most importantly we need to upgrade our services in this changing environment. The next story of transformation should be around how we can go for innovation, up-gradation, value addition, diversification and nature based solutions. All these initiatives will help a lot to disseminate the knowledge on water, environment and climate to different stakeholders of the national and international arena.



Md. Zahirul Haque Khan

Executive Director
Institute of Water Modelling (IWM)

IWM Success 2021-22: At a glance

We are steadily growing to provide sustainable solutions to the water sector of not only in Bangladesh but also in the neighbouring countries. Since its inception in 1986, IWM has been continuing to thrive in an extraordinary manner and is growing day by day. In 2021, IWM took several challenging projects of great national interest and experienced a steady growth. We have provided our services in 82 projects and to 39 clients. Maintaining our strong pursuit in modelling, we are exploring some relevant sectors to meet the pressing demand of our valuable clients. Services of IWM were requested from different international agencies from various countries and thus IWM is getting recognition at a global scale.

IWM Major Completed and Ongoing Projects in 2021-22

- Management Support to the Mathematical Modelling Centre (MMC) for Water Resources Research & Development under Water Resources Department, **Government of Bihar, India**
- Long Term Monitoring, Research and Analysis of Bangladesh Coastal Zone, **Bangladesh Water Development Board (BWDB)**
- Supervision and Monitoring the Performance of Dredging, Morphological and Environmental Impacts, Detailed Design and Assessment of Effectiveness of Dredging, **Bangladesh Inland Water Transport Authority (BIWTA)**
- Joint Cooperation Programme for Bangladesh, **DELTA RES**
- Detailed Hydrological and Morphological Survey and Study for Matarbari Port Development Project (RHD Component), **Orion, DDC & BCL Consortium**
- Comprehensive Feasibility Study for Sustainable Restoration and Protection of Wetlands (Haor, baor, beel, and connected rivers etc.) in different Hydrological Regions of Bangladesh, **Department of Bangladesh Haor and Wetlands Development (DBHWD)**
- Study for Hydrological Investigation & Modelling of the State of Surface Water and Groundwater Resources in the High Barind Region, **Water Resources Planning Organization (WARPO)**
- Understanding the Sea Level Rise Dynamics of Bangladesh along the Coast, **Danish Hydraulic Institute (DHI)**
- 3 New Rail Line, and a New Rail Bridge over the Teesta River Hydro-morphological Study, **Bangladesh Railway (BR)**
- Hydrological & Morphological Survey and 2D Hydrodynamic and Morphological Modelling for Construction of Bangabandhu Sheikh Mujib Railway Bridge, **Bangladesh Railway (BR)**
- Sewerage master plan and detail design of priority works in Sylhet City, **Sylhet City Corporation (SCC)**
- Plan Design & Supervision of Maritime University BSMRMU, **Bangabandhu Sheikh Mujibur Rahman Maritime University (BSMRMU)**
- Emergency Multi-sector Rohingya Crisis Response Project (EMCRP), **Department of Public Health Engineering (DPHE)**
- Independent engineer services for the development of water distribution and supply facilities at Purbachal new town project through public private partnership, **RAJUK**
- Master Plan on Meghna River Pollution Control, Navigability Increase and Ensuring Riverbank Stability, **Dhaka Water Supply & Sewerage Authority (DWASA)**
- Design Review and Construction Supervision of Mirersharai WTP, **Bangladesh Economic Zones Authority (BEZA)**
- Gazipur City Corporation - 2nd Phase, **Gazipur City Corporation (GCC)**
- Implementation support service to BWDB Taskforce during 2021-22, **Bangladesh Water Development Board (BWDB)**
- Site Specific Plan (SSP) and ODK Development for SUFAL Project, **Department of Forest (DoF)**
- Char Development and Settlement Project Phase V (CDSP V), **Bangladesh Water Development Board (BWDB)**
- Updating Feasibility Study for Kurigram Irrigation Project (North and South Unit), **Bangladesh Water Development Board (BWDB)**
- Mathematical Modelling Study for Rehabilitation of Barisal Irrigation Project (BIP), **Bangladesh Water Development Board (BWDB)**
- Mathematical modeling study for sustainable management of the Gorai River basin including offtake, **Bangladesh Water Development Board (BWDB)**
- Feasibility Study and Detail Design for Construction of Large Bridges on upazilla, Union & Village Road Project (FSB)-LBSP-2, **Local Government Engineering Department (LGED)**

**COAST, PORT &
INLAND WATERWAYS
MANAGEMENT
DIVISION (CPI)**



Feasibility Study for Protection and Development of Cox's Bazar Sea Beach

Cox's Bazar is one of the most attractive tourist destinations in Bangladesh. Cox's Bazar is known for its 125 km of the unbroken seashore, believed to be the world's longest natural sandy sea beach. Every year, thousands of local and foreign tourists flock to this long, sandy beach to witness the scenic beauty of the blue waters. Many international quality hotels, motels, and restaurants have been built along the seashore to provide their services. Due to ongoing erosion at various places along the seashore, the scenic tourist area built along the seashore of Cox's Bazar has become vulnerable. Some of the structures have already disappeared due to the ongoing erosion of the seashore and wave erosion over the last few years. Recent erosion includes the area from Labani Point to Diabetic's Point and areas prone to erosion from Bailey Hatchery to Kalatali. If the erosion process continues, a large area developed as a modern tourism industry is likely to be damaged in the next few years.

The main objective of the study is to investigate the coastal erosion processes along the Cox's Bazar sea-beach, revisiting the existing erosion protection measures and devising immediate and long-term erosion mitigation measures considering technical, environmental, and social aspects to safeguard the coastline and develop the beach as a world-class tourist spot.

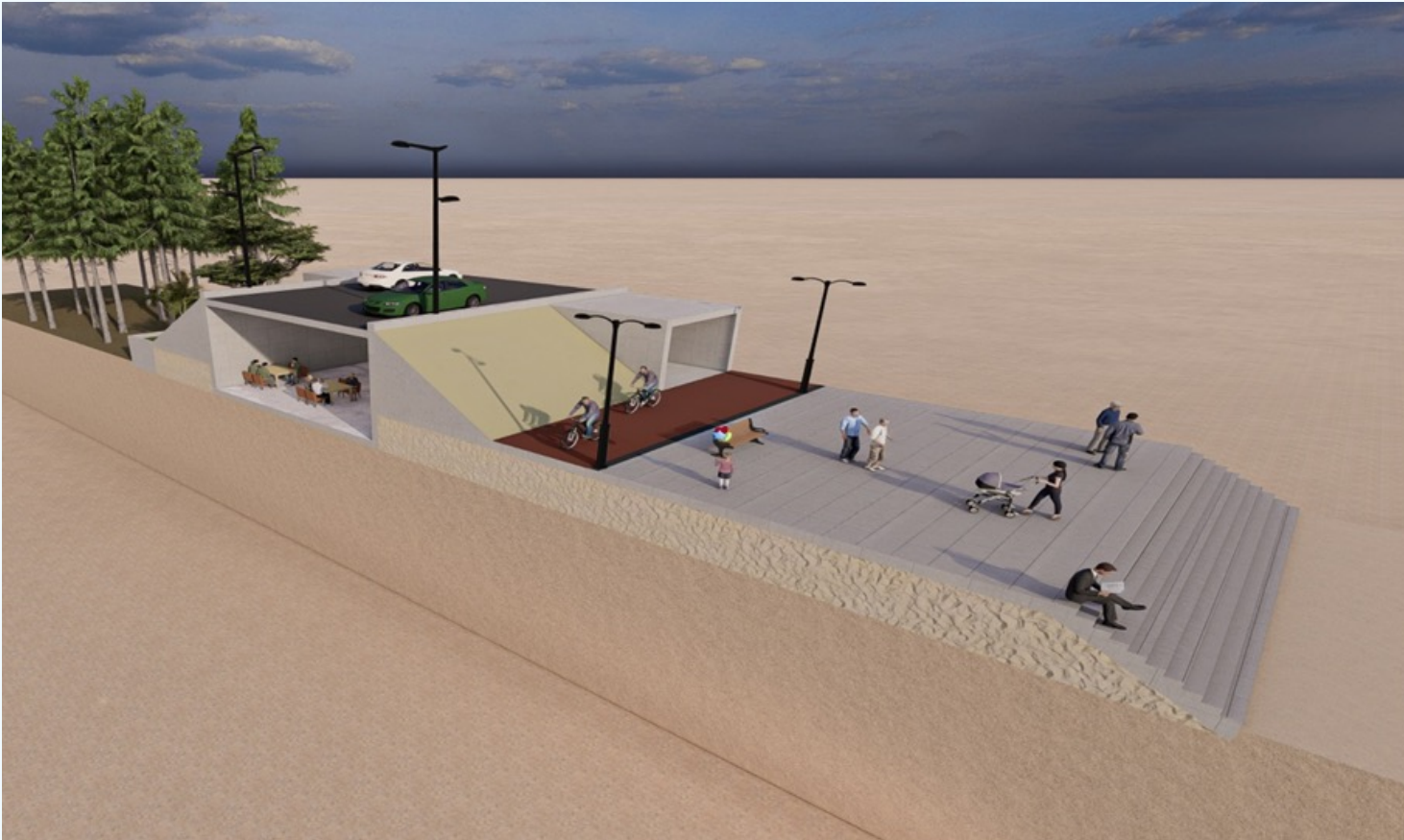
Under this study, extensive work was carried out to finalise the design parameters using surveyed data and different model results. The erosion vulnerability of the study area was assessed considering the severity of erosion in the past, present, and future, longshore sediment transport characteristics, wave dynamics, and places of importance based on model results, field visits, satellite image analysis, and consultation with various stakeholders. Two locations were found as vulnerable to erosion, among which Baily Hatchery to Kolatali Point



Recent Erosion: Labani Point to Diabetic's Point



Erosion Vulnerable: Bailey Hatchery to Kalatali



Proposed multifunctional dyke and it's different functionalities

and Laboni Point to Diabetics Point were identified as the most vulnerable locations.

Several potential erosion protection measures such as breakwaters, revetment, beach nourishment, and groynes were considered and analysed to select the best suited nature-based protective measures in the perspective of a long-term solution. The revetment with sand cover (sleeping defense) was finally selected as the erosion mitigation measure, which is a nature-based solution with less environmental and social impact.

For future beach development, the existing condition of beach facilities was assessed and found to have a few deficiencies, which are the main barriers for the tourist attractions. Finally, eight development components Multifunctional Dyke, Bus Parking, Cycle Bay, Walking Bay, Lifeguard Station, Outside Restaurant Facilities, Space for Exhibition and Aquarium were also proposed. These will turn the beach area into a world-class tourist spot.



Present Situation: Bailey Hatchery to Kalatali



Proposed Plan: Bailey Hatchery to Kalatali

Polder of the Future

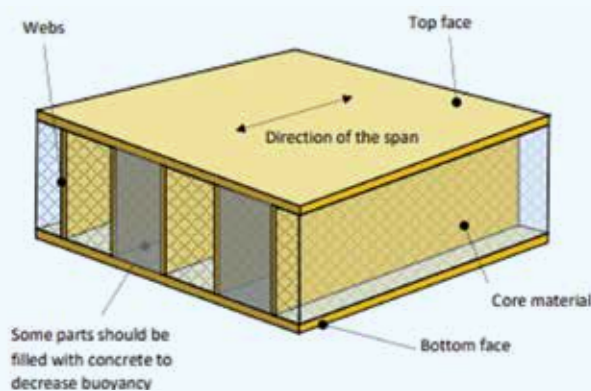
Polders in the Southern part of the country were constructed four decades ago with regulators to protect the area from tidal flooding and salinity intrusion and to enable drainage by gravity in case excess water accumulates inside the polder to improve agriculture and livelihood opportunities. However, the impacts of climate change are deteriorating the polder drainage condition as more intense precipitation and sea level rise are occurring. Increasing the size of the regulator gate is a good option for drainage improvement which is not possible at present. Manual operation and heavy weight of mild steel gate is the main constraint for increasing the gate size. Present study planned for the improved polder drainage system considering the climate change impacts. This study also identified potential alternative materials for the construction of regulator gates in place of mild steel.

Polder-40/1 situated at Patharghata upazila under Barguna district of Barishal division is selected in this study considering its multiple degrees of vulnerabilities, risks, and opportunities. Detailed hydrological and hydrodynamic model has been developed using MIKE software package to simulate different hydrological and climatic scenario and to assess the effectiveness of different drainage improvement interventions. Study shows that the present inundated area i.e. 31.2% will be increased to 52.95% in 2050 and to 95.25% in 2100 due to climate change impact. However, re-modelling of the regulators and excavation of drainage khals can reduce the inundation area to 17.85% in 2050. Thus, the present gravitational drainage system is adequate to mitigate the adverse impact of climate change up to 2050 due to excavation/dredging of drainage khals and peripheral rivers and re-modelling of the drainage structures. After 2050, gravity drainage may not work effectively anymore, and pump drainage system would be required.

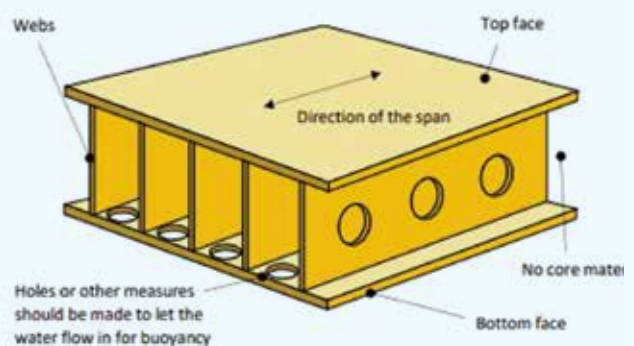


One of the major components of this study is about innovations of the material of regulator gate as MS gate is heavy and corrosive to saline environment. However, Fibre Reinforced Polymer (FRP) can be a good alternative which is anti-corrosive and lightweight. Innovation in regulator gates using FRP in place of MS and increasing the vent size has a significant impact on drainage improvement. At present, the typical gate height is 1.8m. However, this study shows that the increase of gate height to 2.2m can reduce the inundation of Polder-40/1 to 38% from 52.95% in 2050.

The larger composite gates and the improved regulator management will reduce the velocity during part of the period the gates are open. Hence the window of opportunity for the fishes to cross the regulator will be larger and more fishes will be able to swim from the river to the khal and vice versa. The extent to which the migration of fish will be enhanced by the composite gate and regulator management can be partly computed based on the velocity during the entire opening of the regulator.



Design principle with sandwichpanel



Design principle open structure (picture is only a sketch to show the principle and not detailed for the gates)

Flood & River Basin Management Division (FRM)

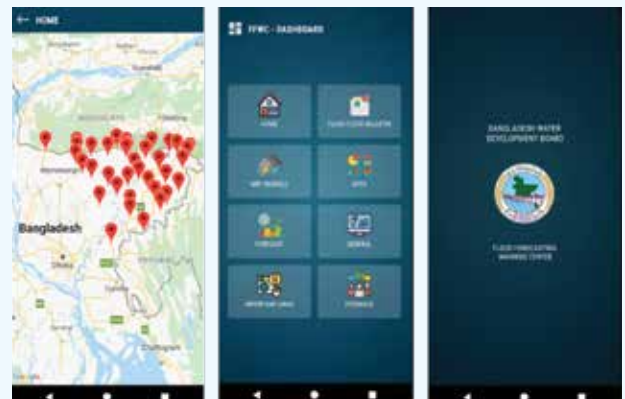


Increased Flash Flood Forecast Coverage through Operational Forecast System



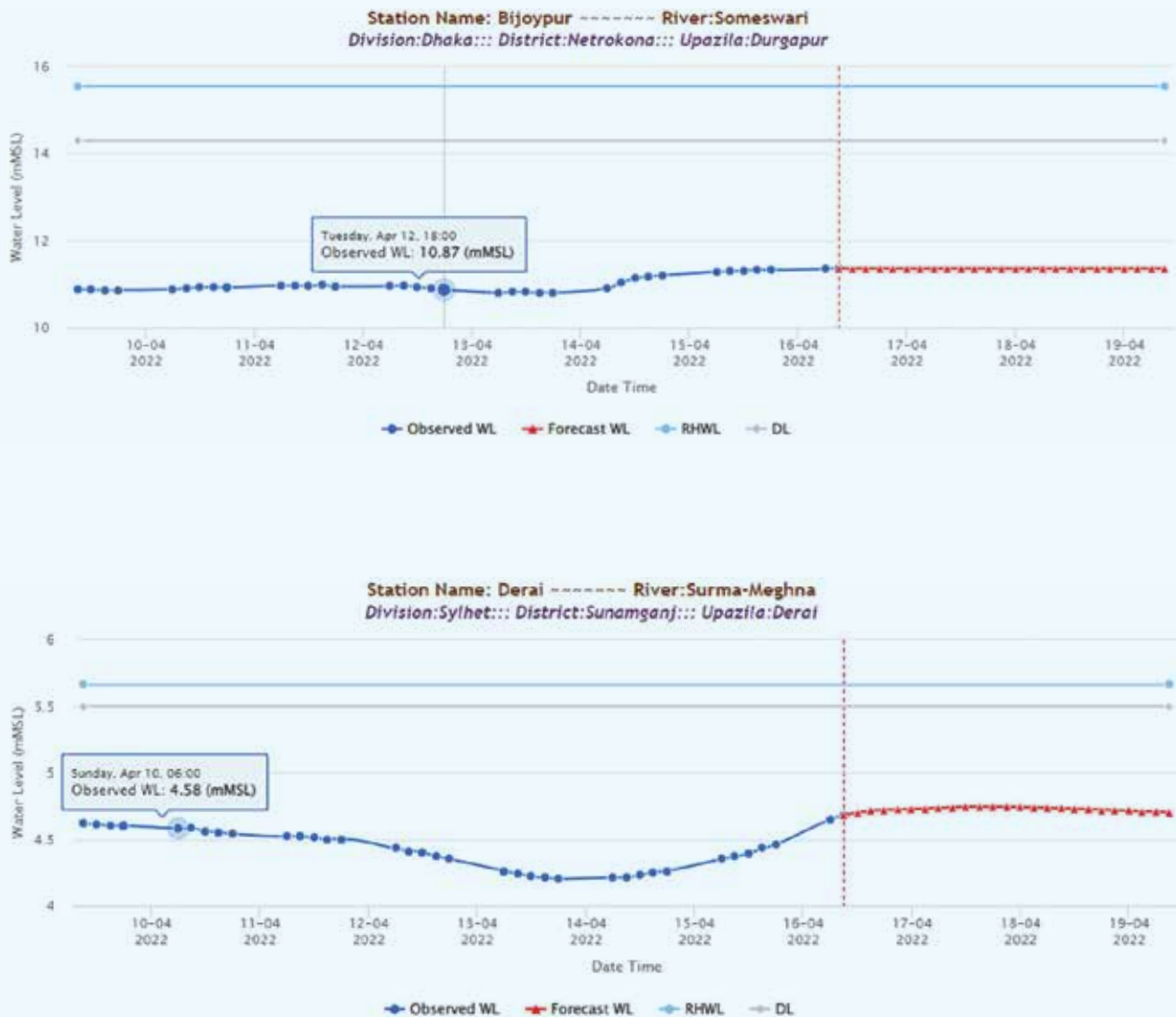
Flood Forecasting and Warning Centre (FFWC), BWDB with technical assistance from the Institute of Water Modelling (IWM) has successfully developed an operational flash flood forecasting and warning system during 2016-19 and further expanded to new areas during 2021-22 supported by Local Government Engineering Department (LGED) and funded by International Fund for Agriculture Development (IFAD) (IWM 2019). The overall objective of the study is to update the developed flash flood forecasting system and carry out further improvements of the warning dissemination system. A total of 12 forecast stations have been incorporated into the system under this study and the Flash Flood Forecast stations have been increased up to 37 nos.

Three separate modules of one-dimensional mathematical modelling tool of DHI, Denmark have been utilized in this study. The modules are Rainfall-Runoff (MIKE11 NAM) for hydrological modelling, One-dimensional River Model (MIKE 11 HD) for hydraulic



Dashboard of Flash Flood Forecast Coverage from BWDB website

modelling of the North-East Region, Bangladesh and Barak Basin, India coupled with the flood forecast module (MIKE 11 FF) for flood forecasting. The hydrodynamic model has been updated through



incorporating recent cross-sections data collected from BWDB. The Flash Flood Forecast model has been re-calibrated for 2021 flash flood event and validated for 2019 and 2020. After satisfactory calibration and validation, this flash flood forecast model has been made operational to forecast 2022 flash flood event. The major outputs of this forecasting system has been kept same, and they are station-wise forecast hydrographs, observed bulletins, forecast bulletins and summary bulletins in both Bangla and English version produced on daily basis. Also, Quantitative Precipitation Forecast (QPF), pre-monsoon flood inundation maps and embankment-based forecast are other major outputs of this study.

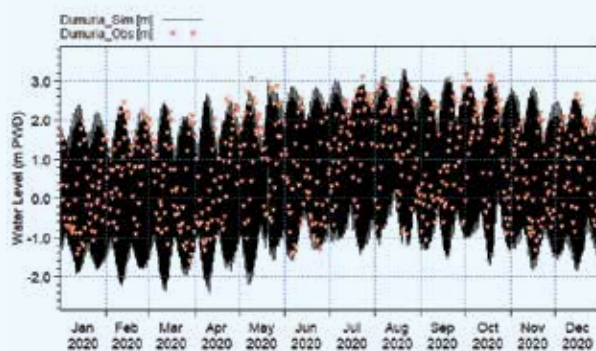
All the forecast products are being successfully uploaded and disseminated through a dedicated website developed under this study and hosted in FFWC main webpage as a link. One can access the webpage and can explore by visiting the following address link <http://ffwc.bwdb.gov.bd/> and then to <http://ffwc.bwdb.gov.bd/flashflood/>. The new forecast stations have been incorporated into this system and made operational in this extension period. Also, an enhanced mobile app has been prepared to ease the warning dissemination through this app and can be accessed through the google play store.



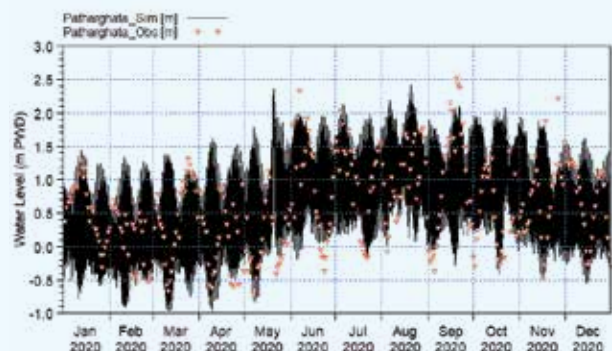
Coastal Polder Based Cyclone Surge Induced Flood Forecast System

The coastal region experiences possibly the most severe consequences of flood intensified by storm/ tidal surges. Thus, along with country-wide generalized flood forecasting, more specific polder wise flood forecasting in the coastal area has been piloted in this study to provide forecast warning effectively to the coastal vulnerable community. Bangladesh Meteorological Department provides real-time weather forecast for the whole country including cyclone surge predictions. But the end users i.e., the affected people

of remote areas having very limited forecast information on upcoming cyclone induced flood conditions, face major damages. With the recent development of mathematical modelling, computer technology along with telecommunication development, an operational web-based cyclone surge induced flood forecasting system have been developed to generate local level flood forecasting information for the selected pilot polders and accordingly disseminate them to the community level.



Water Level at Dumuria on the Bhadra River



Water Level at Patharghata on the Bishkhali River

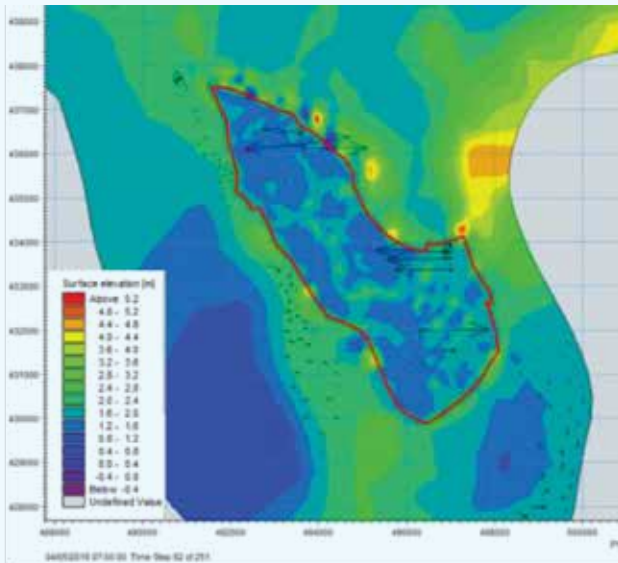
Overall objective of the study is to develop web-based cyclone surge induced inundation monitoring & local level flood forecasting system for selected polders in coastal regions of Bangladesh. Based on the objectives set in the study, a detailed model application of one-dimensional, two-dimensional, and 1D-2D couple modelling approaches have been adopted. Two different sub-models for the selected coastal polders namely polder 29 of Dumuria, Khulna and polder 40/1 of Patharghata and Barguna have been developed, calibrated, and validated. The models were then applied to generate cyclonic surge height with the help of BMD, provided surge model outputs and model generated regular tides for the cyclonic event of 'Fani' in May 2019.

The models have been applied for scenario simulation for two specific conditions, one, with a) polder breach condition and another with b) a green belt approach or afforestation condition on the vulnerable sides of

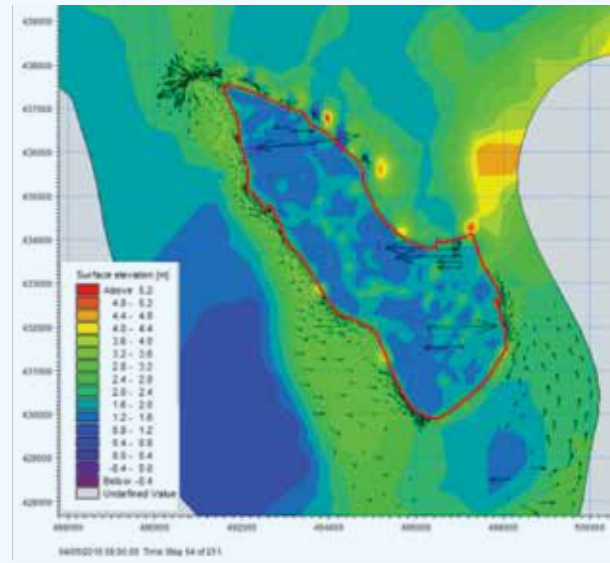
the polders. As Polder 40/1 is sea-facing and most vulnerable to any cyclonic event, these simulations scenarios have been prepared for Polder 40/1. Also, real-time water level monitoring system for the coastal regions of Bangladesh have been developed for FFWC to monitor the significant stations' conditions in real-time manner before and during a cyclone approaching Bangladesh's coastline which will add values to the services provided by FFWC.

The monitoring system and pilot polder-based embankment system has been prepared on web platform and a separate web-based inundation monitoring system has been developed in this study.

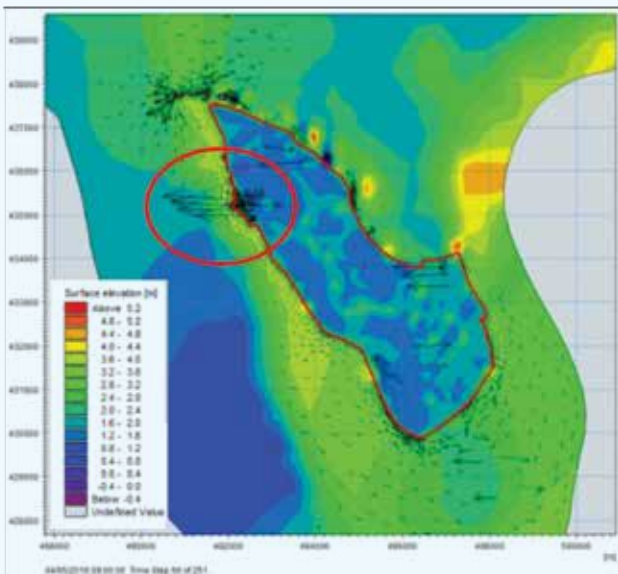
The methodology applied in this study needs to pilot at larger polders to check its applicability and effectiveness in vulnerable coastal polders.



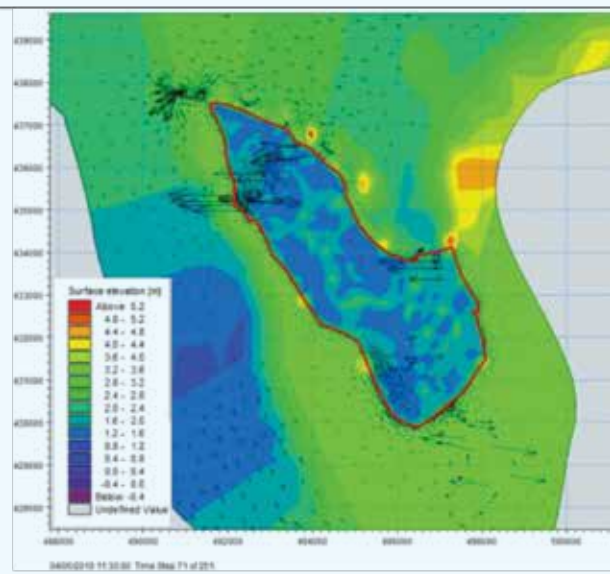
Water surface of Polder 40/1 before storm surge



Embankment resist the entrance of the water inside the Polder 40/1



Water started to overtop embankment of Polder 40/1



Propagation of Water inside Polder 40/1

ICT, GIS & Remote Sensing Division (ICT)





Field level verification of developed Khamari App and discussion with farmers

Development of Upazila Land Suitability Assessment and Crop Zoning System of Bangladesh

Bangladesh Agricultural Research Council (BARC) under the Ministry of Agriculture has been conducting a research project from June 2017 to January 2025 entitled 'Development of Upazila Land Suitability Assessment and Crop Zoning System of Bangladesh' funded by 'Krishi Gobeshona Foundation (KGF)'. IWM is a partner organisation in this study having the responsibilities of GIS and ICT Solution development. Another partner SRDI is providing data on soil resources.

The objective of the project is to provide crop suitability information to different stakeholders including farmers on the choice of rotation of their crops that ensure the increase of food production and maximizes the farmer's income.

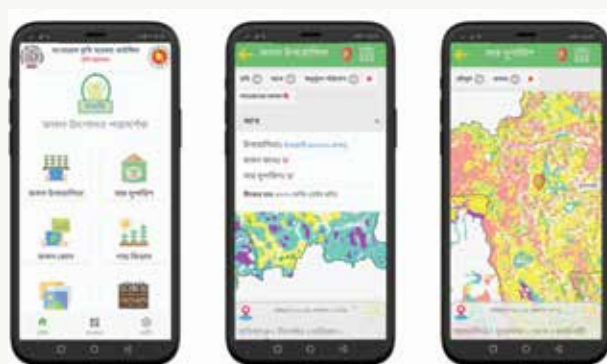
The major activities accomplished by IWM are outlined below:

- Development of an online GIS based software for cropland suitability assessment
- Development of a web based Agri-Advisory Portal, an ICT enabled bi-lingual platform for demand-driven technology information and advisory services in agriculture
- Development of a mobile app titled 'Khamari' specially for farmers

The 'Khamari' mobile app, is mainly focused on providing scientific guidance for best cropping. Through this app, the agricultural manager or officer will be able to know union-based Suitable Crop list, Profitable Crop

list and Fertilizer Recommendations. The farmers will be able to get this information on their farmland (by GPS location) from his smartphone. Crop Suitability is analysed based on nine edaphic parameters and four agri-climatic parameters. Fertilizer Recommendation is calculated based on soil nutrient values and fertilizer recommendation guidelines. Profitable Crops are calculated based on suitability and crop economic data.

Recently The 'Khamari' app was presented to the relevant parliamentary committee where it was appreciated and recommended for its further development and implementation. Hopefully, this app will make revolutionary changes in the field of agriculture in Bangladesh. The app is available at Google Play Store.



Home Screen, Crop Suitability and Fertilizer Recommendation Screen of Khamari App



Home page of the proposed application

Mouza & Plot Based National Digital Land Zoning Project

Day by day, the usage of agricultural lands has been increasing for different purposes with the increase of population in Bangladesh. Agricultural lands are converted into different forms (e.g., roads, rail lines, ports, etc.) for like transport and communication, housing, urbanization, establishing commercial units, industrial/economic zones, educational institutions, and other various infrastructures. Due to this rapid conversion, the country's agricultural land has been steadily declining. This is one of the major concerned areas for the GoB and for this, the Government is determined to protect the agricultural land as well as ensure a planned, efficient, and optimal usage of the land. Under these circumstances, the Ministry of Land has formulated the 'National Land Use Policy 2001.' According to it, lands have been divided into different zones throughout the country. The Government has formulated the draft law on 'Protection of Agricultural Land and Land Use Act 2010' which emphasized on the 'Land zoning for all the lands'. The agricultural land protection should base on the mouzas and plots. Considering all these challenges, Government's priority, policy and citizens' expectations, the Government has taken the 'Mouza and Plot Based National Digital Land Zoning Project.' Under this project the 'Development of Web Application for GIS Database Management & Visualization' has been planned. It will be designed as part of the implementation of the project. [Ref.: Package 09: SD5/2021-2022/Web-mapping, Land Ministry.]

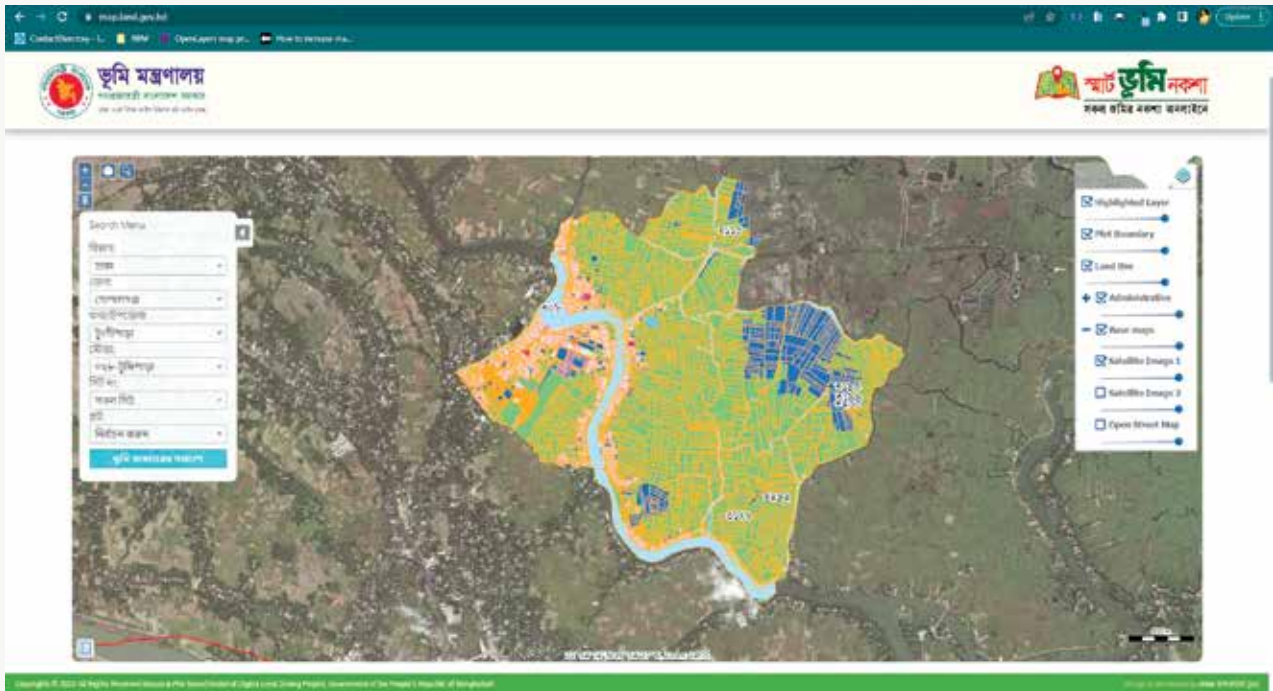
Project Objective:

- Develop a web-based platform based on the systematic storing all the mauza maps and imagery
- Prepare mauza and plot based spatial database for the management and visualisation through the web platform
- Establish linkage among the datasets of the spatial database
- Generate analytical and statistical reports based on the land usage and zoning information
- Enable users to have an overview of land zoning and mauza and plot-based land
- Develop a user friendly and easily accessible web-based platform

The project authority has engaged IWM for digitisation of Mouza Map of Dhaka and Barisal Division, and Development of Web Application for GIS Database Management and Its Visualization.

IWM will provide the services of Development of Web-based GIS Application Software for planned, efficient and best use of land by its categories in Bangladesh. The following are the broad of scopes:

- Web-based platform for systematic storing of all digital mauza maps in vectorised and imagery formats along with the satellite images

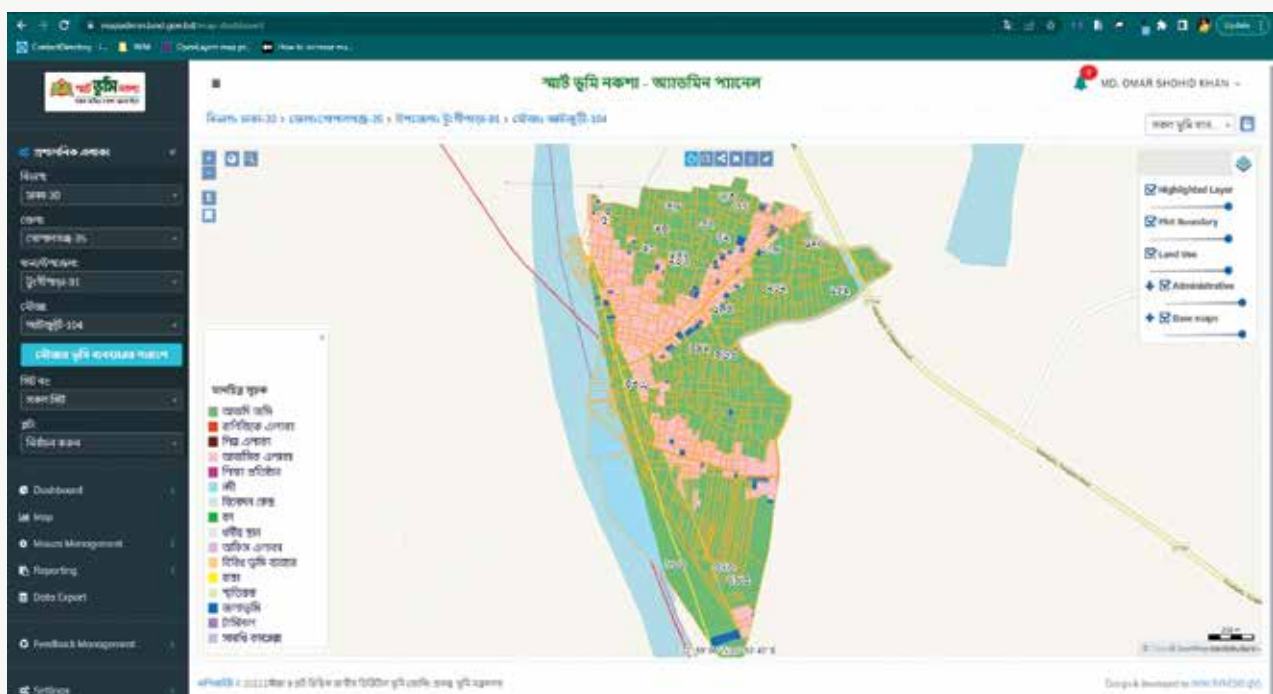


Base map and Layer Change Option

- Graded colour and plot levels, including names and numbers
- Generate a series of reports along with thematic maps to visualise the extracted summary results from the mouza database
- Facilities for viewing, editing, removing, uploading, and querying different kinds of spatial and non-spatial

data, as well as the generation of reports utilizing a spatial database and a geo separate window for the map, database, chart, and graph

- API services sharing data to Digital Record Room, E-mutation and LdTax platforms etc.
- Provide training to the land administrative officers and users at Land Ministry



Division, District, Upazila, Mouza, Sheet and Plot Selection with Advance Filter Option

Irrigation, Groundwater & Wetland Management Division (IGW)



Feasibility study for the enhancement of agricultural production through surface water management and utilization in Sylhet Division

Bangladesh Agricultural Development Corporation (BADC) has been pioneering in utilisation, expansion, and development of minor irrigation activities throughout the country for over five decades and has mastered experience in relevant fields. BADC has undertaken several projects to store and manage surface water. Most of the projects explored the scope of assessment of existing water management status and command area development (CAD) for increasing irrigated area and crop production by utilising surface water available in the re-excavated khals pumped through LLPs. Institute of Water Modelling (IWM) has been assigned to carry out a feasibility study for incremental agricultural production using surface water in Sylhet division through a contract agreement. The study area is spread over 40 upazilas of Sylhet, Sunamganj, Habiganj and Moulabhibazar districts.

The study focuses on feasibility of expansion of command area with associated minor irrigation equipment, sustainable use of surface water and eco-friendly development of infrastructures and economic viability of the proposed interventions.

The study has been carried out based on the primary data surveyed under this study and the secondary

data collected from different sources. The study team has carried out Focus Group Discussion (FGD) and Key Informant Interviews (KII) using pre-designed questionnaire at 27 representative locations.

There is a huge potential for surface water irrigation expansion in the study area. It is possible to introduce modern irrigation facilities based on surface water and groundwater in 78,851 hectares of land through re-excavation/renovation/rehabilitation of canals, khals, drains, hill slopes and construction of other necessary irrigation infrastructures and operation of irrigation systems in the project area. After the implementation of the project additional 19,08,360 MT of crops will be produced every year. To increase surface water for use in irrigation, the study suggested re-excavation of 800 km khal/small rivers, to install 400 nos. power pumps (5-cusec, 2-cusec and 1-cusec), and construct 650 km of buried pipeline. It has also proposed the installation of 300 nos. irrigation infrastructures (regulators, submerged weirs, siphons, aqueducts, flumes, box culverts, footbridges etc.). For groundwater irrigation, it has proposed installation of 105 Force Mood tube well with a capacity of 1.5-cusec, 260 nos. Force Mood tube well with 2-cusec and 150 nos. Artesian well.



Focus Group Discussion (FGD) at Osmaninagor (Left) and Dowar Bazar Upazila (Right)

River Morphology and Engineering Division (RME)



Hydrological/Morphological Survey and Modelling for Proposed Bangabandhu Rail Bridge

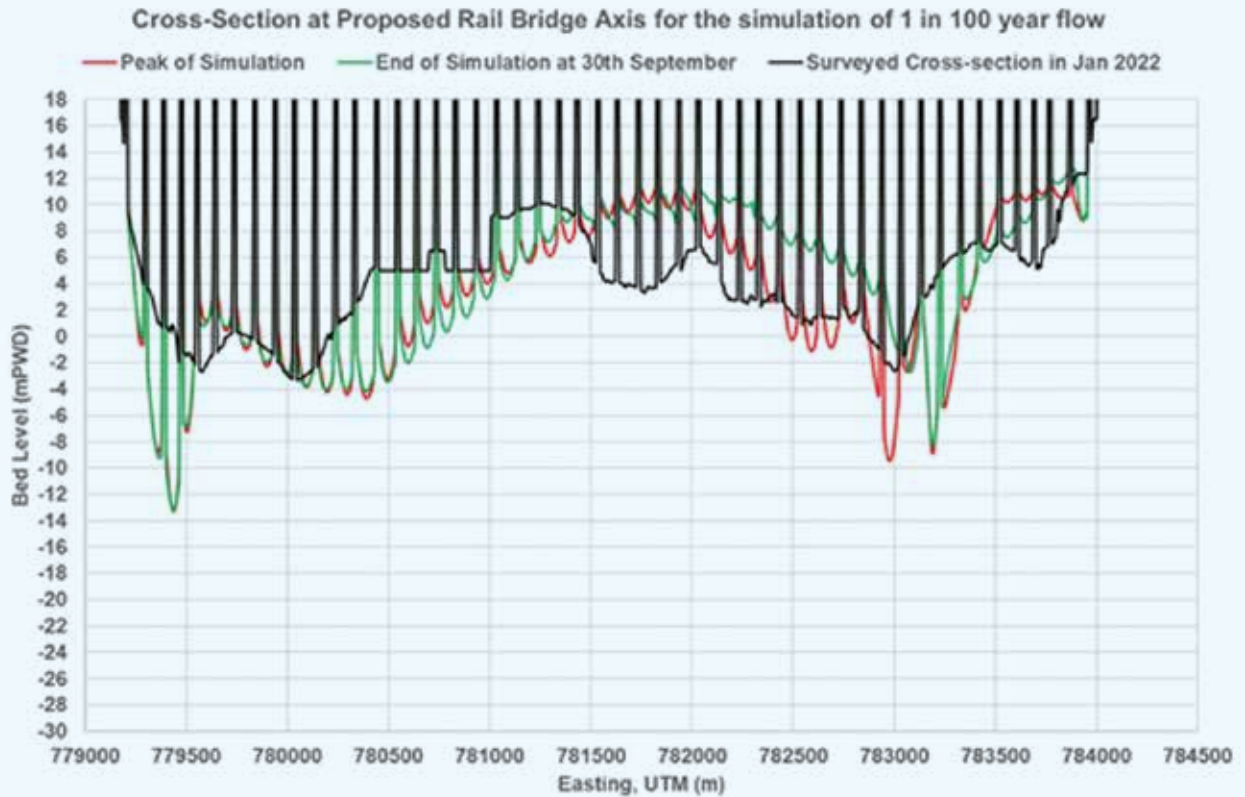


Ongoing Construction of the Bangabandhu Sheikh Mujib Railway Bridge on Jamuna River

The 4.8km long Bangabandhu Multipurpose Bridge is a megastructure over the Jamuna River in Bangladesh which is providing facilities for continued communication between Dhaka Division and the resourceful North-west region by road as well as by rail track. To provide a faster and secure rail communication over the Jamuna River, a separate rail bridge is very much needed to be constructed. For this purpose, Bangladesh Railway has planned to build another 4.8 km long bridge over the Jamuna River, in parallel with the existing road bridge at 300m upstream location that would rely on the continued functionality of the present system of River Training Works (RTW) of the existing bridge to provide protection against possible outflanking and scouring at the structures. The Jamuna is one of the world's great rivers which have been constricted significantly to 4.8km from more than 12km of width in the upstream for construction purposes of the existing bridge. On top of the constriction at the bridge site, variable flows, and sediment as well as the upstream

condition play major role in governing the morphological processes, which can endanger the stability of the river training structures and these two bridges.

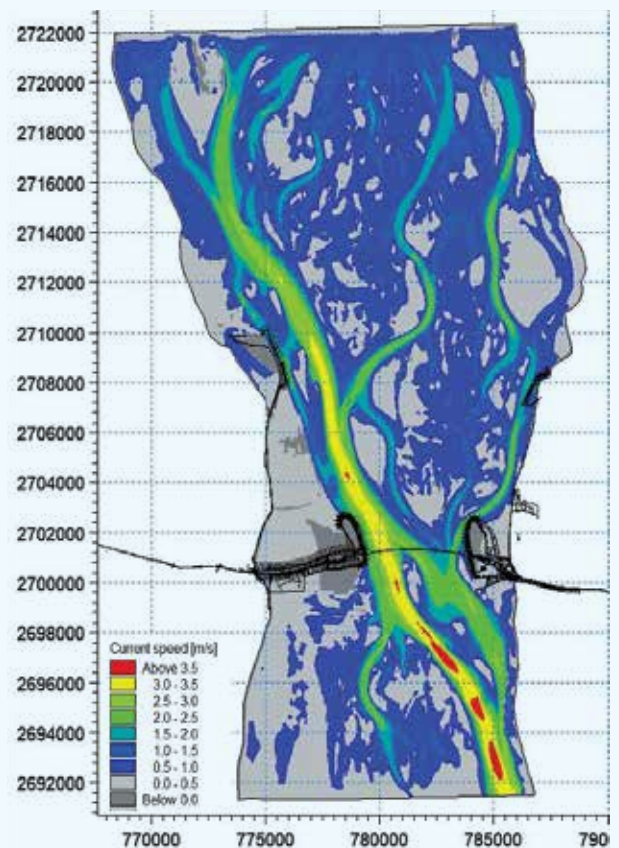
Bangladesh Railway (BR) has engaged two contractors to start construction works on two sides of the river under separate contracts. For smooth execution of the construction works of the contractors as well as safety of the existing bridge and its ancillary structures, detailed hydro-morphological analysis of the Jamuna River is very much essential. Being entrusted by the contractors (WD1 and WD2), Institute of Water Modelling (IWM) is providing hydrological and morphological survey and numerical modelling services as a sub-contractor nominated by Bangladesh Railway. The period of the contract is from November 2020 to December 2025 and within this period, IWM will provide technical support to the contractors in assessing the present and probable hydro-morphological conditions that may take place in the vicinity of the bridge area. To facilitate the two contractors engaged with their schedules of



Simulated Cross-section of Jamuna River with Proposed Rail Bridge after Design Flood Event

construction activities, a hydro-morphological forecast of the Jamuna River is very much required. Forecast of the morphological behaviour in the vicinity of the bridge areas that are needed to be addressed, including maximum flow thrust, bank erosion at immediate upstream and downstream of guide bunds, and probable scour and period of occurrence, are being provided by IWM during this construction work.

IWM has prepared a 2D morphological model of the Jamuna River based on recently collected surveyed data and information to provide the forecast services from hydro-morphological point of view during the construction of the proposed rail bridge. Continuous supervision of any small or large scale construction on the Jamuna Riverbed is being conducted by IWM to ensure the sustainability and safety of the proposed rail bridge as well as the existing Bangabandhu Bridge. Besides this, IWM also contributed to the detail design task with hydraulic design variables of the proposed rail bridge at pre-construction phase. Outputs of the 2D model prepared by IWM such as flow velocity, discharge, water level, riverbed scour level, etc. have been determined by well calibrated model of the Jamuna River and these variables are important keys to the design of this mega hydraulic structure. IWM has been providing similar technical assistance to the contractors and the consultants working for this project since 2017.



Simulated Flow Velocity of Jamuna River at Peak of Design Flood Event

Survey & Data Division (SDT)

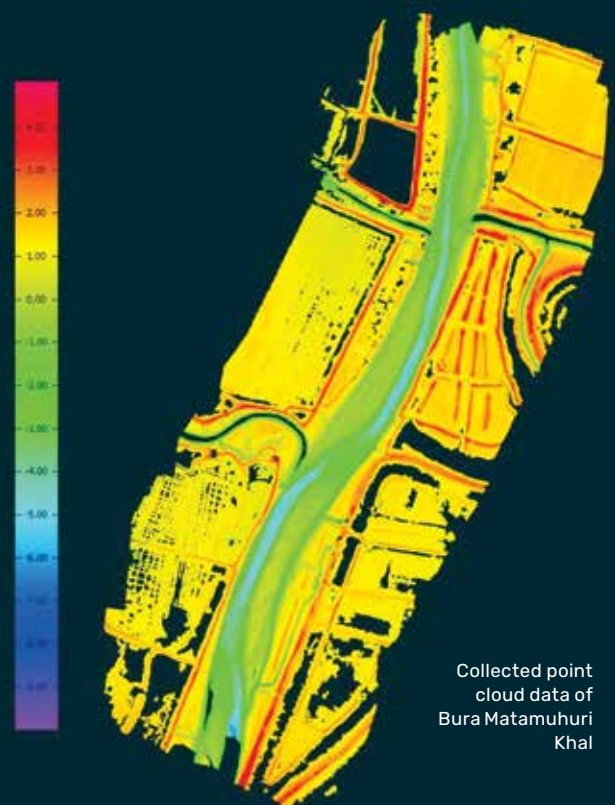




IWM survey boat carrying out multibeam survey at Kohelia River

Multibeam Bathymetric Survey combined with Aerial Survey are used for Long Term Monitoring of Bridge Sites

IWM conducted a multibeam bathymetric survey at four bridge sites located on the 25.8km long 4-lane Matarbari Port Access Road under implementation by the Roads and Highways Department. The road is in Chakaria and Moheshkhali Upazilas of Cox's Bazar district in Bangladesh. The objective of the survey is to monitor long term morphological changes (including scouring, erosion, and siltation) of target rivers to assess future risks of the bridge structures. The rivers concerned are Kohelia River, Moheshkhali Channel, Bura Matamuhuri Khal and Matamuhuri River. The survey campaign was carried out from 16 to 27 July, 2022 and investigated the river bank/bed condition before construction. The survey will be carried out on a regular basis in the future. In addition to the multibeam survey, high resolution data for the river banks are collected through Aerial Survey using DJI Phantom 4 ProV2.0 drone. The survey produced accurate digital elevation models of the river reaches for its application in mathematical modelling.



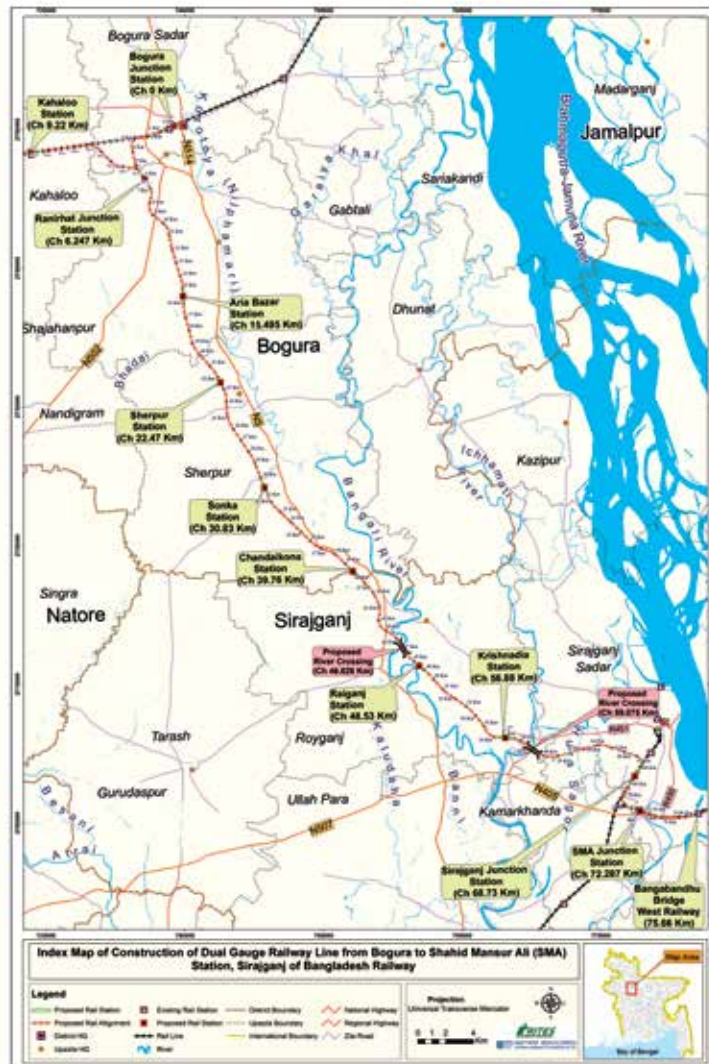
Collected point cloud data of Bura Matamuhuri Khal

Detailed Topographic Survey for construction of Dual Gauge Railway Line from Bogura to Shahid M. Mansur Ali Station of Bangladesh Railway

For modernization of Bangladesh's railway infrastructure, and to further enhance railway connectivity within Bangladesh, a new direct Rail Link from Bogra to Sirajganj will be established. An agreement between Bangladesh Railway and Indian consultant (JV of RITES Ltd. and Aarvee Associates) was signed in September 2021 for updating the project feasibility study, detailed engineering design and drawings of all infrastructure including bridges, embankments, railway tracks, stations, signalling and all other facilities, route alignment, mathematical modelling, tendering services, and construction supervision services. In this regard, the main consultant of Bangladesh Railway engaged Institute of Water Modelling to carry out the detailed topography survey along the newly 90 Km proposed alignment from Bogra to Shahid Mansur Ali Station.



Control Point Establishment through static survey by RTK-GNSS



Proposed Alignment of Bogra-Sirajganj Railway Line

The data collection campaign was conducted from April 2022 to mid of August 2022. The important features included in the survey establishment are eight Master Control Points (MCP) of 20-25km base length covering the whole project area through GNSS observation, installing 33 permanent control point (PCP)

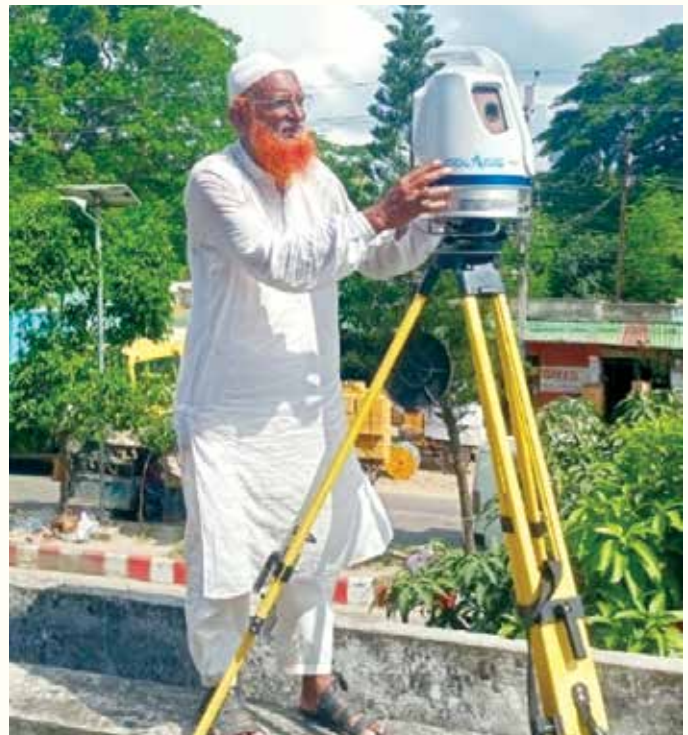
of a smaller network of triangles of around 5 Km intervals following the alignment through GNSS observation, a photogrammetric survey by Unmanned Aerial Vehicle (UAV) along 200m corridor width of the whole alignment, 20m interval cross-sections survey along 200m corridor along the alignment by Real Time RTK GNSS, drone videography along total alignment, 2D and 3D feature extraction from photogrammetric data, casting and erection of pillar along with the centreline of the alignment. The data collection campaign was conducted successfully and submitted the report and other deliverables as per schedule to the main consultant.



Processed Photogrammetric 3D data



Photogrammetric Survey by UAV



Survey by Terrestrial Laser Scanner (TLS)

Water Supply Sanitation and Urban Water Management Division (WSU)

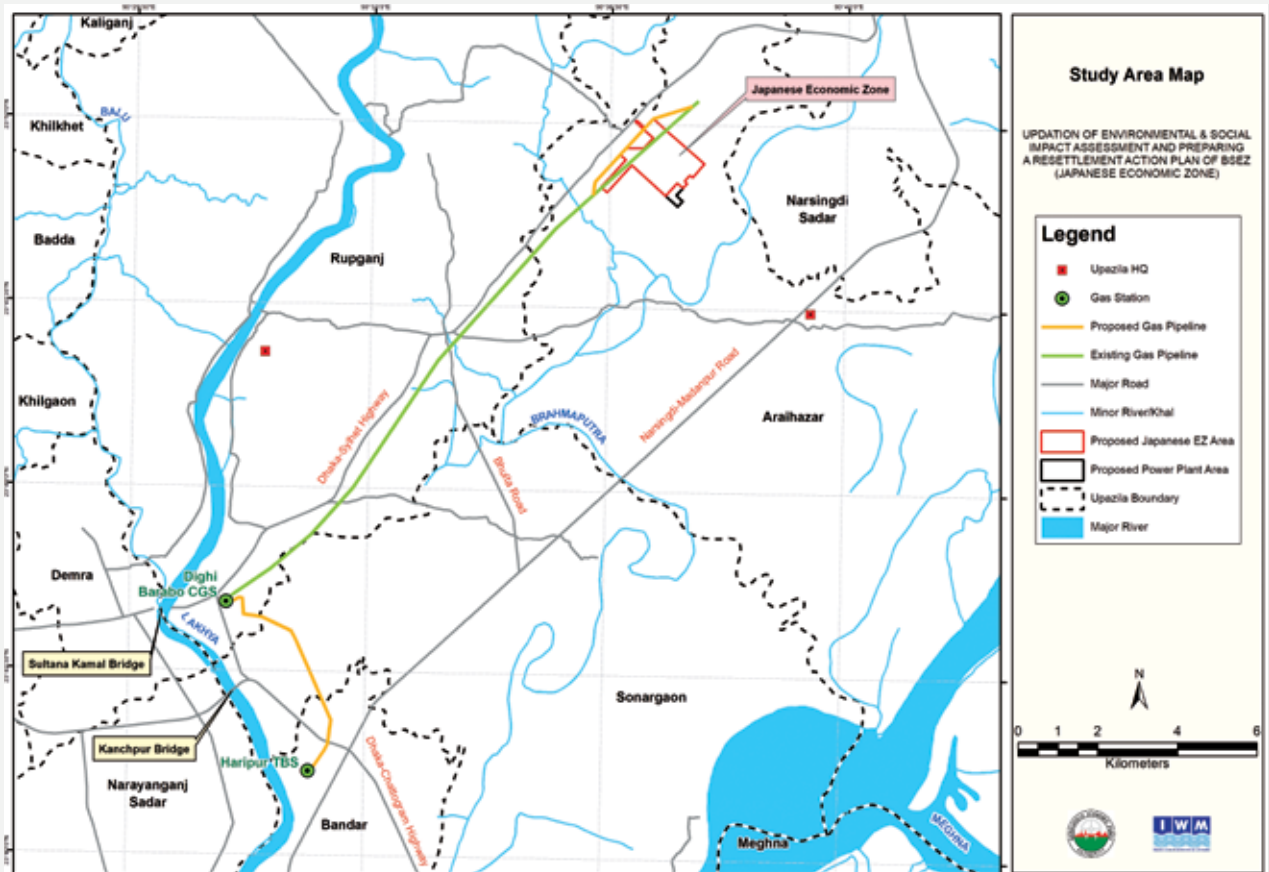


Updating Environmental & Social Impact Assessment and Preparing a Resettlement Action Plan of BSEZ (Japanese Economic Zone)

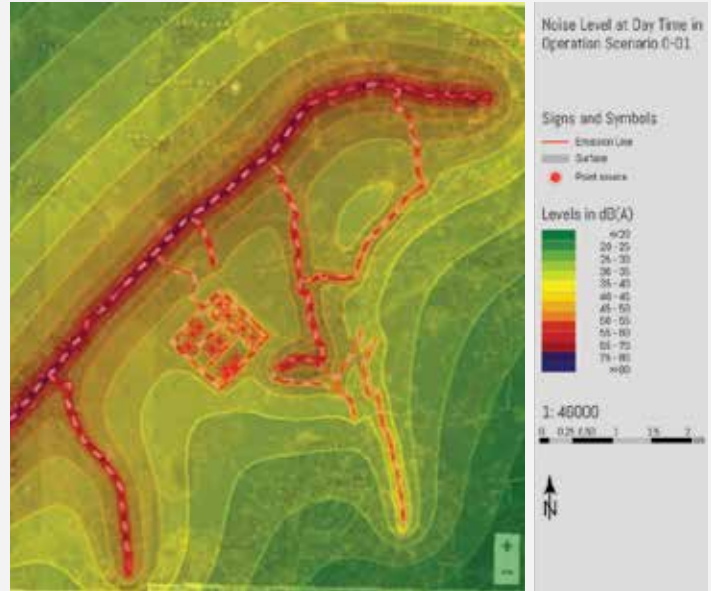
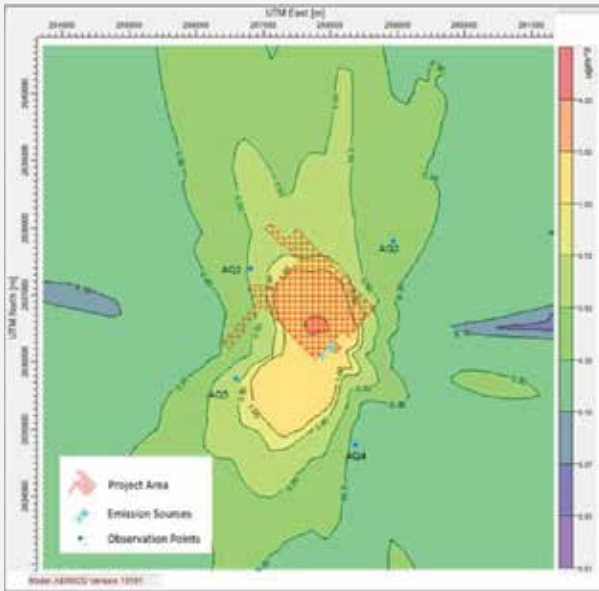
Bangladesh Economic Zones Authority (BEZA) with support of Japan International Cooperation Agency (JICA) and Sumitomo Corporation, Japan is developing a Japanese Economic Zone under Araihasar Upazila of Narayanganj district, located adjacent to the Dhaka-Sylhet Highway. The total land area of Bangladesh Special Economic Zone (BSEZ) is approximately 218.84 ha or 540.77 acres for the first phase (Phase-I). BEZA appointed IWM on February 2021 to update the already conducted two EIAs (which were already approved by BEZA and DoE) using International Finance Corporations (IFC) Performance Standards along with World Bank Group's Environmental, Health and Safety (EHS)

Guideline document. Specific objectives of the study were:

- Detailed gap analysis of previous EIA studies
- To undertake field assessments to fill the gaps
- To identify and assess environmental and social impacts associated with the Japanese EZ and associated infrastructures
- To determine measures to prevent or minimize and mitigate the adverse impacts
- To identify potential environmental and social opportunities
- To identify scopes of improvement for environmental



Photogrammetric Survey by UAV



Hotspot Mapping of SO₂

and social sustainability

- To upgrade/revise the assessments and documents in the form of ESIA & RAP as per applicable reference framework requirements

BSEZ is in Arai hazar Upazila of Narayanganj district adjacent to Dhaka-Sylhet highway (N2) and the power plant and substation nearby. The existing gas transmission line from Haripur TBS to Dighi Barabo CGS is also included in this study. There were two parts in the study: ESIA & RAP.

The ESIA part of the study comprised of following additional assessments for better management of environment in the project area:

- Critical Habitat Assessment (CHA)
- QRA for Gas Transmission Line

- Air Quality Modelling
- Noise Modelling
- Integrated Waste Management Plan
- Hazardous Waste Management Plan
- GHG Emission Estimation
- Traffic Management Plan
- Drainage Management Plan
- Cumulative Impact Assessment

Noise Modelling of BSEZ

In the RAP part, other than standard components, compensation and entitlement matrix, Income and Livelihood Restoration Plan (ILRP), Income Generating Activities, Grievance Redress Mechanism (GRM), Land Acquisition Budget etc. were included.



Design of Water Supply Network for Jahurul Islam City (Aftabnagar) Considering District Metered Area (DMA) Concept

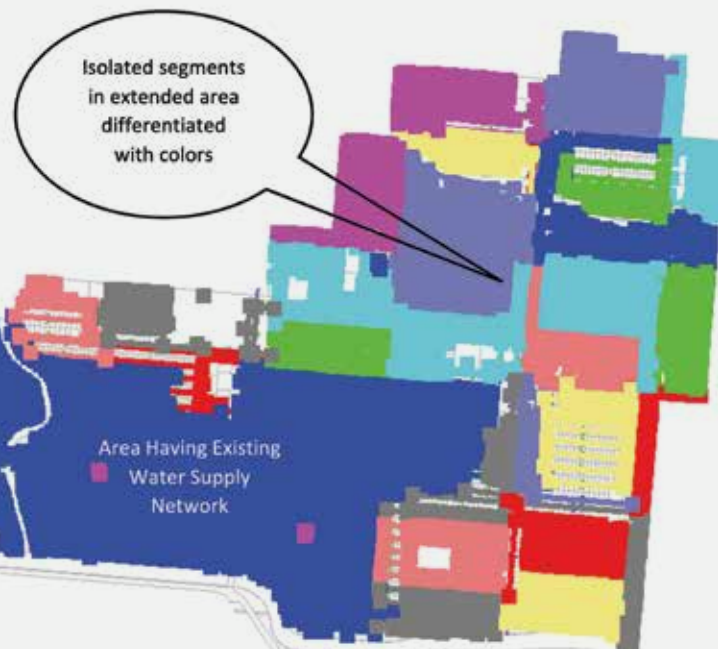


Designed Water Supply Network for the Jahurul Islam City (Aftabnagar)

the area is estimated as 60 MLD at the fully developed phase. Groundwater is considered the only water supply source until surface water from the Gandharbpur Surface Water Treatment Plant (SWTP) becomes available. Total length of distribution network in the JIC area is around 85 Km ranging from DN100 mm to DN450 mm diameter. The network is designed to cope up the peak daily demand. Several scenarios have been analysed considering different water supply sources and to reflect all the probable situations in the water supply system is going to face. To enhance the robustness of the design, different types of analyses like criticality analysis, flushing analysis and water hammer analysis has been conducted. The design and analysis of the water supply network has been finalised through extensive use of sophisticated hydraulic modelling tools. The construction of pipelines and other ancillary facilities will start after getting approval from Dhaka WASA with close supervision from the same.

With an area of 787 acres, the Jahurul Islam City (Aftabnagar) is a fast-growing area situated in Badda having 8,470 plots of different sizes. The area contains well-planned road networks of 66.2 Km and there are provisions for modern living amenities. The western part of Jahurul Islam City (JIC) has water supply network with 3 deep tube-wells as a supply sources. In recent years the city expended significantly towards east and north. The necessity for development of water supply facilities in the newly developed areas is an obvious need. The JIC authorities have appointed the Institute of Water Modelling (IWM) for designing the water supply network in the extended part of the JIC area considering the DMA concept.

IWM started the design work for water supply network in June 2022. The primary objective of the design of the distribution system of the extended portion of Jahurul Islam City (JIC) area is to meet consumer needs by supplying reliable, continuous, and 24 hour pressurized drinking water. Total estimated population for the JIC area is approximately 0.4 million and water demand for



Criticality Analysis for Isolating Segments During Maintenance of Water Supply Network

Climate Change Cell and Environment

Understanding the Sea Level Rise Dynamics of Bangladesh along the Coast- UK Met

Groundwater Rejuvenation as Climate Change Resilience for Marginalized and Gender Sensitive Ganges (GRACERS)- Indian Institute of Technology Bombay (IITB), India

The Climate Change Cell (CCC) of IWM is conducting several projects. One of them is 'Understanding the Sea Level Rise Dynamics of Bangladesh along the Coast.' This is a two-year project and is being carried out in partnership with the UK Met Office under ARRCC (Asia Regional Resilience to a Changing Climate) Programme funded by the UK Foreign Commonwealth and Development Office (FCDO). This study project will focus on zone wise and seasonal relative sea level rise along the coast of Bangladesh with future climate scenario projections. The main objective of this study project is to identify the relative sea level rise along the whole coastal zone of Bangladesh considering climate change. The specific objectives are to:

- Investigate zone wise variation of sea level along the coast (for the three coastal zones separated as West, Central and East)
- Find a seasonal variation of sea level along the coast
- Simulate sea level rise in the future (2035-2065, 2070-2100) in different scenarios (RCP 4.5 & 8.5)
- Simulate sea level rise including local influences such as subsidence, tidal modulation, ENSO etc.

- Investigate polder inundation extent and overtopping due to sea level rise and increased storm surge

Under this ongoing project, training on 'Understanding Sea Level Rise Dynamics along the Coast of Bangladesh' was held from 6th to 7th June, 2022 at the training room of IWM Bhaban, Dhaka. It brought together the research, academic and implementing organisations/institute including BWDB, WARPO, DAE, DoE, BCAS, BRAC, CEGIS, BMD, ICCCAD and Daffodil International University. It aims to build knowledge on an overview of climate information services for regional sea level rise as well as for understanding local sea level rise. It also aims to give a clear idea on different models (Ganges-Brahmaputra-Meghna (GBM), River and BOB model) used in this project along with downscaling of the climate model and bias correction. The training also aims to disseminate the objectives and outcomes/findings of the study. The trainers were from IWM and Met Office.

Another important project is 'Groundwater Rejuvenation as Climate Change Resilience for Marginalized and Gender Sensitive Ganges (GRACERS)' aimed to produce feasibility maps for decentralized/distributed

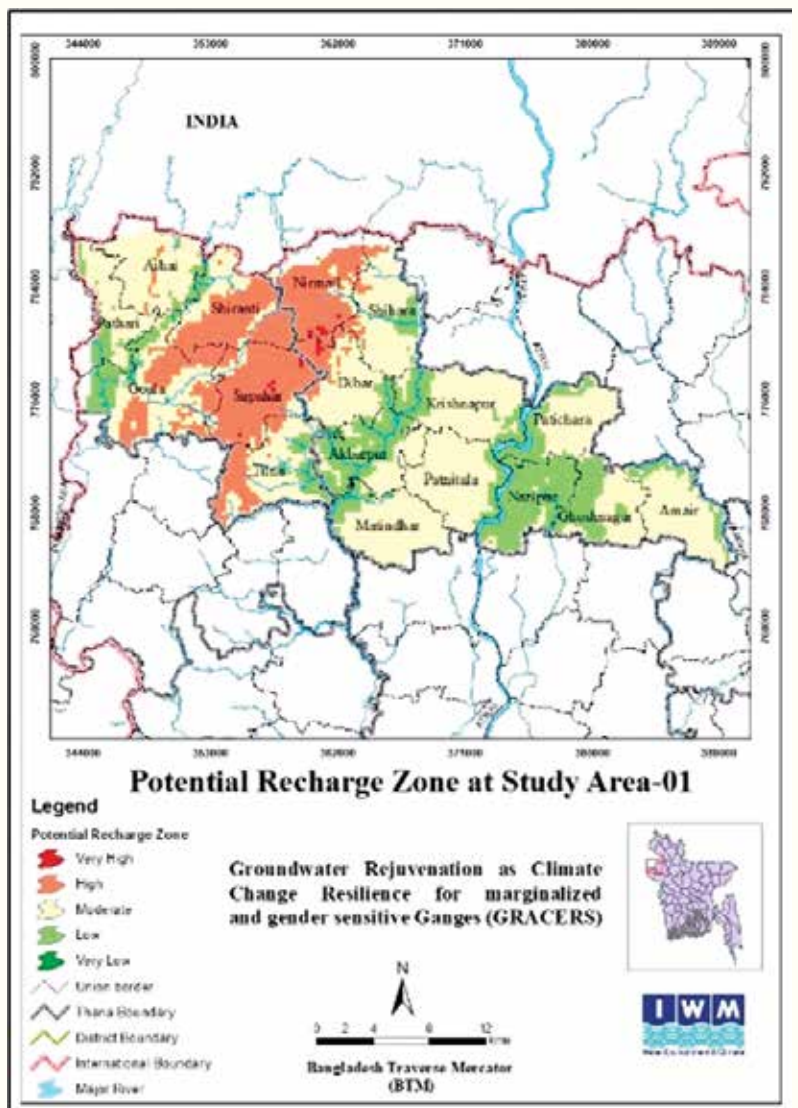
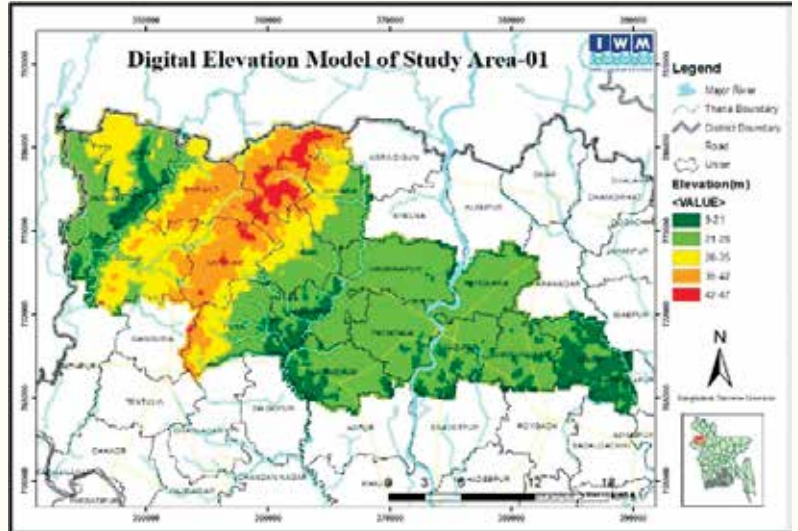


groundwater recharge in the Ganges Basin. This project is funded by DUPC and UN-IHE, Netherlands. The project is being conducted jointly by Indian Institute of Technology Bombay (IITB), India and IWM, Bangladesh. IHE Delft, NM Sadguru and NIH from India are also associated with this project. In Bangladesh side, Sapahar & Patnitala upazilas of the Barind area were selected as the study areas.

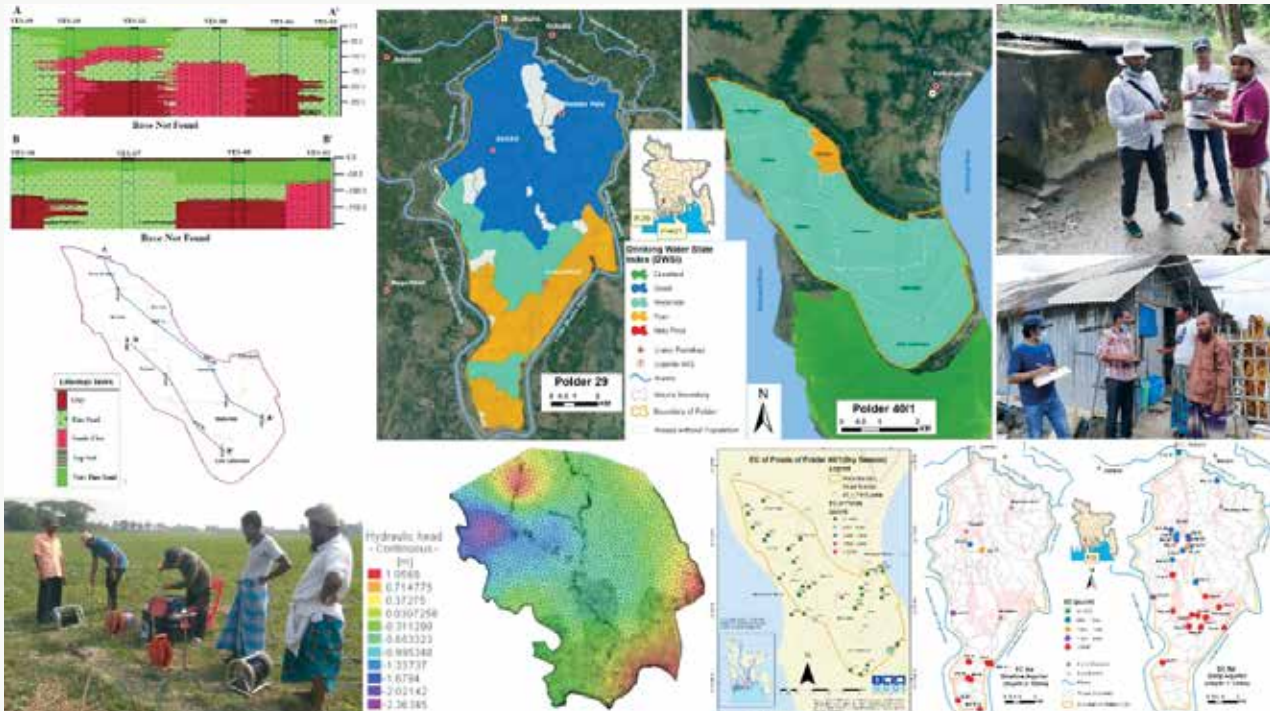
The main research objective is to identify hot spots for decentralized and distributed groundwater recharge networks. The sub-objectives supporting the main research objectives are to:

- Identify changes in the drinking water supply sources for rural, marginalised and women communities
- Identify socio-economic stress due to poor groundwater quality and quantity
- Identify loss of labour time and education time due to water fetching activities
- Identify health issues in consuming polluted water and long-term impacts
- Understand limitations in current water diplomacy and potential recommendations to the Government
- Identify limitations in groundwater recharge due to centralised water supply schemes
- Identify potential private ownership models for rural communities to sustainably manage recharge structures, once key funders exit
- Provide knowledge and technical support to government agencies working in the Ganges Basin
- Provide scientifically validated management plans for up-scaling distributed groundwater recharge networks.

With the help of remote sensing and GIS, a qualitative assessment of groundwater recharge potential has been done. Based on associated weights, among seven thematic layers the most influencing factors are lithology (25%), elevation (20%), drainage density (15%), slope (15%), landcover (10%), soil type (10%) and rainfall (5%) are identified. Accordingly, an integrated groundwater potentiality zonation map of the study area was prepared from the thematic layers and is classified as very low, low, moderate, high and very high recharge potential zones.



Research, Innovation & Development



Map showing different components of the study

Assessment of Drinking Water Resources in the Selected Coastal Polder 29 at Dumuria of Khulna and Polder 40/1 at Patharghata of Barguna in Bangladesh

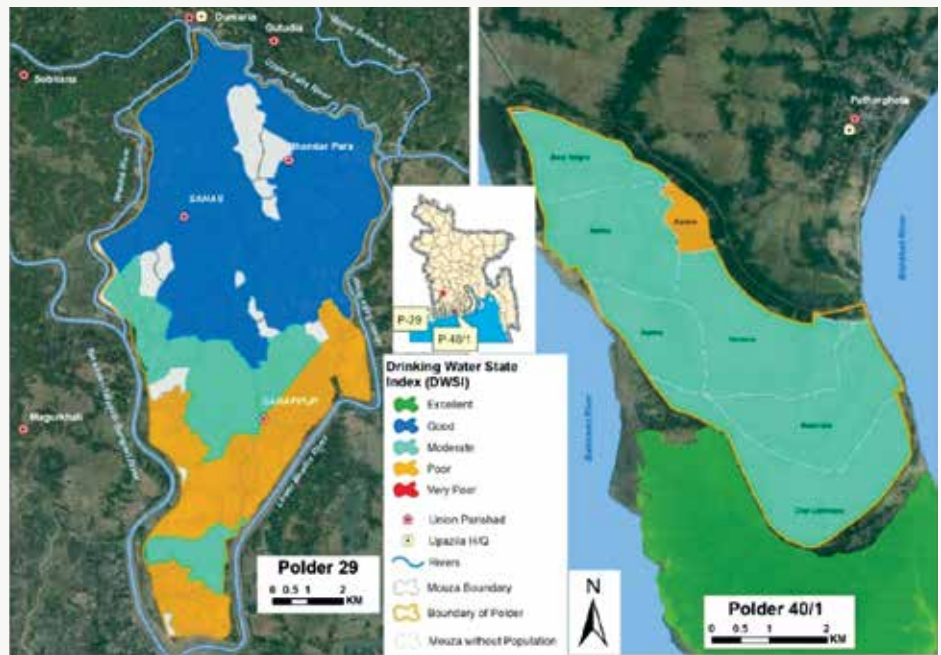
Coastal zone is one of the six hotspots considered in Bangladesh Delta Plan 2100. The coast of Bangladesh is known as a zone of vulnerabilities as well as opportunities. The combination of natural and manufactured hazard has adversely affected lives and livelihoods in the coastal zone and slowed down the pace of social and economic developments in the region. Providing adequate amounts of drinking water of an acceptable quality is a necessity, and ensuring sustainable, long-term supply of such drinking water is of national and international concern. Considering the issue of drinking water insecurity in coastal polders of Bangladesh, a research study was formulated to

develop a methodology to sustain potable drinking water sources in terms of quality and quantity for the selected polders (P-29 and P-40/1). Polder P-40/1 is situated at the vicinity of the coastline and P-29 is around 75km away from the coastline. Literature review, social survey, geophysical survey, hydro-geochemical survey, groundwater salinity modelling are the major activities under this project. From the study, it is found that sources of drinking water in polder 29 are groundwater (95%), surface water (4%) and rainwater (1%). For the polder 40/1, the sources of drinking water are surface water (56%), rainwater (41%) and groundwater (2%).

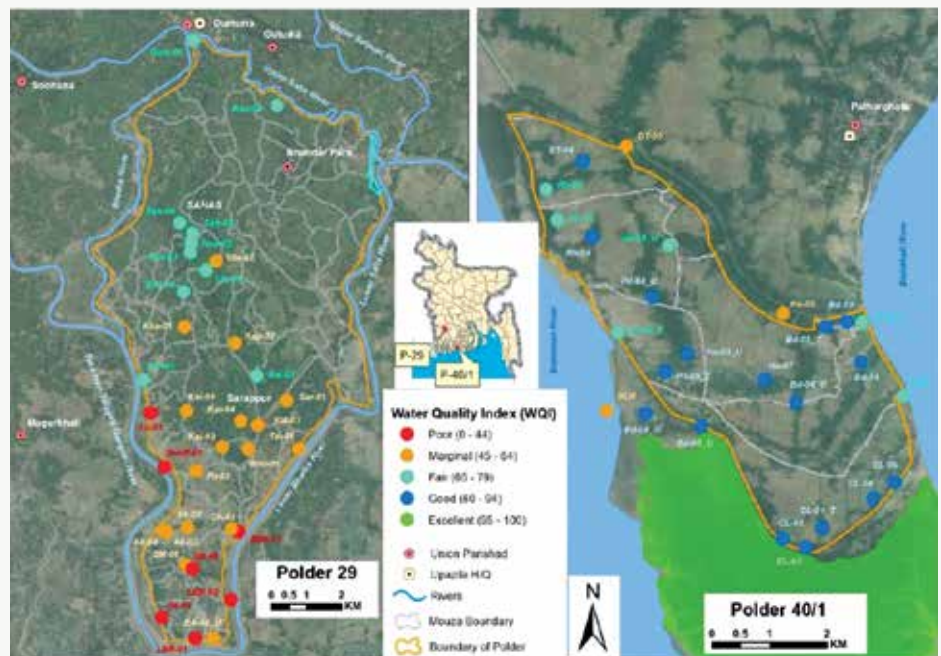
A simple index has been formulated termed as Drinking Water State Index (DWSI) from aggregation of four different indicators to present and compare the overall condition of the drinking water in both polders. The overall statistics represent that there are 62 mouzas of polder 29 where people are living. Drinking water condition is good for 33 mouzas, moderate for 10 mouzas and poor for 19 mouzas in polder 29. While the drinking water situation is moderate for 6 mouzas and poor in one mouza 'Koralia' out of 7 mouzas in the polder 40/1. It is mentionable that there are no 'excellent' and 'very poor condition' in both polders. The future demand of drinking water in the year 2050 is calculated based

on the projected population which is 9.2% more than the year 2021 for Polder 29 and 10.9% more for the Polder 40/1. However, alternative sources will be needed for both polders, especially for the Polder 29. Probable alternative source for the Polder 29 will be surface water source by constructing more PSF, dilution of salinity in the shallow aquifer by MAR technology, and rainwater harvesting. Since people of Polder 40/1 drink water from PSF of surface water sources, proposed PSF by DPHE will enrich the drinking water sources. Alternative sources for the Polder 40/1 will be MAR for very shallow aquifer, RWH and in extreme cases installation of a desalinization plant or reverse osmosis (RO) plant.

Map showing the present drinking water condition in terms of DWSI index for different mouzas



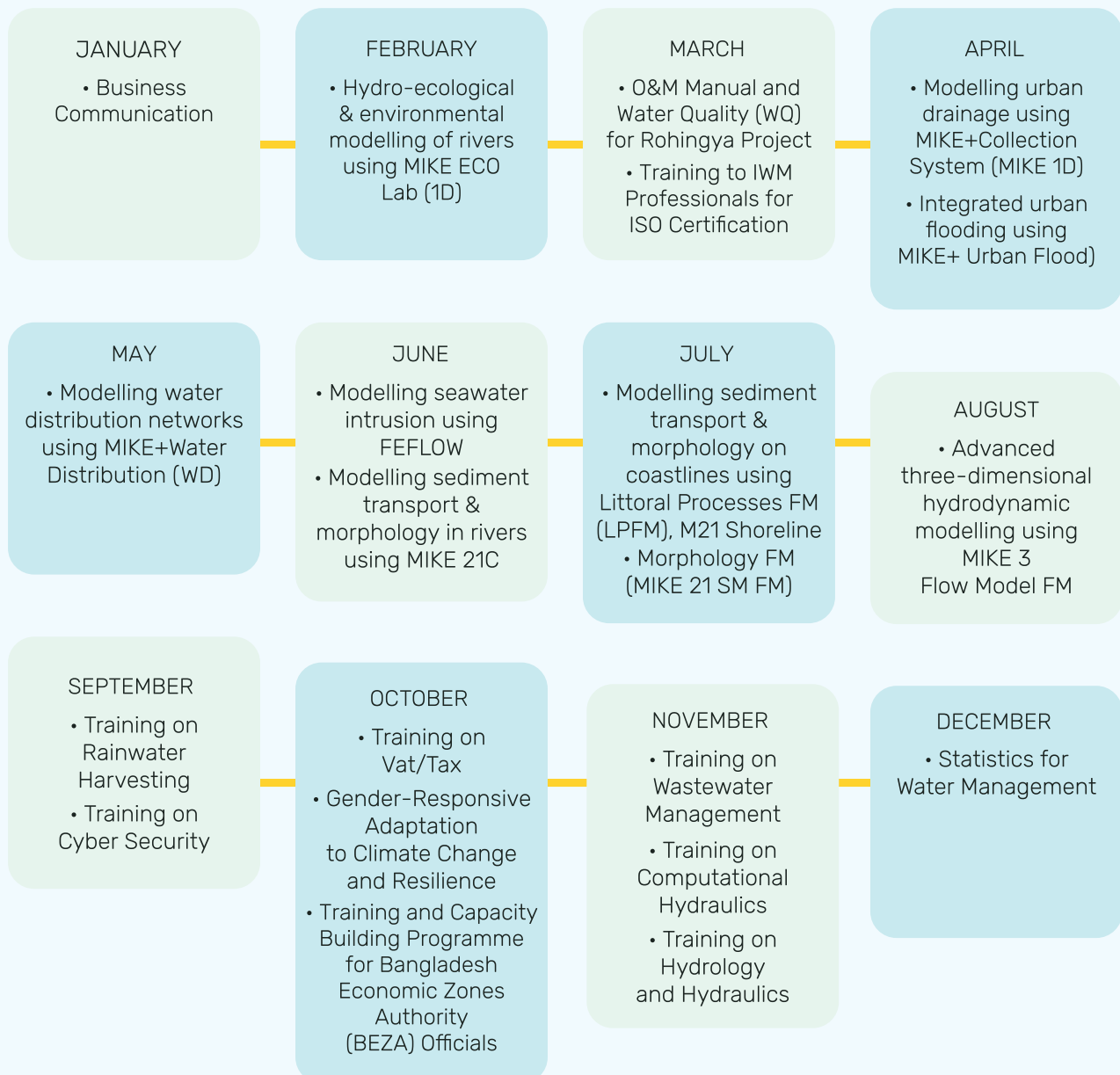
Map showing spatial orientation of WQI Index during dry period



Training & Capacity Development



Training and Technology Transfer is a regular activity of IWM that aims at updating the human resources of the Institute as well as the service users with the new knowledge and technology and to cope with the new challenges in the water sector. Following is the brief on the HRD programmes conducted in 2021.





Training and Capacity Building Programme for BEZA Officials



Closing ceremony of a training programme conducted by IWM for RAJUK



Workshop on Strategic Planning Preparation at IWM



Training on Rainwater Harvesting by Water AID

Some of the Major Events



Hon'ble Prime Minister, Sheikh Hasina, MP, inaugurated the two-day long conference

IWM Participated in 'Bangladesh Delta Plan 2100 International Conference: Issues and Challenges of Implementation'

Mr. Abu Saleh Khan, Executive Director, Institute of water modelling (IWM) attended the International Conference on the Bangladesh Delta Plan 2100 Conference: 'Issues and Challenges of Implementation' which was held in the Ball Room, Pan Pacific Sonargaon Hotel, Dhaka on 26 and 27 May, 2022. It was a high-level, international meeting, consisting of a series of events. The conference aims to lead to meaningful and practical outcomes, furthering implementation.

General Economics Division (GED) of Bangladesh Planning Commission and Embassy of the Kingdom of the Netherlands jointly organised the first international conference on Bangladesh Delta Plan 2100.

H.E. Sheikh Hasina, MP, Hon'ble Prime Minister, Government of the People's Republic of Bangladesh inaugurated the two-day long conference titled 'Bangladesh Delta Plan 2100 International Conference: Issues and Challenges of Implementation' as the Chief Guest.

Summary of Breakout Session (Coastal Zone Session)

Mr. Md. Zahirul Haque Khan, Deputy Executive Director (Operations) of IWM participated as Moderator at the Breakout Session (Coastal Zone Session) on May 26, 2022. Mr. Khan also presented a paper on 'Bangladesh: Enhancing Coastal Resilience in a Changing Climate' as Keynote presenter.

The workshop was chaired by Honourable State Minister of Ministry of Water Resources (MoWR), Mr. Zaheed

Farooque, MP who graced the occasion as Chief Guest while Mr. Fazlur Rashid, Director General, Bangladesh Water Development Board (BWDB) and Professor Saleemul Huq, Order of the British Empire (OBE), Director, International Centre for Climate Change and Development (ICCCAD) were present as special guests.

In his speech, Mr. Zahirul Haque Khan emphasised on the necessity of enhancing coastal resilience in Bangladesh. He said, around 52% of the polder areas will be affected by climate change compared to 35% in the present scenario; where 8.47 million people are affected and 12.32 million people will be affected in near future. Mangrove afforestation is effective for reducing storm surge height; it has other environmental



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and ecological benefits. Hybrid approach (Engineering and nature-based measures) of adaptation can be applied where meaningful community participation and timely maintenance are critical for sustainability. He highlighted on land reclamation and char stabilisation and development are important issues for the implementation programme. He also mentioned the necessity of updates on the design manual to incorporate innovative and adaptive approaches.

The conference aimed at deliberating on practices and solutions for Coastal Climate Change Adaptation and related issues. Seven cross-cutting recommendations will pave the way forward and offer an opportunity to strengthen the resilience of the coastal zone and build shared prosperity for decades to come. Strengthen operation and maintenance to extract

maximum benefits from investments and nurture sustainable interventions; embrace the uniqueness of the Bangladesh coast, recognize local knowledge, strengthen the application of state-of-the-art modelling tools and systems, and cultivate knowledge sharing; apply risk as the guiding principle for adaptive delta management; complement infrastructure interventions with nature-based solutions to enhance resilience and effectiveness; incorporate risk-sensitive land-use planning to guide appropriate activities based on integrated coastal zone management practices; support inclusive community participation, local institutions, and livelihoods adaptation for sustainable resilience; establish an integrated framework of performance criteria of interventions that go beyond risk reduction and inclusive growth, wellbeing, and sustainable development at its core.

Honorable Deputy Minister, Ministry of Water Resources, Mr. AKM Enamul Hoque Shameem, MP Visits IWM Bhaban



Honourable Deputy Minister, Mr. AKM Enamul Hoque Shameem and IWM Management visit Bangabandhu Corner at IWM Bhaban

Honourable Deputy Minister, Ministry of Water Resources (MOWR), Mr. AKM Enamul Hoque Shameem, MP visited IWM Bhaban at Uttara on 13th June 2022. He was welcomed by Mr. Abu Saleh Khan, Executive Director of IWM.

Executive Director, IWM briefed the Honourable Deputy Minister about the progress of work and sought his guidance and decisions regarding issues. Mr. AKM Enamul Hoque Shameem went through the presentations on the development of IWM in recent years and provided his valuable feedback. During the

meeting, discussions were held about the future growth of IWM in relation to the Ministry of Water Resources (MoWR). Mr. Shameem appreciated IWM management and shared his vision to make IWM a more internationally acclaimed organisation.

After the meeting, Mr. AKM Enamul Hoque Shameem visited different floors of IWM Bhaban. Mr. Zahirul Haque Khan, Deputy Executive Director (Operations), Mr. S. M. Mahbubur Rahman, Deputy Executive Director (P&D) and other divisional directors and senior officials of IWM were also present during the visit.

Ms. Lise Abildgaard Sørensen, Head of Cooperation, Royal Danish Embassy Visits IWM



Mr. Abu Saleh Khan Presented Souvenirs and Crest to Ms. Lise Abildgaard Sørensen

Ms. Lise Abildgaard Sørensen, Head of Cooperation, Royal Danish Embassy in Bangladesh made a visit to IWM on 6th October 2021. She was accompanied by Mr. Md. Badrul Alam Talukder, Programme Adviser. Executive Director of IWM Mr. Abu Saleh Khan welcomed Ms. Lise Abildgaard Sørensen with a floral bouquet. During the visit, discussions were held regarding the cooperation between Royal Danish Embassy and IWM on water related study, research and future collaborations.

Mr. Abu Saleh Khan thanked Ms. Sørensen for visiting IWM and expressed his sincere gratitude to DANIDA for its role in supporting the institutionalization and capacity building of IWM over the last 30 years. Ms. Sørensen visited different facilities of the newly constructed IWM Bhaban and was highly impressed about the work environment of IWM. She was hopeful of future continued collaboration with IWM.

International Water Management Institute (IWMI) Visits IWM



IWMI correspondents visit IWM Management

UNESCO IHE visits IWM



Prof. William Verbeek of UNESCO IHE visits IWM

Major MoU, Contract Signing and Workshops

Memorandum of Understanding (MoU) signing between Nippon Koei Bangladesh Ltd. and IWM



Mr. Abu Saleh Khan, Executive Director of IWM and Mr. Naoki Kudo, Managing Director of Nippon Koei Bangladesh Ltd signed a Memorandum of Understanding (MoU) to formulate and develop

research/study projects and carry out scientific research and project-based studies in the common fields of operation of both the organisations as and when appropriate.

IWM Signed MoU with Khulna University



A Memorandum of Understanding (MoU) was signed between the Institute of Water Modeling (IWM) and Khulna University on December 7, 2021, at the Vice-Chancellor's Office. The MOU aims to create research opportunities and project based collaboration in various fields including forest management, community forestry, coastal resource management, blue economy, climate change, biodiversity conservation, environmental impact assessment, etc. Prof. Dr. Mahmood Hossain, Vice Chancellor of Khulna University and Mr. Abu Saleh Khan, Executive Director of IWM signed the MoU on

behalf of their respective organisations. Prof. Khan Golam Quddus, Registrar (in charge), Prof. Dr. Md. Iftekhar Shams, Head of Forestry and Wood Technology, Prof. Md. Nazmus Sadat, SM Atiyar Rahman, Director (in charge) of Public Relations and Publications, and Mr. S M Mahbubur Rahman, Deputy Executive Director (P&D), IWM were also present on the occasion. During the visit, discussions were held regarding the cooperation between Khulna University and IWM on forestry environment, water related study, research and future collaborations.

Workshop on Industry Sector Risk Profile: The Case of KEPZ and Kalurghat Industrial Area in Chattogram



Programming Division of Bangladesh Planning Commission organized a Dissemination Workshop on Industry Sector Risk Profile for flood, cyclone, waterlogging, salinity, earthquake, fire incident, and Covid-19 on 7th October 2021 in Hotel Radisson, Chattogram. This risk profile will facilitate to apprehend the risk information for industrial investment in the public and private sectors. Mr. Mahbulul Alam, President of The Chittagong Chamber of Commerce & Industry, was present as special guest and Mr. Khandker Ahsan Hossain, Chief (Additional Secretary), Programming Division, chaired the workshop. Mr. Abu Saleh Khan,

Executive Director, IWM provided his opinion on the importance of such an initiative for the country. Dr. Mollah Md. Awlad Hossain, Director, ICT-GIS Division of IWM and Prof Dr. Raquib Ahsan, Department of Civil Engineering, BUET, jointly delivered the keynote presentations on risk profile. Dr. Nurun Nahar, Project Director of National Resilience Programme (NRP) & Joint Chief of the Programming Division, informed that this kind of research is the first of its kind in Bangladesh. She appreciated IWM for conducting the research in a very short time



International Workshop on Long Term Monitoring, Research and Analysis of Bangladesh Coastal Zone (Sustainable Polders Adapted to Coastal Dynamics) at BRAC Centre Inn

Memorandum of Understanding (MoU) signed between Daffodil International University (DIU) & Institute of Water Modelling (IWM)



Professor Dr. S.M. Mahbub UI Haque Majumder, Pro Vice Chancellor of Daffodil International University (DIU) presented souvenirs and crest to Mr. Abu Saleh Khan, Executive Director of Institute of Water Modelling (IWM)

Daffodil International University (DIU) and Institute of Water Modelling (IWM) signed a Memorandum of Understanding (MoU) on Monday, 26 December, 2021 to formulate and develop research/study projects and carry out scientific researches and project-based studies in the common fields of operation of both the organisations as and when appropriate. Mr. Abu Saleh Khan, Executive Director of Institute of Water Modelling (IWM) and Professor Dr. S.M. Mahbub UI Haque Majumder, Pro Vice Chancellor of

Daffodil International University (DIU) signed the contract on behalf of their respective organisations. Mr. S M Mahbubur Rahman, Deputy Executive Director(P&D) of IWM, Mr. Mominul Haque Majumder, Treasurer, DIU, Prof. Dr. Engr. A. K. M. Fazlul Hoque, Registrar, DIU, Professor Dr. Md. Ismail Jabiullah, Controller of Examinations, DIU, Professor Dr. M. Shamsul Alam, Dean, Faculty of Engineering (FE), DIU and senior officials of Daffodil International University and IWM were present at the occasion.



Contract Signing for Shabazpur Channel between IWM and BWDB



Contract Signing Ceremony for Mouza Map Digitalization and Geodatabase Creation Web Mapping and Satellite Image & Land uses Classification between IWM and Ministry of Land at Bhumi Bhaban



Seminar on 'Hydro-Geological Investigation of Groundwater Resources Assessment for Sustainable Development of Minor Irrigation' held at Sech Bhaban Auditorium, Manik Mia Avenue with Mr. Md. Mesbahul Islam, Senior Secretary, Ministry of Agriculture as Chief Guest and Dr. A. K. M. Monirul Haque as Chair of the Seminar. Resources Assessment for Sustainable Development of Minor Irrigation' held at Sech Bhaban Auditorium, Manik Mia Avenue with Mr. Md. Mesbahul Islam, Senior Secretary, Ministry of Agriculture as Chief Guest and Dr. A. K. M. Monirul Haque as Chair of the Seminar.



Contract Signing Ceremony for 'Hydrological Monitoring and Implementation Support Service in Connection with Dredging/ Re-Excavation of Bangali-Karotoa-Fuljor-Hurasagor River System with Bank Protection Project'. Mr. Md. Amirul Islam, Director, Survey & Data Division (SDT) of IWM and Lt. Col. Mr. Kismat Hayat, 24 Engineer Construction Brigade of Bangladesh Army also Project Director of this Project signed on behalf of their respective organizations.

IWM Observing Different National Day



IWM senior officials & employees participated in a rally on World Water Day from the National Assembly Building (Jatiyo Sangshad Bhaban), South Plaza to Pani Bhaban, Green Road



Executive Director of IWM placing a floral wreath at the portrait of Father of the Nation Bangabandhu Sheikh Mujibur Rahman on National Mourning Day 2021 at Bangabandhu Memorial Museum at Dhanmondi Road-32, Dhaka



On the occasion of 102nd Birth Anniversary of Father of the Nation Bangabandhu Sheikh Mujibur Rahman; Mr. Abu Saleh Khan, Executive Director of IWM paid tribute placing a floral wreath at the mural of Bangabandhu at Dhanmondi 32. He was accompanied by other senior officials of IWM. After placing floral wreath they were participated in a doa mahfil at Pani Bhaban, Green road.



IWM Celebrates 26 March 2022: 52nd Independence Day of Bangladesh



Mr. Abu Saleh Khan, Executive Director of IWM paying tribute to the martyrs of the Liberation War by placing a floral wreath IWM on Victory Day 2021 at the National Memorial at Savar. He was accompanied by Mr. Zahirul Haque Khan, Deputy Executive Director (Operations), Mr. S M Mahbubur Rahman, Deputy Executive Director (P&D) and other senior officials of IWM.



Mr. Zahirul Haque Khan, Executive Director of IWM paying tribute to the language movement's martyrs by placing floral wreath, IWM on International Mother Language Day 2022 at the Central Shaheed Minar, Dhaka. He was accompanied by Mr. S M Mahbubur Rahman, Deputy Executive Director (P&D) and other senior officials of IWM.



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