

Newsletter

Volume 58, March 2024



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Editorial

IWM was established in December 1996 as a Trust to promote water modelling in managing the complex water resources ecosystem. Since then IWM has been rendering services in water and related projects to various government and other national/international agencies.

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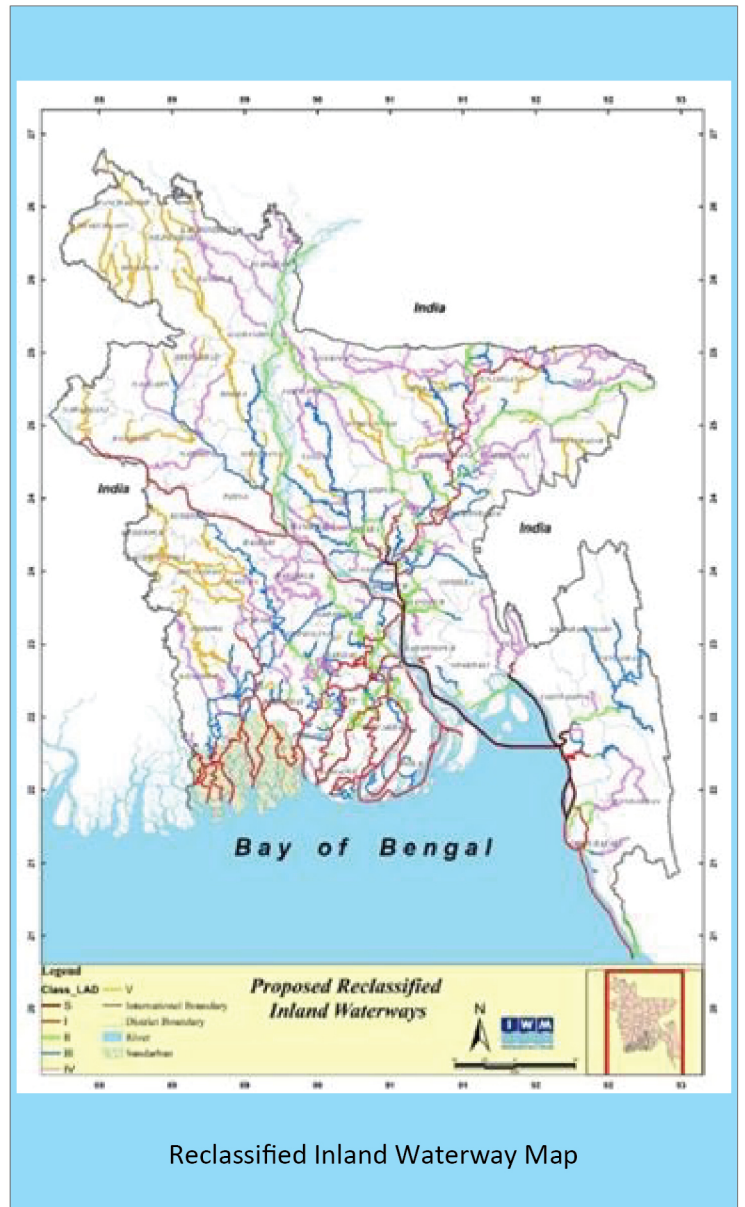
IWM Engaged by BIWTA to Reclassify The Inland Waterways in Bangladesh

IWM has successfully completed a crucial project aimed at determining the Standard High-Water Level (SHWL) and Standard Low Water Level (SLWL) and reclassified the inland waterways in Bangladesh. This initiative, undertaken by Bangladesh Inland Water Transport Authority (BIWTA), marks a significant milestone in classification of 16,357km of inland waterways and updating rules for controlling construction of bridges and installations over the waterways.

IWM updated SHWL and SLWL at 437 water level gauge stations in the waterways of Bangladesh analyzing last 25 years' data. SHWL is a reference water level to decide the navigation clearance under the river crossing structures such as bridges, overhead electrical lines etc. and SLWL is a reference water level for estimating navigability. It is found that SHWLs have lowered since 1991 when Interconsult, a Norwegian firm determined it considering data measured in 166-gauge stations. Lowering the water levels will provide more clearances for the vessels operating beneath the structures and is likely to decrease cost of future bridges.

Hydrological and morphological conditions as well as size, type and intensity of inland water traffic have changed after last reclassification of the waterways of Bangladesh in 1989. Moreover, IWM predicted that the cargo traffic will increase significantly by 2030 though passenger traffic is declining in recent years. IWM classified the inland waterways in Bangladesh into six classes on the basis of least available depth (LAD), waterway importance, IWT traffic intensity, and dependency level in present and future conditions. The new classification system has expanded the total length of classified waterways from 5,968 km to 16,155 km incorporating economically and socially potential routes, particularly in the northeastern region and Chittagong Hill Tracts.

IWM also devised draft new rules for controlling installations in waterways on the basis of the new classification and removing the ambiguities in the previous rules. The new classification and the proposed rules are expected to have significant beneficial impacts on inland goods transport and decreasing transport costs.



Reclassified Inland Waterway Map



Bridge Over Inland Waterways

IWM has Supervised Dredging and Environmental Impact in Four Rivers of Bangladesh

IWM oversaw the performance of dredging and has monitored the morphological and environmental impacts in four rivers across Bangladesh: Old Brahmaputra, Dharala, Punarbhaba, and Tulai. These rivers span the districts of Jamalpur, Sherpur, Mymensingh, Lalmanirhat, Kurigram, Naogaon, and Dinajpur. Out of four, Dharala and Punarbhaba are transboundary rivers, while the Old Brahmaputra experiences tidal effects.

The main objective of the project is to improve the dry season water flow, enhance navigability and manage flooding through detailed design, technical supervision and monitoring of capital and maintenance dredging operations. Key activities include planning and designing dredging operations, supervising dredging activities, offtake management, and creating structures like bank protections, water control structures, landings, and office buildings. The project also includes environmental impact assessment and monitoring as essential components.

IWM conducted hydrographic surveys and is supervising capital and maintenance dredging performance and verifying dredged volumes in collaboration with BIWTA and contractors. A mathematical hydrodynamic and morphological model is used to assess the dredging volume and frequency of maintenance dredging, and the dredged material management plan is updated accordingly. Regular progress meetings and stakeholder workshops are also held to address conflict resolution.

Environmental impact assessments comprise evaluating the physical, biological, and social environments, monitoring water resources, fisheries, and flooding. IWM conducts regular hydrographic and bathymetric surveys to measure dredging progress and the findings are submitted as part of the Environmental Management Plan. The project also considers factors such as water availability, navigation depth, irrigation, crop patterns, fisheries, and livelihoods to establish an informed decision-making system for river dredging.



Dredging of Old Brahmaputra



Spoil Disposal Management



BIWTA Office Building Plan at Dinajpur



Stakeholders Consultation Meeting

Accelerating the Implementation of the BDP2100 through IWM Support



IWM has been actively contributing to the acceleration of the Bangladesh Delta Plan 2100 (BDP2100) implementation. This comprehensive plan was adopted by the government of Bangladesh in September 2018 with a vision to achieve a safe, climate-resilient, and prosperous delta. The BDP2100 seeks to integrate the short to medium-term aspirations of Bangladesh to achieve Upper Middle-Income Country (UMIC) status, eliminate extreme poverty by 2030, and achieving the status of a developed country by 2041 with the longer-term challenges of Climate Change and Socio-economic changes through integrating adaptive strategy in the multi-sectoral vision aiming water, food security, economic growth, and the environmental sustainability. The BDP 2100 has made a paradigm shift in the development planning horizon of Bangladesh by integrating the Adaptive Delta Management (ADM) approach as a planning and decision-making framework.

IWM has been instrumental in developing the Delta Appraisal Framework (DAF), which incorporates Adaptive Delta Management (ADM) principles. This framework addresses the existing gaps in the current guidelines for public sector project preparation and appraisal, ensuring that BDP2100-related projects are evaluated using a robust and adaptable approach. The proposed solution to this systemic problem is the adoption of the “Delta Appraisal Framework (DAF)” by incorporating ADM principles into it for selecting and appraising BDP 2100-related projects. Green and Climate Resilient Development Policy Credit of the World Bank supports the Government of Bangladesh through the General Economic Division (GED) of the Bangladesh Planning Commission to prepare a Delta Appraisal Framework, formulate technical contents of the Delta Act, and provide technical annex of Bangladesh Water Rules (2018) to conform to ADM for accelerating the implementation of BDP 2100. Multi-criteria Analysis (MCA) has been adopted in DAF to evaluate and rank BDP 2100 related projects/programs for

selection and inclusion in the Annual Development Program (ADP), Revised Annual Development Program (RADP), Investment Program (IP) and appraisal for approval.

The framework's (DAF) criteria for appraising BDP2100-related projects include alignment with BDP2100 goals and strategies, climate vulnerability and risk, cross-sectoral integration and cost/benefit analysis of delta and climate change components, alternative adaptive pathways, robustness, flexibility, and scalability. In addition to developing the DAF, IWM is providing technical support for policy formulation, including the creation of technical content for the Delta Act and annexes for the Bangladesh Water Rules (2018). IWM also focuses on capacity building through workshops and training sessions, enhancing the understanding and implementation of ADM principles among stakeholders. These efforts are crucial for achieving Bangladesh's vision of becoming a developed country by 2041, ensuring sustainable and climate-resilient development in the face of ongoing climate and socio-economic challenges.



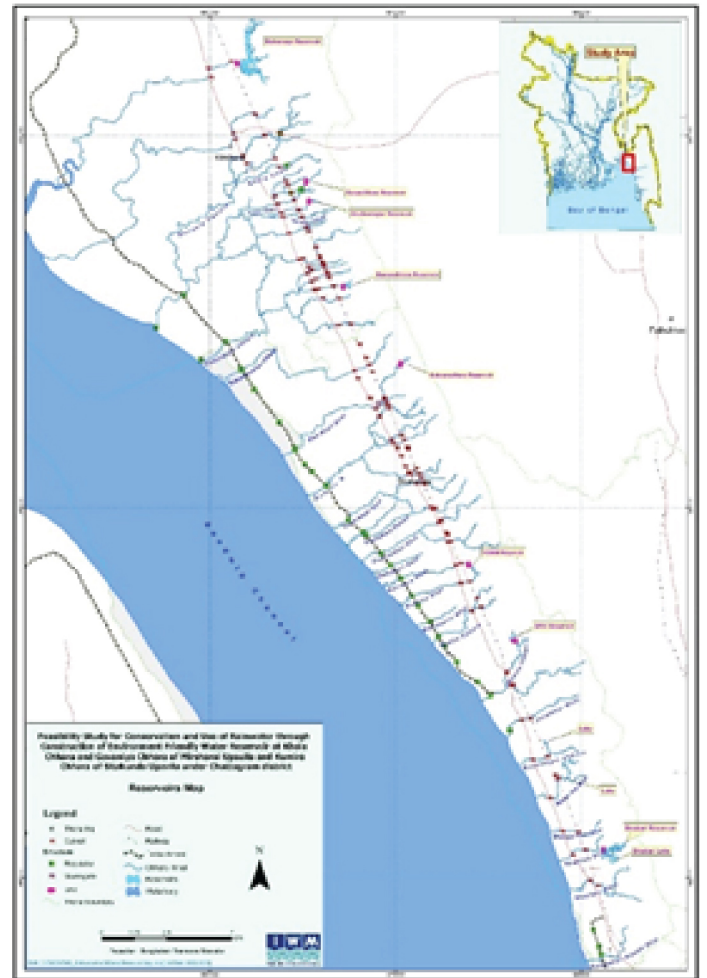
BWDB Assigned IWM to Conduct a Feasibility Study for Eco-Friendly Rainwater Reservoirs in Chattogram

IWM has successfully conducted a project named 'Feasibility Study for Conservation and Use of Rainwater through Construction of Environment-Friendly Water Reservoir' for the Bangladesh Water Development Board (BWDB), focused on assessing the viability of constructing water reservoirs in the Mirsharai and Sitakunda Upazilas of Chattogram district. The project aimed to address the water crisis in the area, particularly during dry months, by harnessing rainwater through eco-friendly reservoirs.

The study focused on the unique geographical characteristics of the area, which is flanked by hills to the east and the sea to the west. Numerous Chharas (creeks) originate from the hills and flow downstream to the Sandwip Channel of the Bay of Bengal. These Chharas experience significant flow during monsoon but hold minimal water during dry months. This results in a severe potable water shortage for domestic, agricultural, and industrial use.

The services provided encompassed a comprehensive assessment of water conservation possibilities in the target area. This involved identifying suitable Chharas and delineating their catchment areas, evaluating surface water availability, quality, and future demand for agriculture, domestic, and industrial purposes. Advanced hydrological and hydraulic modeling was employed to design structures effectively, while meticulous design and cost estimation ensured feasibility. Economic analysis scrutinized financial viability, while environmental and social impact assessments addressed sustainability concerns.

IWM identified 24 hilly Chharas in the study area, with detailed assessments conducted on Govania Chhara, Khoia Chhara, Kumira Chhara, and Joramtol Khal. The proposed solution includes the construction of water reservoirs at Govania Chhara, Chhoto Kumira Chhara, and Joramtol Khal, along with intermediate water control structures to facilitate water



conservation and usage. By addressing technical, economic, environmental, and social considerations, the study supports informed decision-making by the BWDB toward sustainable water management and rural development in the Chattogram district.



IWM Advances Agricultural Productivity by Introducing Khamari App for Development of Upazila Land Suitability Assessment and Crop Zoning System of Bangladesh (Phase-II)

IWM played an important role in the "Development of Upazila Land Suitability Assessment and Crop Zoning System of Bangladesh" project, Phase II. This initiative, led by the Bangladesh Agricultural Research Council (BARC) in collaboration with IWM, aims to enhance agricultural productivity across 195 Upazilas by optimizing land use through advanced Geographic Information System (GIS) and Remote Sensing (RS) technologies.

Key objectives of this phase include enhancing the existing online GIS-based Crop Zoning Information System (CZIS) software and the 'Khamari' mobile app, consolidating information dissemination services, and developing a land parcel/Union-based crop-specific fertilizer recommendation system. IWM is also focusing on the design and optimization of online GIS-based software for data management, crop suitability analysis, and zoning, along with creating and optimizing a mobile app for disseminating crop zoning information. Additionally, an Agri-advisory portal is being established, and comprehensive software documentation and user manuals are being prepared. To ensure sustainable impact, IWM is strengthening the technical capacity of BARC's ICT Unit through targeted training programs.

The project aims to empower farmers with valuable insights and resources, fostering sustainable agricultural practices and driving economic growth across Bangladesh. This project underscores IWM's commitment to leveraging advanced technology for sustainable development and agricultural excellence. For further details, visit cropzoning.gov.bd.



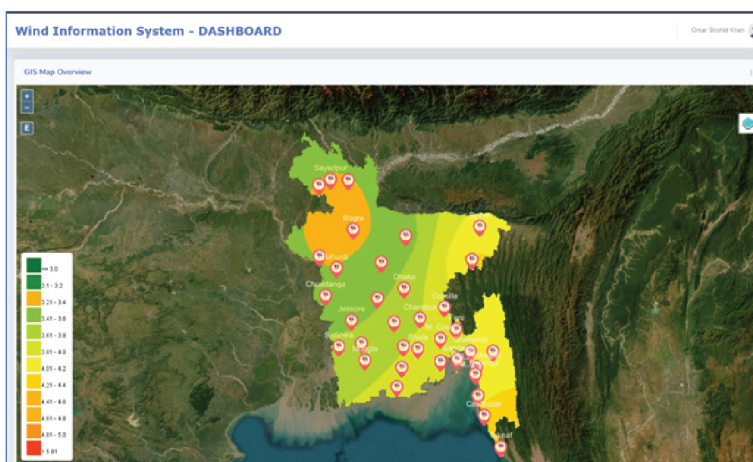
IWM Prepared of GIS-Based Dynamic Wind Map of Bangladesh

IWM has been entrusted by the Sustainable & Renewable Energy Development Authority (SREDA) to develop a Web-GIS Based Dynamic Wind Map of Bangladesh, a crucial step towards harnessing the country's wind energy potential. The Government of Bangladesh has set an ambitious target to generate 10% of its electricity from renewable energy sources by 2030. However, as of now, only 3.72% of this goal has been achieved, with a mere 3% contribution from wind energy. The Honorable Prime Minister envisions ensuring affordable and quality energy supply for all, making this initiative a significant stride towards that vision.

The GIS-based software solution being developed by IWM will enable comprehensive wind data mapping, including historical wind analysis, wind prediction, and wind status monitoring. This data will be presented in a web-based GIS map, showcasing wind speed, wind direction, and Wind Power Density (WPD) across Bangladesh. The application will also integrate GIS layers from eleven other organizations, including the

Roads and Highways Department (RHD), Bangladesh Water Development Board (BWDB), Ministry of Disaster Management and Relief (MoDMR), Forest Department, Survey of Bangladesh (SoB), Department of Shipping, Power Grid Company of Bangladesh (PGCB), Power Development Board (PDB), Civil Aviation Authority of Bangladesh (CAAB), Bangladesh Economic Zones Authority (BEZA), and Bangladesh Meteorological Department (BMD).

The custom-developed software and data will facilitate the estimation of suitable sites for wind turbine installation, significantly boosting the country's renewable energy capabilities. Upon completion, the application will be deployed on SREDA's live server, and two training sessions will be provided—Basic GIS Training and Web Application Training—ensuring that SREDA can operate the application independently. Developed with open-source technologies such as Geo Server and the PostgreSQL database system, this project underscores IWM's commitment to leveraging advanced technology for sustainable development.



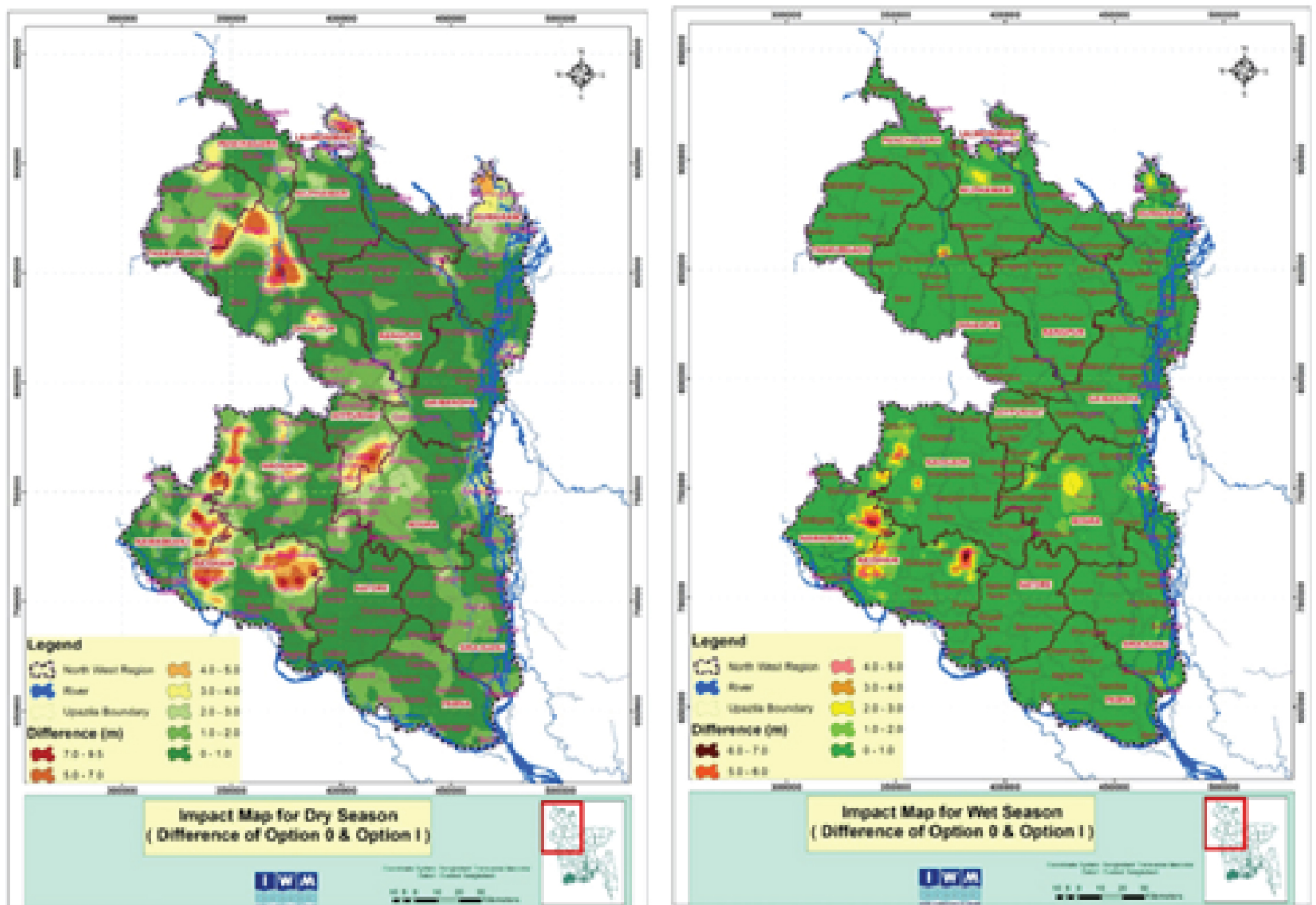
Demonstration of the First Version of the Wind map, showing the locations of wind stations, and wind speed interpolated grid map at a height of 40 meter above the ground level.

Groundwater Management for Food Security: CSIRO Funded and IWM Initiative in Northwest Region of Bangladesh

IWM has completed an important project aimed at “Sustaining groundwater irrigation for food security in the Northwest Region of Bangladesh”. This project, funded by the Commonwealth Scientific and Industrial Research Organization (CSIRO) focused on improving the integrated management of water, food, and energy in South Asia while addressing gender and climate change impacts.

Key services provided by IWM included updating the groundwater trend analysis model with the latest data and running various scenarios; recalibrating the regional hydrological model for dry season flows and analyzing water balances at the catchment level (or district level); updating and recalibrating existing groundwater models using new data from pumping tests and running sustainable groundwater use scenarios. Additionally, IWM prepared comprehensive reports on these activities, served as the local focal point for the project, and organized various workshops and meetings to ensure the project's successful implementation and delivery.

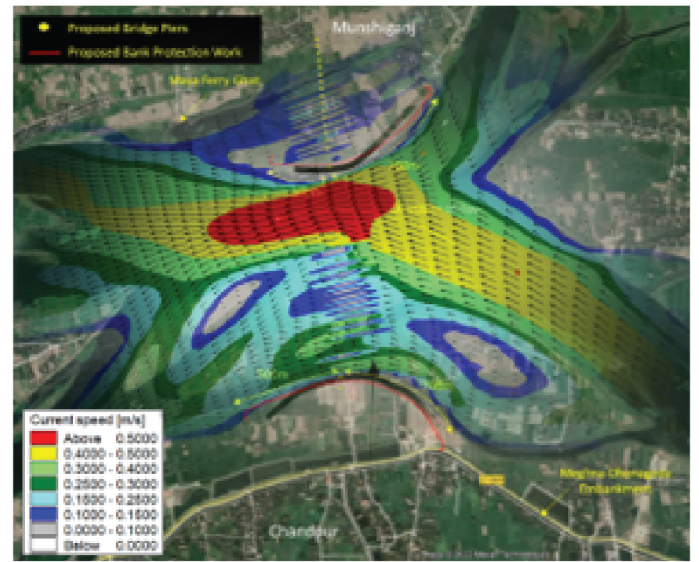
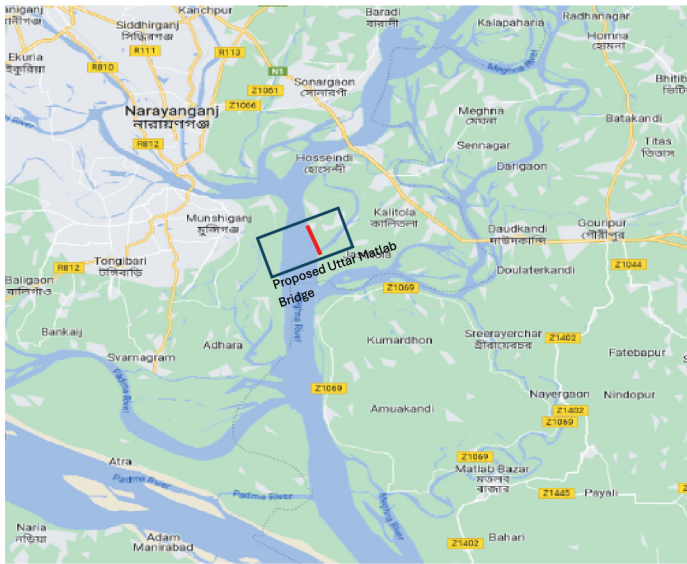
The project's outcomes are expected to significantly contribute to sustainable groundwater management and enhanced food security in the region, providing valuable insights and frameworks for integrated resource management.



IWM Conducts Hydro-Morphological Study for Proposed Matlab Uttar Bridge Under Master Plan of BBA

As part of the ambitious road map and action plan (Master Plan) by the Bangladesh Bridge Authority (BBA), the proposed construction of the Matlab Uttar Bridge over a branch of the Meghna River, approximately 10.30 km downstream of the existing Daudkandi Bridge, marks a significant step toward enhancing nationwide road transport connectivity. This initiative is expected to contribute to the balanced economic growth of Bangladesh by improving infrastructure across the country.

In collaboration with the Spanish consultancy firm TYPASA, IWM has undertaken a comprehensive hydro-morphological study during the feasibility stage of the Matlab Uttar Bridge project. The study focuses on analyzing potential planform changes in the vicinity of the proposed bridge alignment. IWM has also provided detailed hydraulic design variables for the bridge, ensuring that the structure will be resilient against environmental challenges.



To safeguard the bridge and surrounding areas, IWM has recommended the construction of guide bunds on both banks, taking into account ongoing and potential future developments. Furthermore, the study considers the probable worst-case scenarios resulting from climate change, particularly under the

RCP 8.5 scenario, to ensure the bridge's hydraulic design is robust and future-proof. The successful implementation of this project under BBA's Master Plan is expected to significantly enhance transport connectivity and boost economic development across all regions of Bangladesh.



Extensive River and Topographic Surveys under FRERMIP Project-2 for Future Planning

The Survey and Data Division of IWM has successfully completed an extensive river and topographic survey under the Flood and Riverbank Erosion Risk Management Investment Program (FRERMIP) Project-2 under BWDB and financed by ADB. This comprehensive program was from 2022 to 2024 which included five distinct types of hydrological and hydrographical surveys. The objectives of the program are to:

- o Improve the livelihood of people in the project area,
- o Enhance resilience to flood and riverbank erosion risks through the improvement of infrastructure, strengthening of institutional capacity, and the update and expansion of the knowledge base,
- o Establish integrated structural and nonstructural risk management measures at priority erosion sites and address their sustainability.

Under the river surveys, (i) bathymetry survey has been conducted in different seasons for the lower Jamuna, lower Ganges, and upper Padma rivers for documenting the channel characteristics. This included capturing dynamic changes towards the end of the flood season and understanding the river conditions during low flow periods.

(ii) cross sections and discharges for important distributaries i.e. Pungli and Dhaleswary rivers were surveyed to determine flow characteristics and discharge capacity.

(iii) A multibeam survey of the Pungli offtake was conducted to analyze its shape and development.

(iv) Sediment sampling and analysis at 3-day intervals at seven selected key locations, provided critical data on the sediment load transported by the river during the flood season for sediment monitoring,

(v) Sediment dunes were also monitored using a multibeam echosounder and (vi) discharge measurements using ADCP and float tracking has been conducted for determining the flow characteristics.

Under the topographic surveys, (i) photogrammetric and LIDAR surveys have been conducted for proposed and existing embankments (127.8 km) and bank protection works (53.14 km) using drones. These surveys documented physical features for accurate mapping and produced high-resolution point cloud data for accurate Digital Terrain Models (DTM).

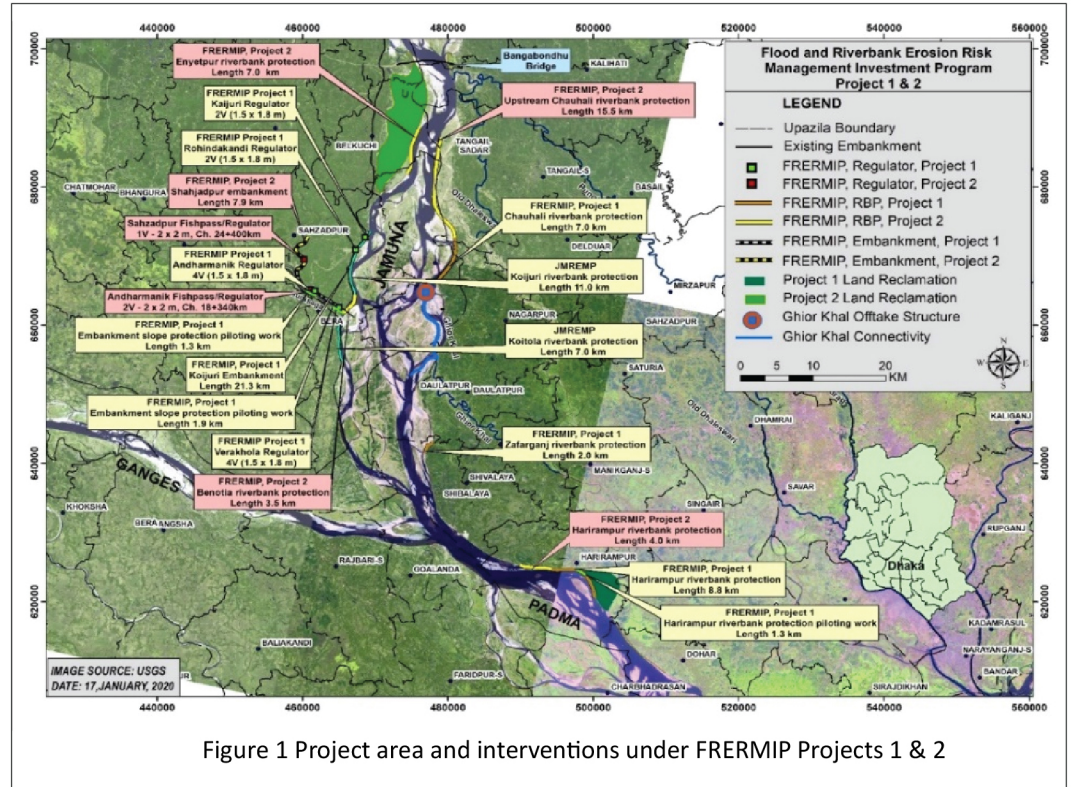


Figure 1 Project area and interventions under FRERMIP Projects 1 & 2

The topographic and bathymetric data collected under this project are invaluable. These datasets are crucial for various analyses, such as sediment studies and examining the relationship between sediment load and water velocity. To ensure their utility for future projects and research, all collected data have been submitted to the project authority and the consultant.

The successful completion of these surveys marks a significant milestone in understanding and managing the hydrology and topography of Bangladesh's major rivers. The insights gained from this project will play a vital role in mitigating flood risks and managing riverbank erosion, contributing to the overall resilience and safety of the region.

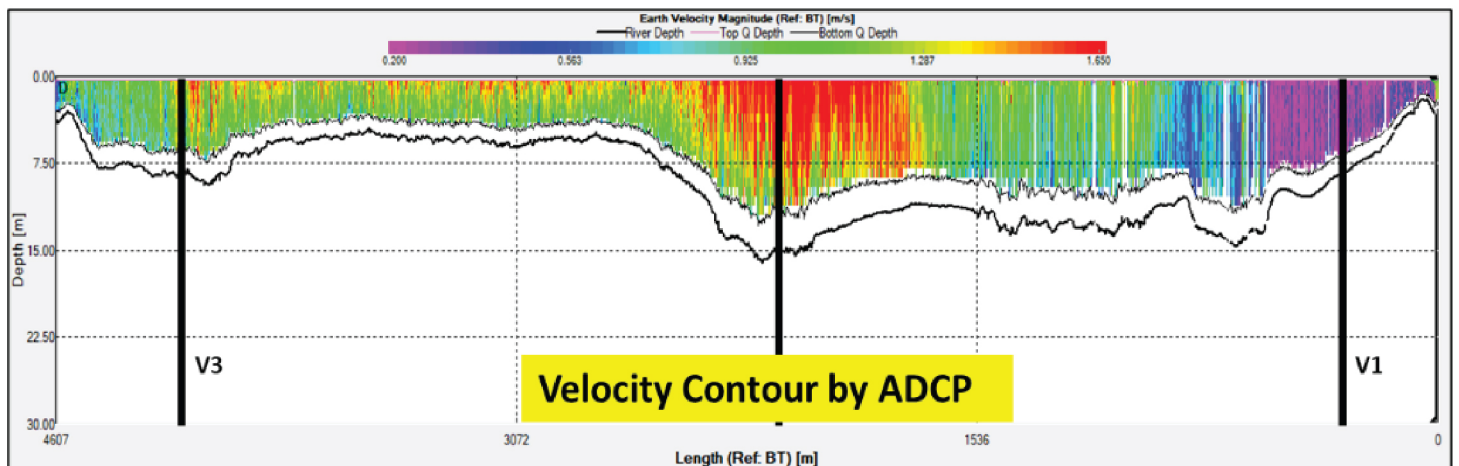


Figure: Velocity and backscatter contours of the Jamuna river at Chauhali

Monitoring and Supervision of Water Supply and Sanitation Schemes and establishment of ICT monitoring system Under EMCRP: A Collaborative Effort by DPHE and IWM

According to the UN Refugee Agency (UNHCR), in response to the influx of over 723,000 Forcibly Displaced Myanmar Nationals (FDMN) from Myanmar have fled to Bangladesh since 25 August 2017. They took shelter for living at the 33 camps and more than 15% of FDMN sheltering with the host communities in Ukhiya and Teknaf Upazilas of Cox's Bazar district. As of 31 December 2023, the number of 971,904 Rohingya refugees have been issued documentation jointly by the Government of Bangladesh and UNHCR. This creates tremendous pressure on available temporary water sources (mainly groundwater) and sanitation facilities. The excessive pressure on the aquifer is lowering the water levels in the camp areas as well as in the adjacent areas.

To ensure the Sustainable Development Goal (SDG 6), safe water and sanitation is a priority. The Department of Public Health Engineering Department has taken a project under the Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP). The project is being implemented by the Additional Financing from the World Bank which will improve access to safe water and sanitation in the host community as well as at the Rohingya Camps.

In this connection, DPHE has engaged the IWM to oversee and manage a range of interventions, including mini piped water supply systems, point water sources, rainwater harvesting, public toilets, bio-fill toilets, fecal sludge and solid waste management systems, and more.

IWM's role encompasses reviewing the design of water and sanitation services, supervising construction, and providing project management support. Additionally, they are responsible for monitoring the implementation of the Environmental and Social Management Plan (ESMDP) across all

related activities.

This collaboration builds on IWM's previous experience, where they provided technical support to DPHE for similar interventions from October 2019 to December 2022. The continued partnership reflects a sustained effort to address the water and sanitation needs of both the Rohingya refugees and the host communities, ensuring that these essential services are delivered sustainably and effectively.



Training to Rohingya beneficiaries on Operation and Maintenance at Camp



Fecal sludge treatment plant at Rohingya Camp 12



Bio fill Toilet at Ukhiya for Host communities



Community Tubewell at Ukhiya for Host communities



Water Treatment Plant for Host Communities

LGED Engaged IWM for preparing Pollution Control Master Plan on Meghna River

IWM prepared a Master Plan on the Upper Meghna River from Bhairab Bazar to Chandpur town to protect the river water from pollution and ensure environmental compliance. The Upper Meghna River is being used as a sink for rainfall-runoff of the surrounding catchments as well as the disposal of all types of waste water within this buffer zone of approx. 3,000 km² encompassing 15 Paurashava.

Under this study, IWM monitored year-round water quality of 22 parameters from 21 locations along the Meghna River. A database of water-polluting industries was collected from the DoE district offices and further industrial survey was conducted to gather more information. There are about 1,200 nos. water polluting industries in this vicinity which include Textile, Cement, Chemical, Composite Mill, Dyeing, Washing, Printing, Food, Garments, Glass, Knitting, Machinery, Metal, Paper Mill, Pharmaceuticals, Plastic, Spinning Mill, Steel Mill, Sugar Mill, etc. Moreover, due to the absence of a proper sanitation chain in the surrounding Paurashava and semi-urban area, domestic waste discharges into the river flowing through tributaries of the Meghna River and other canals.

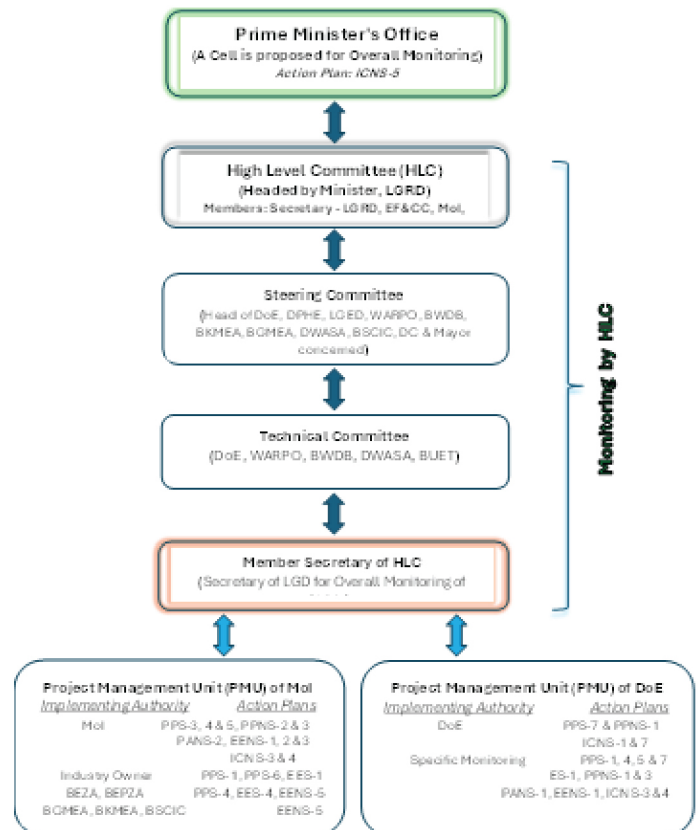
To protect the river from pollution, IWM identified 14 action plans as structural measures and 24 action plans as non-structural measures through analysis of strategic planning processes. The action plans include measures for pollution prevention and enabling environmental as well as public awareness and institutional capacity building. The action plans are prioritized as Very High Priority, High Priority, and Medium Priority based on considering technical issues, socio-economic aspects, interdependency of industries, public health, and future freshwater demand. The Plans are proposed to be implemented by different line agencies under the overall monitoring, coordination, and advice of the Cell of PM's office and HLC as its mandate to coordinate the activities for an integrated approach.

A water quality model was developed and validated for Upper Meghna River to identify the projected pollution situation of the river up to 2041 without and with project interventions as well as the benefits of the action plans. It may cost about BDT 39,117 million in the short term, BDT 232,213 in the medium term, and BDT 139,865 million in the long term for implementation of the Master Plan.



Location of existing industries pollution hotspots

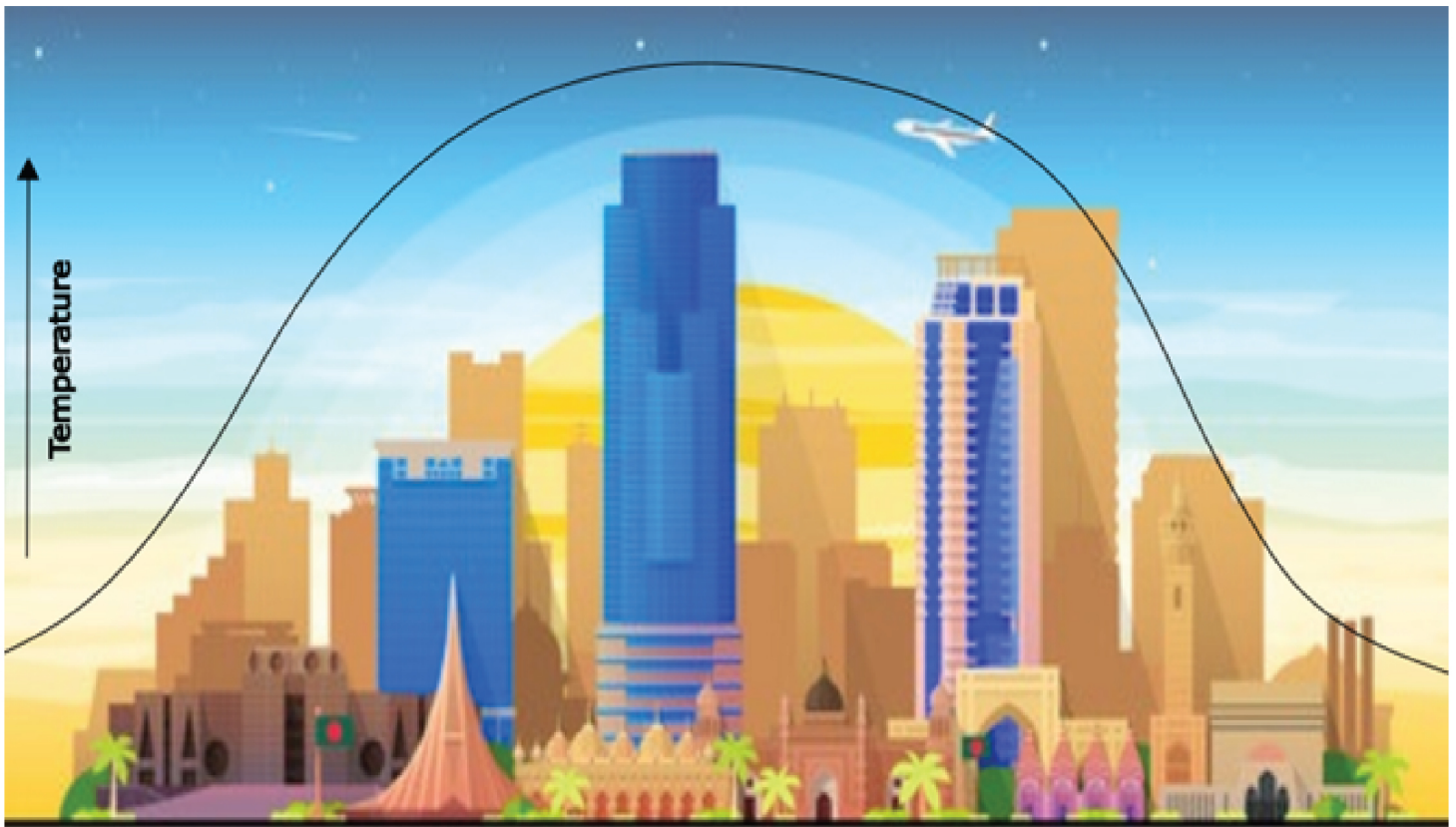
Institutional Arrangement for Implementation of Proposed Action Plans



IWM's Groundbreaking Study on Urban Heat Island Effect in Bangladesh

IWM was engaged in a comprehensive study on the Urban Heat Island (UHI) effect at the city level under different climate change scenarios, focusing on major Bangladeshi cities such as Dhaka and Mymensingh. This study, conducted in collaboration with the Department of Environment (DoE), addresses the pressing environmental challenges posed by rapid urbanization in densely populated countries like Bangladesh.

Urban Heat Islands, characterized by elevated temperatures in urban areas compared to their rural surroundings, exacerbate environmental issues such as air and water quality degradation. This phenomenon is particularly pronounced in Bangladesh, where high population density and climate vulnerability are prevalent. Dhaka, the nation's largest city, has seen significant temperature rises, impacting residents' health and well-being. Similarly, Mymensingh has experienced rapid urban growth, increasing Land Surface Temperature (LST), and decreased vegetation cover.



The project, launched in November 2023, this study aims to investigate the relationship between urbanization and climatic conditions using advanced mapping and climate tools. The research integrates academic insights with practical policy implementation, involving activities such as document research, temperature measurement surveys, and weather station installations in Dhaka and Mymensingh. The study's methodology includes a literature review, satellite imagery analysis, land use assessment, and Land Surface Temperature (LST) calculation, along with climate model downscaling and scenario development to project future temperature changes. Additionally, the study will utilize the CA-Markov prediction model to understand and predict Land Use and Land Cover (LULC) changes. The key output of the study is as follows:

1. Database of Urban Heat Island (UHI) sources and causes,
2. Bias-corrected climate data,
3. UHI maps in present and future climate change scenarios,
4. The heat index, heat stress map, and rainfall variability map,
5. Measures for UHI control

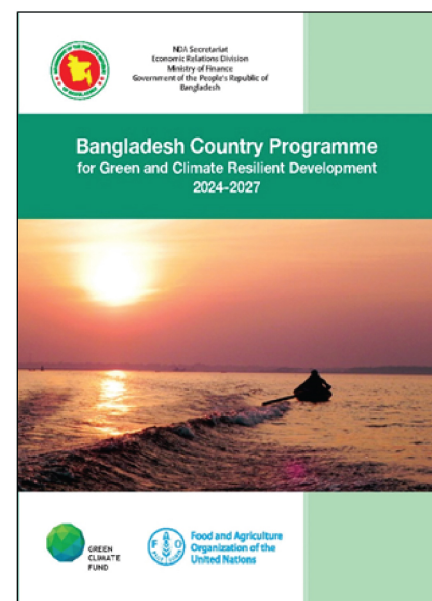
This project aims to contribute to the development of climate-resilient urban frameworks for decision-makers in Bangladesh, particularly for cities like Dhaka and Mymensingh, which face varying levels of urbanization and environmental challenges. By providing a deeper understanding of the UHI effect and offering actionable insights, the study supports the creation of sustainable urban environments in the face of ongoing climate change.

IWM with the Support of ERD is Developing Bangladesh Country Program for Green Climate Fund 2024-27

Bangladesh is one of the most vulnerable countries to climate change impacts. Bangladesh ranked seventh in the Global Climate Risk Index in 2021. The government of Bangladesh currently spends one billion dollars annually towards climate change mitigation and adaptation actions, which is 6-8% of the national annual budget. Bangladesh needs to mobilize and attract an enormous amount of climate finance.

The Green Climate Fund (GCF) was established under the United Nations Framework Convention on Climate Change (UNFCCC) in 2010. It is the largest multilateral global source of climate finance. So far, Bangladesh mobilized 417.41 million US dollars from GCF against 6 projects. Moreover, other bilateral and multi-lateral financing partners and organizations in Bangladesh have also provided climate finance and have expressed a desire to increase their financing to related projects/programs considering climate finance as a priority.

In this regard, IWM was hired by the Food and Agriculture Organization (FAO) for the Technical Upgradation of GCF Bangladesh Country Program (2018), and to develop the Bangladesh Country Program for Green Climate Fund 2024-27.



Major activities carried out by IWM:

- Assessment of the current GCF Country Program and review of the relevant documents, reports, and policy guidelines for Strengthening Bangladesh's (National Designated Authority) NDA Secretariat, Enhancing Pipeline Implementation, and Private Sector Engagement in Effective Climate Action.
- Arranging inception workshops, sectoral workshops, and validation workshops at the national level. Meeting with 11 relevant ministries, 23 stakeholder agencies, representatives from the private sector, NGOs, multi-lateral development banks, bilateral financing entities, research organizations, professional associations, and community representatives to obtain their feedback and recommendations on climate financing and programs/projects for GCF. Multi-criteria analysis was carried out to prioritize green and climate-resilient development projects for GCF funding. In the process, 59 projects were identified with a total estimated investment of around US\$ 16 billion.

IWM Develops Environment Endowment Fund Manual and Investment Policy for Department of Environment

IWM has completed consulting services for the development of an Environment Endowment Fund (EEF) Manual and Investment Policy for the Department of Environment (DoE), Ministry of Environment, Forest and Climate Change. This project, commissioned by the World Bank, ran from April 2023 to June 2023 and aimed to establish a robust operational framework for the EEF under the Bangladesh Environmental Sustainability and Transformation (BEST) Project.

The primary objective of the assignment was to prepare and finalize an operational manual and management guidelines for the EEF. The fund is envisioned to support sustainable environmental initiatives and research projects, promoting long-term ecological resilience in Bangladesh.

Key activities carried out by IWM included conducting a thorough review of relevant Bangladeshi legislation on the operation and management of endowment funds to ensure compliance and legal integrity; developing a comprehensive EEF Operational Manual outlining the fund's governance, administration, and procedural protocols; crafting an EEF Investment Policy aimed at efficiently managing, monitoring, and assessing the performance of the fund's assets to ensure sustainable growth and utilization; and recommending appropriate mechanisms for accounts management, including auditing requirements, to be integrated into both the operational manual and investment plan, with guidelines for managing the principal amount and the utilization of interest or benefits for research and innovation-related projects.

The completion of this project marks a significant milestone in strengthening the financial mechanisms supporting environmental sustainability in Bangladesh. By providing a detailed and actionable framework for the EEF, IWM's efforts will help the Department of Environment manage and deploy the fund effectively, ensuring that financial resources are available for critical environmental projects and research.

Training and Capacity Building Programs 2023

Training and Technology Transfer is a regular activity of IWM that aims to update the human resources of the institute as well as the service users with new knowledge and technology to cope with the new challenges in the water sector. In 2023 around 35 training programs were organized for IWM staff development and capacity building of other organizations in the water sector. Brief information on some important training programs held in 2023 is given below.

Training for Establishment of National Spatial Data Infrastructure (NSDI) for Bangladesh

The objective of the training was to share the latest knowledge and technical skills of modern surveying and mapping technology and the concept and benefits of NSDI including smart city and digital transformation (DX).

The duration of the training was 27 Feb – 15 March 2023. One professional from the ICT Division, IWM participated in this training program.



Training on Survey and Data Collection for FRERMIP-2

The objective of the Training on Survey and Data Collection for FRERMIP-2 was to provide detailed knowledge on GPS-based surveys, the Advantages & disadvantages of satellite-based surveys over conventional surveys and different terminologies, and show the Application of Hydrographic Survey Equipment like Echosounder, Multibeam Echosounder, Sub-bottom Profiler, Side-scan Sonar, and Acoustic Doppler Current Profiler. The duration of the training was 18 Jun – 22 June 2023. 12 professionals from BWDB and 4 participants from IWM participated in this training program.

Training program on Air Quality Modelling

The objective of the Training program on Air Quality Modelling was to provide the participants with an in-depth discussion on the subject for better understanding. In this one-day training session, 15 professionals participated from WSU, IGW, RME, CPI Division, and RID Unit of IWM. The training program was held on 17 July 2023.

Training on Management of Water Resources in Bangladesh

The main objective of this training program was to give the participants hands-on training on different river management practices like; dredging, river bank protective works, etc. To make the training more beneficial for the participants two field

visits have been arranged by the IWM authority for the participants and the Trainer. 18 Professionals from SDT, RME, CPI, WSU IGW Divisions from IWM participated in this training program on 16 July 2023.



Application of Mathematical Modelling and GIS Technology for Feasibility Study of Water Development Projects

The objective of this training program was to achieve the necessary knowledge and skills in the development and application of the mathematical model to analyze the state of water resources, generate required data for feasibility study, and carry out impact assessment of various development options. The duration of the training was from 23 July 2023 to 03 August 2023. 21 professionals from different government and non-government organizations such as DSCC, LGED, SOB, GSB, RRI, Bangladesh Navy, CUET, WaterAid, EQMS, UAP, O.Creeds, and IWM participated in this training program.

Certificate Course on Leadership & Managerial Competencies (CCLMC)

The objective of this training program was to address broad expectations on self-understanding as it is an important building block on which enduring leadership capabilities can be developed. Two participants from HRD and SPB Unit of IWM participated on this training program. The duration of the training was 25- 26 August 2023.

Industrial Training for the students of the Water Resources Engineering Department, CUET

The objective of this industrial training program was to provide real-world insights and practical knowledge that will be instrumental in the participant's academic and professional development. 8 participants from the Water Resources Engineering Department, CUET participated in this industrial training program. The duration of the training was 20 Sep 2023 to 03 Oct 2023.



Training on High-Resolution Satellite Images for DLRS

The objective of this training program was to provide training on capacity building for processing High-Resolution Satellite Images. 15 Professionals from the Land Record and Survey Department (DLRS) participated in this training session. The Duration of the training was 24 Sep 2023 to 01 Oct 2023.

Internship program for students from WRE, BUET

The objective of this Internship program was to provide real-world insights and practical knowledge that will be instrumental in the participant's academic and professional development. 15 participants from Water Resources Engineering Department, BUET participated on this industrial training program. The duration of the training was 05-16 November 2023.



Training on MIKE 21C, a Hydro-morphological Modelling Tool

The objective of this training program was to capacity building on the Hydro-morphological Modelling Tool. The duration of the training was 18-19 Nov 2023. 06 professionals from the RME Division, IWM participated in this training program.

Training on “MIKE 21C River Morphology”

The objective of this training program was to provide in-depth

knowledge on Grid Generation, Hydrodynamics, Helical Flow, Sediment Transport, Morphological Modelling, Bank Erosion, Jamuna Bridge Modelling, and Simulation of Jamuna River Braiding. The duration of the training was 16-29 Nov 2023. 01 professional from the RME Division, IWM participated in this training program.



Training Program on Numerical Modelling and GIS Mapping for BWDB Officials in c/w Flood & Riverbank Erosion Risk Management Investment Program (FRERMIP) Project-2

The objective of the Numerical Modelling and GIS Mapping training program was to better understand Mathematical Modelling, Erosion and Scour Mechanism and Protection measures, Different applications of One-Dimensional Hydrodynamic Modelling, and Learning DEM, DSM, DTM, etc. The Duration of the training was 21-25 Jan 2024. 12 professionals from BWDB participated in this training program.

Training Program on Water Supply Network Modelling for DWASA

The objective of this training program was to capacity building on Water Supply Network Modelling and Designing. The duration of the training was 13-19 Feb 2024. Ten professionals from DWASA participated in this training program.



Major Workshops and Seminars

National Workshop on Hydrological Investigation and Modelling of the State of Surface and Groundwater Resources in the High Barind Region



The National Workshop on Draft Final Report (DFR) of the study “Hydrological Investigation and Modelling of the State of Surface and Groundwater Resources in the High Barind Region” was held on 25 June 2023 at Pan Pacific Sonargaon, Dhaka. The workshop was attended by the participants from Planning Commission, Ministry of Water Resources, BWDB, DBHWD, BUET, SDC, SRC, DASCOH, DPHE, BADC, BMDA and other organizations. Mr. Zaheed Farooque, MP, Honorable Minister of State, Ministry of Water Resources were present at the workshop. The study objectives, methodologies, findings, and recommendations have been presented in the workshop. After a thread bore discussions, some comments and suggestions have been recommended on the DFR.

Consultation Workshop on Detailed Study for Restoration and Development of Water Resources Management System of Polder 31 under Dacope Upazila in Khulna District



IWM arranged a consultation workshop on Detailed Study for Restoration and Development of Water Resources Management System of Polder 31 under Dacope Upazila in Khulna District on 30 September 2023 at Chalna Pourashova, Dacope, Khulna. The workshop was arranged for discrimination of information regarding the present situation, study results, proposed interventions, and cumulative impacts of proposed interventions. Mr. Panchanan Biswas, MP, Hon'ble Whip, Bangladesh National Parliament and Member of the Parliament, Khulna-1 graced the occasion as Chief Guest. Guests of Honor were Advocate Gloria Jharna Sarkar, MP, Member of Parliament, Reserved seats for Women-30, and Mr. Nazmul Ahsan, Secretary, Ministry of Water Resources. Special Guest was Mr. SM Shahidul Islam, Director General, BWDB; Muhammad Amirul Haq Bhuiya, Additional Director General, Western Region, BWDB; Md. Moniruzzaman, Additional director General, Planning Design & Research, BWDB and Representative from DC Khulna. The workshop was presided over by Md. Shafi Uddin, Adl. Chief Engineer (Civil), South-Western Region, BWDB, Khulna.

IWM with the Support of ERD, Organized a Validation Workshop of the Green Climate Fund (GCF) Country Programmed Bangladesh (2024)



Institute of Water Modelling (IWM) has been engaged to provide support in formulating the Bangladesh Country Programmed 2024-2027 for Green and Climate Resilient Development with Funding from the Food and Agriculture Organization (FAO). Ms. Sharifa Khan, Senior Secretary, ERD, Mr. Robert D Simpson, Country Representative, Food & Agricultural Organization (FAO) Country representative along with senior officials from the ministry, development partners, NGOs, civil society, and private sector participated in the validation workshop at NEC-2, Planning Commission, Dhaka.

Consultation Workshop on ‘Developing Water Supply and Sanitation Regulatory Mechanism’



IWM organized a consultation workshop titled ‘Water Supply and Sanitation Regulatory Mechanism Development’ at Padma Hall Room, Hotel Pan Pacific Sonargaon, Dhaka on 28th January 2024. The consultation workshop in Bangladesh aimed to discuss the establishment and implementation of the Water Supply and Sanitation Regulatory Mechanism (WSSRM), involving diverse stakeholders. The target of the occasion was to clarify WSSRM's objectives, functions, and institutional arrangements, contributing to effective governance and enhancing water supply and sanitation services' access, quality, and sustainability. Mr. Muhammad Ibrahim, Secretary of the Local Government Division, graced the occasion as Chief Guest. Dr. Malay Choudhury, Additional Secretary of the Water Supply Wing, Local Government Division, chaired the workshop. Mr. Numeri Zaman, Joint Secretary of the Policy Support Branch, Local Government Division, delivered the welcome speech. Around 95 representatives from all relevant Ministries, affiliated agencies, water utilities, private sector entities, research organizations, and Universities participated in the workshop.³

Workshop on Study for Assessment of the Effectiveness of Constructed Rubber Dams in Bangladesh



The workshop for the progress of work of the project “Study for Assessment of the Effectiveness of Constructed/ to be Constructed Rubber Dams in Bangladesh” was held on 27 February 2024 at Shech Bhaban Auditorium, Sher-E-Bangla Nagar, Dhaka. Mr. Abdullah Sazzad NDC, Chairman (Grade-1), Bangladesh Agricultural Development Corporation (BADC) graced the occasion as Chief Guest. The workshop was attended by participants from BADC, BWDB, Bangladesh Agricultural University (BAU), BUET, and other organizations. The study objectives, methodologies, and progress of work have been presented in the workshop by Goutam Chandra Mridha, Director, Irrigation, Groundwater and Wetland Management, IWM. After a detailed discussion, some comments and suggestions have been recommended.

IWM participated in ‘Sustainable Water Management Expo-2023’



IWM participated in the ‘Sustainable Water Management Expo-2023’ held from 20th to 22nd March 2023 at International Convention City, Bashundhara. This expo covered topics related to Water and Wastewater Management for the Government and Private Sector, WASH, and Rainwater harvesting through number of technical sessions. IWM professionals presenting a session on Wastewater management (top). Ms. Ismat Ara Pervin, Senior Specialist, IWM described the contribution of IWM in the WSS sector to Mr. AKM Enamul Hoque Shameem, Deputy Minister, Ministry of Water Resources during his visit to IWM Stall.

High Officials of the Department of Bangladesh Haor and Wetlands Development Visits IWM



Md. Akhtaruzzaman, Director General of the Department of Bangladesh Haor and Wetlands Development (DBHWD) with High Officials visited IWM. Mr. Zahirul Haque Khan, Executive Director of IWM welcomed Md. Akhtaruzzaman and his team with a floral bouquet. The Executive Director briefly presented the activities of IWM. They were highly impressed with the work environment of IWM and discussed the future collaborations in Sustainable Development and Water-related research for Haor and Wetlands area.



High Officials of Bangladesh Agricultural Research Council (BARC) Visits IWM

Dr. Shaikh Mohammad Bokhtiar, Executive Chairman of Bangladesh Agricultural Research Council (BARC) with High Officials visited IWM. Mr. Zahirul Haque Khan, Executive Director of IWM welcomed his team with a floral bouquet and briefly presented the activities of IWM.

Embassy of the Kingdom of the Netherlands (EKN) Visits IWM



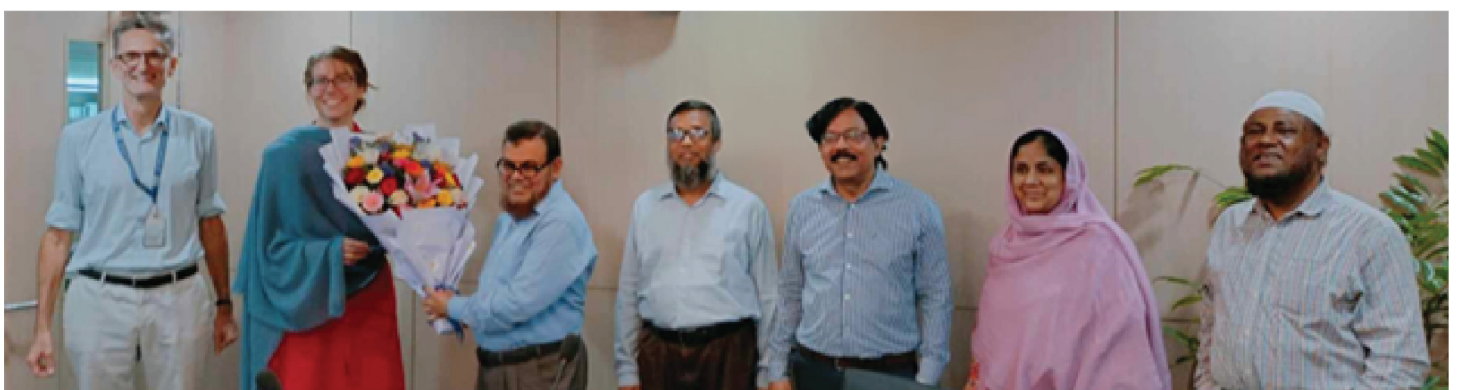
Ms. Neeltje Kielen, Delegated Representative for Water, along with Md. Shibly Sadik, Senior Water Resources Policy Advisor from EKN, visited IWM on 09th August 2023. Mr. Zahirul Haque Khan, Executive Director of IWM welcomed Ms. Neeltje and her team and briefly explained the activities of IWM. During her visit, discussions were held regarding the professional-level cooperation between the EKN and IWM, underlining the nation's ongoing commitment to global water sustainability efforts.

World Bank Team Visits IWM



Ms. Swarna Kazi, Senior Disaster Risk Management Specialist at the World Bank, Bangladesh, and her team visited IWM. Mr. Zahirul Haque Khan, Executive Director of IWM welcomed Ms. Swarna Kazi and her team with a floral bouquet and briefly explained the activities of IWM. During her visit, discussions were held regarding the professional level of cooperation between the World Bank and IWM's field of expertise, potential research, and frequent future collaborations. They visited different Technological and Professional capacities of the IWM and were highly impressed with the work environment of IWM. They were very hopeful of future continued collaboration in every respect with IWM.

National Hurricane Center, USA Team Visits IWM



The Executive Director of IWM welcomes a High Official of the National Hurricane Center and Central Pacific Hurricane Center and discusses About Future Collaborations in Coastal Water Research.

Honorable Delegates of the Ministry of Energy, Water Resources & Irrigation, Government of



Honorable Delegates of Nepal with Executive Director of IWM and Chairperson, IWM Board of Trustees. Mr. Zahirul Haque Khan, Executive Director of the Institute of Water Modelling (IWM) invited a group of high officials of the Ministry of Energy, Water Resources & Irrigation, Government of Nepal on a knowledge-sharing program in October 2023. The visit is in connection with the project of IWM titled 'Development of Flood Forecasting and Early Warning System for Karnali and Narayani River Basins in Nepal'. During the visit, discussions were held regarding the cooperation between the Ministry of Energy, Water Resources & Irrigation, Government of Nepal, and IWM on water-related study, research and future collaborations.

Malaysian Experts Visited IWM



A group of Malaysian experts recently visited the Institute of Water Modeling (IWM) in connection with the Bangladesh Surface Water Supply and Sanitation Project (BSMSN) Water Treatment Plant (WTP) project. This collaborative initiative signifies the ongoing partnership between Malaysia and Bangladesh in the realm of water management and infrastructure development. During their visit, the experts engaged in discussions, knowledge sharing, and technical exchanges with IWM professionals, aimed at leveraging expertise and best practices to enhance the efficiency and effectiveness of the BSMSN WTP project.

Overseas Experience & Recognition

The Chairperson of the IWM Board of Trustees (BoT) was Present at AGM of the IWM Malaysia Office



Mr. Nazmul Ahsan, Secretary, Ministry of Water Resources, & Chairperson, IWM Board of Trustees (BoT) and Md. Zahirul Haque Khan, Executive Director, Mr. S M Mahbubur Rahman, Deputy Executive Director (Planning & Development), Md. Sohel Masud, Director, Water Supply, Sanitation and Urban Water Management Division (WSU) Division of IWM, and high officials of the National Water

The Chairperson of IWM Board of Trustee (BoT) and Executive Director of IWM Visited Nepal



A high-level delegation, led by Mr. Nazmul Ahsan, Secretary of the Ministry of Water Resources, and Chairperson, of the IWM Board of Trustees visited Nepal in response to an invitation from the management team overseeing the study on "Flood Forecasting and Early Warning System for Karnali and Narayani River Basins" at the Department of Hydrology & Meteorology (DHM), Nepal. The delegation, which included Md. Zahirul Haque Khan, Executive Director of the Institute of Water Modelling (IWM), highlighted a collaborative effort to address water-related challenges in the region and emphasized the significance of expertise in developing effective flood forecasting and early warning systems.

IWM Participated in a knowledge-sharing Workshop at WRD, Bihar, India



IWM Professionals participated in a knowledge-sharing workshop for the Operation of Flood Management Support Systems to Mathematical Modelling Center (MMC) of the Water Resources Department (WRD), Government of Bihar, India.

IWM Participated in the Final Workshop of GRACERS at the Indian Institute of Technology, Bombay (IITB) Funded by NUFFIC, Kingdom of Netherlands



The final workshop of the 'Groundwater Rejuvenation as Climate Change Resilience for Marginalized and Sensitive Ganges (GRACERS)' project was held at the Indian Institute of Technology, Bombay (IITB) on 20 March 2023. IWM presented the findings of the project and shared the concept of the Ganges Basin-wise solution. The other Participants of the workshop were IHE-Delft, ACWADAM, CITARE, IITB, NHI, etc.

National Events

IWM Observes International Mother Language Day 2023



Mr. Md. Zahirul Haque Khan, Executive Director, Mr. S M Mahbubur Rahman, Deputy Executive Director (Planning & Development), Mr. Md. Amirul Islam, Deputy Executive Director (Operations), and other senior officials of IWM participated in a rally to pay tribute to the martyrs of the Language Movement of 1952.

IWM Celebrates Victory Day 2023



Institute of Water Modelling (IWM) observes National Victory Day on 16 December and pays glowing tribute to the martyrs who gallantly sacrificed their lives for the country during the Liberation War in 1971, by placing wreaths at the National Memorial at Savar.



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