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Khoia Chhara in Mirsharai Upazila, Chattogram

the CEGIS
NEWSLETTER

Safeguarding Environment for Future

Upcoming

Inside

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East Gopalganj Integrated Water Resources Management

Tanvir Ahmed, Water Resources Management Division

East Gopalganj, with an area of 88,127 ha, consists of Tungipara, Kotalipara, and Gopalganj Sadar (partly) Upazilas, which are located within the floodplains of the Modhumati, Baghiyarkul, Shyaldhah, Ghagor Rivers, and Madharipur Beel Route (MBR). The area is naturally depressed and remains mostly underwater throughout the monsoon. As a result, crops are not usually grown during the monsoon except in some high places. On the other hand, the crops cultivated on the periphery of the depression pockets are also vulnerable to early floods. Besides, due to slow drainage during post-monsoon, the people cannot take advantage of the early plantation of rice crops. Damage to various water control structures in the project area results in flooding and salinity intrusion into the agricultural land, causing further crop damage.

The Bangladesh Water Development Board (BWDB) is currently carrying out an extensive study on Integrated Water Resources Management for the East-Gopalganj Area. The study aims to focus on feasibility analysis and identification of strategic and sustainable, nature-based solutions to improve the livelihood and socio-economic development of the area. In the study area, there are 25 regulators with boat passes, 67 regulators without boat passes and

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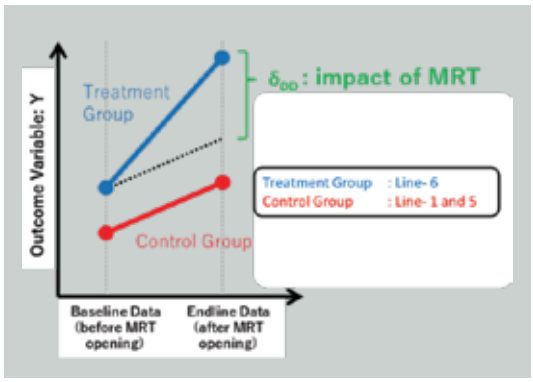
Empirical Research on Social and Economic Impacts of Infrastructure Projects in Bangladesh

Tanvir Ahmed Rifat, Socio-Economic and Institutional Division

The Dhaka Mass Rapid Transit (Dhaka MRT) Line 6, Bangladesh's first urban mass rapid transit system, commenced operations on December 28, 2022. The initial section, connecting Agargaon and Uttara stations, has attracted attention in the country's transportation system. Five stations—Uttara (North), Agargaon, Pallabi, Uttara, and Mirpur-10—were operational initially. Subsequently, all the stations became functional, and the MRT line operating smoothly up to Motijheel. Construction has also begun on Line 1. This research project aims to examine the impact of MRT on people's lifestyles, transportation choices, and the economy. It will investigate how the MRT influences job selection, schooling, and healthcare preferences, distinguishing between male and female experiences. The study will use a Difference-in-Difference (DID) strategy, analyzing microdata from both the treatment group (MRT-6) and the control group (MRT-1 and 5) before and after the intervention. The study must be completed with a baseline dataset before project activities begin to identify potentially affected individuals based on specific indicators.



The baseline study by CEGIS examined people's livelihoods and daily transportation modes in the project influence area, encompassing a 2km buffer on both sides of the MRT (Line-1, 5, and 6) alignment. Using a 500*500 meter grid, the number of samples is allocated in each grid based on population density. Quality control was rigorously maintained throughout the survey project, ensuring proper oversight at every stage, from questionnaire development to survey implementation and data verification.

The sample (N=4000) design was made in a way that it covers the most formal settlement (N=3000) than informal (N=1000) however during the survey result, it is found that around 72.3% (N=2895) people are residing in Apartment buildings, while 16.1% (N=644) people are found living in the informal settlement (Colonies) and rests are living in Detached House, Employer-provided housing etc.)

It has been observed that the ownership of private cars and motorcycles tends to increase with income levels. However, the ownership of bicycles doesn't seem to be related to income. The surveyed area has 282 households with cars and 551 with motorcycles, which results in 20.7 cars and 38.0 motorcycles per 1000 people. Rickshaws are commonly used for daily travel, and buses are the preferred for public transport due to affordability. Taxis, especially bike transportation, are also gaining popularity.

The trip rate, measured as the number of trips per population aged 5 and above, reflects the dominance of male households in Bangladesh. However, the scenario is gradually changing, with women becoming more active. Female trip rates are lower, with over half reporting no trips, but the net trip rate, considering those who do travel, shows no gender differences.

Analysis of this trip information in the future will quantify changes (Difference in Difference) in the transport system and assess overall positive and negative impacts. The metro system is expected to revolutionize the transportation options in Dhaka, influencing economic factors and providing affordable choices to residents.

Contract Signing for Different Studies

During the 4th quarter of the year 2023 (October to December), CEGIS has signed 12 (twelve) Contracts with different organizations and clients. The contract titles with date of signing are given below:

i) "Development of Mobile Responsive Web Application Software" with Bangladesh Bureau of Statistics (BBS) on 05 October 2023;

ii) GIS Work for Securing Food Systems of Asian Mega-Deltas (AMD) for Climate and Livelihood Resilience - Phase-II with International Rice Research Institute (IRRI) on 10 October 2023;

iii) Baseline study for the Preparation of Innovation for Climate Resilient Urban Development (INCLUDE) in Bangladesh project" with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on 15 October 2023;

Mr. A.Q.M. Golam Mawla (4th from left), Deputy Managing Director and Dr. Fazle Rabbi Sadeque Ahmed (5th from left), Deputy Managing Director of Palli Karma-Sahayak Foundation (PKSF) & Mr. Md. Jahid Hossain Jahangir (from left 6th) and Mr. A. T. M. Shamsul Alam (2nd from right) of CEGIS were present in the signing ceremony of Final Evaluation of Extended Community Climate Change Project-Flood (ECCCP-Flood) of PKSF

iv) Integrated Assessment Modelling of Tidal River Management in Bangladesh with Deltares on 25 October 2023;

v) "Final Evaluation of Extended Community Climate Change Project-Flood (ECCCP-Flood) of PKSF" with Palli Karma-Sahayak Foundation (PKSF) on 31 October 2023;

vi) "Updating the Status of SDG Indicator 6.5.1: Degree of Integrated Water Resources Management (IWRM) Implementation" with Bangladesh Water Development Board (BWDB) on 16 November 2023;

vii) "Collection and Supply of Drone Image (with processing) of Pirojpur and Swarupkathi Paurashava of Pirojpur project" with Urban Development Directorate (UDD) on 19 November 2023;

viii) Concept and Practices of Integrated Water Resources Management (IWRM) with Bangladesh Water Partnership (BWP) on 21 November 2023;

ix) Development, Management, and Maintenance of RHD GIS Portal & Database during the financial year 2023-2024 with Roads and Highways Department (RHD) on 22 November 2023;

x) "Improvement of Design and Monitoring the Construction of Climate Resilient Infrastructure in the Haor Region" with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on 29 November 2023;

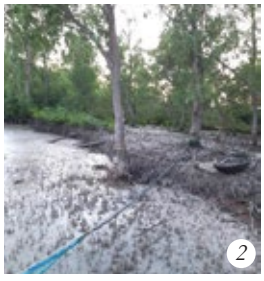
xi) Spatial and Temporal Changes in Dhaka City's Urban Ecosystem, Landscape and Biodiversity over the Past 100 Years with United Nations Development Program (UNDP) on 6 December 2023; and

xii) Morphological study of Karnatali River for PGCB under CCC with China National Cable Engineering Corporation (CCC) on 31 December 2023.

A Prefatory Study on the Development of Disaster Resilient Model Unions in 5 Remote Areas of Bangladesh

Dr. Farhana Ahmed and Anindya Banik, Research, Development and Training Division

CEGIS has been conducting a study for the Department of Disaster Management and Ministry of Disaster Management and Relief. The study aims to develop disaster-resilient model unions in 5 remote and disaster-prone locations across the country. A baseline analysis to investigate the vulnerabilities to disasters in certain study unions have already completed. The study focused on physical and socio-economic aspects of vulnerabilities. The study Unions were Kalarmarchhara Union in Maheshkhali, Cox's Bazar, which is prone to landslides; Gabura Union in Shyamnagar, Satkhira, which is vulnerable to storm surges and salinity intrusion; Mogolbasa Union in Kurigram, which is affected by riverine flooding and riverbank erosion; Islampur Union in Jamalpur, which also experiences riverine flooding and riverbank erosion; and Uttar Sreepur union in Sunamganj, which is susceptible to flash floods and lightning. The analyses were verified using PRA tools and stakeholder consultation workshops, featuring the most threatening disaster for each union. Using feedback from local stakeholders and local govt. agencies, CEGIS also prepared an initial Action Plan for the Development of Disaster Resilient Model Unions. It is ecpected that the action plan would get approved and further scaled up appropriately to broader objective of the study.



1. Shrimp Gher in Gabura Union
2. Mangrove Trees on Kholpetua River Bank

Management of the Mahananda River in Chapainawabganj District and Padma River Basin in Chapainawabganj, Rajshahi, and Natore District: an ESIA Study

Kashmira Camey, Water Resources Management Division

The Mahananda and Ganges-Padma rivers originate from India and flow into Bangladesh through the Chapainawabganj district. The Mahananda River spans roughly 95 km, and the Ganges-Padma River shares a 38.37 km stretch under Chapainawabganj district. Bank erosion is a frequent occurrence in different locations along the Mahananda River. On the other hand, an 11-kilometer stretch of the Ganges-Padma River, which lies along the border between India and Bangladesh, is still exposed to erosion and has no protective measures in place. Therefore, it is crucial to identify the root causes of the erosion and take appropriate steps to address the issue. Bank erosion is currently a threat in the Dovagi and Nano Jagannathpur areas of the Durlavpur Union and the Babupur, Kanchira, and Lakkhipur areas of the Paka Union under Shibganj Upazila of the district. In the above context, BWDB undertook a feasibility study for managing the Mahananda and Ganges-Padma River System in Rajshahi, Chapainawabganj, and Natore Districts. CEGIS is conducting the ESIA study of this project.

The project area is located within the Northwest region of

Mahananda River

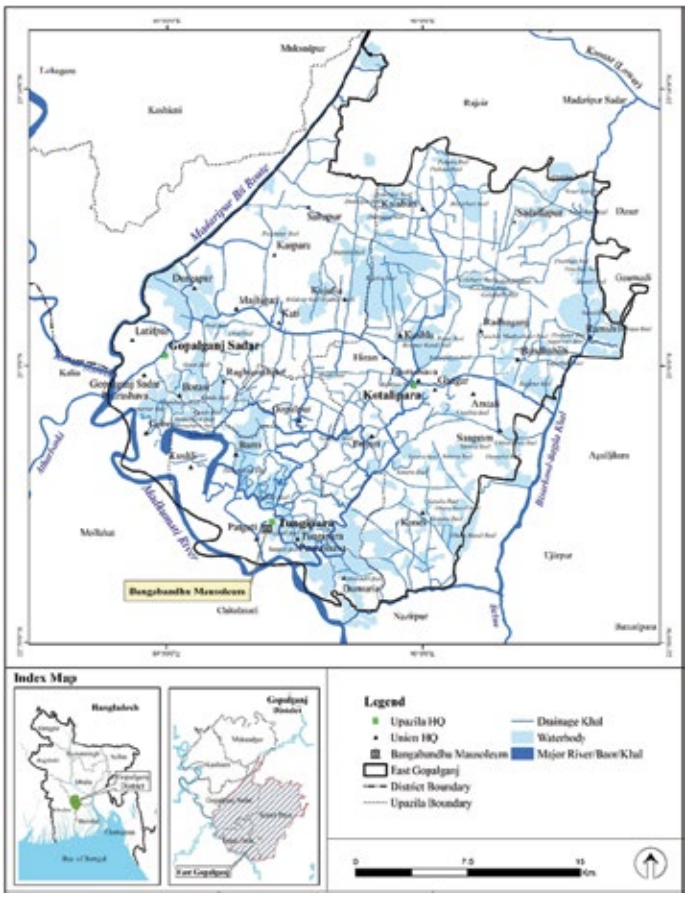
Bangladesh, comprising parts of the Chapainawabganj, Rajshahi, and Natore District districts. The study area includes Mahananda, Punarvaba, Pagla, and Padma Rivers. The study area falls under three distinct Bio-ecological zones (BEZ): Barind Tract, Teesta Floodplain, and Chalan Beel (Source: IUCN 2002). The study area's ecosystems include crop fields, settlements, orchards, charlands, rivers, and associated wetlands. The ecosystem diversity of this study area offers habitats for numerous floral and faunal species. IWM is carrying out the technical and economic components of the project's feasibility study. The primary options suggested by IWM for protecting the Mahananda and Padma riverbanks at upstream and downstream reaches are bank protection work at the newly vulnerable areas and rehabilitation of the existing protective work. CEGIS is studying the impact of these infrastructures and quantifying the effect on the study area.

Padma River

The dredging of the Padma River and the construction of crossbars will increase the river's flow during the dry season. This will lead to the enrichment of the riverine ecosystem and the flushing out of pollution in the Chapainawabganj, Rajshahi, and Natore districts. Crop production will also increase due to changes in cropping patterns and the introduction of high-yielding variety/hybrid crops in the erosion-protected lands. The bank protection work will also create new fish habitats for species like Rita, Baila, Baim, Chingri, Kalbaus, etc. In addition, the Mahananda and Ganges/Padma river-dependent area will see an increase in agro-based employment opportunities after land stability due to bank protection. Tourism-related livelihood would be created in the Padma River adjacent to the crossbar area. The study is expected to be completed by this year.

Non-functional Regulator at Rohanpur, Chapainawabganj

East Gopalganj Integrated ... (Cont'd from page 1)



Water Resources Map for the East Gopalganj Integrated Water Resources Management Project

307 km of flood control embankment. Four hundred sixty-two (462) nos. khals have been identified with a total length of 902 km. In addition, river cross-section, topography, water level, and other data and information have been collected from field surveys and secondary sources. Five (5) water level gauges have been installed to collect water levels at 3-hour intervals. Twenty-two (22) public consultation meetings were conducted at the union level to understand the problems and issues of the project area. The major problems of the study area are as follows:

- River sedimentation and loss of connectivity
- Inadequate and non-functioning drainage regulators
- Crop damage due to early flooding
- Slow drainage and water logging due to siltation of drainage khal
- Prolonged water-logging due to retardation of natural drainage
- Lack of freshwater for irrigation
- Salinity intrusion due to the damage to regulators
- River bank erosion.

The East Gopalganj region is home to a diverse range of fish resources and ecosystems that enrich the area ecologically. The extent of flood areas during dry and wet seasons is important for crops and aquatic fauna. Fish with other aquatic flora and fauna are highly dependent on water flow and wetland areas, and a minimum amount of depth is required during the dry season for their survival The project area's water level has been designed to satisfy the ecological, agricultural, and fisheries water demands by following the eco-hydrograph concept. The aim is to maintain the optimum water level to preserve the ecological and hydrological processes while ensuring a constant water flow. The structure has been designed based on the optimum water level and that will remain open throughout the year except from January to May. However, khal re-excavation is required to maintain a balance between agricultural crop production and the area's natural ecosystem. The boat passes with a broader gate are suggested instead of the regulator to control water; whereas, some regulators will be converted into boat passes. Besides, issues like protection of boro rice from early flooding and salinity, protection of biodiversity, climate change and sea level rise, navigation development to keep minimum environmental impact, etc., are also considered while selecting the intervention.

The interventions have been identified to address the issues mentioned above. Interventions include khal re-excavation (552.65 km), 22 Nos of additional boat pass, replacement of 2 regulators with boat passes, 5.74 km of river bank protection works, repair of Existing 83 Nos. of existing structure, 54.42 km inspection dyke and 18 Nos. of outlets.

The East Gopalganj project area will benefit from the proposed interventions for improving drainage, irrigation, navigability, salinity intrusion protection, and riverbank protection through proposed sustainable and environmentally friendly structures. This project would alleviate drainage congestion by increasing the irrigation and water-carrying capacity of khals. This will result in an increase of 56,000 MT crops and 227 MT fish in the national production.

Integrated Water Resources Management Practices in the Study Area

Addressing Water Scarcity with Environment-Friendly Water Reservoirs in Mirsharai and Sitakunda

Sanjib Sarker Shawon, Water Resources Management Division

Located in the Chattogram District, the inhabitants of Govaniya Chhara, Khoia Chhara, and Kumira Chhara, along with the Joramtol Khal, confront a crucial problem - the lack of drinkable water for their daily needs, irrigation, and industrial requirements. To address this ongoing challenge, the residents, leaders, civil society members, and business owners have been actively promoting preserving rainwater in the Chharas. By doing so, they aim to mitigate this persistent issue effectively.

The hilly catchment areas surrounding Mirsharai and Sitakunda Upazilas hold vast potential for rainwater harvesting. The abundance of rainfall during the monsoon season provides a valuable opportunity to collect and store significant quantities of water.

Recognizing the importance of addressing water scarcity and harnessing the potential of rainwater, the Centre for Environmental and Geographic Information Services (CEGIS) conducted an Environmental and Social Impact Assessment (ESIA) study.

The study identified the pressing water crisis caused by the challenging topography and scarcity of potable water sources. As a solution, the construction of earthen dams at the base of valleys was proposed to create reservoirs, promoting rainwater conservation during monsoons and augmenting water flow during dry periods. Regulators were also constructed previously to facilitate efficient water utilization in the Chharas and Khal.

By undertaking this ESIA study, the project evaluates the potential impacts on the environment and society. It examines factors such as land use, water resources, biodiversity, air and water quality, and noise-pollution while also considering socio-economic aspects. The study identifies potential risks and proposes effective mitigation measures to minimize the identified adverse effects.

The ESIA study findings guided the decision-making processes through detailed multi-criteria analysis, ensuring sustainable implementation, and addressing stakeholders concerns. The construction of environment-friendly water reservoirs in Govaniya Chhara, Kumira Chhara, and Joramtol Khal reduce water scarcity and also contribute to the well-being of the local communities, agricultural productivity, and the overall ecological balance in the region.

Several key measures have been proposed to mitigate the project's negative impact. According to Bangladesh Environment Conservation Act 1995 (amended in 2000), for any activity or any intervention within the jurisdiction of the Reserve Forest area, at the very onset, it is essential to obtain a “No Objection Certificate” (NOC) from the designated authority of the Bangladesh Forest Department as a requirement of the law of Bangladesh, which need to be complied. Hence, the implementation of the project depends on the approval from the Bangladesh Forest Department along with the conditions for adopting the management measures (i.e., habitat and vegetation compensation and construction of wildlife trails, etc.) suggested under this study.

Govaniya Chhara of Mirsharai Upazila

It is strongly recommended to make a Memorandum of Understanding (MOU) between Bangladesh Water Development Board (BWDB) and Bangladesh Forest Department (BFD) before the implementation of the project.

Other relevant regulations include the Wildlife Conservation and Security Act of 2012, Article 18(A) of the Bangladesh Constitution, the Bangladesh Biodiversity Act 2017, and Protected Area Rule (2017), which need to be adhered to, considering factors like disturbance, vegetation damage, hill cutting, and habitat alteration, including habitat loss.

To minimize environmental impact, it is recommended to apply an alternate wetting and drying (AWD) system for irrigation water instead of continuous submergence. Monitoring of siltation in the chharas and khals should be done and re-excavation should be carried out if needed. Additionally, constructing a surface water treatment plant for potable water supply, covering construction materials to prevent dispersion in the air, and implementing temporary noise barriers (such as timber noise barriers, acrylic/Perspex noise barriers, sound blankets) around the working area to reduce noise pollution are suggested.

As the local community is currently living in sub-human conditions due to severe scarcity of domestic water and agriculture water (the mainstay of their livelihood), a tradeoff between the damage of vegetation in reserved forest and the optimum benefit of domestic and agricultural water use can be preferred for the further qualified survival of the local community subject to the approval by the competent authority.

Documentary and ESIA: Re-excavation of Small Rivers, Khals and Waterbodies of Bangladesh

Md. Amanat Ullah, Ecology, Forestry and Biodiversity Division

BWDB is implementing a nationwide project, "Re-excavation of Small Rivers, Khals, and Water Bodies in the 64 Districts Project (1st Phase)". CEGIS has been conducting the ESIA and the Documentary part of the project.

The project aims to improve flood control, drainage, irrigation water supply, local navigation, ecological health, and local livelihoods. This project is aligned with the Delta Plan 2100 project-"Capital CC1.43: Revitalization of khals all over the country".

The ongoing first phase targets improving drainage and flood conditions over a 600,000-ha area, extending irrigation to 150,000 ha, and increasing local navigation by 2,000 km. It also facilitates fish cultivation and land development, increasing plantation coverage along the banks.

The 2nd Phase of the Project will follow the 1st phase, which aims to reduce flooding in an area of over 2,400 sq. km by re-excavating 212 small rivers, 2,004 khals, and 99 wetlands. It also aims to conserve irrigation water for the dry season within 400 sq. km of wetlands and improve navigability for a distance of around 4,000 km.

BWDB's objective is to assess the environmental and social advantages of the project and keep records for future reference. The ESIA Study will yield two results: firstly, an ESIA Report that outlines the project's influence on various sectors, and secondly, video documentaries showcasing the project's impact.

Land utilization of proposed Laboratory and Training Center, CEGIS

Md. Monirul Islam Manik, Socio-Economic and Institutional Division

CEGIS has experienced steady domestic and international growth, leading to a substantial increase in its workforce. With its expansive array of disciplines, diverse studies encompass thorough examinations of various elements, including water, soil, and air, thereby contributing to the advancement of CEGIS. Currently, most of these tasks are performed in various laboratories nationwide.

Given its extensive range of disciplines, CEGIS recognizes the essential requirement for a state-of-the-art Laboratory and Training Center. This facility will cater to its diverse operations, promote innovation and research, and offer skill development across various fields. The establishment of such a center aligns with CEGIS's commitment to fostering excellence and advancement in all of its endeavors.

In response to these challenges, CEGIS is diligently working on establishing a cutting-edge training center equipped with laboratory facilities. The objective is to further elevate research activities across various levels. For this purpose CEGIS has procured a permanent property covering 2.98 acres in Darbaria Mauza of Atabahar Union, Kaliakair Upazila, Gazipur District.

Utilization of CEGIS' proposed Lab and Training Center Land in Organic Farming practices

The facility will have renewable energy infrastructure, to ensure environmental sustainability. Additionally, efforts have been made to enhance the campus's visual appeal by introducing diverse plantations, including fruits, forests, and medicinal plants. Approximately fifty percent of the land has been reserved for seasonal vegetable cultivation, strictly adhering to organic farming practices where only organic fertilizers are used, eliminating the need for pesticides or herbicides. The future plans include cultivating native fruits, timber, and medicinal plants.

CEGIS Commemorates Bangladesh's Victory Day

Bangladesh celebrated its Victory Day on December 16, 2023, which marks the anniversary of the end of the Liberation War of 1971. On this day, the Pakistani Army surrendered in Dhaka, ending a nine-month-long struggle for Bangladesh's independence. The nation emerged as an independent country on December 16, 1971, under the leadership of Bangabandhu Sheikh Mujibur Rahman, the Father of the Nation. This hard-owned independence came at the profound cost of three million lives and the dignity and honor of nearly half a million women.

Like every year, CEGIS enthusiastically observed the Victory Day of Bangladesh on December 16, 2023, where Mr. Malik Fida A Khan, the Executive Director of CEGIS, led a contingent of professionals in a commemorative event. They honored this significant day by placing a wreath at the National Memorial in Savar, Dhaka.

Following their homage-paying ceremony, the professionals observed a solemn moment of silence, a poignant gesture signifying deep reverence for the martyrs and heroes of the 1971 Independence War.

Executive Director and other professionals of CEGIS pay homage to liberation war martyrs in Savar

Event Outline (October-December 2023)

2- 3-Oct-23	Training on GIS Work for Securing Food Systems of Asian Mega-Deltas (AMD) for Climate and Livelihood Resilience
9-Oct-23	Sharing the progressof the Feasibility Study for Water Resources Management in the Kirtonkhola-Shugandhya-Bishkhali River System
9-Oct-23	Project Activities and Progress discussion of Feasibility Study, DRS, IEE, ESIA, LAP and RAP of Construction of Onshore Gas Pipeline from Kuakata to Khulna
10, 12, 19, 22-Oct-23	Discussion on Project Activities and Progress of Feasibility Study from Bhola to Barishal Gas Transmission Pipeline Project
12, 26 Oct and 5 Nov 23	Investing in Climate Change Adaptation through Agroecological Landscape Restoration: A Nature-based Solution for Climate Resilience - 2 Climate Change Risk and Adatatation/Restoration Option Assessment in Bangladesh
16, 22, 25, 26-Oct-23	ISO Recertification Audit: Consultation with ISO Officials for recertification of CEGIS Standards
19-Oct-23	Review Session of DWASA' Technical Proposal with Advisor, SEID
12-Nov-23	Progress sharing and discussion with Winrock International & USAID
23-Nov-23	Discussion of updating the Information of the Rivers in Bangladesh and its IT-Based Management
28-Dec-23	Discussion on updating and Administering of CEGIS Website with the Committee.