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Brown Winged Kingfisher

the CEGIS NEWSLETTER

Safeguarding Environment for Future

Upcoming

- East Gopalganj Integrated Water Resources Management
- Channel Incidence and Char Ages Mapping of the Lower Jamuna River
- Interim Evaluation of Extended Community Climate Change Project-Flood (ECCCP-Flood) of PKSF

Inside

- Climate-Resilient Infrastructure Assessment of Bangladesh
- Environmental Audit of the Extended Community Climate Change-Flood Project (ECCCP-Flood) of PKSF
- Nationwide Climate Change Risk and Vulnerability Assessment for Fisheries and Aquaculture Sector in Bangladesh
- Establishing a Knowledge Repository with the Water Sector Related Information

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The 18th Working Group Meeting on IWRM under the Water Convention

The 18th Working Group meeting on IWRM under the Water Convention was held in Geneva during 19-21 June 2023. Mr. Nazmul Ahsan, Secretary Ministry of Water Resources, and Mr. Malik Fida Abdullah Khan, Executive Director of CEGIS, represented Bangladesh in the Meeting. The Meeting brought together 300 participants in person and online, including government representatives from over 80 countries.

The Working Group reviewed the implementation of the Water Convention program of work for 2022–2024; discussed the main outcomes of the United Nations 2023 Water Conference related to transboundary water cooperation and the Convention; reviewed progress in the Convention's global opening and ongoing and planned future activities; examine the implementation of decisions taken by the earlier Meetings of the Parties.

The different sessions reflected the diverse areas of work and wide range of partners of the Convention. Bangladesh delegation intervened in transboundary issue, Bangladesh Delta Plan, National Adaptation Plan, Source to Sea Approach, and Capacity Building issues - were acclaimed and acknowledged in the meeting. The thematic session on public participation facilitated a rich exchange on the importance of public participation for effective and sustainable transboundary river basin management.

Climate-Resilient Infrastructure Assessment of Bangladesh

Abid Kamal, Geographic Information System Division

Bangladesh is one of the most vulnerable countries in the world in terms of the impacts of climate change due to its geographic location and the economic dependency on climate-sensitive sectors such as agriculture, fisheries, and water resources. The impacts of climate change, such as sea-level rise, increased frequency and intensity of floods and cyclones, and changes in temperature and rainfall patterns pose significant challenges to the country's development. To mitigate the effects of climate change, it is important to build infrastructures, resilient to climatic conditions. Assessment of the climate-resilient infrastructure of the country is imperative to effectively plan, design, and implement infrastructure projects that can withstand the impacts of climate change, protect communities and livelihoods, and contribute to sustainable development.

In this progression, the Center for Environmental and Geographic Information Services (CEGIS) signed a contract on 29 March 2022 with the United Nations Office for Project Services (UNOPS), a subsidiary organ of the United Nations. The Global Center on Adaptation (GCA) and Oxford University co-partnered the project, where the GCA provided funding support.

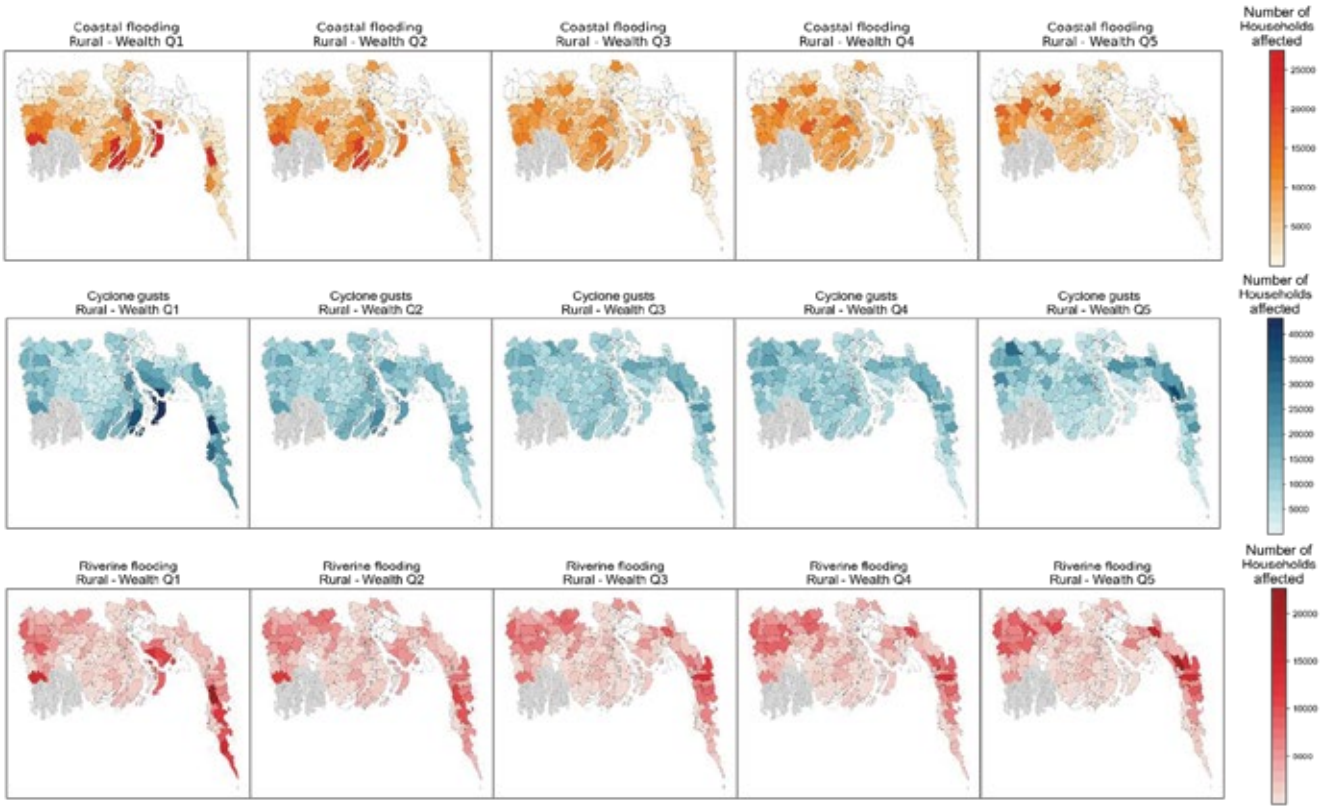
In this project, CEGIS has been responsible for collecting and analyzing spatial information in Bangladesh. CEGIS accomplished the following data provision role:

- Preparation of data inventory
- Identification of Data Sources and their Accessibility
- Communication and Data Collection
- Data Processing and modeling
- Interpretation of the results

The collected data by CEGIS was used in the NISMOD (National Infrastructure System Model) developed by the Oxford team. NISMOD is a series of open-source analysis tools for applying evidence-based decision-making in developing countries. However, this project aimed to introduce the NISMOD model in Bangladesh, which was already applied in Ghana. The NISMOD stores data on cross-sectoral infrastructure assets and networks, exogenous factors such as climate hazards, and socio-economic data, providing an output repository for hazard risk, exposure, and vulnerability models under various future scenarios. One of the critical outputs of the model is to estimate the cost of adapting to hazards, mainly for the infrastructure, water, and power sector.

CEGIS has also been responsible for communicating with various stakeholders and arranging workshops to demonstrate the model and its output for future need assessment. CEGIS and UNOPS jointly organized several stakeholder consultations with WARPO, RHD, LGED, BREB, and BWDB to assess the needs of government officials and gather feedback on how the tools and datasets could be further improved to support future projects and planning purposes.

Overall, the collaboration between CEGIS, UNOPS, GCA, and Oxford University has been instrumental in advancing the understanding of applying geo-spatial technology for climate-resilient infrastructure in Bangladesh. CEGIS has played a crucial part in enhancing its capabilities and knowledge for future projects by successfully undertaking the data provision role and facilitating stakeholder consultations.



Sector-wise household-level infrastructure service disruptions in different wealth quintile ranging from Q1 (poorest) to Q5 (richest) based-on socioeconomic survey data and principal component analysis (PCA)

Contract Signing for Different Studies

During the 2nd quarter of 2023 (April to June), CEGIS signed 5 (five) contracts with different organizations and clients. The contract with titles and the signing dates are mentioned below:

i)"Development of GIS-based online Inventory for Cultural Heritage (Intangible) of Bangladesh for BNM" with Bangladesh National Museum (BNM) on 9 April 2023; ii) "Supply of equipment for ICH Inventory System's fieldwork and office set-up for ICH training'' with Bangladesh National Museum (BNM) on 16 May 2023; iii) "Detail Feasibility Study including Master Plan and Environmental and Social Impact Assessment (ESIA) for Establishment of Gopalganj Economic Zone-1" with Bangladesh Economic Zones Authority (BEZA) on 11 June 2023; iv) "Water Quality Monitoring Software Update" with Department of Environment (DOE) on 12 June 2023; v) "Feasibility Study for Integrated and Sustainable Development of Water, Environment, Ecology and Biodiversity in Borni Baor area" with Bangladesh Water Development Board (BWDB) on 18 June 2023.

Mohammad Ahsan Ullah, Deputy Secretary, Manager (Environment & Development) of BEZA and Mr. A. T. M. Shamsul Alam, Director, Socio-Economic and Institutional Division of CEGIS were present in the signing ceremony of Detail Feasibility Study including Master Plan and Environmental and Social Impact Assessment (ESIA) for Establishment of Gopalganj Economic Zone-1

Training on Dhaka Food System Policy Planning Tool

Nusrath Jahan Nisha, GIS Division

The Dhaka Food System (DFS) project is one of the significant projects led by the Local Government Division of MoLGRD & C, together with four City Corporations (Dhaka North, South, Gazipur, Narayanganj) in Dhaka Division, received technical support from the Food and Agriculture Organization (FAO) and Wageningen University and Research (WUR) funded by the Embassy of the Kingdom of the Netherlands (EKN) in Bangladesh.

WUR provided training to 20 professionals from various organizations (CEGIS, LGED, DSCC, DNCC, GCC, NCC, FAO) through online and in-class on this tool. Professionals attended a 5-day in-person live training session at the

Certificate giving ceremony of the training program

Hotel Bengal Canary Park, Gulshan. The training aimed to enhance the participants' technical knowledge in DFS modeling tools to ensure a more resilient, equitable, and sustainable urban food system for the Dhaka Metropolitan Area.

The participants experienced immense benefits from the training, which covered two crucial areas: Interactive GIS dashboard and socio-economic modeling using iCLUE, QUICKScan, and MAGNET tools. This comprehensive training divided participants into two groups, allowing them to focus on GIS and spatial aspects or socio-economic factors, respectively.

The GIS and spatial aspect sessions introduced participants to powerful tools like iCLUE and QUICKScan, enabling them to tackle diverse challenges such as future land use projection, biodiversity conservation, and food system planning for Dhaka City. Through a systematic spatial modeling process involving problem identification, scenario development, indicator selection, quantification, and decision-making, the professionals honed their skills in addressing critical issues related to the city's food system.

In parallel, the socio-economic model (MAGNET) provided participants with the ability to simulate global impacts resulting from agricultural, trade, land, and bioenergy policies. By analyzing effects on land use, agricultural prices, nutrition, and household food security, professionals gained valuable insights to inform policy and decision-making processes.

The training's significance lay in its practicality and versatility. Armed with newfound knowledge and expertise, CEGIS professionals can now apply these tools in a multitude of areas, including urban planning, environmental conservation, and food security. By leveraging the insights gained from the training, they are empowered to contribute to a more sustainable and resilient future for Dhaka City and beyond. The enriched skills and capabilities acquired through this training will undoubtedly play a crucial role in addressing the complex challenges faced by the region and making informed decisions for the benefit of the community and the environment.

Environmental Audit of the Extended Community Climate Change-Flood Project (ECCCP-Flood) of PKSF

Md. Alamgir Hossain, Socio-economic and Institutional Division

Palli Karma-Sahayak Foundation (PKSF) is a "not-for-profit" organization working for the vulnerable people of Bangladesh to eradicate poverty and improve their livelihood. The vision of this organization includes: poverty alleviation, sustainable development, and contributes to the improvement of the socio-economic condition of the poor and marginalized people in Bangladesh through various development programs and initiatives. PKSF has been relentlessly putting efforts into making a significant contribution to people-cented holistic development, including climate change adaptation and mitigation through efficient implementation of various programs and projects. In continuation of this, the "Extended Community Climate Change Project-Flood (ECCCP-Flood)" under the Green Climate Fund (GCF) is being implemented in five flood vulnerable districts in Bangladesh namely Nilphamari, Lalmonirhat, Kurigram, Gaibandha, and Jamalpur. The ECCCP-Flood project is placed under Category-C, according to the GCF's Environment and Social Safeguard Policy, because the project involves minimal or no impact categorically. However, this audit has assessed the effectiveness of the project's environmental and social management system comprising its 'Environmental and Social Action Plan (ESAP) and PKSF's 'Environmental Health and Safety Guidelines to ensure the compliance and effectiveness of the implementation of the ESAP activities.

The study's objective is to assess and explore the effectiveness of the implementation and compliance status of the Extended Community Climate Change Project-Flood (ECCCP-Flood) following the Environmental and Social Management System, including its Environmental Health and Safety (EHS) guideline of PKSF.

Center for Environmental and Geographic Information Services (CEGIS), a center of excellence, has been entrusted with auditing the Extended Community Climate Change-Flood Project (ECCCP-Flood). This auditing has evaluated the effectiveness of the Environmental and Social Management System of the ECCCP-Flood project against the targeted objectives. Besides, this study has suggested a Corrective Action Plan (CAP) on the non-compliance issues to ensure better project outcomes and successful implementation of the project activities.

Visiting a construction site in Gaibandha

Slatted house of Goat rearing in Jamalpur

Kingfishers ... (Cont'd from page 5)

populations, regulating aquatic ecosystems, and acting as bio-indicators of water quality. They also hold cultural significance in many societies. They are sometimes associated with good luck, prosperity, and tranquility. Kingfishers are regarded as symbols of beauty, agility, and resilience in various folklore, and traditions.

Conservation benefits associated with kingfisher protection extend beyond the species itself. By safeguarding kingfishers and their habitats, we support ecosystems' overall health and functioning, preserve biodiversity, foster sustainable tourism, and promote environmental education and awareness. The presence of thriving kingfisher populations can create economic opportunities for local communities through birdwatching tours, guiding services, accommodations, and associated businesses. This, in turn, contributes to sustainable livelihoods and community development. These benefits contribute to the well-being of wildlife and local communities, fostering a harmonious relationship between humans and the natural world.

CEGIS Environmental Lab
LUX LIGHT METER

Md. Rafiqul Alam, Water Resources Management Division

Digital Light Meter is a battery-operated handheld EXTECH Brand Instrument. Its Model is 401025. It measures ambient light/existing light, natural or artificial, in a scene. This also includes any constant light source, like fluorescents or LEDs. Some light meters are also capable of measuring strobe exposures. Most handheld light meters do this. These meters are sometimes called flash meters. It contains LCD Display, Data Hold Switch, Power off or Range Switch, Analog Output Terminal, Battery Compartment, Response Switch and Lux/ Fc Switch, Light Sensor, and Zero adjust. The photodetector of the light meter is positioned perpendicular to the light source for optimal exposure. Many light meters use an articulated photodetector for this purpose. Readouts are presented to the user via analog instrument or digital LCD. The illuminometer's light sensor comprises a photodiode that converts light into an electrical signal. It consists of an optical filter that ensures the same sensitivity as the human eye and a diffusing globe that facilitates cosine correction, which satisfies the requirements for this type of instrument. The Light meter works by using a photocell to capture light. The basic principle of the light meter is that the meter finally converts the light to an electrical current signal. After measuring this current, it allows the device to calculate the Lux value of the light it has captured and shows the result value on the display.

Operation: It is to be selected units Lux/ Fc candle and the response time (Fast/slow) by using the slide switch of the meter. A typical selection is slow, and Fc uses grey lettering. The maximum range selects by using the range switch. The meter has three measurement ranges (0-2000, 0-20000, and 0-50000) Lux. and (0-200, 0-2000, and 0-5000 Fc). The range is to be selected by the user. The light sensor is to be held such that the sensor faces the light to be measured. The display will indicate the calculated value. To hold a measurement, one has to slide the data hold switch to hold the position. The meter zero (display with no light input) may change with time. So occasional checking and adjustment requires for accuracy. The sensor is to be covered completely to block out any light. The range switches will be set to the lowest lux or Fc range. This instrument is used for different EIA, SIA, EMP, ESMP, and ESIA studies for the growth of trees, their productivity, forest vigor, air pollution, insect defoliation, and the Leaf Area Index (LAI) of plants or crops. CEGIS can use this instrument for different Ecological studies and Environmental monitoring projects.

Lux Light Meter

Nature
Kingfishers - The Colorful Avian Gems

Mushfiq Ahmed, Ecology, Forestry and Biodiversity Division

Common Kingfisher

Kingfishers, with their vibrant plumage and fascinating hunting techniques, have captivated the hearts of nature enthusiasts and birdwatchers worldwide. They are renowned for their iridescent plumage, featuring of various colors, including shades of blue, green, orange, and red. The colors are often striking and eye-catching, making kingfishers some of the most visually appealing birds in the world that also play a crucial role in maintaining the ecological balance of wetlands, rivers, and forests.

Kingfishers are a diverse group of birds belonging to the family Alcedinidae. Except for Antarctica, they are found in various habitats of all continents, including both freshwater and marine environments. There are over 90 species of kingfishers, each with its distinct appearance and behavior, but their abundance is in Southeast Asia and New Guinea. However, tropical Africa also has a strong representation. In Bangladesh, there are 12 species, two of which are threatened: one is endangered, and the other is vulnerable; three could not be evaluated due to paucity of data; seven do not have any immediate threats.

Most kingfisher species are skilled hunters specializing in catching fish. They have sharp, dagger-like beaks designed for grasping and capturing prey. They are also equipped with excellent eyesight, enabling them to spot fish from above the water's surface. They employ various hunting techniques, including perching on branches or posts near water bodies and diving to catch fish with remarkable precision. Kingfishers attract nature enthusiasts, birdwatchers, and eco-tourists willing to travel to observe and photograph these charismatic actions.

Kingfishers, known for their remarkable fishing abilities, serve as indicators of ecosystem health. Their presence signifies the availability of fish and other aquatic prey, indicating the quality of water bodies. Kingfishers contribute to the ecological balance by controlling fish

Cont'd on page 4

Nationwide Climate Change Risk and Vulnerability Assessment for Fisheries and Aquaculture Sector in Bangladesh

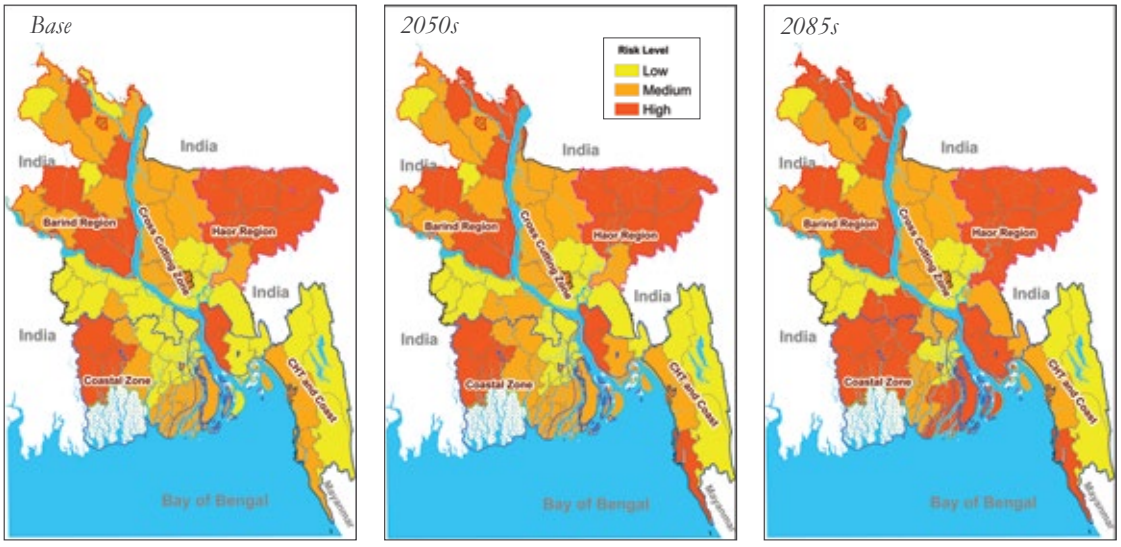
Ahmmed Zulfiqar Rahaman and Shajal Mehedi, Climate Change and Disaster Management Division

Bangladesh's national economy relies heavily on fisheries and aquaculture, which play a vital role in the agricultural GDP, accounting for 3.52%. However, this sector is facing significant challenges due to the impact of climate change, like other sectors in Bangladesh. Communities and livelihoods dependent on the F&A sector are experiencing losses and damages due to climate change impacts which call for planned adaptation actions to build resilience in the system.

In order to assess the climate risks and develop a resilience action plan against climate change for fisheries and aquaculture, the UN Food and Agriculture Organization (FAO) entrusted CEGIS to conduct a comprehensive Climate Change Risk and Vulnerability Assessment (CRVA) by highlighting the risk and vulnerability of fishery resources, local fishers, and fish farmers to the observed and predicted effects of climate change on F&A livelihood, with a special focus on gender. This study was carried out at the national level and nine project areas separately. Nine project areas are: South Sunamganj, Juri, Jagannathpur and Nasirnagar Upazilla from northwest region and Dumuria, Dakop, Bagerhat Sadar, Kachua & Shyamnagar Upazilla from southwest region. CEGIS developed a well-structured top-down indicator-based CRVA framework for this study based on the latest climate risk concept of IPCC AR5 and validated by DoF and FAO. CEGIS developed separate impact chains for culture fisheries, capture fisheries, and fisheries ecosystems for 6 identified zones. DoF and FAO Officials identified and prioritized 11 types of climate hazards. This study was assessed for base, 2050s, and 2085s under climate change scenarios SSP1-2.6 and SSP5-8.5.

Climate risk assessment of the capture fisheries for the base scenario depicts that all of the districts in the NE zone are at high risk except Brahmanbaria. In the SW Zone, Satkhira, Khulna, and Jessore are found susceptible to high risk. In the 2050s and 2085s, risk will be increased substantially in the NE Zone. In case of culture fisheries, the overall risk is lower than that of capture fisheries. Most of the districts in the NE Zone are found at medium risk. In the base scenario for fisheries ecosystem, Sylhet, Maulvibazar, Habiganj districts of the NE Zone and Satkhira, Bagherhat, and Khulna of the SW Zone are found at high risk due to critical ecosystems like Haor and Beel Ecosystem, Mangrove and Saline Water Ecosystem, etc. In 2085s, all of the districts of the NE zone except Brahmanbaria will be at high risk. Risk will increase in the 2085s for the districts along the coastal belt.

In addition, gender-responsive and hazard specific climate-resilient action plans for capture and culture fisheries with a total of 14 adaptation interventions were proposed for the national level incorporating a specific guideline on the improvement of Early Warning System (EWS) for F&A. Extension of climate resilient technology, development of climate-ready open water fisheries, expansion of coastal and marine fisheries to foster blue economy, promotion of extension of indigenous techniques, expansion of mariculture, improvement of post-harvest storage infrastructures, climate-sensitive F&A Zoning, skill and capacity development for alternative income generation activities especially focusing on women, ICT based improved EWS for F&A, the introduction of climate risk recovery tools & techniques and insurance mechanism, easy access to soft loans for women, disbursement of climate resilience funds for marginal fishermen are highly prioritized, among others. This plan identifies critical stakeholders corresponding to the adaptation actions or interventions for its smooth and successful implementation. The study will enhance knowledge and awareness about the impacts of climate change at the national and local levels via targeted training of fishermen and fish growers, with a special emphasis on gender issues.



Climate change risk for Capture Fisheries at national level

Establishing a Knowledge Repository with the Water Sector Related Information

Md. Anisur Rahman, Associate Specialist, Database, ICT & System Management Division

Ministry of Water Resources (MoWR) has engaged CEGIS to develop a Knowledge Repository with the Water Sector Related Information of Bangladesh. One of the major purpose of developing such a repository is to aggregate information related to water sector of Bangladesh in one platform which aims to be a comprehensive database represented through a web based system where all key agencies of the relevant sectors will publish their knowledge information day by day. The knowledge repository will assist MoWR to monitor water sector operations in a more efficient and flexible way before designing and executing any development programs. It will also be a knowledge base for the higher-level officials of ministry and corresponding agencies, planners, decision-makers, and researchers who will be the stakeholders of the repository.

The Knowledge Repository has an interactive and dynamic dashboard that contains most of the necessary information in a summarized form based on the associated organizations and data categories. A significant number of data categories are available in the system like Acts, Policy, Rules, Guidelines, Agreements and MoUs, Reports, Plans, Modeling Tools etc. The knowledge information has been organized as the public, restricted and limited type access categories. The public type of documents will be visible to all type of users but the restricted and limited type of documents will be visible only to the authorized users. There are three type of data searching facilities in the system to facilitate users to get knowledge information very quick, smooth and efficiently. A data download option is available in the system so that any user can have a local copy of the document of interest. A data entry module, an admin module and an authorization and authentication are also available in the system. The knowledge repository is a national level platform and will support the decision making process of Bangladesh Government especially for the water sector.

Homepage of the Knowledge Repository with Water Sector Related Information of Bangladesh

MOU between the CEGIS, Bangladesh, and the Korea Institute of Aviation Safety Technology (KIAST)

A Memorandum of Understanding (MOU) was signed between the Center for Environmental and Geographic Information Services (CEGIS), Bangladesh, and the Korea Institute of Aviation Safety Technology (KIAST) on 18 May 2023 at Songdo Convensia, Incheon, Republic of Korea. Mr. Motaleb Hossain Sarker, Director of the Water Resources Management Division, CEGIS, and Mr. Chang-Bong Kang, Director General of the Advance Aviation Research Division, KIAST signed the MOU as a representative of CEGIS and KIAST respectively.

The MOU aims to identify a framework of cooperation between CEGIS and KIAST, to strengthen collaboration and coordination of efforts to enhance information exchange in technologies for sustainable development in geo-spatial technology. It will also establish a framework of cooperation with advance program concepts for developing and disseminating innovative geo-spatial technology and knowledge and to modernize and building the capacity of professionals for land management and survey expertise in Bangladesh.

KIAST is a public organization specializing in leading aviation safety and technology advancement and works under the auspices of the Ministry of Land, Infrastructure and Transport, Republic of Korea. It aims to advance the drone industry by building infrastructure, improving regulations, and supporting technological development, preparing the drone planform for a safe next-generation growth industry of remote GIS, search and rescue surveillance, urban air mobility, and other innovative applications.

Mr. Chang-Bong Kang, Director General of KIAST and Mr. Motaleb Hossain Sarker, Director of the Water Resources Management Division, CEGIS signed the MOU

Event Outline (Apr-Jun 2023)

27 April 23	Inhouse Lecture on the Development of 2D Wave Modeling for Design of Landing Stations and Vessel Storm Shelters (VSS) Bangladesh
3 May 23	Meeting with study team for Feasibility Study, DRS, IEE, ESIA, LAP and RAP of Construction of Onshore Gas Pipeline from Kuakata to Khulna of Xcelerate Energy, Inc.
17 May 23	Meeting with CEGIS and Hajee Mohammad Danesh Science and Technology University for Mainstreaming SEA in study curriculums
18 May 23	Technical Meeting with the team of Landuse Mapping using Satellite Images and Remote Sensing Technology of Land Ministry
21 May 23	Meeting with Dr. Takanori Hayashida, Representative of the International Development Center of Japan (IDCJ) for future SEA study in the south central region of Bangladesh
22 May 23	Meeting with Mr. Erin Hughes, Senior Manager, Global Programs, Winrock International, US Office regarding upcoming 5-year Multispecies Biodiversity Conservation Activity in Bangladesh
22 May 23	Lecture on Transboundary River Navigation and Governance for the CEGIS Professionals
24 May 23	Team meeting on Feasibility Study for Water Resources Management in the Kirtonkhola-Shugandhya-Bishkhali River System of BWDB
28 May 23	CEGIS's Management Team Coordination (MCT) Meeting
01 Jun 23	Meeting with IMF mission on Climate Change Risk to Financial Sector of Bangladesh
14 Jun 23	Study team meeting on the Survey of Vascular plants of Barisal and Sylhet Divisions for Bangladesh National Herbarium.