



কলাবতী ফুল

Upcoming

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the CEGIS NEWSLETTER

Safeguarding Environment for Future



Courtesy Visit of Honorable Chairperson of the Board of Trustees to CEGIS

Mr. Kabir Bin Anwar, the honorable Chairperson, CEGIS-BoT and Senior Secretary, Ministry of Water Resources, Government of Bangladesh paid a courtesy visit to the CEGIS office on 1 February 2021. The chairperson was warmly greeted by the Executive Director Mr. Malik Fida A Khan along with the management. A meeting was arranged in the conference room of CEGIS maintaining health and safety protection considering the pandemic situation. The Executive Director initiated his speech with the vision of CEGIS and the intellectual services it provides in both national and international levels. He briefly

pointed out some of the flagship studies conducted by CEGIS which are playing important roles at national level. In addition, the Executive Director also mentioned the initiatives which are taken to build up the capacity of the professionals through training, coaching, and higher studies.

The honorable chairperson, CEGIS-BoT appreciated CEGIS for its involvements in different studies and offered a lots of inspirations. He acknowledged the efforts of CEGIS which it put forth for the overall sustainable management of natural resources. Mr. Anwar advised to

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Paturia - Baghabari Navigation Route Upgraded to Class-I

Jakia Akter, River, Delta and Coastal Morphology Division

Baghabari is one of the biggest inland ports located at the left bank of Hurasagar River, a tributary of the Jamuna River. Baghabari has the largest fuel store in the north-west region of Bangladesh, for which the port is very important for transporting fuel and fertilizer to this region. Besides, various commodities (food, food grains, jute and jute made products, cement, clinker, and petroleum products), yearly 0.6 Million tons of goods are carried by cargo vessels through this river route amounting to taka 5 crore for transporting. BIWTA is responsible for maintaining this important navigation route.

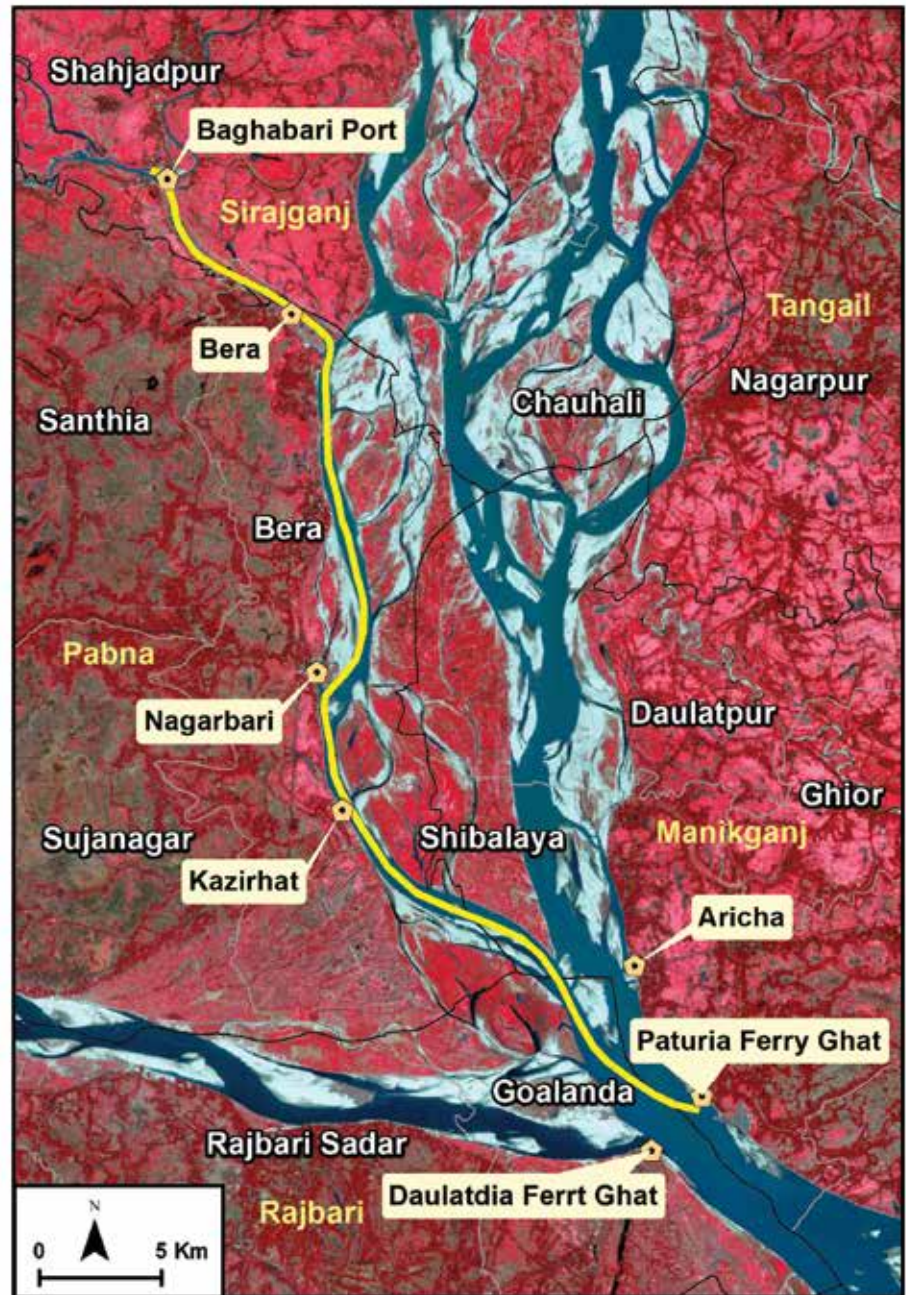
As being connected with a morphologically very dynamic river, Jamuna, riverbed aggradation is a common feature throughout the river route. BIWTA has to provide enough effort in dredging for maintaining this route. Because of unsustainable maintenance in recent years, disrupted navigation and created scarcity of fuel and electricity, and caused extra costs for carrying goods, unemployment, etc. This in turn poses a serious threat to the national economy of Bangladesh.

BIWTA has taken initiatives for improving and converting the navigation route from Paturia to Baghabari (about 50 km in length) from Class-II (6 ft depth) and Class-III (3 ft depth) to Class-I (minimum 12 ft depth). Accordingly, they engaged CEGIS to conduct a feasibility study of this route titled "Feasibility Study of the Route from Paturia to Baghabari for the Improvement of Navigability as Class-I". The route consists of about 11 km of Hurasgar River (from Baghabari Port to Hurasagar-Jamuna confluence), 35 km in the right anabranch of Jamuna River and about 6.5 km of Padma River (from Ganges-Jamuna confluence to Paturia Ferry Ghat).

Dynamics of the sand-bed Jamuna River causes declination of navigability creating unstable chars and sandbars. Average width of the Jamuna was 8 km in early 1970s, which is presently more than 12 km. The river has a tendency of shifting towards the west. Based on the understanding of the hydro-morphology of the river, erosion is the dominating process during the last few decades. CEGIS has a long-term understanding of the hydro-morphology of the Jamuna River since 1990s. CEGIS has conducted the hydro-morphological analysis, hydrodynamic and sediment transport modelling, traffic assessment, dredging volume assessment,

environmental and social impact assessment, and economic viability for the projects feasibility.

Hydrodynamic and sediment transport modeling was developed using TUFLOW Software incorporating two bathymetry datasets in dry and wet seasons. Along with



Map showing the Paturia- Baghabari Navigation Route

the hydro-morphological understanding of the route, and examining different probable options with the mathematical modeling tools, the best option indicates that dredging in few locations in the route with continuous maintenance would be good enough for year-round sustainable navigation. The ESIA indicates the best option considered to be environment-friendly and socially acceptable. Moreover, the economic analysis finds it viable as well.

Contract Signing for Different Studies

During the first quarter of the year 2021 (January - March), CEGIS has signed number of contracts with different organizations and clients. The contract titles with date of signing are given below:

i) "A Study to Delineate the ECA Boundaries for all ECAs of Cox's Bazar District" with Department of Environment (DoE) on 7 January 2021; ii) "Master Plan of the Upper Meghna River" with Dhaka Water Supply and Sewerage Authority as Focal Point on behalf of Local Government Division on 23 January 2021; iii) "Water Resources Investigation, Aminbazar, Dhaka" with China National Electric Engineering Co. (CNEEC), Ltd. on 2 February 2021; iv) "Establishment of Dhaka-Laksmipur Navigational Route on Meghna (Lower) River" with Bangladesh Inland Water Transport Authority (BIWTA) on 8 February 2021; v) "Feasibility Study for Crop Production Embankment and Subsurface Drainage Pipeline under the Cumilla-Chandpur-Brahmanbaria District Irrigation Area Development Project" with Bangladesh Agricultural Development Corporation (BADC) on 8 February 2021; vi) "Geo-Spatial (GIS-RS) Support for Land Acquisition Process of the River Training Works (Janjira Side) under Padma

Multi-Purpose Bridge Project (PMBP)" with Padma Multi-Purpose Bridge Project (PMBP), Bangladesh Bridge Authority (BBA) on 18 February 2021; vii) "Review of EIA for Mymensingh 360 ($\pm 10\%$) MW Dual Fuel (Gas/HSD) Combined Cycle Power Plant Project" with Rural Power Company Limited (RPCL) on 22 February 2021; viii) "Feasibility Study of Grounded Solar Power Plant (100 MWAC) in Bangladesh Feni District" with Suntrace GmbH on 16 March 2021.



Mr. Md. Salim Bhuiyan, PEng, Executive Director RPCL and Mr. Md. Jahid Hossain Jahangir, Director of CEGIS during contract signing

Environmental Impact Assessment for Construction of India-Bangladesh Friendship Pipeline Project (Siliguri, India- Parbatipur, Dinajpur, Bangladesh: Bangladesh Part)

Deeba Farzana Moumita, Power Energy and Mineral Resources Division

An increasing demand of oil consumption along with long and cumbersome transportation mode, people in the northern part of Bangladesh faces shortage of oil which becomes a regular phenomenon, particularly during the irrigation season (dry season). This has adverse impacts on crop production and transportation. To reduce the dependency on the transported diesel from the southern part of Bangladesh, the Government has taken an initiative through Bangladesh Petroleum Corporation (BPC) to import about one hundred thousand (100,000) tons of Oil per year (initially) through a Pipeline to be constructed from Numaligarh Oil

Refinery's off-take point at Siliguri, India to Parbatipur Oil Depot, Dinajpur, Bangladesh. The length of the Pipeline is in Bangladesh 124.34 km out of the total length of 129.50 km and the required land area for pipeline construction will be 124.8 hectare through acquisition (6 sqm) and requisition area (4 sqm).

As per ECR 1997, the Oil Pipeline Project falls under "RED Category" hence, it requires Site Clearance Certificate (SCC) through IEE Study and the Environmental Clearance Certificate (ECC) through EIA Study from DoE for implementation of the Project. BPC entrusted CEGIS

for conducting both the studies and to provide the intellectual services to this project. CEGIS observed the baseline condition through field visit and analyzed primary and secondary data of the study area. It also assessed the probable impacts along with corresponding mitigation measures for this Project. Moreover, several consultations with the stakeholders and local people have been conducted and accordingly their suggestions and comments were considered to improve the EIA Report. The EIA study reveals that employment for the local people will be generated during different phases of the project activities. Irrigation and communication facilities will be improved in the area as well. Based on the results of the EIA Study, an EMP, EMoP, Emergency Response Plan, Greenbelt Plan and Grievance Redressal Mechanism has also been given in the EIA Report.



Site view along the pipeline alignment on Korotoya River near Kazi Tea Estate

Formulation and Advancement of National Adaptation Plan (NAP) Process in Bangladesh

Ahmed Zulfikar Rahaman, Climate Change and Disaster Management Division

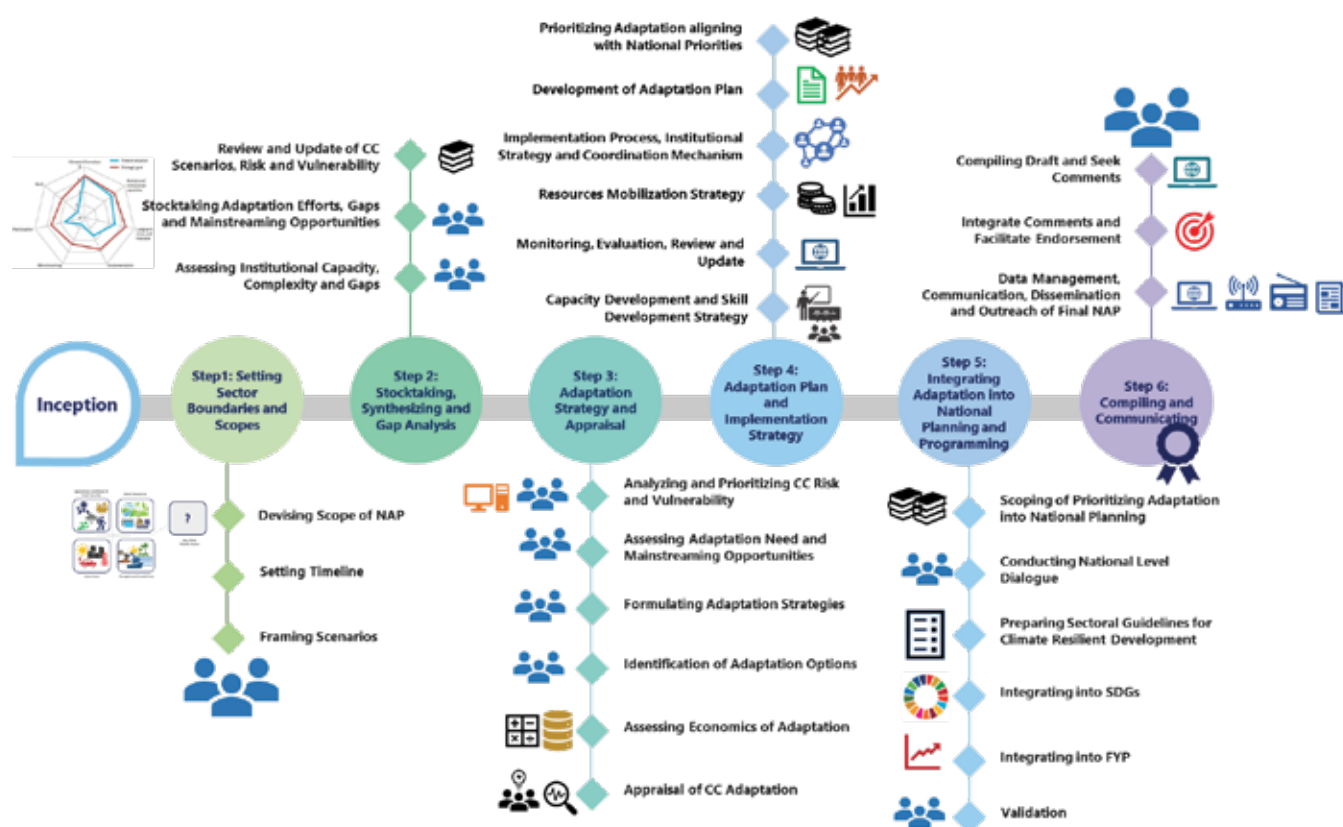
Context

Climate change is a global phenomenon but more often its manifestations and impacts which are felt by nations are local-context-specific. The linkage between climate change adaptation and national development process postulates the urgent need of mainstreaming the long-term adaptation plan into the national economic and development planning and process. The UN Framework Convention on Climate Change (UNFCCC) which is produced in 1992 and followed by the Kyoto Protocol (1995) becomes an international treaty was envisioned to assist the countries to undertake adaptation initiatives. The Marrakech Accord (2001), adopted by COP 7, is reflected as the landmark for adaptation within the UNFCCC. In COP 13 (2007), adaptation is brought on to equal footing with mitigation, highlighting it as one of four 'building blocks' required in response to climate change: alongside mitigation, technology cooperation and finance which ends in Bali Roadmap. Formulating the National Adaptation Plan focusing the mid-term and long-term measures is a step towards a resilient future as envisaged by the Cancun Adaptation Framework. The Cancun Adaptation

obligated to uphold COP decisions. Bangladesh will corroborate to COP decision and engage its institutions and citizens concerned in planning all future CCA activities in coming future. Moreover, the country has been spending in the order of US\$10 billion per annum for implementing its Annual Development Programme (ADP), where a planned approach towards integrating adaptation could produce great adaptation co-benefits in the medium to long term approach/measures. The present initiative of NAP process focuses on the mid-term and long-term measures. Accordingly, the UNDP is supporting this project to advance the formulation of the National Adaptation Plan by facilitating the Ministry of Environment, Forest and Climate Change of Bangladesh with financial support from Green Climate Fund (GCF) (UNDP, 2019). In this regard, UNDP has assigned CEGIS for the formulation and advancement of National Adaptation Plan process along with the other consortium partners C3ER-Brac University, BCAS and ICCCAD.

Objective

The main objective of the assignment is "to formulate the Bangladesh National Adaptation Plan (NAP), ensure the



Framework emphasized the need for integrating adaptation to climate change into the national development process (UNFCCC, 2010). It also recognized that such integration must be facilitated through appropriate institutional arrangement, financial resources, implementation capacity; and to this end, international cooperation must be extended to the developing countries.

As, Bangladesh is a signatory to UNFCCC, and thus

Climate Change Adaptation (CCA) is mainstreamed into the national planning process, building capacity, including the formulation of institutional mechanism and financing". The overall objective of the project has two parts to be fulfilled as indicated above but needs some reiteration for properly understanding the challenges. The first part is the formulation of the NAP and the second is its integration into the national development process and plan.

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CEGIS Environmental Lab: Digital Dissolved Oxygen Meter

Md. Rafiqul Alam, Water Resources Management Division

This instrument is a microprocessor- based battery operated DO/O₂/Temperature Meter. It can measure a wide range of Dissolved Oxygen and Temperature of water samples with a replaceable probe. Its model is PDO-519. It is LUTRON Brand and manufactured in Tiwan. It contains battery compartment cover, main display, power button, hold button (Unit button), REC button (OC, OF button), probe head with diaphragm set, and protection cover for probe head. This Dissolved Oxygen Meter measures DO of water samples in mg/L (0 to 20) with accuracy of ± 0.4 mg/L or O₂ in % (0 to 100) with accuracy of $\pm 0.7\%$ and Temperature °C (0-50°C) with accuracy of $\pm 0.8^\circ\text{C}$. Percentage of O₂ can be changed to mg/L by pressing HOLD button continuously at least 2 seconds. Temperature °C can be changed to Temperature °F by pressing REC button continuously for at least 2 seconds and vice versa. It has multiple applications in different studies, like environmental impact assessment and monitoring, researches, engineering, with common usage in water pollution studies for verification of DO level of different purposes, especially for hygiene investigations, environmental impact and monitoring. It is the perfect tool for diagnosing problematic DO level of drinking water, waste water, river water, reverse osmosis, agriculture, fish hatcheries, aquariums, water conditioning, mining industry etc. Main applications of this meter include: Hygiene investigations, water quality control for aquatic life etc. as per national standard. It is easy to read the present digital readings in display. Most of the measurements covers the values corresponding to ISO, IEC standard. Calibration is necessary before taking measurements. The instrument has to be switched on for taking measurement. After that the Hold button has to be pressed continuously for two second and the meter will then be ready for DO measurement. The probe head is then to be immersed in the sample completely for measuring temperature but for DO measurement it is sufficient to immerse the tip of the probe in the sample and velocity of the sample is at 0.2-0.3 m/s or to shake the probe. During measurement, if Hold button is pressed once then meter will hold the value on display and LCD will display HOLD symbol. The HOLD button is to be pressed once again for releasing the data hold function. The maximum and minimum values can also be recorded from this meter. After finishing measurement the probe has to be rinsed with normal tap water.

Basic Principle:

The basic principle of this DO meter underlying the electrochemical determination of oxygen concentration is the use of membrane covered



Dissolved Oxygen (DO) Meter

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Nature: Kolaboti: a very common flower in Bangladesh

Md. Amanat Ullah, Forestry and Biodiversity Division



Kolaboti Flower

Kolaboti (*Canna indica*), commonly known as 'Indian Shot' or 'African Arrowroot' native to South America, Central America, the West Indies and Mexico. It is a perennial plant grows up to 300cm tall having large leaves. The shape of the leaves of this plant is like banana leaf and hence is called as "Kolaboti" or "Kola Ful" in Bangladesh. The flowers of this plant are either red, yellow or occasionally red and yellow with red spots. This plant is widely distributed along the marshy lands of homestead boundaries, pond sides and ridges of urban lagoons.

Kolaboti is commonly planted in our country for ornamental purposes for its colourful flowers and attractive leaves. But in some countries of the world, the plant is used for having some edible and medicinal values. The root of this plant contains 25% starch and as such is used as an arrowroot. Roots are sometimes eaten raw, but usually consumed after being cooked in various ways. The very young tubers are eaten cooked as they are little bit sweet. The root in Peru is also consumed after baking up to 12 hours, when they become a white, translucent, fibrous and somewhat mucilaginous mass with a sweetish taste. Besides, the roots can be peeled, dried and then ground into flour which contains more than 90% starch and 10% sugar. This flour is highly soluble and are easily digestible. Leaves are used for wrapping foods. Starch from this plant and polyethylene are used as raw materials to produce biodegradable plastics in China.

Among the medicinal importance, the plant is used for the treatment of women's complaints, the leaves and the powdered seeds are mixed and used to treat dermatoses.

The natural habitat area for this plant is squeezing in our country due to filling up of the small marshes and ponds within the village and urban area for land development. Although the plant is little bit invasive but have no evidence of negative impact of this plant in Bangladesh. It can be planted along the ridge slopes of marshes, ditches and ponds to reduce erosion and enhance aesthetic beauty of the wetlands.

Using UAV technology for Biodiversity Conservation and Ecosystem Development of Mahamaya Eco-Park Mirsharai, Chattogram

Premanondo Debnath, Remote Sensing Division

DJI Mavic 2 Pro Unmanned Aerial Vehicles (UAV) was used to acquire ultra-high resolution aerial imagery and ultra 4K real time video of Mohamaya Eco Park Area. Detail land use and land cover, location of structures and topographic features are prerequisite for better understanding a study area as well as it will help to prepare a detail planning of an Eco-Park.

The UAV, Mavic 2 Pro, helps us in capturing data at centimetre level which is clearly visible to identify plant species, structures and any other small features of the landscape. A total of 6000 low altitude UAV images of 2 cm resolution were captured within 5 square kilometres for Mohamaya Eco-Park Study Area. The images were used to prepare GIS database of land use, landcover, infrastructure and detail topography. The UAV controlling and flight planning were performed by DJI Go 4 and DroneDeploy Mobile Apps respectively. The images were processed using Pix4D Mapper and Agisoft Metashape. The Photogrammetric Workstation was used to process the high volume image data and video.

A raw Digital Elevation Model (DEM) was created to show the landscape of the hilly area of Mohamaya Eco Park. Using UAV Data, we analyzed the greenness area and plant health of the study area to show the ecology and biodiversity of the vegetation. We were also able to identify plant species from the ultra-high-resolution UAV images. Finding the catchment area of the streams and measured flow we used UAV photo and video from different angles.



Aerial Photograph of Mohamaya Eco Park Area

Digital Dissolved Oxygen Meter... (Cont'd from page 5)

electrochemical sensors and polarographic type oxygen probe with an incorporated temperature sensor. The main components of the sensor are the polarographic type oxygen probe, thin Teflon Diaphragm housed in the top of the probe which is permeable by oxygen molecules but not by larger molecules contained in the electrolyte, the working electrode, the electrolyte solution and reference electrode. Due to the permeable characteristics of Teflon Diaphragm which is housed in the top of the probe, the oxygen molecule may enter in the electrolyte via the membrane and may diffuse throughout the electrolyte solution contained in the probe, and its concentration may be quantified by the measurement circuit. The measurement can be determined with the DO meter that uses oxygen-sensing probes. This probe is polarographic type sensor. In this meter, the polarographic sensor acts as a battery and is able to generate power without external voltage. Polarographic probes contain anode and cathode in electrolyte. Oxygen enters the electrolyte via the oxygen probe membrane, which generates voltage between the anode and cathode. This difference in potential voltage is used to measure

the amount of dissolved oxygen. This instrument is frequently used for In-Situ measurements of DO/Temp of water samples of different EIA, EMP, SIA study projects. CEGIS can use this DO Meter in water resources and environmental impact assessment and monitoring related studies.



Measuring DO during field visit using Digital Dissolved Oxygen Meter

Formulation and Advancement... (Cont'd from page 4)

Guiding Principle and Sectors

The NAP will focus on four main sectors of national strategic importance and other cross-cutting sectors which are: i) Water Resources, ii) Agriculture, Livelihood and Food Security, iii) Drought and Coastal Zone, and iv) Urban area. System based approach has been adopted to consider the overlapping and other cross cutting issues as well like WASH and health. CEGIS led consortium proposes the NAP process to be built on seven principles – i) Multi-disciplinary and complementary, ii) Participatory and Inclusive, iii) Synergy with International Environmental Agreement on Climate Change and SDGs, iv) Aligned with National Development and Economic Priorities, v) Ensured regional coordination based on local evidence and latest information, vi) Private sector engagement and vii) Financial integrity.

Key Activities and Outcome

Several key activities have been identified. After inception of the study, sector boundaries will be set and then scope comprising of selection of priority areas, setting timeline and boundaries will be fixed. To review and update the climate change scenarios, risk and vulnerabilities, adaptation efforts, gaps and mainstreaming opportunities; stocktaking will be performed with series of stakeholder consultations in different tiers considering horizontal and vertical integration and accordingly further gap analysis will be performed.

Based on these, climate change risk and vulnerabilities will be analyzed and prioritized to assess the adaptation needs and mainstreaming opportunities. This step will lead to develop adaptation plan, implementation and institutional strategy and coordination mechanism. To integrate the formulated adaptations into National Planning, SDGs and programming activities scoping of prioritizing adaptation into planning will be performed through conducting National Level Dialogue. Consequently, sectoral guidelines and a SDG integration

paper will be adopted as outcome of the integration process. Lastly, to outreach the final NAP, 16 working papers will be identified from the mentioned activities where detailed analysis and information of every aspects will be reported. The working papers are:

The compilation and dissemination process of NAP includes incorporation of identified knowledge and gaps, prioritized adaptation gaps and strategies, integration of comments and feedbacks for endorsement through peer review, validation workshop. This will enable the NAP to nationally owned global document and to be in accordance with the national mandate and global agenda. After the endorsement, it will be disseminated as National Policy to all relevant stakeholders.

Stakeholder Engagement and Gender Inclusion

Keen involvement of stakeholders will be ensured throughout the entire NAP process. Relevant ministries and public departments as well as private sectors, NGOs, CSOs, development partners, youth involved and having a stake in NAP process will be involved. More than 15 local and divisional level workshops along with several number of thematic and national workshops, more than 40 Focused Group Discussions (FGDs) and more than 60 Key Informant Interviews (KIIs) will be conducted all over Bangladesh. Engagement of stakeholders will enable to designate the spearheading or coordinating mechanism for NAP. Alongside the stakeholder engagement, NAP will also be gender responsive. According to the UNFCCC, “adaptation efforts will not be effective or sustainable if they do not take gender into account” (UNFCCC, 2015a). Hence, identification of entry key points for gender mainstreaming, gender actors (the government ministries responsible for gender issues as well as gender experts, civil society organizations, academic institutions and women’s groups) will be identified and involved in the entire process. NAP will be disseminated as National Policy to all relevant stakeholders. A national level workshop will be organized for proper dissemination of the NAP.

CEGIS Celebrated Bangabandhu Sheikh Mujibur Rahman's Birth Centenary



Paying homage to Bangabandhu, Father of the Nation by placing wreath at Memorial Museum on 17th March

The year-long (March 17, 2020 to December 16, 2021) celebrations marking the 100th birthday of the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, the architect of independent Bangladesh, got underway throughout the nation.

CEGIS also celebrated this day with due respect through fanfare and gaiety. A number of professionals along with Mr. Mahmudul Hassan, Adviser, Lt Col Afzalul Abedin, Director, Administration and Finance participated on the rally from Kolabagan Sports Ground to Bangabandhu National Museum at Dhanmondi.

After placing wreath CEGIS professionals stood in solemn silence for couple of minutes as a mark of profound respect to the memory of father of the nation.

CEGIS professionals also attended the Discussion Meeting and Doa Mahfil in the afternoon at Pani Bhaban. With the presence of number of participants from all agencies under Ministry of Water Resources, recalled Bangabandhu with humility and with pride of his contribution to the emergence of a sovereign Bangladesh. The participants offered fateha and munajat seeking eternal peace for the departed soul of Bangabandhu and his parents along with those martyred on 15th August 1975 as well as prayers were also offered for the wellbeing of Honorable Prime Minister Sheikh Hasina, country's continued peace, progress and prosperity. All promised to make his dreams into reality with determination and dedication.

Courtesy Visit of Honorable Chairperson ... (Cont'd from page 1)

ensure the sustainable improvement of aquatic environment by preserving water in the water-bodies during dry seasons. He advised CEGIS to develop the cutting edge techniques for polder management. He also instructed to identify some best spots to check sediments for better sediment management of our mighty rivers.

The honorable chairperson assured to provide full support to CEGIS in conducting studies or for any other operational issues. He praised CEGIS with inspirational words in the Comment Book. The conference ended by presenting a CEGIS Crest to the Hon'ble Senior Secretary, MoWR and the Chairperson of CEGIS-BoT.



With deepest sorrow, sharing you all that **Mr. Subrata Kumar Mondal**, Director, Research, Development and Training Division of CEGIS has passed away (May he receive the heavens) on 13 January 2021 at around 7 AM. His health condition deteriorated suddenly in the previous night and was taken to the Bangabandhu Sheikh Mujib Medical University Hospital and then to BIRDEM General Hospital.

He was only 55. He left behind his beloved wife, only daughter and son. His funeral was arranged at his hometown Barishal. Mr Mondol was a longest serving professional and contributed a lot in CEGIS. All the members of CEGIS are heartbroken at the sad demise of Subrata Kumar Mondal. CEGIS family extremely grieving for his immature and sudden departure. Heartiest condolence and sincere sympathy to the bereaved family members on this difficult time. CEGIS's thoughts and prayers are forever for his work and active contribution.

"Death brings pain that time can only heal, no words could ease what we truly feel"

May his soul rest in eternal peace and may God grant him a place in the paradise.

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