



### Upcoming Events

- ❑ CEGIS' 15 yrs celebration
- ❑ Ensuring sustainable water supply for the communities of coastal areas
- ❑ Development of DEM and Delineation of Catchments of polders
- ❑ Preparation of GIS Based Digital Land Information System
- ❑ Feasibility Study for Electronic Energy Metering Project of BREB

### Inside

- ❑ Guideline for Improvement of Quality of CEGIS Study Reports
- ❑ Dissemination Seminar on Riverbank Erosion Prediction 2017
- ❑ Development of 2-Dimensional Hydrodynamic Model for the Bay of Bengal using Delft3D FM
- ❑ Feasibility Study, EIA, SIA and RAP Study of 350MW Coal Fired Thermal Power Plant at Gazaria, Munshiganj
- ❑ Hatirjheel Area of Dhaka City in TripleSat Satellite Image
- ❑ Capacity Building Training in the Netherlands for CEGIS Professionals



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# the CEGIS NEWSLETTER

Quarterly Newsletter of the Center for Environmental and  
Geographic Information Services (CEGIS)

## International Visits of Executive Director, CEGIS to Professor Abdus Salam International Center for Theoretical Physics (ICTP), Italy and University of Ljubljana, Slovenia



*Engr. Md. Waji Ullah, Executive Director of CEGIS meets Prof. George Thompson, Acting Director of ICTP during the visit at Abdus Salam International Centre for Theoretical Physics*

Executive Director Eng. Waji Ullah and Director of Ecology, Forestry and Biodiversity Division, Mr. Motaleb Hossain Sarker of CEGIS, visited the prestigious institute "Professor Abdus Salam International Center for Theoretical Physics (ICTP)" during 15-19 May 2017 in Trieste, Italy to establish a knowledgebase relationship between the two dedicated and firmly committed research organizations for future scientific studies with relevant departments of the institute.

The Abdus Salam International Centre for Theoretical Physics (ICTP) has been a driving force behind global efforts to advance scientific expertise in the developing world. ICTP organizes different scientific events and

capacity building programs on Climate Modelling, Erath System Physics and Hydroclimate Modelling and Analysis Tools. From this point of view, a much fruitful and generative meeting was held on 18th May 2017 at the office of ICTP between the Acting Director, Prof. George Thompson and the CEGIS representatives. It was an opportunity to gather knowledge on application of climate model, hydrological model and basin wise agricultural/natural resources management models (e.g. RegCM, CHyM and GLAM Model) from renowned scientists and professors of ICTP. It is definite that there are ample opportunities to collaborate between CEGIS and ICTP. ICTP is a center which is highly scientific and knowledge based, where substantial climate

(Cont'd on page 4 ...)

## Preparation of Guideline for Improvement of Quality of CEGIS Study Reports

*A. T. M. Shamsul Alam, Director, Quality Management and Publication Division*



*Dr. Zafar Ahmed Khan, Senior Secretary of the Ministry of Water Resources and Chairperson of the Board of Trustees of CEGIS is seen as Chief Guest in the workshop*

In order to improve the quality of study reports/deliverables the Quality Management and Publication Division (QM&PD) of CEGIS has arranged three-round discussion sessions during April-June, 2017. Under the guidance of the CEGIS Management the QM&PD arranged first-round consultation session in April, 2017; second-round discussion meeting on early May, 2017; and third-round plenary session at the end May, 2017. Around 40 (forty) participants including CEGIS's internal and external Advisors, Panel of Experts (PoEs), Panel of Reviewers (PoRs), Deputy Executive Director (Development and Operations), Directors, Project Leaders and Senior Professionals attended a half-day long consultation session held at the CEGIS Conference Room on May 26, 2017. The session was inaugurated by Hon'ble Chairperson of CEGIS' Board of Trustees Dr. Zafar Ahmed Khan, Sr. Secretary of the Ministry of Water Resources, GoB as the Chief Guest; while Engr. Md. Waji Ullah Executive Director CEGIS Chaired the session.

Prior to this session 15 (fifteen) study reports of different divisions/disciplines were sent to 15 (fifteen) PoRs for technical review. Out of 15, 12 (twelve) reports were reviewed so far, where the PoRs have given their valuable thoughts, ideas and feedbacks through critical review of respective reports and sent them back to CEGIS (soft copy) before the session. During the session, each Member of the PoRs presented their comments, suggestions and opinion on the

reviewed study report, while the Director of the Division concerned along with the Project Leader and Study Team Members (who prepared the reports) took necessary notes from the discussion.



*Dr. Md. Abdul Matin, Professor, Department of Water Resources Engineering, BUET is commenting on a published report of CEGIS*

Based on the PoR's comments, presentations, discussion notes and transcript/gist of the consultation session (taken so far from voice recorder), two follow up discussion meetings were held on May 3 and May 9, 2017 respectively in presence of the Study Team Members, Project Leaders and Directors of the Divisions concerned for summarizing as well as finalizing the outcome of all sessions/meetings. The outcome was compiled later and prepared a 'Draft Guidelines for Improvement of Quality of CEGIS Study Reports/Deliverables' which was shared with all professionals in a plenary session held on May 25, 2017. Considering all remarks and suggestions from the plenary session, the Draft Guidelines have been finalized keeping it as a living document expected to be updated time to time as per future need and practices in CEGIS. Later, on 14 June, 2017 this Guideline was made mandatory for all professionals concerned through an 'Office Order' from the Management to follow its instructions properly aiming to improve the quality of CEGIS reports/deliverables.



*Mr. Mujubul Huq, Environmental Advisor of CEGIS is facilitating the session*



## Dissemination Seminar on Riverbank Erosion Prediction, 2017

*Sudipta Kumar Hore, River, Delta and Coastal Morphology Division*

A dissemination Seminar on Riverbank Erosion Prediction, 2017 for the Jamuna, the Ganges and the Padma Rivers was held at CIRDAP (Chameli House), 17 Topkhana Road, Dhaka on 24 May 2017. The objective of this seminar was to disseminate the erosion prediction results for 2017 as well as the monitoring result of the prediction made in 2016. Mr. Anisul Islam Mahmud, M.P, Honorable' Minister, Ministry of Water Resources, Government of the People's

Riverbank Erosion Prediction 2017.

The technical session started with a detailed presentation on Riverbank Erosion Prediction, 2017 by Mr. Sudipta Kumar Hore, Junior Specialist, CEGIS which was chaired by Dr. Ainun Nishat, Professor Emeritus, BRAC University. Dr. Maminul Haque Sarker, Deputy Executive Director (Development), CEGIS then gave a presentation



*Mr. Anisul Islam Mahmud, M.P, Hon'ble Minister, Mr. Muhammad Nazrul Islam, Bir Protik, psc, M.P, Hon'ble State Minister, Dr. Zafar Ahmed Khan, Senior Secretary, Ministry of Water Resources, Engr. Md. Jahangir Kabir, Director General, BWDB and Mr. Zahir Uddin Ahmad, Team Leader, Water Resources Management, Bangladesh Resident Mission, ADB are seen with Engr. Md. Waji Ullah, Executive Director and Dr. Maminul Haque Sarker, Deputy Executive Director, (Development), CEGIS in the dias of the seminar*

Republic of Bangladesh graced the occasion as Chief Guest and Mr. Muhammad Nazrul Islam, Bir Protik, psc, M.P, Honourable State Minister, Ministry of Water Resources Government of the People's Republic of Bangladesh was present as Guest of Honour. Dr. Zafar Ahmed Khan, Senior Secretary, Ministry of Water Resources, Government of the People's Republic of Bangladesh, Engr. Md. Jahangir Kabir, Director General, BWDB and Mr. Zahir Uddin Ahmad, Team Leader, Water Resources Management, Bangladesh Resident Mission, ADB were present as Special Guests in the seminar.



*Dr. Maminul Haque Sarker, Deputy Executive Director, (Development), CEGIS is delivering presentation on Sediment Management in the seminar*

The inaugural session was chaired by Engr. Md Waji Ullah, Executive Director, CEGIS. The program started with registration of the participants at 9:30 AM. The seminar started at 10:00 AM through recitation from Holy Quran. Mr. A. M. Aminul Haque, Project Director, FRERMIP gave the introductory speech. Afterwards, Dr. Maminul Haque Sarker, Deputy Executive Director (Development), CEGIS presented the summary on "Updating of Tools and

on Sediment Management. After which a open discussions were made by the designated discussants.

About 160 participants including national and international dignitaries in water resources sector were present in the seminar. The floor was opened at the end of the presentation and discussions by the designated discussants, where participants provided their valuable suggestions and comments for the enhancement of the study report.

### CEGIS Environment Lab

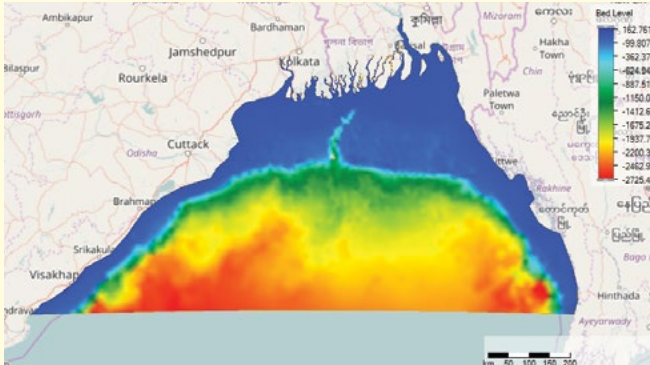
CEGIS has established an Environmental Lab with advanced and modern equipments for air and water quality measurements, bathymetry survey of river and estuary, noise measurements and topographic survey. These equipments include Water Salinity Meter, Soil Salinity Meter, Noise Meter, Plankton Sampler, Ultra-violet visible Spectrometer, Hobo weather station, Gaseous sampling kits, Turbidity Meter, Sediment Grab sampler, Multi-parameter Tester, Microscope, and Binocular.



## Development of 2-Dimensional Hydrodynamic Model for the Bay of Bengal using Delft3D FM

*Gazji Md. Riasat Amin, Climate Change and Disaster Management Division*

CEGIS has developed and simultaneously updated a 2-dimensional hydrodynamic model for the Bay of Bengal applying a combination of structured and unstructured grid tailored to fit the changing coastlines for such a morphologically active region using latest version of Delft3D FM. Delft3D FM has a flexible combination of curvilinear grids and unstructured grids composed of triangles, quads, pentagons, hexagons and boundary fitted grid which ensured computational speed and accuracy with optimal model flexibility.

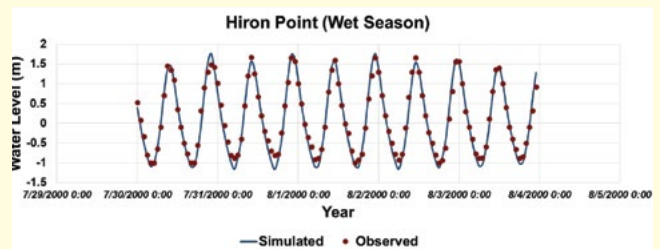


This model has been set up of varying grid size including combination of both rectangular and triangular grids and have been applied considering both the computational requirements as well as priority locations. One of the important parameter of unstructured grid is orthogonality, which is needed for overall accuracy of the model outcome. Maximum orthogonality of the overall grid is found 0.043, which is satisfactory. Bathymetry of estuaries and sea for the Bay of Bengal have been developed through a combination of survey data from

Bangladesh Water Development Board (BWDB) for rivers and offshore areas and Open Access General Bathymetric Chart of the Oceans (GEBCO 14) for the deep sea portion.

Two open boundaries have been taken in the model, one is in the Lower Meghna River at Mawa as northern upstream boundary and another one is in the Bay of Bengal as the southern downstream boundary. Time series data of discharge collected from BWDB has been used as upstream boundary. For downstream, astronomic tidal water level data generated from delft dashboard has been used.

The flow model is initially calibrated and validated at



*Calibration at Hiron Point*

Hiron Point and Cox's Bazar. Model reliability for the flow model is found to be approximately 57% and 56% for Cox's Bazar and Hiron Point respectively. The value of  $R^2$  is found to be 0.71 and 0.76 for Hiron Point and Cox's Bazar, respectively.

Simulated results clearly portray the variation of the flow circulation, velocity distribution and direction separately for monsoon and dry season around the model area. This model would be very useful for the hydrodynamic study in the coastal region of Bangladesh.

### A Visit to ... (Cont'd from page 1)

and water modeling activities are being carried out by the Department of Earth System Physics (ESP). Such kind of activities hold very good potential for CEGIS, as CEGIS is also doing climate, water, environment and agricultural modeling activities running under the Climate Modeling and Disaster Management Division and is one of the pioneer research centers of Bangladesh.

Executive Director and Director of CEGIS met Dr. Filippo Giorgi, Head of Earth System Physics and gave virtuous direction for organizing the outreach scientific events in Bangladesh for South Asian Countries. CEGIS also proposed to sign an MoU with ICTP that will encourage proposal for cost sharing scientific events and to work as a joint venture in carrying out mutual research and scientific knowledge sharing opportunities. Professionals from CEGIS also visited TWAS (The World Academy for Science), the ICTP Library, Multi Laboratory, ESP, T/ICT4D Laboratory for ionospheric electron density modeling and other sub-center such as IAP (the Inter Academy Partnership). All these centers are carrying out high level research. Dr Bruno NAVA informed about the ionospheric modeling which is concern with Ionospheric data ingestion into electron density

models to produce 3D specification of the ionosphere, GNSS radio-occultation data inversion to obtain electron density profiles in the ionosphere to improve the accuracy of GNSS (Global Navigation Satellite System) and its application in Global Positioning System (GPS). All these were highly motivating and have potential application in our country in the near future.



*Ms. Anka Lisec, Faculty of Civil and Geodetic Engineering at University of Ljubljana, is receiving a souvenir form Engr. Md. Waji Ullah, Executive Director of CEGIS*

(Cont'd on page 5 ...)



## Feasibility Study, EIA, SIA and RAP Study of 350MW Coal Fired Thermal Power Plant at Gazaria, Munshiganj

*Jasia Tahzeeda, Pranab Kumar Halder & Md. Azizul Haque, Power, Energy & Mineral Resources Division*

The Rural Power Company Limited (RPCL), an enterprise under the Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh has planned to enhance the country's power generation by constructing 350 ( $\pm 10\%$ ) MW Super Critical Coal based Thermal Power Plant at Gazaria Upazila in Munshiganj District. For this purpose RPCL has entrusted O&M Solution, India in association with CEGIS, Bangladesh to carry out the Feasibility Study, Environmental Impact Assessment (EIA), Social Impact Assessment (SIA) and Initial Resettlement Action Plan (IRAP) for this proposed Project.

The proposed Power Plant Project will be Coal Fired Thermal Power Plant with rated capacity of 350 ( $\pm 10\%$ ) MW which will have a pulverized Coal Fired Super Critical Boiler with built in dry low NO<sub>x</sub> burners, 220 meter high stake with auxiliaries and ancillaries like Feed Water Pump, Forced Draft (FD) Fans, Coal Crasher etc., a Steam Turbines coupled with hydrogen cooled Generators suitable for indoor installation. The primary fuel will be bituminous/sub-bituminous coal for continuous operation and liquid fuel like Heavy Fuel Oil (HFO), Light Diesel Oil (LDO) for Boiler start-up, flame stabilization and low load operation. This Project is located within two Mouzas namely, Daulatpur (North) and Sholo Ani (South) of Imampur Union in Gazaria Upazila under Munshiganj District. The site is approximately 3 (three) km from Gazaria Upazila Headquarter which is approachable through the existing road network, connected to the Dhaka-Chittagong Highway at Bhoberchar Bazar. The Meghna River, the main water course, flows along the western side of the Project. Hence, the proposed Jetty will be built at the western side of the Project area for Coal Handling, Loading/unloading of Coal Ash and Heavy Equipments.

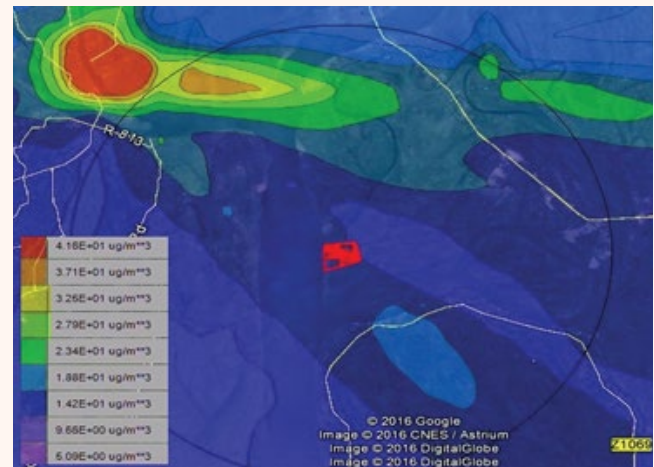
A Team of Experts from CEGIS have contributed both for Feasibility and EIA studies. The EIA Study revealed that installation of this Power Plant can cause



*Proposed Resettlement Plan*

significant impacts to the study area. Acquisition of the land is a crucial issue for this Project. The total land of the Project area is about 127.11 hectares (314.10 acres) covering 99% agricultural land and 1% household settlement. Around 20 households were observed in the Project area. Therefore, Land and Resettlement Action Plan (RAP) is emphasized in the Environmental

Management Plan (EMP). Another significant potential negative impact of the Project is air pollution, which will occur particularly due to vehicle movement.



*Air Quality Modeling Data-SO2-24 HR*

Hazard and Risk Assessment and implementation of Environmental Management Plan in three phases as suggested by CEGIS Team will minimize the negative impacts, compensate the residual impacts and enhance the positive impacts of the Project. A number of plan and program and a detailed spatial monitoring framework have been suggested by the study team for the proper implementation of the EMP.

In spite of having some potential negative impacts, the new Power Plant Project will create enormous potentiality and economic and social development of the Study area by proposing a large number of job opportunities, infrastructural development and increasing social security. Finally, the recommendations of the EIA studies (if followed) and paying compensation is given to the affected person, the Power Plant can provide optimum benefits with minimum environmental impact for achieving the goal of increasing electricity generation and reducing the dependency of power generation on our limited natural gas reserve.

### A Visit to ... (Cont'd from page 4)

Prior to the visit of ICTP, Executive Director of CEGIS and Director Ecology, Forestry and Biodiversity Division visited the University of Ljubljana, Slovenia on 16th May 2017. During this visit the CEGIS representative met with Professor Dr. Matjaz Dolsek and Dr. Anka Lisec who are working in the Faculty of Civil and Geodetic Engineering of University of Ljubljana, Slovenia. Ms. Rumana Hudin, Coordinator of the faculty has facilitated the meeting. Executive Director, CEGIS gave a presentation on CEGIS technical capability and scope of possible collaboration between the two institutions. Dr. Matjaz Dolsek and Dr. Anka appreciated the presentation and mentioned that there may be a possibility of future research collaboration with CEIGS. Dr. Matjaz also made a briefed on different research activities of their universities. Finally, they expressed gratitude and gave thanks to CEGIS for visiting the university.



## Hatirjheel Area of Dhaka City in TripleSat Satellite Image

The images of Hatirjheel area were acquired by TripleSat Satellite Sensor on 6th February 2017. The TripleSat Constellation was launched on July 10, 2015 and it delivers 0.8m panchromatic and 3.2m multispectral high resolution satellite imagery. It consists of three identical optical earth observation satellites. It has the capability to target anywhere on Earth once per day, which makes it ideal for providing timely spatial information to wide range of applications

such as National Land and Resource Management, Agriculture Resource Census, City Development, Ecological Environment and Disaster Monitoring. It supplies the best combination of spatial resolution and temporal resolution – aiming at simulating operational monitoring applications, such as urban planning and intelligent management, based on changes detected by timely and regular cloud-free, very high-resolution imagery.



*TripleSat Satellite Image (Acquisition date: 6th February 2017)*



## Capacity Building Training in the Netherlands of CEGIS Professionals

*Abmmed Zulfiqar Rahaman, Climate Change and Disaster Management Division*

CEGIS always encourages professionals to build their capacity in multidisciplinary sector through tailor made training at home and abroad. Such opportunities not only enhance individual capacity, but also enrich organizational strength. As a part of the capacity building, opportunities were given to five professionals to attend three separate foreign trainings. Two training were arranged under Nuffic Niche BGD 155, a Dutch funded project aiming to build capacity of the four organization namely Department of Water Resources Engineering, Bangladesh University of Engineering and Technology, Department of Irrigation and Water Management, Bangladesh Agricultural University, Centre for Environmental and Geographic Information Services and Water Resources Planning Organization. Among these two trainings, one was a twelve (12) days Software Training Course at Deltares, The Netherlands and another was a fifteen (15) days short course on 'Water Economics' at UNESCO-IHE, Institute for Water Education, Delft, The Netherlands. The other training was organized by the Faculty of Geo-Information

foundation, the course further elaborated on and synthesized economic approaches to manage water including quantity and price based policy instruments, institutional role and benefit-cost analysis. The course also covered economic valuation of water uses and decision-making context. It helped participants to learn allocation of water for different sectors optimizing the benefit of water use. The roleplay game also helped to understand sustainable water resources management in the real world.

### Software Training Course at Deltares

This software training course provided short introduction and hands on exercise on the uses of different water modeling tools i.e. Meta Model (a tool for rapid assessment of strategies and scenarios), SOBEK (Hydrodynamic model) and MODFLOW (Groundwater modeling tool). This training also covered decision making game named "Sustainable Deltagame" through which participants were able to take flexible and adaptive strategic decisions for longer term considering different scenarios and uncertainties. Last but not the least, a one day field trip was arranged to visit Biesbosch Natural Museum and Krammer Sluices. Biesbosch Natural Museum was a historical archive of natural defense during 1953 devastating floods in the Netherlands. Professionals learned mechanism of navigation lock to separate brackish and freshwater through visiting Krammer Sluices.



*Participants from different agencies are seen in a field visit at Krammer Sluices in The Netherlands*

Science and Earth Observation (ITC), University of Twente, AE Enschede, the Netherlands on developing Decision Support System.

Short overview of and lesson learn from these training courses are briefly described below:

### Short Course on Water Economics

The course introduced economic principles, concepts, and theory to build economic foundation for understanding water issues. Based on the economic



*Participants are sharing their knowledge, learnt in the training sessions*



*Software Training Course at Deltares, The Netherlands*

### Training on Developing Decision Support System

The major topics covered during the training session were the uses of Integrated Land and Water Information System (ILWIS) software for implementing spatial multi-criteria evaluation (SMCE), analyzing a decision problem dividing it to some evaluation criterion based on spatial analysis in the ILWIS. Programming techniques with ILWIS script was demonstrated for different spatial calculations. Discussions on spatial criteria for the solution of a decision making problem were held in the training. Participant also learned about software development opportunities using the ILWIS API, practical sessions with the ILWIS software development team and some case studies on decision making problems of different areas.

## Contract Agreements

CEGIS has highly qualified multi-disciplinary researchers, scientists, experts, technical professionals and a panel of advisers who have a wide range of experience and skills and who use the latest and modern tools and techniques in their service areas to provide the best quality output.

These professionals, with high skills, are committed to conducting EMP, IEE /EIA /SIA /ESIA /Environmental Monitoring, Feasibility Study reports, Geo-informatics and Remote Sensing. CEGIS is trusted by its clients at home and abroad for the quality outputs it produces in its study works.

Four contracts have been signed by CEGIS with various other organizations and clients to carry out different studies during the period April to June 2017. These contract titles are i) Environmental Safeguard Monitoring of Implementation of Bheramara to Ishwardi 230 kv 12km Transmission line and 2nd block 1X500 MW Back to Back Substations with Power Grid Company of Bangladesh (PGCB) on May 02, 2017; ii) Sub consultancy agreement for Deltacap project with Institute of Water Modeling

(IWM) on May 16, 2017 ; iii) Environmental Monitoring report (EMR) of "Construction of five 132/33/11 KV Grid Sub-stations in DESCO area" with Dhaka Electric Supply Company Limited (DESCO) on May 25, 2017, and iv) Environmental Impact Assessment Study of Land



*Mr. Mina Masud Uzzaman, Secretary, Bangladesh Power Development Board (BPDB) and Engr. Md. Waji Ullah, Executive Director, CEGIS and other officials from BPDB and CEGIS are seen in the contract signing ceremony*

Development Work on Acquired Land at Rampal, Bager Hat, Bangladesh with Bangladesh Power Development Board (BPDB) on June 07, 2017.

## New Faces



**Mr. Md. Jahid Hossain Jahangir** joined CEGIS in April 2017 as an Adviser. Mr. Jahangir has worked in the water resources sector for about 34 years. Prior to his joining in CEGIS, he spent most part of his service career in Joint Rivers Commission (JRC), Bangladesh, Ministry of Water Resources, Government of the

People's Republic of Bangladesh at different capacities such as Assistant Engineer, Sub-Divisional Engineer, Executive Engineer, Director and Member. He also worked in Bangladesh Water Development Board as Sub-Divisional Engineer in Planning IV Directorate, as Superintending Engineer at the office of the Chief Engineer, Design and as Additional Chief Engineer, Training Institute, Bhagyakul, Munshiganj.

Mr. Jahangir led JRC, Bangladesh as Member for more than one year and he led the Bangladesh side of the Technical Committee of the JRC on Trans-boundary River issues with India and Nepal. Under the provision of the Ganges Water Treaty of 1996, he also acted as Chairman, Indo-Bangladesh Joint Committee on sharing of the Ganges water at Farakka, India. He acted as Team Leader of the Indo-Bangladesh Joint Observation Team of the Bangladesh side for sharing of the Ganges Waters at Farakka for a number of times. He had participated at Intensive English Language Course at the British Council, Dhaka and in UK. He had visited countries like Sri Lanka, Egypt, Malaysia, The Netherlands,

Tunisia, USA, Switzerland, Turkey for participating in conferences, trainings, workshops, seminars and dialogues. He attended the 7th International Law and Transboundary Freshwaters Workshop at the Centre for Water Law, Policy and Science at the University of Dundee, Scotland, UK.



**Mr. Muhammad Shahadat Hossain** has Joined CEGIS as Principal Manager under Administration, Finance, Accounts, Audit and Logistics Division on 2nd May 2017. Previously he worked in CIRDAP. He also worked in Asian Consumer Care (Pvt) Ltd (A joint venture of Dabur India & ACI Ltd), PRAN-RFL

group and Malaysian International Shipping Corporation (MISC).

Mr. Hossain completed M.B.A (Executive) from East West University and M.Com from Jagannath University. He also completed Chartered Accountancy course from M.R. Khan & Company under Institute of Chartered Accountants of Bangladesh (ICAB). He was enlisted as Income Tax Practitioner under the National Board of Revenue (NBR) and is a Member of Dhaka Taxes Bar Association. He has intensive experience in Financial Accounting, Financial Management, Financial Reporting, Budgeting, Auditing, Asset Management, Investment Analysis, Administration, Procurement and Operations Management. His total work experience is 20 years.

### Chair of Editorial Board

Engr. Md. Waji Ullah

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