



Center for Environmental & Water Management (CEWM)



Proposal Worksheet

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**Department of Environmental, Water Resources, and Coastal Engineering
(EWCE)**

Military Institute of Science and Technology (MIST)

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1. Background

The overall development and economy of Bangladesh are largely dependent on the environmental and water resources of the country due to its natural and geographical location in the GBM delta. Natural and human-induced hazards like- floods, droughts, pollutions, cyclones and storm surges, salinity, etc. are disrupting the socio-economic condition of the country and making a negative impact on the overall life system. Besides, Bangladesh is expected to suffer from the adverse impacts of climate change according to the IPCC 5th assessment report and other hydrological studies. To deal with the prevailing situation and to overcome these issues the present government of Bangladesh has formulated the Bangladesh Delta Plan (BDP) 2100 and has taken action to implement it step by step. To implement this master plan and to solve water and environment related problems there is no alternative to research-based knowledge and sustainable innovation.

Center for Environmental & Water Management (CEWM) under the Department of Environmental, Water Resources and Coastal Engineering, MIST will play an effective and far-reaching role in the implementation of BDP by solving water and environment related issues through research-based knowledge and sustainable technology innovation. In addition to conduct basic and applied researches, **CEWM** will act as the driving force of inter-departmental coordination of environmental and water-related researches. **In this context, the council of MIST (20th meeting) approved the proposal of the formation of the CEWM on December 10, 2019.** Also, it was instructed to formulate and present a detailed proposal on the Scope of **CEWM**, Organizational structure, Charter of duties, and Financial Implication at the 21st Council Meeting.

2. Review of Similar Organizations in Bangladesh

While preparing our proposal we have studied the following academic institutions-

1. Bangladesh University of Engineering & Technology (BUET)

- a. Institute of Water and Flood Management (IWFM)
- b. Centre for Environmental and Resource Management (CERM)
- c. International Training Network: Centre for Water Supply and Waste Management (ITN-BUET)

2. Chittagong University of Engineering & Technology (CUET)

- a. Center for River, Harbor & Landslide Research (CRHLSR)
- b. Centre for Environmental Science & Engineering Research (CESER)

3. Rajshahi University of Engineering & Technology (RUET)

- a. Institute of Energy and Environment Studies (IEES)

4. Dhaka University of Engineering and Technology (DUET)

- a. Institute of Water and Environment (IWE)

5. Islamic University of Technology (IUT)

- a. Institute of Energy and Environment (IEE)

6. BRAC University

- a. Centre for Climate Change and Environmental Research (C3ER)

7. Independent University, Bangladesh (IUB)

- a. International Center for Climate Change & Development (ICCCAD)

We have also reviewed the following non-academic institutions-

- a. Institute of Water Modeling (IWM)
- b. Center for Environmental and Geographic Information System (CEGIS)
- c. Flood Hazard Research Centre (FHRC)

3. Scope of CEWM

3.1. Vision

The vision of CEWM is to be a leading center for the advancement of research-based knowledge and technology, development of human resources, and sustainable solutions, for environment and water management issues.

3.2. Mission

To generate knowledge through basic and applied researches

- a. To develop human resources to deal with national and global challenges in the environmental and water management sector.
- b. To associate in the implementation of national environmental and water management plans and policies.
- c. To establish linkage with the national and international institutions for collaborative research and knowledge sharing.
- d. To provide expert advisory services and technical supports to government and non-government organizations.

4. Proposed Organizational Structure

The proposed organizational structure of CEWM is as follow:

The Center for Environmental & Water Management (CEWM)

- Advisor (Comdt, MIST)
- Director (Head, EWCE Dept)

Environmental Management

1x Deputy Director (Professor & Eqvt)
1x Office Assistant
1x Office Attendant

Division 1: Climate Change and Disaster Management

1 x Senior Research Officer (Associate Professor & Eqvt)
1 x Associate Research Officer (Assistant Professor & Eqvt)
1 x Junior Research Officer (Lecturer & & Eqvt)
2 x Research Assistants (MSc/BSc)

Division 2: Pollution Management

1 x Senior Research Officer (Associate Professor & Eqvt)
1 x Associate Research Officer (Assistant Professor & Eqvt)
1 x Junior Research Officer (Lecturer & & Eqvt)
2 x Research Assistants (MSc/BSc)

Division 3: Environmental Impact Assessment

1 x Senior Research Officer (Associate Professor & Eqvt)
1 x Associate Research Officer (Assistant Professor & Eqvt)
1 x Junior Research Officer (Lecturer & & Eqvt)
2 x Research Assistants (MSc/BSc)

Water Management

1x Deputy Director (Professor & Eqvt)
1x Office Assistant
1x Office Attendant

Division 1: River and Flood Management

1 x Senior Research Officer (Associate Professor & Eqvt)
1 x Associate Research Officer (Assistant Professor & Eqvt)
1 x Junior Research Officer (Lecturer & & Eqvt)
2 x Research Assistants (MSc/BSc)

Division 2: Coastal Zone Management

1 x Senior Research Officer (Associate Professor & Eqvt)
1 x Associate Research Officer (Assistant Professor & Eqvt)
1 x Junior Research Officer (Lecturer & & Eqvt)
2 x Research Assistants (MSc/BSc)

Division 3: Integrated Water Resources Management

1 x Senior Research Officer (Associate Professor & Eqvt)
1 x Associate Research Officer (Assistant Professor & Eqvt)
1 x Junior Research Officer (Lecturer & & Eqvt)
2 x Research Assistants (MSc/BSc)

5. Manpower Requirement

The following table summarizes the total manpower of CEWM-

Sl	Appointment	No.	Remarks
1	Advisor	1	Comdt, MIST
2	Director	1	Head, EWCE Department
3	Deputy Director (Prof & Eqvt)	2	Existing faculty in addition to their regular duty
4	Senior Research Officer (Associate Professor & Eqvt)	6	
5	Associate Research Officer (Assistant Professor & Eqvt)	6	
6	Junior Research Officer(Lecturer & Eqvt)	6	
7	Research Assistant	12	To be employed by MIST
8	Office Assistant	2	
9	Office Attendant	2	
Total		38	

6. The requirement of Lab Facilities

The following table summarizes the laboratories that will provide support to CEWM-

Sl	Name	Remarks
1	Physical Modeling Lab	Included in the proposed TO & E of EWCE Department
2	Modeling & Simulation Lab	
3	Environmental Microbiology Lab	
4	Bio-Chemical Lab	Existing Environmental Engineering Lab
5	Pollution Chemistry & Sludge Management Lab	Included in the proposed TO & E of EWCE Department
6	Coastal Engineering Lab	

7. Proposed Activities

7.1.Environmental Management

Division 1: Climate Change and Disaster Management

To conduct researches/workshops/seminars/training on the following issues-

- Atmospheric Modeling and Forecasting
- Technologies for Reducing Greenhouse Gas Emissions
- Climate Resilience
- Disaster Likelihood Analysis
- Disaster Management Policy

- Renewable Energy etc.

The Climate Change and Disaster Management division will require the **Modeling and Simulation Lab** to conduct researches/training.

Division 2: Pollution Management

To conduct researches/workshops/seminars/training on the following issues-

- Water and Wastewater Treatment
- Environmental Microbiology
- Transport and Transformation of Contaminants
- Air Pollution Modeling and Impact Analysis
- Soil and Groundwater Remediation
- Municipal and Industrial Waste Management
- Environmental Monitoring and Instrumentation

The Pollution Management division will require the Bio-chemical Lab, **Environmental Microbiology Lab**, and **Pollution Chemistry and Sludge Management Lab** to conduct research experiments/training.

Division 3: Environmental Impact Assessment and Management

To conduct researches/workshops/seminars/training on the following issues-

- Environmental Impact Assessment
- Social Impact Assessment
- Resettlement Action Plan
- Life Cycle Assessment
- Project Management and Pollution Mitigation Plan
- Water, Air, and Noise Pollution Modeling
- Environmental Policy and Law etc.

The Pollution Management division will require the **Modeling and Simulation Lab** and **Biochemical Lab** to conduct research experiments/training.

7.2. Water Management

Division 1: River and Flood Management

To conduct researches/workshops/seminars/training on the following issues-

- Hydrodynamic/Morphodynamic Modeling of River Flow
- Sediment Modeling
- Assessment of River Bed Changes, Erosion and Accretion
- Bridge Hydraulics
- Effects of Training Structures on River Stages

- Trans-boundary River Challenges
- Flood Detection, Forecasting, Warning, and Damage Assessment
- Impacts of Flood on Water Supply and Sanitation etc.

The River and Flood Management division will require the **Physical Modeling Lab and Modeling and Simulation Lab** to conduct research experiments/training.

Division 2: Coastal Zone Management

To conduct researches/workshops/seminars/training on the following issues-

- Numerical Modeling of Coastal Sediment Transport and Shoreline Changes
- Coastal Subsidence and Sea Level Rise
- Salinity Intrusion in the Coastal Zone
- Coastal Agricultural Productivity
- Fresh Water Scarcity in the Coastal Zone
- Groundwater Decline and Depletion in the Coastal Zone
- Design of Shore Protection Structures
- Climate Change and Coastal Zone of Bangladesh (Vulnerability, Resilience, and Adaptability), etc.

The Coastal Zone Management division will require the **Coastal Engineering Lab and Modeling and Simulation Lab** to conduct research experiments/training.

Division 3: Integrated Water Resources Management

To conduct researches/workshops/seminars/training on the following issues-

- Watershed Management
- Haor and Wetland Management
- Analysis of Water Logging Problems
- Evaluation of Drought Risks and its Impact
- Sustainable Floodplain Management
- Watershed/Basin Hydrological Modeling
- Natural Resources Degradation and Management Prospects for Biodiversity Conservation
- Irrigation Management Techniques
- Numerical Modeling of Sub-surface flow etc.

The Integrated Water Resources Management division will require the **Physical Modeling Lab and Modeling and Simulation Lab** to conduct research experiments/training.

8. Charter of Duties

The responsibilities of the center personnel may include but not limited to the following duties:

Advisor: To promote conditions conducive to research and growth of the center, providing appropriate guidance on the progress of the research and the standards expected.

Director: To direct and implement research and development policies, objectives, and initiatives; to make recommendations based on research findings; to create functional strategies and specific objectives for the divisions and to develop budgets/policies/procedures to support the functional infrastructure.

Deputy Director: To be responsible for the development, facilitation, and reporting of the strategic direction of research within the center, the quality and impact of the research and journal, the growth of local, national, and international research collaborations and engagement and impact with a broad range of stakeholders, including academia and industry.

Senior Research Officer: To supervise research projects and work with team members to determine the goals of the research project research methods, variables, and other test parameters, to choose how to collect data and offer recommendations on evaluating the project, to review gathered research and analyze data during the project, to help in interpreting data and writing reports.

Associate Research Officer: To provide professional expertise and skills in research methodology, research design, data collection, data analysis, and the interpretation and presentation of research and evaluation results.

Junior Research Officer: To carry out research objectives that are outlined by the research team and work in collaboration with the senior and associate research officers, and research assistants/associates.

Research Assistants/Associates: To conduct research experiments according to protocols laid out by research officers; to be responsible for the tasks that support the research activities; to assist in developing and scheduling workshops, seminars, and training.

9. Financial Implication

- a. The Center for Environmental & Water Management (CEWM) will not require any external financial source.
- b. Financial support for the center will be provided by the MIST research fund.
- c. Funds received from advisory services will be used for the development of the center and other expenditures.