

Report on

Training of Trainers (ToT) Course on Concept and Practice of Integrated Water Resources Management



April, 2015

Submitted by

**Report on
Training of Trainers (ToT) Course on
“Concept and Practice of Integrated Water Resources Management”**



**Organized by: CEGIS in Association with
Bangladesh Water Partnership (BWP)**

April 2015

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1. Introduction

CEGIS organized a Training of Trainers (ToT) course on “**Concept and Practice of Integrated Water Resources Management**” from 29th March to 2nd April 2015 in association with Bangladesh Water Partnership (BWP). The purpose of the training programme was to introduce the Integrated Water Resources Management (IWRM) concept and its principles to the water managers and experts from different organizations of Bangladesh so that they were able to disseminate and utilize achieved knowledge in their respective working areas. It also aimed to aid the policymakers considering the importance of IWRM in country perspective.

The inaugural session of the training was held at CEGIS conference room on 29th March. This session was chaired by Engr. Md. Waji Ullah, Executive Director of CEGIS. In this session, Dr. Dilruba Ahmed, Director, Socio-economic and Institutional Division, CEGIS welcomed to the participants and the distinguished guests. Afterwards, an introductory speech was delivered by the Chief Guest, Mr. Md. Shahidul Hassan, President of BWP. The Special Guest Mr. Istiaq Uddin Ahmed, Country Representative of International Union for Conservation of Nature (IUCN) also delivered his valuable speech. At the end of the inaugural session, the Chairperson of the event finally delivered his speech.

Nineteen (19) participants of different disciplines with diverse experience participated in the Training Programme from different organizations such as Bangladesh Agricultural Research Institute (BARI), Bangladesh Forest Department (BFD), Bangladesh Inland Water Transport Authority (BIWTA), Bangladesh Power Development Board (BPDB), Bangladesh Rice Research Institute (BRRRI), Bangladesh Water Development Board (BWDB), Center for Environmental and Geographic Information Services (CEGIS), Department of Agricultural Extension (DAE), Department of Environment (DoE), Department of Fisheries (DoF), Dhaka WASA, Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering & Technology (BUET), Institute of Water Modeling (IWM), International Union for Conservation of Nature (IUCN), Khulna University, Local Government Engineering Department (LGED).

The closing ceremony was held at CEGIS premises on 2nd April 2015. The Honorable Secretary, Ministry of Water Resources, Dr. Zafar Ahmed Khan was kind enough to attend the closing ceremony. After successful completion of the five days long training programme the participants were given Certificates of Completion along with necessary training materials.

2. Objectives

The objectives of the ToT on IWRM course were to:

1. Impart knowledge to the participants on IWRM concept and principles;
2. Make the participants capable to apply the integrated and participatory water management;
3. Make them understand the government procedure of planning and implementation of water resource development projects; and
4. Develop knowledge and skills of the trainees in conducting the training course on IWRM in their respective organizations on IWRM application.

3. Training Approach and Methodology

IWRM is an integrated, participatory, noble approach. Its implementation involves changes in management and implementation of the usual or current systems. Changing in management systems is a deliberate process which can be time consuming, and without an appropriate strategy and follow-through, might lead only to deteriorate the situation and loss of social, financial, and technological investments. Hence, to make the participants cognizant regarding this issue, training must follow participatory approach. Training of Trainers (ToT) Course on “Concept and Practice of Integrated Water Resources Management” also follow participatory approach where participants from various organizations including GOs and NGOs learned through hands-on experiences about the issues on IWRM which facilitated the learning process. Through this training programme, participants actively participated in exploring and discovering their knowledge bank in various IWRM related segments.

Concepts, methods, and practical experiences on IWRM practices in Bangladesh were highlighted through various lecture sessions of the training. Discussion based lectures on various topics of IWRM were also followed with the intention of making participation of participants effective and fruitful.

The training programme was arranged for the regional level water managers and professionals of different government, non-government organizations. . Resource persons were the experts from CEGIS, BUET, BRAC University and United Nations (UN) organizations having national and international reputations produced the training modules gave lectures on different aspects of IWRM.

4. Roles and Responsibilities of CEGIS and BWP

CEGIS played the key role in steering and coordinating the entire training programme while BWP was involved in overall monitoring and evaluation of the training programme through their presence and financial support in addition to that contributed by CEGIS.

5. Training Contents and Course Schedule

Day One: 29 March, Sunday

Time	Day 01: Sunday	Date: 29 March, 2015	Venue: CEGIS, Dhaka	Key Presenter
08:30-09:00	Registration			
Opening Ceremony				
09:00	Recitation from the Holy Quran			
09:10	Welcome address: Dr. Dilruba Ahmed, Director, Socio-Economic and Institutional Division, CEGIS			
09:30	Address By Special Guest: Mr. Ishtiaq Uddin Ahmad, Country Representative, IUCN			
09:40	Address by the Chief Guest, Md. Shahidul Hassan, President, BWP			
09:50	Speech by Chairperson, Engr. Md. Waji Ullah, Executive Director , CEGIS			
10:00-10:30	Refreshment			
10:30-11:30	Lecture 1: Introduction & Practices of IWRM with Global and Bangladesh Perspectives		Engr. Md. Waji Ullah Executive Director, CEGIS	
5 minutes intermission				
11:35-12:30	Lecture 2: IWRM Concept, Demand management and Water allocation principles		Prof. Rezaur Rahman Professor, IWFM, BUET	
5 minutes intermission				
12:35- 01:30	Lecture 3: IWRM for Ecosystem Balance		Prof. Rezaur Rahman Professor, IWFM, BUET	
01:30-02:30	Lunch and prayer break			
02:30-03:30	Lecture 4: Environmental concepts and issues in Water Resource Management projects		Md. Shahajahan Ex-Additional Director General, Department of Environment	
03:30-04:00	Coffee/Tea Break			
04:00-05:00	Lecture 5: IWRM for Agriculture, Fisheries and Livestock		Dr. Zahurul Karim Agriculture Expert, CEGIS	

Day Two: 30 March, Monday

Time	Day 02: Monday	Date: 30 March, 2015	Venue: CEGIS, Dhaka	Key Presenter
08:30-09:00	Reflection on the lectures of the previous day activities (one person from each group)			
09:00-10:00	Lecture 6: Water Pollution, Water Supply, Health and Sanitation in IWRM		Dr. M. Ashraf Ali Professor Department of Civil Engineering BUET	
10:00-10:30	Refreshment			
10:30-11:30	Lecture 7: Water Governance: Water Resource Institutions, Environmental Rules, Law and Policy		Hossain Shahid Mozaddad Faruque Adviser Water Resources Planning, CEGIS	
5 minutes intermission				

Time	Day 02: Monday	Date: 30 March, 2015	Venue: CEGIS, Dhaka	Key Presenter
11:35-12:30	Lecture 8: IWRM for Haor and Wetlands Resource Management and the use of Touch Table Atlas		Mr. Malik Fida Abdullah Khan Director Climate Change Division, CEGIS	
5 minutes intermission				
12:35-1:30	Lecture 9: Gender Perspective in IWRM		Ms. Halima Neyamat National Consultant,FAO	
1:30-02:30	Lunch and prayer break			
02:30-03:30	Lecture 10: Natural Disaster and Hazard Management in Bangladesh		Mohammad Abdul Qayyum Additional Secretary & National Project Director, CDMP II	
3:30-4:00	Coffee/Tea Break			
04:00-05:00	Lecture 11: Importance of IWRM in Power Sector		Jalal Ahmed Choudhury Power Plant Expert (Electrical), CEGIS	

Day Three: 31 March, Tuesday

Time	Day 03: Tuesday	Date: 31 March, 2015	Venue: CEGIS, Dhaka	Key Presenter
08:30-09:00	Reflection on the lectures of the previous day			
09:00-09:45	Lecture 12: Tools & Techniques for Resource Assessment in IWRM		Mr. Malik Fida Abdullah Khan, Director Climate Change Division, CEGIS	
5 minutes intermission				
09:50-10:40	Lecture 13: Climate Change and IWRM in terms of Adaptation, Water Resource and Rehabilitation		Dr. Ahmadul Hasan Programme Coordinator UN Eken Project, UNDP	
10:40-11:00	Coffee/Tea Break			
11:00-11:45	Lecture 14: Environmental and Social Impact Assessment		Mujibul Huq Environmental Advisor, CEGIS	
5 minutes intermission				
11:50-12:40	Lecture 15: Urbanization and Climate Change		Prof. Dr. K.B Sajjadur Rasheed Environmental Expert, CEGIS	
5 minutes intermission				
12:45-01:30	Lecture 16: Economic and Financial Aspects of IWRM		Dr. Nabiul Islam Team Leader, LGED Study CEGIS	
01:30-02:30	Lunch and prayer break			
02:30-03:30	Lecture 17: Economics of Climate change with respect to IWRM		Dr. Anjan Kumar Datta Socio-economic Advisor, CEGIS	
03:30-04:00	Coffee/Tea Break			
04:00-05:00	Lecture 18: Trans-boundary Water Management Issues under Climatic Change Perspective in IWRM		Dr. Ainun Nishat Professor Emeritus, C3ER, BRAC University	

Day Four: 01 April, Wednesday

Time	Day 04: Wednesday	Date: 01 April, 2015	Venue: CEGIS, Dhaka	Key Presenter
8:30-9:00	Reflection on the lectures of the previous day			
09:00-10:00	Lecture 19: Optimization technique and irrigation/Water management long term planning process		Abul Fazal M. Saleh Professor, IWRM, BUET	
10:00-10:30	Coffee/Tea Break			
10:30-11:30	Lecture 20: Water Right and Equity		Dr. Sultan Ahmed Director (Natural Resources Management) DoE	
5 minutes intermission				
11:35-12:30	Lecture 21: Social and Institutional Conflicts: Role of Stakeholder Analysis		Dr. Shah Alam Khan Professor, IWFM, BUET	
5 minutes intermission				
12:35-1:30	Lecture 22: Socio-cultural aspects of IWRM		Dr. Dilruba Ahmed Director, Socio-Economic and Institutional Division, CEGIS	
1:30-2:30	Lunch and prayer break			
2:30-3:30	Lecture 23: Modeling concept and its use in IWRM		Prof. Dr. M. A. Matin Ahsanullah University of Science & Technology	
3:30-4:00	Coffee/Tea Break			
4:00-5:00	Lecture 24: Issues and Concern of IWRM in Coal Based Mega Power Plants		Mr. Md. Maqbul- E- Elahi Primary Energy Expert, CEGIS	

Day Five: 02 April, Thursday

Time	Day 05: Thursday	Date: 02 April, 2015	Venue: CEGIS, Dhaka	Key Presenter
08:30-08:45	Reflection on the lectures of the previous day			
08:45-09:45	Lecture 25: Relation between Climate Change and Estuarine and River Morphology		Dr. Maminul Haque Sarker Deputy Executive Director (Development) CEGIS	
09:45-10:00	Tea-Coffee break			
10:00-10:45	Lecture 26: Application of GIS and its implication in IWRM		Mollah Md Awlad Hossain Director, GIS Division CEGIS	
5 minutes intermission				
10:50-11:40	Lecture 27: Forestry Resources Management in IWRM		Mr. Haradhan Banik Chairman, Bangladesh Forest Foundation	
5 minutes intermission				
11:45-12:30	Lecture 28: Strategy Formulation and Option Development for IWRM through People's Participation		Prof. Dr. M. A. Matin Ahsanullah University of Science & Technology	
12:30-01:00	Closing Ceremony			
	Feedback session by the participant attended the course			
	Closing address by the Chief Guest			
Certificate distribution				
01:00-02:00	Lunch and prayer break			

6. Description of the topics covered in the training

A total number of twenty eight lectures on different relevant topics of IWRM were covered in the 5 days long training programme. The sequence of lectures was designed from introductory level to particular topics so that one can easily understand the basics of IWRM, its extensions to other sectors and debate on the issue from both national and global levels. The training contents and course schedule in detail are presented above. Each of the topics covered in the training programme is in short presented below:

Lecture One: Introduction & Practices of IWRM with Global and Bangladesh Perspectives

This introductory lecture was intended to focus on basic concept of IWRM, its principles, its importance in national and global perspectives, driving forces of IWRM and how it can be integrated in various sectors. This topic also pointed out the history, benefits and the future visions of IWRM.



Lecture Two: IWRM Concept, Demand Management and Water Allocation Principles



This lecture was framed to focus on detail conceptualization of IWRM; its necessity for managing local, regional, national and global demand. It also focused on dynamics on water allocation principles along with historical changes.

Lecture Three: IWRM for Ecosystem Balance

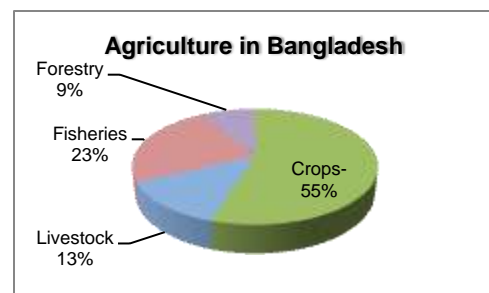
This topic covered the concept of ecosystem, ecosystem service and well being of mankind related to sound ecosystem. The presenter also discussed a case study of the Jamuna River where sustainable management of rivers was the main concern.

Lecture Four: Environmental Concepts and Issues in Water Resource Management Projects

The whole lecture covered mainly these topics such as definition of environment, water related functions and services, environmental degradation concept, utilization of water resources, issues integrated in water resource management projects.

Lecture Five: IWRM for Agriculture, Fisheries and Livestock

The lecturer started his lecture to discuss on IWRM principles. Agriculture was the main topics of this lecture. Agriculture related many issues as well as emerging threats on agricultural development, challenges of agricultural IWRM in Bangladesh; shrinking global agricultural resources was also pointed out in this lecture.



Lecture Six: Water Pollution, Water Supply, Health and Sanitation in IWRM

Sanitation Scenario in Bangladesh: 2003, Sanitation Improvement Trend (JMP 2014), Sanitation Situation in Bangladesh, WS Improvement Trend (JMP 2014), National-Scale Sanitation Status: JMP 2014, Urban Sanitation Options/Technologies, Sewerage System in Dhaka City, How Sanitation Systems Affecting Water Resources etc was focused on this lecture. He also overviewed the Fecal Sludge Management (FSM).

Sanitation Situation in Bangladesh	
Improved sanitation	57%
Shared latrines	28%
Unimproved latrines	12%
Total	97%

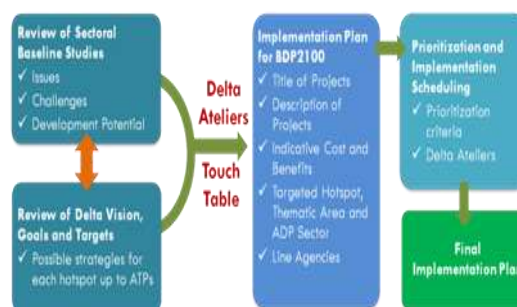
Lecture Seven: Water Governance: Water Resource Institutions, Environmental Rules, Law and Policy

The lecturer principally focused on water related major problems, adverse impact of Indian River linking project, effect of Farakka Barrage, governance and its types, good governance, water governance, importance of water governance, dimensions and forms of water governance etc.

He also gave an overview on national water policy (1999), National Environmental Policy (1992), Coastal Zone Policy approved in 2005, Coastal Development Strategy approved in 2006 etc. He also discussed about water rights and laws, international treaties and protocols.

Lecture Eight: IWRM for Haor and Wetlands Resource Management and the use of Touch Table Atlas

The presenter introduced these topics such as water implications in IWRM, tools and techniques for IWRM, introduction to Atelier, formulation of Bangladesh Delta Plan, thematic areas for BDP2100, Atelier process steps, aim of the Delta Atelier etc to the trainees. He also gave an idea about Touch Table intervention, use of Touch Table Atlas, benefits of Touch Table.



Lecture Nine: Gender Perspective in IWRM

General Framework for IWRM



The lecturer started her lecture with the definition and the general framework of IWRM. The topics which focused on this lecture were principles of IWRM, definition of gender, gender mainstreaming, goal of mainstreaming of gender in IWRM etc. Securing women's access to land and water governance, women voice in decision-making for water management, capacity-development of women and men, documenting and sharing existing knowledge and mainstreaming gender for empowerment were also discussed in this lecture.

Lecture Ten: Natural Disaster and Hazard Management in Bangladesh

Topography of Bangladesh, river systems of Bangladesh, common hazards/disasters in Bangladesh, determinants of natural disaster and its losses, causes of high vulnerability, disaster management regulative framework, disaster management institutions in Bangladesh, DM model for Bangladesh, intervention phases, policy provisions in the SOD, NPDM action agenda for 2010-2015 etc were discussed in this lecture. Finally a brief history of flood forecasting in Bangladesh was highlighted in this lecture.

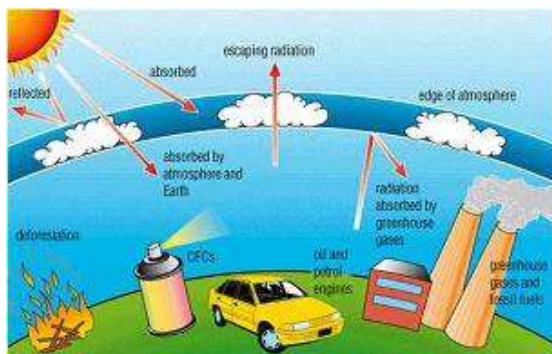
Lecture Eleven: Importance of IWRM in Power Sector

In this lecture, the resource person intended to give an overview about the importance of power in civilization and importance of water in power sector. He also showed typical flow diagram of a gas based CCPP, typical condenser and typical waste water treatment plant in his lecture.

Lecture Twelve: Tools & Techniques for Resource Assessment in IWRM

The resource person expressed his thought that IWRM could be a key tool for sustainable development. He mentioned the challenges ahead. Application of hydrological & mathematical modeling and different evaluation tools were also discussed under this topic.

Lecture Thirteen: Climate Change and IWRM in terms of Adaptation, Water Resource and Rehabilitation



The resource person discussed about the definition of climate change, key challenges in climate change, difference between climate and weather. He also explained the importance of IWRM on climate change, impact of climate change on floods, droughts, cyclones, salinity intrusion, coastal polders, river bank erosion. Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2008 was also focused in his presentation. Lastly he gave the mitigation measures along with the capacity building and

institutional strengthening to overcome this problem.

Lecture Fourteen: Environmental and Social Impact Assessment

Environments and environmental impact as well as social impacts were the main topic of this lecture. Project development stages were discussed in this lecture. EIA, need of EIA, multidisciplinary team required for conducting EIA and SIA were covered in this topic. EIA finally covered baseline, scoping, bounding, major field investigation, impact assessment, evaluation of impacts, and environmental management plans.



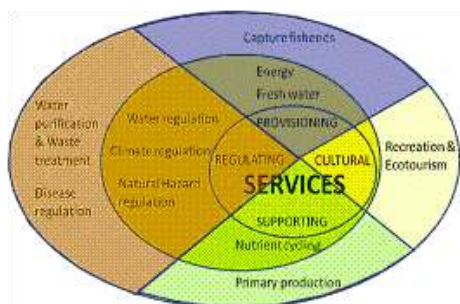
Lecture Fifteen: Urbanization and Climate Change

The lecture covered issues of trends in urbanization, role of cities in climate change, vulnerability and resilience, types of climate change in cities, most vulnerable class in cities, urban sectors of climate change, response options and resilience.

Lecture Sixteen: Economic and Financial Aspects of IWRM

This lecture presented water as economic goods. The presenter discussed about multiple demand/use, multiple supply/source, water management problems, water and land use conflict. He also discussed on financial & economic analyses in detail.

Lecture Seventeen: Economics of Climate change with respect to IWRM



Climate change and IWRM, ecosystem services, projected impacts of climate change, mean losses in income per capita from scenarios of climate change, costs of climate change, kinds of costs were the main topics in the lecture.

Lecture Eighteen: Trans-boundary Water Management Issues under Climatic Change Perspective in IWRM

Issues and opportunities of trans-boundary water resources of the region were highlighted in this topic. Elements for effective management of trans-boundary water resources were discussed in detail. Regional issues and international treaties were also focused in the lecture.

Lecture Nineteen: Optimization Technique and Irrigation/Water Management Long Term Planning Process

Water use in agricultural sector was the main theme of this lecture. Water demand scenario in Bangladesh, effects of unregulated groundwater development, causes of declining trend of command area per STWs, operation and maintenance cost of STW at 2012, profit or loss of pump manager of STWs in different pricing systems, reasons of increasing command area of DTW, crop water requirement, water pricing and irrigation management (2009) etc were also discussed in this lecture.

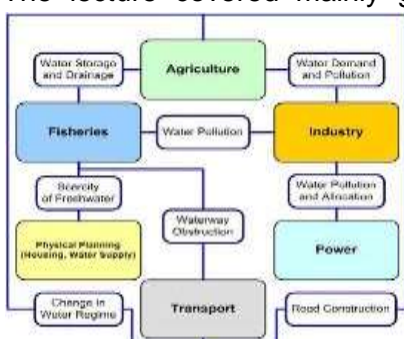
Lecture Twenty: Water Right and Equity

The topics included in this lecture were global water budget, main users of global water, right to use natural resources, water right and allocation (NWPo, 1999), The Bangladesh Water Act 2013, The BWDB Act 2000, other policies and acts in different sectors in Bangladesh, present water right and allocation practice and overview of water equity.

Global Water Budget	
Sources of water	Percentage (%)
Oceans	97.2
Atmosphere	0.001
Rivers and Streams	0.0001
Groundwater	0.31
Lakes	0.009
Glaciers/Icecaps	2.15

Lecture Twenty One: Social and Institutional Conflicts: Role of Stakeholder Analysis

The lecture covered mainly general conflicts in IWRM, types of conflicts, reasons behind conflicts in water resources management, major competing sectors in water resources, resolution of conflict, conflict resolution methods and components, steps for conflict resolution etc. The presenter also shared two case studies on “Trans-boundary water sharing dispute resolution” with the participants.

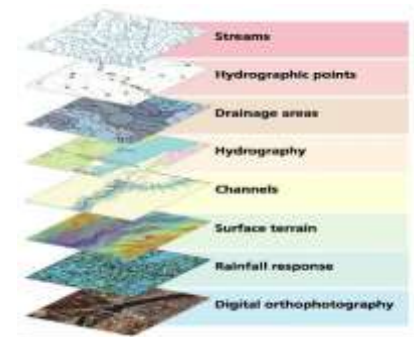


Lecture Twenty Two: Socio-cultural Aspects of IWRM

IWRM concept, overview of the role of water in socio-cultural life, socio-cultural content of water, water for livelihood, safe water, health & sanitation, water as a concern of peace & conflict, water for aesthetics & recreation, water for religion, importance of IWRM, challenges of IWRM etc were highlighted in this lecture.

Lecture Twenty Three: Modeling Concept and its Use in IWRM

Modeling is the main concept of the lecture. Under this lecture definition of model, role of model in IWRM, UNESCO-IHP IWRM guidelines, collaborative modeling for decision support and IWRM, characteristics of collaborative models, role of model in WRM/P, The modelling process was focused in this lecture.



Lecture Twenty Four: Issues and Concern of IWRM in Coal Based Mega Power Plants

The resource person discussed about the definition of IWRM, necessity of IWRM in power sector, power demand forecast based on GDP growth rate scenarios, water requirement in a coal based power plant (CBPP) for different purpose, water contamination concerns during coal transportation, concerns for coal based power plant during operation etc.

Lecture Twenty Five: Relation between Climate Change and Estuarine and River Morphology

Functions of rivers, geo-morphological settings of the rivers in Bangladesh, delta development process, shifting of the river courses during last 250 years, human interventions and their consequences etc were the topics highlighted in this lecture. The lecturer illustrated an example of effects of human interventions on Mongla - Ghasiakhali Navigation Route.

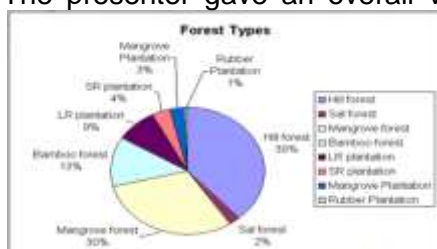
Lecture Twenty Six: Application of GIS and its Implication in IWRM

The trainees gathered knowledge of meaning and definition of GIS, layers and spatial operation in GIS, conceptual representation of water model and water balance, watershed and drainage stream, GIS data layers for IWRM planning etc from the lecture.



Lecture Twenty Seven: Forestry Resources Management in IWRM

The presenter gave an overall view about Bangladesh: Forestry. Under this lecture he also explained about forest land of Bangladesh, tree cover of Bangladesh, tree cover classes, forest types and areas, gross and commercial volume for major National LUCs, biodiversity conservation areas of Bangladesh, goods & service functions of forests, past and present forest management, new approaches in forest management system etc.



Lecture Twenty Eight: Strategy Formulation and Option Development for IWRM through People's Participation

The resource person discussed five phases of IWRM process, vision & mission of IWRM, goal and strategy, role and approach of strategy, strategy planning key activities etc. He emphasized on options developed in KJDRP, an IWRM project, activities on private sector participation, "road map" to achieve the planned objectives and principles of IWRM.



7. List of Resource Persons:

- **Engr. Md. Waji Ullah**, Executive Director, CEGIS
- **Dr. Maminul Haque Sarker**, Deputy Executive Director (Development), CEGIS
- **Mujibul Huq**, Environmental Advisor, CEGIS
- **Hossain Shahid Mozaddad Faruque**, Adviser, Water Resources Planning, CEGIS
- **Mr. Malik Fida Abdullah Khan**, Director, Climate Change Division, CEGIS
- **Mollah Md Awlad Hossain**, Director, GIS Division, CEGIS
- **Dr. Dilruba Ahmed**, Director, Socio-economic and Institutional Division
- **Dr. Anjan Kumar Datta**, Socio-economic Advisor, CEGIS
- **Dr. Nabiul Islam**, Economist, Socio-economic and Institutional Division, , CEGIS
- **Dr. Zahurul Karim**, Agriculture Expert, CEGIS
- **Jalal Ahmed Choudhury**, Power Plant Expert (Electrical), CEGIS
- **Dr. K.B Sajjadur Rasheed**, Environmental Expert, CEGIS
- **Mr. Md. Maqbul- E- Elahi**, Primary Energy Expert, CEGIS
- **Prof. Rezaur Rahman**, Professor, IWFM, BUET
- **Md. Shahajahan**, Ex-Additional Director General, Department of Environment
- **Dr. M. Ashraf Ali**, Professor, Department of Civil Engineering, BUET
- **Ms Halima Neyamat**, National Consultant, FAO
- **Mohammad Abdul Qayyum**, Additional Secretary & National Project Director, CDMP II
- **Dr Ahmadul Hasan**, Programme Coordinator UN Eken Project, UNDP
- **Dr. Ainun Nishat**, Professor Emeritus, C3ER, BRAC University
- **Abul Fazal M. Saleh**, Professor, IWFM, BUET
- **Dr. Sultan Ahmed**, Director (NRM) DoE, Dhaka
- **Dr. Shah Alam Khan**, Professor, IWFM, BUET
- **Dr. M. A. Matin**, Professor, Ahsanullah University of Science &Technology
- **Mr Haradhan Banik**, Chairman, Bangladesh Forest Foundation

8. List of Trainees

Sl. No	Name of Participants	Organization	Department/ Division	Occupation/ Designation	Contact No.
1.	Dr. Sujit Kumar Biswas	BARI	IWM Division	Senior Scientific Officer (SSO)	01816880562
2.	M. Arifur Rahman Khan	BPDB	CIVIL Division	Executive Engineer	01712074970
3.	Md. Shajadur Rahman	BIWTA		Superintendent Engineer	01917545639
4.	Md. Shafiqul Islam	LGED	IWRM Unit	Executive Engineer	01717040904
5.	Md. Tariq Aziz	BFD	RIMS Unit	Research Officer	01790284328
6.	S. M. Ataur Rahman	BWDB		Executive Engineer	01729788425
7.	Mohammad Badrul Alam	DWASA	Local Govt. Division	Sub-Divisional Engineer	01558325423
8.	Dr. Shahana Parveen	BRRRI		Senior Scientific Officer (SSO)	01672041482
9.	Debanjali Saha	IWFM, BUET	Irrigation and Water Management Division	Lecturer	01719355305
10.	Md. Sharful Alam	IWM	Water Resource Planning	Junior Specialist	01711161158
11.	Md. Mizanur Rahman	CEGIS	Research, Development and Training Division	Director (in-charge)	01726652541
12.	Md. Mizanur Rahman	CEGIS	Remote Sensing Division	Professional	01709272049
13.	Md. Samsuzzaman Sarker	DoE	Environmental Impact Assessment	Assistant Director	0176861848
14.	Kazi Md. Shaiful Islam	DAE	Field Service Wing	Deputy Director (Extension)	01720444344
15.	Dr. Farida Perveen	DAE	Crops Wing	Additional Deputy Director	0174140156
16.	Asif Ahmed	BWDB	Planning-3	Assistant Engineer	01914994936
17.	Md. Ali Akber	Khulna University	Environmental Science Discipline	Assistant Professor	01911117329
18.	Sakib Mahmud	IUCN	Environmental Quality	Project Assistant and Field Investigator	01852833381
19.	Krishnandu Shaha	Department of Fisheries	Extension wing	Chief Fisheries Extension Officer	01711192431

9. Lessons Learned by the Trainees

The trainees identified the following vital learning points after completion of the training.

1. Water resource is under tremendous pressure today as it is finite resources and it is using indiscriminately for various development sectors namely agriculture, forestry and industry. Since water has the potential to be used for various purposes, it needs integrated management with maximum possible efficiency. Water allocation is more challenging because of multidisciplinary demand of water used for irrigation leads to waste and mismanagement of water. Water should be allocated on the basis of demand and pricing of the same is to be imposed for careful use of water and owning the same. To know the demand of water of various sectors and allocation equity, different techniques for demand management should be carefully applied. However, water allocation mechanism depends on the need assessment.
2. IWRM helps surface and ground water management practices. IWRM provides suitable policies, strategies and legislation for sustainable water resource development and management. IWRM process helps to know the coordinated development and management of water. IWRM leads to protect the interest of the stakeholders. For a successful IWRM it needs an effective plan. Moreover, water has both social and economic value. IWRM is an integrated process through which economic and financial analysis need to be thoroughly practiced. Internal Rate of Ratio (IRR), Net Present Value (NPV), Benefit-Cost Analysis is quite necessary for implementation of a good project. For a good project NPV is not less than zero. The steps in benefit-cost analysis can now be explained more effectively after having the training than before.
3. Everybody has the right to get water equitably to fulfill his/her purpose based on his/her demand. Water rights and water distribution should be equitably ensured. Equity gives social justice. Change and impact in the state or behavior of environmental component are due to the action of a project as well as impact in the society. Success rate of project implementation depends on good governance at all stages. This training taught the way as how the water right and equity could be ensured in case of IWRM practices. Besides, brief knowledge on various acts, rules, regulations related with water and water resource management could be learned from this training. IWRM is a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. Model calibration and validation can be done through this process.
4. Mainstreaming of gender perspectives into IWRM includes understanding and explanation of different roles, rights and responsibilities of both men and women and the relation between them in view of project development. Involvement of women in all processes, activities and decision making of water management should be ensured because they play important responsible in terms of household water management and safeguarding of water as well. Apart from this, women can play an important role in participatory approach with respect to water management.
5. Ateliers are design workshops where scientists and stakeholders jointly develop ideas, Formulation of Bangladesh Delta Plan, Thematic Areas for BDP2100; A Touch Table is an

interactive surface computing platform that's combination with a specific software to visualization of different maps. The use of touch table atlas helps bring data to life at the delta atelier sessions.

6. Temperature is the main driver of climate change and thus become more threat to our global ecosystem. No development can be sustained without ecological conservation. Being a part of economic development social forestry is in need of consideration for a successful project. If we do not implement law, we cannot stop water pollution and cannot get optimum benefit. This training provides the participants four dimension of sustainable development.
7. This training also taught the driving forces of water resource management in relation to trans boundary river management issues, peoples role in planning of IWRM is optimal way in a good project, social and institutional conflicts arise with regards to development and management of the resources, how labor intensive agriculture is moving towards mechanization in IWRM, how IWRM concept evolved from the affected areas and the concept of GIS and RS tools and incorporation of satellite information in IWRM. Moreover, this training provides knowledge on various CBOs in water resources project; its formation, hierarchy and capacity development within CBOs.
8. At last, the five days long training programme created a good bonding and enhanced the learning process. The trainers appreciated the initiative of knowledge sharing through such an integrative approach and shown their willingness to participate in such training programmes in future. On the other hand a good relationship had been developed among the participated members of different organizations, CEGIS and BWP. Through this training programme the trainees felt that they had learned water management and its related many themes which would help them to apply in different fields of their respective organizations.

10. Follow up and Expectation

The participants were very much satisfied to take part in this training. They appreciated the joint idea of BWP and CEGIS for organizing such a wonderful training programme. They emphasized on a field trip, as the field activities would have helped them to apply the knowledge practically. After completion of each lecture some practical tasks should be added to extend their knowledge. The lecture time should be extended for understanding the topics easily. They also opinioned that the training programme could be more developed to add some water relevant innovative idea.

11. Training Evaluation

To get feedback from the trainees, an evaluation form was designed and distributed among the trainees. The following graph was prepared from the results of the trainee's responses to questions regarding whether the lectures were understandable or not. The evaluation form is also attached herewith.

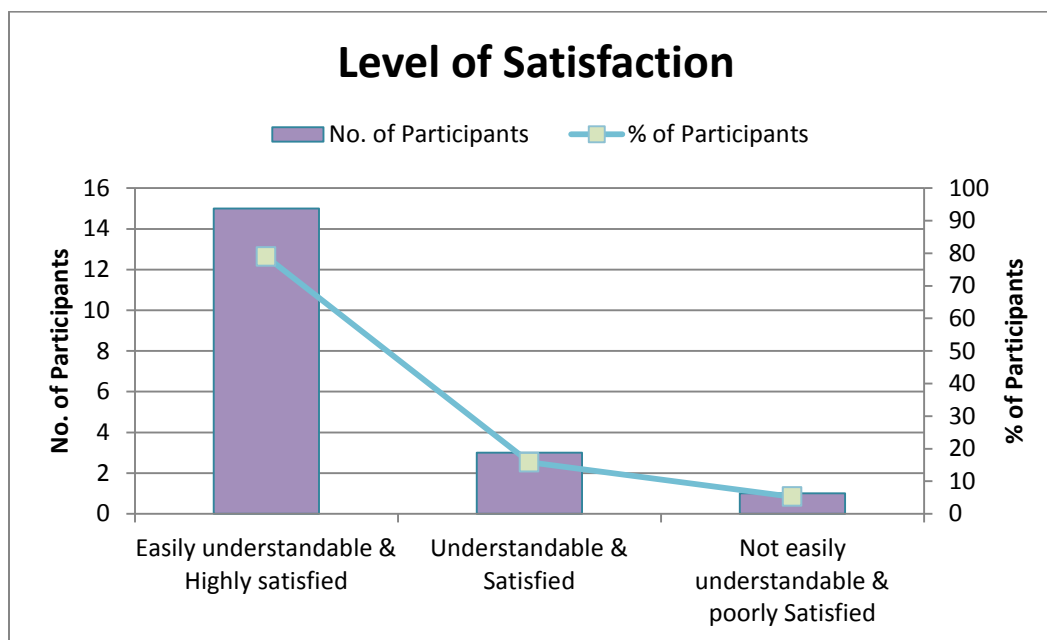


Figure 11.1: Participants' responses on level of satisfaction

Evaluation Form		
Training of Trainers (ToT) Course on		
"Concept and Practice of Integrated Water Resources Management"		
Training Evaluation		
Method: Learning Point		
Name:		
Organization:		
Please write down one single sentence on your learning from each training session		
No. of Days	Name of the Topic	Learning Points
Day 1		
Day 2		
Day 3		
Day 4		
Day 5		

12. Some Pictures of Different Events of the Training Programme

Picture of Opening Ceremony



Picture of Closing Ceremony



13. Finances and Expenditure

The total expenditure for the training programme was Tk. 233,000.00 (Two Lakh Thirty Three Thousand Taka) only. The fund contributed by BWP was Tk.2,10,000.00 (Two Lakh Ten Thousand Taka) only and the remaining amount of Tk. 23,000.00 (Twenty Three Thousand Taka) only was contributed from CEGIS' own funds as a partner organization of BWP. Breakdown of Training expenditure of IWRM ToT course is shown below:

SI No	Items	Total (Taka)
1.	Honorarium for Chief Guest & Special Guest	11000
2.	Honorarium for Resource Persons	40000
3.	Honorarium for Participants	34000
4.	Honorarium for Quran Telwat	500
5.	Inaugural Ceremony	
	a) Refreshment for 50 persons (Participants, Resource persons, Guests)	12000
	b) Banners	1500
	c) Flowers	1000
6.	Training Materials	
	a) Bag	20000
	b) Pen	1300
	c) Note book	1500
	d) Folder	2000
	e) Paper for Photocopy	6000
	f) CD	1000
	g) Certificate preparation	4000
7.	Daily Food (Participants & Resource Persons)	
	a) Refreshment	18000
	b) Lunch & cold drinks	40000
	c) Tea and snack for afternoon	10000
8.	Closing Ceremony	
	a) Lunch & cold drinks	20000
	b) Tea and snacks/fruits	3200
	b) Flowers	1000
9.	Cash in hand	5000
	Total	233,000