

National Water Management Plan Approved

The National Water Management Plan (NWMP), prepared by WARPO under the supervision of the Ministry of Water Resources has been approved by the National Water Resources Council (NWRC) headed by the honorable Prime Minister of the People's Republic of Bangladesh. The approval was given at the seventh meeting of the Council held on March 31, 2004. It was decided in the meeting that WARPO will centrally monitor and coordinate the implementation of NWMP.

NWMP is a framework plan consisting of 84 programmes. These programmes are to be implemented by the line agencies and others as designated. Each organization is responsible for planning and implementing its own activities and projects within the NWMP framework. 35 agencies have been identified for implementing the programmes of NWMP in independent, lead and supporting capacities. Projects may be designed to implement programmes in part or as of one or more programmes. It is a matter for the agency in

question to determine on the basis of practical experience, current knowledge and capacity. All projects will adhere to normal Government administrative procedures and will conform to all relevant rules and guidelines issued by the Government.

The National Water Management Plan is structured in a manner that enables the objectives of the 84 different programmes planned for the next 25 years to contribute individually and collectively in attaining both the overall objectives as well as the intermediate sub-sectoral goals. The programmes are grouped into eight sub-sectoral clusters and spatially distributed across eight planning regions of the country. Information on each, together with a wide range of planning data, is contained in the National Water Resources Database, accessible through an information management system. There are three main categories of programmes in the NWMP, namely, Cross-cutting Programmes, National-level Programmes and Regional Programmes.

Water Resources Minister visits ICZMP Project of WARPO

The Honorable Minister of the Ministry of Water Resources (MoWR), Mr. Hafiz Uddin Ahmad Bir Bikram, visited the Program Development Office-Integrated Coastal Zone Management Plan Project of the Water Resources Planning Organization (WARPO) on August 4, 2004. He was accompanied by Dr. Md. Omar Faruque Khan, Secretary of MoWR. Mr. H.S.M. Faruque, Director General of WARPO welcomed the Honorable Minister and gave a presentation on the project activities. The Honorable Minister expressed his concern at the pronounced poverty and delayed development of the coastal zone, and observed that since the ultimate goal of the Bangladesh Government is to eradicate poverty, the development agencies should try to work with each other and streamline their activities. Lauding WARPO activities and office set up, the Honorable Minister described it as an organization which is at the forefront in bringing about positive changes in the poverty situation at the coastal zone.



From left: Dr. Rafiqul Islam, TL, ICZMP, Mr. Hafiz Uddin Ahmad BB, Hon'ble Minister, MoWR, Mr. H.S.M. Faruque, DG, WARPO, Dr. Md. Omar Faruque Khan, Secretary, MoWR.

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Regional Meeting of National Water Sector Apex Bodies At Hanoi, Viet Nam

The first Regional Meeting of the National Water Sector Apex Bodies (NWSAB) was organized during May 18-21, 2004 in Hanoi, Vietnam by the Asian Development Bank (ADB), Office of the National Water Resources Council (ONWRC), and the Ministry of Natural Resources and Environment (MONRE), Vietnam. The objectives of the meeting were to:

- (i) exchange information and experience on the work of national water sector apex bodies; and
- (ii) identify priority needs and opportunities for networking, capacity building and research among the apex bodies including the development of methodologies for benchmarking and peer review to assess and monitor their effectiveness.

The meeting included a two-day discussion cum workshop and a two-day field visit. Around 50 delegates participated in the meeting from 12 different countries. Mr. H.S. Mozaddad Faruque, Director General and Mr. Md Abdul Baten, Principal Scientific Officer of WARPO attended the meeting from Bangladesh.

The two-day discussion meeting was started with a welcome address by H.E. Mai Ai Truc, Minister of Natural Resources and Environment, Vietnam. The Hon'ble Minister welcomed all participants and mentioned some of the issues and problems related to water management.

Mr. Pieter M. Smidt, ADB Resident Mission, Vietnam mentioned one of the principal elements of ADB's Water for All Policy which is to "promote regional cooperation and



Mr. H.S. Mozaddad Faruque, Director General, WARPO presenting paper in NWSAB meeting, Hanoi.

increase the mutually beneficial use of shared water resources within and between countries."

Mr. Alfred Birch, Senior Water Resources Adviser, National Water Resources Council, Vietnam briefly explained the major role of the apex body and its composition/procedures. He mentioned that the apex body needs a strong secretariat and some external technical assistance. Moreover, he recommended that NWSABs should strengthen integrated water resources management.

The speeches were followed by presentations given by the countries that have established NWSABs, i.e., Vietnam, Bangladesh, Lao PDR, Nepal, Philippines, Sri Lanka, and Thailand. Mr. H. S. Mozaddad Faruque, Director General, WARPO, MoWR, Bangladesh gave a presentation on WARPO and briefly described the mandate, achievements, on-going and future reform process, including lessons learned with regard to the water sector apex body in Bangladesh. The four countries those have not yet established National Water Sector Apex Bodies i.e. Cambodia, Indonesia, Malaysia and Pakistan, were also present at the meeting.

In the Breakout session, Mr. H. S. Mozaddad Faruque, Director General, WARPO was elected as Chairman of the group formulated with the apex body countries. Mr. Ramon B. Alikpala, Executive Director, National Water Resources Board of Philippines was elected as rapporteur.

The group with representatives of the apex body countries identified the priority issues and actions needed. At the end of the session, some closing remarks were made by H. E. Nguyen Cong Thanh, Vice Minister of Natural Resources and Environment, Vietnam and Mr. Wouter Lincklaen Arrien, ADB.

At the end of the 2 days deliberations, the participants agreed to:

- Pursue regional cooperation among NWSABs, beginning with the sharing of basic information among each other.
- Develop performance indicators, peer review, and

ICZMP Project: Development of Integrated Coastal Resources Database (ICRD)

The Integrated Coastal Resources Database (ICRD) has been conceived as an important tool for bringing about the required interactions between and among agencies in the coastal zone. It is being developed as a primary source of information for others. An accessible, updated and reliable computerized database would greatly enhance ICZM's focus on coastal livelihood conditions and vulnerability mapping, with full recognition of regional and social differences.

The primary objective of developing the ICRD is to help planners of the Integrated Coastal Zone Management process through establishing a spatial database and developing a knowledgebase system. It will be a centralized database system linked with the National Water Resources Database.

Components of ICRD

The tasks under ICRD have been categorized into 3 components, which are:

Component A: ICRD development and operationalization:

This activity will be carried out in two phases: A **Preparatory Phase**, that will provide an operational database for ICZMPP at the earliest. The tasks under this phase are: performing needs assessment; preparing existing data inventory; linking with NWRD; installing hardware and software; implementing database structure; and preparing an interim report. The **Development Phase** is aimed at having a full-fledged ICRD to support the formulation of the Coastal Development Strategy (CDS). Detailed design of ICRD, collection, collation and compilation of data from primary and secondary sources, implementing the database, developing metadata, developing tools, assessing hardware and software system requirement, providing feasibility analysis report to link with other projects and data and database documentation are some of the activities that will be carried out in this phase.

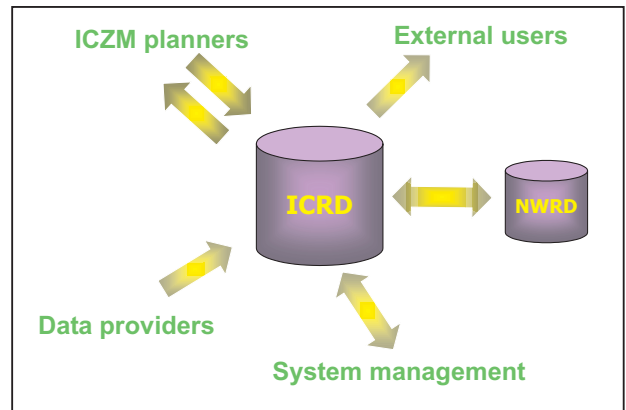
Component B: Dissemination and awareness building:

One of the major objectives of developing ICRD is to build awareness among national, regional and local level stakeholders about the database and overall knowledge base. This can be fulfilled by disseminating analyzed information in a suitable format and in a timely manner. Under the framework of ICRD the stakeholders can participate in the process of planning and management by sharing their views which will ensure two-way flow of information.

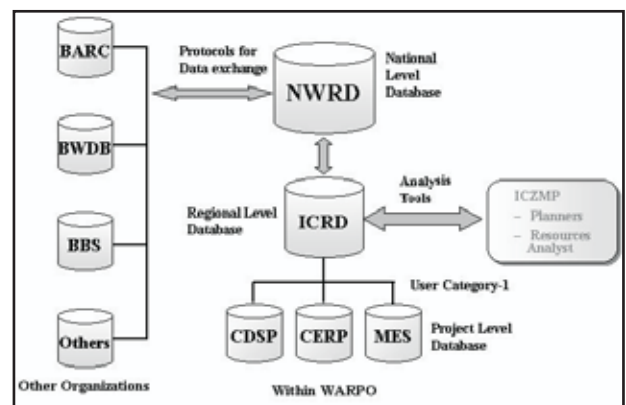
Component C: Knowledge gap filling

For the ICRD to become the kernel component of the assessment framework for the ICZM planning process, important knowledge gaps need to be filled. The following major issues and tasks are identified which would require immediate attention to improve the knowledge base for the development of the ICZM Program:

- Climate change scenario development
- Future scenario development
- Ground truthing of inventory of islands
- Preparation of district development plan
- Supports and facilitate line agencies for PIP development



ICRD: Organization and User



ICRD: Linkage with Databases & ICZMP

Task Force Meeting on Integrated knowledge base

The first meeting of the Task Force on the Integrated knowledge Base (IKB) of the ICZMP project was held on July 1, 2004 in the conference room of the Ministry of Water Resources (MoWR). Officials from MoWR, Department of Environment, Forest Department, BARC, BWDB, WARPO, IWM and representatives of the project attended the meeting. Mr. Md. Habib Ullah Majumder, Joint Secretary of MoWR and Chairman of the Task Force, delivered the address of welcome and chaired the meeting. Mr. Md Abdul Baten, Principal Scientific Officer, WARPO and Member-Secretary of the Task Force described the task force as the main platform for interaction and work-coordination among WARPO/PDO, other relevant GoB departments, NGO stakeholders and consultants.

The status of the integrated knowledge base activities was elucidated at the meeting and a briefing was given on the

knowledge management approach report and Integrated Coastal Resources Database (ICRD) development proposal. The salient features of the knowledge gap document was also presented and the option to incorporate an ICZM introductory course in the school curriculum was discussed. The meeting co-opted the deputed government officials designated as Bio-diversity Conservation and Environmental Expert and Coastal and Marine Engineer in the task force.

The meeting endorsed the ICRD proposal and the structure of the knowledge management report. The meeting also decided to initiate a process of inclusion of ICZM aspects in the higher secondary school curricula. Mr. Md. Habib Ullah Majumder made concluding remarks with a vote of thanks to the participants.

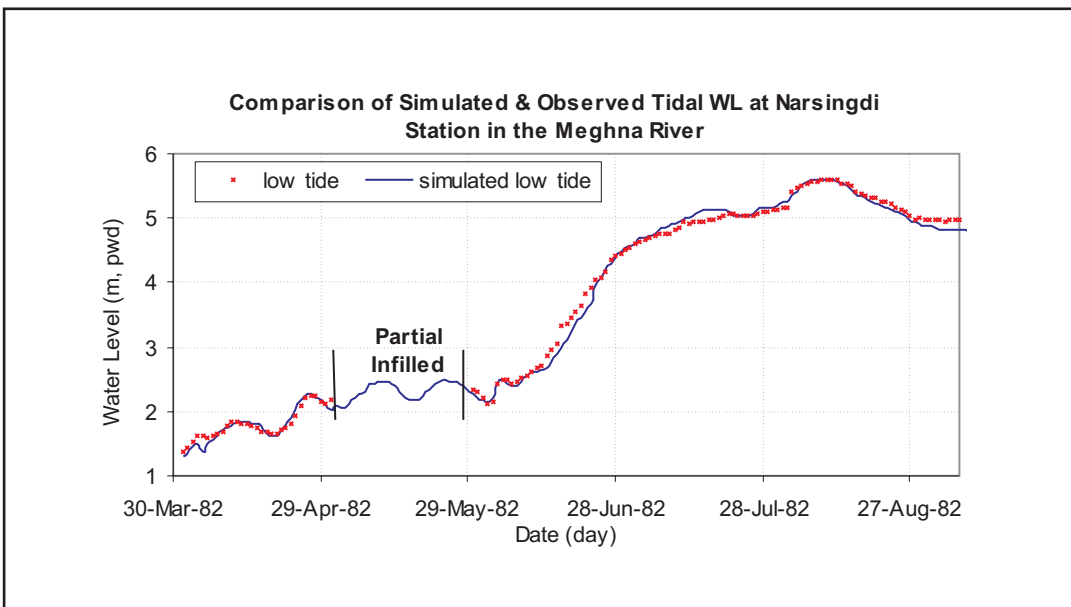
Application of Artificial Neural Network (ANN)

Ensuring data quality is a major concern for any database. One of the comprehensive approaches to evaluating and improving data quality is presented in this article. One of the key beliefs of this approach is that data quality is not a binary attribute. It is not enough to declare that a data set is (or is not) of high quality; it is necessary to evaluate data in the context of specific intended use and to feed the results of these evaluations back to improve quality. Data quality has two distinct aspects, one involving the objective "correctness" of data (such as accuracy and consistency), the other involving the appropriateness of data for some intended purpose.

Quality of data is essential for any planning. NWRD holds a wide-range of times series data with variable quality. The monitoring of data is never seen to be perfect and the hydrological variables often exhibit some form of deficiency due to the presence of gaps, discontinuities, and inadequate lengths. Such deficiencies in the hydrological time series

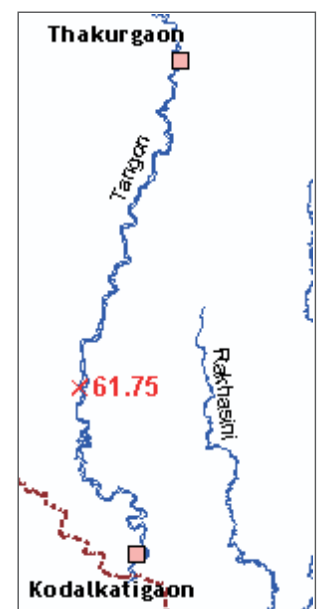
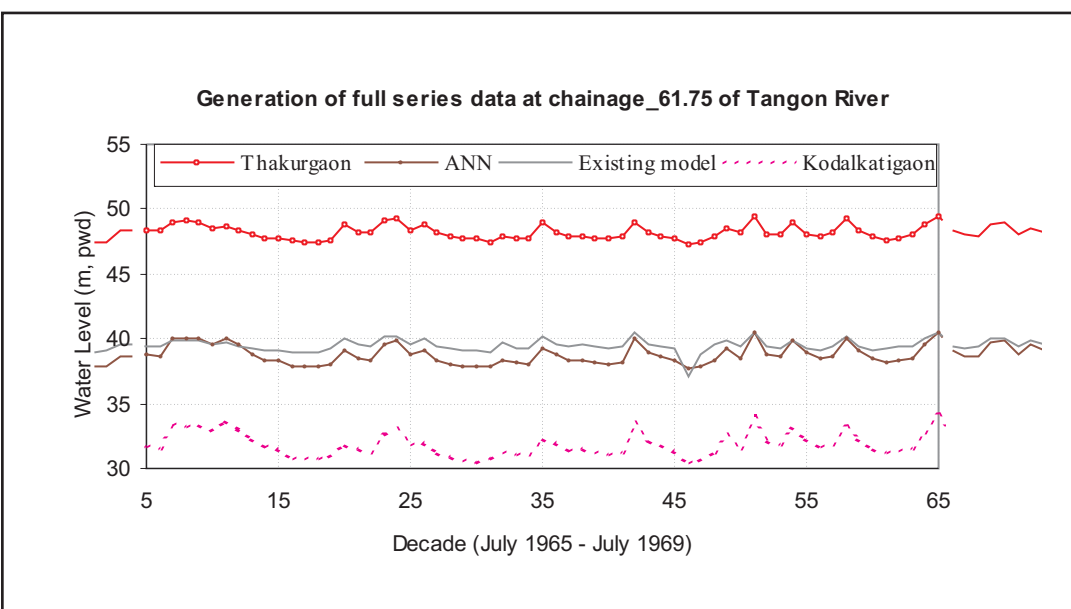
data are attributable. The analysis/modeling for the water system needs complete time series data for proper calibration and verification. This urges to look for methods that permit reconstruction of missing data so that on the basis of complete time series, models can be built and calibrated, and can subsequently be used for the generation or prediction of water-system behavior.

Data Driven modelling techniques, especially the Artificial Neural Network (ANN) is used extensively in the developed countries. The ANN technique is being applied for data quality improvement in NWRD. It performs better quality control where ordinary methods are not able to sustain the desired quality level. The ANN technique for filling in partial missing data and full series data generation is being investigated. The chart shown below is the observed and simulated water level at the Narsingdhi station in the Meghna River with partially filled in data. The other chart shows full series data generation in the Tangon River at Chainage 61.75. The methodology of filling in missing data is documented in a Technical Note.



Simulation at Narsingdi follows an RMS error of 0.16 and correlation is 0.995.

The correlation between Thakurgaon (285) and ANN simulation is 0.90 and with existing model is around 0.89. The correlation of Kodalkatigaon (287) with ANN simulation is 0.74 and with existing model is 0.66.



Environmental Monitoring Information Network for Water Resources (EMIN)

Bangladesh, one of the most hydrologically dynamic regions in the world, experiences various water related natural disasters every year such as recurrent flooding, drought, cyclone, large scale river bank erosion and continuous river drying/river siltation etc.

The broad objective of the EMIN project is to implement an information network to facilitate the planning and management of water and land resources as it relates to flood, erosion, river morphology monitoring and regional basin resources among national stakeholders and potential local stakeholders of the Brahmaputra-Jamuna floodplain region.

The project is being implemented jointly by WARPO and BWDB with WARPO as lead agency and with technical assistance from CIDA. Project implementation was started from July 01, 2003 and is expected to be completed by June 30, 2006.

Workshop on Gender Issues

- A Workshop on Gender issues was held in the Conference Room of Water Resource Planning Organization (WARPO) on 21 June, 2004 under "Modernization of the Ministry of Water Resources' Financial Management Capability Project", a project of the Ministry of Water Resources (MoWR) funded by the Canadian International Development Agency (CIDA). There were 23 participants from the MoWR Secretariat and its 4 organizations.

The organizations are: Bangladesh Water Development Board (BWDB), Joint River Commission (JRC), River Research Institute (RRI) and Water Resources Planning Organization (WARPO).

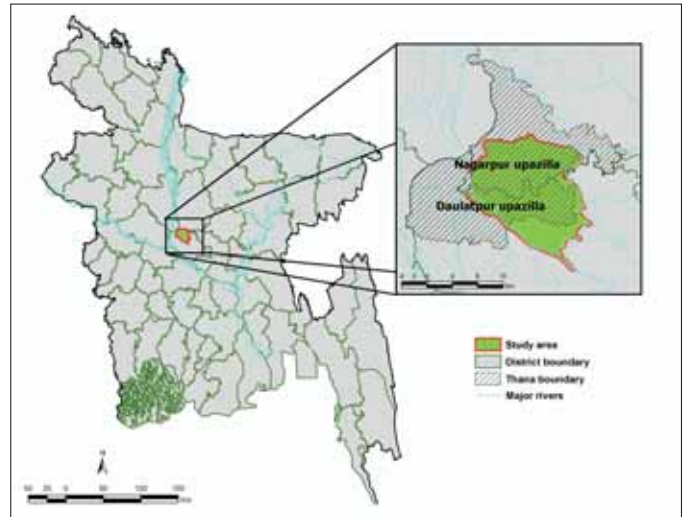
- Mr. H.S.Mozaddad Faruque, Director General of WARPO and Mr. Graham L. Sim were present as the Chief Guest and Special Guest respectively and a number of high officials were attended the program. Mrs. Lailun Nahar Ekram, Gender Equality Specialist was the Facilitator of the Workshop. Mr. H.S. Mozaddad Faruque welcomed and appreciated the Gender initiatives of the project. He is hopeful that this initiative will strengthen specially women awareness and skill.
- This "Modernization of the Ministry of Water Resources' Financial Management Capability" project has been started since January 2003 for a total duration of 3 years.

A Gender Focal Point Committee was formed in the first gender equality workshop held on March 30, 2004 with one Gender Focal Point and one Back-up Gender Focal Point from each of the above institutes. The Terms of Reference and Action Plan of this project have been also finalized in this Workshop.

This project is being implemented through the following 6 outputs:

1. Modernization of the MoWR Secretariat, WARPO, RRI and JRC
2. Computerization of BWDB Other Functions (Accounting System has been computerized in the last Phase)
3. Human Resource Development
4. Enhanced Financial Management and FMU
5. Gender Equality and
6. Project Management

Daulatpur Upazila of Manikganj District and Nagorpur Upazila of Tangail District have been selected for the dissemination of flood-related information. Necessary mathematical tools have been developed to generate information, and necessary hardware (Fax machine etc.) have also been installed in the offices of the Upazila Nirbahi Officers in these upazilas. For proper interpretation of flood-related information, extensive consultation with people at the village level, including relevant persons at the upazila level has



Study area of EMIN local level flood application



Group discussion of the gender workshop

South West Area Integrated Water Resources Management Plan

The problems related to integrated water resources management of the southwest area of Bangladesh are diverse and complex. During the dry season, there is severe shortage of good quality water, while during monsoon flood causes havoc to life and property in the area. Besides, drainage congestion, riverbank erosion, salinity intrusion, arsenic contamination in the ground water etc., aggravate the water management situation in the region.

To address these issues a holistic and integrated water resources management approach is essential. By adopting the National Water Policy and approving the National Water Management Plan, the Government of Bangladesh (GoB) has formally recognized the concept of integrated water resources management. The Asian Development Bank has approved US\$ 0.9 million for technical assistance to the GoB in terms of preparing an integrated water resources management plan for the area and a subsequent detailed study for implementing the proposed interventions. Five districts of the area Jessore, Narail, Magura, Faridpur and Rajbari have been selected for the purpose.

The overall objective of the project is to reduce poverty and enhance the socio-economic status of the people in the selected districts through improved water resources management while addressing diverse social and environmental concerns from an IWRM perspective.

The project is being implementing in two phases. Each phase has been planned to be completed in six-months. The implementing agencies for phases I and II are WARPO and BWDB, respectively. Phase-I work has just been completed.

The findings of the phase-I study are as follows:

- Regional IWRM Strategy
- Sub-regional (district-level) participatory IWRM plans and priority investment opportunities and possible scope of the ensuing loan
- Institutional action agenda to operate IWRM and sustainable service delivery

A total of 96 projects, comprising small, medium and large-scale projects were initially identified for the 5 districts. A preliminary screening has however, reduced the 96 projects to 6, with 2 additional separate programme components. A detailed screening of these components with respect to social, economic/financial, environment, water resources management and amount of project preparation information available, has resulted in the following recommendations for Phase-II:

- Arsenic Mitigation and sanitation programme
- Chenchuri Beel FCD Rehabilitation
- Narail FCD Rehabilitation/upgrade
- Floodproofing of Charlands

The Tripartite Meeting held on May 15, 2004 decided that the Flood Proofing component was not appropriate at this time and that it should not be considered for incorporation.

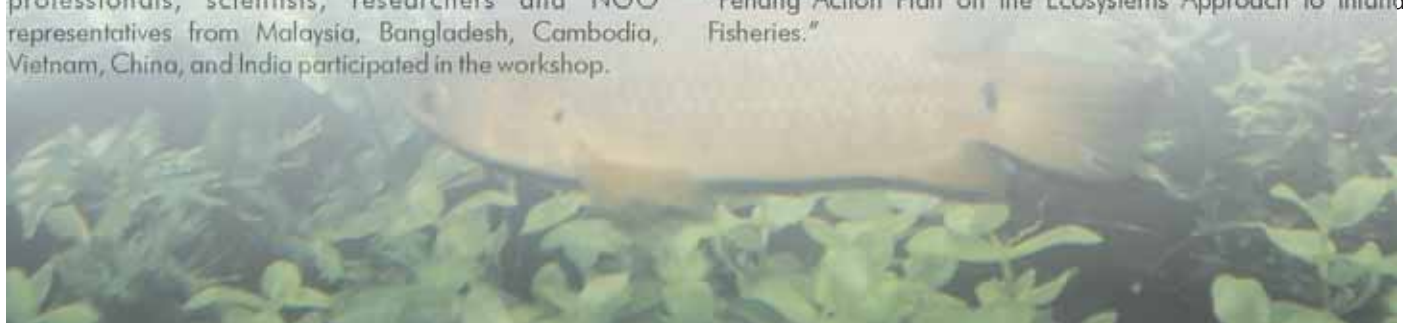
Aquatic Resources are more than Managing Fish

An international Workshop on "Aquatic Resources are more than Managing Fish: The Ecosystem Approach to Inland Fisheries and Role of Intra-country Linkages" was held in Penang, Malaysia on 12-16 January 2004. The workshop was jointly organized by WorldFish Center and InWENT Capacity Building International to ensure that the required intra-country linkages are strengthened to implement an ecosystem approach to inland fisheries at the national level.

Mr. Md. Hasan Parvez, Principal Scientific Officer, WARPO attended the workshop. Senior government officials, professionals, scientists, researchers and NGO representatives from Malaysia, Bangladesh, Cambodia, Vietnam, China, and India participated in the workshop.

The overall objective of the workshop was to contribute to the sustainability of fresh water fisheries (aquaculture, culture-based fisheries, and open water fisheries) through the ecosystem approach. The highlighted specific objectives were to analyze areas of intra-country conflicts in terms of realizing the ecosystem approach and to identify recommendations for action.

Six status papers and nine case histories were presented in the workshop. During the five days of discussion, the 46 participants endorsed the Penang Statement on "Adopting the Ecosystem Approach to Inland Fisheries," and drafted the associated "Penang Action Plan on the Ecosystems Approach to Inland Fisheries."



NWMP Presented at Bangladesh Water Development Board

NWMP is a framework plan consisting of 84 programmes. Ministries concerned and line agencies as designated in the NWMP will plan and implement their projects in accordance to the NWMP framework following existing rules and procedures and priorities set by the Government. 35 organizations have been identified for implementing the programmes of NWMP in independent, lead and supporting capacities. WARPO plans to demonstrate the NWMP to these organizations with special emphasis on their own programmes. As part of this initiative, WARPO made a

presentation of the NWMP to the Bangladesh Water Development Board (BWDB) on July 22, 2004. BWDB professionals including their top management attended the presentation. Mr. H. S. M. Faruque Director General WARPO made the presentation, Dr. Nilufa Islam PSO (Env, Fish & Forest) and Mr. Arzel Hossain Khan PSO (Water Resources) assisted the DG with the presentation.

The involvement of BWDB in implementing the NWMP programmes in different capacities is listed below.

Sl #	Name of the NWMP Programmes	Implementation	
		Start	Duration (Year)
01	ID 003 FCD and FCD/I Management Rehabilitation	2002	6
02	ID 004 BWDB Regional and Sub-regional Management Strengthening	2002	6
03	ID 010 BWDB Capacity Building	2002	10
04	EE 002 Field Testing of Participatory Management Models	2003	5
05	MR 001 Main River Study and research Programme	2002	10
06	MR 002 Main River Abstraction Projects	2004	10
07	MR 003 Ganges Barrage and Ancillary Works	2002	15
08	MR 004 Meghna Barrage and Ancillary Works	2012	9
09	MR 005 Brahmaputra Barrage and Ancillary Works	2016	12
10	MR 006 Regional River Management and Improvement	2002	25
11	MR 007 Ganges Dependent Area Regional Surface Water Distribution Network	2009	8
12	MR 008 North East and South East Regional Surface Water Distribution Network	2016	5
13	MR 009 North Central and North West Regional Surface Water Distribution Network	2021	12
14	MR 010 Main Rivers Erosion Control at Selected Locations	2006	25
15	MR 011 River Dredging for Navigation	2002	10
16	TR 007 Large and Small Town Flood Protection	2003	25
17	MC 010 Dhaka Flood Protection	2003	23
18	MC 012 Chittagong Flood Protection	2003	4
19	MC 014 Khulna Flood Protection	2003	10
20	MC 015 Khulna Storm Water Drainage	2004	22
21	MC 016 Rajshahi Flood Protection	2003	9
22	MC 017 Rajshahi Storm Water Drainage	2004	22
23	AW 002 Improved Performance of Existing Public Surface Water Irrigation Schemes	2004	20
24	AW 003 New Public Surface Water Irrigation Schemes	2005	15
25	AW 007 Rehabilitation of Existing FCD Infrastructure	2007	20
26	AW 008 Land Reclamation, Coastal Protection and Afforestation	2001	24
27	EA 005 National Fish Pass Programme	2003	15
28	EA 009 Improved Water Management and Salinity Control in the Sundarbans	2002	10

After the presentation an open discussion was held. Director General, WARPO clarified queries made by some BWDB professionals. The meeting was ended with a vote of thanks from Mrs. Khaleda Shahriar Kabir, Additional Director General (O & M) of BWDB.

Twinning Mission for Supporting Institutional Development of WARPO

Twinning Arrangement and its Objectives

A Twinning Arrangement between the Ministry of Water Resources, Government of Bangladesh (GoB) and the Ministry of Transport, Public Health and Water Management of the Government of Netherlands (GoN) was signed on November 22, 2000 with the following objectives:

- Provide a long-term basis for inter-agency/ institutional collaboration in the water sector within the policy framework of bilateral development co-operation;
- Support the ongoing transformation process in the water sector, with an emphasis on multidisciplinary co-operation, management structures, policy development and implementation, and division of tasks and responsibilities between public and private sectors; and
- Strengthen capacities in integrated approaches for planning, implementation and maintenance of water and coastal resources and water-related infrastructure.

Under the Twinning Arrangement the Twinning Mission made successive visits to Bangladesh and had a series of meetings with the WARPO Task Force members. The issues were discussed during the mission mainly focused on the following:

Vision, Mission, Role and SWoT of WARPO.

Stakeholder Analysis and PEST Analysis.

Organization Development Plan (ODP).

The Twinning Mission VIII visited WARPO from July 03 to 08, 2004 and held a series of brainstorming sessions on the following issues:

Post approval scenario of the National Water Management Plan (NWMP).

Stakeholder Consultation Process with line agencies.

Clearinghouse role of WARPO.

Preparation of Organization Development Plan (ODP) in view of approved NWMP.

Preparation of Action Programme related to ODP.

The WARPO task force handed over a complete set of draft action programme (road map) that was developed in consultation with the mission members along with draft ODP.

Wrap up meeting

A wrap up meeting with the Twinning Mission VIII was held on July 08, 2004 in the conference room of the Ministry of Water Resources (MoWR) chaired by Mr. Md. Habib Ullah Majumdar, Joint Secretary, MoWR.

A PowerPoint presentation on the progress of WARPO and BWDB was made by the Twinning Mission. Progress made in connection with the Organizational Development Plan (ODP) and its related action programmes were appreciated by the Twinning Mission. Fine tuning work on ODP and related action programmes are in progress and will be completed before the next visit of mission by September 17, 2004.



WARPO official's brainstorming session with the twinning mission.