

## Regional Workshop at Noakhali

### 9 Projects/Programmes Participated

## Field Level Interaction Important

The Program Development Office (PDO) of the Integrated Coastal Zone Management (ICZM) organized a regional workshop on April 16, 2001. The purpose of this Regional Workshop was to interact closely with different multi-sectoral projects being implemented in and around Noakhali. The discussion meeting was attended by representatives of the following 9 projects/programmes :

- Char Development & Settlement Project
- DPHE-DANIDA Coastal Belt Water Supply & Sanitation Project
- Greater Noakhali Aquaculture Extension Project
- Poverty Alleviation Programme in Greater Noakhali District (ASA)
- Coastal Embankment Rehabilitation Project
- SDC/LGED Noakhali Rural Infrastructure Development & Maintenance Project
- DANIDA/LGED Rural Infrastructure Development & Maintenance Project
- Agriculture Programme, MCC
- BRAC/CDSP Programme



Char Development & Settlement Project-II facilitated the organization of the workshop. Mr. Anne van Urk, Team Leader PDO-ICZM presented the key-note paper on conceptual issues of ICZM in Bangladesh. He explained the importance of regional workshops in advancing the causes of integrated management of the coastal zone. Each project/ programme made a presentation, which was followed by a detailed discussion. During the presentations, issues

of coastal embankment, char development, land settlement, rural infrastructure, aquaculture extension, water supply & sanitation, arsenic mitigation, agricultural programme, poverty alleviation programme were dealt. The speakers appreciated holding of such a workshop and took decision to organize follow-up workshops at 3-4 months interval. The next workshop, to be facilitated by LGED, will discuss on theme 'Experience & Limitations of Inter-organisational Interactions'. Dr. M Rafiqul Islam presented concluding remarks and a recommendation of the 'Steps Forward'.

The Proceedings of the regional workshop has been prepared and circulated.

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## Ship - Breaking Industry & Coastal Pollution

A ship breaking industry has grown up in the coast of Chittagong, at a stretch of 10 kms from Foudjerhat to Kumira, north of Chittagong. The industry has an important role in reusing the iron, iron made equipment and the other used materials of the worn-out sea liners. At least, 60-65 ships are broken every year. A country without an iron mine, this industry meets a considerable part of the demand.



The industry is also a polluter to coastal environment. It has affected coastal fisheries resources. Oil and oily substances are just dumped into the sea. Many poisonous or radio-active substances are also scrapped here.

In order to encourage consolidate, environmental balance and technology dependent of ship-breaking industry, the Ministries of Shipping, Industry and Labour will perpare policy jointly (National Shipping Policy 2000).

There are some studies done but most of the reports are not readily available. The PDO-ICZM plans to compile available liturature and will appreciate your contibution. Mean time, you can also contribute your thoughts of what can be done ([rafiqpdo@bangla.net](mailto:rafiqpdo@bangla.net))

## PDO-ICZM Publications

- Integrated Coastal Zone Management Program, Inception Report; January 2001.
- Coastal Zone Management: An Analysis of Different Policy Documents; February 2001.
- Proceedings of the Round-Table Discussion : Status of Activities in the Coastal Zone (of selected GoB -Departments); April 2001
- Proceedings of the Regional Workshop, Noakhali : Status of Activities in the Coastal Zone : May 2001
- Press Clippings (Bi-monthly; compilation of coastal related news & info from national dailies)

Copies of these reports are distributed widely. Additional copies are available by mailing a request to [rafiqpdo@bangla.net](mailto:rafiqpdo@bangla.net)

## Close Contact with ITCZM of the AIT, Bangkok Established

Dr. M. Rafiqul Islam visited AIT, Bangkok on May 16, 2001. He had an extensive discussion with Prof. C. Kwei Lin, Co-ordinator, Integrated Tropical Coastal Zone Management (ITCZM) on possible co-operation between these two programs. A possible Twinning Arrangement has been discussed. . However, it has been agreed to initiate activities as deemed mutually beneficial, such as, assistance in selection of Bangladeshi candidates, short course training, professional consultation, workshop etc. In line with this, the PDO-ICZM is facilitating selection of candidates for the degree programme for the Jan 2002 term. At present, 5 Bangladeshi students are participating in degree programme in ITCZM.



## Char Development & Settlement Project - II

### SALINITY AND COASTAL AGRICULTURE

The Char Development and Settlement Project (CDSP) is working in thirteen specific coastal areas in Chittagong-, Feni and Noakhali Districts. These areas either are already protected against floods from the Bay of Bengal (by a system of embankments and sluices), or will be protected under the project, or are and will continue to be unprotected (because they are too small in size or have as yet too low land levels). Protection creates a new environment for agricultural production due to the fact that agricultural fields are made flood free and water levels can be controlled by the operation of sluices. A possibly even more important effect is that salinity levels of the soils will decrease over time.

In both CDSP and its predecessor, the Land Reclamation Project, attention has been given to the issue of soil salinity. Soil salinity conditions are dynamic and show an annual as well as long term trend. In one polder (Char Baggar Dona) salinity decreased from about 10 EC to about 2 EC in the eight years after it was embanked (EC stands for electrical conductivity; the higher the EC value, the higher the salinity). It decreased in particular during the first five years and stayed fairly stable thereafter. In any given year salinity was highest in April, at the beginning of the pre-monsoon season (in the range of 8.5 to 14.0 EC) and lowest during the monsoon (1.5 to 4.2 EC). The salinity stress is most pronounced in the top soil, that is the top 10 cm. Large spatial variations exist though, both in the top and sub soil layers, and even within the same plot of land. For most of the individual project areas of CDSP the soil salinity (and fertility) is monitored on a regular basis so that more information is available on long term and seasonal trends on a wider variety of lands, including unprotected areas. The actual tests are carried out by the Soil Research Development Institute.



**The preliminary conclusion is that among rabi crops, chili, sweet potatoes, groundnuts and batisak performed relatively well in soils with a salinity level up to 11EC.**

Soil salinity is an important factor with regard to the agricultural potential of an area. This is not so much the case for aman (monsoon) rice crops because the monsoon rain depresses the salinity level of the soil, while the water of the Bay of Bengal close to the coast is fresh during that season. This leads to the conclusion that the need for salt tolerant rabi (winter vegetables) and aus (spring rice) crops is greater than that for a salt tolerant aman crop. Research into salt tolerant rice crops at international and national research institutes have not been highly successful to date. An aus crop can only be grown on plots of land that have the suitable land level and soil salinity. Among the range of varieties of aus crops there is no big difference in their level of salt tolerance. The same applies for aman crops, but, as mentioned before, that is less relevant. Experiences in CDSP have led to the preliminary conclusion that among rabi crops, chili, sweet potatoes, groundnuts and batisak performed relatively well in soils with a salinity level up to 11EC. They were followed by china sak, spinach, greengram, linseed, maize, wheat and sunflower. Potatoes showed satisfactory results up to a salinity level of 8 EC. This implies that even in coastal unprotected area, these crops offer opportunities for farmers.

In about a quarter of the CDSP project areas the salinity in April is less than 4 EC, which means all crops can be grown there out of a viewpoint of salt contents of the soil. Apart from the regular monitoring of those levels, the project is engaged, in close collaboration with the Department for Agricultural Extension and local NGOs, in testing of varieties and technologies and in demonstration and extension activities. The national policy is implemented of following a group approach: a group is addressed rather than an individual farmer. Every type of grass root group is considered to be eligible for CDSP activities with regard to testing and extension, while the approach is to see these groups more as clients than as tools for extension.

## CARE, Bangladesh

### SMALL SCALE INTEGRATED FARMING IN FRESHWATER GHER SYSTEMS IN SOUTH-WEST BANGLADESH

The culture of the Giant Freshwater Prawn (*Macrobrachium rosenbergii*) first started in Bangladesh in 1978 when a few innovative farmers in Bagerhat district frustrated with waterlogging in their paddy fields began to experiment with prawn cultivation. The farming system developed into the gher: a modified rice field with raised embankments, a trench for growing the prawns and fish and a rice chatal in the middle. The technology, indigenous to Bangladesh, soon evolved into a rotational cropping system of prawn and fish cultivation during the rainy season followed by a crop of boro rice in the winter season.



The gher revolution spread as farmers quickly realised the profits. Thriving local economies emerged and important foreign exchange earnings were generated. However, as input costs rose dramatically and external fluctuations in market conditions led to falling prices, profits dwindled and gher farming became a risky business particularly for small scale farmers.

The DFID-UK funded GOLDA (Greater Options for Local Development through Aquaculture) Project was established to enhance the livelihoods by increasing income, in a sustainable manner, from the gher farming system for 15,000 small-scale and vulnerable households. A research and education programme was launched taking a household approach to ensure that both men and women would participate. In each of the selected villages, two Field Trainers (one male and one female) worked with groups of farmers for a two year cycle facilitating learning sessions every 15 days and making follow up visits in between sessions. 20% of the participants were landless people who leased ghers. Over five years, the project improved the overall management of the Giant Freshwater Prawn by developing low cost home-made feeds as an alternative to the costly snail meat and developing nursery systems to improve survival rates of post larvae in ghers. Improved lending policies were negotiated with Banks and credit NGOs to make low cost, flexible loans more accessible to poor farmers and savings groups were established within poor gher farming communities. Options for diversification were developed and tested to reduce the reliance on the prawn harvest. Cultivation of summer and winter vegetables on the dikes, improved fish/prawn polyculture methods and the introduction of aus and aman rice crops helped gher farming evolve from a rotational to integrated farming system. This doubled profits for the small scale farmer and reduce their exposure to the risk of disease, floods and other unplanned events. Another important aim of the project was to increase the role of women in household economic decision making through the household approach equipping women with the skills needed to manage a gher. The messages were reinforced through a gender awareness campaign. In many gher farming families, women are actively involved in economic productive activities such as vegetable cultivation and feed preparation and, as a result have increasing influence over economic decision making. Despite these advances many challenges remain; women's workloads have increased and dowry disputes are common due to the perceived high incomes in areas of prawn cultivation.

Gher farming has also had an effect on the rural landscape; vast areas of low-lying floodplain have been converted into ghers. Unplanned expansion has reduced beel area and blocked fish migration routes, caused drainage problems and reduced grazing for livestock. However, these should be put in the context of the underlying environmental degradation caused by interventions such as the construction of coastal embankments. In fact, gher farming in some areas can be regarded as a coping mechanism for farmers faced with unproductive waterlogged land. Another concern is that the supply of hatchery Golda PL is limited and fishing for wild PL in the coastal regions continues to intensify threatening other marine and riverine fish stocks. These adverse effects were monitored through a community based system and the results were disseminated in a campaign that included a travelling drama show, posters, billboards and leaflets. However, gher expansion continues unabated although better planning has been observed in new areas, hatchery production is slowly increasing and nursing of PL is becoming more common. A number of villages have also established community groups to combat environmental problems but it remains to be seen whether gher farmers can overcome these problems alone.

## Surface Water Modelling Centre (SWMC)

### MATHEMATICAL MODELLING : AN ESSENTIAL TOOL FOR PLANNING ICZM

The vulnerabilities of coastal zone of Bangladesh include the risks to life and property of recurring cyclones and related storm surges, salt-water intrusion and salinisation, drainage congestion, habitat and biodiversity loss, as well as climate change induced increased sea level rise and tectonics. Mathematical models are seen to provide suitable decision support tools for planning the coastal zone in these complexities.

Recent application of the mathematical model comprising physically based one dimensional and two-dimensional hydraulic mathematical models has formed the essential basis for development of the modelling tools for ICZM. This model complex has been developed over the last 15 years through several projects and programmes such as: Mathematical Model Study of Pussur-Sibsa River System and Karnafuli River Entrance, Flood Action Plan Studies, Cyclone Protection Project, Coastal Embankment Rehabilitation Project, Meghna Estuary Study, Surface Water Simulation Modelling Programme.

First step in an integrated system approach is to learn the symbiotic relationship between the different ingredients of coastal ecosystem. Due to advances in computer and computational technologies, mathematical models are developed these days on the basis of systematically collected discrete data over time and space. There can be several tiers of models where natural process like eco-hydraulics provide the understanding of the main arterial system of the coastal zone : the surface and ground water system.

Once the model complex is developed prediction of the natural autonomous development and that for essential structural interventions should be carefully analysed. Appropriate model simulated results for receptive sectors can constitute a strong foundation for development of an efficient coastal zone management plan. Figures I and II show the effects of proposed two cross dams and impact of sea level rise on coastal hydrology as simulated by the Bay of Bengal Model under Meghna Estuary Study Phase II and Second Coastal Embankment Rehabilitation Project respectively.

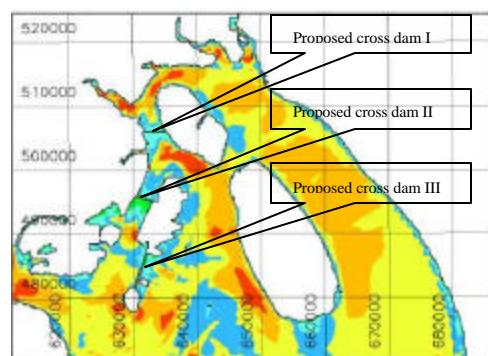


Figure 1: Maximum speed distribution for Sandwip Area for dry 1999 with three proposed cross dams

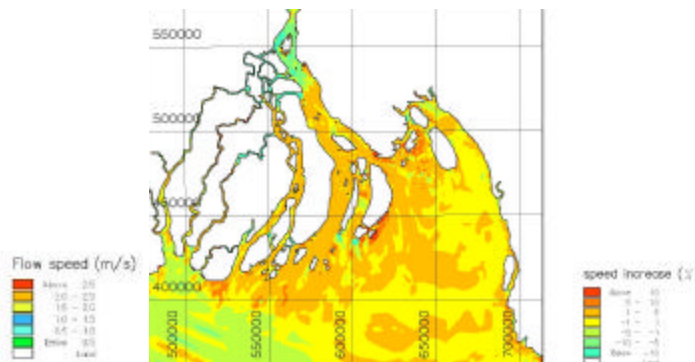


Figure II: Impact of sea level rise on coastal hydrology

The modelling systems developed by SWMC presently constitute the hydrodynamics of the coastal zone of Bangladesh and can readily be applied for ICZM in the following contexts:

- To form an ICZ resource database
- To develop the necessary basis for the planning, design, implementation, management, operation and maintenance of the zone's infrastructure
- To design and initiate a systematic planning process to prioritise and select works for implementation and prepare feasibility studies and detailed design for those works
- To implement the high priority embankment system rehabilitation works identified and planned
- To plan and commence of a network of safe heavens (shelters and/or raised areas)
- To establish foreshore mangrove planning to protect embankments
- To apply in cyclone flood forecasting

These models can be upgraded and integrated with models of other processes both natural and social and developed into a decision support system for the ICZM.

## Meghna Estuary Study - II

### HYDRODYNAMICS OF THE ESTUARY - RECENT RESULTS

The "Meghna Estuary Study" covers the period 1995 - 2001. A "Master Plan" for the Meghna estuary (fig.1) with its islands and chars for 25 year ahead was prepared and a "Development Plan" for a first phase. Intensive surveys were carried out along with research on the hydro-morphology of the estuary. Pilot projects for erosion control and land accretion were implemented and all this has led to a full package of knowledge from where a next phase can embark. The BWDB has already taken up some of the activities as delineated in the plans, in the framework of CDSP.

Sustainable development also depends on the physical sustainability of people and their livelihood. Therefore, it is essential to keep up the knowledge of the rapidly changing estuary. Survey campaigns along with satellite images have given insight in both erosion and accretion of the land (fig.2) as well as in the formation of deep channels and shallow areas (fig.3). Based on this an indication was given of the future shaping for spatial planning purposes. For example comparing the two figures it can be seen that in places where deeper channels develop close to the land, the erosion of the land is relatively high.

When the ongoing natural erosion cannot be accepted due to various reasons, the success of feasible erosion control works is crucial. Pilot works for low-cost erosion control works as carried out under MES have given invaluable information, but no final solution could be found so far. However, the feeling is that it is at close reach. A pilot trial for the acceleration of land accretion was successful, and can be put into practice on a larger scale if desired.

Fig.1 Satellite image 2001 estuary

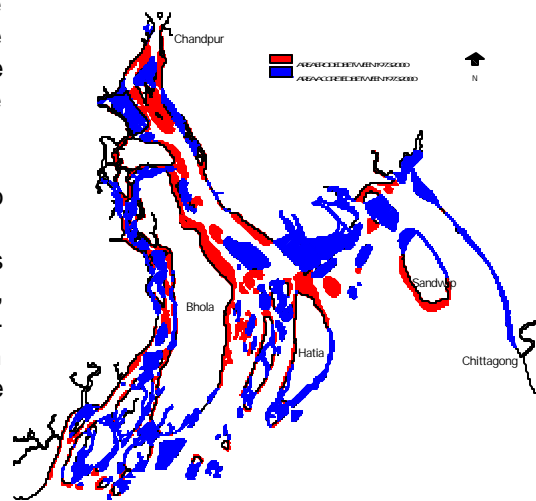


Fig.2 Erosion and accretion 1973-2001

- Having seen all this, the BWDB wants to put emphasis on:
- Ongoing surveys and monitoring of the coastal zone with up to dated survey facilities.
  - Keeping up the knowledge of the processes along with modelling facilities for prediction purposes
  - Interventions for erosion control and land accretion based on the MES lessons

The achievements of MES are in short:

- Master Plan and Development Plan for consideration
- Operational Survey Unit with all data processing facilities
- Effectiveness of trials for erosion control and land accretion
- Updated bathymetry and other hydrographic data
- Numerical models of the estuary for prediction purposes
- Knowledge of hydro-morphological dynamics the estuary
- Trained MES and BWDB staff on various aspects

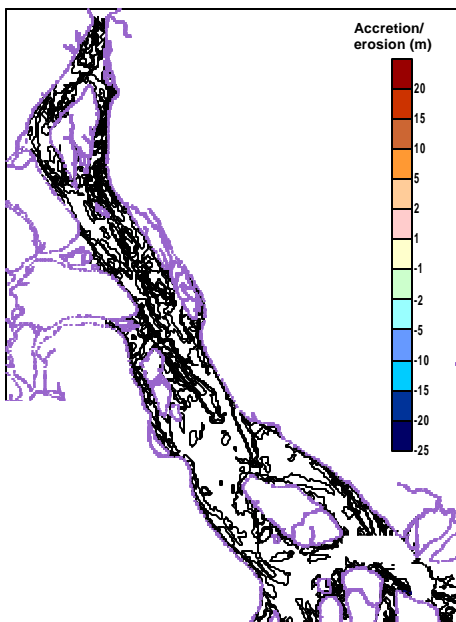


Fig.3 Changes in depths from 1997-2000

The BWDB considers this, apart from their other projects, as an essential contribution to the future development of the estuarine area within her own scope.

## Institutional Review Study

### On-going Studies

This short study has been initiated to understand the existing mechanism of the concerned Govt. departments/ agencies to deal with coastal zone issues.

The objectives of the study are:

- Assessment of the existing mechanism of the concerned Govt. departments/ agencies to deal with coastal zone issues
- Knowledge of the linkages with other departments for dealing coastal zone issues
- Appraisal of the suitable mechanism for co-ordination to deal with implementation of activities under the ICZM.

Dr. ATM Shamsul Huda, former Secretary MoWR, is carrying out this study with assistance from Mr. D. K. Chowdhury. The study findings will form the basis for institutional mechanism of the proposed ICZMP. The study will be completed by August 2001.

## An Analysis of Projects Contributing to the ICZM Process

A total of 6 projects are being analysed through review and discussion with the parties involved in order to achieve:

- Assessment of a selection of projects and programs in the coastal zone on their contribution to the ICZM process and their embedding in the coastal zone
- Defining lessons learned in planning, execution and implementation of the project
- Appraisal of a suitable mechanism for pro active interaction and harmonisation

Mr. Mirza Nazmul Huda and Ms. Farida Sheikh are carrying out this analysis through review of documents and visit to project sites and discussion with relevant people. The study findings will also form the basis for institutional mechanism of the proposed ICZMP.

## Resource Use by Ethnic Communities in the Coastal Zone

From a preliminary analysis of the BBS (1991) population data, at least 10 different ethnic communities are located in several districts of the coastal zone. These communities often have specific resource use and diverse profession. The information will be valuable as reference for any development initiative in the coastal zone.



Mr. Mesbah Kamal, Dr. Reaz and a team of 4 researchers carried out visits to isolated ethnic communities in the districts of Chittagong, Cox's Bazar, Khulna, Satkhira and Patuakhali. Local NGOs active with ethnic communities extended all support to the study. The study will be completed August 2001.

## Inventory of Coastal & Estuarine Chars (Islands)

Comprehensive information on coastal islands is one of the key requirement coastal database. The information will be valuable as reference for any development initiative in the coastal zone. During the period of Meghna Estuary Study, comprehensive surveys have been carried out in the estuary and in the coast. A list of 158 different coastal islands is available. Many of this information are available in different reports of the MES, LRP, FAP-4, FAP-5, CDSP and others. Often, exact location of the coastal islands are either not known or mapped. A knowledge gap exists.

Mr. Faridul Islam, Senior Sociologist is carrying out this desk study to compile all relevant information from different sources. The study will be completed in July 2001.

## Citizen's Committee for Conservation of Coastal Environment, Khulna Seminar on Development Planning for the Coastal Region

On the occasion of World Environment Day, a three day programme was held in Khulna during June 5-7, 2001. A total of 87 organizations as CARE Bangladesh, IUCN Bangladesh, The PRIP TRUST, ICZMP, Unnayan Samunnay, INCIDIN Bangladesh, BRAC, PROSHIKA, IDPAA, IMEK, RDC-Dhaka and Khulna University participated in the event. Nine seminars on different topics related to environment of the south-west region were held.



The concluding seminar formulated a list of Draft recommendations for evolving an appropriate development perspective for the Ganges Dependent Area including the Southwest Coastal region. Advocate Firoz Ahmed presided over the session. Dr. Ziauddin Hyder of BRAC, Dr. Rafiqul Islam of Integrated Coastal Zone Management Programme, and Mr. Ashraf-ul-Alam Tutu participated in the discussion & formulated recommendations. A proceedings will be published.

### About PDO-ICZM

The PDO-ICZM is constituted as a separate and independent unit under the mandate of Inter-Ministerial Steering Committee and Technical Committee. The Ministry of Water Resources is the lead Ministry.

*The PDO-ICZM is responsible for:*

- Developing a common vision for the coastal zone and a strategy to achieve this.
- Preparing a framework for a comprehensive & multi-sectoral ICZM Program.
- Identification, formulation and appraisal of activities as building blocks for the ICZMP.
- Pro-actively interaction with activities along with harmonization where needed.
- Initiating a stakeholder's consultation and the set up of a coastal resources database.
- Co-ordination and facilitation of the exchange of data and information.
- Generating & integrating relevant information into the ICZM Program.

In the preparatory phase of ICZM, the PDO will operate for three years

### COASTAL ZONE ASIA-PACIFIC CONFERENCE (CZAP2002) 12-16 May, 2002, Bangkok, Thailand

### Announcement

An international conference focusing on the coastal zones of the Asia-Pacific region is being organized to bring together regional and international researchers, policy-makers, interest groups and communities to address and discuss issues of common concern in those tropical coastal areas. Key themes of the workshop are i) Integrated Coastal Resource Policies, ii) Community/Resource Interactions, iii) Coastal Ecosystem Management, iv) Coastal Resource Economics, v) Coastal Activities: Aquaculture/Fishing/Tourism and vi) Coastal Area Planning.

The PDO-ICZM is one of the Conference Partners and is the local contact of this conference in Bangladesh. For circulars, mail to [rafiqpdo@bangla.net](mailto:rafiqpdo@bangla.net). There will be opportunity for sponsors to exhibit products at the conference site. Sponsors are requested to contact [ratana@vims.edu](mailto:ratana@vims.edu). The website of the conference is <http://www.vims.edu/czap>.

**Projects/Initiatives are encouraged to send news & information relevant for the coastal zone for the next issue of the Coast News, to be published in October 2001.**

For further information please contact:  
Program Development Office for ICZM  
Saimon Centre (6th Floor)  
House 4A, Road 22, Gulshan 1, Dhaka 1212, Bangladesh  
Phone: 8811370/8826614, Fax: 880-2-8821891

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