

The water resources systems in Bangladesh and the Netherlands

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ing rules and regulations which specify their responsibilities and tasks, is still under development. The problem of integrated water management in this country is to allocate the available scarce means effectively and efficiently and to develop the institutional mechanisms for implementation.

In the Netherlands, on the other hand, where a balanced system of organizations and their legal responsibilities is already functioning for some time, management is fragmented in a complicated structure of specialized agencies with their own objectives and detailed knowledge and information circuits. Integrated management is needed to create common objectives or interests for these water management agencies to coordinate their activities. This appears to be difficult. It illustrates that in developed societies, where basic conditions as food security and poverty alleviation have relative low priorities, a different kind of questions of a "higher order" figure on the political agendas, for example on genetic manipulations and bio technology and on the graying society. The problem thus is to identify concrete common, national policy objectives for water management. The national objectives which are formulated clearly tend to relate to system management objectives for individual managers rather than to policy objectives. This, in fact, shows that water management in the Netherlands has created a level of confidence with the general public, who seem to forget how important proper water management is for the Dutch society. It is worth mentioning that the continuous concern about new problems has initiated the government to call upon a special commission on integrated water management.

In spite of the significant differences in the physical structure, the organization of WRM, the available technical, financial and institutional/legal instruments and in the level of development, there are commonalities in water management. One such commonality is found in the importance of local organizations and stakeholders. In the Netherlands, recent experience has clearly shown that the organization of water and land management can not be fully prescribed at a national level and that local focus

and initiatives are needed to find tailor made solutions to which implementing agencies at a local level are committed. For example, an important issue for the special commission on integrated water management is that the highly technical approach in the Netherlands put at risk the local involvement and the institutional coordination, which is needed to meet future challenges such as changing demands and preferences and climatic change and consequent sea level rise.

Local management does also have high priority in Bangladesh as it is recognized that the WRS is too diverse and the involvement of local people and organizations are too essential for local and regional water systems to be managed at a national level. In Bangladesh, however, local water management organizations are either not existing or weak and major emphasis has been put on project oriented participatory approaches. Experience learned, however, project oriented approaches do not survive and that operational implementation of such an approach needs continuous initiatives at the national level. Other important lessons are that the "models" for participation should be tailored to the local conditions and that a substantial paradigm shift is needed with the national water engineers and planners. *The common lesson from both countries may be that water management should be left as much as possible to the mandate of local organizations with the national government creating the boundary conditions.*

Another commonality is found in the need for integrated planning. The coordination of a wide variety of implementing line agencies on different levels of government needs careful planning, based on participatory approaches and reliable quantitative analysis which is able to predict the consequences of proposed courses of action. In Bangladesh, planning has long been viewed as a one-shot exercise to prepare for physical interventions and produce portfolio master plans (often by consultants), but recent developments in the WRS raised the concern for long term deteriorations which adversely affect the country's potential for sustainable development. This triggers the need for planning as a continuous effort (by the government), supporting a continuous and iterative

decision making on the use of the water resources, based on a feedback about the performance of the WRS (monitoring).

In the Netherlands integrated planning focuses on coordinating the many existing organizations, while in Bangladesh a first task of planning is to develop a proper organizational structure for IWRM. In both countries, however, it is recognized that planning not only needs one central decision making body, but also needs capable and operational planning mechanisms which would include a network of organization and procedures for their coordination and cooperation.

Discussion

Participants during the seminar (mentioned below) expressed their opinion that the exposition of the issues involved in the water sector under the different physical and socio-economic circumstances existing in Bangladesh and the Netherlands helped in reflecting the role expected of IWRM under varying circumstances. There was general consensus that integrated water resources management (IWRM) should play a key role in the management of water resources of a country. The importance of integration was especially appreciated in the context of achieving complementarity between surface water and ground water, upstream situation and downstream situation, the flood plain and coastal environments, and land resources and water resources.

The contention of the paper that the water resources system is to be viewed as a productive system and that it is necessary to ensure optimum efficiency of the system was emphasized. It was supported that the next step would be to develop a computational framework by which one would be able to examine the performance of the functions of the water resources system under alternative options of water resources management.

It was made clear that the whole process of defining the functions and understanding the linkages among different physical, environmental and socio-economic indices was still at an initial stage. Thus, there would be scope for the inclusion of national objectives like equity and functions of the water resources system like dry season retention of water.

One of the constraints in ana-

lyzing the water resources system of Bangladesh was identified to be the fact that a full-year hydrological model has not been available yet. While elements for simulating the flood conditions are more or less available, the ones for simulating the dry season conditions are much less available.

A number of other important points were made. It was noted that some of the changing circumstances should be kept in mind (for example, in the earlier times protecting the aman crop was the most important consideration; now protecting the boro crop has become more important). The participants reiterated that the role of local government would be of crucial importance in the whole process of IWRM. The issue of cost sharing at local level also came up for discussion. In this context, the participants felt that cost-sharing can be effected only if appropriate efficiency is achieved in providing the expected services from the concerned agencies.

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A typical Dutch landscape

Gorai River Re-excavation Project Pilot Priority Works (PPW)

THE Gorai river is one of the most important tributaries in Bangladesh. The river, bifurcating from the Ganges near Talbaria is the main feeder for the Southwest, being essential for agriculture, navigation, fisheries and the environmental conditions in the coastal mangrove forest of the Sundarbans. Last but not least, the waters are very important for domestic use of the numerous people inhabiting the adjacent land.

In the last few decades the river flow changed gradually. Especially so during the lean season, with flows having decreased over the years. In contrast, the annual rate of sedimentation has seen a significant increase. This combination of too little water and too much sand has led to increasing periods of no flow. The drying up is disastrous for all river functions. Last year, from about January through April, no water was flow-

ing in the upper Gorai anymore. Water borne transport and trade were disrupted. Moreover, the absence of good water affected health conditions of the local people. Due to the absence of flow, the salinity intrusion via the Sundarbans into the lower Gorai was increasing. This means, for instance, that along some river stretches, water could not be used for irrigation anymore. Moreover, the increased salinity intrusion leads to a decline in biodiversity of the Sundarbans.

To solve these problems, the Bangladesh Government reached a "Water Sharing Treaty" with India, giving a certain minimum flow and corresponding minimum water levels on the Ganges entering into Bangladesh. The treaty became effective in 1997, but because the upper region of the Gorai River was choked with sediments, still no flow existed during the low water season. Therefore, a

dredging project has been started to restore the low water flows of the Gorai River. The major importance of this work on a short-term basis explains the word "Priority" in the project title.

Because the limited knowledge regarding the behaviour of rivers like the Gorai and off-takes from braided rivers and the capriciousness of the river discharges, the response of the river system on dredging or construction of hard-points is hardly predictable. Therefore the second major goal of dredging besides water flowing in the river Gorai, is to gain insight in the contribution that dredging can give on the long-term restoration of the Gorai River off-take and the resulting water flows. This explains the word "Pilot" in the project title.

By the end of October 1998 dredging started in the off-take area, where a huge plug of sand was blocking the river entrance.

From there a new low water channel was dredged, using two cutter suction dredgers. Dredging proceeded down river until the low season flow was restored. In the second half of February 1999, it became clear that flow conditions were strongly improved. In the second dredging season, starting early by mid September 1999, only one dredger was deployed. Flow was restored again at the end of the season, and it was proven that the Gorai could be kept flowing, and strong improved river conditions were obtained. Results were that promising that it was decided to extend the project for yet another year. After the third dredging season flows were restored once again.

Today, despite the dry spell prevailing throughout the country, water is flowing in the Gorai. Women are using the water for washing clothes, men are fishing in the waters bringing home a nutritious meal, and children are

playing in and around the water. A lot of fishing birds are spotted around the Gorai, indicating that fish-stock is restored. Many boats are plying the river, carrying goods from one place to the other. Shallow tube wells are still in operation, and salinity intrusion via the Sundarbans reduced significantly.

The restored flow in the Gorai provides the pre-condition for a sustainable development of the Sundarbans. The secured water supply during the dry season creates opportunities for irrigation of agricultural land. The availability of surface water throughout the year can in future even be used, via drinking water purification, for drinking water supply. Because the surface water of the Gorai is not contaminated with arsenic, it could take away a major health threat from the people living in the southwest. Hence, the restored flows in the Gorai have created a lot of opportunities for the southwestern part of Bangladesh.

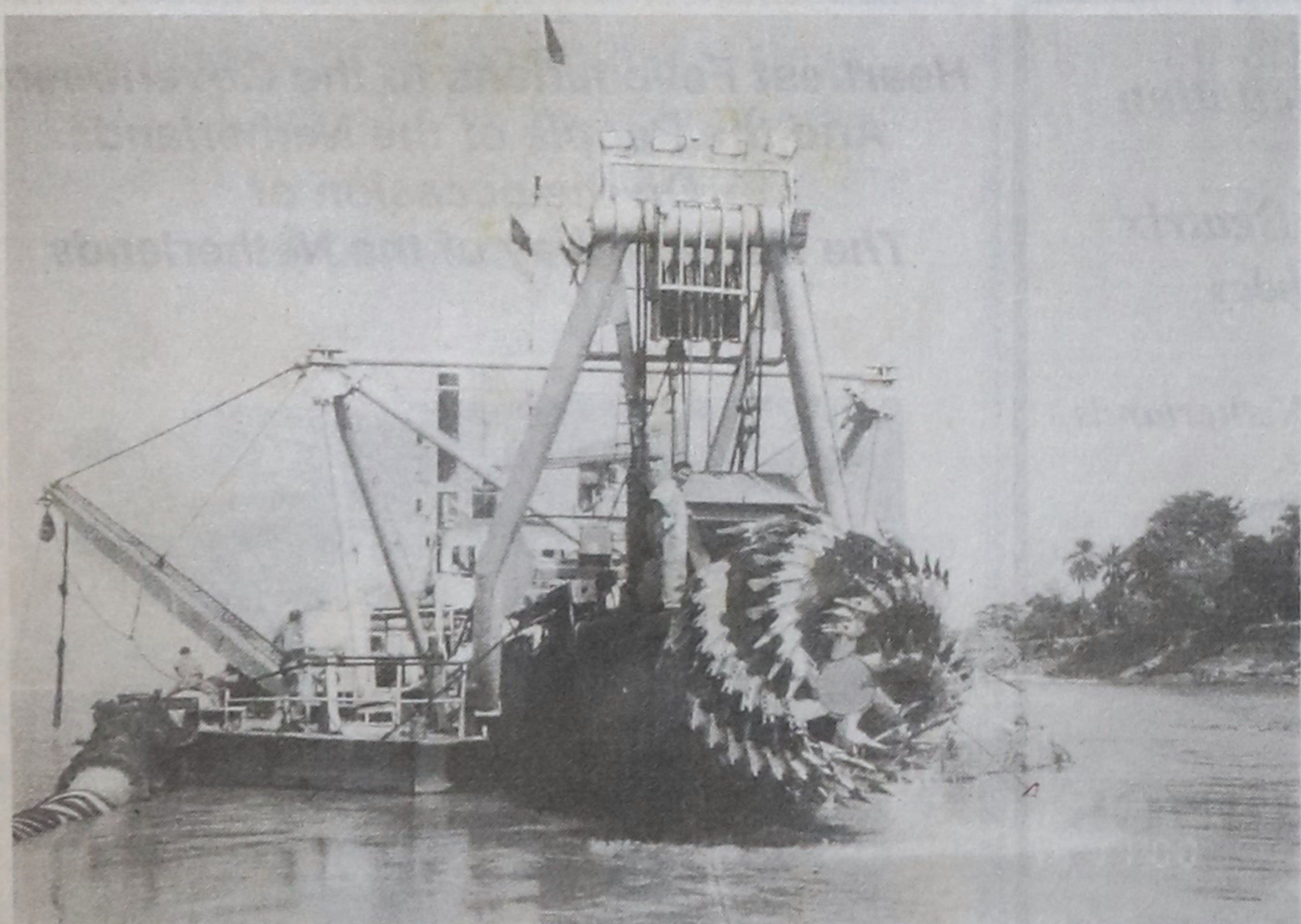
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