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INSTITUTIONAL DEVELOPMENT PROGRAM

(5)

REPORT NO. 2

(FEBRUARY 1995)

STUDY FOR FPCO BY PANEL OF EXPERTS

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Chapter 1

BACKGROUND OF THE STUDY

1.1.1 It was envisaged at the inception of FAP that implementation of the Action Plan will require substantial improvement in the performance of existing institutions and, perhaps, creation of new institutions and work procedures. To this end, a study was to be undertaken to[1]

- examine the problems facing BWDB in the implementation of water control programmes, including delays in appointing consultants and awarding contracts, shortage of local funds for construction and maintenance, and procedural delays in land acquisition and project approval:

- review the capacity and present workload of existing institutions (including BWDB) at national and local levels and assess their potential contribution to the implementation, operation and maintenance of projects under the Action Plan, including compartments; and

- propose ways to strengthen BWDB and other institutions to implement the Action Plan and/or propose a new institutional set-up. Consideration would be given to ways of ensuring the participation of the beneficiaries and local councils and involving the private sector (e.g., through "turnkey" projects).

1.1.2 The POE team had divided its task in three phases. Five major areas were examined in Phase-I[2] and definitive recommendations made where possible; otherwise key issues were identified and further investigation indicated. The present volume focuses on (i) review of major water sector institutions - BWDB, WARPO and RRI, (ii) institutional arrangements for the continuation of GIS and EIA activity, and (iii) re-allocation of functions and responsibilities amongst water sector institutions.

1.2.3 It became clear, as FAP studies progressed, that the institutional development programme must address a wider range of issues than originally envisaged, such as, satisfactory arrangements for (i) ensuring public/beneficiary participation from planning through implementation stages, and (ii) taking care of social, environmental and bio-diversity concerns. FAP projects stipulate a new level of multi-sectoral and multi-disciplinary input and a larger group of participants. Designing appropriate institutional framework in this context requires

[1] The World Bank-Bangladesh, Action Plan for Flood Control (December 1989)
[2] POE team: Institutional Development Program Interim Report No.1 (April 1994).

a careful approach. Proposed Phase III will look at (i) enhancement of private sector capability for planning, designing, supervision and implementation of water sector projects, (ii) role of local government institutions, (iii) role of NGOs, and (iv) designing appropriate institutional arrangements for people's/beneficiary participation on basis of experience gathered in EIP, SRP, SSFCDI and the Compartmentalization Pilot Project.

Chapter 2

REVIEW OF MAJOR INSTITUTIONS - BWDB

1. Mandate and Organisational Structure

2.1.1. The Bangladesh Water Development Board (BWDB) is the lineal descendant of the Water Development Wing of the erstwhile East Pakistan Water and Power Development Authority (EPWAPDA), created in 1958. BWDB was created by Presidential Order No.59 in 1972 when water and power wings were separated.

The aforesaid legislation authorises the Board to prepare, for the approval of the Government, a comprehensive plan for the control of floods and the development of water resources in Bangladesh. The functions specified under the statute include:

a) construction of dams, barrages, reservoirs and other original works; irrigation, embankment and drainage, bulk water supply to communities and recreational use of water resources;
b) flood control including water-shed management;
c) prevention of salinity, water congestion and reclamation of land;
d) except within the limits of sea-ports, maintenance, improvement and extension of channels for inland water transport, including dredging of channels, but excluding all such operations as may be assigned by the Government to any other agency;
e) regulation of channels to concentrate river flow for more efficient movement of water, silt and sand, excluding all such operations as, in the opinion of the Government, may be carried out by any other agency.

2.1.2. BWDB is a body corporate consisting of a Chairman and five other Members appointed by the Government. The Board, in the discharge of its functions, is required, under the relevant law, to be guided by such directions as the Government may give from time to time. In addition to this, the law provides overriding authority to the Government in terms of

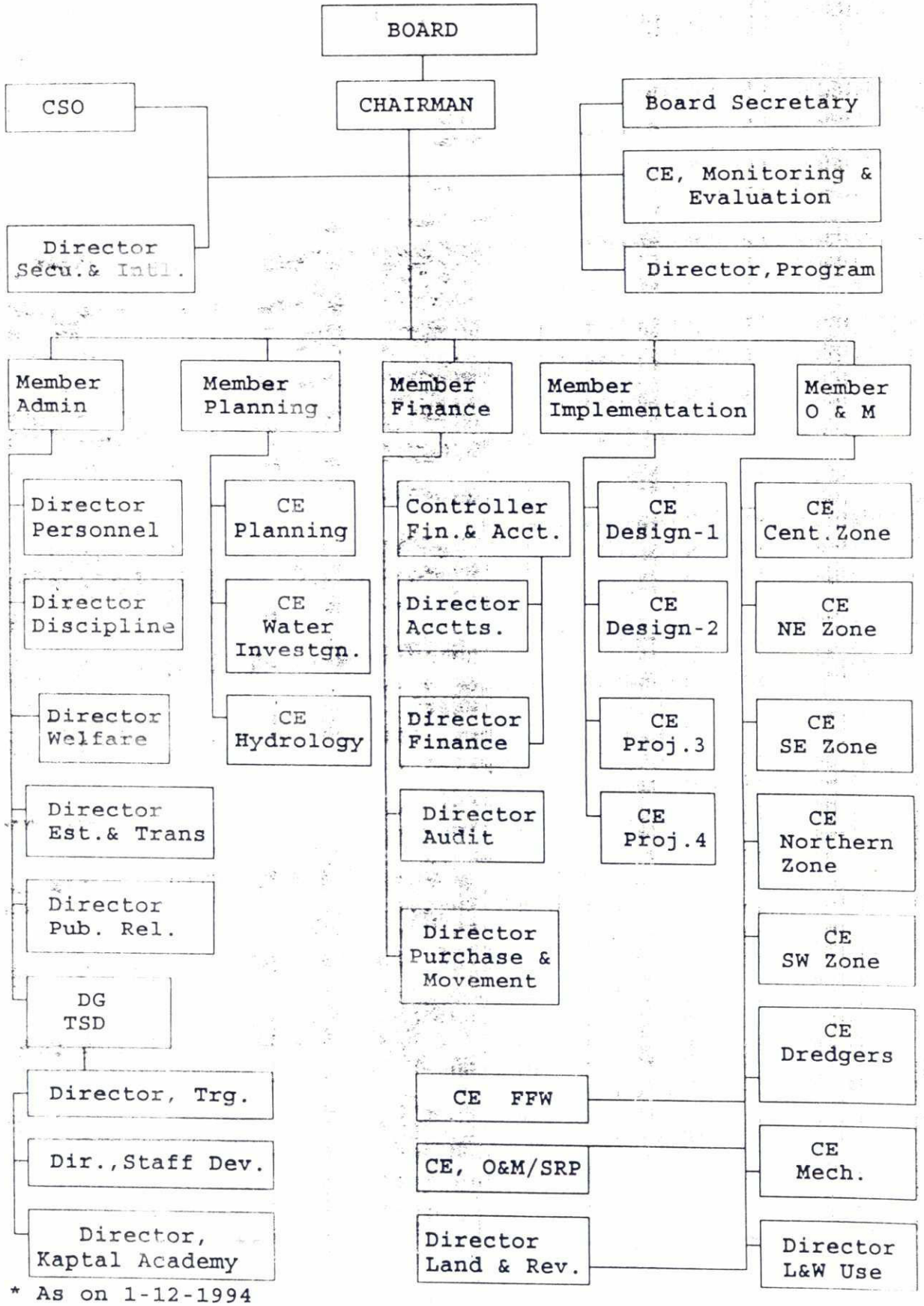
a) determination of the terms and conditions of service of the Chairman and the Members of the Board.
b) termination of their appointment without assigning any reason.
c) allocation of functions and delegation of authority to the Chairman and Members.

2.1.3. At the apex of the organisation is the Board of Directors consisting of the Chairman and five Members. The position is shown in Figure 1. The Chairman acts as the Chief Executive. Each Member has his own area of responsibility and

Figure 1

ORGANOGRAM OF BWDB*

(Top and Senior Management)



* As on 1-12-1994

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a separate set of functions. The Chairman is assisted by five staff offices. BWDBhas a large head office with 21 directorates/divisions headed by officers of the rank of Chief Engineer/Director.

The field and project offices are headed by Chief Engineers (CEs). Initially, only four Zonal Chief Engineers were there. Four more Chief Engineers with project set-up have been added in recent years. Below the Chief Engineers in the field are the Superintending Engineers (SEs) at the head of Circle Offices; in the next layer are the Executive Engineers (XENs) in charge of Divisions followed by subdivisions with Subdivisional Engineers (SDEs). At the bottom are the Sectional Officers (SOs). Among officials of class I category, 946 (61.62%) are engineers, 174 (11.33%) are other professionals including a small number of economists and 415 (27%) belong to other jobs that include finance and accounts.

2.1.4 In 1979, when the Joint Review was completed, BWDB had nearly 18,500 personnel of whom 2000 were professionals, 6500 technical and accounting staff and 10,000 non-technical. Five years later when Enam Committee completed its organisational review of BWDB, the total strength stood at 18813 against a sanctioned strength of 24386. The said committee made a marginal reduction of the manpower strength from 18813 to 18032. This was done mainly in class III and class IV categories. A summary view of the manpower situation is shown in Annexure 1 of Vol.II. Compared to 1984, the number of staff in terms of sanctioned and existing employees have been reduced by 384 and 1691 respectively. The factors attributable to this are mainly that, in addition to retirement, RRI, WARPO and FPCO have drawn on deputation a good number of staff. Regardless of this decrease, the historical trend of a higher ratio of non-technical, mainly class III and IV, have remained unchanged.

2.1.5 BWDB now has a sanctioned personnel strength of 17684 against which the total number on the job is 16341. The break-up by category is shown in below:

Class	Number
Class-I	1535(9.39)
Class-II	54(0.33)
Class-III	9372(57.35)
Class-IV	5380(32.92)
Total:	16341(100)

Note: Figures in the parentheses indicate % of total.

2.1.6 BWDB has compiled a list of 500 completed water sector projects (Annexure 2 Vol.II) of various sizes and types; of these, 33 projects were completed before EPWAPDA was established. Out of the 500 completed projects the dominant type is FCDR/DRFC (34.4%) followed by DR (22.6%), IR (19,2%), others (7.4%), DRFCIR (7%), FC (5.8%), IRDR (2.2) and FCIR (1.4%). The total outlay is

computed at Tk. 3650 crores. The list indicates the physical works undertaken and the types of benefit derived from these projects. In physical terms BWDB itself has been able to construct 7.44 thousand km of embankment, 4.54 thousand km of drainage channel, 3.34 thousand km of irrigation canals, 5995 numbers of structures, 49 pumps houses, 390 sluices and 3659 bridges/culverts. Compilation of the list is in itself a commendable performance. The next stage is to undertake a physical verification to determine the current status of these projects.

2. Review of Earlier Studies of BWDB

2.2.1 BWDB is a major organisation of Bangladesh and its performance has considerable direct and indirect impacts on the national economy. Naturally, BWDB has consistently received high priority in allocation of development funds. Considerable investment has also gone into efforts to improve BWDB management. Over the years, a number of studies have looked at the organisation and structure of BWDB. Some of the important studies include the following:

Joint GOB-World Bank Review (1979)
Strengthening the Organizational and Implementation Aspects of the Bangladesh Water Development Board (Project BGD/79/040, 1981).
The Report of the Committee for Reorganization of the Bangladesh Water Development Board (March 1984).
Bangladesh Agriculture Sector Review (March 1989)

Important findings and recommendations of these studies are summarised below:

2.2.2 Joint GOB-World Bank Review (1979)

The Joint GOB-World Bank review found that the basic organizational structure of BWDB was sound. It noted, however, that BWDB had problems in implementing projects resulting in cost over-runs and generally low accomplishments per unit of resources spent. It also averred that many of the problems arose from external constraints.[2]

The Joint Review also found that the operational efficiency of BWDB is handicapped by-

sharp decline in real terms of the BWDB budget since liberation;
short fall of 10 to 15% in funds allocated by the ADP;
absence of provision for the carry-over of funds from one ADP to the next;
upward revision in the ADP at the expiry of the dry season construction period;

[2] GOB-World Bank Review, Annex I/p.7.

- Establishing Performance Requirements for BWDB personnel.
- Reducing the Staff Organizations reporting to Chairman.

Some of the important recommendations made by the Task Force on Implementation include the following:

- securing multiyear commitment for aid from external donors;
- the possibility of securing firm commitments of aid by April to facilitate the ADP fund allocation process;
- payment of customs duties and taxes for development projects to be made through book transfer;
- ADP to have a smaller number of viable projects. The share of ADP allocation for unapproved projects to be limited to 20% of the local currency allocation;
- improving forward planning process for implementation programming and the establishment of a monitoring and evaluation system;
- fund release procedures to be simplified to authorize the administrative ministry to release fourth quarter funds and adjustments as required to be made during the first quarter of the following year. In addition, administrative ministries to have the authority to release funds for unapproved projects with concurrence of the Planning Commission but without further clearance from the Ministry of Finance;
- increased delegation of authority to the Zonal CEs to transfer and post officials upto the level of SDEs and to the Board to approve projects upto taka ten million.
- establishment of Project Implementation Committees (PIC) for all projects and a central Evaluation Committee to provide high level oversight for government review;
- assigning requisite staff including those of Land & Revenue Directorate to the XENs for land acquisition, approval of estimates at the XEN level, timely placement of fund with the Deputy Commissioners and appointment of an Additional Deputy Commissioner with the required number of Special Land Acquisition Officers to exclusively deal with land acquisition matters of BWDB. The salaries of the Additional Deputy Commissions and Special Land Acquisition Officers to be paid by BWDB;
- an information network for implementation monitoring to be developed and utilized by BWDB.

2.2.4 Report of the Committee for Reorganisation of Bangladesh Water Development Board (March 1984)

This report made an extensive review of previous studies and gave

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2.2.4 Report of the Committee for Reorganisation of Bangladesh Water Development Board (March 1984)

This report made an extensive review of previous studies and gave

recommendations. Some of the major recommendations are listed below:

- to improve its operational efficiency BWDB should take full advantage of the recent simplification of fund release procedure. To achieve this end, it should resort to forward planning in terms of implementation of the on-going projects which require several years to be completed. Procurement and tendering formalities should also be so designed as to enable project implementation on schedule.
- Independently organized O&M set-up is nowhere required except for big projects like GK, CIP, BIP, etc.
- In order to find a way out of the mixed set-up, the rigmarole of O&M and Implementation set-up needs to be settled in a way that is practical and does not affect the operational efficiency of BWDB.
- To reduce the O&M burden of BWDB, most of the completed projects that do not need whole time attention of a regular set-up can be transferred to the Upazila administration or even to Union Parishads. A political commitment at the appropriate level to implement such a programme, and willingness of BWDB to take appropriate steps to effect such a transfer of responsibility and ensure that it is implemented, are the two pre-conditions for the success of such a line of action.
- Any future effort of reorganizing BWDB must be preceded by an indepth analysis of the personnel requirement of O&M in relation to the implementation set-up. The analysis is to be done on the work content and the size so that the bulk of completed projects can be looked after by the Upazila Administration with necessary technical and support services from BWDB wherever required.
- The O&M functions should not be narrowly conceived in terms of a technically organized maintenance programme. Even a technically organized maintenance programme will not need much of a guidance and supervision from the head office. The O&M functions in the field will have the following work components which can be taken care of in the field without reference to the head office.

  Preparation of estimates
- Approval of estimates and technical sanction at appropriate level
- Tendering
- Examination and approval of tender
- Award of work order
- Supervision of work by the engineers on site
- Head office intervention has to be reduced as far as practicable.
- The functions of Member (O&M) should not be so defined as to impair the authority and functional responsibility of the Zonal

Chief Engineers. The functions of Member (O&M) should be more in the direction of (a) providing policy guidance for operation and maintenance of completed project, (b) Initiating and sustaining adequate policy intervention to ensure orderly and appropriate management of collection of water rates, and (c) ensuring administrative and logistic support for smooth operation and maintenance of completed projects.

In addition to the foregoing functions suggested by task force the principal tasks of Member (O&M) should be to:

- update the cost estimates for maintenance of completed projects and initiate appropriate steps to obtain the necessary budgetary support.
- ensure, through adequate supervision, that operation and maintenance functions are carried out in the field.
- draw up annual operation and maintenance programme clearly setting out the priorities based on the budgetary estimates.
- the relationship between Member (O&M) and the O&M staff in the field right from the Chief Engineer downwards should be more clearly delineated. The Zonal Engineers should not be allowed to report directly to the Chairman in the interest of efficiency, administrative discipline and unity of command.

There is a lot of scope for readjustment of personnel as well as functions of the existing Planning unit of BWDB. The planning organization should have only one Chief Engineer assisted by a multidisciplinary team. The size of the team should be decided after identification of the appropriate role of BWDB in the planning process consequent upon the creation of MPO. A separate study should be conducted on this issue pending finalization of the redefined role of Chief Engineer, Planning. The question of transferring planning personnel to Zonal Chief Engineers should be re-examined.

- The current policy for promotion of Assistant Engineer to Executive Engineer may continue to be followed. However, a system of examination be introduced at the level of Assistant Engineers, be it departmental examination or promotion examination, to ensure that the XENs have the necessary professional competence and expertise to carry out the onerous functions which the job entails.
- The selection posts (above the level of XEN) are to be filled up on the basis of merit-cum-seniority. In the selection of SEs and in particular, CEs, special weightage should be given to the range of experience, while merit, objectively determined through numerical rating of ACRs, should be given over-riding consideration.
- Recruitment and promotion rules should not be viewed as a means to control and regulate recruitment and promotions. The rules should be viewed as an effective management tool intended to

enable the Board Management get the best out of its existing personnel.

- Some of the Divisions which were created 8 to 10 years back and still continue without much work are to be redistributed immediately by the BWDB Management, so that, optimum utilization of personnel is achieved. Field visits by the top management may solve more problems in a day than lengthy correspondence over months, provided Board Members act as a united body with complete mutual trust and co-operation.
- The Board should immediately establish clear policies and procedures fixing the minimum tour requirement of the Zonal Chief Engineers. The Zonal Chief Engineers should be left free to plan, supervise and guide the implementation of projects and their operation and maintenance.

2.2.5 Bangladesh Agriculture Sector Review (March 1989).

Agriculture Sector Review (ASR) in Volume V looked at the institutional aspect of BWDB mainly in such areas as planning and design, implementation (construction) and operation and maintenance, their problems and alternate solutions.[4] The major deficiencies and recommended measures in each of the above areas are discussed below:

A. Planning

i) Absence of Strategic Planning
ii) Absence of local input into planning
iii) Overlapping functions and lack of coordination with other agencies
iv) Problems at H.Q. Planning and Design Departments
v) Problems at Field Level Planning Units.

Recommendations

- Introduction of the concept of strategic planning in terms of definition of specific objectives and strategies over a time-bound frame;
- Replacing the Office of Chief Engineer Planning with the Office of Chief Planning to be supported by a multidisciplinary team and linking the Office of Chief Engineer Design to the Chief of Planning;
- Effective coordination and linkage between the head office Planning Department and field level planning units;
- Ensuring local input into the planning process through an appropriate forum at the local level and involving beneficiaries the time of project identification;

[4] **ASR (Volume V), pp 89-113.**

- Providing incentives to qualified and competent personnel of the Design Office;
- Strengthening data base by establishing a research cell under Chief of Planning;
- Using Programme Evaluation and Review Technique (PERT) chart to facilitate implementation of projects, and
- Monitoring of progress of all projects by Chief Engineer, Monitoring and Evaluation who should periodically report to Member, Implementation.

B. Implementation

i) Lack of coordination between design phase and construction phase;

ii) Delay in hiring contractors;

iii) Inappropriate screening of contractors;

iv) Delay in fund release;

v) Delay in land acquisition, and

vi) Laxity of the monitoring system.

Recommendations

- The application PERT programming to reduce the time gap between design and construction;
- Starting the process of hiring contractors before the approval of ADP;
- Developing and strictly enforcing prequalification criteria for selection of contractors;
- Submission of accounts by BWDB to the Ministry of Finance right at the end of the first and second quarters to avoid time loss for release of third and fourth quarter funds;
- Revising land acquisition rules to give more flexibility to the Deputy Commissioner and instituting adequate forward planning; and
- Streamlining the system of monitoring, among other, by installing a computer based MIS.

C. Operation and Maintenance (O&M)

i) Defective physical design;
ii) Lack of finance;
iii) Lack of credit facilities for farmers in old projects,
iv) Absence of extension services,and
v) Absence of leadership within farmer groups in project area.

Recommendations

It recommended to look at O&M function from two major perspectives. First, project management i.e. the task of providing a systemic link between the physical project and the beneficiaries. Second, the task of maintaining project structures. It suggested a set alternative forms of organisation such as

a) An agency under the direction and control of BWDB.

b) The Upazila Parishads in organisational set-up resembling the Thana Irrigation Program (TIP).

c) a separate public institution like the Bangladesh Rural Development Board (BRDB) or the Rural Electrification Board (REB).

d) Non-Government Organisations (NGOs).

e) A series of private franchises under the overall control of BWDB or any other institution.

It could not, however, suggest the best choice among the above organisations without detailed study.

This POE study is conceived as a continuation of the on-going effort to improve BWDB management and performance. This study looks at four specific areas namely, (i) Project implementation, (ii) Operation and maintenance, (iii) Planning, and (iv) Financial management.

3. Improving project implementation capabilities

2.3.1 In view of persistent criticism of poor project implementation performance of BWDB, the POE team considered it necessary to examine the matter in reference to some specific projects. A list of 16 projects was furnished to BWDB and information collected on key items. The analysis, presented in Table 1, gives a disappointing picture.

2.3.2 It will be seen that out of 16 projects including one on-going, all except 1 had time overruns ranging from 0.5 years to as high as 13 years based on the original period of implementation. Thus it can be said that about 95% of the projects suffered from time-overruns. Out of the 16 projects as many as 13 had to undergo revision, some of them more than once. Factors necessitating revision include changes in government policy relating to projects, repeated changes in design, inadequate allocation of funds and in some cases non-allocation of funds for several years.

Table 1

BWDB Project Status

Sl. No.	Name of Project	Time Overrun Over		Cost Overrun % Over	
		Original Implementation Period	Revised Implementation Period	Original Project Cost	Revised Project Cost
1.	Tubewell Proje North Bangladesh: The project is divided into separate components, namely			(+) 57.69	(-) 2.29
	PP-'A': Deep Tubewell equipments procurement & Installation	4 years	1 year	(+) 24.63	(-) 3.68
	PP-'B': Electrification	2 years	0	(+) 143.65	(-) 0.58
	PP-'C': Irrigation Distribution System for New DTWs and command are a Development.	2 years	0	(+) 37.46	(-) 2.67
2.	Rehabilitation and construction of coastal Embankment Project: Part-C	0.5 years	-	(+) 68.72	-
3.	Naogaon Polder 1	3 years	0	(+) 95.71	(-) 1.42
4.	Pabna Irrigation & Rural Development Project, Phase-1	13 years	-	(+) 44.59	-
5.	Narayanganj-Narsingdi Irrigation Project (Block-A/1)	0	0	(+) 8793.44	(-) 2.81
6.	Madhumati-Nabaganga	3 years	0	(+) 39.05	0
7.	Bhola Irrigation Project	4 years	0	(+) 182.47	(-) 16.42
8.	Gumti Phase-1	1 year	(-) 1 year	(+) 68.41	(+) 7.53
9.	Chandpur Irrigation Project	2 years	-	(+) 9.33	-
10.	Meghna-Dhonagoda Irrigation Project	2 years	0	(+) 63.30	(+) 63.30
11.	Karnafuli Irrigation Project (Halda & Ichamati Unit)	1 year	0	(+) 26.57	(+) 26.57
12.	Muhuri Irrigation Project	2 years	-	(-) 2.47	-
13.	Dhaka Integrated Flood Protection Project	On going (Expected date of completion): 1996-97	-	(+) 1.28	-
14.	Manu River Project	Not known	-	(+) 103.22	-
15.	Khowai River Project	11 years	-	(-) 26.08	-
16.	Teesta Barage Project, Phase-1	5 years	On going (Expected date of completion: 1994-95	(+) 1717.26	0

Source: BWDB

2.3.3 The table also shows that out of these 16 projects all except 2 had cost-overruns ranging from 1.42% to as high as 8793% based on original estimates of project cost. However, based on the revised costs, only 3 projects constituting 19% of

the total number had cost overruns ranging from 7.53% to 63.30%. It may be noted that an exact assessment of the cost-overrun situation is difficult: on the one hand currency devaluation from time to time automatically raised costs as expressed in taka; on the other omission of project components, substantial in many cases, is not reflected in the comparison. Another interesting point relates to Narayanganj-Narsingdi Irrigation Project (Serial 5) constructed by Japanese contractors under Japanese supervision. The project was completed on time, but was the most expensive project by far in terms of per unit development cost.

2.3.4 The next area of concern is quality of work. Faulty project design, poor quality of structures and earthwork, unsatisfactory procurement performance and lower than intended benefits are the common complaints. The POE team did neither investigate nor is in a position to comment on this. The matter will perhaps be looked into in a separate study. Since majority of important BWDB projects were designed and supervised by foreign consulting firms, the competence of these organisations will also need to be investigated.

2.3.5 Problems encountered in the implementation of these 16 projects are listed in Table 2 below.

Table 2: Problems listed by 15 projects.

Sl. No.	Nature of Problems	No.of Projects reporting
1.	Land Acquisition	8
2.	Inadequate release of fund	6
3.	Public opposition	1
4.	Changes in government policy relating to projects	1
5.	Insufficient O&M funds	1
6.	Defective design	2
7.	Carelessness in site Selection	1
8.	Variation in scope of work as envisaged in PP necessitating revision	3
9.	Lack of cooperation from farmers	2
10.	Delay in recruitment of consultants	1
11.	Delay in lining up foreign aid	1
12.	Repeated changes in design	1
13.	Failure to complete all components due to lack of funds	1
14.	Non-allocation of fund for several years	1
15.	Theft of equipments from project site	1
16.	Electricity failure	2

Source: BWDB.

It is seen that land acquisition constitutes the single biggest obstacle that delayed or hindered timely implementation, followed by inadequate release of funds and then variation in scope of work as envisaged in the PP. It is further seen that over 50% of the impeding factors are external to BWDB i.e. these are factors over which BWDB has no control. The implementation capability of BWDB has to be seen in that light. At the same time it is also true that there is considerable scope

to improve performance by eliminating or at least reducing the impact of factors that lie within the control of BWDB. If one looks at the figures relating to project completion for the years 1991-92 through 1993-94 (Table 3), one gets the impression that the situation has not improved much.

Table 3: Status of Implementation of Projects 1991-92 to 1993-94.

Year	Projects due for completion	Complete	Sub-projects due for completion	Complete	TA due for completion	Complete
1991-92	7	7 (100)	20	17 (85)	11	11 (100)
1992-93	7	4 (57)	14	11 (79)	4	4 (100)
1993-94	6	4 (67)	15	13 (87)	5	4 (80)

Source: BWDB.
Note : Figures in the parentheses indicate % of the total.

There is evidently a declining trend as far as project completion is concerned. For 1993-94, an additional relevant information is that the four projects declared to be completed are in fact still on the list of on-going projects as part of ADP to clear past liabilities. On the positive side, utilisation rate in relation to funds made available is now quite satisfactory (Table 4). BWDB has installed a computerised system for monitoring project implementation which is proving to be quite effective. A similar arrangement for O&M is needed.

Table: 4 ADP Provision, Actual Release and utilisation

(Taka in Crore)

	1990-91	1991-92	1992-93	1993-94
1. ADP Allocation	623.38	753.29	789.97	609.87
2. Release (% of release over allocation)	466.88 (74.54%)	503.02 (66.78%)	689.18 (87.24%)	542.23 (88.91%)
3. Expenditure (% of expenditure over release	421.51 (90.28%)	555.59 (110.45%)	677.60 (98.32%)	526.00 (97.01%)

Source: MWR

2.3.6 The broad organisation structure of BWBD is quite adequate; if anything, it is more elaborate than is necessary for an average annual expenditure level of Tk.700 crores. The POE team was informed, in a meeting with the Board, that a field division (the basic work unit headed by an XEN) can undertake and properly supervise work worth Tk. 40 crore in a year. BWDB has 77 field divisions, supervised by 29 Superintending Engineers and 9 Chief Engineers. On the criteria mentioned by the Board, BWDB should have no problem properly executing a total annual work program of Tk. 3000 crore (this is without taking into consideration the large input from foreign and local consulting firms engaged by BWDB). If this claim is accepted and compared with BWDB's track record

of performance, two conclusions arise: first, BWDB is a poorly managed organisation; second, it is grossly overmanned relative to its financial programme. On a positive note, one can conclude that it has underutilized capability.

2.3.7 Will BWDB work better in the future than in the past ? The broad organisation structure, as analysed earlier, is quite adequate; BWDB also has, within its large cadre, adequate number of competent professional personnel. Obviously, the answer lies in the quality and level of effort that the top management is able and willing to put in. There is urgent need also to remove internal and external constraints. BWDB is a much-studied organisation and the diagnosis is already there. Some of the constraints are being addressed under the reform program recently agreed[5] between GOB and the World Bank Mission. Additionally, the POE team would recommend the following:

(i) BWDB's problems are largely the result of passive top management. Now that the Board has regained autonomy, the top management must assert their position, re-orient their approach, and define their role. Within the organisation, it will mean providing leadership, setting a firm work agenda and pursuing its implementation aggressively. Externally, it will involve establishing good working relationship with the Ministry of Water Resources, the Planning Commission, the Ministry of Finance, and the donors. The top management must focus attention on target setting and performance monitoring and not spend time on exercising powers which have been or should be delegated.

(ii) Over the years, a lot of investment has gone into technical assistance and studies to improve BWDB performance. It is sad that the Board management failed to take advantage of this investment. To give an example, the reform program enjoins the Board to use critical path analysis beginning June 1995. This is something that was recommended long back and should have been introduced by the Board itself. The same holds good for majority of the reforms that have now been made a condition. The POE team is quite certain that everything that is needed to improve BWDB management, in terms of reform recommendations and equipment support, is already there; it is just a question of making the correct choice and implementing it. The POE team recommends that the Ministry should take interest in the matter and insist on the Board to speedily bring in the required changes.

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[5] World Bank: Aide Memoire dated 28-8-1994.

(iii) A small (2/3 member) management team be engaged for a limited period to assist the top management in (a) work programming, (b) progress monitoring, (c) de-bottlenecking and (d) system adjustment as new problems come to notice. Additional studies are not considered necessary at the moment.

(iv) It is necessary for BWDB management to acknowledge donor misgivings about the performance of BWDB and do something about it. The POE team feels that the Board made a serious mistake in not involving itself intimately with FAP activities which will set the future investment program in the water resources sector. There is still time to remedy the situation. The POE team strongly recommends that the Board hold a series of 'free and frank' discussions with the donors and take steps to address their legitimate concerns.

(v) The Board has repeatedly mentioned (a) land acquisition, and (b) slow fund release as the most serious problems requiring immediate solution.

The POE team does not accept fund release as a constraint. This was a serious problem in the seventies but is no longer so. Enquiries involving 46 projects revealed that in as many as 21 (47%) projects there was no 3rd or 4th quarter release of funds. due to: dispute with Ministry of Finance with regard to determination of unspent balance of the preceding year, failure on the part of BWDB to deposit DSL, revised unapproved status of the project(s), reduction in RADP provision, closing of the project(s), failure to meet 75% of the targeted expenditure of previous quarters, funds not required. It is seen that all of the above reasons are not such as to be beyond the control of BWDB. Of these at least two i.e. closing of projects and funds not required do not in any way adversely affect BWDB's performance. On the other hand, factors such as determination of unspent balance of the preceding year, failure to deposit DSL and to meet 75% of the targeted expenditure of the previous quarters definitely indicate weaknesses in the financial management of BWDB. As to the revised unapproved status of projects, there are three principal actors i.e. BWDB, MWR and the Planning Commission. At each stage there can be delay for procedural reasons. In such cases, BWDB and MWR should pursue the procedure of getting fund allocated whereupon there is scope for release even within the existing procedures. It is important to bear in mind that if BWDB is able to improve its financial management, the gap between ADP allocation and release can be reduced and/or eliminated. This will add to the needed financial resources for BWDB to implement its

projects. The importance of this aspect of management is further attested by the fact that since 1991-92 through 1993-94, the development budget of BWDB has registered a compound growth of 10%. This is a healthy trend for water resource sector and BWDB should make all efforts to take full advantage of this trend.

Land acquisition is a problem which is becoming more and more acute as time passes. It would be important to bear in mind that resistance to land acquisition will keep on increasing due to pressure on land. Apart from solving procedural problems of land acquisition, it is necessary to (a) design projects keeping land requirement to a minimum, (b) provide for resettlement wherever possible, (c) mobilize public opinion in favour of the project so that resistance to land acquisition is minimized. The reform program already covers the procedural aspect. The POE team would only add that land acquisition being so important the Board should deploy more personnel to prepare and pursue land acquisition proposals and ensure prompt placement of funds. At the same time, the Government may allow land acquisition proceedings to start as soon as negotiation with the donor has reached a stage where withdrawal is unlikely. This will provide considerable lead time.

(vi) A re-orientation of attitude is required at all levels. The emphasis, at every stage, appears to be on exercising control on those below. This must change towards assisting the man in the field to get his job done.

The latest administrative delegation of powers dates back to February 1986. The delegation needs to be revised giving more decision-making power at the field level.

(vii) The Board must take advantage of recent delegation of administrative and financial powers. Powers of the Board for procurement and work have been increased to Tk.10.00 crores (while that of the Ministry has been enhanced to Tk.25.00 crores).The Board used to enjoy earlier the powers for appointment of consultants upto Tk.1.00 crore but the Cabinet Division Order of September 04, 1994 through which these powers were revised, remains silent about any power of the Corporation/Board for appointment of consultants. It is understood that this issue is now being examined by the Cabinet Division and hopefully an amending order restoring the authority will be issued. MWR may pursue this and have necessary amendment made.

(viii) BWDB's work procedure is no different from other parastatal bodies having similar set-up i.e. Members of the Board are also executives. As in other offices or organizations, files with excessive notings on the relevant subject-matter for decision is an integral and deeply entrenched part of the work procedure. Initiatives for decision-making tend to be top-down rather than bottom-up approach. In such a work environment, initiative at appropriate level is an exception rather than the rule. The Board may start the process of reducing excessive file work, encouraging initiatives at mid and bottom level units; ensuring that delegated authority is exercised by the appropriate personnel.

(ix) Motivation is a major problem and has been repeatedly mentioned. The inhibiting factors for manpower motivation are (a) inadequate financial compensation and benefits,(b) helplessness against external interferences, (c) slow and uncertain career advancement prospects, and (d) absence of incentives and encouragement for development of professional excellence.

On the first point, there is very little that can be done separately for BWDB which, like any other parastatal body, is subject to a unified national pay and allowances system fixed by the government from time to time. The unified pay scale is also applicable to state-owned enterprises involved in commercial operations and "earning a profit."

The second factor, that of excessive external interferences also runs across the public sector. This is an area where the government has a role. Specific areas of interferences need to be identified and corrective actions taken.

On the question of slow and uncertain career opportunities, promotion prospects are now reported to be dismal. Every one must realise that the situation can only improve if the Board, through better performance, is able to attract more investment. On the contrary, the situation will get much worse if BWDB loses credibility. It is therefore incumbent on the BWDB officer cadre as a body to initiate and undertake organisational improvement. Flowing from the above, the question of absence of incentives and encouragement for development of professional excellence can also be handled by the Board to a large extent. Several actions appear important in this area. **First**, designing standards of performance against which individual functionaries can be measured in terms of professional excellence. **Second**, selecting appropriate personnel who qualify against the standards set. **Third,** awarding advance increments to the selected personnel and sending them abroad for

higher training in order for them to improve knowledge and skill in their chosen fields of expertise. **Fourth**, giving due weightage to efficiency and merit rather than seniority while deciding cases of promotion.

(x) Finally, the POE team feels that MWR should play a more practical role in terms of providing the needed direction and guidance to BWDB without impairing its autonomy and initiative. For instance, MWR can speed up fund release, aggressively pursue project approval process, speed up decisions on appointment of consultants and timely approval of all procurement cases which lie within its competence.

4. Operation and Maintenance

2.4.1 Operation and maintenance (O&M) is no doubt a very serious problem. It works almost in a cycle - a project is implemented, maintenance is neglected, project structures deteriorate and benefits start to disappear, the project goes for rehabilitation/reconstruction. Except in cases where bank erosion or change in river course necessitates new construction, rehabilitation/reconstruction is mostly delayed maintenance.

2.4.2 Poor operation and maintenance is a continuing problem. The POE team is of the opinion that past efforts to alleviate the situation did not address the underlying causes of neglect of O&M and consequently the solutions have not worked. At the same time, the separation of O&M from (project) Implementation, as recommended by the Joint Review (1979), has given rise to new problems undermining the overall effort.

2.4.3 The causes of neglect of O&M are many and varied. These are briefly analyzed below:

(a) Insufficient budgetary allocation is a major factor. Funds for O&M of completed projects are made available from the revenue budget. Allocations and expenditure items for the period 1989/90 to 1994/95 are shown in Table 5. It will be seen that most of the money was spent on personnel expenses and obligatory payments for fuel, electricity etc, leaving very little for physical work. Allocations have been increased during the past two years substantially. Inspite of this increase, BWDB could spend money only on 136 projects in 1991-92, 170 projects in 1992-93 and 206 projects in 1993-94 and that also in small amounts. This means that on an average only 34% of the completed projects had funds for O&M leaving the remaining 66% out of the budgetary allocation. Board members, in a meeting with the POE team, admitted that the O&M situation would have been much worse but for funds made available under the Flood Damage Repair projects

Table 5

YEARWISE EXPENDITURE/ALLOCATION UNDER 163-IRRIGATION MEANT FOR OPERATION AND MAINTENANCE

Sub-Head	1989-90 Actual Exp.	1990-91 Actual Exp.	1991-92 Actual Exp.	1992-93 Actual Exp.	1993-94 (Allocation)	1994-95 (Allocation)
For BWDB						
a) Establishment	2905.26	3194.73	3585.55	4403.29	3064.00	3200.00
b) Electricity	1587.67	1643.43	1813.89	1998.12	2000.00	2100.00
c) Dredging	1.50	28.92	7.07	-	56.00	60.00
d) Fuel	9.00	22.96	28.75	37.54	4.00	10.00
e) Repair	790.49	737.74	1021.61	1786.50	3500.00	4500.00
f) Outstanding	10.05	2.58	-	151.92	150.00	150.00
g) Land Revenue	35.08	14.45	6.22	5.97	10.00	100.00
h) Plantation	0.73	1.18	2.56	10.18	3.00	5.00
i) Payment of Foreign Loan	1860.00	2871.00	2600.00	2600.00	2600.00	3600.00
j) Miscellaneous	129.43	188.87	52.25	47.25	15.00	15.00
Total	7329.21	8305.86	9113.50	11040.77	11402.00	13740.00

of the World Bank and ADB. It may be noted that 'Food For Work' wheat has been an important source for earthwork for repair/maintenance of embankments/canals. BWDB engineers do not like to work with FFW wheat because of associated problems and would prefer to have cash allocations.

Neglect of O&M is partly the result of our development process. Projects are prepared and structures/facilities are built under the development budget (which is better funded) without full regard as to how these will be maintained after completion. The Government is usually not in a position to allocate adequate funds for O&M under the revenue budget. The problem exists in all sectors and is not unique to BWDB.

(b) BWDB's O&M performance has not been subjected to close monitoring. If the Ministry and/or the top management of BWDB had undertaken regular annual field verification of (i) irrigation coverage, and (ii) project by project comparison of achievements vis-a-vis project stipulation, the Board's field personnel would have been compelled to properly maintain the works under their charge or to press for solutions to the problems they encountered. The point here is that not enough pressure has been brought upon the Board for operation and maintenance.

2.4.4 The POE team recommends a study of the O&M problem in its totality. This would include:

(a) Field verification of the list of 500 completed projects (Annexure 2 Vol.II) to determine the size and nature of annual O&M needs. The POE team believes that a large percentage of the completed projects mentioned in the list are no longer operative (some may not even exist) due to neglect of maintenance, change in topography or hydrological regime, or for other reasons. The first task is to identify investments which are operative or have the potential for economic operation.

(b) The next step is to put a cost and determine (i) who will undertake operation and maintenance, and (ii) how it will be financed. For (i) above, a broad range of options/alternatives will have to be studied and evaluated: giving the responsibility to BWDB, LGED, local councils, NGOs, beneficiary groups or straightforward contracting out. Experience gained from the Early Implementation Project (EIP), the System Rehabilitation Project (SRP), and the Small Scale Flood Control, Drainage and Irrigation Projects (SSFCDI) where a whole range of possibilities are being tested,

will be useful guides. A flexible approach will be necessary - the best solution will vary from project to project or between components of the same project. In large projects, single agency responsibility will be desirable to pin-point accountability for delivering full benefits.

(c) Finding the money will be the most difficult task. The only possible sources are the Government, the local councils and the beneficiaries. The Government has been allocating O&M funds, albeit insufficient, from its revenue budget; contributions from local councils and beneficiaries, in the case of BWDB projects, have been insignificant.

The first question is, who should pay ? A distinction between irrigation and flood control/drainage is valid here. If the economic analyses forming part of feasibility studies are correct, the benefits of irrigation should be sufficiently large to enable beneficiaries to bear not only the O&M but also the capital costs. Since farmers find it profitable to buy water from privately-owned tubewells/lift pumps, the case for realising irrigation charge is strong. The situation with flood control/drainage is somewhat different; the benefits are indirect and cannot be easily quantified. BWDB projects are often a combination of flood control, drainage and irrigation and this adds a new dimension. From the beneficiaries point of view, the major issue is whether O&M costs are commensurate with the benefits they receive. The question of ownership is also important, why should LGED/the local council/any other body maintain projects owned by BWDB. Finally, FCD projects often involve a trade-off between the interests of beneficiaries and those affected. It cannot be expected that in areas of "public cuts", the local people will participate in maintenance.

2.4.5 Once the magnitude of O&M requirements is established following the study recommended in the previous section, the Government will take stock of the situation and decide on a realistic course of action. The POE team recommends that first a set of policy decisions be taken, such as (i) who will bear O&M costs and to what extent, (ii) basis on which beneficiaries will be required to pay, (iii) which class of projects will go to LGED/local councils/other bodies (iv) transferring water rate collection and maintenance responsibilities to beneficiaries/local community etc. The decision in respect of each project will then be governed by principles already established; the purpose is to avoid local pressures for a separate dispensation.

2.4.6 The financial implications of an effective O&M program for so many dispersed projects will be very large. It is unlikely that the Government will be able to

provide even a significant portion of the required funds out of its revenue budget; the beneficiaries will have to be required to share the cost. This is an area where the political will and strategy of the Government will come in. Water rate imposition and collection will not be a popular move.

2.4.7 Statutory provisions for water rate collection have been in place for several years but collection has been unsatisfactory. Water rate collection during the last three years is presented in Table 6. It will be seen that this constitutes 3.4% of the miscellaneous income and 0.44% of the revenue budget. However, it must be stated in fairness to BWDB that during the last two years or so a new mechanism for imposition, assessment and collection of water rate has been put in place on an experimental basis. The selected projects are Chandpur Irrigation Project (CIP), Karnafuli Irrigation Project (KIP) and Muhuri Irrigation Project (MIP). Important improvements made in the experimental project include:

- involvement of the beneficiaries in the process of assessment and collection;

Table: 6 **Water Rate, Miscellaneous Income and Revenue Budget**

(Taka in Million)

Year	Water Rate	Misc. Income	Revenue Budget
	Total	Total	Total
1991-92	0.53	108.00	857.60
1992-93	4.13	135.30	968.90
1993-94	8.60	143.60	1140.20
Total	13.26	386.90	2966.70

Source: BWDB

- agreement with the Ministry of Finance to retain the amount collected to pay for O&M cost which involves a departure from financial practices that require all money to be deposited in the treasury and allocated in the budget.
- formation of Water User's Association (WUA) and their participation in O&M at all stages.

2.4.8 Prior to reorganisation in pursuance of the Joint Review (1979), BWDB had two members on the operation side; Member Implementation (for all works) and Member Supply and Services (for support services). The Joint Review recommended separation of O&M function from Member, Implementation "to enable him to focus full attention on implementing schemes". The post of Member, O&M was created abolishing the post of Member, Supply and Services.

This decision, taken primarily to meet donor anxiety about slow project implementation, has had a number of negative effects:

(i) Project implementation is the better-funded and the more flashy part of BWDB work. Naturally the competition to get involved in project work intensified, lowering the morale of engineers left behind to undertake poorly-funded and more difficult O&M work.

(ii) Most projects contain large components of rehabilitation /reconstruction work which is in reality repair/maintenance. Maintenance of constructed facilities, till project completion, is also borne on the project budget. Thus, the distinction between project work and O&M work is often one of funding source rather than type of activity. In fact, substantial part of project work, of necessity, is given to field divisions of the O&M wing. This has resulted in dual control and blurring of the chain of command and accountability because of the division of responsibility at the higher level.

(iii) BWDB's O&M network covers all parts of the country. Posting of separate project personnel in the field results in duplication of manpower and back-up facilities. This is how establishment expenses of BWDB have steadily increased over the years and the total manpower has remained nearly unchanged inspite of transfer of personnel to WARPO, RRI and FPCO.

(iv) Since implementation personnel are not required to operate the project, a tendency towards sloppy completion has developed. To quote a recent discussion paper[6] "There have been major problems in implementation of FCDI projects. Most of the projects took longer to implement than the period originally specified, resulting in cost overruns. The quality control was lacking. Regulator gates leaked due to poor installation. In many cases, the projects were not constructed as designed. Embankment compactions have often been inadequate. The drainage canal excavations have mostly been inadequate or not implemented at all. Internal road development and navigational locks, where planned, were usually curtailed during design and/or construction. A 95% completion, which would satisfy most of the progress monitors, was considered to be the right time for the construction units to move out and abandon the project, not realizing that the unfinished 5% could be the vital part of the project-- filling up gaps in the embankments, fixing the gates etc. A project left incomplete in this manner would be more hazardous than being beneficial to the communities."

(v) Even a casual glance at the BWDB organisation chart (Figure 1) will show that the distribution of responsibilities between Member Implementation and Member O&M is uneven.

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[6] Saeed Rana: Water Resources Development in Bangladesh - Prospects and Issues (1994)

2.4.9 The reform program agreed between GOB and the World Bank stipulates complete separation of project staff and O&M staff. The POE team considers this division to be unnecessary and expensive. BWDB cannot be down-sized into a lean and efficient organisation with this type of duplication; the aim should be consolidation, rather than further fragmentation, of the field offices. The basic problem of BWDB is poor management, and this is where the main focus should remain for improvements in implementation as well as O&M.

The POE team recommends that

(a) Responsibilities of the two members be divided on a geographical basis: Member Operation (Eastern Region) and Member Operation (Western Region), the arterial Jamuna-Padma-Meghna channel constituting the dividing line. Members will remain responsible for all implementation as well as O&M work within their respective regions.

(b) As a policy, project personnel should be kept in the area till full benefits, as stipulated in the project document, are delivered. It is unfair that one set of people implement a project and another set are asked to maintain it and show the results. Project personnel will avoid mistakes and sloppy work if they know that they have to operate it later on.

(c) The two design departments, Design I and Design II, be re-assigned, one to each region.

(d) The service departments be placed under Member Admin. or if necessary, the post of a separate Member (Services and Supplies) be created.

(e) Zonal Chief Engineers be made responsible for all works of project as well as O&M, within their jurisdiction. Where a project is located in two or more zones, a staff officer of suitable rank will be given to the Member concerned for co-ordination. Projects with components in both regions will be split into two separate projects.

(f) The current work-load on O&M field divisions (XEN) is quite low and there should be no problem in undertaking project work falling within their area. Additional staff necessary for successful and timely project completion, will be provided; as and when necessary, additional field divisions should also be created. The arrangement will be sufficiently flexible.

(g) The system described above is similar to the current implementation arrangements for EIP and SRP projects. Problems

faced in these two projects will be analysed to refine the system.

(h) Specialised work, such as construction of dams or heavy structures, will be done by specialised divisions/circles.

(i) The top-management will focus attention on target-setting, progress monitoring and assisting the Zonal Chief Engineers in fulfilling their assigned task. The top-management will be given staff officers to assist them.

The re-organisation described above is an outline to be worked out in detail after acceptance in principle. The POE team believes the proposed arrangement will work better and enable substantial reductions in cost.

5. Planning

2.5.1 All the planning work of water development projects of BWDB is done through the Chief Engineer (Planning) under the supervision and guidance of Member (Planning). To meet the changing needs of BWDB and donor agencies, re-orientation/re-organisation of the planning offices were made several times in the last 20 years. In 70's there was one Chief Engineer (Planning) with eight Directorates/Offices under him; Directorate of Planning (F.S.), Directorate of Planning (Contract), Directorate of Planning (Perspective), Directorate of Special Studies, Directorate of Planning Schemes I,II, & III, Office of Superintending Engineer, Land Reclamation and Delta Development Projects.

Major responsibilities of the above-mentioned Directorates/Offices were: (i) Directorate of Planning (Feasibility Study) was responsible for identification and feasibility study of all schemes which were implemented with own resources of GOB, (ii) Directorate of Planning (Contract) was responsible for loan negotiations and agreements with different donor agencies, (iii) Directorate of Planning (Perspective) was responsible for preparation of long-term and perspective planning of water development projects,(iv) Directorate of Special Studies was responsible for carrying out special studies relating to water development projects in the fields of tidal effect,forest, fisheries, ecology, agriculture and economy. This Directorate was also responsible for quantifying the adverse effects due to upstream withdrawal of the Ganges water and to prepare contingent plans to meet the crisis, (v) Office of the Superintending Engineer, Land Reclamation and Delta Development Project was to conduct survey in coastal areas and to formulate land reclamation projects. Rehabilitation of old coastal projects known as 'Delta Development Project' was also a function of this office, (vi) Directorate of Planning Schemes-I was in charge of all feasibility studies of medium and large size projects, (vii) Directorate of Planning Schemes-II was entrusted with the identification, feasibility study and implementation of early implementation type small schemes aided by Asian Development Bank and the European Economic

Commission, (viii) Directorate of Planning Schemes-III was responsible for identification, feasibility study and implementation of early implementation type small schemes aided by IFAD and IDA.

2.5.2 The planning offices were twice re-organised in the eighties, in response to donor requirements, increased work-load and change in priority. In the first re-organisation, two posts (Planning-I and Planning-II) of Chief Engineer were created and the subordinate Directorates distributed between them.

The second re-organisation in late 80's brought in substantial changes. This time one post of Chief Engineer was abolished. Several Directorates were abolished/ merged with other Directorates.

2.5.3 The present organisation chart of the Planning Unit is shown in Figure 2. The Chief Engineer (Planning) has six Directorates working under him: (i) Directorate of Planning (General), (ii) Directorate of Planning Schemes I, (iii) Directorate of Planning Schemes II, (iv) Directorate of Planning Schemes IV, (v) Directorate of Land Accretion and Estuary Development, and (vi) Directorate of Economic Planning. The administrative control of the Project Management Unit is now with Chief Engineer (Monitoring).

The Planning Unit has a total personnel strength of 387 of whom 133 are in the officer cadre and 254 in other grades. Out of these 133 professionals, only 20% (11 Economists and 15 Agronomists) belong to disciplines other than engineering. This low proportion of officers from other disciplines is a key weakness of the planning process. There is evidently a need for more multi-disciplinary input.

2.5.4 The functions of Member (Planning), CE (Planning) and the six Directorates under the unit are described in Annexure of Vol.II. In reality, the Planning Unit spends most of its efforts on (i) preparation and processing of PCP, PP and TAPP, (ii) assisting foreign and local consultants working on pre-feasibility and feasibility studies, (iii) holding dialogues and negotiations with donors for project acceptance and project review. The planning process is tailored to meet the requirements and criteria of donors participating in water sector projects. Some Directorates are assigned to specific donors. It is interesting to note that the Directorates dealing with long-term/perspective planning, special studies and river morphology were weakened or abolished in course of successive re-organisations.

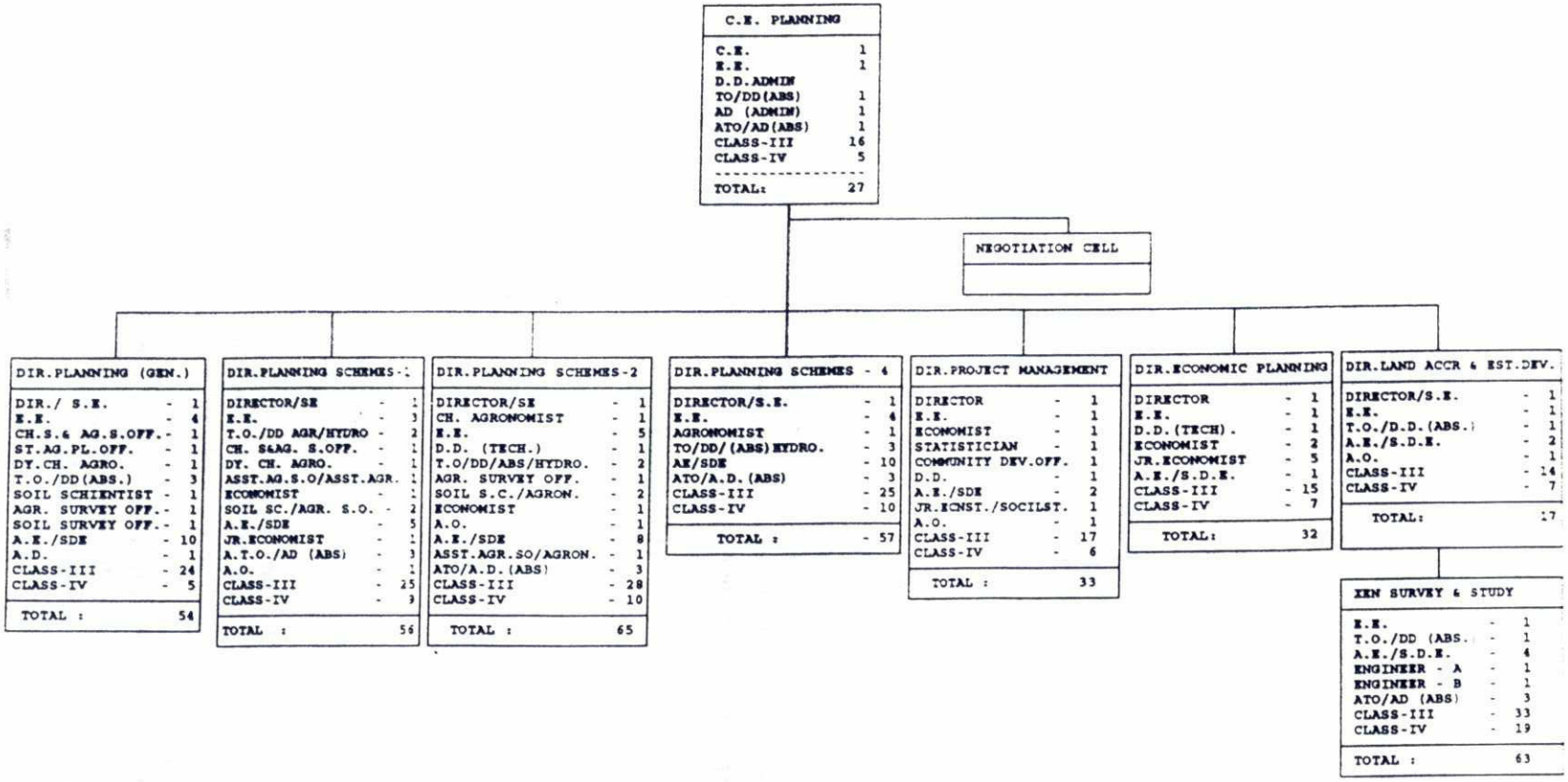
2.5.5 A number of criticisms have been voiced against the planning work of BWDB. The most important issues are the following:

(i) BWDB has relied too heavily on structural solutions in its projects.

(ii) There was very little consultation with the local community and the beneficiaries. At the same time, inadequate attention was paid to negative externalities. Public cuts are a manifestation of the problems which this type of planning brings in its train.

FIGURE - 2

PLANNING UNIT OF BWDB



(iii) Projects were narrowly focussed - on flood control, drainage, irrigation and agricultural output. Planning on a sectoral basis was never attempted. Water sector planning should have proceeded from the realization that water is a finite resource with competing demands and far-reaching implications for fisheries, environment, bio-diversity and sustainable development.

(iv) The development of ground water resources was generally neglected.

2.5.6 The criticisms are no doubt valid and BWDB should have been pro-active in all these areas. However, the picture would be incomplete without two observations. (i) Some of the concerns such as local level participation, bio-diversity, and environmental impact have been articulated in recent years, (ii) Prior to NWP, there was no comprehensive basis for sectoral planning keeping all competing demands in view, and (iii) Water sector planning has been dominated by expatriate consultants beginning with the IECO Master Plan (1964), World Bank Land and Water Sector Study (1972), Joint Review (1979), and the horde of consultants who were employed for feasibility studies and subsequently for project supervision. In all fairness, the blame for the lapses must be shared all around.

2.5.7 What is the next course of action for BWDB ? The Planning Unit has a portfolio of 29 projects (Annexure Vol.II) for which funding is still to be lined up; of these 8 are FCDI Projects, 10 Bank Protection Projects, 9 Town Protection Projects, 1 Irrigation Project and 1 Area Development Project. The first task is to revise these project documents or perhaps prepare new documents meeting current requirements. The Board does not have enough projects in its pipeline and urgent action is called for.

2.5.8 At the same time, BWDB should re-organise its Planning Unit on following lines:

(i) Employ professionals with specialisation in fisheries, forestry, botany and environmental engineering.

(ii) Constitute multi-disciplinary teams for field visits. The teams will monitor the field situation from project preparation through post-implementation stage and pay special attention to fisheries, bio-diversity and environmental issues. These teams will also be required to hold consultations with proposed beneficiaries and leaders of the local community.

Project concepts and field data generated by FAP studies and the National Water Plan will guide future investments in the water sector. BWDB will prepare projects starting from the work already done. In this context, the POE team does not envisage any need for expansion of the Planning Unit. Attempts should be made to accommodate the new professionals by re-deployment of equivalent

number of personnel from engineering discipline.

2.5.9 It has been noted that revision of approved projects and their subsequent approval by ECNEC involves delays entailing time and cost-overrun. Of the 16 projects reviewed by the POE team, as many as 13 had to undergo revision, some more than once. As a way out, there was a provision for release of funds prior to the final approval of ECNEC subject to clearance from the Planning Commission and the Ministry of Finance. This provision needs to be restored.

Finally, the project document should pay adequate attention to and specify the post-implementation arrangements for operation and maintenance. Agencies/bodies earmarked for O&M work must be associated with the project from the beginning.

6. Financial Management

2.6.1 The Staff Appraisal Report of the World Bank (Report No.6904-BD, December 1987) drew attention to the need for improvement in financial management. Following this, under CIDA assistance, a study was conducted. This study, among others, pointed out the

- need to improve internal control,
- need for timely, accurate and relevant financial reports;
- need for higher level of accuracy and completeness of accounting records;
- need for up-grading of accounting methods to meet standards expected in the international community, as well as to ensure accounting control over BWDB's assets and activities;
- need for accounting and financial information to be more responsive to the planning and decision-making requirements of BWDB management and the GOB.

2.6.2 Notwithstanding the limitation of current accounting policies and procedures, actual practices followed by BWDB accounting personnel do not constitute an adequate system of internal control and are not sufficient to maintain reliability of accounting data, for example;

- Cheques are signed by single signing officers having disbursing authority as well as custody and control over assets;
- Double entry accounting procedures are not followed;
- The accounting system is based on cash receipts and disbursements, not on accrual system;
- Reliability of accounting information is based on reviews of disbursements, rather than internal checks and balance;
- A balance sheet disclosing current and fixed assets, current and long-term liabilities etc. is not produced. The overall statement for the BWDB is a combined statement of receipts and expenditures;
- Monthly financial reports are not produced on a timely basis,

although due on the 7th of the following month. Late report preparation tends to be the rule rather than the exception. Thus, delay reduces their effectiveness in supporting management control and decision making.

2.6.3 In order to remove the above anomalies, the study proposed four basic principles for modernization:

- decentralization of accounting by creation of Regional Accounting Centers (RACS);
- improvement in accounting standards to an internationally acceptable level i.e. adoption of double entry and accrual system;
- computerization;
- training of BWDB personnel on modern accounting system both at home and abroad.

The above four principles were accepted by the government and it was decided to establish 25 Regional Accounting Centers (RAC) throughout Bangladesh.

The primary benefits of the new system would be to:

- provide a basis to obtain accounting data more quickly;
- significantly reduce accounting workload at the head office
- improve controls and methods of payments to contractors and vendors, including audit trails, information about vendors, historical data etc;
- reduce financial irregularities and resultant audit objections;
- strengthen the accounting organization and render it more capable of providing management support;
- remove significant workload from divisional engineering staff, who are overly involved with record keeping;
- provide more opportunities for accounting staff development and career progression;
- capture and hold accounting and financial data in electronic form;
- allow information to be produced in a wide variety of formats, or cross-sections to facilitate analysis of BWDB operations and enable prompt response to inquiries from GOB and external agencies;
- provide for transfer of critical accounting data throughout the country in electronic form, to facilitate sharing of the same data, and to provide a more reliable and faster medium of data transfer;
- provide for integration of accounting and financial data between different components of the accounting system, thus reducing redundancy of transactions recording and at the same time providing for co-relation of released information;
- facilitate training of accounting staff to operate the new system by

providing training for each module as it is developed, rather than iterating a huge training task required to implement a new system all at once.

BWDB has 216 Divisions each headed by a XEN. These Divisions has been grouped under 25 RAC's. Already 18 such centres have been opened. The remaining 7 RAC's will be opened in December 1994.

Enquiries made with BWDB reveal that following the opening of RAC's, considerable improvement in budgetary discipline and expenditure control has been effected. These included, among other, the following:

- expenditure in excess of budget under major and minor heads has been or are going to eliminated;
- 1500 bank accounts have been reduced to only 200;
- huge number of audit objections relating to excess expenditure has been or are going to be eliminated;
- prior sanction of estimated expenditure has been or are going to be enforced.

In addition to the above, 25 RACs are going to be computerized with on-line connection to a central computer. This will vastly reduce delay in providing the needed financial reports and reforms thereby effecting efficiency in financial management.

Chapter 3

REVIEW OF MAJOR INSTITUTIONS: WARPO AND RRI

A. WATER RESOURCES PLANNING ORGANIZATION (WARPO)

1. Mandate and Organizational Structure

A.1.1 WARPO was created in December,1991 through an ordinance as a permanent organization for water resources planning in Bangladesh. In fact, WARPO is the successor to Master Plan Organisation (MPO) set up in 1983. The metamorphosis from MPO to WARPO was accompanied by additional responsibilities for the latter. A few words for the creation of MPO is therefore in order.

MPO was established to take stock of the total water resources of Bangladesh and to ensure its optimum utilization amongst the various users e.g. agriculture, fisheries, navigation, public health, industry etc.. MPO completed the National Water Plan Project (NWPP) in two phases. During Phase-I (1983-86), National Water Plan-I was produced in four volumes together with 28 Technical Reports covering the entire water sector. In Phase-II (1988-91), an updated National Water Plan-II was produced in three volumes with 12 supporting reports. Many components of Phase-II were not however completed. For example, computerization of database by ORACLE and field verification of the model estimates were some of the important tasks left half done. Implementation of training of local staff and the transfer of technical skill for proper management of the computerized database and the "investment analysis model" were also not done properly. After hasty closure of the project, WARPO was created to continue the work of MPO.

A.1.2 WARPO does not merely represent a name change. It has a great objective to fulfil, namely to update and upgrade the "National Water Plan" through continuous data collection, improvement of analytical methods and models, and continued testing of alternative options. The above objective of WARPO was marked by two important characteristic features; the interdisciplinary nature of the work of WARPO and the management of a highly computerized system of database. WARPO needs a viable capability for planning water resources to fulfil its mandate.

The WARPO mandate consists of the following:

(a) To prepare a Water Resources Master Plan for the development of the water resources of the country having full regard to environmental compatibility.

(b) To determine national policies and strategies for the scientific utilization and conservation of the water resources.

(c) To provide consultancy services to other organizations involved in the development, utilization and conservation of water resources.

(d) To assist other organizations in conducting surveys related to the development, utilization and conservation of water resources and also to conduct in this connection special surveys if necessary.

(e) To review and evaluate the impact of actions taken by any organization involved in the development, utilization and conservation of water resources and also to offer counsel in those matters.

(f) To improve the level of education, training and professional standards related to the utilization of water resources.

(g) To collect and review information related to the utilization of the water resources and to arrange for its dissemination.

(h) To arrange and conduct national and international seminars, conferences and workshops related to water resources with prior approval of the government for international events.

(i) To perform any other duties assigned by the government in connection with the water resources.

A.1.3 The management structure of WARPO as laid down in its ordinance provides for a Director General and two Directors to be appointed by the Government. The DG will be the chief executive of WARPO and will look after its administration.

WARPO is run by a Board of Governors composed of :

(a) Minister in charge of the Ministry of Water Resources who would also be the Chairman of the Board.

(b) Relevant member of the Planning Commission who would also be the Vice-Chairman of the Board.

(c) Secretary, Ministry of Water Resources.

(d) Secretary, Ministry of Agriculture.

(e) Secretary, Local Government Division.

(f) Secretary, Roads, Highways and Road Transport Division.

(g) Secretary, Planning Commission.

(h) Secretary, Ministry of Forest and Environment.

(i) Secretary, Ministry of Inland Waterways and Ports

(J) Director General of WARPO, who would act as the Secretary of the Board.

WARPO also has an Executive Committee chaired by the DG with the two Directors as members. The Executive Committee will implement the decisions of the Board and will have powers and responsibilities as delegated by the Board. For purposes of framing a Master Plan for the development of water resources

and also for assisting the Board in resolving problems related to the use of water by different organizations, the Board will appoint a Technical Committee with five members. The Vice-Chairman and Secretary of the Board will be the Chairman and the Secretary of the Technical Committee respectively.

A.1.4 The organization structure of WARPO is presented in Figure 3. The sanctioned manpower resource reflects, though not fully, the needs of the multi-disciplinary character of WARPO's mandate. However, the POE team found a number of key posts vacant; for example the posts of PSOs in the Economic Section, and the Environment, Forest and Fisheries Section were still to be filled. A number of posts of SSO/EE were also vacant.

2. Activities Since Establishment (December 1991)

A.2.1 WARPO activities till date have been financed out of two sources: (i) allocations from the revenue budget under budget head 163-IND, and (ii) a development project funded by UNDP. WARPO also had a modest income from sale of data/publications totalling Tk.917,000 upto 1992/93.

A.2.2 Funds sanctioned under the revenue budget have gone mostly for salaries and establishment expenses, as may be seen from Table 7. WARPO could spend only modest amounts for continuing data collection from its 8 Planning Areas (established by MPO).

The development project "Strengthening of WARPO" was intended to start the organization on a strong footing. Project components included the following:

i) preservation of processed data
ii) updating/upgrading of the data-base
iii) procurement of additional equipment
iv) training of staff at home and abroad
v) field verification work

Under the project, 104 observation wells and 33 rain gauges installed during the period of MPO in the Planning Areas were rehabilitated. To strengthen the database section, 2 COMPAQ PROSIGNA, 3 SENDON UPS, 2 EPSON LQ-1170 printers, other support equipment and one ORACLE software were procured and installed. A local consulting firm trained WARPO personnel to operate the data-base. 11 officers of WARPO were trained in the Netherlands under the project.

A.2.3 In context of its budgetary constraint,WARPO activity has been limited to (i) collection, checking, computer entry and preservation of data relating to hydrology, climate, land-use, cropping pattern, irrigation, social indices,etc (ii) supplying data to various agencies and project consultants as requested, (iii) giving comments and views on reports of other agencies such as BWDB, FPCO, RRI, DPHE, SWMC.

Figure - 3

EXISTING ORGANOGRAM OF WARPO

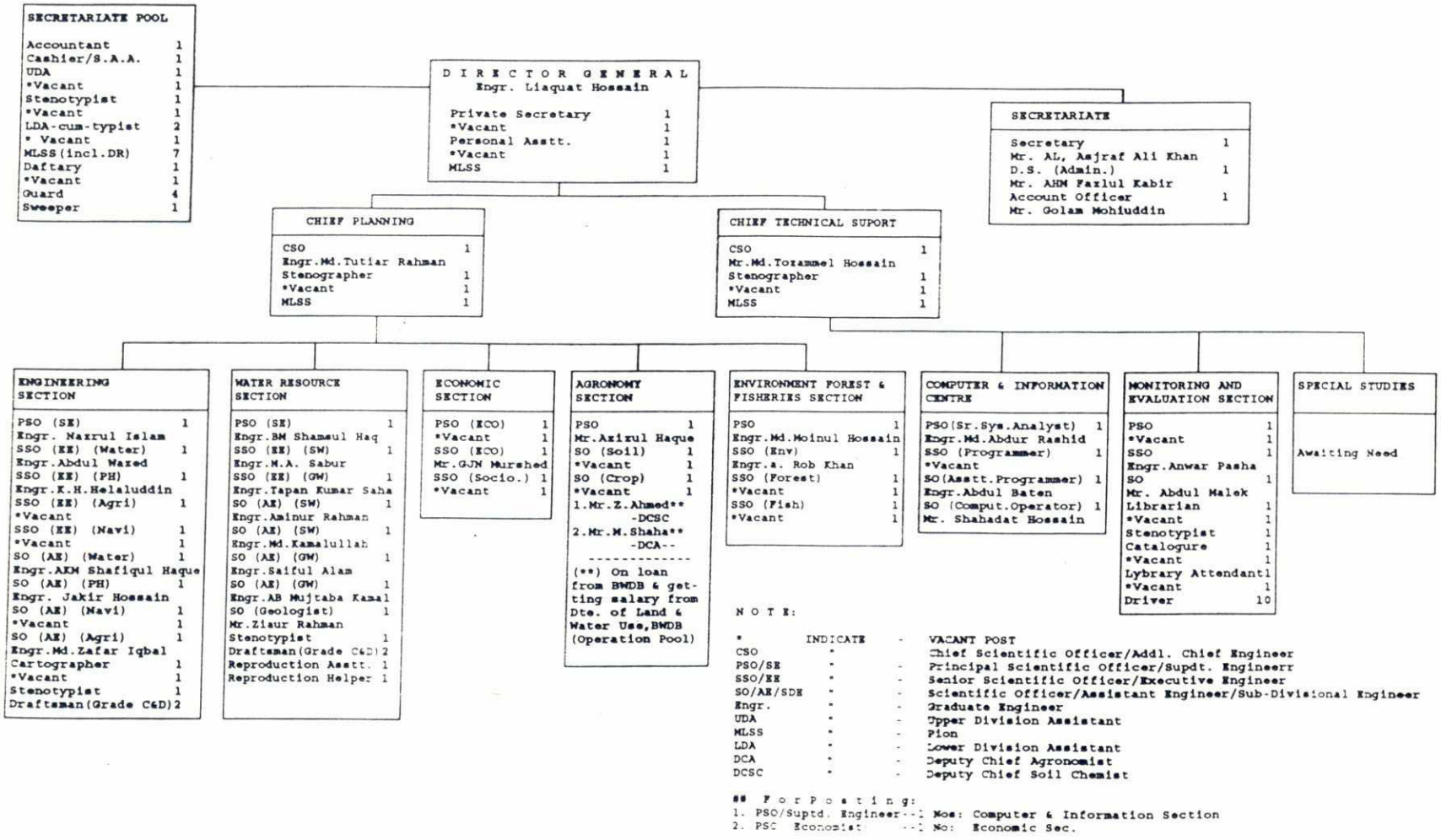


Table - 7

BUDGET ALLOCATION AND HEADWISE ACCOUNTS STATEMENT FROM THE YEAR 1990-91 TO 1994-95

Figure in Lac Taka

Detailed Statement of Salary and Allowances	1990-91 Allotted Fund	1990-91 Actual Exp.	1991-92 Allotted Fund	1991-92 Actual Exp.	1992-93 Allotted Fund	1992-93 Actual Exp.	1993-94 Allotted Fund	1993-94 Actual Exp.	1994-95 Allotted Fund	1994-95 Actual Exp.
A. Officers' Salary										
1. Scale 1 - 9		1490088		2187019		2347427		2532000		
2. Scale 13										
B. Staff Salary										
1. Scale 11-16		209277		591385		631289		736000		
2. Scale 17-20										
		1699365		2778404		2978716		3238000		
D.	110.00		82.00		90.00		94.00		95.00	
1. Trav. Allw.		4155		46980		64794		32000		
2. D. Allw.		390672		39451		-		-		
3. H.R. Allw.		586342		615432		1015883		1058000		
4. Medical Allw.Ex.		50816		82121		112020		109000		
5. Amusemt. & Fest.Allw.		276830		393770		471652		494000		
6. Conv. Allw.		5085		70840		24408		20000		
7. Other Allow.		458521		767562		955715		696000		
		1772429		2016156		2644472		2409000		
E. Office rent,utilities & vehicles Operations										
1. Office Rent		1311959		570000		711000		740000		
2. Post & Telegraph		-		6870		5430		-		
3. Telephone		-		463794		309334		367000		
4. Muni.Tax & Gas		-		1586		3010		3000		
5. WASA		-		17415		26282		27000		
6. Electricity		-		108646		120072		167000		
7. Vehicle Maint.		-		1380603		1301923		1645000		
8. Entertainment Allw.		16106		-		-		-		
9. Others		5104137		614286		634503		385000		
		6432202		3163200		3111554		3334000		
F. Civil Works/Repairs		-		-		218312		419000		

WARPO also prepared a number of reports on special topics as requested by the Ministry or other organizations. These are listed below:

- Revision of National Water Plan Phase II
- National Dredging Scheme, Phase I
- Water Transfer from Brahmaputra to Ganges through Baral and Ichamati rivers.
- Proposal for construction of the Ganges Barrage.
- Per hectare cost of different modes of irrigation in Bangladesh.
- Compilation of Agronomic Database on Flood for the preparation of a Flood Model to forecast flood damage and review of WARPO's existing Agronomic Database.
- Investment Analysis for Water Resources Planning in Bangladesh.
- Review of Water Policy of France.
- Improvement of Water Resources Data.
- Development and Management of Newly-accreted Coastal Land in Bangladesh.
- A Sustainable Development Strategy of Disaster Management with reference to Drainage and Flood Control Projects.
- Some Reflections on Disaster Mitigation Strategies and Sustainable Development in relation to FAP.

3. Strengths and Weaknesses of WARPO

A.3.1 WARPO had a poor start. Offices were hastily shifted from Banani to Uttara which caused considerable dislocation. Majority of professional staff on deputation to MPO from various agencies returned to their parent departments leaving a vacuum. During a visit in 1993, the POE team found the organization without a clear sense of direction. Officers posted to WARPO on deputation from BWDB were eagerly looking forward to any opportunity to go back to their parent organization. Staff morale was low, and this is reflected in the indifferent quality of reports produced.

A.3.2 WARPO has reasonable computer support in terms of both hardware and software. However, considering the broad mandate of WARPO and expected work to be done, computer facilities will need further expansion in future.

Models: For estimation of water resources available in the country and for deciding priority of investment in water sector, the following mathematical models are available in WARPO:

i) Water Balance Model,
ii) Ground Water Model, and
iii) Investment Analysis Model

WARPO also has a technical library of text books, reports and specialized publications.

A.3.3 WARPO needs a change of orientation. Manned mostly by BWDB professionals, it has some engineering bias. This is quite natural and the officers posted in WARPO should not be blamed; after all, they are expected to feel comfortable in disciplines where they have worked all their life.

There is clearly a need for a review of personnel policy. WARPO is a planning organization for computer-based data analysis/modelling, sectoral allocation of water resources, and investment prioritization. Such work cannot be effectively performed by deputed personnel joining every 2-3 years in rotation. It is very important to appoint at least 30% of the staff on direct recruitment basis as the permanent core staff of WARPO who would learn and retain the technology. These officials would mentally belong to WARPO and would devote their capability for developing the institution. WARPO also requires more economists and social scientists on its staff.

This brings up the next issue. In view of the multi-sectoral and multi-disciplinary character of WARPO, co-ordination with other agencies should be a high priority item for consideration of all concerned. The coordination existing at the moment is far from satisfactory. The act of co-ordinating with some confidence on the part of any individual would need a certain depth of expertise in the relevant field. People with only engineering background cannot be ideally suited for all types of co-ordination work. During Phase I and II of the National Water Plan Project, many representatives from different organizations and with different backgrounds were working for the project. However, in the present phase, adequate number of people from BIWTA, BADC, DPHE and Fisheries Directorate are simply not there in WARPO; as a result, the provision of inputs as a prelude to updating of the National Water Plan in terms of data and analysis is suffering a set back.

An immediate remedy would be to recruit experienced researchers through open competition for the various disciplines needed by WARPO. This could probably overcome the problems of deputationists who, more often than not, tend to return to their parent organization either for purposes of promotion or for matters of pension benefits etc.

A.3.4 WARPO's interaction with agencies other than BWDB,DAE and BBS are weak. The institution must develop strong linkages with DOF, SRDI, DPHE, BADC, LGED, Dhaka WASA, Chittagong WASA, BIWTA and all other departments/agencies dependent on the development of water resources.

Interaction with the Department of Environment calls for special arrangements; Water resources and environment are inseparably linked. These two agencies should work together and establish joint country-wide programs for monitoring the water sector.

Delivery of service by WARPO could be substantially improved. Since major water sector agencies now have computer facilities, arrangements should be made for collection and dissemination of data on a real time basis through networking.

A.3.5 WARPO is currently working without a firm agenda. It is recommended that the Board of Governors (i) set the annual work agenda for the organisation, (ii) provide necessary financial allocation for field work and research support, and (iii) review progress of implementation on a quarterly basis. The work agenda would include routine work as well as analysis of important water sector issues. A regular annual lump-sum allocation for research purposes, subject to

submission of acceptable proposals, may be considered. It is understood that similar provisions are being made for some research organisations.

WARPO needs to develop clear plans in two areas: (a) strengthening of institutional arrangements for providing routine services to water user agencies/clientele in terms of a modern networking system for collection and dissemination of data, (b) training young engineers, scientists, economists etc in the area of skill development for planning of water resources in the country. With adequate measures for (a) and (b), WARPO could also build up water consultancy services in the country so vitally needed for the implementation and monitoring of the various FAP projects.

B. RIVER RESEARCH INSTITUTE (RRI)

1. Mandate and Organisational Structure

B.1.1 The River Research Institute (RRI) was established in 1977 by merging the Hydraulics Research Laboratory and the Directorate of Soil Mechanics/Materials. RRI moved to its current location in Faridpur between April and June 1989. The Institute has extensive facilities to construct and run physical models to study river behaviour. It also has a well-equipped soils and materials laboratory. RRI received equipment support and technical assistance under Danish assistance and a UNDP project. By a government order of 26 January 1993 the Surface Water Modelling Centre (SWMC) came under the administration of RRI.

B.1.2 RRI has the mandate to perform hydraulic studies for the design of river training/ bank protection work and embankment structures, hydraulic structures in general, and for the assessment of flow conditions for all kinds of hydraulic structures. The mandate also includes soil mechanics testing, material testing, water quality analysis, publication of reports etc. RRI also advises the government, local authorities or organisations on all of the above-mentioned matters. The SWMC (now under RRI) initially was responsible for developing a regional model of the south-east region and a general model for the whole of Bangladesh. Later, initiatives were taken to develop models of other regions of the country. SWMC was also made responsible for compilation and analysis of (i) Hydro-meteorological data, (ii) Hydrometric data and , (iii) Topographic data

B.1.3 RRI consists of three Directorates namely, Geo-Technical Research Directorate, Hydraulics Research Directorate, and Technology and Services Directorate. Each Directorate is further divided into divisions. These are listed below:

Geo-technical Research Directorate
- Mechanics Division
- Sediment,Chemical,Water Pollution and General Water Utilization Divison
- Material Testing and Quality Control Division

Hydraulics Research Directorate
- River Hydraulics Division
- Estuarine and Coastal Hydraulic Division
- Hydraulics of Structure and Irrigation Division

Technology and Services Directorate
- Scientific and Technical Service Division
- Soil Mechanics Division
- Sediment, Chemical, Water Pollution and Ground Water Utilization Division
- Material Testing and Quality Control Division

Each division and constituent parts have their own administrative set-up and required logistic facilities. Administration and finance of the organization is under the direct control and supervision of the Director General. This unit comprises of Accounts and Budget, Establishment and General Accounts and Audit.

B.1.4 RRI is headed by a Director General. 425 officials and staff are working in the institution. This is less than the manpower sanctioned. Details are given below:

Director General	-	1
Director	-	3
Chief Scientific Officer	-	7
Principal Scientific Officer	-	11
Senior Scientific Officer/Deputy Director	-	20
Scientific Officer/Accounts Officer/ Security Officer etc.	-	40
Class II	-	9
Class III	-	222
Class IV	-	103
Total	-	425

B.1.5 The Surface Water Modelling Control (SWMC) was brought under the administrative responsibility of RRI in January 1993. The Director General of RRI remains the Chief Executive of the organization. However, the main responsibilities for carrying out the tasks lie with the Project Coordinator who holds the rank of a Superintending Engineer. He is assisted by a Deputy Project Coordinator, an Assistant Project Coordinator, a System Manager and an Assistant System Manager. Administrative support staff are directly linked to the Project Coordinator. There are three Divisions namely, (i) Data Collection and Processing Division, (ii) Hydrology and Hydrodynamics Division, and (iii) Special Topics Division which work under the direct control and supervision of the Project Coordinator. A parallel set-up of expatriate consultants, funded under DANIDA assistance, is also working in SWMC. This set-up is headed by a Project Manager who is functionally linked to DG, RRI. The Chief Technical Adviser works under the supervision of the Project Manager. He has also direct functional linkage with the Project Coordinator and heads of different divisions. The Chief Technical Advisor is assisted by a number of consultants including Adviser (BUET), Environmental Modeller, Computational Hydraulics Engineer, Water Quality Expert, Computational Hydraulics Engineer (Two Dimensional), System Analyst, Morphologist, Field Measurement Engineer, Hydrologist, and Institutional Specialist.

2. Performance of RRI

B.2.1 The POE team reviewed the work done by RRI during the last three years- 1991/92 to 1993/94. The most important activity was model study by the Hydraulic Research Directorate. These are listed below:

1991-92	1.Model study for the protection of Fulcharighat area under Brahmaputra River Training Studies (BRTS). 2. Model study for the protection of Sariakandi area under BRTS. 3. Model study for the protection of Chandpur area under Meghna River Bank Protection Study (MRBPS). 4. Model study for the protection of Ekhlaspur area under MRBPS. 5. Model study for the protection of Sirajganj area under BRTS. 6. Flume study on Revetment structure, Ferryghat, groynes etc. under BRTS (Partly).
1992-93	1. Flume study on revetment structure, Ferryghat, groynes etc. under BRTS (Completed). 2. Jamuna Bank Protection and River Training/ AFPM Pilot Project, FAP-21/22 (Bahadurabad area). 3. Jamuna Bank Protection and River Training/ AFPM Pilot Project, FAP-21/22 (KAMARJANI AREA). 4. Model study for the Protection of Dhohazari R&H Bridge from erosion of the Sangu River, Chittagong. 5. Model study for the Protection of Gorai railway bridge from the erosion of Gorai river, Kushtia.
1993-94	1. Jamuna Bank Protection and River Training AFPM Pilot Project, FAP-21/22 (Bahadurabad area) 4 Nos. additional tests. 2. Jamuna Bank Protection and River Training AFPM Pilot Project, FAP-21/22 (Bahadurabad area) 4 Nos. additional tests. (Kamarjani area). 3. Model study on the silt Trap of Teesta Barrage Project. 4. Model study for the protection of Kurigram Town and Palashbari Regulator from erosion of the Dharla River.

B.2.2 Activities undertaken by other Directorates included (i) over 300 tests carried out in the Soil Mechanics Laboratory, the Sediment Technology Laboratory, Water Quality Laboratory and the Materials Testing Laboratory. Samples tested came mostly from BWDB, though some other Government agencies also used the facilities of RRI. The services provided by the Directorate of Technology and Services included the following: computer support, instrumentation, workshop facilities, photography, library and publication. A full description of all activities may be seen at Annexure Vol.II.

3. Institutional Strengths and Weaknesses

B.3.1 The River Research Institute (RRI) was created to undertake studies related to hydraulics. In the past it received generous foreign assistance especially to increase the institute's capacity to fulfil its mandate. It has over the years, however, not been able to have an impact proportionate either to its mandate or

the size of its establishment. The few major tasks it has undertaken recently have been in the nature of executing testing assignments. The interesting point to be noted here is that the technical and scientific control of these exercises has in most of the cases been in the hands of the expatriate consultants. SWMC has done a commendable job in providing modelling support to FAP regional studies; in coming years, it needs to re-orient itself towards becoming an institution which can sustain itself through selling its services. This issue along with a similar proposal to convert RRI into a self-sustaining Bangladesh Hydraulic Institute (BHI) was covered in the April 1994 report of the POE team.

B.3.2 RRI has a large campus with several test beds, well-equipped and extensive laboratory facilities, and ample office/staff accommodation. The Institute is hugely under-utilized. Following suggestions are made in this connection:

(i) The Ministry of Water Resources may hold an inter-ministerial meeting to make other departments/agencies aware of the facilities available at RRI and request them to take advantage of the investment. Three studies could immediately be given to RRI: (a) problem of siltation in the Pussur River upto Chalna port, (b) siltation at the mouth of the river Karnaphuli, and (c) bank erosion near Meghna Bridge on Dhaka Chittagong Highway. RRI could also undertake town protection studies. The facilities for soils and materials testing could be used by RHD, Buildings Directorate and all other departments/agencies undertaking large construction work. The Department of Environment could give all its work relating to water pollution investigation to RRI.

(ii) RRI was funded, until 1-7-93, through a development project of BWDB. The Institute is understood to have come under the revenue budget with just enough funds for salary and establishment expenses. The Institute has some unfinished work for which funding is necessary.

(iii) RRI should be given an annual lump-sum research grant to undertake systematic study of the morphological behaviour of major rivers.

Chapter 4

INSTITUTIONAL ARRANGEMENTS FOR THE CONTINUATION OF GIS AND EIA WORK

A. Geographic Information System (GIS)

4.1.1 The GIS project was intended to (a) assist the planning and design of the main components of FAP, and (b) to establish a permanent tool for future use in the investigation, design, execution, operation and monitoring of water sector projects. ISPAN, a US consulting firm, is working on the GIS project (FAP 19) since April 1991. The consultants were to complete their work by October 1993; implementation has been slow leading to considerable overrun and the project is now scheduled to be completed in June 1995.

4.1.2 A detailed statement on activities and output of the project till date may be seen at Annexure of Volume II. In summary, the project has (a) completed 12 National-level Data Layers including hydrologic, topographic, soil and flood regime data for water sector investigation and study, (b) provided GIS support to eight studies as listed below, (c) undertaken a training program for developing local GIS skills, and (d) promoted the establishment of a GIS Users' Group.

GIS Application	Main Component	Status
Dynamics of Brahmaputra/Jamuna River	FAPs 1,21/22	Complete
Spatial Interface for Hydrologic/Hydraulic Models	FAPs 20, 25	Complete
Computer Design and Management	FAP 20	Complete
Environmental Impact Assessment Case Study	FAP 16	Complete
National Database	FAPs 2, 4	On going
Disaster Management and Relief Pilot Study	CARE, Disaster Management Bureau	On going
Satellite Radar Applications for FAP Pilot Study	FAPs 17,25 SPARRSO	On going
Charlands of Major Rivers in Bangladesh	FAP 16	Complete

4.1.3 What should be the institutional arrangement for continuation of the GIS work beyond the current project ? Two issues are of prime importance. Firstly, the host agency for the FAP 19 GIS must have skilled personnel, budgetary resources and interest in continuing GIS activity. Secondly, GIS application, as a modern analytical tool, must be broad-based to enhance sustainability and the total availabile data-base must be extensive to provide maximum analytical capability to current and potential users. The second point is elaborated in the following paragraph.

4.1.4 The POE team had pointed out in Interim Report No.1 (April 1994) that the possibility of having one GIS for the whole country with the widest possible range of data layers should be explored. Bangladesh is a small country and there should be no technical problem in this. Investigations since then indicate that as many as 14 separate GIS projects are on-going or proposed in different sectors with considerable duplication/overlap of effort (Table 8). Clearly, co-ordination of these projects will yield enormous benefits in terms of cost-saving as well as coverage.

4.1.5 The data layers of FAP 19 GIS and LGED GIS are compared below to elaborate this point. It will be seen that many data layers are common which means duplication of effort, wasteful of both time and money. Further, the POE team has been informed that though the same or compatible software is being used by both these organisations, there is problem in inter-changeability because of different data standards; thus, neither organisation can take advantage of the work done by the other. This is exactly the type of situation that needs to be avoided.

Comparison of Data Layers of FAP 19 GIS and LGED GIS

FAP 19	LGED
AEZ Boundaries	-
Administrative Districts	Administrative Headquarters Union, Thana, District, Division. (ADH)
Thana Boundaries	Administrative Boundaries Mouza Boundaries. (ADB)
Major Roads	Road Network along with road structures. (RDS)
Railways	Railway communication and railway structures. (RLY)
River Network	Natural water features, wide and narrow river, chars, island, khal, irrigation canal, source and direction of flow. (RIV)
-	Waterways launch/steamer/ferry routes, ghats, ferry locations. (WWS)
-	Water Resources Infrastructure for Flood Control and Drainage (embankments, regulator, water control structures.) (WRI)
-	Small-scale Irrigation schemes (DTW, STW, DSSTW, LLP etc.). (SCI)
Water Level and Discharge Stations	-
Rainfall Stations-Daily Rainfall Data	-
Soil Association Boundaries	-
Topsil Texture	-
Land Types (Flood Regime)	-
-	Growth Centers & Markets, Hat, Bazar etc. (GCM)
-	Educational Institutions & Cyclone shelters. (EIC)
-	Health Facilities. (HPS)
-	Financial, Commercial and Religious Institutions. (FCR)
-	Power Transmission Network, Telecommunication Network. (PRT)
Digital Elevation Model	-

Table 8

List of on-going/proposed GIS activities in Bangladesh

Name of Organization	Project Name	Funding Source
1. BBS	Follow-up Census (1994-98)	UNFPA, The Netherlands
2. BBS	Population and Housing Census Project (1987-95)	UNFPA, The Netherlands World Bank
3. BBS	National Data Bank	UNFPA, CIDA, ADB
4. Ministry of Works/CDA/ RAJUK	Chittagong Metropolitan Area Development Plan Dhaka Metropolitan Area Development Plan	UNDP/UNCHS UNDP/UNCHS
5. Dhaka University	Part of academic program	Own funds
6. Department of Forests	Forest Resource Management	World Bank
7. FPCO	FAP 19 GIS	USAID
8. FPCO	FAP 25 FMM	DANIDA
9. Local Government Engineering Department	Establishment of GIS	UNDP, ICIMOD SIDA, NORAD
10. BADC/MOA	National Minor Irrigation Development Project	IDA, EEC
11. SPARRSO	Agro-Climatic Environment Monitoring Project	USAID
12. SPARRSO	Application of Remote Sensing Technology to water resources, fishing and forestry sectors	UNDP/FAO
13. Soil Resource Development Institute	Soil Testing Management and Development	DANIDA
14. BCAS (NGO)	Coastal Area Pilot Study	The Netherlands

4.1.6 FAP 19 Consultants have submitted preliminary recommendations about selection of the organisation which can take over and continue their work (Annexure). The POE team have examined these recommendations and are in agreement that WARPO, responsible for national water resources planning, is the most appropriate host organisation. The POE are also in full agreement on following points:

(a) The trained personnel, database and equipment of FAP 19 are interdependent assets and should be transferred as a whole. This is,however, the subject to acceptance of Government pay-scale etc by the personnel of FAP 19.

(b) The host organisation must be supported with adequate financial resources, in local currency as well as foreign exchange. Foreign exchange will be necessary for procurement of satellite imagery, equipment upgrade/spares,, technical supplies, and some expatriate support.

(c) A transfer plan should be immediately drawn up so that there is no discontinuity or dislocation. FAP 19 will come to a close in July, 1995 and not much time is left.

4.1.7 The broader issue of establishing an integrated multi-sectoral GIS for the whole country is equally important and should be the background against which future investments in this area are made. The POE team sponsored a meeting on this subject under the chairmanship of Member (Programming) of the Planning Commission. The following recommendations are made on basis of discussions in that meeting:

(a) There should be one co-ordinating agency for all on-going/proposed GIS facilities. The co-ordinating agency will

(i) set data standards and maintain a core database to be used by all other agencies.
(ii) ensure that there is no duplication of effort
(iii) provide technical training and guidance to staff of all GIS projects.
(iv) assist access to data which can be a serious problem.

(b) GIS facilities with more detailed and/or specialised database will be established and maintained by individual agencies such as WARPO, SPARRSO, DOE, SRDI etc to meet their special needs. These databases will be available to other users.

(c) BBS is the most suitable organization to act as the co-ordinating agency. The National Data Bank project of BBS could be used to (i) provide the core database for all users, and (ii) establish and monitor data standards and quality control.

B. Environmental Impact Assessment Studies

4.2.1 Environmental Impact Assessment Study was accepted as a mandatory requirement for all FAP regional studies as well as for individual FAP projects. ISPAN was engaged as consultants under FAP 16 for the EIA work.

4.2.2 ISPAN drafted the Environmental Impact Assessment Guidelines which have been followed in all FAP studies. The EIA Guidelines, first of its kind for any sector in Bangladesh, provided a standardized format for all regional studies and were extremely useful. An EIA Manual for the water sector is also to be published.

ISPAN also carried out 3 FCD/FCDI case studies and 4 special studies as under:

Case study: Surma-Kushiyara Project,
Bhelumia-Bheduria Project,
Compartmentalization Pilot Project.

Special study: Nutritional Consequences of Bio-diversity of Fisheries,
Impacts of Flood Control and Drainage on Vector-borne Disease Incidence in Bangladesh.
The Demographic, Health and Nutritional Impacts of the Meghna-Dhonagoda Embankment.
Effects of Flood Protection on the Fertility of Soils at the Chandpur Irrigation Project.

Training and the development of local EIA expertise was the third component of FAP 16. ISPAN organized six skills workshops in which over one hundred senior government officials and executives of consulting firms/NGOs working in the environment field were trained in EIA work. A study tour for senior GOB officials to USA was also organized.

4.2.3 FAP 16 Consultants have submitted a proposal (Annexure Vol.II) regarding institutional arrangements for the continuation of EIA work after FAP 16 comes to a close in April 1995. The POE team has examined the proposal which sadly goes no further than making out a case for extension of the contract of the consultant by 15 months. The issue deserves to be considered in a broader perspective.

4.2.4 The just enacted Environmental Protection Act 1995 has made EIA study obligatory for every development project. These studies will be guided by the Environment Policy and Environmental Protection Plan 1992 (Annexure Vol.II). It is expected that the Department of Environment (DOE), as the technical arm of the Ministry of Environment and Forests, will be authorised to

(a) lay down the method and scope of environmental impact assessment and its evaluation for different projects and activities, and (b) after consideration of the EIA report in respect of a project, issue environmental clearance (with or without conditions) or decline to do so.

The sectoral action plans will be implemented by concerned Ministries and their sub-ordinate departments/statutory bodies: The Environmental Action Plan for the water resources sector may be seen at Figure 3.

4.2.5 The POE team is of the opinion that DOE should do much more than what is envisaged in the broad institutional framework described above. Bangladesh is a small flat riverine country with a closely-meshed ecology. High density of population, intense pressure on land and water resources, generally poor condition of hygiene and sanitation, and easy transmissibility of pollution and diseases have created an extremely fragile situation. The environment issue in this country should not be compartmentalized into separate segments such as air, water, soils, flora, fauna etc. It is best to deal with the matter on a total basis; fortunately the small size of the country permits such an approach. Separate environmental monitoring establishments for each sector, apart from being duplicative and expensive, will not be advisable.

4.2.6 Two more considerations govern the recommendations that follow: (i) With EIA study enforced as a requirement for project approval, ministries/departments/ statutory bodies will need expertise in this field. EIA is a multi-disciplinary exercise and this will entail a large addition to the Government's payroll if every agency wants its own personnel. A better course would be to assist development of the expertise in private sector consultancy firms, whose services would be hired by Government departments/statutory bodies as and when required. (ii) Though EIA is a new discipline, there is potential for rapid development of in-country expertise. BUET is now offering an M.S. course in Environmental Engineering. Personnel for other major disciplines including agriculture, soils, fisheries, geography and terrestrial/aquatic ecology could come from the universities.

4.2.7 In light of foregoing analysis, the POE team recommends as follows:

(a) DOE will be the centre-piece for environmental management and will be responsible for (i) monitoring changes in the environment and ecology on a national basis and covering all sectors, (ii) environmental data collection and database development, (iii) establishment and operation of a GIS-based environmental data management system for the whole country, (iv) maintaining a data archive and reference centre accessible to all users, and (v) setting environmental standards and environmental management tasks.

(b) The enhanced role of DOE will reduce the work-load of departments/statutory bodies; instead, these agencies will concentrate on micro-monitoring and implementation of mitigation measures.

(c) The Government will assist the development of private sector expertise for undertaking EIA studies.

4.2.8 The present organisation structure (Figure 4), personnel strength and equipment support of DOE is not adequate for the role envisaged for it. Presumably, these matters will be examined and taken care of after the recommendations are accepted in principle.

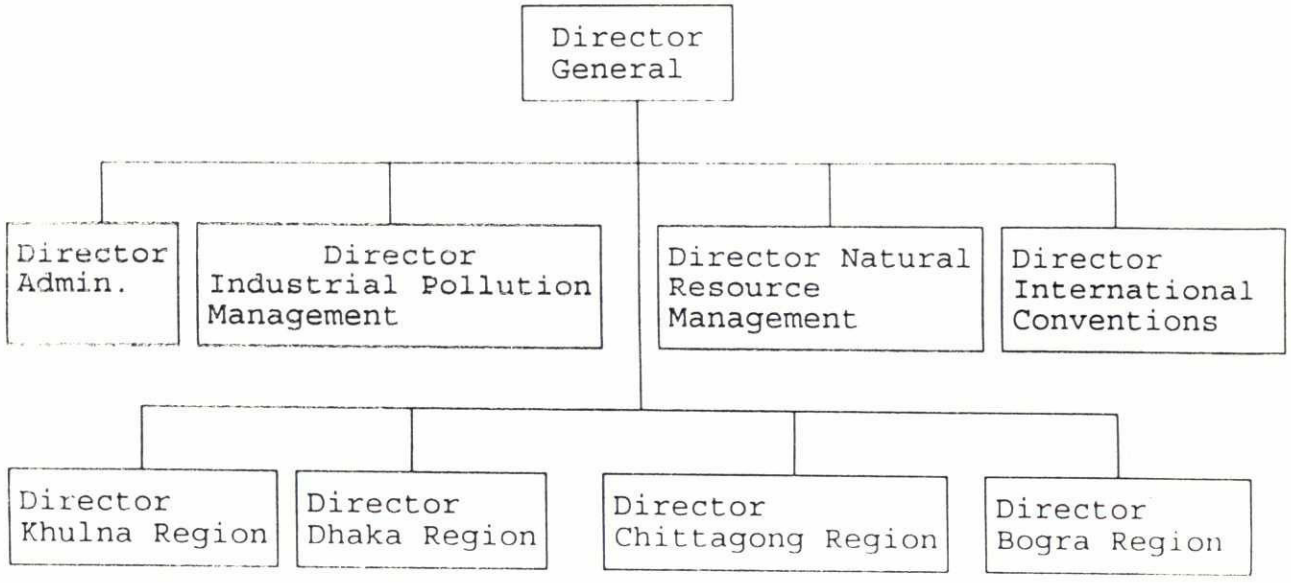
Figure 3

ENVIRONMENTAL ACTION PLAN FOR WATER RESOURCES SECTOR

	Action	Implementing Agency
1.	Environmental Audit to determine the impact of completed FCDI projects, identify adverse effects and take remedial measures.	MWR MOEF BWDB FPCO
2.	EIA study as mandatory requirement for all proposed/new projects and to include provisions for EIA study and mitigating measures in all investment proposals.	MOEF MWR Planning Commission BWDB
3.	Strictly control dumping of household, industrial or any other pollutant waste into rivers, canals, wetlands or other water areas.	MOI MOEF DOE BOI Deptt. of Textiles Bangladesh Silk Board
4.	Increase navigability and reservoir capacity of rivers, canals,wetlands and other water areas.	MWR MIWT&P
5.	Co-ordinate national program for the control of flooding, desertification and salinity with regional and internationational efforts.	MWR MOFA MOD MOEF BMD
6.	Remove obstructions hindering free flow of rivers, canals and other natural drainage systems;ensure that roads and irrigation projects do not interfere with drainage and sewerage lines.	Min.of Communication MWR LGED
7.	Prevent mining of groundwater resources and undertake special projects to counter this trend in areas where the groundwater level has already gone down.	MWR LGED FPCO
8.	Designate water as the most important and valuable natural resource and create awareness for preserving this resource.	MWR FPCO WARPO BWDB
9.	Ensure proper operation and maintenance of all water development projects and monitor impact of these projects on the environment on a regular basis.	MWR BWDB FPCO BADC
10.	Establish environment cell in all agencies involved in water resource management.	MWR BWDB FPCO WARPO BADC
11.	Conduct regular survey, monitoring and research on changes in river course, wetlands, water areas etc.	MWR MOD BWDB SOB SPARRSO

Figure 4

DEPARTMENT OF ENVIRONMENT
ORGANISATION CHART
(Proposed)*



Total Staff:	Director General	1
	Director	8
	Dy. Director	19
	Program Coordinator	1
	Legal Advisor	1
	Chemists and Research Officers	17
	Other	256
	Total :	303

* Under consideration of Administrative Reorganisation Committee.

Chapter 5

RE-ALLOCATION OF FUNCTIONS AMONGST WATER SECTOR INSTITUTIONS AND RECOMMENDATIONS FOR POLICY CHANGE.

5.1.1 At the time of the creation of EPWAPDA in 1959, all existing departments/ directorates concerned with flood control, irrigation and water management, three in all, were taken over and merged into the new statutory body. The tasks assigned to the Water Wing (of EPWAPDA) and its successor BWDB covered all aspects of water sector activity - FCD/FCDI/DI projects, river training, bank/town protection, hydrological survey and water investigation, flood forecasting, river research, protection against salinity intrusion, coastal land accretion, dredging, materials testing and so on. The first large-scale deep-tubewell project was also implemented by EPWAPDA in Dinajpur area in the sixties. Over the years the organisation became too-large and too-diversified for efficient management. It was also felt that BWDB was focussing most of its attention on project implementation neglecting other aspects of its mandate. RRI and WARPO were created taking away some of the functions of BWDB. The need for the creation of RRI, WARPO and subsequently FPCO as separate institutions has been questioned (by BWDB officials) on the ground that these bodies in any case depend on BWDB for personnel. This is a legitimate question and an answer is called for. The fact is BWDB, being the major* water sector institution for a long time, is the best source for engineering expertise in this field. This cannot however be an argument for not creating new institutions. Water is a vital resource and the sector has a key role to play in Bangladesh's growth and development. Re-organisation, in the interest of overall efficiency, is part of the growth process.

5.1.2 A comparative view of the functions of BWDB, WARPO and RRI are presented in Figure 5. It will be seen that the functions assigned to WARPO and RRI are of specialised nature. There is considerable overlap with BWDB which has retained, on the statute books, its old all-encompassing mandate. There is evidently a need for re-definition of the role of BWDB. The POE team would reiterate the earlier recommendation made in its April 1994 report, that responsibilities of these three organisations be defined on basis of broad separation of functions, viz. (i) engineering work, (ii) sectoral research and planning, and (iii) river research, morphological studies and modelling. This should not be viewed as a condemnation of BWDB; stated simply, it is not necessary for the organisation to do everything. BWDB should concentrate on

* BADC is the other organisation involved in surface and groundwater irrigation.

Figure 5

A Comparative view of functions of BWDB, WARPO and RRI

Sl. No.	BWDB Section 8 of the Act, 1972	WARPO Section 6 of the Act, 1992	RRI Section 7 of the Act 1990
1.	Construction of dams, reservoirs, irrigation embankment, drainage, bulk water supply to communities and recreational use of water resources.	1. Formulation of National Water Plan for water resource development which is environment-friendly.	1. Surface water modeling studies relating to river training and river morphology.
2.	Flood control including watershed management.	2. Determining national strategies/policies for scientific use of water resources and water preservation	2. Mathematical modeling studies relating to surface/ground water resources.
3.	Prevention of salinity, water congestion and reclamation of land.	3. Assisting/advising other organizations on development, use and preservation of water resources.	3. Investigation and evaluation of materials to be used for river training and other water control/development structures.
4.	Maintenance, improvement & extension of channels for inland water transport, including dredging, excluding all such operations as may be assigned to any other agency by the Government.	4. Conducting/assisting in the conduct of studies relating to water resource development, use and preservation: a. Advising other organizations through evaluation/ studies on matters connected with water resource development, use and preservation. b. Improving the quality of education, training and professional standard of water resource development.	4. Conducting training in above matters and publication of reports etc. 5. Advising the Government, local authorities or interested organisations on all of the above matters.
5.	Regulation of channels and river flow for more efficient movement of water, silt and sand, excluding all such operations as in the opinion of the Government may be carried out by any other agency.	a. Collecting data relating to water resources, and analysis and publicity thereof. b. Organising national and international seminar/ workshop etc, on water resource 5. Deal with any other matter referred to by the Government.	6. Cooperating with national/international institutions undertaking similar work and engaging in joint projects. 7. Taking any step necessary to undertake work referred to above.

project implementation and O&M work, with greater emphasis on O&M than before. The importance of O&M can hardly be over-emphasised; there can be no economic justification for undertaking new schemes while old projects are allowed to decay. The focus should be on the end-product - coverage achieved on a sustained basis.

5.1.3 Important elements of the proposed re-allocation of functions are described below:

(a)**Sectoral Planning:** Sectoral planning, in the way it is currently conceived, was neither required of nor attempted by BWDB. As a matter of fact, the necessary data-base for intersectoral allocation of water resources (i.e. between agriculture, industry, fishery, navigation, public health/sanitation etc.) were developed only during the mid-eighties as part of the National Water Plan Project. FAP projects have taken the process a step further by (i) drawing attention to cross-sectoral issues, namely the impact of water development projects on fisheries, wetlands and aquatic ecology, bio-diversity and the environment, (ii) requring mitigation measures alleviating negative externalities, (iii) mandating consultation with the local community/ beneficiaries, and (iv) further refining the analytical tools and equipment support available to planners. WARPO, as its mandate shows, is the appropriate organisation for sectoral planning.

(b)**Project Selection:** Current procedure for project selection, as laid down by the Planning Commission, is summarised below:

Stage	Agency involved
1. Preparation of Preliminary Project Proforma (PPP) (for aided projects only)	Executing agency/Ministry
2. Provisional approval of PPP	Inter-ministerial Committee
3. Preparation of TAPP for feasibility study, if required	Executing agency/Ministry
4. Approval of TAPP	Special Project Evaluation Committee/Minister for Planning
5. Preparation of Project Concept Paper (PCP)	Executing agency/Ministry
6. Approval of PCP	Minister for Planning (upto Tk.100 million) ECNEC (above Tk.100 million)
7. Preparation of Project Proforma (PP)	Executing agency
8. Approval of PP	DPEC of the Ministry (DPEC not authorised to make any substantive change from approved PCP).

FAP studies have generated a large portfolio of projects at various stages of preparation: majority at pre-feasibility stage, some at feasibility stage and a few ready for approval. Since most (if not all) future water sector projects will come from this portfolio, the basic material for project selection is already available. The question is, who will take it up from here ? It is recommended that project selection be done by the Ministry of Water Resources on the basis of recommendations of an inter-ministerial committee. Inter-ministerial consultation is considered necessary for two reasons: (i) the multi-disciplinary character of majority of FAP projects, and (ii) flexibility in the selection of the executing agency for a project (or specific components thereof) from a wider field. The executing agency, so selected, will be responsible for project preparation and processing. As a policy, BWDB may not be involved in execution of small schemes which are better handled by LGED/local councils.

(c) **Feasibility Studies:** Feasibility studies for aided-projects are done either (i) by a consultant/agency selected and remunerated by the donor, or (ii) in the case of loan funding, by a consultant/agency appointed with approval of the donor. The agency selected for executing a project should pilot the feasibility study in the interest of unity of responsibility. Fuller examination of implementation possibilities (such as combining embankments with road network) as well as adequate attention to cross-sectoral issues (such as impact on fisheries, navigation, environment etc) will be ensured by incorporating appropriate provisions in the study contract.

The POE team is of the opinion that BWDB can and should carry out more feasibility studies with their own personnel. It has been indicated that such feasibility reports are unlikely to be accepted by donors. The POE team is not in a position to comment on this, but surely this should be attempted.

(d) **River Morphology:** Past neglect of the subject has been a serious error. Greater understanding of the morphological behaviour of major rivers is essential for river training and bank protection work as also for the construction of barrages to come someday in the future. It may be noted that National Water Plan-I envisaged using groundwater and regional surface water to their full potential by the year 2000 and development beyond that period to be based on barrages on the Ganges and the Brahmaputra. Adequate data-base and knowledge of river behaviour must be assembled before that time. It is recommended that (i) the River Morphology Directorate be transferred to RRI, and (ii) appropriate facilities and incentives be provided to attract bright young engineers to this field.

The POE team has noted with deep anguish the absence of effort for professional excellence. It is difficult to understand why BWDB has not associated itself actively with river training works for the Jamuna Bridge, probably the largest such on-going work in the world; the level of interest shown in the pilot bank

protection work under execution in Gaibandha under FAP 21/22 also leaves much to be desired. One would expect that Bangladeshi engineers, living on an active delta in the lower reaches of three mighty rivers, would be in the forefront of fluvial morphology; instead the country is dependent for river training and bank protection studies on consultants from countries which have no river of this type.

(e) **Hydrology Directorate**: It has been suggested[8] that Hydrology Directorate should be transferred to WARPO. BWDB officials have argued tha apart from hydrological data, WARPO also needs rainfall data from BMD and hydrographic data from BIWTA. Since these latter organisations are separate there is no compelling reason that WARPO should control Hydrology Directorate. The POE team does not agree with this argument and is of the opinion that collection of both surface and groundwater data should be within the domain of WARPO. However, the present arrangement may continue for sometime. WARPO is yet to be established on a proper footing and its performance needs to be watched for sometime before giving it additional responsibility. In future, the Hydrology Directorate, the Flood Forecasting and Warning Center and SWMC, which operates the Flood Management Model, should be brought under one roof.

It appears that there is considerable duplication of effort in collection of data, particularly for groundwater resources. Apart from BWDB, WARPO is collecting data from 8 planning areas. The World Bank-funded National Minor Irrigation Development Project has also a large data collection and analysis component. Co-ordination of all these activities is needed.

(f) **Personnel Policy:** BWDB, WARPO, RRI and FPCO operate on the basis of a joint pool of engineering professionals. Posting (to a particular organisation) is made on the basis of aptitude, past experience and convenience; when a promotion vacancy comes up all eligible officers, irrespective of place of posting, are considered. The arrangement has a number of advantages. WARPO, RRI and FPCO could secure the services of experienced professionals which would not have been possible if recruitment was made through advertisement on a one-off basis; for BWDB, the opportunities created for its professionals in WARPO, RRI and FPCO offer a welcome relief from a dismal promotion situation. On the negative side, WARPO and RRI are not in a position to develop own cadre of professionals who identify their career prospects with performance of the organisaiton and can therefore be expected to make a determined effort for its success. The present arrangement should be treated as transitional and posting to WARPO and RRI should be governed on basis of aptitude, past training, and willingness to serve for a long tenure. At an appropriate cut-off time, professionals would be asked to opt for one organisation or the other on a permanent basis. Permanent option should be made a condition, with immediate effect, for selection against foreign training facilities meant for WARPO and RRI.

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[8] S.M. Al-Hussainy: Bangladesh Flood Action Plan Report-Review

(g) **Re-organisation of WARPO:** The review in Chapter 3 indicates that WARPO will not be able to effectively perform its assigned role in water resources planning without additional multi-disciplinary expertise and re-orientation of its approach. Budgetary support for the organisation needs to be suitably enhanced along with provision for an annual grant for research on selected issues; at the same time, the organisation should be asked to augment its funds through sale of data/publications. WARPO management is looking forward to the acceptance of two projects submitted by them to raise the level of activity: (i) a TAPP for UNDP assistance, and (ii) a scheme for the 'Construction of WARPO Bhaban'. The POE team is not in a position to comment on these proposals which they have not seen.

It has been suggested that FPCO should be merged with WARPO after the current UNDP project supporting FPCO comes to an end in December 1995. The POE team recommends that the matter be decided on basis of a well-thought-out plan addressing all relevant issues, namely:

(i) what will be WARPO's responsibility in respect of follow-up FAP work and evaluation/further development/processing of FAP projects.

(ii) does FPCO possess the kind of expertise that WARPO will need.

(iii) will FPCO personnel* be absorbed in WARPO on a regular or ad-hoc basis, and where will they fit in the organisation structure of WARPO.

The POE team understands that the Government will soon take a decision on the next course of action following the completion of FAP final report.

(h) **Attention to WARPO and RRI:** The POE team would urge the Ministry of Water Resources to give more attention to WARPO and RRI. These institutions are yet to find a sure footing and an appropriate place in the configuration of water sector institutions. There is a need to nurse these organisations into vibrant activity.

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* **List of FPCO personnel**

Chief Engineer	1
Superintending Engineers	6
XEN	10
Deputy Director	1
AEN	4
Agronomist/Economist	2
Other staff	54
Total:	78

5.1.4 The question of providing appropriate incentives for retaining suitable staff for BWDB's planning and design activities has been raised in several documents. Limitations in this area were pointed out in Chapter 2. There is very little that can be done in terms of special pay scales or speedy promotions. Even then, the management, if it is serious, can do a lot within the parameters of broad public sector employment policy. Incentives in the shape of good posting and preference in housing and foreign hiring can do wonders in motivating officers.

5.1.5 The POE team recommends gradual switching over to integrated planning for the whole physical infrastructure sector. This would mean planning roads, embankments, canals, railway track, housing, industrial projects and so on taking the total picture of existing investments and the topographic and ecological situation of a region (or the whole country) in view. The task will become easy with the development of GIS facilities recommended in Chapter 3. Inter-sectoral cross-checking will aim at the removal of conflicts as also taking advantage of complementarities. Investment in the development of GIS technology for this purpose will yield (i) enormous cost savings, and (ii) better designed projects. In a small, densly- populated country, there is no other option.