

Water Resource Management in Bangladesh

A Policy Review

Livelihood-Policy Relationships in South Asia
Working Paper 1

Matthew Chadwick and Anjan Datta

DFID Department for
International
Development

MRAG



iied
International
Institute for
Environment and
Development

**ODG
DEV**

LIFE



The UK Department for International Development (DFID) supports policies, programmes and projects to promote international development. DFID is providing funds for this study as part of this objective but the views and opinions expressed here are not necessarily those of DFID.

Contents

Bangla Terms	ii
Abbreviations and Acronyms.....	iii
1. Introduction and Abstract.....	1
2. Genealogy of Policy	2
2.1 A Brief History of Water Resource Management and the Emergence of Current Policy	2
2.1.1 <i>Water Sector Development 1947-1988</i>	2
2.1.2 <i>Water Sector Development - The FAP Era</i>	4
2.1.3 <i>The Call for Restructuring the Water Sector</i>	7
2.1.4 <i>The New National Water Policy</i>	8
2.2 International Water Resource Treaties	14
2.2.1 <i>The Ganges Water Treaty</i>	15
2.3 Inter-Sectoral Policy Linkages	16
2.3.1 <i>National Policy for Safe Water Supply and Sanitation (1998)</i>	16
2.3.2 <i>National Fisheries Policy (1998)</i>	16
2.3.3 <i>National Agricultural Policy (1999)</i>	17
2.3.4 <i>National Environmental Policy (1992)</i>	17
3. Water Resources and Livelihoods	18
4. The Policy Process: A Political Narrative.....	21
4.1 Formal role and responsibilities of main institutions	21
4.2 Peoples Participation.....	23
5. The Future: A Longer Term View	24
5.1 The Development of the National Water Management Plan	24
6. How might the livelihood model improve policy?	25
References	27
Annex A: Key Policy Documents: Content and Analysis.....	I

Bangla Terms

<i>Beel</i>	Low-lying depression on the floodplain that generally retains water throughout the year
<i>Boar</i>	Water body similar to an oxbow lake
<i>Hoar</i>	Extended depression between the levees of a river; saucer shaped with a deep central part with is perennial
<i>Jalmahal</i>	Water bodies leased only by government - a water estate
<i>Union Parishad</i>	Lowest level of administrative organisation
<i>Zamindar</i>	Feudal landlord/revenue collector

Abbreviations and Acronyms

ABD	Asian Development Bank
BADC	Bangladesh Agricultural Development Corporation
BWDB	Bangladesh Water Development Board
BWFMS	Bangladesh Water and Flood Management Strategy
CEP	Coastal Embankment Project
CPP	Compartmentalization Pilot Project
DFID	Department for International Development
DOE	Department of the Environment
ECNEC	Executive Committee of the National Economic Council
EIA	Environmental impact assessment
EIP	Early Implementation Project
EPADC	East Pakistan Agricultural Development Corporation
EPWAPDA	East Pakistan Water and Power Development Authority
EU	European Union
FAP	Flood Action Plan
FCD	Flood control and drainage
FCDI	Flood control drainage and irrigation
FPCO	Flood Planning Coordination Organisation
GDP	Gross Domestic Product
GoN	Government of the Netherlands
GoB	Government of Bangladesh
GPA	Guidelines for Project Assessment
GPP	Guidelines for People's Participation
GPWM	Guidelines for Participatory Water Management
HYV	High yield variety
IBRD	International Bank for Reconstruction and Development
IECO	International Engineering Company
LGED	Local Government Engineering Department
LLP	Low lift pumps
MoIWDFC	Ministry of Irrigation, Water Development and Flood Control
MoL	Ministry of Land
MOU	Memorandum of Understanding
MoWR	Ministry of Water Resources
MPO	Master Plan Organisation
NEDA	Netherlands Environment and Development Agency
NGO	Non-governmental Organisation
NMIDP	National Minor Irrigation Development Project
NWCo	National Water Code
NWMP	National Water Management Plan
NWP	National Water Plan
NWPo	National Water Policy
NWRC	National Water Resources Council
PC	Project Council

SRP	Systems Rehabilitation Project
TW	Tube-wells
UN	United Nations
UNDP	United Nations Development Programme
WARPO	Water Resources Planning Organisation
WB	World Bank
WFP	World Food Programme
WMCA	Water Management Cooperative Association
WUA	Water user association
WUC	Water user committee
WUG	Water user group
WUO	Water user organisation

1. Introduction and Abstract

The Department for International Development (DFID), UK has commissioned a Consortium led by the University of Leeds, UK and including: the International Institute for Environment and Development, Overseas Development Group, University of East Anglia, Marine Resources Assessment Group, and Agricultural Extension & Rural Development Department, University of Reading, in the UK, in collaboration with: the Bangladesh Centre for Advanced Studies, and IUCN in Bangladesh, Development Alternatives and Centre for Economics and Social Studies, in India, the International Centre for Integrated Mountain Development in Nepal, the Lanka International Forum on the Environment, the International Water Management Institute and the World Conservation Union, in Sri Lanka to undertake the study "Improving Policy-Livelihood Relationships in South Asia" (R7604). The goal of the work is to develop and promote practical policy options to support rural livelihoods through a range of research, development and advocacy activities. An early output of this work during the Inception Phase is to undertake a review and synthesise the literature on each of the specific policy arenas outlined in the research.

This paper represents the policy review for the water sector in Bangladesh. The paper begins with a brief history of water resources management in Bangladesh and goes on to consider the development of the current water policy.

2. Genealogy of Policy

2.1 A Brief History of Water Resource Management and the Emergence of Current Policy

2.1.1 *Water Sector Development 1947-1988*

Prior to the partition of the subcontinent in 1947 there had been no national scale government-led water sector development in what is now Bangladesh. However, public investment in water resources development dates back to the pre-British period. During this time the then Bengal had a kind of public works programme for the construction of local infrastructure such as small reservoirs to reduce the adverse impact of flood and to ensure water for irrigation during dry seasons. Following devastating floods in 1954 and 1955 a United Nations mission (the Krug Mission) investigated the possibilities for water resources development in East Pakistan. On the UN missions recommendations, the East Pakistan Water and Power Development Authority (EPWAPDA) was created in 1959. The Authority was responsible for the planning, design, operation and management of all water development schemes. The real beginning of water sector planning in what is now Bangladesh was marked by the completion in 1964 of a 20-year Water Master Plan, prepared by EPWAPDA with USAID assistance. It envisaged a strategy of massive flood control and drainage to be followed by irrigation in a later phase. However, in actual implementation of the plan, much emphasis was put on the construction of embankments and polders over much of the country (Rogers *et al.*, 1994), and construction began in earnest. The activities carried out under the Master Plan brought about immediate results, however and later evaluations noted the rapid rate of decline in performance, especially in terms of operation and maintenance, of much of this infrastructure. In particular the increases in agricultural production (the main objective of the interventions) failed to materialise as predicted (Datta, 1999).

The orientation of all water sector development to this time was almost exclusively aimed at achieving the goal of increasing agricultural production to achieve national self-sufficiency. This bias towards agriculture meant that solutions tended to be in the form of flood control drainage and irrigation (FCDI) projects. In reality, emphasis was placed on flood control mainly and much attention was given to the improvement of drainage and irrigation. Development during this period was strictly sectoral with very little inter-sectoral communication. Instead agencies pursued their own, separate and often conflicting interests. Then, as is still the case today, the majority of staff at EPWAPDA (now Bangladesh Water Development Board (BWDB)) were civil engineers and the organisation was inclined to seek structural engineering solutions at the expense of all alternatives. In the absence of other organisations to act as advocates for non-structural development of the Nation's water resources (especially where structural ones were inappropriate or costly) water resources management in Bangladesh became synonymous with flood control, drainage and irrigation.

Following independence in 1971, the EPWAPDA was restructured and responsibilities concerning planning and management of water resources was handed over to the newly created BWDB.

The country gained support from several agencies immediately following independence, including the International Bank for Reconstruction and Development (IBRD) in 1972. The IBRD, which had undertaken a study in 1969-70, reviewed the investment and performance of the water sector and submitted its findings in a report titled "Land and Water Sector Study" in 1972. The study recommended a strategy of extensive minor irrigation in winter using low lift pumps (LLP) and tube-wells (TW) and for flood control small-scale, low-cost, quick-gestation flood control projects in shallow flooded areas. This was a major deviation in the strategy followed since 1964. Although not officially accepted by the Government of Bangladesh (GoB), the IBRD report was endorsed by donors and as such guided their investment pattern.¹ The emphasis on minor irrigation and privatisation resulted in a dramatic increase in irrigated area. However, the implementation of large-scale water control projects was not totally abandoned, with a further 1,963 km of embankments and 8,000 hydraulic structures added and 1,000 river closures taking place in the 1980s alone (Hughes *et al.*, 1994; WSIP, 2000).

In 1974 Bangladesh was once again hit by a severe flood that renewed interest in flood control and drainage. The country was still recovering from the war and in need of a means of rapidly improving its agricultural production. The government of the day held consultations with many donors and several new initiatives began. One of these was the Early Implementation Project, undertaken in collaboration with the Government of the Netherlands (GoN).

In the meantime, the construction of Farakka Barrage on the Ganges in India at about 20 km upstream from the Bangladesh border was completed in 1974 for directing Ganges water into the Hooghly river for the stated purpose of improving navigability around Kolkata (then called Calcutta) port. For the test run of the barrage, a sharing arrangement with India was made in 1975 for diverting 11,000 to 16,000 cubic feet per second (cusecs) of water between April 21 and May 31, 1975 leaving about 44,000 cusecs for Bangladesh. However, India continued the unilateral withdrawal at a higher level in 1976 without any agreement and that severely affected Bangladesh in the dry season. Bangladesh took the issue to the United Nations General Assembly and finally an agreement with India was concluded in 1977 for five years.

Following the recommendations of 1972 IBRD study, minor irrigation through LLPs and STWs spread extremely rapidly. The potential for LLP was soon exhausted due to lack of surface water availability but growth of STW continued remarkably. Before long conflicts amongst various water users surfaced in the form of fish versus LLP irrigation and domestic hand tubewells versus STW irrigation on the one hand and drastic reduction of flow in the Ganges on the other. Against this backdrop, a joint Government of Bangladesh and World Bank (WB) Mission reviewed and made detailed recommendations for institutional reforms and the need for a new Master Plan.

¹ Based on interviews with a number of senior water resources experts and officials.

By the early eighties, the pressures of a burgeoning population and expanding agricultural and industrial sectors had brought about the recognition of the need for long-term comprehensive water resources development. The country also faced new challenges due to the expiring of the Ganges treaty. In 1982, Bangladesh had no choice but to sign a Memorandum of Understanding (MOU) with India on the issue of the sharing of Ganges water. Against this backdrop, in 1983 the National Water Resources Council (NWRC) was established as an inter-ministerial body. Later in the same year the Master Plan Organisation was created and entrusted with the task to draft the first National Water Plan (NWP). Development of the plan was a lengthy process requiring the collection of large quantities of baseline information. As a result, the first National Water Plan (Phase I) was not completed until 1986. An assessment was made in the plan document on the availability of water from various sources and the plan also projected the future demand for water by different sectors.

The NWP was extended (Phase II) in 1986 and was completed in 1991. During this phase, a substantial volume of information was generated. This included the development of a number of planning models and analytical tools for defining and evaluating strategies. During this phase the country was divided up (initially) into 173 catchments. These were grouped into 60 planning areas, and further aggregated into five regions (Northeast, North-west, South-east, South-west and South-central). One important outcome of this process was a baseline assessment of water resources of the country. The water balance model (for both surface water and groundwater) was made in an effort to determine the extent of surface water and groundwater reserves. This assessment was one of the first to look at all aspects of water resource utilisation in the country. The model predictions took into account the future development of irrigation, fisheries, navigation as well as environmental needs. Both phases of the NWP recognised the importance of fisheries and recommended several basic policies to strengthen fisheries institutions, improve the design of water control structures for providing fish migration, improve the management of FCDI projects to enhance fish production, and the need to reserve certain water bodies for fisheries development (World Bank, 1997, p.54). Also during this period the Master Plan Organisation (MPO) prepared a draft water code and outlined proposals to institutionalise the process of planning and development of water resources (World Bank, 1997). These recommendations reflected the views of the day of both government and the donor community. To recast the NWP within the appropriate inter-sectoral focus, the MPO was restructured as the Water Resources Planning Organisation (WARPO) in 1991 with the mandate to "evolve national policies and strategies for utilisation and conservation of water by all" (GoB, 1999, p15).

2.1.2 Water Sector Development - The FAP Era

During the second phase of the NWP Bangladesh experienced two severe floods in 1987 and 1988, the latter of which was the worst in living memory. The flood at peak time covered approximately 65 percent of the country. These floods caused massive infrastructural damage, loss of crops and the deaths of nearly 1,700 people (Haggart *et al.*, 1994). The event brought the issue of flood control and flood management to international forums and led to renewed, and greatly increased, levels of assistance. In the year proceeding the floods, four studies, undertaken by the United Nations Development Programme (UNDP), the

Japanese, the French and the Americans were undertaken. Additional studies were also undertaken by Bangladesh in collaboration with India, Bhutan, Nepal and China (WB, 1987).

The World Bank took the lead in coordinating the programme on behalf of the donor agencies and in July 1989, the World Bank and the GoB recommended an integrated approach for flood mitigation based on the concept of 'controlled flooding' to be implemented over the next 20-30 years. In December of the same year, in a meeting held in London, representatives of the Government of Bangladesh and the donors endorsed the plan for the Flood Action Plan (FAP).

The FAP was seen as a five-year rolling plan that would be reviewed every two years. The first five-year study phase of the project (1990-95) was financed by 16 major donor countries and multilateral agencies and originally involved 11 main components and an additional 15 support studies. Various plans of action were put forward by different donor countries ranging from improved flood forecasting and warning systems to high cost embankment schemes aimed at changing the entire hydrological regime of the country. With time, the original 26 components were subdivided and new off-shoots developed to the point that by September 1992 the FAP consisted of 30 separate components (Adnan *et al.*, 1992). These regional and supporting studies were to be managed by a newly established Flood Planning Coordination Organisation (FPCO).

However, even during the formulation stage of the FAP there was criticism of the Plan by pressure groups, some donors and civil society as a whole. At that time Bangladesh was governed by a military dictatorship, which suppressed the scope for the active participation of civil society in these processes. The FAP was never debated in Parliament and no public consultation was carried out prior to project implementation.

In its early years FAP could be seen as the continuation of planning in the traditional *modus operandi* of the BWDB but on a much grander scale. As it continued so did the criticism, especially by non-governmental organisations (NGOs) although the criticism was by no means confined to them. The Bangladesh Agricultural Research Council (BARC) was also critical to the point that President Ershad had the Executive Vice Chairman sacked for his critical views². Over the next few years the campaign against the FAP gathered momentum with public displays of dissatisfaction becoming more frequent.

Despite its shortcomings FAP did set in motion several processes of change. The Plan brought about "unaccustomed scrutiny of the water sector that exposed hydrological flaws, doubtful economic viability, environmental shortcomings and other problems that had been accumulating for several decades" (Rogers *et al.*, 1994, p. 3).

The combination of the poor results of FAP project evaluation studies and pressure from donors and NGOs led to the realisation of the need for a participatory approach to water development. At the second conference on the FAP, in 1992, the FPCO was determined to

² As to this action of the President there is another view which states that the Vice Chairman of the BARC was sacked for presenting a paper on the effects of salinity on the Sunderbans, and had nothing to do with FAP. Discovering the real truth, however, remains a difficult task.

produce a set of guidelines for participation in management projects. The GoB and the BWDB were largely opposed to this.

Box 1: Selected Comments from the Second Conference on FAP, 1992

"With low literacy rates and limited exposure to the outside world, rural people are not adequately equipped to find and suggest solutions to all of their problems."
BWDB official at the FAP conference, March 1992

"Your idea regarding women's participation is not correct for the overall national interest"
BWDB official at the FAP conference, March 1992

However, after extensive debate, it was agreed that guidelines needed to be established and that these would describe local people as the partners of professionals in water management. This conclusion represented a radical departure from existing approaches (Hanchett, 1997).

In 1995 the FAP final report, the Bangladesh Water and Flood Management Strategy (BWFMS), was approved by the GoB and the implementation strategy laid out in the Bangladesh Water and Flood Management Strategy Report in 1995 was also endorsed by the associated donor agencies. Following the recommendation of the BWFMS, the institutional arrangements for planning of water resources were reviewed leading to the merging of the FPCO into an expanded WARPO in 1996.

In parallel to the FAP, the BWDB was continuing its work on existing programmes. One such programme was the Systems Rehabilitation Project (SRP), which aimed to rehabilitate some of the 80 BWDB projects that were partly or wholly dysfunctional. The project aimed to rehabilitate the whole system rather than simply the infrastructural elements such as embankments or sluices. The project, which started in 1992, was largely unsuccessful (Soussan and Datta, 1997). However, here too people's participation was gaining increasing credibility as an essential element for the success of the project, and after a review by the World Bank in 1994, the project reduced its number of sub-projects and introduced participatory elements to the work. The approach adopted was based on the formation of water user organisations (WUOs). However, this approach was also criticised as being unrepresentative. The approach was that most of the WUOs consisted only of farmers rather than representatives of all water users (farmers were defined as the 'project beneficiaries' as the project's economic rate of return was based on assumptions about increases to crop outputs that better flood control would bring). However, as with the FAP, through its mistakes SRP did serve to draw attention to several areas requiring improvement. The SRP showed that the structure of the BWDB was incompatible with the needs of small-scale rehabilitation and also went some way to changing the attitudes of BWDB staff to people's participation.

The NWP I and II set out projections of resources and demands for the period up to 2005 and 2010 respectively using complex water balance models. The plans were based on estimates of the net cropped area and area that could be irrigated in each of the five regions, plus the available groundwater and surface water resources in each. Both Plans also emphasised the

role of minor irrigation with LLPs and STWs. In response to this, in 1992 the National Minor Irrigation Development Project (NMIDP) was launched by the Ministry of Agriculture with the principal objective of consolidating the transition of minor irrigation from a supply driven public sector to a demand driven private sector one, and has been generally successful in identifying affordable options. There has been widespread growth throughout Bangladesh of minor irrigation in part through the promotion by NMIDP but arguably more as a result of the privatisation, obvious benefits of the technology and through the reduction in government taxes on the equipment.

2.1.3 The Call for Restructuring the Water Sector

In recent years the pressure for the restructuring of the water sector has grown. The GoB responded to this initially through the Bangladesh Water and Flood Management Strategy, which proposed the formulation of a national water management plan and the institutional strengthening of water sector organisations. It also openly recognised that there are considerable limitations on an approach to water management involving widespread large hydrological engineering intervention. However, it still placed great emphasis on floods compared to the Nation's dry season scarcity problems, which many considered to be of an equal if not greater problem. That said, it did recognise the inadequacy of the existing institutional framework for meeting the needs of the sector and proposed restructuring.

Also during this period guidelines for people's participation, project assessment and environmental impact assessment were developed by FPCO. The Bangladesh Water and Flood Management Strategy recommended people's participation as mandatory from the inception phase, and environmental impact assessment (EIA) as an integral part of planning. These guidelines went through a screening and testing phase which led to the Ministry of Water Resources issuing the Guidelines for People's Participation (GPP) for all water development projects in 1994. At the same time the GoB also made EIAs mandatory for all new or revised water sector projects prior to submission to the Executive Committee of the National Economic Council (ECNEC), the highest authority for approving projects. Since this time, to varying degrees, the guidelines have been applied in the management of water sector projects implemented by the BWDB. The Local Government Engineering Department (LGED) also prepared guidelines on how to involve local people in water projects. A number of projects including SRP, and the Compartmentalization Pilot Project (CPP) also developed GPPs. As a result, different agencies developed slightly different sets of procedures to ensure stakeholder participation. This is particularly true in the case of the suggested institutional arrangements of the beneficiaries both in terms of registered or unregistered groups.

As part of the decentralisation process the GoB drafted new legislation relating to the new responsibilities delegated to local government institutions. This culminated in the enactment of the Upazila Parishad Act in 1998. Schedule 2 of the Act specifically deals with the water resources sector development, in particularly relating to planning and management of small-scale water resources schemes below 1,000 hectares.

2.1.4 The New National Water Policy

In response to the Government's Bangladesh Water and Flood Management Strategy Report the World Bank produced its report "The Steps Towards the New National Water Plan" (World Bank, 1997). This described a structure for the water sector (covering both surface and ground water). These initiatives which essentially described the need for a coherent water strategy for water resource exploration, use and management, led the GoB to begin the process of drafting a National Water Management Plan (NWMP) and National Water Policy (NWPo). This process involved the revival of the dormant National Water Resources Council (NWRC). The NWRC led the NWPo development process and led to the first National Water Policy being published in January 1999. The NWPo goal is stated as being:

"to ensure progress towards fulfilling national goals of economic development, poverty alleviation, food security, public health and safety, a decent standard of living for the people and protection of the natural environment" (GoB, 1999).

Whilst it is beyond the scope of this paper to analyse the Policy in minutiae, it is useful to set out the policy's broad aims and objectives. These are stated as:

"The water policy of the government aims to provide direction to all line agencies working with the water sector, and institutions that relate to the water sector in one form or another, for achievement of specified objectives. These objectives are broadly:

- *To address issues related to the harnessing and development of all forms of water and ground water and management of these resources in an efficient and equitable manner.*
- *To ensure the availability of water to all elements of society including the poor and the underprivileged, and to take into account the particular needs of women and children.*
- *To accelerate the development of sustainable public and private water delivery systems with appropriate legal and financial measures and incentives, including delineation of water rights and water pricing.*
- *To bring institutional changes that will help decentralise the management of water resources and enhance the role of women in water management.*
- *To develop a legal and regulatory environment that will help the process of decentralisation, and sound environmental management, and will improve the investment climate for the private sector in water development and management.*
- *To develop a state of knowledge and capability that will enable the country to design future water resources management plans by itself with economic efficiency, gender*

equity, social justice and environmental awareness to facilitate achievement of the water management objectives through broad public participation" (GoB, 1999).

It is acknowledged in the new NWPo that the existing legislation on water management requires supplementing in a number of key areas (GoB, 1999, p21). It is the intention of the Government that the policy will be given effect through a National Water Code (NWCo) which will outline the specific provisions of the water policy required to facilitate implementation. The views of government are to enact this NWCo by revising and consolidating the laws governing ownership, development, appropriation, utilisation, conservation and protection of water resources.

The NWRC is also responsible for the continued development of water resources institutions and for providing policy directives for co-ordination across sectors. However, it is the responsibility of WARPO to determine the means by which the broad policy aims in the NWPo are to be implemented and the Policy itself implies the framework within which this is to be achieved is through the NWMP.

A detailed analysis of the Policy is beyond the scope of this paper³, but the general consensus within Bangladesh and internationally was that the policy was a significant landmark that reflected a major shift in the approach to water resources management within government circles. In particular, the dominance of floods as the issue and infrastructure as the solution is challenged by the new policy that prioritises a range of issues and recognises the importance of, in particular, institutional change.

However, whilst in general the policy must be viewed positively there are some queries and concerns. For example, the policy states that "*Water will be considered an economic resource and priced to convey its scarcity value*" (GoB, 1999, p. 16). The argument of scarcity value definitely has merits, as the experiences suggest that desirable practices relating to rationale use of water emerges when all users perceive and do recognise the scarcity value. However, it could be argued that in the policy though the principles are laid out, the efficacy of it to a great degree remained open for varied interpretations, which may not be easy to address at implementation.

Similarly, on pricing of surface and ground water the policy stated that "*... rates are to reflect where possible, the cost of delivery*" (*op cit.*, p. 16). The whole issue of pricing of water thus becomes crucial. Even in a situation where principles are clearly laid down, complexities crop up on calculation of costs, particularly when major water investment are in the form of flood control and drainage. The pricing of irrigation water is not simple either when argument of "scarcity value" is applied. As in the Bangladesh context, at times scarcity value of water could greatly exceed the cost of delivery which is often taken as a basis for pricing. Thus it could be safely argued that the NWPo has just laid down the basic principles. The complexity of various issues and concepts has not fully been addressed, but the NWPo has created a framework for continuing debate and discussions to resolve them in the process.

³ For a detailed analysis of these the reader is referred to Halcrow, Mott McDonald and Associates, (2000). However, this document itself needs analysis

The policy also talks of standards of effluent disposal in common watercourses being set by WARPO in consultation with the Department of the Environment (DOE). However, review of WARPO's activities since the formulation of NWPo suggest that WARPO is too occupied with the drafting of NWMP and has very little time and/or expertise to address other issues which in the NWPo are indicated as an integral part of WARPO's mandate. Further, interviews with the senior WARPO officials gives the indications that the WARPO as yet, has no powers or capacity to act as a regulator and there is no other agency mandated to do so.

Despite shortcomings such as these, most stakeholders seem generally pleased with the position the Policy has taken. However, of most concern is the fact that the policy is yet to be endorsed by the Parliament or backed by an Executive Order. As a result, no agency including BWDB and LGED or the Ministries of Fisheries and Livestock or Roads and Highways is at present obliged to submit their plans and projects to WARPO even though this is seen as an integral part of the policy. As such, the NWPo in Bangladesh shares with many other policies in many parts of the world the characteristic of being a good document that reflects significant changes to the dominant approach, but also of being limited in terms of the details through which the policy intentions will be implemented or the capacities of the institutions to enact crucial pieces of the policy. The key pieces of legislation and influences on their formulation are given in Table 2.1a.

Table 2.1a: Chronological History of Policy Development in the Water Sector of Bangladesh

Year	Major Events	Major Events (FAP only)	Year
1947			1947
1948			1948
1949			1949
1950			1950
1951			1951
1952	Drainage Act		1952
1953			1953
1954	Major Flood		1954
1955	Major Flood		1955
1956	Krug mission fielded by the United Nations		1956
1957	Submission of the Report by the Krug Mission		1957
1958	Coastal Embankment Project (CEP) and Polder construction started under East Pakistan Irrigation Department.		1958
1959	Creation of East Pakistan Water and Power Development Authority (EPWAPDA) as per recommendation of the Krug mission		1959
1960			1960
1961	Creation of East Pakistan Agricultural Development Corporation (EPADC)		1961
1962			1962
1963			1963
1964	Master Plan formulated by the International Engineering Company (IECO) of the USA recommending 58 large-scale Flood Control Drainage and Irrigation (FCDI) projects.		1964
1965	CEP and Polder development takes place rapidly and continues till 1980s. Total number of polders constructed about 140.		1965
1966	Continuation of CEP, International Bank for Reconstruction and Development (IBRD) reviews Master Plan and terms it as ambitious and unimplementable		1966
1967	Continuation of CEP		1967
1968	Continuation of CEP, Introduction of high yield variety (HYV) rice (IR-8)		1968
1969	Set-up of Flood Commission by the Pakistan Central Government		1969
1970	Continuation of CEP, GBM modelling was recommended by the Harvard Group		1970
1971	Bangladesh achieves Independence		1971
1972	EPWAPDA restructured into Bangladesh Water Development Board (BWDB) under Presidential Order. IBRD commissioned land and water Study and this recommended <i>small, low cost, quick generation flood control and drainage (FCD) projects</i> . Start of a mix of minor irrigation models and low cost FCD schemes along with larger more capital intensive FCD and FCDI schemes by government and other agencies. EPADC was restructured into the Bangladesh Agricultural Development Corporation (BADC)		1972
1973			1973
1974	Major flood Government of Bangladesh (GoB) and donors emphasise need for small-scale, quick yielding projects		1974

1975	Renewed emphasis on small-scale quick yielding projects (Early Implementation Project (EIP) by the Dutch and several small-scale projects initiated by the World Bank (WB), Asian Development Bank (ADB) etc.). New emphasis was given on extraction of surface and ground water through low-lift pumps and tube-wells, specially for cultivation of winter <i>boro</i> rice. Farakka Barrage goes into trial run		1975
1976			1976
1977	Indo-Bangladesh agreement on the Ganges water		
1978			1978
1979	Joint GoB and WB review of BWDB, recommends restructuring of BWDB and new National Water Plan (NWP)		1979
1980			1980
1981			1981
1982	The Ganges agreement expires, a memorandum of understanding (MOU) is signed		1982
1983	Master Plan Organisation (MPO) was established under the Ministry of Irrigation, Water Development and Flood Control (MoIWDFC) to prepare a long-term water resources development plan. Start of Phase I of National Water Plan		1983
1984			1984
1985	New MOU on the Ganges water		1985
1986	National Water Plan (Phase I) completed its first report. <ul style="list-style-type: none"> As assessment was made on the availability of water from various sources and projected the future demand for water by different sectors. Phase II begins with new agenda and continues till 1991 National Minor Irrigation Development Project (NMIDP) was launched in 1986 to investigate and develop the groundwater with the European Union (EU) funding under the Ministry of Agriculture.		1986
1987	Major Flood		1987
1988	Major Flood Studies undertaken by GoB, UNDP, USAID, Government of Japan and France. The Ganges MOU expires.		1988
1989	National Water Plan (Phase II) continues	Flood Action Plan (FAP) was approved in the Donors' meeting in London held in December. <ul style="list-style-type: none"> FAP consisted of 11 main components and 15 supporting studies. For co-ordination of FAP activities, Flood Plan Co-ordination Organisation (FPCO) was created under the MoIWDFC. From donor side FAP was co-ordinated by the World Bank 	1989
1990	Master Plan Organisation (MPO) within the framework of National Water Plan drafted <i>Water Code</i> and <i>Revised the Water Act</i>	FAP continues	1990
1991	National Water Plan (Phase II) completed. <ul style="list-style-type: none"> A number of planning models and analytical tools for defining and evaluating strategies were developed. This was done by dividing the country initially into 173 catchments and then translated into 60 	FAP continues	1991

	<p>planning areas, and further aggregating them into five regions (Northeast, North-west, South-east, South-west and South-central).</p> <ul style="list-style-type: none"> • One of the most important outcomes of this process was 'the assessment of water resources base for development'. • The water balance model tried to determine the extent of surface water and ground water, both in terms of current use and the volume remaining for future use and development. • In the model total water outflow that was considered as potentially available for development took into account the future development of irrigation, fisheries, navigation and environmental needs. <p>It was endorsed by the GoB and donors MPO restructured into Water Resources Planning Organisation (WARPO) under the MoIWDFC</p>			
1992	<p>Systems Rehabilitation Project (SRP) under the BWDB was launched with support from the WB, Netherlands Environmental Development Agency (NEDA), EU and World Food Programme (WFP). National Minor Irrigation Development Project (NMIDP) was launched to investigate and develop the groundwater with the EU funding under the Ministry of Agriculture.</p>	<ul style="list-style-type: none"> • FAP Conference in Dhaka • NGOs and Academics were critical of FAP for its non-participatory mode of operation and poor dissemination of information 	1992	
1993	<p>MoIWDFC was re-named, as Ministry of Water Resources (MoWR). The event is important as the name gives a much more holistic and wider vision on water.</p>	<p>Under FPCO several Guidelines were drafted and approved</p> <ul style="list-style-type: none"> • Guidelines for People's Participation (GPP), • Guidelines for Project Assessment (GPA), and • Guidelines for Environmental Impact Assessment (EIA) • Manual for EIA 	1993	
1994	<p>MoWR approved GPP and circulated for its application in new projects of BWDB</p>		1994	
1995	<p>FAP Final Report was produced, GoB approved Bangladesh Water and Flood Management Strategy (BWFMS)</p>		1995	
1996	<p>FPCO was merged with WARPO. WARPO got its extended mandate</p> <ul style="list-style-type: none"> • Initiative to prepare the National Water Management Plan (NWMP) addressing the overall resource management issues under supervision of the WARPO • The Government of Bangladesh and India signed the Ganges Water Sharing Treaty 		1996	
1997			1997	
1998	<p>Major Flood both in terms of area coverage and duration</p>		1998	
1999	<ul style="list-style-type: none"> • National Water Policy adopted by the GoB • BWDB is mandated to implement all major surface water development projects and other FCDI projects with command area above 1000 hectares. • The Local Government Engineering Department (LGED) is mandated to implement FCDI projects having a command area of 1000 hectares or less after identification and appraisal through an "interagency project appraisal committee". 		1999	
2000	BWDB	LGED	WARPO	2000

2.2 International Water Resource Treaties

On 12 December 1996, the Prime Ministers of Bangladesh and India signed a treaty on sharing of Ganges water. This represented the culmination of efforts to end a dispute that had run for many years, and to put in place an agreement between the two nations that had elapsed in 1988. A first agreement on the sharing of the Ganges water was signed in 1977 and lasted for five years. A further five-year MOU in 1982 replaced this. However, after this expired in 1988, the countries failed to reach a new agreement and entered a period marked by disagreement and posturing. During this time, India unilaterally diverted Ganges water through the Farakka barrage located a few kilometres north of Bangladesh's border.

Negotiations on the sharing of Ganges water at Farakka were started in 1960 at the time of the signing of the Indus Water Treaty between India and Pakistan. India decided it needed to construct a barrage across the Ganges at Farakka in 1951 in order to divert water to Bhagirathi to maintain its navigability which was being hampered due to siltation. India's decision to start construction of the Farakka Barrage in 1960 violated the international norms on infrastructure for the diversion of water on any international river. Construction of the 7363 ft long barrage, designed for a maximum design discharge of 27,00,000 cusecs and a head regulator for diversion capacity of 40,000 cusecs of flow, was completed in 1974.

India then approached Bangladesh for test operation of the Farakka Barrage and feeder canal. The Prime Minister of the day Sk. Mujib agreed to India's proposal for test operation of the barrage and feeder canal. Initially in 1975 India was allowed to divert flows varying from 11000 cusecs to 16000 cusecs for a period of 41 days from 21 April to 31 May 1975. With this was the understanding that India would not operate the feeder canal until a final agreement was reached between India and Bangladesh on the sharing of Ganges water. Violating this understanding India started diverting the Ganges water in the upstream region in 1976 and 1977. Unilateral withdrawal of Ganges water during the dry months resulted in serious adverse effects in the South-western and Western areas of Bangladesh, covering almost 20 percent of country's area (30,000 km²) and inhabited by about 30 million people. Effects included those on the environment, agriculture, industries, fisheries, navigation, the river regime and salinity contamination in the surface and ground water.

Withdrawal of the Ganges water upstream of Farakka varies from 40,000 cusecs to 45,000 cusecs during the months of March and April. This coupled with diversion at Farakka to the feeder canal means India has been withdrawing between 60,000 to 80,000 cusecs of water from the Ganges leaving a relatively low flow for Bangladesh in recent years (India Today, 1997).

The consequences of this have been severe for Bangladesh, where the salinity front has moved some 280 km upstream from the coast and salinity levels in the surface water have increased from 500 μmho to 29000 μmho at Khulna in April, exceeding the safe limit by several times. The groundwater salinity has also increased from 200 μmho to about 3000 μmho in the region during the Farakka period and there is some evidence that the Sunderbans, one of the world's largest mangrove forest, is suffering due to increased salinity in the estuarine rivers flowing through it.

After failing in attempts to resolve this issue bilaterally, Bangladesh raised the issue of Ganges water sharing in the UN General Assembly session in 1976 and an ad hoc five year agreement on Ganges water sharing was agreed in 1977.

2.2.1 *The Ganges Water Treaty*

The Bangladesh-India Treaty has as its principal objective the determination of the amount of water to be released by India to Bangladesh at the Farakka Barrage on the Ganges for a period of 30 years (Articles I and XII). The difficulty of the task of reaching agreement is not apparent in the text of the Treaty, which makes only implicit reference to the long-running dispute. The 1996 Treaty establishes a new formula for sharing the Ganges waters at Farakka in the dry season (1 January to 31 May). The new arrangement states that when the Ganges flow at Farakka:

- falls below 50,000 cusecs in any 10 day period the two governments will enter into immediate consultation to make adjustments on an emergency basis (Article II(iii)).
- is 70,000 cusecs or less, both countries are to receive 50 percent;
- is between 70,000 and 75,000 cusecs Bangladesh receives 35,000 cusecs and India receives the remainder;
- is more than 75,000 cusecs India receives 40,000 cusecs and Bangladesh receives the balance (Article II(i) and Annex 1 of the treaty).

The sharing arrangements are to be reviewed every five years and if no agreement can be reached on adjustments India is to release at least 90 percent of Bangladesh's share as provided by Article II.

Reaction to the agreement has been mixed. Some claim that based on the available data Bangladesh will receive a lower flow under the 1996 treaty than it did under the 1977 agreement as the sharing and schedule are based on average flows. A further problem highlighted is that the Treaty makes no provision to augment the flow through regional co-operation, unlike the 1977 agreement. There is no provision for international arbitration in case of dispute nor does the treaty take account of water quality.

There is also evidence that the flow agreed under the agreement is insufficient to redress the problems of the high levels of salinity in surface and groundwater, and problems for navigability, fisheries and general deterioration of river ecosystems. This was revealed by the FAP study on South-west Water Resources Management (FAP 4). According to this, Bangladesh needs a minimum flow of 55-60,000 cusecs during the critical period of the year (March and April) to meet the demand for water for agriculture and industrial development, as well as to maintain ecology, navigability and control salinity intrusion. Figures for the last five years show that the flow availability has declined to around 50,000 cusecs in the months of March and April and that Bangladesh will have a shortfall of about 30,000 cusecs of water during April (India Today, 1997).

2.3 Inter-Sectoral Policy Linkages

A number of related policies have implications for water management in Bangladesh.

2.3.1 *National Policy for Safe Water Supply and Sanitation (1998)*

This policy, published by the Local Government Division of the Ministry of Local Government and Rural Development and Co-operatives goal is to ensure that all people has access to safe drinking water and sanitation services at an affordable cost. Since the NWPO places the highest priority on the provision of domestic water supplies and sanitation during times of water shortage, the policy is clearly important. There appear to be no real contradictions in the policy that could limit their ability to achieve their aims and objectives but it is notable that this key area of water policy does not fall within the remit of the MoWR and has traditionally be neglected to the point of ignoring it by both the BWDB and WARPO.

2.3.2 *National Fisheries Policy (1998)*

Fisheries is still an integral part of Bengali life. The fisheries sector accounts for roughly 3.5 percent of Gross Domestic Product (GDP), 11 percent of export earnings and employs over two million people in the various stages of the production process. Furthermore, with fish providing most households with the majority of their animal protein, fishing for domestic consumption is an important part of rural life in Bangladesh.

As with the legal systems of most countries, water resources were placed under the category of *res communis*. Within this framework, the management of water resources and rights of access had largely been achieved through local customs and traditional institutional structures. Even under British rule, when laws began to be put in place, these referred to tradition institutional systems of management. Under this state adopted feudal system (*zamindari*), the ownership of big rivers remained ambiguous with some rivers entirely within the *zamindari* domain whilst in others ownership rights were placed with the central government in Delhi.

The usufructuary rights of the *zamindari* were encapsulated under the Permanent Settlement Act of 1793 (Farooque, 1997). Through this, huge tracts of land (including rivers) called *Mahals* (estates) were permanently settled with *Zamindars* under payment of fixed annual revenue. The water bodies within such *Mahals* were called *Jalmahals* (water estate) and the rent-receiving interests fell to the *Zamindars*. This system remained in place until the government took over rent receiving rights from the *Zamindars* through the State Acquisition and Tenancy Act (1950). Since then, fisheries has become an estate which cannot be retained under private ownership. Today, most of the water bodies in the country are owned and administered by the Ministry of Land (MoL) through the Deputy Commissioners or Collectors of the Districts. Water resources in Bangladesh, under the overall control and ownership of the MoL are, from a fisheries management point of view, defined as open (rivers and streams) or closed water bodies (*beels*, *haors* and *baors*). The basic mechanism for managing fisheries resources in the inland open-waters of Bangladesh has been based on the allocation of fishery rights through periodic leasing. Although recently a licensing system

has been introduced for this, the revenue-oriented traditional leasing system is still the dominant management mechanism.

Originally the leasing system was through an auction. However after protests by fishermen in 1971 the system was changed whereby in the first round the auction was restricted to registered fishermen cooperative societies only. It is generally accepted that there is widespread abuse of the system, with traditional local non-fishermen who previously held leases often excluded unless they come under the patronage of financial and political muscle that sponsors fishermen co-operative societies. As a result, the management and control of *jalmahals* still remains in the hands of local elites. Finally, in 1995, the Prime Minister, as part of an initiative placing the focus on inland fisheries (fisheries fortnight), declared the abolition of the leasing of flowing water bodies (MoFL, 1997).

In part under increased pressure from the NGO community and environmental advocates and as a result of extensive changes to the management of water resources brought about by other Ministries, the GoB embarked on, and completed a re-drafting of its National Fisheries Policy in 1998. The policy sets out the importance of conserving fish breeding grounds and habitats, especially in relation to water management infrastructure such as flood control, irrigation and drainage projects. As such the policies have in the past and may continue to clash, although the NWPo has similar provisions (GoB, 1999: 12, article 4.9).

A specific area of fisheries that has received much attention is that relating to shrimp production. As the sector has grown so has the level of conflict at local level between stakeholders. Under this increased pressure the GoB initiated the development of a specific Shrimp Policy in early 2000. Two draft policies have now been developed one by Bangladesh Fisheries Research Institute and another by the Department of Fisheries. The Ministry of Fisheries has now established a Task Force to assess these documents and produce a final draft policy. This was expected towards the end of 2000 but has yet, in spring 2001, to be formally approved and enacted.

2.3.3 *National Agricultural Policy (1999)*

The main objective of the policy is to maintain food self-sufficiency. As highlighted by Halcrow *et al.* (2000a), this has implications for the NWPo and may be inconsistent with the aims of the NWPo, particularly during times of water scarcity. A related feature is the fact that the National Agricultural Policies (NAPs) drive to self-sufficiency has implications for agro-chemical usage and discharge. Any such increases are in contradiction of the policy's objective to maintain an ecological balance, conserve biodiversity and ensure public health, and the NWPo's stated goal of protection of the environment.

2.3.4 *National Environmental Policy (1992)*

The Bangladeshi Government, worried by the potential problems associated with rapid economic development for the environment, completed the development of its National Environmental Policy in 1992. The GoB has since gone on to establish acts by which the policy can be administered. This included the Environmental Conservation Act of February

1995. The law was enacted for conservation, improvement of quality standards, and control and mitigation of pollution of the environment.

The Act covers a wide range of areas that relate to water resources management in Bangladesh. Key sections under the Act include those that deal with water pollution and fisheries. The Act states that if discharge of any environmental pollutant occurs, or is likely to occur, in excess of the prescribed limit laid down by the Rules, either through accident or other unforeseen events, the person responsible at the place where the discharge occurs is bound to control and mitigate the environmental pollution caused. However, despite such unequivocal statements within the Act, the discharge of untreated industrial waste, including heavy metals, is common and little, if anything, is done to enforce existing policy provisions (Syed, 1998).

In the fisheries sector, the objectives of the Environmental Policy focussed on the conservation of the resource base. It aims to ensure that an appropriate environment exists for the conservation and development of fisheries, to prevent activities that diminish fish habitats, particularly wetland ecosystems and encourage rehabilitative measures in such areas, to ensure that development activities that do take place within the fisheries sector do not have an adverse impact on ecosystems, and to evaluate existing projects on water resources development, flood control and irrigation to determine if any adverse impact on fisheries exists and if so, to determine mitigation measures (Farooque, 1997).

An outline and critique of the key policy documents relating to water resources, fisheries and the environment is given in Annex 1.

3. Water Resources and Livelihoods

Bangladesh is a nation where agricultural production is still the mainstay of the rural population's livelihood system, and therefore its people's livelihoods are still inextricably linked to the nation's water cycle. The nation's water, both above and below ground, provides a multitude of *services* to the population: water to drink, water for irrigation, fish water and for transport and other uses. These resources are the raw materials that support a population with complex, interwoven and overlapping livelihood strategies and they are being placed under increasing stress.

Water resources, present as surface stocks such as lakes or ponds, flows (rivers) or groundwater reserves (aquifers or soil moisture) are all used directly in activities undertaken to sustain a livelihood or, to support ecosystems which in turn support a variety of livelihood activities. The utilisation of these sources by a variety of resource users or "stakeholders" means that multiple interests are operating at any one time. These uses often occur in harmony but can be incompatible, as one use lessens the resource's availability and utility for others downstream. Wisely managed, water means adequate harvests, health, prosperity, peace and a stable environment; badly managed, water brings poverty, disease, disasters, degraded environments, social conflict or dispute and even war. These interactions are shown in *Figure 3.1a*, which is an attempt at a schematic representation of how water

resources and their uses are inter-linked in the activities that constitute the livelihoods of rural people in countries such as Bangladesh. Although abstract, the model is based on the starting point for local people – the use of specific resources (an aquifer, a stream or rainfall) for particular uses (irrigation, fishing and drinking) by specific people (the farmers, fishermen and women).

This is the reality around which decisions on and perceptions of the management and potential of water resources are based; a person is concerned with whether his tubewell will provide enough irrigation water, whether there are fish in the lake or whether the water in a stream is available and clean enough to be used for the family.

These resource-use combinations take place within a local social and institutional setting that is crucial in defining how the resources are managed and allocated, and in particular the form that the rights and entitlements of access to the resources held by different sections of the community take. It also defines norms, customs and obligations that may be as important as the formal institutions in moulding the patterns of resource use and management.

These local-level patterns of management of water resources, and the context within which they take place, interact with and are influenced by the external legal, policy and institutional contexts that determine many aspects of local change and development. This includes the functioning and impact of the specific areas of policy (water, land, fish, environment and others) discussed above, but also includes markets as well as the wider framework of laws, government policies and the actions of government agencies.

Water resources are so central to the lives of rural people in Bangladesh that anything that affects these resources has livelihood implications. These impacts can be immediate and direct, as with the land laws and the policy of leasing *beels* discussed above. They can be indirect or periodic in effects: for example, the policy of building rural roads has had major consequences for the livelihoods of traditional boaters, whilst the embankments on which these roads have been built create major disruptions to hydrological systems (as witnessed in the 1998 floods, where they severely impeded the draining away of flood waters in many places). The intimate inter-weaving of water and livelihoods and the impacts of a wide range of policies means that the traditional perception that water equals floods and water policies equal flood protection does not even begin to provide a meaningful policy framework for understanding water resources-livelihood relationships in Bangladesh. This has, to an extent, been realised in the recent policy and planning changes, but there is still only a limited understanding of the full nature of these relationships in policy and planning circles.

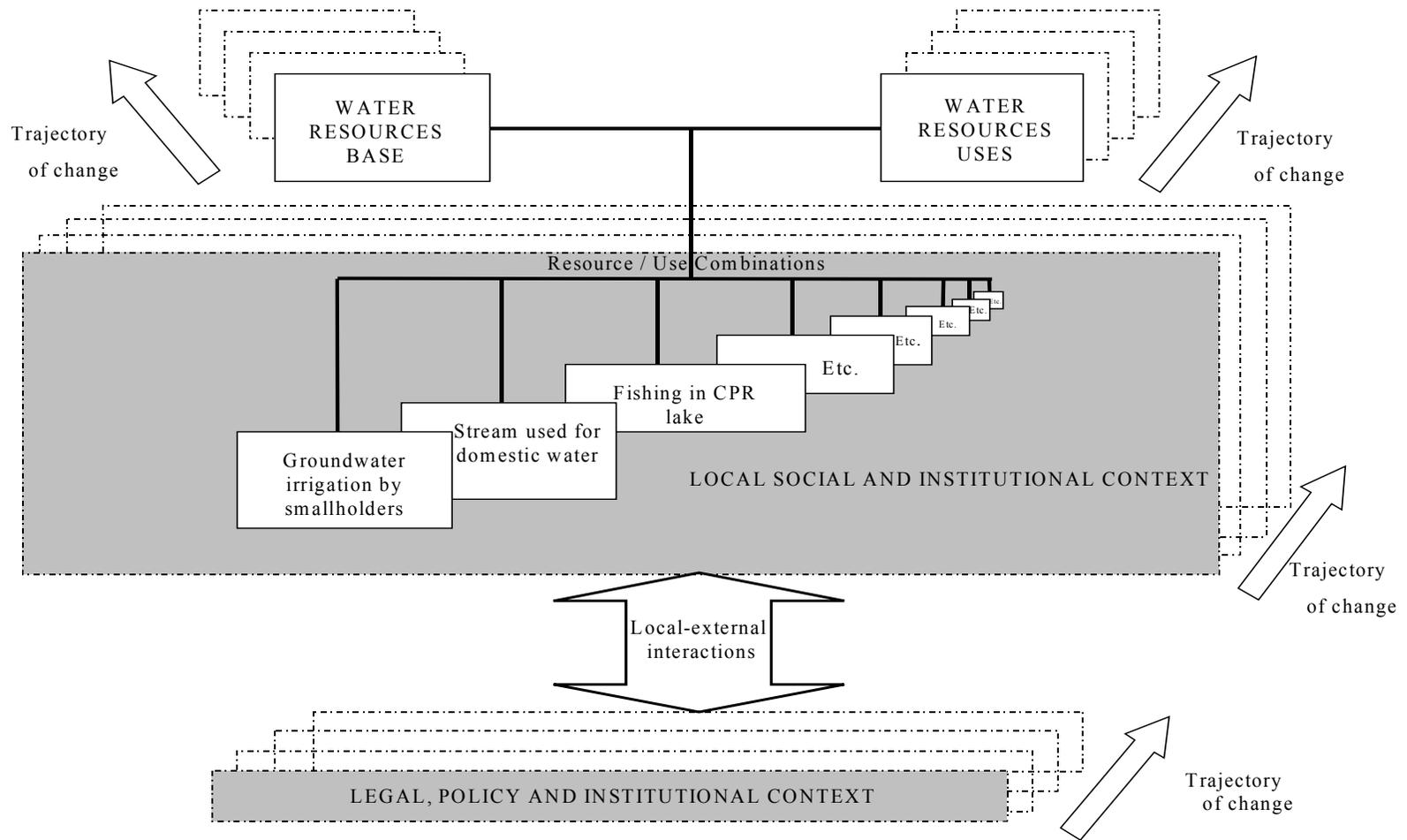


Figure 3.1a: Water Resources-Utilisation Relationships

4. The Policy Process: A Political Narrative

4.1 Formal role and responsibilities of main institutions

The core government organisations relevant to the water sector are shown in *Table 4.1a*. At the highest level is the National Water Resources Council, with representatives from all water-related ministries. This body approves policy prior to presentation before Cabinet.

The WARPO was created by the GoB as the organisation responsible for overall water sector planning for the nation. WARPO's task is to initiate and develop national policies and plans for water resources, ensuring optimum utilisation among various users such as agriculture, fisheries, navigation, public health and industry. WARPO is also charged with collating data collected by the various water sector agencies. However, it is widely acknowledged that WARPO has struggled to fulfil its sectoral planning and coordination role to any great extent and the individual line ministries tend to rely on their own planning departments, which tend to work in isolation from other sectors.

This problem is acknowledged by the government, who are seeking to find solutions through the new approaches being developed by the NWMP. The Plan is intended to identify the needs and priorities for water resources management, the institutional structure through which these resources should be managed and the process through which both institutional reform and priority interventions can be realised. If successful, the NWMP will represent a radical break with the past and provide a framework for the more effective management of these resources in the future. However, as already mentioned, the jury is still out on whether it will achieve this.

At present, major investments in the sector are made by the Ministry of Water Resources through, the BWDB, and by the Ministry of Local Government Rural Development and Co-operation through its LGED. However, other water-related ministries have their own investment programmes. Each of these agencies has, in the past, attracted donor support for projects in a manner that has little coherence and much duplication. It is structural problems such as these that have become the focus of concerns for those involved in the sector's development.

The BWDB, which falls within the MoWR but is operationally independent, was and still is predominantly an engineering, construction-oriented agency. It has a large professional staff, almost all of whom are engineers by training, and a centralised structure which is suited to large scale construction-type activities but far less appropriate for any management functions which require significant devolution of responsibilities and the capacity to respond to local conditions and events. Yet credit must be given where credit is due. A great deal of consideration is being given to profound changes to the institutional arrangements of water resources management within GoB and the search for strategies through which local people can become central actors in water resources management policies and programmes. Whereas in the past government agencies were, for many years, hostile to concepts of local-level involvement in decision-making, today, whilst there are still formidable barriers to the emergence of widespread and sustained participation, there now is at least lip-service paid to

the need for such a process. A consensus has been reached in Bangladesh, at least in principle (albeit with many problems and considerable debate along the way), and this consensus is reflected in the new National Water Policy. The importance of the direction this new policy provides cannot be over-stated.

Table 4.1a: Administrative Structure and Roles within the Water Sector, Bangladesh

Ministry	Organisation	National/Regional							Regional/ Sub-regional							Local rural/Semi rural							Urban				
		Policy	International river basins	National/regional planning and coordination	Laws, regulations rules, guidelines etc	Economic instruments	Research/service/education	Flood warning dissemination	Data collection	Programme planning and coordination	Standards monitoring	Major river maintenance and erosion control	Barrages and transfers	Management of medium/large FCD	River maintenance and erosion control	Large -scale irrigation projects	Local area development planning	Rural/village water supply and sanitation	Management of small water bodies	Minor irrigation	Maintenance of local irrigation	Flood proofing	Management of small-scale FCD	Promotion/education/awareness raising	Urban development planning	Town water supply and sanitation	Flood protection/proofing and drainage
Inter-ministerial	National Water Resources Council	■																									
	Executive Committee of NWRC	■																									
MoWR	National Economic Council																										
	Executive Committee of NEC																										
MoA	Water Resources Planning Organisation	■	■	■	■	■																					
	Joint Rivers Commission		■																								
MoA	Flood Forecasting and Warning Centre																										
	River Research Institute																										
MoA	Surface Water Modelling Centre ¹																										
	Environment and GIS Support to the Water Sector ²																										
MoA	Bangladesh Water Development Board																										
	Bangladesh Agricultural Development Corporation																										
LGRD&C	Department of Agricultural Extension																										
	Soil Resource and Development Institute																										
LGRD&C	Bangladesh Agricultural Research Council																										
	Bangladesh Agricultural Research Institute																										
Works	Bangladesh Rice Research Institute																										
	Local Government Division																										
Science & Tech	Local Government Engineering Department																										
	Department Of Public Health and Engineering																										
MoEF	Dhaka Water Supply and Sanitation Authority																										
	Chittagong WASA																										
MoPS&WT	Rajdhani Unnayan Katipakha																										
	Space Research and Remote Sensing Organisation																										
MoFL	Department of Environment																										
	Department of Forestry																										
MoPlan	Department of Roads and Highways																										
	Bangladesh Inland Water Transport Authority																										
MoL	Department of Fisheries																										
	Planning Commission																										
MRDM	Bangladesh Institute of Development Studies ¹																										
	Bangladesh Bureau of Statistics																										
Other organisations	Ministry of Land																										
	Ministry of Industry																										
Private sector ³	Disaster Management Bureau																										
	LGI: Paurashava																										
Co-operatives	LGI: Parishads																										
	Community-Based Organisations																										
Non-Governmental Organisations	Non-Governmental Organisations																										
	Co-operatives																										

¹ Established as a not-for-profit trust

³ Excluding consultants and contractors

² At present a project to become a Trust in 2001

Indirectly related to water sector activities

Source: Halcrow *et al.*, 2000b, p.36

What has not yet emerged is a robust process through which meaningful participation can be achieved. This is particularly true of government programmes and nowhere is this truer than in the water sector. The history of participation in water resources management programmes is relatively recent. The first concerted attempt to develop a process through which participation could be achieved parallels the FAP process, but was not wholly within FAP. Whilst some FAP projects had participation as central dimensions to their implementation, the core process was through the development of GPP by the BWDB and the main vehicle for this was the SRP, which was not a FAP project. A simultaneous draft developed by FPCO was merged with the one of BWDB to synthesise the 1994 version of GPP.

4.2 Peoples Participation

The initial approaches to participation in the water sector were unsuccessful. Such activities were generally marginal and frequently "added on" to projects, and where they were included, the formulation of these activities was extremely weak. Project's also adopted an approach which aimed to form a dedicated set of local groups, WUGs. However, these tended to be comprised of farmers only, organised around hydrological units.

These failings were compounded by the lack of a clear vision as to why participation was needed in the first place and the failure to introduce needed changes to decision-making authorities within the BWDB which would allow meaningful decisions to be negotiated and followed through at the sub-project level: in effect, where the WUOs did emerge they had no function and quickly became disillusioned. They were also compounded by the fact that only farmers, and not all stakeholders, were involved in the process. This meant that vital issues were excluded from the system and that the participatory process was one which, if it had worked, would frequently have widened, not lessened, local inequalities.

The emerging consensus on the failure of past participatory approaches was reflected in a discussion at a workshop on "People's Participation in the Water Sector: Lessons Learned from Experience" in 1997, where the participants agreed that there had been no real participation in water sector activities in Bangladesh. The participants also suggested that, to ensure a genuine participation of stakeholders, there was a need for representative local government and community leaders and for people to be involved at every level from problem identification, needs assessment, feasibility test, project designing, implementation and operation and maintenance. It was also reported that a meaningful participation should consider the following three issues (Huq, 1998):

- What kind of participation is under consideration?
- Who participates in the process?
- How does participation occur?

In this regard, a recent development is that government is trying to involve people in the planning of projects, particularly in the water sector, so that they would have a greater say in its design and hence a greater sense of ownership. As a consequence of this aim, clarification was provided in the NWPo as to the mandate and responsibilities of the various agencies involved in water resources management such as WARPO, BWDB and LGED. It was felt by government that it was necessary to produce uniform guidelines for participatory water management. The MoWR established an Inter-Agency Task Force with the job of formulating the new guidelines. The Task Force was made up of officials from BWDB, officials and experts from LGED and officials from WARPO. It also included engineers, water resource planners, sociologists, economists, agronomists, and fisheries and gender specialists. The draft guidelines were circulated to professionals and stakeholders in April and revised and presented at a national workshop in May 2000. At present there is no separate Rule or Act for registration of the WUO proposed in the new guidelines and most of the WUOs are unregistered. Some are registered under the Co-operative Societies Ordinance, 1984 and the Cooperative Societies Rules, 1987 (known as the Water

Management Cooperative Association, WMCA). To ensure effective WUOs, the GoB is considering the formulation of a separate and appropriate Act or Rule for registration of the WUOs for participatory water management.

This new paradigm steps away from project to regional level planning and tries to establish what people really want and need with respect to the water sector. The days of top-down and technocratic planning are over and a new direction which will involve people in the development of any major national planning exercise and will lead to an accountable form of government and sustainable development is emerging (Huq, 1998).

5. The Future: A Longer Term View

The last decade has seen the water management policy arena in Bangladesh in an almost permanent state of flux, a trend that shows little sign of abating. The sector has matured greatly and is genuinely more transparent and proactive. There are positive signs that the sorts of institutional reform processes needed to make the policies work are being introduced (if only slowly, and in the face of opposition from some key groups) and there is a wider process of opening up government agencies to influences from NGOs, academics and the wider civil society. There are also some signs of recognising the need for government agencies to break out of their traditional sectoral divisions and work together, but this is as yet only nascent and tremendous challenges remain in creating effective integration. In both of these, the development of water policies and institutional changes need to be seen within the wider social and political context of contemporary Bangladesh. Of critical importance here are the moves towards decentralisation and democratisation discussed above, as there is an increasing recognition of the importance of having institutional capacities at the local level if there is to be effective participation and a meaningful link between local communities and government agencies. The GoB is taking a number of specific steps to develop reform further and a number of policies and related plans are at present being drafted to assist the NWPO in its aims.

5.1 The Development of the National Water Management Plan

The NWMP is at present being finalised. The intention is that it will provide advice on the actions required to successfully implement the policies outlined in the NWPO. WARPO is, with the assistance of external consultants, responsible for the development of the NWMP, which is to outline the strategy, management programme and principal works up to 2025. The work has progressed slowly and has been hit by wrangling over contractual details and the timetable has slipped. The Plan's consultant-led development team, have recently produced a revised Draft Development Strategy report comprising of eleven volumes but this has yet to be formally approved.

There still appears to be opposition to the Plan primarily based on the fact that some feel there has been inadequate consultation between the consultants and government lead agencies. However, it is likely after minor revisions the Strategy will be accepted.

6. How might the livelihood model improve policy?

The purpose of water resource-based policies and those associated with water resources such as fisheries and the environment in Bangladesh is, like those elsewhere and in other sectors, to allow the development of resources in such a way as to maximise the benefits to the population whilst maintaining or enhancing the resources themselves, to bring about sustainable development. A sustainable livelihoods (SL) perspective provides a framework within which to assess the 'fit' between water resource-based policies and rural livelihoods and ultimately poverty alleviation.

The SL framework adds levels of complexity to analysing resource utilisation patterns (in this case (water resources) at the household level and identifying the trade-offs in household decision making by:

- disaggregating the capital assets called upon in production processes,
- identifying the range and depth of barriers to access,
- establishing the factors involved in households decision making within community- and national-level processes and;
- linking these decisions to macro-level policy and internal and external institutional environments.

Water resources policies need to be assessed in terms of the different components of SLs. Those components that are likely to be of greatest importance include capital assets, livelihood strategies and sustainable livelihood outcomes. For example, any analysis of policy should determine the relative importance of capital assets in time and space and determine whether availability and access to these assets have improved as a result of specific water resource policies. The establishment of the relationship between policy and livelihood components will involve the development of indicators. These will need to be carefully determined and go beyond the frequently used targets often set. For example, quantitative information on the number of fishermen's co-operatives who have gained leasing rights to water bodies or the number of water user organisations formed does not provide a robust assessment of policy initiatives to improve the access of local communities, or sections of them, to their local water resources.

References

Adnan, S. and Sufiyan, A.M. (1993) *State of the FAP: Contradictions between Policy Objectives and Plan Implementation*, Research and Advisory Service, Dhaka

Adnan, S., Barrett, A., Alam, S.M.N., Brustinow, A., Rahman, M.A. and Sufiyan, A.M. (1992) *People's Participation, NGOs and the Flood Action Plan - An Independent Review*, Research and Advisory Service, Dhaka

Datta, A. (ed.) (1999) *Planning and Management of Water Resources - Lessons from two Decades of Early Implementation Projects in Bangladesh*, University Press Limited, Dhaka

Farooque, M. (1997) *Regulatory Regime on Inland Fisheries in Bangladesh: Issues and Remedies*, Bangladesh Environmental Lawyers Association (BELA), Dhaka

GoB (1999) *National Water Policy*, Ministry of Water Resources, Dhaka

GoB (2000) *Guidelines for Participatory Water Management*, Ministry of Local Government, Rural Development and Cooperatives, Government of Bangladesh, Dhaka

Halcrow *et al.* (2000a) *National Water Management Plan Project, Draft Development Strategy, Volume No 3, Annex A: Policies*, Water Resource Planning Organisation, Ministry of Water Resources, Government of Bangladesh, Dhaka

Halcrow *et al.* (2000b) *National Water Management Plan Project, Draft Development Strategy, Volume No 2, Main Report*, Water Resource Planning Organisation, Ministry of Water Resources, Government of Bangladesh, Dhaka

Hughes, R., Adnan, S. and Clayton, B.D. (1994) *Floodplains or Flood Plans? A review of approaches to water management in Bangladesh*, Research Advisory Service, Dhaka

Huq, S. (1998) *People's Participation in Water Sector: Lessons Learned from Experience*, Bangladesh Centre for Advanced Studies, Dhaka

MFA (1998) *Bangladesh - Evaluation of the Netherlands Development Programme with Bangladesh, 1972-1996*, Netherlands Ministry of Foreign Affairs, The Hague

MoFL (1997) *National Workshop on Fisheries Resources Development and Management in Bangladesh 29 October 1 November 1995 Dhaka*, Ministry of Fisheries and Livestock, Government of Bangladesh, Dhaka

MoWR (1998) *Overview of Water Resources Management and Development in Bangladesh*, Ministry of Water Resources, Government of Bangladesh, Dhaka

MoWR (1998) *National Water Policy*, Ministry of Water Resources, Government of Bangladesh, Dhaka

MoWR and MoLGRD&C (2000) *Guidelines for Participatory Water Management*, Ministries of Water Resources and Local Government, Rural Development and Cooperatives, Government of Bangladesh, Dhaka

MPO (1991) *Evaluation of Historical Water Resources Development and Implications for the National Water Management Plan Project - Phase II (BGD/85/076)*, Ministry of Irrigation, Water Development and Flood Control, Government of Bangladesh, Dhaka

Soussan, J.G. (1996) *Joint Donor Review of SRP*, World Bank/Netherlands Government/Government of Bangladesh, Dhaka

Soussan, J.G. and Datta, A. (1998) *Community Partnership for Sustainable Water Management: Experiences from the BWDB Systems Rehabilitation Project, Volume I - Summary Report*, University Press Limited, Dhaka

Syed, A.S. (1998) *Introduction to Environmental Laws in Bangladesh*, Ace Data Product, Dhaka

World Bank (1997) *Water Resource Management in Bangladesh: Steps Towards a New National Water Plan*, Dhaka

WSIP (2000) *Water Sector Improvement Project Report*, Ministry of Water Resources, Government of Bangladesh, Dhaka

Annex A: Key Policy Documents: Content and Analysis

Key Policy Documents	Summary of Aims and Objectives	Critique
Water Resources		
National Water Policy, 1999	Overall policy objectives of water use	Not yet adopted by Parliament or backed by an Executive Order
The Groundwater Management Ordinance, 1985	Ordinance empowering Thana Irrigation Committee to determine the granting licenses for groundwater extraction. Deals with installation and spacing of minor irrigation equipment.	Ordinance not enforced at local level and water mining continues in some areas Largely ineffective
Indo-Bangladesh Joint River Commission Statute, 1972	Statute outlining the functions of the Committee. Five functions of which the last refers to ensuring effective joint efforts to maximise the benefit of rivers systems	Functions only at limited "technical" level
Ganges Water Sharing Treaty (1996)	Agreed distribution of Ganges water between India and Bangladesh	
Guidelines for Project Assessment (GPA), 1994		Limited application by donor funded projects
Guidelines for Environmental Impact Assessment (EIA)		Not universally applied
Water Act, 1990	Originally drafted under National water Plan Phase I, and subsequently revised in 1990.	Never reached implementation stage
Bangladesh Irrigation Water Rate Ordinance, 1983	Outlines charges relating to public water distribution for agriculture	Collection of water charges undertaken locally but failure to pass on to the State
Local Government Ordinance, 1983	First attempt at decentralisation of judiciary and administrative system	Was effective but was abandoned by later government
Upzila Parishad Act 1998	Schedule 2 of the Act deals with water resources development, in particularly the planning and management of small-scale water resources scheme.	Since enactment of Act elections have not taken place and the Thana Parishad is still led and dominated by bureaucrats rather than elected members.
Fisheries		
The Protection and Conservation of Fish Act, 1950	An Act to provide for the protection and conservation of fish in Bangladesh	Largely ineffective
The Protection and Conservation of Fish Rules, 1985	Rules governing construction of infrastructure, and the use of chemicals to aid fishing and temporal and spatial limitations of fishing	Largely ineffective
The Private Fisheries Protection Act, 1889	An Act for protection of the right to fish in private waters	Largely ineffective
New Fisheries Management Policy (1996)	Management of the jalmahal (large water bodies). Outlines sharing of the management responsibility between MOL and MOFL	Limited application and enforcement of policy.
The Environment		
Industrial Policy, 1991	Includes as one of its objectives to take appropriate measures to prevent environmental pollution	Largely ineffective
Factories Act, 1965	Outlines arrangements required for the disposal of wastes and effluent	Largely ineffective
Bangladesh Wildlife Order, 1973	Article 23 prohibits the pollution of water bodies in protected areas.	Largely ineffective
Environment Policy, 1992	Outlines the objectives of the GoB regarding the identification and regulation of activities that pollute the environment, and means to ensure sustainable development.	General principles only, implementation is ineffective
Environmental Conservation Act, 1995	Protects water from industrial pollution	DOE largely ineffective as enforcer
Environmental Rules, 1997	Added water quality standard to the Environmental Act	DOE also generally unable to enforce
Future Statutes		
National Water Management Plan (2001?)		
National Shrimp Policy (2000?)		
National Wetlands Policy (2000)		
National Land Use Policy (2000?)		
Revised Guidelines for People's Participation (2000?)		