



National Water Policy

Ministry of Water Resources

Government of the People's Republic of Bangladesh

প্রধানমন্ত্রীর কার্যালয়



PRIME MINISTER
GOVERNMENT OF THE PEOPLE'S REPUBLIC OF
BANGLADESH

FOREWARD

The declaration of the *National Water policy* is a bold step towards good governance in Bangladesh. In the absence of such a policy, much damage has already been done to the bio-diversity and environment of the country. Many adverse and counter-productive situations have been created due to lack of coordination in development programmes and use of water resources. For a water-dependent country like Bangladesh, this situation is highly detrimental to its overall development and this needs to be remedied urgently.

The National Water Policy seeks remedy to this chaotic situation by bringing order and discipline in the exploration, management and use of water resources in Bangladesh. It clearly and unequivocally declares the intention of the government that "all necessary means and measures will be taken to manage the water resources of the country in a comprehensive, integrated and equitable manner." It sets out the objectives of such a policy and provides the broad guidelines for achieving those objectives. The policy has successfully integrated internationally accepted water management principles, norms and standards, with the demanding social and economic needs of a developing country. The true strength of this policy, however, emanates from its decentralized and democratic nature that gives every user the opportunity to vote for the use and sharing of water in an efficient, equitable and environmentally sustainable manner.

The publication of this *Policy* is only the beginning of a long-process of water resources management in the country. Attaining the objectives of the policy would depend largely on quick follow-up action and concerted effort by all concerned agencies and the people in general. I call upon all concerned to implement this *Policy* in right earnest. I hope the National Water Council will oversee its implementation with diligence and determination.

Sheikh Hasina



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PREFACE

Life in riverine Bangladesh is based on water. Availability of water, in both quantitative and qualitative terms, is a basic human right and sound planning is necessary to ensure it. It is an unfortunate fact that we did not have any water policy in the past. All our activities used to be conducted on the basis of our experience and expediency. Now, we have finally come to realise that water is not an infinite bounty of nature. Rather it is a finite resource and it is imperative that we have sound policies and plans for its exploration, development and use to meet the requirements of all users. It was from this realisation that in a meeting of the National Water Council held under the chairmanship of the Hon'ble Prime Minister on March 18, 1997 she gave the directive to formulate the National Water Policy on a priority basis.

The *Policy* has been prepared by our officials and local experts without any assistance from foreign experts. All efforts have been made in the *Policy* to protect all interests by ensuring a neutral perspective. It also contains the objectives of the *Policy* and the actions to be taken to achieve those objectives. This *Policy* attaches special importance to the conjunctive use of ground and surfacewater. Policy indications regarding such issues as overall basinwide planning, water rights and allocation, public and private involvement, public investment, water supply and sanitation, fisheries, navigation, agriculture, industry and environment are also incorporated in the *Policy*. We are happy and proud to be able to publish this *Policy* for the first time during the tenure of the present government.

We have already taken up the formulation of the National Water Management Plan (NWMP). The NWMP will provide necessary advice on follow-up actions to be taken for implementing the policies enunciated in the National Water Policy. It is our expectation that all concerned government and non-government organisations and the people at large will make all out efforts for the implementation of the *Policy* for exploration, development, use and management of water resources of the country.

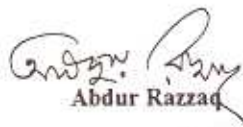

Abdur Razzaq

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1. Introduction

Water is central to the way of life in Bangladesh and the single-most important resource for the well-being of its people. It sustains an extremely fragile natural environment and provides livelihood for millions of people. Unfortunately, it is not infinite and cannot be treated as a perpetual free gift of nature to be used in any manner chosen. The unitary nature of water makes its use in one form affect the use in another. Its availability for sustenance of life, in both quantitative and qualitative terms, is a basic human right and mandates its appropriate use without jeopardising the interest of any member of the society.

Availability of water, including rainwater, surface water, and groundwater, in usable forms calls for its sustainable development, a responsibility that has to be shared collectively and individually by members of the society. Private users of water are the principal agents for its development and management and private investments need to be actively promoted in the water sector, ensuring equal opportunity to all. However, development of water resources often requires large and lumpy capital investment and generates economies of scale, which justifies public sector involvement. Government's role also becomes important because of the necessity of protecting the needs of the society at large and addressing important environmental as well as social issues such as poverty alleviation and human resources development.

Water resources management in Bangladesh faces immense challenge for resolving many diverse problems and issues. The most critical of these are alternating flood and water scarcity during the wet and the dry seasons, ever-expanding water needs of a growing economy and population, and massive river sedimentation and bank erosion. There is a growing need for providing total water quality management (checking salinity, deterioration of surface water and groundwater quality, and water pollution), and maintenance of the eco-system. There is also an urgency to satisfy multi-sector water needs with limited resources; promote efficient and socially responsible water use; delineate public and private responsibilities; and decentralise state activities where appropriate. All of these have to be accomplished under severe constraints, such as the lack of control over rivers originating outside the country's borders, the difficulty of managing the deltaic plain, and the virtual absence of unsettled land for building water structures.

The water policy provided hereunder, lays down the broad principles of development of water resources and their rational utilisation under these constraints. It will help guide both public and private actions in the future for ensuring optimal development and management of water that benefits both individuals and the society at large.

2. Declaration of National Water Policy

As water is essential for human survival, socio-economic development of the country and preservation of its natural environment, it is the policy of the Government of Bangladesh that all necessary means and measures will be taken to manage the water resources of the country in a comprehensive, integrated and equitable manner. The policies enunciated herein are designed to ensure continued progress towards fulfilling the national goals of economic development, poverty alleviation, food security, public health and safety, decent standard of living for the people and protection of the natural environment.

The National Water Policy will be reviewed periodically and revised as necessary. It will guide management of the country's water resources by all the concerned ministries, agencies, departments, and local bodies that are assigned responsibilities for the development, maintenance, and delivery of water and water related services as well as the private users and developers of water resources.

3. Objectives of National Water Policy

The water policy of the government aims to provide direction to all 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:

- a. To address issues related to the harnessing and development of all forms of surface water and ground water and management of these resources in an efficient and equitable manner
- b. To ensure the availability of water to all elements of the society including the poor and the underprivileged, and to take into account the particular needs of women and children
- c. 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
- d. To bring institutional changes that will help decentralise the management of water resources and enhance the role of women in water management
- e. To develop a legal and regulatory environment that will help the process of decentralisation, sound environmental management, and improve the investment climate for the private sector in water development and management
- f. 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

4. National Water Policy

The policies set forth herein are considered essential for addressing the objectives of improved water resources management and protection of the environment. Every public agency, every community, village and each individual has an important role to play in ensuring that the water and associated natural resources of Bangladesh are used judiciously so that the future generations can be assured of at least the same, if not better, availability and quality of those resources.

4.1 River Basin Management

Basin planning provides the most rational basis of development of water resources under the influence of one or more major rivers. International river basins, however, such as the Ganges basin, the Brahmaputra basin, and the Meghna basin present special problems. Due to its location as the lower-most riparian, Bangladesh has no control over the rivers entering through its borders. The adverse effects of this are the floods and water scarcity, which occur frequently. Although the 1996 Treaty on Sharing of the Ganges Waters with India has brought some relief to the drought-prone area of the southwest, the water shortage problem during the dry season is likely to aggravate in the Ganges and other basins with rising demands of the increasing population. It is, however, encouraging to note that the relevant provision of the treaty will provide the basis in the future for discussion on sharing of waters of the common rivers.

It may take considerable effort and time for Bangladesh to work out joint plans for different river basins with other co-riparian countries. As a long-term measure, therefore, it is the policy of the government to undertake essential steps for realising basin-wide planning for development of the resources of the rivers entering its borders.

The Government will endeavour to enter into agreements with co-riparian countries for sharing the waters of international rivers, data exchange, resource planning and long-term management of water resources under normal and emergency conditions of flood, drought and water pollution. While moving towards the attainment of basin-wide plans in the long run, it will also be necessary for Bangladesh to concentrate on the development of individual hydrological areas to meet short and intermediate term requirements.

The policy of the Government of Bangladesh, in the short and intermediate term, for fostering international cooperation in water management is, in italics letter, to:

- a. Work with co-riparian countries to establish a system for exchange of information and data on relevant aspects of hydrology, morphology, water pollution, ecology, changing watershed characteristics, cyclone, drought, flood warning, etc., and to help each other understand the current and emerging problems in the management of the shared water sources.
- b. Work with co-riparian countries for a joint assessment of all the international rivers flowing through their territories for better understanding of the overall basins' potentials.
- c. Work jointly with co-riparian countries to harness, develop, and share the water resources of the international rivers to mitigate floods and augment flows of water during the dry season.
- d. Make concerted efforts, in collaboration with co-riparian countries, for management of the catchment areas with the help of afforestation and erosion control for watershed preservation and reduction of land degradation.
- e. Work jointly with co-riparian countries for the prevention of chemical and biological pollution of the rivers flowing through these countries, by managing the discharge of industrial, agricultural and domestic pollutants generated by human action.
- f. Seek international and regional cooperation for education, training, and research in water management.

4.2 Planning and Management of Water Resources

The Government recognizes that the process of planning and managing water resources requires a comprehensive and integrated analysis of relevant hydrological, topographical, social, political, economic, environmental and institutional factors across all related water-using sectors.

The intricate nature of drainage systems within the country requires that activity for planning and management of the nation's river systems is undertaken within the context of hydrological regions. The principal river systems create natural boundaries for these regions. The hilly areas of the east form another hydrological region.

Henceforth, to address these issues the policy of the Government will be as follows:

- a. The Water Resources Planning Organisation (WARPO) will delineate the hydrological regions of the country, based on appropriate natural features, for planning the development of their water resources.
- b. WARPO will prepare, and periodically update, a National Water Management Plan (NWMP) addressing the overall resource management issues in each region and the whole of Bangladesh, and providing directions for the short, intermediate, and long runs. The plan will be executed by different agencies as determined by the Government from time to time.

- c. The NWMP and all other related plans will be prepared in comprehensive and integrated manner, with regard for the interests of all water-related sectors. The planning methodology will ensure co-operation across sectors and people's participation in the process.

Within the macro framework of the NWMP:

- d. Sector agencies of the Government and local bodies will prepare and implement sub-regional and local water-management plans in conformance with the NWMP and approved Government project appraisal guidelines. The Executive Committee of the National Water Resources Council (ECNWRC) will resolve any interagency conflict in this regard.
- e. The Bangladesh Water Development Board (BWDB) will implement all major surface water development projects and other FCDI projects with command area above 1000 hectares. The Local Government will implement FCDI projects having a command area of 1000 hectares or less after identification and appraisal through an interagency Project Appraisal Committee. Any interagency dispute will be resolved by means prescribed by the Government.
- f. The participation of all project affected persons, individually and collectively, will be ensured in the planning, design, implementation, and operation and maintenance (O&M) of publicly funded surface water resources development plans and projects. Local Governments (Parishads) will be the principal agencies for coordinating these efforts. Community level self-help groups (private) and Non-Government Organisations will also be relied on to assist in the participatory process.

The Government will further:

- g. Frame rules, procedures, and guidelines for combining water-use and land-use planning
- h. Frame, and periodically revise, the rules, procedures and guidelines on all aspects of water management
- i. Make social and environmental assessments mandatory in all plan development

Through its responsible agencies, the Government will:

- j. Undertake comprehensive development and management of the main rivers through a system of barrages and other structural and non-structural measures
- k. Develop water resources of the major rivers for multipurpose use, including irrigation, fisheries, navigation, forestry, and aquatic wildlife
- l. De-silt watercourses to maintain navigation channels and proper drainage
- m. Delineate water-stress areas based on land characteristics and water availability from all sources for managing dry season demand
- n. Take steps to protect the water quality and ensure efficiency of its use

- o. Develop early warning and flood-proofing systems to manage natural disasters like flood and drought
- p. Designate flood risk zones and take appropriate measures to provide desired levels of protection for life, property, vital infrastructure, agriculture and wetlands. In this regard the following principles will guide future action:
 - i. Regions of economic importance such as metropolitan areas, sea and air ports, and export processing zones will be fully protected against floods as a matter of first priority. Other critical areas such as district and upazila towns, important commercial centers, and places of historical importance will be gradually provided reasonable degree of protection against flood. In the remaining rural areas, with the exception of those already covered by existing flood control infrastructure, the people will be motivated to develop different flood proofing measures such as raising of platform for homesteads, market places, educational institutions, community centers, etc., and adjusting the cropping pattern to suit the flood regime.
 - ii. In future all national and regional highways, railway tracks, and public buildings and facilities will be constructed above the highest ever-recorded level of flood in the country. This principle will also apply in cases of reconstruction of existing structures of this nature.
 - iii. All plans for roads and railways embankment will adequately provide for unimpeded drainage.
- q. Undertake survey and investigation of the problem of riverbank erosion and develop and implement master plans for river training and erosion control works for preservation of scarce land and prevention of landlessness and pauperisation.
- r. Plan and implement schemes for reclamation of land from the sea and rivers.

4.3 Water Rights and Allocation

The ownership of water does not vest in an individual but in the state. The Government reserves the right to allocate water to ensure equitable distribution, efficient development and use, and to address poverty. The Government can redirect its use during periods of droughts, floods, cyclones, and other natural and man-made disasters, such as contamination of groundwater aquifers that threaten public health and the ecological integrity. Allocation rules will be the formal mechanism for deciding who gets water, for what purpose(s), how much, at what time, for how long, and under what circumstances water use may be curtailed. Rules for water allocation will be developed for in-stream needs (ecological, water quality, salinity control, fisheries and navigation) during low-flow periods; for off-stream withdrawal (irrigation, municipal and industrial, power), and for groundwater recharge and abstraction. Allocation for non-consumptive use (e.g. navigation) would imply ensuring minimum levels in water bodies used for that purpose.

Henceforth, the policy of the Government to regulate the use of water, where required, will be exercised in the following manner:

- a. The Government will exercise its water allocation power in identified scarcity zones on the basis of specified priorities.
- b. In general, the priority for allocating water during critical periods in the water shortage zones will be in the following order: domestic and municipal uses, non-consumptive uses (e.g. navigation, fisheries and wild-life), sustenance of the river regime, and other consumptive and non-consumptive uses such as irrigation, industry, environment, salinity management, and recreation. The above order of priority could however be changed on specific socio-economic criteria of an area by local bodies through local consensus.
- c. For sustaining rechargeable shallow groundwater aquifers, the Government will regulate the extraction of water in the identified scarcity zones with full public knowledge.
- d. Specific drought monitoring and contingency plans will be prepared for each region experiencing recurrent seasonal shortages of water with due consideration to conjunctive use of rainwater, surface water and ground water and alternative ways of satisfying demand. The contingency plan will include action to limit the use of groundwater according to priorities. Appropriate provisions of law should be made to protect specific users' rights in these extreme cases.
- e. The Government may empower the local government or any local body it deems fit, to exercise its right to allocate water in scarcity zones during periods of severe drought, and it will monitor the water regime and enforcement of the regulations through specifically designed mechanisms.
- f. The Government may confer water rights on private and community bodies to provide secure, defensible and enforceable ownership/usufructuary rights to ground water and surface water for attracting private investment.
- g. In specifying surface water rights, the minimum requirement of stream-flow for maintaining the conveyance channel will be ensured.

4.4 Public and Private Involvement

Water resources management requires involvement of the public and private sectors, communities and individuals that benefit from the delivery of water-related services. The ultimate success and effectiveness of public water resources management projects depends on the people's acceptance and ownership of each project. It is important to delineate the roles and responsibilities of every one involved in water resources management. The principle that community resources should be managed by the community concerned, alongwith local government institutions unless a greater national interest prevails, should guide water resource

management. It is recognised that women have a particular stake in water management because they are the principal providers and carriers of water, main caretaker of the family's health, and participants in many stages of pre and post harvest activities. The policies of the Government regarding the respective roles of the public and private sectors are:

- a. Government's investments in water programme will be directed towards creation of public goods or for addressing specific problems of market failure and protecting particular community interests.
- b. Policies and programmes of any public agency involving water resources will be coordinated with the policies and programmes of all other public and private bodies to build synergy and avoid conflict.
- c. Public water institutions will, to the extent feasible, use private providers of specific water resources services in carrying out their mandates, giving preference to beneficiary groups and organisations.
- d. The management of public water schemes, harring municipal schemes, with command area up to 5000 ha will be gradually made over to local and community organisations and their O&M will be financed through local resources.
- e. Public water schemes, harring municipal schemes, with command area of over 5000 ha will be gradually placed under private management, through leasing, concession, or management contract under open competitive bidding procedures, or jointly managed by the project implementing agency alongwith local government and community organisations.
- f. Ownership of FCD and FCDI projects with command area of 1000 ha or less will gradually be transferred to the local governments, beginning with the ones that are being satisfactorily managed and operated by the beneficiary/ community organisations.
- g. Appropriate public and private institutions will provide information and training to the local community organisations for managing water resources efficiently.
- h. Enabling environment will be created for women to play a key role in local community organisations for management of water resources.
- i. Government, where appropriate, will restructure its present institutions and design all future institutions for efficient implementation of the above policies.

4.5 Public Water Investment

The Government considers that a consistent and uniformly applied analytical framework for project appraisal is essential to equitable, efficient and effective water resources management. A true multi-objective analysis of the water needs of an area, and the formulation of options for investment and management must consider the interrelations among different sources of water, different management schemes and the interaction between needs of different users and

purposes. Investments in infrastructure may displace people and disturb ecosystems and, as such, broader water resources planning assessments and specific project appraisals must consider these cross-sectoral implications.

The policy of the Government in this regard is to ensure that:

- a. Water resource projects, as far as possible, are developed as multipurpose projects with an integrated multi-disciplinary approach from planning to implementation to monitoring.
- b. Planning and feasibility studies of all projects will follow the Guidelines for Project Assessment (GPA), the Guidelines for People's Participation (GPP), the Guidelines for Environmental Impact Assessment (EIA), and all other instructions that may be issued from time to time by the Government.
- c. All relevant analytical procedures and evaluation methods, such as mathematical modelling, physical modelling, cost-benefit analysis, risk analysis and multi-criteria decision making are routinely used as part of water resources planning and project appraisal.
- d. Public water projects are designed with specific provision for future disinvestment, if and when feasible.
- e. Interests of low-income water users, and that of women, are adequately protected in water resource management.
- f. There is continuous updating and archiving of water resource data and basic information by relevant public sector agencies.

4.6 Water Supply and Sanitation

The rural areas of Bangladesh suffer from lack of quality drinking water. Surface water supplies are generally polluted and groundwater, which till now had been the best source of safe drinking water, is contaminated with arsenic in many parts of the country. Heavy withdrawals of groundwater for irrigation have also lowered the water table in many areas below the effective reach of hand tubewells. Seepage of agro chemicals into shallow aquifers may also pollute water for human and animal consumption. Salinity intrusions from seawater deep into the land in the southwest are rendering groundwater unfit for consumption. Cities and urban areas too are facing the problem of receding water table due to heavy groundwater extraction. These water supply and sanitation problems have obvious implications for public health. Diarrheal diseases, arising largely from drinking unsafe water, are a leading cause of death in the rural areas. Lack of proper sanitation and drainage facilities, inadequate water supply, and insufficient health and hygiene education are the primary causes of diseases in the urban areas. Lack of access to safe water supply in the rural areas is a special hardship for women who have to carry water over long distances, with significant impact on their health and productivity.

To address these problems, it is the policy of the Government to:

- a. Facilitate availability of safe and affordable drinking water supplies through various means, including rainwater harvesting and conservation.
- b. Preserve natural depressions and water bodies in major urban areas for recharge of underground aquifers and rainwater management.
- c. Mandate relevant public water and sewerage institutions to provide necessary drainage and sanitation, including treatment of domestic wastewater and sewage and replacement of open drains and construction of sewers, in the interest of public health.
- d. Empower, and hold responsible, municipalities and urban water and sewerage institutions to regulate the use of water for preventing wastage and pollution by human action.
- e. Mandate local governments to create awareness among the people in checking water pollution and wastage.

4.7 Water and Agriculture

Support of private development of groundwater irrigation for promoting agricultural growth will continue, alongside surface water development where feasible. But there will be a renewed focus towards increasing efficiency of water use in irrigation through various measures including drainage-water recycling, rotational irrigation, adoption of water conserving crop technology where feasible, and conjunctive use of groundwater and surface water.

Water allocations in irrigation systems have to be done with equity and social justice. At the same time, serious consideration should be given to non-point pollution of water systems by fertilizer and pesticides that are either leached to the groundwater or washed off the fields to rivers and lakes. For this purpose, the policy of the Government is to:

- a. Encourage and promote continued development of minor irrigation, where feasible, without affecting drinking water supplies
- b. Encourage future groundwater development for irrigation by both the public and the private sectors, subject to regulations that may be prescribed by Government from time to time.
- c. Improve efficiency of resource utilisation through conjunctive use of all forms of surface water and groundwater for irrigation and urban water supply.
- d. Strengthen crop diversification programmes for efficient water utilisation.
- e. Strengthen the regulatory system for agricultural chemicals that pollute ground and surface water, and develop control mechanism for reducing non-point pollution from agro-chemicals.
- f. Strengthen appropriate monitoring organisations for tracking groundwater recharge, surface and groundwater use, and changes in surface and groundwater quality.

4.8 Water and Industry

Excessive water salinity in the southwest region is a major deterrent to industrial growth. Also, pollution of both surface and groundwater around various industrial centers of the country by untreated effluent discharge into water bodies is a critical water management issue. The policy of the Government in this regard is that:

- a. Zoning regulations will be established for location of new industries in consideration of fresh and safe water availability and effluent discharge possibilities.
- b. Effluent disposal will be monitored by relevant Government agencies to prevent water pollution.
- c. Standards of effluent disposal into common watercourses will be set by WARPO in consultation with DOE.
- d. Industrial polluters will be required under law to pay for the cleanup of water body polluted by them.

4.9 Water and Fisheries and Wildlife

Fisheries and wildlife are integral aspects of economic development in Bangladesh and strongly linked to advancement of target groups, poverty alleviation, nutrition, and employment generation. Availability of water for fisheries is thus important from the point of view of sustenance as well as commercial ventures. It is, therefore, the policy of the Government that:

- a. Fisheries and wildlife will receive due emphasis in water resource planning in areas where their social impact is high.
- b. Measures will be taken to minimise disruption to the natural aquatic environment in streams and water channels.
- c. Drainage schemes, to the extent possible, will avoid state-owned swamps and marshes that have primary value for waterfowl or other wildlife.
- d. Water bodies like baors, haors, beels, roadside borrow pits, etc. will, as far as possible, be reserved for fish production and development. Perennial links of these water bodies with the rivers will also be properly maintained.
- e. Water development plans will not interrupt fish movement and will make adequate provisions in control structures for allowing fish migration and breeding.
- f. Brackish aquaculture will be confined to specific zones designated by the Government for this purpose.

4.10 Water and Navigation

Inland navigation is of substantial economic importance to Bangladesh because its numerous watercourses provide the cheapest means of transportation. Siltation, however, has disrupted river communications in many water channels. De-siltation of these channels is required not only to restore their navigational capability but also to assist surface drainage. The policies of the Government in this regard are:

- a. Water development projects should cause minimal disruption to navigation and, where necessary, adequate mitigation measures should be taken.
- b. Minimum stream-flows in designated rivers and streams will be maintained for navigation after diversion of water for drinking and municipal purposes.
- c. Dredging and other suitable measures would be undertaken, wherever needed, to maintain navigational capability of designated waterways.

4.11 Water for Hydropower and Recreation

Bangladesh has limited potential for hydropower due to its flat terrain and the absence of suitable reservoir area. However, it may be possible to build mini hydropower plants at small dam and barrage sites. A major environmental concern of hydropower development is the impediment to a river's natural flow imposed by structures built on it. A hydropower facility may be restrictive for fish movement also.

Use of water for recreational purposes is useful for developing tourism facilities. Introducing these facilities at the sites of reservoirs, lakes, dighis (big ponds), sea resorts, etc., would help the tourism industry of the country. The policy of the Government is therefore that:

- a. Mini-hydropower development schemes may be undertaken provided they are economically viable and environmentally safe.
- b. Recreational activities at or around water bodies will be allowed provided it is not damaging to the environment.

4.12 Water for the Environment

Protection and preservation of the natural environment is essential for sustainable development. Given that most of the country's environmental resources are linked to water resources, it is vital that the continued development and management of the nation's water resources should include the protection, restoration, and preservation of the environment and its bio-diversity including wetlands, mangrove and other national forests, endangered species, and the water quality. Accordingly, water resource management actions will take care to avoid or minimise environmental damages.

Water quantity and water quality issues are uniquely linked. Poor water quality affects the availability of fresh water for different uses. Contamination of surface water bodies and groundwater aquifers by agricultural pollutants, industrial discharge, domestic pollution, and non-point source urban runoff exacerbate water quality problems and endanger both natural ecosystem integrity and public health. Other environmental problems include: excessive soil erosion and sedimentation, waterlogging and salinisation of agricultural land, groundwater depletion, watershed degradation and deforestation, reduction of biodiversity, wetland loss, saltwater intrusion, and coastal zone habitat loss.

Henceforth, all agencies and departments entrusted with water resource management responsibilities (regulation, planning, construction, operation, and maintenance) will have to enhance environmental amenities and ensure that environmental resources are protected and restored in executing their tasks. Environmental needs and objectives will be treated equally with the resources management needs. It is, therefore, the policy of the government that all water management agencies and related natural resources departments will:

- a. Give full consideration to environmental protection, restoration and enhancement measures consistent with the National Environmental Management Action Plan (NEMAP) and the National Water Management Plan (NWMP).
- b. Adhere to a formal environmental impact assessment (EIA) process, as set out in EIA guidelines and manuals for water sector projects, in each water resources development project or rehabilitation programme of size and scope specified by the Government from time to time.
- c. Ensure adequate upland flow in water channels to preserve the coastal estuary eco-system threatened by intrusion of salinity from the sea.
- d. Protect against degradation and resuscitate natural water-bodies such as lakes, ponds, beels, khals, tanks, etc. affected by man-made interventions or other causes.
- e. Completely stop the filling of publicly-owned water bodies and depressions in urban areas for preservation of the natural aquifers and environment.
- f. Take necessary steps to remove all existing unauthorised encroachments on rivers and watercourses and to check further encroachments that cause obstructions to water flows and create environmental hazards.
- g. Stop unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land.
- h. Encourage massive afforestation and tree coverage specifically in areas with declining water table.
- i. Enforce the "polluter pay" principle in the development of regulatory guidelines for all regulatory actions designed to protect public health and the environment.
- j. Provide education and information to the industrial and farming communities on self-administered pollution control mechanisms and their individual and collective responsibilities for maintaining clean water sources.

4.13 Water for Preservation of Haors, Baors, and Beels

Water bodies like haors, baors, and beels are precious assets of Bangladesh with unique regional characteristics. Apart from their scenic beauty, they have great economical and environmental value. Even during extremely dry seasons, when the smaller beels turn into quagmires, the haors and the baors retain considerable amount of water. These water bodies account for a large share of the natural capture fisheries and provide a habitat for a wide variety of aquatic vegetation and birds. They also provide sanctuary to migratory birds during winter. The haors and the beels usually connect to some adjoining river through khals.

In the past, many beels have been drained through engineering interventions and turned into cropland for immediate gains. The adverse effects of such interventions have been deleterious to the environment. They have destroyed the fish and aquatic vegetables that thrive in these wetlands and are important in the diet of the rural poor. They have also blocked the flow of wastes, discharged from the flood plains and domestic sources, which naturally move out of the beels through the khals into the river's drainage system. Only submersible dikes have provided tangible benefits in certain haor areas by enabling cultivation of high yielding variety boro rice.

The Government believes that in order to assist the natural processes of groundwater recharge, maintenance of aquatic life and ecological balance, disposal of wastes through the dynamic river system, and for turning the huge water bodies into recreational areas, their planned development is essential.

It is, therefore, the policy of the Government that:

- a. Natural water bodies such as beels, haors, and baors will be preserved for maintaining the aquatic environment and facilitating drainage.
- b. Only those water related projects will be taken up for execution that will not interfere with the aquatic characteristics of those water bodies.
- c. Haors that naturally dry up during the winter will be developed for dry season agriculture.
- d. Take up integrated projects in those water bodies for increasing fish production.
- e. Natural water bodies will be developed, where possible, for recreational use in support of tourism.

4.14 Economic and Financial Management

Changes are required in the system of prices and other economic incentives affecting water demand and supply in Bangladesh. Unless the users pay a price for water, there will be a

tendency to misuse and deplete it under scarcity conditions. Desirable practices such as conjunctive use, water-saving agricultural and industrial technologies, water harvesting, water transfers, and water recycling, both within and between sectors, will emerge only when users perceive the scarcity value of water.

A system of cost recovery, pricing, and economic incentives/disincentives is necessary to balance the supply and demand of water. Cost recovery of services such as flood control, drainage, irrigation, and wastewater treatment has not been considered adequately. Failure to recover O&M cost leads to decline of service quality and deterioration of the system. This, in turn, makes the consumers less willing to pay for the deteriorating services. An important principle, for the long-term, in this regard is that public service agencies should be converted into financially autonomous entities, with effective authority to charge and collect fees. The participation of users in managing and maintaining water facilities and operations is an important element of financial accountability. It is, therefore, the policy of the Government that:

- a. Water will be considered an economic resource and priced to convey its scarcity value to all users and provide motivation for its conservation. For the foreseeable future, however, cost recovery for flood control and drainage (FCD) projects is not envisaged in this policy. In case of flood control, drainage, and irrigation (FCDI) projects water rates will be charged for O&M as per Government rules.
- b. Relevant public water supply agencies will be gradually given authority to charge for their services.
- c. Recovery of O&M cost will, as far as possible, be made through private collection means such as leasing and other financial options. Beneficiaries and other target groups will be given preference for such contracts.
- d. The pricing structure will match the goals and needs of the water provider and the population served. Water rates will be lower for basic consumption, increasing with commercial and industrial use. The rates for surface and groundwater will reflect, to the extent possible, their actual cost of delivery.
- e. Water charges realised from beneficiaries for O&M in a project would be retained locally for the provision of services within that project.
- f. Effective beneficiary participation and commitment to pay for O&M will be realised at the project identification and planning stages by respective public agencies.
- g. Appropriate financial incentives will be introduced for water re-use and conservation, responsible use of groundwater, and for preventing overexploitation and pollution.

4.15 Research and Information Management

Informing policy makers of the choice of appropriate technology to meet policy goals and make them aware of their significance and impact is an essential requirement of a dynamic water

management policy. It is important to reach a common understanding between specialists, planners, politicians and the general public about the changing environment and the optimal ways and means of achieving the national water management goals. As management decisions become increasingly complex and information-sensitive, the demand for supporting research and information management increases:

It is the policy of the Government in this regard to:

- a. Develop a central database and management information system (MIS) consolidating information from various data collection and research agencies on the existing hydrological systems, supply and use of national water resources, water quality, and the eco-system.
- b. Restructure and strengthen, where appropriate, water resource and agriculture research institutions to undertake systematic research and analysis of water and land management issues and problems arising both nationally and internationally.
- c. Investigate thoroughly important flood control and management issues, such as the efficacy of coastal polders, for guiding future policy on structural interventions.
- d. Investigate important sociological issues, such as the phenomenon of interference with water structures (e.g. public cuts), and the motives and conflicting interests behind them, to assist the process of building public support and acceptance of government water management programmes.
- e. Strengthen and promote the involvement of public and private research organizations and universities to:
 - i. Develop and disseminate appropriate technologies for conjunctive use of rainwater, ground water and surface water.
 - ii. Develop and promote water management techniques to prevent wastage and generate efficiency of water and energy use.
 - iii. Produce skilled professionals for water management.

4.16 Stakeholder Participation

Decisions regarding water resources management can affect nearly every sector of the economy and the public as a whole, and stakeholder participation should be established in a form that elicits direct input from people at all levels of engagement. Stakeholder involvement should be an integral part of water resources management, at all stages of the project cycle. Towards that objective there should be a complete reorientation of the institutions for increasing the role of stakeholders and the civil society in decision making and implementation of water projects. The Government has to be at the core of the effort to help build the local institutions and to impart a precise awareness of the issues and an unambiguous understanding of their role in water management. Similarly, Government must lead the effort to ensure greater participation of women in this endeavour.

In order to ensure that all stakeholders actively and fruitfully participate in water resources management decision making at all stages, it is the policy of the Government that:

- a. The "Guidelines for People's Participation (GPP) in Water Development Projects" be adhered to as part of project planning by all institutions and agencies involved in public sector management of water resources.
- b. Guidelines for formation of water user groups (WUG) and similar community organisations will be formulated.
- c. Generally 25 percent of the earthwork of any public water project will be offered to specific target groups or beneficiaries.
- d. All opportunities are explored and efforts undertaken to ensure that the landless and other disadvantaged group are directly involved in participatory management of local water resources.
- e. New projects proposed by a community or local institution will be considered for implementation on a priority basis only when the beneficiaries have mobilised a certain percentage of the total cost as their contribution to the project.

5. Institutional Policy

The governance and management of the national water resources require a great deal of coordination of existing institutions and in some cases reform and creation of new community-based institutions. Water resources management extends across many water using sectors as well as political jurisdictions and geographically and hydrologically diverse areas. Properly functioning institutions are essential for effective implementation and administration of the country's water and related environmental resource management policies and directives.

The Government will restructure and strengthen, where appropriate, the existing institutions to ensure that the agenda for reform and the action plan is implemented efficiently. Two important principles will govern institutional restructuring. Firstly, there should be separation of policy, planning, and regulatory functions from implementation and operational functions at each level of government. Secondly, each institution must be held accountable for financial and operational performance.

It is the policy of the Government that:

- a. The Government will formulate a framework for institutional reforms to guide all water sector related activities. It will periodically review the mandates of all water sector institutions and redefine their respective roles, as necessary, to ensure efficient and effective institutions commensurate with changing needs and priorities.
- b. The National Water Resources Council (NWRC) will coordinate all water resources management activities in the country, and particularly:
 - i. Formulate policy on different aspects of water resource management.
 - ii. Provide directions for optimal development and utilisation of the national water resources.
 - iii. Oversee the preparation and implementation of the National Water Management Plan.
 - iv. Provide directions on the development of efficient institutions for managing the water resources.
 - v. Provide policy directives for appropriate coordination among different water sector agencies.

- vi. Look after any other water resource management matter that may require its attention.
- c. The Executive Committee of the National Water Resources Council (ECNWRC) will have the following responsibilities:
 - i. It will provide directives on all matters relating to the planning, management, and coordination of water resources across all sectors, as may be required by the NWRC.
 - ii. It will guide water management institutions at the national, regional, and local levels in the formulation and implementation of policies and plans for improved water management and investment.
 - iii. It will apprise and advise the National Water Resources Council periodically on matters of water resource management.
 - iv. It will undertake any other function, as may be required from time to time, by the NWRC.
- d. WARPO will be the exclusive government institution for macro-level water resource planning. It will also serve as the Executive Secretariat of the ECNWRC with the following principal responsibilities:
 - i. Providing administrative, technical, and legal support to the ECNWRC.
 - ii. Advising the ECNWRC on policy, planning, and regulatory matters of water resources and related land and environmental management.
 - iii. Preparing and periodically updating the National Water Management Plan for approval of the NWRC.
 - iv. Setting up and updating the National Water Resources Database (NWRD) and Information Management System.
 - v. Acting as a "clearing house" for all water sector projects identified by different agencies and reporting to the ECNWRC on their conformity to the NWMP.
 - vi. Undertaking any special study, as may be required by the ECNWRC, for fulfilling the objectives and programmes envisaged in the National Water Policy and the Bangladesh Water and Flood Management Strategy.
 - vii. Performing any other function as may be assigned to it from time to time by the Government.
- e. The Government will lead the effort towards developing grassroot institutions, in conjunction with the civil society, for managing water resources at community levels.
- f. Public water projects will include a training component for transfer of knowledge and technology to the users that will be monitored by the executing agency at every stage of the project work.

6. Legislative Framework

Setting the appropriate legislative framework is fundamental to effective implementation of the water policy. The existing legislation related to any form of water management in Bangladesh requires supplementing in a number of key areas. This policy will be given effect through a National Water Code encoding specific provisions of the water policy to facilitate its implementation.

The policy of the Government in this regard is:

- a. To periodically review the provisions of the body of laws and regulations that have an impact on water resource management and to recommend changes and amendments in them for efficient coordination of the work of different water-related sub-sectors;
- b. To enact a National Water Code revising and consolidating the laws governing ownership, development, appropriation, utilisation, conservation, and protection of water resources.