Flood management in Bangladesh

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Background

Bangladesh is the lowest riparian to the following 3 (three) main Rivers:

- The Ganges
- The Bramhaputra
- The Meghna

The large majority of the annual runoff enters into the country from outsides of its border
The over bounce of water in the monsoon brings in its devastating floods, erosion of land and vagaries of the braided and meandering rivers



The Ganges-Brahmaputra-Meghna Basins



- Annual Sediment Transport
 - □ The Ganges-Padma:886 Mtons
 - □ The Brahmaputra: 600 Mtons
 - □ The Meghna: 1 Mtons



Floods differ in
location
timing
intensity
duration

Floods are of four types:

a) River floods

b) Rainfall floods

c) Flash floods

d) Tidal floods.



Floods inundate about one-fifth of the country each year



Extreme Flood

In extreme events, more than 60% of the country is flooded.

Flash Flood

Pre-monsoon flash floods also occur in the NE, SE & Northern region



Tidal Flood



The coastal areas of Bangladesh is susceptible to tidal floods.

Historical Flood Events

Historical floods are not well recorded Professor Mahalnabish prepared report on 1922 flood This report says ♦ 25 floods occurred during 1870-1922 ♦ 8 floods were severe No dependable record available for period 1923-53, except for 1931 flood Floods occurred after 1954 well recorded

Historical Flood Events

Severe floods occurred in 1954, 55, 73, 87, 88, 98



Comparison of flooded area

YEAR	INUNDATED AREA (Sq. km)	PERCENTAGE OF AREA (%)
1954	>50,000	34
1955	50,500	34
1971	36,300	25
1974	52,600	36
1987	57,300	39
1988	89,970	61
1998	1,00,250	68
2004	56,000	38

Flood Management Initiative



Catastrophic floods of 1954 and 1955 led the Government to undertake flood control measures, following the recommendation of the Krugg Mission

At present BWDB is the major organization to deal with the countries flood management and drainage improvement. Presently the following skilled and supporting professionals are working under BWDB.

Sl. No.	Category	Manpower	Remarks
1	Engineer	519	B.Sc Engineer
		752	Diploma
2	Water Management	59	
3	Administrative	130	
4	Economic	20	
5	Finance Audit & Accounts	61	
6	Land & Revenue	17	
7	Non Cadre (grade-1)	49	
	Sub Total	1607	
8	Other Support Staff	7302	
	Total	8909	Excl. ME & Dredgers



617 projects so far completed

Flood Management

- Drainage Projects
- Flood Control
- Flood Control & Drainage
- Flood Control,
 Drainage & Irrigation
- Irrigation & Drainage

Irrigation Projects
65% of flood prone
lands now under
flood management

FCDI Infrastructures

Embankment		9 462 km
Coastal	:	5126 km
Others	:	4 336 km
Irrigation Canal	:	5 104 km
Drainage Channels	:	5 104 km
Hydraulic Structures	:	13 326 nos
Barrages	:	4 nos
Pump houses	:	19 nos
Pumps	:	100 nos
River closures	:	100 nos
Roads	;	1 013 km
Bridges & culverts	1	5 559 nos

Achievement in Flood Management

- Areas under Flood Management : 5.39 m ha
- Areas under irrigation facilities : 1.63 m ha
- Annual incremental food production due to
 - flood management facilities : 7.8 m tons
 - irrigation facilities : 3.2 m
 tons

Water Resources in Bangladesh

Surface Water

Rivers

Total river	:	262 nos
Transboundary river	:	57nos
Main River	:	3nos

Rainfall

Annual average:2320 mmIt varies from 1100 mm in the West to 5690 mm in
the North-east

Groundwater

Annual average recharge : 300 mm to 600 mm

Bangladesh - A Land of Calamities





Flood



Erosion

Flood



A Scene of Flooding in Haor



Inundation in 2000 : Sagarkhali Basin



Flood in Urban Areas









River Erosion

Erosion is a very common phenomenon in all the river systems in Bangladesh

- About 100 sq km is eroded every year
- Erosion is very acute in the Brahmaputra -Jamuna, annually on average 300m erosion take place all along left river bank

Chandpur Town



Chandpur Town



River Erosion







River Bank Protection Project

Bhuapur Hardpoint

Sirajganj Hardpoin

West Guide Bund, Sidabad

SPOT Image (1999) of Jamuna Bridge Site East Guide Bund, Kalihati

River training works





Agency initiatives for City drainage



Agency initiatives

Photos on 27th July 2004



Peoples initiatives during severe flooding

Photos on 25th July 2004

Management Options for Flood

- Flood Proofing & Zoning
- Improved Flood Forecasting & Warning System
- Improved Communications
- Relief and Rehabilitation
- Hazard preparedness

Management Options for Erosion

- Low Cost Erosion Control Measures
- Erosion Forecasting & Warning System

Future Improvement Financing (loan, insurance etc.) Workable institutional arrangements Risks and uncertainties Regionality Integrated approach for the improveme

Institutional Development

- Following the floods of 1987 & 88, the Government has undertaken FAP studies
- National Water & Flood Management Strategy
- National Water Policy
- National Water Management Plan
- Guidelines for Participatory Water Management

Institutional Development

BWDB Act 2000

- Conforms to National Water Policy
- Separation of policy & oversight functions from operational management
- Ownership transfer of small projects (less than 1000 ha)
- Management transfer of medium projects (1000 to 5000 ha)
- Joint Management of Larger Projects

Flood Management Strategy

Past flood management measures mainly focused on protection of agricultural lands.

Present focus on integrated water management encompassing all sectoral interests.

Issues of Institutional Development

- Internalization of BWDB's ongoing reforms
- Following GPWM, an act needs to be enacted for regulating the activities of WMOs

Observations

- FCD schemes could achieve its primary goal
- Increasing intensity of floods calls for changing design criteria

Observations

Constant vigilant by BWDB officials and the public helped in taking corrective measures to protect the embankments in time

Railways, highways, roads etc, constructed across the flood plains, obstructed timely drainage of flood flows.

Recommendations

- Rationalising of Existing FCD Infrastructure" need to be taken
- Integrated river Basin Management
- Flood risks zones should be designated
- Safe conveyance of the large cross-boundary flows by channelising and stabilizing these rivers with appropriates measures
- Excavation and desilting of rivers, khals, offtakes of distributaries etc
- Rivers, khals and floodways may be kept free from encroachment for free flood flows.
- Full flood protection and proper drainage for the urban areas

Recommendations

- Required fund may be ensured for the maintenance
- Revolving fund for emergency flood fighting
- Coordinated planning, design and construction of all rural roads, highways and railway embankments
- Adequate on-the-spot security for the personnel engaged in flood fighting
- Legislation to regulate the community participation in O&M activities
- Water Act may be enacted to regulate all water management activities
- Improved flood forecasting system

THANK YOU EVERYBODY

