



Preparation and Response to Emergencies: Floods in Bangladesh

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- **Flooding in Bangladesh**
- **Current Situation**
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Introduction:

- **Situated in flat deltaic and alluvial terrain.**
- **Very significant flood event occur about once every 20 years.**
- **During last 20 years major floods were in 1987, 1988, 1998 and 2004.**
- **Protection required for 240,000 km of road assets against such damage (asset value approximately US\$ 25 billion) .**

Introduction:

- About 63% of the country is flood plain.
- Over 90% of the country is less than 10m above sea level.
- The rate of sea level rise is 7mm/year (Global warming effect).
- Siltation caused by an annual average 2 billion tons of sediment carried by the rivers.
- Deposition reduces the effective river channel
- Government Flood Action Plan (FAP) formulated in 1989.

Cont.



Introduction:

- During severe floods, the land area under water is around 69%.
- The high flood levels are increasing with time. In 1987 flood, major part of all category of roads were submerged.

Roads in Bangladesh:

There are two major Road-Management agencies in Bangladesh:

1. Roads and Highways Department (RHD)
 2. Local Government Engineering Department (LGED)
- Total asset is about US\$ 25 billion.
 - RHD is responsible for the main road network of the country
 - LGED is responsible for mainly rural roads.



Considering the Flooding Situation:

- **Coping with the consequences of flooding.**
- **Keeping road network well maintained after seasonal and localised floods.**
- **Designing road network to suffer minimal damage from floods.**

The Issues Involved for Road Agency (RHD/LGED)

- **Damage to the Infrastructure.**
- **Cost and Time Overrun in implementation of the ongoing projects.**
- **Additional funds required to restore/rehabilitate and reconstruct the damaged road infrastructure.**
- **Socio economic aspects.**
- **Delay in urgent maintenance works.**
- **Reduction of Institutional Capacity.**



Addressing the Issues:

- **Development of policies to minimize flood damages in future**
- **Investment in best possible way**
- **Strengthening of Institutional Capacity.**
- **When roads are designed, the prevailing drainage conditions must be fully accounted for.**



Need more on

- **Preparation of Road Agencies**
- **Emergency response from agencies, restrictions on plying heavy vehicles on submerged pavements.**

Lessons from Previous Floods and Subsequent Mitigation Activities

- The roads which have been raised above 1988 and 1998 Flood Level, have suffered minimum damage in 2004-flood.
- The roads, which were inundated by floodwater, have been affected more when vehicles moved on submerged roads.
- Selection of road alignment should be made parallel to the river flow rather than across it.
- Special Action Plan to be drawn during recession of flood water.
- Location of flood fuges and causeways to be carefully identified in flash flood area.

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Lessons from Previous Floods and Subsequent Mitigation Activities

- Existing bridges/culverts should be investigated and improved if necessary by providing extra span at peak flow stage.
- Damage to roads caused by water passing over the road surface could be reduced by providing asphalt concrete topping and hard shoulder.

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Lessons from Previous Floods and Subsequent Mitigation Activities

- Side slope should be protected by appropriate means e.g. concrete blocks, growing plants like vetiver (Kashphul), turfing etc.
- Flood affected people occasionally use high road embankment, may be considered in planning of disaster management.
- Drainage through natural channels needs to be augmented.
- Coordination required amongst road agencies, ministries, NGOs and local authorities.

Strengths and Weakness, Relevant Policies, Regulations, Institutional Capacity

Strength

- Road agencies with their resources and countrywide networking has an organized set up to take up challenging tasks caused by flood.
- Large fleet of ferry can be redeployed at critical sections where communication is threatened or breached.

Weakness

Weakness

Road agencies need to be equipped for disaster management, especially for floods up to Division level by being allowed to keep reserve of:

- Portable steel bridge in flood prone areas for spanning damaged bridges or embankment breach along with skilled team for installation.
- Sufficient stockpile of rehabilitation materials like stone and brick aggregates, sheet piles, gunny bags, sands etc. before monsoon for emergency restoration of affected roads and bridges.

Institutional capacity of road agencies need to be strengthened by making available more resources and updating all databases for disaster management.

Policies and Initiatives by Road Agencies

- When roads are designed the prevailing drainage condition must be fully accounted for.
- A flood control room headed by a liaison officer is the focal point for management of activities.
- Alternative roads and diversions to be planned for movement of vehicles, especially relief operation.
- Emergency response from road agencies to implement restrictions on heavily loaded commercial vehicles on submerged pavements.
- Restoration of communication to be commenced by using localized materials like stone, bricks, granular materials etc.
- Flood Action Plan to be followed and implemented on priority basis.

Conclusions and Recommendations

- **Flood Action Plan to be adopted as national policy.**
- **An extensive database for assessment of impact by previous flood is needed urgently.**
- **Coordination and synchronization are needed amongst the agencies, ministries, NGOs, local bodies to be considered as priority.**
- **Stock of road building materials including portable steel bridge to be available in vulnerable areas.**
- **Govt. budget must have special allocation for flood damage mitigation.**
- **Road design standard should include drainage facility on integrated surface water modeling study.**
- **Unplanned construction of water barrier to be removed in phases.**

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