

Volume 2

INTEGRATED FLOOD RISK MANAGEMENT

Draft Outline

- 13 Chapters
- Most Second order headings finalized
- Many 3rd order headings suggested, but details left to the actual writers

4-5 August 2003

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2 *INTRODUCTION*

2.1 *Types of floods*

2.2 *Causes of flooding*

2.3 *Current Concepts related to flood risk management*

2.3.1 *Integrated Disaster Risk management*

2.3.2 *Integrated flood management*

3 *POLICY AND INSTITUTIONAL AND LEGAL ISSUES*

3.1 *Integrated Water management*

3.2 *National water policy*

Law, Regulation and enforcement

3.3 Awareness and education

Curricula, , public awareness programs

3.4 Institutional arrangements for flood risk management

Responsibilities including enforcement, coordination mechanism, inter-agency information sharing, feed back

Capacity Building

4 FLOOD RISK ASSESSMENT

4.1 Flood Meteorology

State-of-the-art techniques on meteorological observation – satellite based techniques, Cyclone / typhon, rainstorms, cloud burst,

4.2 Flood Hydrology

Measurement and data transmission methods, Monitoring of snow melt
Rainfall-runoff processes; data analysis, statistical techniques, state-of-the-art modelling of river and floodplain flows,

4.3 Geophysical Phenomena

Erosion, Landslide and Glacial Lake Outburst Floods (GLOF)

Reservoir induced seismicity

Monitoring techniques, geological and seismological observation, risk assessment

4.4 Flood Risk Mapping

4.5 Potential Loss Assessment

Direct damages, indirect damages

5 LAND USE PLANNING

5.1 Watershed management

Sustainable logging practices, erosion control,

5.2 Floodplain management

Agriculture and aquaculture,

5.3 Effect of infrastructure development

5.4 Urban planning & development

5.5 Integrated River Basin Management

(river basin commissions, examples- Japan, etc.)

6 STRUCTURAL INTERVENTIONS

6.1 General classification of structural measures

Need analysis, advantages, disadvantages, precaution

6.2 Storage Type Structures for flood modulation

Examples: Reservoirs, Retention Basins (Monkey Jowls), tidal basins

Planning , Design, Operation and Maintenance

Risk assessment

6.3 Flood Protection Structures

Examples: Dykes, bunds, drainage channels, sluice gates, flood by-pass, pumping

Planning, design, materials and construction methods, indigenous techniques, risk analysis of structural failure, Environmental and social impact analysis, operation and maintenance

Risk Minimization

6.4 *Management of flood protection systems*

Inventory control, monitoring, capacity rating, repair and maintenance, priority ranking, budgeting, stockpiling

7 *FLOOD PROOFING*

7.1 *flood proofing of homes*

raising homesteads, various techniques, construction materials and techniques, indigenous techniques

7.2 *flood proofing of infrastructure*

raising above flood levels, various techniques, construction materials and techniques, indigenous techniques

8 *FLOOD PREPAREDNESS*

8.1 *Preparedness planning*

8.2 *Forecasting*

8.2.1 *Climate forecasts*

Climate vs weather, Climate variability vs climate change, state-of-the-art on Short, medium and long range forecasts

Applications: Input to flood forecasts; Agriculture, energy, fisheries, forestry, ,

8.2.2 *Hydrological forecasts*

Real time monitoring and forecasting of floods, data requirements, various techniques; flood referencing (e.g. danger levels)

8.3 *Warning and Dissemination*

Contents and formats; dissemination techniques and channels, use of media and Internet, examples of websites, examples of best practices (multipurpose, credible, received, understood, personalised acted upon), evaluation and feedback

8.3.1 Evacuation plan

8.3.2 Flood Shelters

9 COMMUNITY BASED FLOOD MANAGEMENT

9.1 Planning

Early Warning: needs assessment, interpretation, dissemination

Evacuation (people):

Where do we go?;

What do we bring ? important asset (list)

What should communities / authorities have there? (list):potable water, sanitation facilities (including gender sensitiveness), fuel

Evacuation (livestock):

Where do we bring them (size, fencing? Fodder requirement,

What should authorities provide? : veterinary services, fodder

Livelihoods : how do we earn our living during floods?; what do we need to earn a living ?; How (and when) do we get these things

Recovery

9.2 Community projects

Protection of assets: water source, schools, health unit, livestock,

Implementation: community level,

Resource mobilization (internal and external)

9.3 Forming Strategic Alliances

Joining with other communities, linking activist groups

Community development, environmental aspects, micro-finance, legal aid and justice

9.4 Political Action to Reduce hazards

Over-logging, unregulated urban development, inadequate / un-enforced zoning, environmental degradation

9.5 Demanding Appropriate Flood Proofing Assistance

10 EMERGENCY MANAGEMENT

10.1 Response Planning

Stock piling of essentials; Communication systems, Action Planning, Exercises and drills, Training

10.2 Need assessment

10.3 Search and Rescue

10.4 Medical treatment

10.5 Water supply and sanitation

10.6 Shelter materials

Tents, plastic sheeting, clothing, blankets,

10.7 Food, cooking utensils, fuel

11 RECOVERY AND REHABILITATION

11.1 Damage assessment

Public and private property, lives, livestock, ...

11.2 *Re-establishing livelihood*

Agriculture and aquaculture: farming, irrigation infrastructure, seeds, credit,

Aquaculture: Repair of fish ponds, re-stocking

Fishing : Boats, credits for repairs,

11.3 *Rehabilitation of Infrastructure*

Identifying priorities, establishing standards of reconstruction, financing

12 *ECONOMICS OF FLOOD MANAGEMENT*

12.1 *Economic analysis*

Return period, costs benefit analysis,

12.2 *Financing flood management projects*

Cost recovery, ..

12.3 *Flood Insurance*

13 *CROSS CUTTING ISSUES*

13.1 *Transboundary, Regional / international co-operation*

Information sharing, compensation, examples (Mekong, Ganges-Brahmaputra, Rhine River,)

- 13.2** *Climate change / global warming*

- 13.3** *Sustainability issues*

- 13.4** *Development Planning – integration of flood risk*

- 13.5** *Environmental issues*

- 13.6** *IWRM vs TDRM*

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References

Annotated Bibliography

Websites of International Resources Centres

Appendices

Examples