# Strategy for Implementing Integrated Flood Management (IFM)[1]

## 1.1. What is IFM?

***Integrated Flood Management (IFM)*** integrates land and water resources development in a flood plain, within the context of ***Integrated Water Resources Management (IWRM),*** with a view to maximise the efficient use of the flood plains and minimise loss of property and life. For flood management to be carried out within the context of IWRM, river basins should be considered as integrated systems. Socio-economic activities, land-use patterns, hydro-morphological processes, etc., need to be recognised as constituent parts of these systems. A consistent approach needs to be applied to all forms of possible intervention. The entire ***hydrological cycle*** is considered rather than differentiating between floods and droughts when planning for water resources development.

## 1.2. Why IFM?

The aim of IFM is to put in place ***well-functioning integrated*** measures for flood management, which ***enhance the benefits of floods*** and ***minimise their destruction***. For this, the linkages between various relevant sectors become very important. Thus, the most important key will be co-operation and co-ordination across institutional boundaries, noting that the mandates of many institutions will either cover only part of the river basin or extend well beyond the basin boundary. At the core of integration is ***effective communication*** across institutional and disciplinary boundaries, which can take place only if there is a perception of common interest.

## 1.3. Vulnerability to Floods

The **"*vulnerability*"** of potential victims of flood losses is a function of their ability to mobilise the assets available to them to meet the challenge posed by the ***flood risk*** versus the extent of the challenge. More generally, the capacity of the society to maintain or improve its quality of life in the face of such external disturbances may be enhanced either by reducing the extent of the challenge presented by the disturbance or by enhancing their capacity to cope with the disturbance. Emphasis should be on the adoption of flexible strategies tailored to each flood-prone region (characterised by their various *physical, social,*

[1] Based on Materials of the Associated Programme on Flood Management – www.apfm.info

*cultural and economic aspects*) – recognising the importance of evaluating differing options and their relative advantages.

## 1.4. Floodplain Management Measures

Major flood management measures aim to reduce flood risk and flood hazard across the flood plain and can be grouped into 4 classes

1. Land-use measures; - aimed at ***"keeping people away from floods".***
2. Structural measures;- aimed at ***"keeping flood waters away from the people".***
3. Flood preparedness measures; aimed at ***"getting people ready for floods".***
4. Flood emergency measures; - aimed at ***"helping affected people cope with floods".***

## 1.5. The challenges of flood management

1. Securing livelihoods for growing populations through economical use of floodplains.
2. The need for a basin approach taking into consideration interactions between the land and water environments.
3. Absolute safety from flooding is a myth. We should emphasise the principle of managing all floods and not some.
4. The effects of proposed flood management interventions on the floodplain aquatic ecosystem as these depend on flood events for survival.
5. Effects of climate change and variability.
6. Changes in decision-making process from being one-dimensional focussing on economic efficiency to multi-dimensional and concerned with resolving multiple, often conflicting, objectives.
7. Balancing development needs with risks as people will not (and in some instances will not) abandon flood prone areas.

## 1.6. IFM Strategy

A ***Strategy for Flood Management*** for a country not only deals with the flood hazard but also has strong links with ***national, social, cultural, economic and other development policies***. Disaster prevention and mitigation due to floods is therefore a ***multidisciplinary*** endeavour wherein development activities in different sectors of the economy help in prevention of the disasters and reduce the vulnerability of the society. A strategy for implementation of IFM should recognise the following factors

1. A river basin is dynamic over time and space. There are a series of interactions

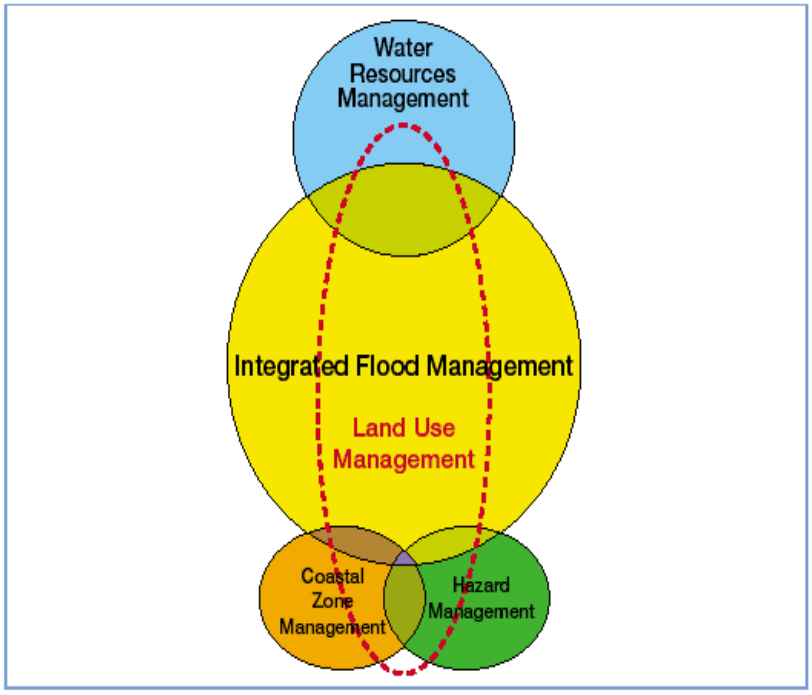
between water, soil/sediment and pollutants/nutrients.

2. Population growth and economic activities exert pressure on the natural system.
3. Increased economic activities in floodplains increase vulnerability to flooding.
4. High level of investment in floodplains and the lack of alternative land in many countries means that abandoning flood-prone areas cannot be a viable option for flood damage reduction.
5. Changes in land use across the basin affect runoff and the probability of a flood of a given magnitude.
6. Changes in the intensity and duration of precipitation patterns as a result of climate change could increase flash floods and seasonal floods.
7. The likelihood that existing flood protection measures could fail and how such situations should be managed need to be considered.
8. Riverine aquatic ecosystems provide many benefits such as: clean drinking water, food, flood mitigation and recreational opportunities.
9. A trade-off between competing interests in a river basin is required to determine the magnitude and variability of the flow regime needed within a basin to maximise the benefits to society and maintain a healthy riverine ecosystem.

## 1.7. Elements of Integrated Flood Management

The defining characteristic of IFM is ***integration***, expressed simultaneously in different forms. It is an appropriate mix of strategies, points of interventions, types of interventions (i.e. structural or non-structural), short or long-term, and a participatory and transparent approach to decision making – particularly in terms of institutional integration and how decisions are made and implemented within the given institutional structure.

Therefore, an integrated flood management plan should address the following five key elements that would seem to follow logically for managing floods in the context of an IWRM approach




Integrated Flood Management Model, Adopted from APFM, 2004

| *Elements and aspects of Integrated Flood Management(IFM)* |
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| ***1 Managing the water cycle as a whole***<br>a) Flood management plans must be intertwined with drought management through the effective use of floodwater and/or by maximising the positive aspects of floods.<br>b) Manage all floods and not just some. For example, how to manage floods greater than the designed standards needs to be addressed.<br>c) Seek multi-beneficial solutions that serve several purposes simultaneously. |
| ***2 Integrating Land and Water Management***<br>a) Land-use planning and water management must be combined in one synthesised plan, through co-ordination of land and water management authorities to achieve consistency in planning.<br>b) The three main elements of river basin management – i.e. water quantity, water quality and the processes of erosion and deposition – should be linked in planning.<br>c) Effect of land-use changes on the various elements of the hydrological cycle needs to be taken into account. |
| ***3 Adopting a best mix of strategies/options***<br>a) Flood management strategies should involve a combination of complementary options.<br>b) A layered strategy appropriate to given socio-economic and geo-climatic conditions and adaptable to changing conditions should be adopted.<br>c) An appropriate combination of structural and non-structural measures must be evaluated, adopted and implemented, recognising the relative merits and demerits |
| ***4 Ensuring a participatory approach***<br>a) IFM should be based on a participatory approach involving users, planners and policymakers at all levels and should be open, transparent, inclusive and communicative.<br>b) Decentralisation of decision-making is necessary, with full public consultation and involvement of stakeholders in planning and implementation.<br>c) Gender, religious and cultural difference must be taken into account.<br>d) An appropriate combination of both the *"bottom-up"* and *"top-down"* approaches needs to be adopted.<br>e) Co-ordination at the highest level to promote co-ordination and co-operation across functional and administrative boundaries needs to be ensured. |
| ***5 Adopting integrated hazard management approaches***<br>a) Flood management should be integrated into a wider risk management system of *"all hazards"* including emergency planning and management.<br>b) Experts from all sectors, involving different disciplines, should be involved in the implementation of disaster management plans.<br>c) Consistency in approaches to natural hazard management in all relevant national and local plans should be ensured.<br>d) Early warnings and forecasts, that are key inputs for reducing the socio-economic impacts of all natural hazards including floods, should be strengthened. |

## 1.8. Implementation of IFM

Integrated Flood Management requires certain basic inputs and a conducive environment for its effective implementation. These requirements are a function of the specific hydro-meteorological and physical conditions of the basin coupled with cultural and socio-

economic interactions and existing development plans for the location. Some of the inputs necessary for successful implementation of IFM include;

**Clear and objective policies supported with legislation and regulation**;- Political commitment to IFM principles and practice is critical. The strategies developed for IFM need to be translated into specific policies for planning, allocation and management of resources. Linking flood management with IWRM and thus social and economic development, providing inter-sectoral linkages and the basis for stakeholder participation call for a substantial overhaul of policies, laws and management institutions. Clear and objective policies for the declared goals of the government, supported with appropriate legislation and regulations to enable the process of integration, are a prerequisite for IFM.

**Institutional structure through appropriate linkage**;- It is important to attain a mutually beneficial synergy between national interests, regional prosperity and the people's well-being through the best possible use of regions' natural resources – both land and water – and human capacity. River basin management is a long-term strategy to combat the threat of flooding and erosion with the need to preserve ecosystems.

**Community based institutions**:- the requirement of stakeholder involvement needs institutions that are community based. The challenge is to find ways of co-ordinating and co-operating across institutional boundaries, to achieve IFM through decisions at the basin level with the complete involvement of local level institutions and implementation through these institutions. Existing institutional and community capacity needs to be enhanced to adjust to the requirements of IFM.

**Information management and exchange**:- The community has to be fully involved in data and information collection and in formulating and implementing emergency plans and post disaster responses. The sharing and exchange of data, information, knowledge and experience among experts and the general public, policy makers and managers, researchers and voluntary organisations, upstream and downstream users, all co-basin states and various institutions, in a most transparent manner is an essential ingredient for consensus building and conflict management and for the implementation of a chosen strategy. Trans-boundary sharing and exchange of flood information is essential for implementation of flood preparedness plans in downstream regions.

**Appropriate economic instruments**:- The cost of living on flood plains is borne by flood plain occupiers, by way of economic losses and reduced opportunities, and taxpayers, through government funded protection measures and relief and rehabilitation activities. To what extent this split is acceptable depends on the social and economic

construct of the society. Ideally, the share in the risk should be commensurate with the gains to the common taxpayer from the economic activities of the flood plains occupier. To what extent a government should fund flood mitigation activities and subsidies to flood insurance can be debated and will largely depend on the socio-economic policies of the government. The success of the IFM approach will depend on how these economic instruments are used.