

SUMMARY: MRC Strategy on Flood Management and Mitigation

1. The Council of the Mekong River Commission responded to the extreme floods of 2000 by charging its Secretariat (MRCS) with preparing a **Flood Management and Mitigation (FMM) Strategy**. Although this flood event was an extraordinary event in large parts of the Lower Mekong Basin, the high concentration of people living in flood prone areas in all four member countries of MRC (see Map 1) shows that the people living here, as well as the agencies concerned, have to be better prepared for future floods. This report is one result of the process by an MRC FMM team to prepare such a strategy for this regional organisation. **It is not a flood management strategy for the Basin, or for the member countries, but it is the strategy for this regional organisation**, i.e. what the organisation shall do to respond to flood hazards and to effectively contribute to national or basin-wide strategies. This MRC FMM Strategy is to be presented to the Council at its 2001 annual meeting for consideration and endorsement.
2. The **strategy formulation process** was highly participatory. The National Mekong Committees (NMCs) and representatives of line agencies, civil society organisations and international organisations in each riparian country hosted the MRCS team during fact-finding and consultation visits to each country. The NMCs and the related line agencies met with the team at a national FMM workshop. Subsequently, all four NMCs and representatives from selected line agencies and civil society and international organisations joined the final discussions at a regional workshop to review the strategy before submitting it to the Council.
3. According to the **concept of modern floodplain management**, four major groups of management measures to reduce flood risk and flood hazard across the floodplain are to be distinguished:
 - **Land-use Planning Measures** are aimed at '*keeping people away from the floodwaters*'. Land-use measures on the floodplain aim to ensure that the vulnerability of a particular land-use activity is consistent with the flood hazard on that area of land, ie the objective is to keep people and vulnerable activities out of the most hazardous areas of the floodplain.
 - **Structural Measures** are aimed at '*keeping floodwaters away from the people*'. Typical structural measures include flood mitigation dams, embankments and flood detention basins. Development and Building Controls can be seen as a particular kind of structural measures for urban and settlement areas, aimed at reducing flood damage to buildings. Typical building controls include minimum floor levels to eliminate nuisance flooding, and the use of building materials and building designs that enable rapid and effective cleanup after a flood.
 - **Flood Preparedness Measures** recognise that - no matter how effective the above types of management measures are - an overwhelming flood will always occur. They aim at '*getting people ready for floods before they come*'. In a number of cases, Flood Preparedness

and Emergency Measures may be the only type of management that is feasible or economically justified. Flood preparedness measures embody flood forecasting, flood warning, and raising the general flood awareness of the potentially affected population groups.

- **Flood Emergency Measures** deal with the aftermath of such an event by *‘helping affected people to cope with floods’*. Flood Emergency Management, like Floodplain Management, is a process that typically encompasses preparation, response, and recovery. In addition to flood preparedness, the flood emergency management process embodies evacuation planning and training, emergency accommodation planning, flood cleanup planning and the restitution of essential services, and social and financial recovery measures.

Integrated Floodplain Management involves an **integrated and coordinated mix of these types of management measures** that reflects the flooding, flood risk and flood hazard characteristics of the particular floodplain, the specific social and economic needs of the flood-prone communities, as well as environmental and resource management policies for the floodplain.

4. Floodplain management issues - based on the extent of their impact - can be of three types - **National, Regional and Trans-Boundary Issues**. In defining possible roles for the MRC, it needs to be recognised that national flood impacts – ie impacts generated and experienced solely in a single country – remain that country’s responsibility. Therefore, the lead function for dealing with most of these elements are with the responsible line agencies at national level, possibly supported by international organisations and civil society organisations. MRC is to mainly support these agencies and organisations with supplementary services that are of relevance at the regional level and with respect to trans-boundary issues.
5. The 1995 Agreement sets the mandate for the organisation’s involvement in FMM. According to this mandate and the results of the strategy formulation process, the **roles for MRC** can be grouped into three categories:
 - **Providing Technical Products and Services** includes first of all the provision of flood forecasts to the member countries. This activity has already commenced: –the requested immediate improvement of the MRC Flood Forecasting System is well underway and 3 to 5-day flood forecasts are published on the web (www.mrcmekong.org) on a daily basis. The forecasting system will be further enhanced when the telemetering network of water level (and rainfall) stations will be online by the second half of 2002, including data from two stations in China. MRC will also act as a repository of flood data and information for the basin, and will provide technical products, such as flood hazard maps and other GIS services. Flood data and information can be entered into the MRC database for ready retrieval, the production of thematic maps, and further use by member countries. Provision of technically excellent analytical services to the member countries in relation to flooding and flood issues includes the setting of standards in relation to flood management, so that all member countries use a common terminology, common data recording forms, common methods of analysis, etc.

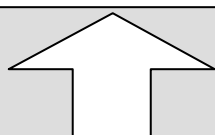
- ?? **Addressing Differences and Facilitation** on water and related issues is explicitly mentioned in the 1995 Agreement as one essential role of MRC. The member countries respect MRCS for its neutrality, objectivity and technical excellence. With respect to trans-boundary issues of FMM, for example on land-use or structural measures, MRCS should serve the member countries – upon invitation - as a neutral facilitator.. The results of scientific modelling provide an excellent base for MRC to assess and facilitate such trans-boundary issues. In addition, MRC should assist with respect to coordinating floodplain management aspects of national programmes with relevant MRC programmes. For example, the three MRC Core Programmes, ie the Water Utilisation Programme, the Basin Development Plan, and the Environment Programme, are of direct relevance to floodplain management and vice versa. Finally, MRC should build confidence among the neighbouring countries by becoming the focal point for a floodplain management forum that addresses flood and floodplain management and flood preparedness.
- **Capacity Building and Technology Transfer** to the member countries is required, especially with regard to flooding issues that are of regional and trans-boundary relevance. MRC could develop standard training programmes to be delivered to relevant line agencies in the member countries, including the transfer of technology/know how and equipment.
6. These roles are to be played by MRC as an organisation made up of the Council, Joint Committee and **MRC Secretariat** as well as the **National Mekong Committees** in the four member countries. The NMCs are national public agencies that represent the relevant line agencies. With this, they also play a unique coordinating role in their respective countries between the MRC Joint Committee, MRC Secretariat and national interests. Concerning flood management measures, the NMCs promote adopted positions of the MRC Council and Joint Committee to national agencies, provide insights on national concerns for guiding MRC's involvement with respect to the above mentioned roles, and provide a forum for continued interaction with other stakeholders
7. Looking at these roles, it becomes clear that MRC can only be one player in Integrated Floodplain Management in the Basin. The services that the organisation can provide are basically **support services for others**, such as national line agencies and emergency relief agencies, to more efficiently fulfil their own tasks in this field. Cooperation with these other national and international agencies is therefore of utmost importance for the effectiveness of an MRC Strategy. Partnerships have been formed already between MRC and organisations such as WMO, UNDP, IFRC, USGS, ESCAP, ADPC, etc. Such cooperation initiatives have been further worked out during the Regional Workshop and form part of the strategy. The benefit of any MRC involvement in FMM will have to be judged according to the usefulness of MRC products and services for the MRC clients who are the main implementers of floodplain management measures in the field, mainly at the national and local level. And the final benefit of all these concerted efforts will be seen from how much damage of properties and loss of life resulting from flood impacts was likely to have been spared.

8. According to the three Strategic Roles of MRC, ie (1) Providing Technical Products and Services, (2) Addressing Differences and Facilitation, and (3) Capacity Building and Technology Transfer, and the four elements of integrated floodplain management, ie (a) Land-use planning, (b) Structural measures, (c) Flood preparedness, and (d) Emergency management, the **fields of intervention for a future MRC Programme on FMM** are outlined and defined in this MRC Strategy document. These have been prioritised by the national and regional workshops.
9. Within each of these elements, the Strategy discusses the **needs and justifications**, defines possible **MRC involvement**, identifies possible **cooperating organisations**, and lists the **clients** to be served. The strategy formulation process revealed a large number of flood-related needs of MRC member countries, both domestically and from regional and trans-boundary points of view. These were then screened as to whether it is appropriate for MRC to assume a role to meet the need. Each country indicated its priority for MRC to undertake the range of roles identified by the strategy. The Strategy and its elements, ie the fields of intervention for the MRC FMM Programme, have then been formulated based on a summary of the countries' common needs and priorities, as well as the MRC mandate, policies, and working principles.
10. This Strategy document provides now the **basis for the preparation of an MRC FMM Programme**, including a detailed action plan and bankable programme components. During the remainder of 2001, the MRCS team with active involvement of and consultation with the NMCs, relevant line agencies, and other stakeholders, will define the programme components to implement the strategy. These components will be discussed with — and reviewed by - the above mentioned co-operators and stakeholders. Thereafter, the MRC Strategy for FMM will be updated in about three years from now, as lessons are learnt about how MRC is coping with its challenge to support management and mitigation of the periodic floods in the Mekong River Basin.

Figure 1: Hierarchy of Objectives of the MRC Strategy on FMM

Recognising MRC’s role as a river basin organisation for regional co-operation on sustainable development, utilisation, management, and conservation of water and its related resources in the Mekong River Basin, the MRC Strategy on Flood Management and Mitigation fully reflects the concept of integrated floodplain management and highlights those aspects of this concept that could be addressed under the present mandate of MRC. With reference to the logic and terminology of Logical Framework, the MRC Strategy can be summarised as follows (with the arrows representing the means-impact relationships that are expected from implementing the strategy):

Development Objective (Benefit for Riparian Countries):
People’s suffering and economic losses due to floods are prevented, minimised, or mitigated, while preserving the environmental benefits of floods.



Immediate Objective (Utilisation of MRC Services by Clients):
Mekong floods are well managed and mitigated, by making appropriate use of reliable flood-related information, land-use potential, structural measures, and effective emergency response.



Strategy of MRC Intervention within a new FMM Programme (MRC Services)
Reliable flood related information, training, and scientific advice on the appropriate and well-coordinated management and mitigation of the Mekong floods is provided.

Prioritised Fields of MRC Intervention according to 3 Strategic Roles and 4 Elements of Integrated Floodplain Management:

Role / Element	Providing Technical Prod. and Services	Addressing Differences and Facilitation	Capacity Building & Technology Transfer
Land-use planning	Field of Intervention 1.1	Field of Intervention 2.1	Field of Intervention 3.1
Structural measures	Field of Intervention 1.2	Field of Intervention 2.2	Field of Intervention 3.2
Flood Preparedness	Field of Intervention 1.3	Field of Intervention 2.3	Field of Intervention 3.3
Emergency Response	Field of Intervention 1.4	Field of Intervention 2.4	Field of Intervention 3.4

With: High Importance Medium Imp. Lower Imp.

(These Fields of Intervention are described in more detail in Table 1, below)

Table 1: Overview on Possible MRC Intervention by Strategic Role and Elements of Floodplain Management in descending order of importance. These possible fields of intervention will be taken into consideration for the detailed MRC programme for Flood Management and Mitigation.

<div style="text-align: right;">Role</div> <div style="text-align: left;">Element</div>	Strategic Role 1: PROVIDING TECHNICAL PRODUCTS AND SERVICES	Strategic Role 2: ADDRESSING DIFFERENCES AND FACILITATION	Strategic Role 3: CAPACITY BUILDING AND TECHNOLOGY TRANSFER
For Land-use Planning:	<ul style="list-style-type: none"> - Develop common definition for flood risk areas and flood hazard areas - Provide regional flood maps (flood hazard maps, flood damage risk maps) - Conduct research and analytical analysis on the transboundary impact of land-use changes on flooding, - Develop guidelines on integrated land-use planning and land-use for flood hazard areas and catchment areas - Develop a (general) land-use classification system (in cooperation with other programs) 	<ul style="list-style-type: none"> - Promote data and information exchange and sharing - Provide inputs on flood-related land-use aspects to the MRC Basin Development Plan (BDP) - Organise workshops and forums to discuss best practices and regional guidelines for land-use planning in floodplains and catchment areas - Provide objective technical expertise and act as facilitator on trans-boundary impact of land-use (if invited) 	<ul style="list-style-type: none"> - Improve institutional capacity and facilitate technology transfer and on the job training for the preparation of flood maps - Provide on the job training to promote the better use of flood maps for land-use planning. - Provide tools, software such as GIS, Remote Sensing - Start pilot projects in selected areas to demonstrate best practices for land-use planning in flood prone areas and catchment areas. - Public education

Summary: MRC Strategy on Flood Management and Mitigation

<div style="text-align: right;">Role</div> <div style="text-align: left;">Element</div>	Strategic Role 1: PROVIDING TECHNICAL PRODUCTS AND SERVICES	Strategic Role 2: ADDRESSING DIFFERENCES AND FACILITATION	Strategic Role 3: CAPACITY BUILDING AND TECHNOLOGY TRANSFER
For Structural Measures:	<ul style="list-style-type: none"> ?? Provide analytical services by making use of flood patterns and frequency analysis, hydrologic and hydraulic model analyses, correlations of flood frequency with land-use, water-quality implications of floods, and flood-inundation maps (in cooperation with the WUP and other core programmes). ?? Test or adjust for the appropriateness of hydrologic and hydraulic models of other programmes for FMM for the Lower Mekong Basin ?? Compilation of existing and planned infrastructure in the LMB ?? Risk assessment of structures ?? Guidelines on flood proofing for specific areas (on building and development control) with data from line agencies 	<ul style="list-style-type: none"> ?? Provide impartial technical expertise and act as facilitator to address trans-boundary issues on structural measures (if invited) ?? Promote data and information exchange and share; ?? Foster regional exchange of information on gate/dam operations which may have trans-boundary impacts ?? Promote notification, prior consultation and agreement wrt water use in cooperation with WUP ?? Draft and promote guidelines for gate operating rule of dams and flood embankments / dikes 	<ul style="list-style-type: none"> ?? Provide training in hydrologic and hydraulic modeling in cooperation with WUP, BDP, EP and other programmes

Summary: MRC Strategy on Flood Management and Mitigation

<div style="text-align: right;">Role</div> <div style="text-align: left;">Element</div>	Strategic Role 1: PROVIDING TECHNICAL PRODUCTS AND SERVICES	Strategic Role 2: ADDRESSING DIFFERENCES AND FACILITATION	Strategic Role 3: CAPACITY BUILDING AND TECHNOLOGY TRANSFER
For Flood Preparedness	<ul style="list-style-type: none"> - Improve and maintain an accurate and user oriented flood forecasting system - Assure that forecasting is accurate (quality assurance), and indicate level of uncertainty - Support the dissemination of the forecasts through better understanding of users' needs - Develop instructions for the use of flood forecast, flood map information, etc. - Weather forecasting reflected in the flood forecast uncertainty - Support reliable and accurate real time data collection and transmission for the flood forecasting - Support a (regional) flood warning system - Establish a Regional Flood Information Center (data repository, flood risk maps, satellite remote sensing and GIS based information on flood extent, flood behaviour analysis, evaluation of efficiency/ effectiveness of flood preparedness, lessons learned, scenarios' simulation of flooding by incorporation up to date information on land-use, structural development, etc) - Combining flood forecasting and flood prone areas' information (inundated areas, villages, population density, flood extent/depth/duration, etc.) - Flood mapping at local/community level (Pilot areas in the riparian countries). - Set up guidelines and provide assistance for flood warning and information dissemination (warning preparation, dissemination, interpretation) - Set up guidelines for flood preparedness (regional and community based preparedness), <i>(TO BE CONSIDERED AS NATIONAL ISSUE).</i> 	<ul style="list-style-type: none"> - Set up common standards on hydro-meteorological data collection and transmission <i>(COMMENT: already set by WMO)</i> - Establish standard data exchange format - Establish data and information exchange and sharing - Establish a network for efficient dissemination of flood preparedness information 	<ul style="list-style-type: none"> - Act as a forum of consultation and experiences sharing - Provide (Master) Training on flood forecast and flood map interpretation - Flood warning dissemination to the areas concerned - Act as data/information and knowledge center - Act as capacity development center - Preparedness planning (at national, provincial and community level) - Act as technology transfer center

Summary: MRC Strategy on Flood Management and Mitigation

<div style="text-align: right;">Role</div> <div style="text-align: left;">Element</div>	Strategic Role 1: PROVIDING TECHNICAL PRODUCTS AND SERVICES	Strategic Role 2: ADDRESSING DIFFERENCES AND FACILITATION	Strategic Role 3: CAPACITY BUILDING AND TECHNOLOGY TRANSFER
For Emergency Management:	<ul style="list-style-type: none"> - Provide timely information and data from geographic information systems (flood maps, thematic maps, and satellite imagery) in a form that is easily understandable, and easily retrieved by field workers in emergency operations. Link to the MRC general procedures on information exchange and sharing. - Prepare and recommend common standards for reporting damage assessment, and linking needs assessment results with other flood information systems. - If possible, develop and forward timely information about appropriate evacuation channels and safe havens, both for preparation and for “real time” flood emergencies. 	<ul style="list-style-type: none"> - Promote trans-boundary data and information exchange and sharing through such measures as annual flood management meetings involving emergency managers. - Provide appropriate and efficient communication and coordination channels for supporting trans-boundary emergency operations, in cooperation with existing international and national mechanisms, as appropriate. - Facilitate formation of agreements to mobilize resources between lower basin countries in support of emergency management 	<ul style="list-style-type: none"> - Conduct practical training for emergency managers to bridge the gap between scientific study and practical tools (NDMCs, relief agencies) - Provide training opportunities through joint simulation exercises, incorporating new technologies and information. - Advocate for national capacity building support with donors.