Strengthening Climate Resilience

Integrating climate change into regional disaster risk management

at the Mekong River Commission

Emily Polack

Strengthening Climate Resilience Discussion Paper 4

Strengthening Climate Resilience (SCR) – through Climate Smart Disaster Risk Management' is a UK Department for International Development funded programme that aims to enhance the ability of developing country governments and civil society organisations to build the resilience of communities to disasters and climate change. It is co-ordinated by the Institute of Development Studies (UK), Plan International and Christian Aid, who are working with a variety of organisations across ten countries (Kenya, Tanzania and Sudan in East Africa; Nepal, India, Bangladesh and Sri Lanka in South Asia and Philippines, Indonesia and Cambodia in South East Asia). SCR has developed the Climate Smart Disaster Risk Management Approach (see Climate Smart Disaster Risk Management). If you would like to be involved in SCR meetings or work with the programme to trial the Climate Smart Disaster Risk Management Approach with your organisation, please either visit the SCR website: www.csdrm.org or send an e-mail to info@csdrm.org

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Abstract

The Flood Mitigation and Management Programme (FMMP) of the Mekong River Commission provides a regional disaster risk management programme through which to explore progress towards and opportunities for integrating climate change into disaster risk management at a regional level.

The Climate Smart Disaster Risk Management (CSDRM) approach (see page 36) being developed through the Strengthening Climate Resilience Consortium is used as an analytical framework to explore key components of the FMMP's work, alongside the development of the MRC's newly launched Climate Change Adaptation Initiative and efforts to integrate climate information into basin development planning. The case is then used to provide lessons on opportunities and challenges for a more integrated approach to DRM at basin-wide, regional or transboundary levels.

The transition to a more climate smart approach for four regional flood risk management functions are explored: joint analysis of common resources for scenario-based planning and decision-making; joint capacity building for flood risk management; development of methods, standards and guidelines for flood risk management for national application; and tackling specific transboundary flood risks.

This work is already supporting national governments to be more prepared for extreme flood events. A CSDRM approach requires integration of climate change information from different sources into all elements of flood risk management, and increased attention to understanding and tackling changing disaster risks and uncertainty, enhancing adaptive capacity and addressing poverty, vulnerability and their structural causes. The FMMP, as a regional technical support programme, of a government led transboundary river basin management authority is in a strong position to contribute to understanding and tackling changing flood risks and uncertainty at different levels, and is contributing to adaptive capacity at a regional and state level through joint learning and capacity building on considering climate impacts in flood risk management.

A key contribution has been developing forecasting capacities and developing approaches to integrating flood risk management in development planning at commune, district and provincial levels. It has been less able to engage directly with addressing poverty and differentiated vulnerability to flood risks.

Addressing transboundary flood risks in the Mekong Basin are embedded in the politics of transboundary water governance more broadly, and in the Mekong Region the geo-politics of water governance are complex and influenced by the historical legacies of international

financiers such as the Asian Development Bank and plans to harness the 'untapped potential' of the Mekong River for hydropower.

Transitions in the MRC Secretariat's approach to improving public dialogue, mediation and concern with rigorous analysis and risk management still stand to be sidelined by pursuit of national interests in dams and difficulties in curbing other forms of land use change that are impacting on flow regimes and flood risk.

In this context, many aspects of a CSDRM approach appear particularly relevant to enabling the MRC to support effective flood risk management at different levels in a changing climate.

These aspects include: bringing together diverse actors (climate scientists, ecosystems analysts, social development organisations); developing innovative, reflective and regular approaches to learning for sustained capacity building and integration of new information over time; understanding differentiated vulnerability to flood risks and approaches to risk management; enforcement of regional or effective mediation through transboundary water management agreements.

Abbreviations

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Centre
AMRC	Australian Mekong Resource Centre
BDP	Basin Development Plan
CCA	climate change adaptation
CCAI	Climate Change Adaptation Initiative
CSDRM	Climate Smart Disaster Risk Management
DRM	disaster risk management
DRR	disaster risk reduction
FMMP	Flood Mitigation and Management Programme
FRM	flood risk management
HFA	Hyogo Framework for Action
IFRM	Integrated Flood Risk Management
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resources Management
LMB	Lower Mekong River Basin
MRC	Mekong River Commission
UNECE	United Nations Economic Commission for Europe

Executive summary

In 2000, the Mekong saw the worst floods to hit the region in approximately 40 years. Eight hundred people died, 9 million people were affected, and the costs of damages reached over US$455 million[1]. Livelihoods in the Mekong Basin are dependent upon and entwined with the flood pulse of the Mekong River and the Tonle Sap Lake. This pulse makes the Tonle Sap one of the most productive freshwater ecosystems in the world. Yet large-scale floods and flash flooding can have devastating consequences, particularly for agricultural livelihoods. Following the floods in 2000, the Mekong River Commission (MRC), an intergovernmental River Basin Management Authority for the Mekong Basin[2], established a permanent Flood Mitigation and Management Programme (FMMP) under its Technical Support Division, designed to prevent, mitigate or minimise economic losses and suffering, whilst preserving the benefits of floods.

The FMMP was established with five components of flood risk management and the types of coordination and technical services deemed appropriate to the MRC:

1. Establishment of a Regional Flood Management and Mitigation Centre
2. Structural Measures and Flood-proofing
3. Enhancing Cooperation in Transboundary Flood Issues
4. Flood Emergency Management Strengthening
5. Land Use Management

A range of initiatives has been implemented under the components including: flood forecasting capacities; best practice guidelines for integrated flood risk management; guidelines for integration of flood preparedness plans in district and provincial planning processes; approaches to flood probability mapping and land use zoning; an annual Mekong flood forum. Activities under each component are funded by different international bodies such as GTZ, Government of the Netherlands, European Commission and the Asian Development Bank. The FMMP is implemented in partnership with the national Mekong committees and relevant line ministries and departments in each country. A number of regional and international organisations (e.g. Asian Disaster Preparedness Centre) and international consulting firms lead the implementation of the different components. FMMP staff also directly commission short-term 'national experts' to play advisory roles to government departments.

Whilst the presentation of a range of detailed scenarios are required to illustrate projected climate impacts (based on climate scenarios and multiple drivers of change for different topographical zones in the basin), climate change could increase the frequency and intensity of extreme floods in parts of the basin and the FMMP is seeking to take this into account:

> We are at a critical time for learning on integrating climate change into disaster risk management. DRM is already designed to reduce vulnerability to different hazards, including the kind of risks and extremes that climate change is already bringing. However we know there are new trends. We need to consider what the surprises are likely to be and how to incorporate these 'additionalities'.
> (Nicolaas Bakker, Chief Technical Advisor, FMMP)

Too early to investigate climate smart approaches within individual projects of the FMMP, this case study looks across the FMMP as a whole and particularly at its distinctly regional dimensions, and across a number of other aspects of the MRC Secretariat's portfolio of work, such as the cross-cutting Climate Change Adaptation Initiative (CCAI) launched in 2009 (Box 1).

[1]Reliefweb (2001) Southeast Asia: Mekong Floods 2001, Information Bulletin No. 1, 27 August 2001, www2.reliefweb.int/rw/rwb.nsf/db900SID/OCHA-64BTCN?OpenDocument.

[2]The MRC, successor to the Mekong Committee, was established by the 1995 Mekong Agreement for Cooperation for the Sustainable Development of the Mekong River Basin. The Agreement was signed by the counties of the Lower Mekong Basin, Thailand, Lao PDR, Cambodia and Vietnam. China and Burma are 'dialogue partners'.

Box 1: The Mekong River Commission's Climate Change Adaptation Initiative will:

- Assess vulnerability, future climate risks and adaptive capacity
- Scope an adaptation framework and formulate an adaptation plan

Through (amongst other initiatives):

- Demonstration sites in each country to develop tools and methods for enhancing adaptive capacity
- Establishing a Mekong Panel on Climate Change

Consideration of how this initiative is evolving and its linkages with the FMMP provides additional input into an assessment of lessons for CSDRM at basin-wide scales of governance, in particular the benefits and trade-offs of separate initiatives and integrated approaches. To date, the FMMP and CCAI teams have agreed to base vulnerability assessments upon the same set of downscaled climate models and projections and to pool expertise where relevant (e.g. the CCAI's social vulnerability and capacity analysis tools and the FMMP's flood risk management approaches respectively).

CSDRM in Mekong flood risk management
The MRC has a mandate for a number of roles pertinent to DRM at the basin scale which reflect elements of the CSDRM approach:

Considering climate change in analysis of the state of common resources and risks to inform basin-wide dialogue and decision-making
The MRC facilitates scenario-based planning. Whilst certain models are continually contested and reviewed, integrating downscaled climate projections with hydrodynamic modelling enables the MRC to contribute to assessments of the effects of climate change on the different topographical zones and categories of livelihoods. The MRC compiles an annual State of the Basin report as part of the integration of new information into basin planning processes. Climate change scenarios and impacts have been assessed and are already informing assessments of regional development scenarios compiled from national plans for dialogue and decision-making. Local perceptions of change are presented in the State of the Basin report, but diverse local realities are not always reflected in hydrological modelling work. The FMMP's 2009 Flood Report elaborated on the implications of climate change specifically for flood risk. The Regional Flood Risk Management Centre is continually seeking to improve flood forecasting capacities across the region, backstopping national forecasting departments. A flash flood guidance system is also under development.

These activities reflect Pillar 1 of the CSDRM approach and in particular 1b: Periodically assess the effects of climate change on current and future disaster risks and uncertainties (see the CSDRM approach, page 36).

Facilitating joint capacity building on climate risk management through pooled resourcing, expertise and experiences
Climate change was a key theme of the FMMP's 2010 Annual Mekong Flood Forum. The Annual Forum promotes learning at the basin scale – a space for governments and others involved in the FMMP's programme to gather more information on changes in flow regimes and flood risks at different levels and to explore implications and responses through sharing good practice case studies and experiences. For example, initiatives under Component 4 led by the Asian Disaster Preparedness Centre (ADPC) on integrating flood risk management at district and provincial levels is providing lessons across countries with decentralised disaster management systems that are facing similar gaps in capacities at sub-national levels. At a national level ADPC's participation in the Cambodia national DRR Forum, comprising national NGOs and the government Disaster Management Committee, has been a source of learning on multi-scalar approaches to DRR for ADPC and MRC, and a channel for linking local-level pilots to national DRM policy processes. The MRC also hosts many regional summits and exchange visits to promote information sharing and learning across the basin; increasingly

this includes promoting dialogue with civil society organisations and experts from outside of MRC programmes. A Mekong Panel on Climate Change is due to be established under the Climate Change Adaptation Initiative (CCAI) for continuous learning and reflection on climate change in the region.

These activities demonstrate contributions to enhancing adaptive capacity, in particular reflecting 2b: Promote regular learning and reflection to improve the implementation of policies and practices.

Integrating climate information into the development of risk management standards or good practice guidelines for national application
The development of a range of flood risk management tools and guidelines, for example for mainstreaming FRM into sub-national development planning, is done through implementing pilot projects, usually at least one in each country. This reflects a learning and methodological development role of a regional agency when learning is shared across levels and across the region. Nationally applicable flood risk management tools will help develop national capacity for targeting vulnerable populations, planning for extremes and developing flood-proof infrastructure. The FMMP will begin to integrate climate information into risk assessment tools for use at different levels. Methodologies for flood risk and climate vulnerability and adaptation capacities will be exchanged between the FMMP and the CCAI.

The development of standards supports capacity building on integrating climate information into flood risk management approaches reflecting 1b: assessing the effects of climate change on flood risk, but also developing adaptive capacity through piloting methods (2b) for coping with uncertainty and unexpected events (2d), and implementing initiatives that integrate climate information across sectors and scale (2c).

Tackling specific transboundary flood risk contexts through facilitating mediation, dialogue and learning from good practice cases
Regional and international exchange visits for developing flood risk management in border zones on the mainstream is a unique transboundary context which the FMMP is seeking to tackle. Whilst not yet explicitly incorporating climate information, this convening of dialogue and collaboration and development of processes for mediation and cross-border planning in border zones, should support adaptive capacity in a context of changing risks.

This activity deals with flood risk management at the level of ecosystems rather than national borders, and recognises the need for transparency in information flow to ensure initiatives to tackle changing disaster risks do not create new risks downstream (2c) as well as preparing for unexpected events (2d).

Challenges and learning for the development of CSDRM
CSDRM in the Mekong Region suffers less from a lack of available downscaled models and projections and more from a concern for how these will impact dynamic systems in different parts of the basin; how the levels of uncertainty and variability can be considered alongside multiple drivers of environmental change; and how diverse local solutions are reflected and supported at different levels.

1. Pillar 3 – Addressing poverty and vulnerability and their structural causes – was not well integrated into the core functions of the FMMP and associated programmes.

Currently, vulnerability assessment tools are based upon historical damage data on costs to housing, infrastructure and agriculture. In light of increased recognition of socially differentiated vulnerability, the FMMP will incorporate socioeconomic data and collaborate with the CCAI on the development of tools for vulnerability and capacity assessments for adaptation. A number of the projects are already using household-level data for mainstreaming FRM in local sectoral planning, but are still not oriented towards addressing underlying vulnerabilities.

Currently there is little analysis of how to support governments to target more vulnerable

or marginalised populations. People-centred approaches to flood risk management are still marginalised in regional dialogues which have tended to focus on modelling capacities, so the space for recognising diversity, local knowledge and localised approaches to risk management and adaptation are still minimal. The FMMP team sees broader partnerships with the social development community as one approach to this and the CCAI also hopes to address this imbalance.

2. The geo-political context – in particular the politics of regionalism and water governance – in the Mekong Region in which MRC operates presents major challenges for 'More Effective Use of the Mekong's Water and Related Resources to Alleviate Poverty While Protecting the Environment'[3] and therefore also for CSDRM.

There is both hope and deep scepticism around the potential for the MRC's current Integrated Water Resources Management (IWRM) approach to contribute to a democratisation of water governance and pro-poor development. Prevailing narratives of 'big is beautiful' in energy generation and distribution and agricultural and industrial development shape country development plans. Regional decision-making is trumped by national interests that frequently gloss over the potential for risk transference to more marginalised peoples and downstream populations. Related to this, the MRC serves the implementation of the Mekong Agreement and is essentially accountable to the member governments. This can pose challenges to ensuring that their operations are in the interests of the populations of the Mekong at large, in particular groups typically marginalised from government-led policy processes. Ensuring that local communities are empowered to influence decisions that affect their livelihoods is a great challenge at a regional level, making cross-scale linkages more pertinent.

3. Separate flood management and climate change adaptation work programmes allow for specialised interrogations into particular approaches, but for CSDRM closer attention is required to the mechanisms of integration and learning internally, across the relevant government ministries and departments and regionally. Approaches to learning are challenging in bureaucratic settings where technical capacities are variable across ministries that do not always function well or collaborate without projects to convene trainings and exchanges. One-off consultations, workshops or trainings in new tools and approaches may limit adaptive capacity dependent upon regular, ongoing and innovative learning and reflection. One climate change adaptation expert from an international development organisation commented, 'we want to see the MRC succeed, but there needs to be a more process-oriented approach to learning about climate change adaptation, then we would be happy to engage'.

- A CSDRM approach at the regional or basin-wide scale needs social dimensions of risk to be more central to the common analysis and methodological development of risk management approaches. This includes recognition for diverse livelihoods and perceptions of the flood risk, and spaces for citizen engagement in decision-making and capacity within regionally directed programmes to facilitate local dialogues around these issues.
- Integrating regional climate scenarios into scenario-based regional planning processes is critical, but will only contribute to a climate smart approach when decision-making is transparent, accountable and responsive to technical information and when technical information reflects diverse and dynamic systems that incorporate local knowledge around flood risk management.
- Recent experiences of flood and drought being exacerbated by hydropower dam operations overlaid with extreme climatic conditions, mean that DRM in the Mekong requires enhancing transboundary information flows and early warning systems, including on tributaries. CSDRM therefore also demands mechanisms for mediation and compliance with the Mekong Agreement.
- The regional level offers a space for dialogue between different actors, which is particularly important when the national space for dialogue and citizen engagement is limited. Regional analysis, capacity building and guidelines for national application could be more oriented towards examining decision-making structures that empower

[3]MRC's 2006–2010 five-year goal set out in MRC 2010b: 9.

commonly excluded voices. A number of other regional initiatives can be drawn upon where diverse perspectives are being presented, debated and challenged (e.g. the MPower programme on water, environment and resilience).

- The politics of knowledge production underpins water governance and risk management debates in the Mekong Region. With the MRC bringing climate science from different levels into regional political dialogues and the development of risk management approaches, a CSDRM lens reinforces the important role of independent institutions, diverse partnerships, and recognition of and attention to multiple drivers of changing disaster risks and uncertainty and the political nature of decision-making in the region.

1. Introduction

A 'climate smart' approach expands disaster risk management (DRM) to deal with the changing nature of risks under global climatic change and seeks to make DRM more effective at tackling the structural causes of vulnerability to different types of hazards (Mitchell et al. 2010a). In current debates around the integration of climate information and adaptation approaches into DRM, references to the regional level are scarce. Furthermore there has been a strong push for more localised approaches to both disaster risk reduction and climate change adaptation (CCA), demonstrating and emphasising the role of local institutions, social networks and the importance of local knowledge and addressing vulnerability at the household level (O'Brien et al. 2009; Berger and Ensor 2009; Commission on Climate Change and Development 2009). What then is the role of institutions such as regional river basin management authorities in building the enabling environment for effective DRM in a changing climate?

This paper explores the current contributions of a regional DRM programme to tackling climate risks and asks how a 'climate smart approach to disaster risk management' can provide guidance policy and practice at a regional level. The focus of this investigation is the Flood Mitigation and Management Programme (FMMP) of the Mekong River Commission (MRC), taking into consideration the broader role of the MRC and moves to integrate climate change across the Commission's work. The MRC is not a DRM agency, but established the FMMP in 2004 following the Mekong floods of 2000 that took more than 800 lives and affected 9 million people. The FMMP seeks to link across levels and promote learning across the region, both aiming to build cooperation for regional or transboundary approaches for flood risk management and capacities for local delivery. In 2009 the MRC launched its Climate Change Adaptation Initiative (CCAI), intended as a cross-cutting programme. The FMMP is now grappling with understanding its linkages with the CCAI and its potential contribution to Climate Risk Management.

Section 2 provides background to the development of a CSDRM approach and its relevance to regional dimensions of DRM and the development of this case study. Section 3 sets the scene with contextual information about climate change and flood risks in the Mekong and institutional responses to date. Section 4 embarks on an analysis of how climate change is being integrated into the work of the MRC and implications for the FMMP and identifies core activities relevant to CSDRM. Section 5 reflects on the enabling environment and challenges to a more integrated approach on this scale and in the Mekong context. Section 6 draws together lessons from across the investigation to offer recommendations for CSDRM at the MRC and in regional, transboundary or basin-scale contexts more broadly.

2. Methodology

2.1 Background to a climate smart approach to disaster risk management

In 2010 a consortium led by Institute of Development Studies, with Christian Aid and Plan International, launched the Strengthening Climate Resilience initiative with the aim of enhancing the ability of governments and civil society organisations in developing countries to build the resilience of communities to disasters and climate change. In the preceding years, a considerable body of literature and policy debates had sought to unpack, identify and set out the linkages between approaches to disaster risk management and climate change adaptation (Mitchell et al. 2010b) and the integration of both in development processes. Current DRM approaches are critical to deal with the ways in which people are experiencing climate change and at the same time insufficient in their current framings and scope to address current and projected changes in the magnitude and frequency of hazards. The SCR initiative is building on this body of knowledge and seeking to develop a more 'climate smart' approach to disaster risk management.

A draft approach was developed through an extensive literature and expert reviews process (Mitchell et al. 2010a). This paper is an output of the 'evidence-gathering' phase that trialled the approach to both gather information about current DRM interventions at different levels and to provide guidance to improve DRM interventions in response to global climate change. The objective was to build a practice-oriented approach for practitioners and policymakers to use to review and develop more robust programmes and policies that in some way address the different dimensions of a climate smart approach. The approach is organised around three pillars (see the CSDRM approach, page 36):

Tackle changing disaster risk and uncertainties

Pillar One supports the priority areas of the Hyogo Framework for Action (HFA), highlighting the importance of collaboration between multiple actors. It calls for improved information on risks by conducting detailed risk assessments that recognise the value of multiple sources of knowledge. It highlights the importance of increasing access to information by all stakeholders through education, early warning and the media while foregrounding measures to understand and address vulnerability and the conditions creating risks. The CSDRM approach treats climate change as a key consideration and attempts to insert climate change into the most critical, climate-sensitive elements of the HFA.

Enhance adaptive capacity

Adaptive capacity refers to our ability to manage change sustainably by strengthening resilience[4]. Promoting adaptive capacity means that institutions and networks learn and use knowledge and experience and create flexibility in problem solving (Scheffer et al. 2000; Berkes et al. 2003: 1–29).

The key characteristics which enhance adaptive capacity have been identified as: promoting diversity; creating flexible, effective institutions; accepting non-equilibrium; adopting multi-level perspectives; integrating uncertainty; ensuring community involvement; promoting learning; advocating for equity; recognising the importance of social values and structures and working towards preparedness, planning and readiness[5]. Enhancing adaptive capacity is a key strategy for managing increasing uncertainty associated with a changing climate and allows people and organisations to respond to shocks and unexpected events more effectively. The CSDRM approach weaves together many of the characteristics of adaptive capacity highlighted above and offers guidance on how to consider these in a practical way.

Address poverty, vulnerability and their structural causes

Pillar Three is strongly influenced by the 'pressure and release' model (Wisner et al.2003) and longstanding research that attributes the causes of disasters to failures in development (e.g. Bankoff et al. 2003). Wisner et al.'s model treats root causes, dynamic pressures, unsafe conditions and hazards as all contributing to disaster risk. Root causes underscore the importance of access to power, structures and resources. A lack of skills and institutions (i.e. markets, press freedom) coupled with macro forces, such as urbanisation and population growth, contribute to vulnerability.

[4]The term 'resilience' is increasingly used in climate change and disaster discourses and in policies and programming related to these issues. It has become common to describe the intersection between these two fields and those of poverty and development as 'climate resilient development'. The SCR programme recognises the difficulty in operationalising the concept of resilience and its multiple meanings and as such has chosen to focus on more tangible and practical dimensions of 'adaptive capacity'. Carpenter et al. highlight that little attention has been paid to the operational indicators of resilience (2001).

[5]For more details on the ten characteristics, see SCR Discussion Paper 1, The Resilience Renaissance? Unpacking of Resilience for Tackling Climate Change and Disasters, by Aditya V. Bahadur, Maggie Ibrahim, and Thomas Tanner.

2.2 Background to a regional-scale climate smart disaster risk management approach

The role of regional institutions is not well addressed in DRM literature. The principle of subsidiarity suggests a number of roles for regional institutional capacity for DRM, in particular the need for coordination for effective response and recovery in times of emergency. Ecosystem-based DRM approaches also often demand transboundary collaboration for sustainable management of shared resources.

State-led regional DRM exists in the form of either a Disaster Management Agreement between two or more countries or a DRM component of a regional political or economic agreement. The latter may afford higher profile with national governments. Attempts at regional risk management will always be limited by concerns for state sovereignty, but cooperation is also likely to be more effective between states with similar economic or political frameworks and with shared interest in managing common hazards (UNDP 2007) such as the sustainable management of water resources.

Transboundary flood risk management is an increasingly established area of policy and practice in shared river basins:

> Transboundary cooperation on flood risk management is not only necessary, but also beneficial. Early warning by upstream countries can save lives and reduce economic losses. Moreover, cooperation helps to strengthen the knowledge and information base and enlarge the set of available strategies. Widening the geographical area considered in basin planning enables finding better and more cost-effective solutions. Finally, disaster management is highly dependent on early information and requires data and forecasts from the whole river basin. (UNECE 2009)

Functions of cooperation may include contrasting impact information for each country for allocation of regional resources, developing guidance and trainings relevant to common hazards and contexts, cooperation for sustainable management of resources to minimise risk to cross-border populations (e.g. hydropower, water pollution), cross-border learning to enhance awareness and standards in countries that are lagging in DRM policy and practice.

Climate impact projections vary according to topographical regions that usually cross national borders, making climate risk assessments and scenario modelling at the regional level particularly relevant. However, little is known of how models downscaled to topographical zones, ecosystems or bioregions are being used in policymaking at these levels. This paper looks at the potential for regional collaboration for climate smart flood risk management. As becomes clear through this investigation, some of the challenges to effective regional institutions and policy processes such as unclear lines of accountability and flexibility to respond to diverse cultural and socioeconomic contexts are as relevant to DRM as any other policy arena.

2.3 Methodology

Alongside the development of the CSDRM approach this research was based upon a desk-based review of the MRC's Flood Management and Mitigation Programme and institutional responses to climate change, and literature relating to drivers of, and responses to, changing flood risk in the Mekong Region. This included literature on water governance in the Mekong Region.

Through a first round of discussions around the draft approach with the FMMP management team, a broad set of questions were developed for a range of informants engaged in the relevant programmes, policies and interventions to draw out lessons both for the climate smart approach and for the work of the MRC. A series of key informant interviews with regional actors, some of whom were implementing MRC programmes at the national or sub-national level were held. One district-level focus group in Cambodia was also conducted. The investigator attended the 8th Annual Mekong Flood Forum, at which informal discussions were held with participants from across the region. Following this process, further secondary data in the form of programme documentation was reviewed. Exploring such a broad set of initiatives with varying forms and scales of intervention meant that breadth outweighed

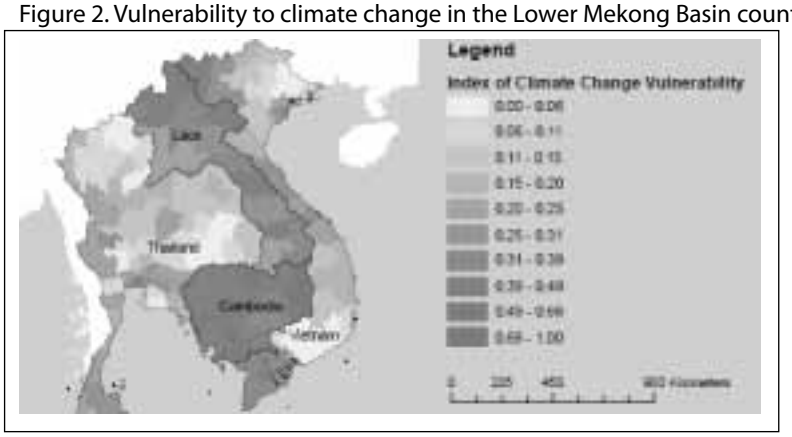
depth in this snapshot study of a regional flood risk management programme through a climate smart DRM lens. The analysis is conducted at the level of programme design more than that of implementation on the ground.

3. Setting the scene: changing disaster risks in the Mekong region and institutional responses

3.1 Climate change in the Mekong region

Climate hazard hotspots in the Lower Mekong River basin (LMB) fall in Vietnam (in the northwestern, eastern coastal and Mekong delta regions) and Thailand (in Bangkok and surrounding areas and southern regions) (Yusuf and Francisco 2009). Yet low 'adaptive capacity' in Cambodia and Lao (based upon Yusuf and Francisco's study on socioeconomic factors, technology and infrastructure (ibid.) means that 'vulnerability to climate change' in these countries far exceeds that of Thailand and Vietnam (Figure 2).

Figure 2. Vulnerability to climate change in the Lower Mekong Basin countries



(Source: Extracted from Yusuf and Francisco 2009)

The climate change scenarios and projections for the Mekong Region set out in the Mekong River Commission's State of the Basin Report 2010 (MRC 2010a) draws heavily on a studies by CSIRO (Eastham et al. 2008) and the Helsinki University of Technology and the Southeast Asia START Regional Center[6] at Chulalongkorn University (TKK and SEA START 2009). These studies use IPCC Global Circulation Models downscaled using the Hadley Centre's PRECIS model, validated with observational data, and the impacts on the Mekong were generated through integrating projections with hydrological models.

Significant variation is displayed in the different projections compiled by numerous authors. Overall climate change models for the Mekong Region are indicating a high level of uncertainty. More certainty is tied only to temperature increases projected at 0.79˚C by 2030. The southwest monsoon onset dates have a major impact on the Mekong flood regime and this is set to become more variable and increase in intensity. Total annual precipitation increases of 200mm are projected by 2030 but with significant variability across the basin (increase in wet season and dry season precipitation in northern catchments, and increased wet season and decreased dry season precipitation in most of the Lower Mekong Basin (LMB). This would lead to an increase in total annual runoff of 21 per cent, increasing flooding in all parts of the basin with the greatest impacts in the wet season in downstream catchments (MRC 2010a: 126). Impacts differ across the diverse topography. Sea-level rise and an increase in intensity of tropical cyclones will also have major implications for flood risk in parts of the basin and the Mekong region.

This rising variability demands precautionary and efficient management of water resources (IMWI/SIDA/WorldFish 2010) and approaches to decision-making that take account of increased uncertainty. Accounting for climate change in the Mekong region is particularly challenging given it is just one of many drivers of hydrological changes in the basin. Other critical drivers include deforestation, increased or intensive agriculture production, expansion of urban areas and large-scale infrastructure. The likely impacts of proposed hydropower dams throughout the basin, including 11+ on the mainstream are currently seen as a more significant driver of change (at least in the short to medium term) in flow regimes and water quality (TKK and SEA START 2009). All such changes are already impacting the 'essential

[6]The Southeast Asia START Regional Center is the regional research node of the Southeast Asia Regional Committee for START (SARCS). Southeast Asia is one of the eight existing regions of the Global Change SysTem for Analysis, Research and Training (START) network, jointly initiated by the International Geosphere-Biosphere Programme (IGBP), International Human Dimension Programme (IHDP), and World Climate Research Programme (WCRP). For more information visit www.sea-climatechange.org.

regulating ecosystem services such as flood retention capacity, erosion control and biological pest control' (ibid.).

3.2 Flood risks in the Mekong basin

Floods are identified as major hazards in all four countries, yet livelihoods in the Mekong are entwined with the natural flood pulse of the Mekong River and the Tonle Sap lake, which drives ecosystem productivity and sustains productive livelihoods particularly amongst farmers and fisherfolk who make up the majority of the region's population. Approximately 60 million people live in the Lower Mekong River Basin (in Cambodia, Lao PDR, Thailand and Vietnam). The hydrology of the Mekong combines the seasonal pulse brought by the southwest monsoon and run-off from its wide drainage area stretching from the Tibetan plateau to the Mekong delta in Vietnam. The Mekong sees some of the largest floods in the world (MRC 2010a). The benefits brought by floods far outweigh the challenges faced by the region's populations who depend on the fisheries, the water supplies and the nutrient deposits. The Tonle Sap Lake is one of the world's most productive ecosystems (Kummu et al. 2006). Yet large-scale floods (including unusually early start of flooding, or delayed draining of floodwater), and flash flooding can have devastating consequences, particularly for agricultural livelihoods. This context requires dramatic improvements in disaster management systems.

The floods of 2000 in the Mekong reportedly caused 800 deaths and over US$400 million of damage and affected 9 million people[7]. These were the worst seen in the Mekong delta for 70 years[8]. Floods the following year caused further damage before people had had a chance to recover. As with each disaster, the floods were a significant catalyst to both national and regional disaster risk management efforts. Typhoon Ketsana, which hit the region in September 2009, was a more recent reminder to many disaster management agencies that they were not nearly as prepared as they should have been. According to the Head of Care Lao PDR, the Lao Disaster Management Office had no information regarding the potential flood impacts and the office had no fax machine with which to receive the forecasts (Henry Braun, pers. comm.).

In Cambodia coordination amongst agencies (government and non-government) for disaster response for Ketsana was reported by NGOs working on community-based DRR to have improved on previous events, with sub-national-level contingency planning kicking into operation in their target provinces. They recognise, however, that there remains a long way to go to be adequately prepared for floods and storms on these scales (George Were, Oxfam GB and Chum Vuthy, ADPC, pers. comm.).

There is a historical legacy in the region of a technical fix approaches to flood risk management making use of dams, dykes and embankments for keeping water away from people. Learning from local and global experiences and the evolution of integrated flood management approaches that recognise both the benefits and adverse impacts of flooding has led to more of a balance between 'hard' and 'soft' risk management measures. Structural measures are still often favoured and poorly implemented (from impact assessment through to monitoring and evaluation) in ways that result in transference of risks to other locations or groups of people (Lebel et al. 2009). Water governance debates in the Mekong region raise critical questions around decision-making processes, legitimacy of different actors and institutions, dominant development paradigms and conceptual debates around concepts and practices of 'flood risk management' or 'flood protection'. As Lebel states, 'The interplay of institutions not only defines what and whom will be at risk, but also shapes the way flood disasters are defined, perceived and acted upon' (Lebel 2006).

A drive for more decentralised governance and localised approaches to DRM in development is beginning to shift policy and practice. However, DRM efforts are still not tackling some of the increasing drivers of flood risk such as deforestation and changing land use, and progress towards addressing poverty and social vulnerability to flood risks is slow. The mandate for transboundary flood risk management is clear: understanding changing flood risks and addressing land use change drivers demands coordination across administrative boundaries at district, provincial and national borders.

[7]ReliefWeb (2001) Southeast Asia: Mekong Floods 2001 Information Bulletin No. 1, 27th August 2001, www2.reliefweb.int/rw/rwb.nsf/db900SID/OCHA-64BTCN?OpenDocument (accessed 15 June 2010).

[8]Save the Children (2000) Key work: Emergency Preparedness and Response, Mekong Floods of 2000 – Rehabilition Activities, www.savethechildren.net/vietnam/key_work/emerg_prep/fld_2000.html (accessed 15 June 2010).

3.3 Regional DRM actors

ASEAN countries have signed the Agreement on Disaster Management and Emergency Response (AADMER) following the Indian Ocean tsunami, reportedly the 'first ever HFA-related binding instrument in the world' (AADMER)[9]. It is not currently considered to be driving disaster management agendas in the Mekong region, but DRM agencies are beginning to engage in the Agreement as an entry point for promoting greater attention to risk reduction approaches amongst national governments. The MRC's programme for cooperation in the Lower Mekong Basin (LMB) is not a DRM initiative but has DRM components and the objective of sustainable development. The MRC suffers from China not being a signatory to the Agreement and others see regionalisation programmes such as the Asian Development Bank's Greater Mekong Sub-region (ADB-GMS) programme as more influential on development trajectories, being more oriented towards economic integration. The ADB, alongside other international donors, supports DRM initiatives through the MRC and directly to member governments.

The Asian Disaster Preparedness Center (ADPC), a Bangkok-based resource centre providing training and technical services, has played an important role in promoting community-based approaches to climate and disaster risk management. Many international development organisations are engaged in DRR across the region but have country-specific programmes seeking to integrate DRR into development (e.g. Oxfam, CARE, ActionAid, IFRC). A number of the same agencies now have climate change initiatives, and are also seeking to develop integrated approaches to policy and practice work on climate change adaptation, disaster risk reduction and development. A number of regional agencies and academic institutions offer basin-wide programmes, often relating to water governance but with DRM or climate change dimensions (SEI Mekong Basin Focal Project, MPower Programme). A key regional climate science institution is the SEA START Center[10].

Whilst this paper focuses on analysing regional flood risk management from a CSDRM perspective, there is concern in the region that an overemphasis on flood risks from climate change could detract attention from less visible vulnerability to worsening drought conditions experienced across the region (GERES 2009). DRR agencies are therefore placing an emphasis on water resources management at different levels but particularly drought management techniques for agriculture, building on traditional and new approaches to water harvesting and irrigation (Ahmed 2010). This study in no way intends to undermine this; it is just that the permanent status of the MRC's Flood Management Programme made it a good starting point for examining how climate change is being considered in a regional DRM initiative.

[9]www.pacificdisaster.net/pdnadmin/data/documents/4597.html.
[10]see footnote 7.

4. Integrating climate change into disaster risk management at the MRC

4.1 Background to the flood mitigation and management programme

Established in 1995 under the Mekong Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin, the Mekong River Commission (MRC) succeeded the former 1957 Committee for Coordination of Investigations of the Lower Mekong Basin – the 'Mekong Committee'. The four countries of the Lower Mekong Basin, Thailand, Lao PDR, Cambodia and Vietnam, are signatories to the 1995 Agreement, with China and Burma holding 'dialogue partner' status. The MRC is an 'international, country-driven river basin organization' with a mandate to promote regional cooperation for more effective use of water and related resources to alleviate poverty while protecting the environment (MRC 2010b: 9). Its current guiding framework is Integrated Water Resources Management (IWRM)[11]. The MRC Secretariat (MRCS) is the technical and operation arm of the MRC, providing support through National Mekong Committees in each country.

The MRC is not a DRM agency per se, but was established to enable transboundary cooperation, and since 2004 has been host to the 'Flood Mitigation and Management Programme' (FMMP) in response to the floods of 2000/1. The FMMP aims to 'prevent, minimise, or mitigate people's suffering and economic losses due to floods, while preserving the environmental benefits of floods', i.e. to respond to some of the challenges set out in the previous chapter:

> The issue of flooding in the Lower Mekong Basin requires us to adopt a regional perspective to understanding causes and proposing solutions. It requires an integrated, holistic and balanced approach to flood management that draws on an increasing knowledge base. Our approach also focuses special attention on transboundary issues, so that impacts across boundaries and borders are considered.
> (Paudyel 2002)[12]

The FMMP comprises five components:

C1. Establishment of a Regional Flood Centre
C2. Structural Measures and Flood-proofing
C3. Mediation of Transboundary Flood Issues
C4. Flood Emergency Management Strengthening
C5. Land Management

The components were built upon mainstream flood management approaches of the time, and the components of flood management deemed appropriate to the MRC's institutional mandate. Its focus is on coordination and technical support to the four countries.

A range of initiatives have been implemented under the five components including developing: flood forecasting capacities; best practice guidelines for integrated flood risk management; guidelines for integration of flood preparedness plans in district and provincial planning processes; approaches to flood probability mapping and land use zoning; and hosting an Annual Mekong Flood Forum. Activities under each component are funded by different international bodies such as GTZ, Government of the Netherlands, European Commission and the Asian Development Bank. The FMMP is implemented in partnership with the national Mekong committees and relevant line ministries and departments in each country. A number of regional and international organisations (e.g. Asian Disaster Preparedness Centre) and international consulting firms lead the implementation of the different components. FMMP staff also directly commission short-term 'national experts' to play advisory roles to government departments.

At the time of writing the FMMP was undergoing its Phase 1 (2004–2010) review process to develop a strategy for Phase 2. The outputs from a review mission and consultations were

[11]Integrated Water Resources Management is a prevailing approach to water management, formulated initially at the International Conference on Water and the Environment in Dublin, 1992. Defined by the Global Water Partnership as 'the coordinated development and management of water, land and related resources in order to maximise economic and social welfare without compromising the sustainability of ecosystems and the environment', www.gwp.org/en/The-Challenge/What-is-IWRM/. The IPCC defines it according to the four principles developed there: '1) fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment; 2) water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels; 3) women play a central part in the provision, management and safeguarding of water; 4) water has an economic value in all its competing uses and should be recognised as an economic good', www.ipcc.ch/pdf/technical-papers/climate-change-water-en.pdf. Critics of the IWRM approach are concerned about the idea of a catch-all single framework and the resulting vagueness, and capacities of the types of international institutions embracing the approach to translate the principles into meaningful changes in modes of operation and responses to diverse contexts and local political dynamics.

[12]Paudyel was consultant to the MRC in the development of the FMMP.

unavailable but greater attention to climate change risks and to poverty outcomes are being emphasised.

> We are at a critical time for learning on integrating climate change into disaster risk management. DRM is already designed to reduce vulnerability to the different hazards, including the kind of risks and extremes that climate change is already bringing. However we know there are new trends. We need to consider what the surprises are likely to be and how to incorporate these 'additionalities'. (Nicolaas Bakker, Chief Technical Advisor, FMMP)

The Annual Flood Report 2009 provides an assessment of climate impacts and linkages to flood risk management, concluding with recognition for the need to draw on existing DRM approaches to respond effectively to an intensification of existing hazards (floods, droughts, storm surges) but also that climate change adaptation requires a broader set of development approaches that may include livelihood diversification or relocation of populations.

4.2 Responding to climate change at the Mekong River Commission

Too early to investigate climate smart approaches within individual projects of the FMMP, this case study looks across the FMMP as a whole and particularly at its distinctly regional dimensions, but also across a number of other aspects of the MRC Secretariat's portfolio where climate change is being considered and therefore has relevance to a CSDRM perspective, such as its core Basin Development Planning work.

> The Basin Development Plan Programme (BDP) includes climate change effects in their scenario work. Combined climate and development scenarios are being modelled assessing the hydrological, environment and socioeconomic impacts of climate change in a development context. Through consultation processes with regional and local stakeholders, led by BDP, potential impacts and adaptation strategies on climate change will be discussed for policy uptake and implementation in the planning processes. (MRC 2009b)

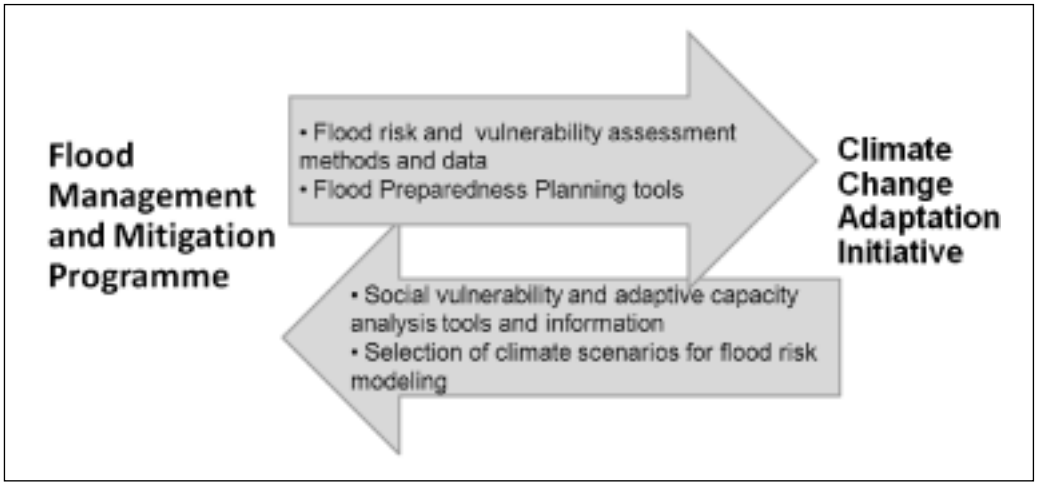
The MRCs Strategic Plan 2006–2010 included 'prevent, mitigate or minimize people's suffering and economic loss due to climate variability' and in 2009 the MRC launched the cross-cutting Climate Change Adaptation Initiative (CCAI) (Box 1). The CCAI is an ambitious 15-year initiative responsible for climate change impact assessments and adaptation planning to contribute to achieving 'the MDGs, poverty eradication and improved food security' (MRC 2009a).

The CCAI will test tools and methods for vulnerability assessments and adaptation planning, linking top-down climate science and indigenous knowledge through broad stakeholder engagement, and engagement across all levels and sectors. The final details of scope and modes of implementation are still being established, but the technical team realise that the initiative's contribution to the MDGs 'cannot be achieved without high commitment of the national governments'.

It was not within the scope of the research exercise to explore the CCAI in depth, rather to look at how attention to climate change at the MRC intersects with the FMMP. This provides lessons for CSDRM on basin-wide scales of governance, in particular the benefits and trade-offs of separate initiatives and mainstreaming or integrated approaches. Several discussions have taken place between the FMMP and CCAI to establish complementary roles.

The CCAI team played an active role in the 8th Annual Flood Forum and the downscaling of data and socioeconomic impact assessment information is currently seen as the main contribution of the CCAI to the FMMP's work (pers. comm., Neou Bonheur). The FMMP and CCAI teams have agreed to base vulnerability assessments upon the same set of downscaled climate models and projections and to pool expertise where relevant (Figure 3).

Figure 3: Proposed information exchange between the FMMP and CCAI



A further cross-cutting body of work is the Initiative on Sustainable Hydropower. Investigating the initiative is outside the scope of this study, but as indicated in Section 3, the proposed hydropower projects on the Mekong mainstream are putting the Mekong Agreement and transboundary management to the test. The MRC faces a challenge in both assessing impacts of proposed projects (and how to ensure climate projections have been taken into account in their development) and in developing flood management programmes when the flow of the Mekong is uncertain based on the rapid hydrological changes from upstream dams and land use change.

Impact assessments conducted at the basin scale are included in references to the broader work of the MRC, particularly the Basin Development Plan (BDP). The BDP facilitates analysis of the Mekong's common resources and scenario development, and develops basin-wide planning methods. Under the IWRM Support Programme structure, the BDP plays an overarching role across all services and sectoral programmes (Appendix 1).

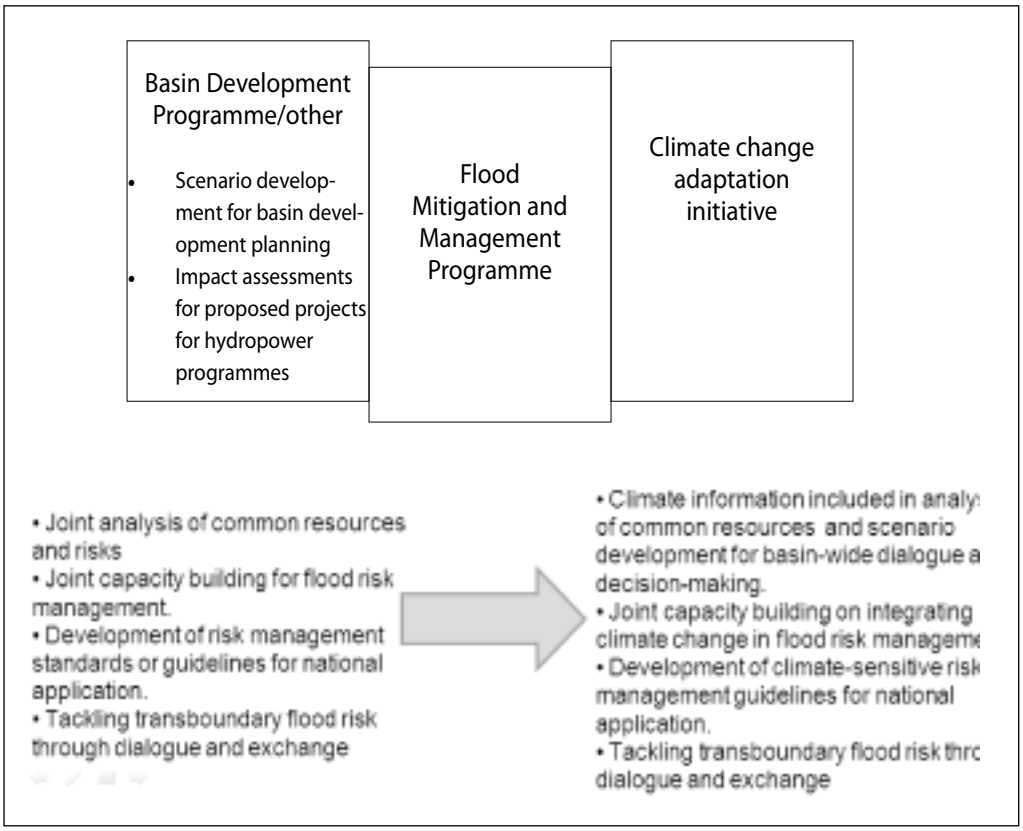
4.3 Key regional CSDRM functions

Several key functions of the MRC appear particularly relevant to the CSDRM approach at a regional level:

1. Considering climate change in analysis of the state of common resources and risks to inform basin-wide dialogue and decision-making.
2. Facilitating joint learning and capacity building on climate risk management through pooled resourcing, expertise and exchanges.
3. Integrating climate information into the development of risk management standards or good practice guidelines for national application.
4. Tackling specific transboundary flood risk contexts through facilitating mediation, dialogue and learning from good practice cases.

These four functions are not necessarily fully developed. For example, approaches to integrating climate change information from different sources have not yet been included in the flood probability assessment tools or the guidelines for flood risk management developed by the FMMP. Nor are they mutually exclusive.

Figure 4: Current or emerging MRC functions relevant to climate smart flood risk management at a regional level



The next section explores these four areas from a CSDRM perspective, presenting the approach both as an analytical tool through which to look at the MRC's DRM work, and also as guidance for policy and CSDRM programming by teasing out gaps and opportunities for CSDRM in the Mekong region.

5. The FMMP from a CSDRM perspective

This section explores the four elements of MRC's disaster risk management work set out in Section 4, in relation to the CSDRM approach (CSDRM approach, page 36) which formed the basis for the investigation: 1. Tackle changing disaster risks and uncertainties; 2. Enhance adaptive capacity; and 3. Address poverty and vulnerability and their structural causes.

5.1 Progress towards CSDRM through the four elements

5.1.1 Analysis of the state of common resources and risks to inform basin-wide dialogue and decision-making

A core function of the MRC is its development of tools and methods for assessing the state of the basin and scenario-based planning based on national development plans and trajectories. The MRC compiles an annual State of the Basin report as part of the integration of new information into basin planning processes and it now includes accessible information on how climate change is impacting the basin's ecosystems and lives and livelihoods. As described above, the latest range of climate change scenarios and impacts have been reviewed and assessed according to topographical zones and livelihoods.

Downscaled climate information integrated with development trajectories is already informing regional development scenarios, analysis of changing flood risk and impact assessments. The FMMP's 2009 Flood Report elaborated on the implications of climate change specifically for flood risk. These activities reflect Pillar 1 in 'periodically assessing the impacts of climate change on current and future disaster risks and uncertainties'. The FMMP is drawing on the work of regional climate specialists and bringing this information into the realm of basin-wide coordination and planning between national governments. The proposed Mekong Panel on Climate Change under the CCAI will strengthen this ongoing assessment of climate impacts on disaster risks and the FMMP's intention to bring expertise in-house for running integrated climate change and hydrological models for flood probability assessments will also be building this capacity for flood risk analysis for basin-wide dialogue and decision-making.

Currently, local perceptions of change are presented in the State of the Basin report, but diverse local realities are not always reflected in hydrological modelling work. Attention to drawing information on changing risks from different sources, including local knowledge, is not currently strong within regional assessments of changing flood risks. The CCAI also hopes to drive the inclusion of diverse perspectives and local experiences and knowledge about changing risks and tackling risks. It intends to build a strong network of expert agencies including climate and hydrology agencies, natural systems assessment agencies and socioeconomic systems groups (MRC 2009a).

Climate change projections are also considered in the MRC's strategic environmental assessment of the proposed mainstream dams, determining the potential impacts for the region and its populations of the dams alone, and when overlaid with climate projections. The assessment also indicates some of the steps required to take climate change impacts into account. Also included in the assessments is consideration of GHG emissions from the proposed hydropower projects vis-à-vis those from coal and gas which, in terms of CSDRM, is part of the promotion of environmentally and climate smart development (3d) (MRC 2010c). This should be treated with caution and there is a need to further investigate any assumptions and calculations made, and to ensure that these emissions are weighed against other impacts on the environment and vulnerability of populations.

5.1.2 Facilitating joint capacity building on flood risk management through pooled resourcing, expertise and experiences

Information and knowledge management and integrated capacity building are promoted as core cross-cutting roles of the MRC through its IWRM approach (Appendix 1). This is reflected in the FMMP's work programme; in the provision of technical support services through the regional centre for flood management; the implementation of programmes in the form of pilots through which to test and develop methods; and the facilitation of regional fora.

Combined forecasting capacities

FMMP's Flood Forecasting is a form of joint service provision compiling water level data from all monitoring stations across the basin. Water level and quality data gathering are the responsibility of national governments as is dissemination of flood forecasts and early warning systems, but through the Regional Flood Centre and the programme components, the FMMP provides backstopping support to national agencies, and continues to improve regional forecasting capacity. This also includes developing a flash flood guidance system. The current system provides five-day flood forecasting and therefore provides some capacity for building preparedness for increased flood risk.

Piloting FRM approaches at different levels

Component 4 led by the Asian Disaster Preparedness Centre (ADPC) has been piloting the integration of flood risk reduction in development planning at district and provincial levels in all four countries. This is generating lessons on delivering DRM in decentralised disaster management systems that are facing similar gaps in capacity at the sub-national level. With ADPC's experience of community-based approaches, and attention to the gender and age dimensions of flood preparedness, their involvement is also driving a more 'people-centred' approach to flood risk management within the FMMP.

At the national level, ADPC has worked closely with DRR networks to be part of national policy processes. In Cambodia, ADPC participated in the Cambodia national DRR Forum, comprising national and international NGOs and the government National Disaster Management Committee[13]. This has been a source of learning on multi-scalar approaches to DRR for ADPC and the MRC, and a channel for national coordination and linking local-level pilots to national DRM policy processes. Flexible funding mechanisms, partnerships and multi-scalar working are supporting capacity building for flood risk management. These learning spaces also provide more entry points for taking new climate information into account in flood management work in the region.

The FMMP's delivery of pilot programmes provides opportunities for developing new methods amongst government and disaster management stakeholders at different levels, but only in the flood-prone areas in which the pilots are sited, and often with insufficient timeframes or budgets to capitalise on learning opportunities. The ADPC is proposing a 'longer-term programmatic approach [to delivering under the Components] and up-scaling to wider geographical areas' to link this work more effectively to national policy (Perwaiz 2010).

Several components of the FMMP also facilitate exchange visits for governments, including local authorities, to other districts, countries and river basin management authorities. Further enquiry would be required to see how this is directly building capacities for particular FRM approaches, in particular building momentum for cross-border preparedness planning or collaborative risk management initiatives.

Facilitating regional fora

The Annual Mekong Flood Forum (AMFF) promotes learning at the basin level – a space for governments and others involved in the FMMP's programme to gather more information on changes in flow regimes and flood risks at different levels and to explore implications and responses through sharing good practice case studies and experiences around key themes. Climate change was the theme of the 8th Forum in 2010, reflecting the FMMP's contribution to promoting access to information and regular learning and reflection to improve implementation of flood management in the region (i.e. CSDRM 2b). The MRC also hosts many regional summits and exchange visits to promote information sharing and learning across the basin; increasingly this includes promoting dialogue with civil society organisations and experts from outside MRC programmes.

The CCAI has also been developed through regional consultations and will create space for learning across the four pilot initiatives currently under development. There is room for a larger range of stakeholders and a more diverse set of approaches to sharing lessons learnt at such meetings with a wider audience, particularly given the high quantity of papers

[13]Many of the agencies in the DRR Forum, including ADPC, received funding from the European Commission Humanitarian Aid Department's Disaster Preparedness Programme (DIPECHO) for delivering DRR and building government capacity, providing support for convening a national forum.

generated. Finally, forming a Mekong Panel on Climate Change should also be a driver of regional capacity on climate risk management.

5.1.3 Development of risk management standards or good practice guidelines for national application

The MRC cannot enforce standards but instead contributes to the body of tools and latest good practice methods and standards available to member and regional countries – developed locally and therefore relevant to the Mekong context. Component 2 (C2) of the FMMP develops best practice guidelines for Integrated Flood Risk Management, through trialling the application of standards to projects prioritised by national governments, with a view to identifying 'bankable' projects (economically viable projects that would likely secure funding from the ADB) and to inclusion in the Basin Development Plan.

One component of developing guidelines for structural measures was a study for the development of sound and environmentally friendly planning and design of roads in the Mekong floodplains in Cambodia and Vietnam (implemented by WWF/UNESCO-IHE-Delft Cluster). At face value this reflects 3d (promoting environmentally sensitive development). Further investigation would be required to assess the extent to which the development and implementation of the guidelines are integrated with bottom-up planning processes (and other dimensions of Pillar 3 relating to tackling poverty and vulnerability, such as attention to access to resources and decision-making processes amongst different groups) and take into account changing disaster risks and uncertainty.

The proposed projects include both hard and soft measures to mitigate and tackle exposure to extreme events. The extensive reports for C2 do not explicitly discuss the process for integrating climate information into flood risk assessments, which is critical, particularly for infrastructure planning guidelines. The FMMP will develop in-house capacity to assess changing flood risks and integrate scenario-based planning into flood risk assessments for different purposes. CSDRM promotes integrating climate information into all DRM standards and guidelines, and suggests that they need to be developed with a wide range of partners and made accessible to all those involved in addressing flood risks. Providing the latest approaches to Integrated Flood Risk Management is important for regional capacity but needs to be contextually relevant and appropriate to the different capacities of governments and legislative environments.

5.1.4 Tackling specific transboundary flood risk contexts through facilitating mediation, dialogue and learning from good practice cases

Facilitating transboundary resource management underpinning transboundary Flood Risk Management is the MRC's raison d'être. Component 3 (C3), Enhancing cooperation in transboundary flood issues, seeks to facilitate dialogue and build awareness to open possibilities for collaboration and joint planning between governments. C3 includes exchange visits to the border area of Vietnam and Cambodia, to the Rhine and Meuse basin organisations in Europe, and the Yangtze Water Resources Commission in China. Regional and international exchange visits for developing flood risk management in border zones on the mainstream is a unique transboundary context which the MRC is well placed to convene.

Transboundary coordination is also tackled under the FMMP through developing joint preparedness plans (Component 4) and piloting guidelines for IFRM in border provinces (Component 2). For CSDRM these activities reflect a number of elements relating to building partnerships, creating opportunities for innovating, and developing processes to plan for unexpected events.

Again, to date, interventions have not been explicitly concerned with climate smart approaches to transboundary flood management but are serving to enhance coordination for improved FRM in a context of changing flood risks and uncertainty and in this way support adaptive capacity (Pillar 2). Convening dialogue with local authorities in cross-border zones may also provide a space in which local authorities can be more involved in national or regional decision-making or gain access to information on upstream developments (CSDRM 3c).

5.2 Progress towards CSDRM according to the three pillars

Tackle changing disaster risks and uncertainties

The FMMP is actively promoting enhanced understanding of the implications of climate change for flood risk in the basin, to provide guidance for flood risk management approaches and activities. The FMMP is promoting awareness raising about climate change amongst the riparian states and seeking to improve access to information on changing flood risks amongst relevant stakeholders. A key role of the MRC is to integrate this new information (downscaled models and projections) into the basin development planning process, thereby, with the activities of the FMMP, linking disasters, climate change and development at the regional level. The assessments of changing flood risks are 'periodic' through the annual Flood Report and Annual Flood Forum. Currently, the climate information is drawn more from climatology and hydrology, but through its State of the Basin reporting, the MRC is also drawing together some perspectives from communities on changing risks, and the CCAI intends to draw on the social sciences and socioeconomic development actors to enhance knowledge of the social dimensions of risks and related approaches to building resilience at different levels, and integrate these into regional capacity building and decision-making.

The Regional Flood Centre plays an important role in building regional forecasting capacities designed to reduce the exposure of people's lives and livelihoods to flood risks. All of the five components in some way are also building this capacity, although they are currently basing flood probability analysis on historical data. Component 4, in particular, is making headway in strengthening flood preparedness systems through improving communications between different levels of government and developing guidance on integrating flood preparedness plans in development planning at different levels.

Enhance adaptive capacity

The FMMP's current contribution to enhancing adaptive capacity according to the CSDRM approach is its promotion amongst government agencies of learning about managing flood risks. As a matter of course this is increasingly including learning about the implications of climate impacts on flood risk, and how to integrate this into flood risk analysis. Piloting methods provides some opportunity for experimentation and innovation, depending on the implementing institutions, and the Annual Flood Forum provides a focus for sharing experiences of using different tools and methods and reflecting on their contribution to effective flood risk management in the basin. This includes a 'people-centred approaches' theme to reflect on community-based work and the social dimensions of flood risk management. As a regional agency, the emphasis is on learning amongst government actors.

Established after the 2000/1 floods, the FMMP is driving the development of flood risk management tools intended to help national governments mitigate, prepare for and respond to extreme flood events such as these. Capacities are very different in each of the four countries so developing relevant support services so that governments can plan for uncertainty is mainly in the form of developing forecasting capacities (through the gathering and sharing of flow data basin-wide) and overall assessments of the state of the basin and scenario development, based on integrated analysis of national development plans and environmental change. These support services may or may not be capitalised upon by national governments.

Address poverty, vulnerability and their structural causes

Pillar 3 – addressing poverty and vulnerability and their structural causes – was not well integrated into the core functions of the FMMP and associated programmes. The FMMP is operating within its bounds as an MRC technical support division programme and sees its primary role as developing technical capacities within national governments for assessing, analysing and responding to flood risks. It doesn't see itself as having a strong mandate to tackle socioeconomic development issues. Pilot programmes are mostly located in particularly flood-prone provinces but, in general, programmes are not targeted towards those most vulnerable to changing flood regimes. This is because current vulnerability assessment tools are based upon historical damage data on costs to housing, infrastructure and agriculture at the district level. In light of increased recognition of socially differentiated vulnerability, the FMMP will incorporate socioeconomic data and collaborate with the CCAI

on the development of tools for vulnerability and capacity assessments for adaptation. A number of the projects are already using household-level data for mainstreaming FRM in local sectoral planning, and developing flood preparedness programmes targeting women and children specifically, but these projects are not oriented towards addressing underlying vulnerabilities. Currently there is little analysis of how to support governments to target more vulnerable or marginalised populations.

People-centred approaches to flood risk management are still marginalised in regional dialogues, which have tended to focus on modelling capacities, so the space for recognising diversity, local knowledge and localised approaches to risk management and adaptation is still limited. The FMMP team sees broader partnerships with the social development community as the way to ensure components of the CSDRM approach – such as ensuring the rights and entitlements of people to access basic services and productive assets – are also being met. The CCAI also hopes to address this imbalance through building a strong network of partners.

Table 1. The FMMP (and related programmes) through a CSDRM lens

	Tackle changing disaster risks and uncertainties	Enhance adaptive capacity	Address poverty, vulnerability and their structural causes
Joint analysis of common resources and risks Joint capacity building on flood risk management. Developing risk management standards or good practice guidelines for national application Tackling specific transboundary flood risk contexts	State of the Basin reporting on effects of climate change impacts on disaster risks. Scenario-based planning includes downscaled climate information. Changing flood risk/probability analysis includes downscaled climate information. Increasing access of all stakeholders to analysis of flood risks. Building flood forecasting capacity across the region, backstopping national agencies and developing a flash flood guidance system for the basin. Building partnerships between governments in border districts and provinces for joint flood risk management planning. Improving access of all stakeholders in border zones to information on upstream developments and support services for tackling flood risks	Convening different organisations and networks to contribute to analysis and assessments Developing scenario planning tools and vulnerability assessments. Regular learning and reflection on climate-related flood risk management through regional fora, exchange visits (regionally and internationally) and pilot projects. Flood risk management (flood emergency management strengthening, protection and preparedness planning, flood-proofing infrastructure) tools to plan for extreme flood events on local and transboundary scales. Pilot programmes to test methods and promote contextualised learning for developing appropriate standards in the guidelines	Greenhouse Gas emission assessments included in infrastructure impact assessments (particularly hydropower). Environment impact assessments and scenario planning to inform decision-making on the basin scale (in Lower Mekong Basin) to promote environmentally sensitive and climate smart development. Emerging partnerships with social development agencies (academia, NGOs) to gather and analyse differentiated vulnerability to changing risks and underlying causes.

6. Enabling environments and contextual challenges for CSDRM in the Mekong region

On the one hand, the individual initiatives under the different components of the FMMP have to be considered on their own merit, due to their differing objectives, donors, institutional arrangements, partnerships and objectives. On the other, none of the work of the FMMP can be considered outside the historical legacy and mandate of the MRC and the political economy of water governance in the region. Furthermore, the FMMP is by no means the locus of DRM activities in the region, nor will it be the leading agency to convene knowledge and drive best practice on climate change adaptation. Many other processes are influencing DRM nationally and responses to climate change, and there is an increasing body of knowledge and experts on approaches to community based DRM and adaptation that are influencing sub-national and national policies and programmes. Yet there are some fundamental challenges to FRM in the region that can benefit from transboundary cooperation for capacity development, knowledge management and mediation.

6.1 Enabling factors and opportunities

Legislative and institutional mandate for cooperation for transboundary disaster risk management and sustainable development

The MRC boasts an established legal agreement and basin-wide institutional structures within which to cooperate and build trust to improve the joint management of the Mekong River, all stated as necessary elements of transboundary flood risk management by a United Nations Economic Commission for Europe (UNECE) conference on this theme in 2009 (UNECE 2009). Making transboundary FRM 'climate smart' is a more recent and uncertain endeavour with which the MRC is making headway. A number of enabling factors are supporting a CSDRM approach at the MRC.

Methods and models for downscaling and using climate information

Scenario-based planning requires the MRC to incorporate the latest information on drivers and impacts of change into hydrological modelling to inform scenarios and impact assessments. This mandate and capacity act as a driver and enabler for assessing likely effects of climate change on changing disaster risks and uncertainties. The MRC is drawing on the IPCC and Hadley Centre models but also the approaches to downscaling by SEA START, amongst others. The availability of a significant number of studies into climate impact projections by regional institutions, based on different climate scenarios and downscaling methods, has enabled the MRC to begin integrating climate information into basin planning processes.

Profile and prioritisation of climate risk analysis

The high global profile of global climate change politics and the generation of international climate finance have driven institutional and policy responses to climate change at all levels, but interest amongst national governments and international donors has provided support for a clear response to climate change at the MRC. This does, however, risk developing new adaptation initiatives disconnected from DRM. The cross-cutting nature of the CCAI is intended to overcome this and a CSDRM perspective can help guide this integration.

Stronger role of civil society and academia

Frustration with exclusion from processes concerning the future of the Mekong region and witnessing the impacts of economic development projects that have sought to 'harness the untapped potential' of the Mekong River has led to strong civil society interest in regional and very local water and energy politics.

The MRC, multilateral banks and bilateral donors and national governments have all come under scrutiny for their promotion of forms of unsustainable development and for technical, model-based approaches to assessing joint resources and impacts of proposed projects that simplify complex ecological systems (Kakonen and Hirsch 2009). Kakonen and Hirsch say these approaches remain relatively closed and exclusive and civil society movements for change in the way regional institutions and national governments operate (e.g. more

accountability, participation, rigorous analysis in decision-making processes), combined with resistance to individual projects, have led to shifts in approach and perspectives within the MRC, such as increasing to some extent the knowledge base upon which basin planning is facilitated. New practitioner research networks such as the Mekong Programme on Water, Environment and Resilience[14], and community-led research initiatives are contributing action research-based debates on water governance across the region. These bring to light the complexities of water politics across levels, questions of knowledge ownership and the politics of knowledge production, diverse perspectives and practices and policy analysis for improving water governance.

6.2 Challenging contexts

Politics of regional water governance and prevailing narratives

The Mekong is still seen as an insufficiently tapped resource for economic development. Alongside this, 'big is beautiful' remains part and parcel of energy generation narratives and the only route out of poverty for Lao PDR and Cambodia is seen as encouraging foreign investment for large hydropower together with intensification of agriculture through large irrigation schemes. Emerging assessments are confirming that large-scale hydropower on the Mekong mainstream poses one of the greatest disaster risks for downstream populations and countries, in terms of irreversible damage to natural ecosystems and the world's largest freshwater fishery, and therefore food security, economic development and political stability.

The ADB's promotion of regional economic integration is a significant driver of large-scale infrastructure developments (Middleton, Garcia and Foran 2009) with implications for the management of water resources, decision-making processes and framing of flood risks. Historically, the MRC and its predecessor have been instrumental in driving forwards regional hydropower development plans and the institution is still locked in partnership with the multilateral development banks. There is both hope and deep scepticism around the potential for the MRC's current Integrated Water Resources Management (IWRM) approach to contribute to a democratisation of water governance and pro-poor development (AMRC 2007).

Lazarus and Dore (2009) note the MRC Secretariat's recent interest in addressing risks in the basin as part of a drive to improve social and environmental impact assessments for proposed projects and how these inform decision-making. However, to date, the MRC and the Mekong Agreement have been unable to address some fundamental transboundary conflicts over water management, and poor hydro developments have led to catastrophic consequences for downstream populations, and a continuing context of uncertainty and increased risk of exposure to extreme floods. Despite transformations taking place under current MRC Secretariat leadership for more open and participatory dialogue, the institution continues to be sidelined by the pursuit of each member's national interests, and the activities and decisions of China, with downstream countries losing out. Lazarus and Dore (2009) discuss the need to 'de-marginalise the MRC'.

Accountability

The MRC Secretariat serves the implementation of the Agreement through services to the national governments. This is essentially where the lines of accountability lie. International donors and financiers continue to play a strong role in shaping the programmes of the MRC. Whilst this is likely to have driven attention to climate change across the MRC, making a transition to facilitating decision-making and planning in the interests of wider riparian populations, where accountability of national governments towards citizens is weak, is challenging. However, it may be important to distinguish here between some of the technical programmes and the more political Basin Development Plan programme.

Multiple drivers of change

Latest assessments reveal that, in the shorter term, large-scale hydropower projects on the Mekong mainstream will have far greater impact on flow regimes than climate change will. Rapid land use change in the region is also a major driver of change in flood risks. Balancing attention to all of these in scenario planning is one challenge. Orienting flood risk management initiatives towards drivers of vulnerability also becomes highly political.

[14]The Mekong Programme (MPower) is driven by a network of researchers committed to improving local, national and regional governance in Cambodia, China, Laos, Burma/Myanmar, Thailand and Vietnam through action research and practical policy support (Molle et al. 2009: preface). For more information on the Programme, see www.sea-user.org/uweb.php?pg=19.

Institutional separation of adaptation and DRM at a national level
Whilst there are generally some linkages between the institutional architecture of climate change and disaster risk management, this varies between countries. Climate change adaptation programmes, policies and institutions are in some cases evolving without due recognition for the role parallel DRM structures and programmes could play. This could limit regional progress towards CSDRM.

Decentralisation without adequate resources

Working with decentralised planning structures and mainstreaming of DRR in development planning (as in FMMP's Component 4), should enhance a CSDRM approach as long as the governance arrangements are as representative and effective as they purport to be. Often resources and capacities for DRM mandated authorities at sub-national levels remain weak. An integrated CSDRM approach faces challenges when basic preparedness functions are not in place.

Implementing multi-country programmes

Rolling out pilot programmes and sharing lessons across four countries is challenging when each country presents a different set of institutional and legislative arrangements and technical capacities for water resources and disaster management. Several components were not successful either because they lacked data or were not deemed a priority in a particular country, where they were perhaps at odds with established approaches to land management or infrastructure planning. This requires a high degree of flexibility within the programme to respond to different capacity gaps in each country.

Learning, integration and sustainability

Different types of partnerships are promoting diverse approaches and expertise across the FMMP and CCAI. The use of short-term national experts can help bring needed expertise into government departments, but the sustainability of this has been questioned, and reflects challenges within the MRC itself to retain riparian expertise within its programmes and facilitate a more process-oriented approach to capacity development. One climate change adaptation expert from an international development organisation commented, 'we want to see the MRC succeed, but there needs to be a more process-oriented approach to learning about climate change adaptation, then we would be happy to engage'. The CCAI hopes to achieve this, and establishing a 15-year programme at least provides the timeframe for this.

7. Conclusion

CSDRM in the Mekong region suffers less from a lack of availability of downscaled models and projections and more from a concern for how these will impact dynamic systems in different parts of the basin; how the levels of uncertainty and variability can be considered alongside multiple drivers of environmental change; and how diverse local solutions are reflected and supported at different levels. The CSDRM approach presented in Section 2 does not propose that all elements should be met by a single agency but it helps to highlight where there are institutional, programmatic or policy gaps that will limit the effectiveness of DRM interventions in development in a changing climate. Applying the CSDRM approach to the work of the FMMP and related MRC programmes highlighted the challenges to ensuring that existing DRM knowledge, policy and practice are capitalised upon and enhanced by new climate change initiatives.

According to this investigation the FMMP, alongside the CCAI, is making significant progress towards a CSDRM approach, and the FMMP management team found the approach useful in identifying areas of strength and weakness and opportunities to improve their technical service provision. CSDRM at the MRC, in reference to the FMMP in particular, involves: including climate information in basin-wide assessments and scenario-based planning tools; developing joint capacity for climate-sensitive flood risk management; building a body of tools and guidelines for FRM at different levels that include the integration of climate information in risk and vulnerability assessments; tackling specific transboundary flood issues that may be affected by changing flood risks and uncertainty.

The MRC is proactively bringing climate science from different levels into regional political dialogues and the development of risk management approaches. A CSDRM lens reinforces the important role of diverse partnerships, flexibility in programme design to enable regionally led initiatives to be responsive and sensitive to local realities and politics in these processes, and a more intentional and process-oriented approach to learning and capacity development. The FMMP team proposed closer ties with social development organisations to better integrate an understanding of analysing and responding to differentiated vulnerability, and build skills for facilitating local-level dialogue. The aim is to strengthen approaches to integrating local knowledge and perspectives on flood risks and to link flood risk management to targeted poverty reduction measures such as social protection. These conclusions were formed with recognition that programme design is bound by the process of approval by the four-country committee.

From this investigation, a number of broad lessons can be transferred to other transboundary or regional contexts:

- Recent experiences of flood and drought being exacerbated by upstream hydropower dam operations overlaid with extreme climatic conditions in the Mekong, reiterate that transboundary FRM requires enhancing transboundary information flows and early warning systems, including on tributaries. CSDRM therefore also demands mechanisms for mediation and compliance with legal agreements for the management of transboundary waterways.
- Separate flood management and climate change adaptation work programmes allow for specialised interrogations within their particular communities of practice, but for CSDRM closer attention is required to the mechanisms of integration and learning internally in organisations, across the relevant government ministries and departments and regionally.
- Approaches to learning are challenging in bureaucratic settings where technical capacities are variable across ministries that do not always function well or collaborate without projects to convene trainings and exchanges. Short-term initiatives, involving one-off consultations, workshops or trainings in new tools and approaches may limit adaptive capacity dependent upon regular, ongoing and innovative learning and reflection. This is relevant to internal learning and capacity development in regional technical agencies as well as in government departments.

- A CSDRM approach in regional technical agencies or government-led institutions needs social dimensions of risk to be central to the common analysis and methodological development of risk management approaches, particularly for determining vulnerable populations and ensuring local implementation of FRM is facilitated with attention to power dynamics. This includes recognition for diverse livelihoods and perceptions of the flood risk, and spaces for citizen engagement in decision-making, and requires capacity within regionally directed programmes to facilitate local dialogues around these issues. Regional analysis, capacity building and guidelines for national application could be more oriented towards examining decision-making structures that empower commonly excluded voices.
- The regional level offers a space for dialogue between different actors, which is particularly important whenever the national space for dialogue and citizen engagement is limited. The CSDRM approach helps organisations capitalise on the available spaces for citizen engagement that exist to improve DRM effectiveness.
- Integrating regional climate scenarios into scenario-based regional planning processes is critical, but will only contribute to a climate smart approach when decision-making is transparent, accountable and responsive to technical information and when technical information reflects diverse and dynamic systems that incorporate local knowledge around flood risk management.

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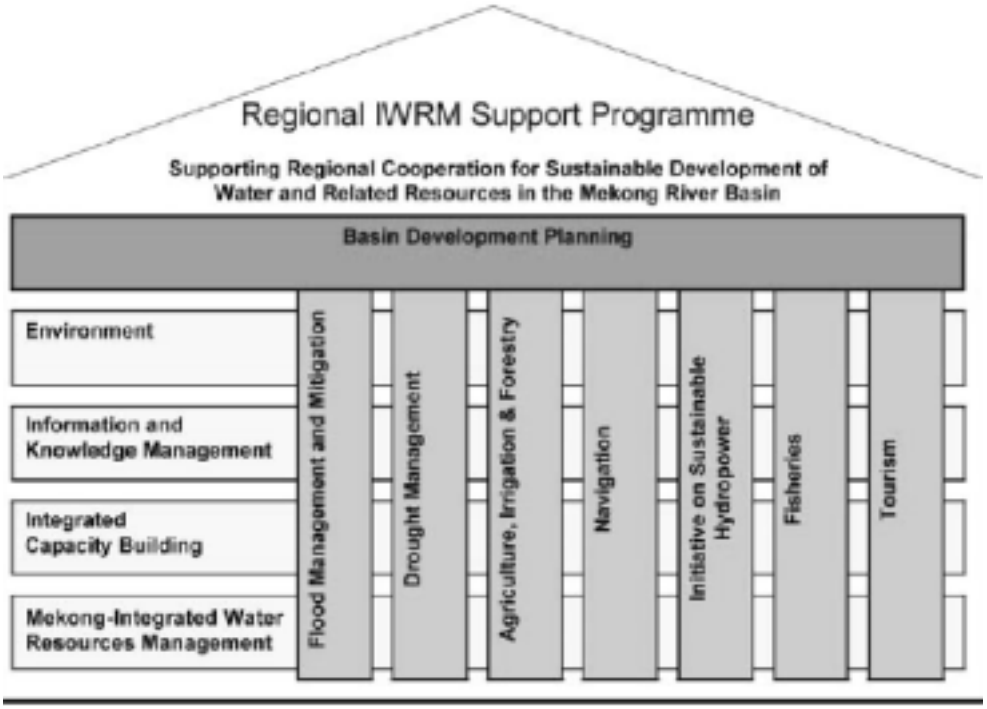
8. Appendix 1: The MRC's Integrated Water Resources Management Support Programme Structure



Source: MRC Work Programme 2010b

9. Appendix 2: Summary of the Flood Mitigation and Management Programme's core activities and financiers

Component	Key Activities Implemented	Countries	Funders/Institutional Arrangements – Implementers and Partners
Component 1 Establishment of a Regional Flood Management and Mitigation Centre	Centre established in Phnom Penh since 2004. Annual Mekong Flood Forum since 2002 (includes Annual Flood Report comprising four government reports). Flood Risk Assessments (based on 97 years' historical data (water levels) and 6–8 years' damage/impact data on infrastructure, agriculture and housing in financial terms). Five-day flood forecasts at the monitoring stations on the mainstream, and backstopping for national flood forecasting systems. Developing flash flood guidance	Relevant to all Four China and Myanmar participating as MRC dialogue partners	Donors: • Government of the Netherlands • United States Agency for International Development Office of US Foreign Disaster Assistance (USAID-OFDA) • Government of Japan • Government of Denmark Implemented by: FMMP staff
Component 2 Structural Measures and Flood-proofing	Flood Risk Assessments in selected sites in all four countries leading to Best Practice Guidelines (BPG) (see below) and selected 'bankable projects' to be included in the Basin Development Plan. • Best Practice Guideline for Flood Risk Assessment • Best Practice Guidelines for IFRM Planning and Impact Evaluation • Best Practice Guidelines for the development and design of structural measures and flood-proofing (*) • Best Practice Guidelines for IFRM for Basin Development Plan These are intended to provide an informational resource, not supersede national planning guidelines, but BPG will be applied in Priority Project development. (*)The study for the development of economically sound and environmentally friendly planning and design of roads in the Mekong floodplains in Cambodia and Vietnam (WWF/UNESCO-IHE-Delft Cluster) provides policy recommendations (for follow-up by WWF). Its 'best practice guidelines' are embedded in the best practice guidelines of the Final Report of Component 2. Limitations acknowledged (Limited topographical information and modelling quality or availability hamper accurate flood hazard assessments.)	All four	Donors: • Government of the Netherlands • Asian Development Bank Implemented by: Consulting firms: • Royal HASKONING (Haskoning Nederland B.V. together with Deltaris and UNESCO-IHE) • WWF/UNESCO-IHE/Delft Cluster (Data gathered purely from Final Report of Component 2)

Component	Key Activities Implemented	Countries	Funders/Institutional Arrangements – Implementers and Partners
Component 3 Enhancing Cooperation in Transboundary Flood Issues	Mediation initiative between all four countries. Awareness raising; knowledge and skills building; clarification of the MRC mandate; training; toolbox development, including exchange study visits to border areas of Vietnam and Cambodia, Rhine and Meuse basin organisations in Europe, and Yangtze Water Resources Commission in China. Available administrative and technical tools to be tested through pilot study implementation system.	All four	Donors: • Government of the Netherlands Implemented by: FMMP staff and UNESCO-IHE (Second phase capacity building programme to be initiated in September 2010)
Component 4 Flood Emergency Management Strengthening	• Flood Preparedness Programs Development and Implementation • Priority Activity Implementation to facilitate Flood Preparedness and Emergency Management • Capacity Building for Flood Risk Reduction • Flood Awareness and Education • Flood Knowledge Sharing and Documentation • Integration of Flood Risk Reduction into local development planning process • Transboundary (Province to Province) Joint Planning and Information Exchange	All four	Donors: Government of the Federal Republic of Germany (FRG) represented by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) and the European Commission (EC) under the European Commission Humanitarian Aid Department (ECHO) Geographical coverage: 11 Provinces and 28 Districts Cambodia: 4 Provinces, 10 Districts Vietnam: 4 Provinces, 10 Districts Lao PDR: 2 Provinces, 6 Districts Thailand: 1 Province, 2 Districts Implementing partner: Asian Disaster Preparedness Centre (ADPC) through the national Mekong committees and working with national, provincial and district disaster management committees as well as relevant line ministries. The projects have stronger strategic and onsite partnerships with the National Red Cross in the member country as well as civil society organisations such as OXFAM (UK), Action Contre la Faim (Action Against Hunger), and CARE, Save the Children etc.
Component 5 Land Management	Developing an approach to generating flood probability information in order to establish an approach to Flood Information Based Land Management, through Pilot Projects. The GIS generated maps are based aerial photographs, then field checked through local consultations and combined with gathered flood data. The project has explored the application of these maps and land use zoning for different purposes: Preparedness and Early warning; Rural Infrastructure Planning and Design; Irrigation and Flood Protection Planning; Agriculture and Fisheries Planning. The project has recognised these maps as largely a tool for planners.	All four (Thailand limited exposure) Cambodia (all along good progress), Vietnam (initially delayed but now good progress), Lao PDR (system not effectively applicable at selected site), Thailand (system not applicable at selected site, less interest, have own systems in place already).	Donors: Government of Germany, Gezellschaft für Technische Zuzammenarbeit (GTZ) (for two phases during 2004-2010) Implemented by: Staff recruited to FMMP. National short-term experts have been relied upon in all countries for strengthening the linkages between FMMP-C5 staff and the line ministries (in Cambodia – the Department for Hydrology and River Works) Partnered with the Land Management Department of the Royal University of Agriculture (RUA). Interns from the Department were involved in the community liaison component.

The Climate Smart Disaster Risk Management Approach

Strengthening Climate Resilience

The questions in the approach are suggestions only and there may well be others

1. Tackle changing disaster risks and uncertainties

1a

Strengthen collaboration and integration between diverse stakeholders working on disasters, climate and development

To what extent are climate change adaptation, disaster risk management and development integrated across sectors and scales? How are organisations working on disasters, climate change and development collaborating?

1b

Periodically assess the effects of climate change on current and future disaster risks and uncertainties

How is knowledge from meteorology, climatology, social science, and communities about hazards, vulnerabilities and uncertainties being collected, integrated and used at different scales?

1c

Integrate knowledge of changing risks and uncertainties into planning, policy and programme design to reduce the vulnerability and exposure of people's lives and livelihoods

How is knowledge about changing disaster risks being incorporated into and acted upon within interventions? How are measures to tackle uncertainty being considered in these processes? How are these processes strengthening partnerships between communities, governments and other stakeholders?

1d

Increase access of all stakeholders to information and support services concerning changing disaster risks, uncertainties and broader climate impacts

How are varied educational approaches, early warning systems, media and community-led public awareness programmes supporting increased access to information and related support services?

2. Enhance adaptive capacity

2a

Strengthen the ability of people, organisations and networks to experiment and innovate

How are the institutions, organisations and communities involved in tackling changing disaster risks and uncertainties creating and strengthening opportunities to innovate and experiment?

2b

Promote regular learning and reflection to improve the implementation of policies and practices

Have disaster risk management policies and practices been changed as a result of reflection and learning-by-doing? Is there a process in place for information and learning to flow from communities to organisations and vice versa?

2c

Ensure policies and practices to tackle changing disaster risk are flexible, integrated across sectors and scale and have regular feedback loops

What are the links between people and organisations working to reduce changing disaster risks and uncertainties at community, sub-national, national and international levels? How flexible, accountable and transparent are these people and organisations?

2d

Use tools and methods to plan for uncertainty and unexpected events

What processes are in place to support governments, communities and other stakeholders to effectively manage the uncertainties related to climate change? How are findings from scenario planning exercises and climate-sensitive vulnerability assessments being integrated into existing strategies?

3. Address poverty & vulnerability and their structural causes

3a

Promote more socially just and equitable economic systems

How are interventions challenging injustice and exclusion and providing equitable access to sustainable livelihood opportunities? Have climate change impacts been considered and integrated into these interventions?

3b

Forge partnerships to ensure the rights and entitlements of people to access basic services, productive assets and common property resources

What networks and alliance are in place to advocate for the rights and entitlements of people to access basic services, productive assets and common property resources?

3c

Empower communities and local authorities to influence the decisions of national governments, NGOs, international and private sector organisations and to promote accountability and transparency

To what extent are decision-making structures de-centralised, participatory and inclusive? How do communities, including women, children and other marginalised groups, influence decisions? How do they hold government and other organisations to account?

3d

Promote environmentally sensitive and climate smart development

How are environmental impact assessments including climate change? How are development interventions, including ecosystem-based approaches, protecting and restoring the environment and addressing poverty and vulnerability? To what extent are the mitigation of greenhouse gases and low emissions strategies being integrated within development plans?

This publication is part of the Strengthening Climate Resilience Discussion Series, which aims to elaborate concepts and application of the Climate Smart Disaster Risk Management approach. All papers are available free to download through the Strengthening Climate Resilience (SCR) website: www.csdrm.org

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