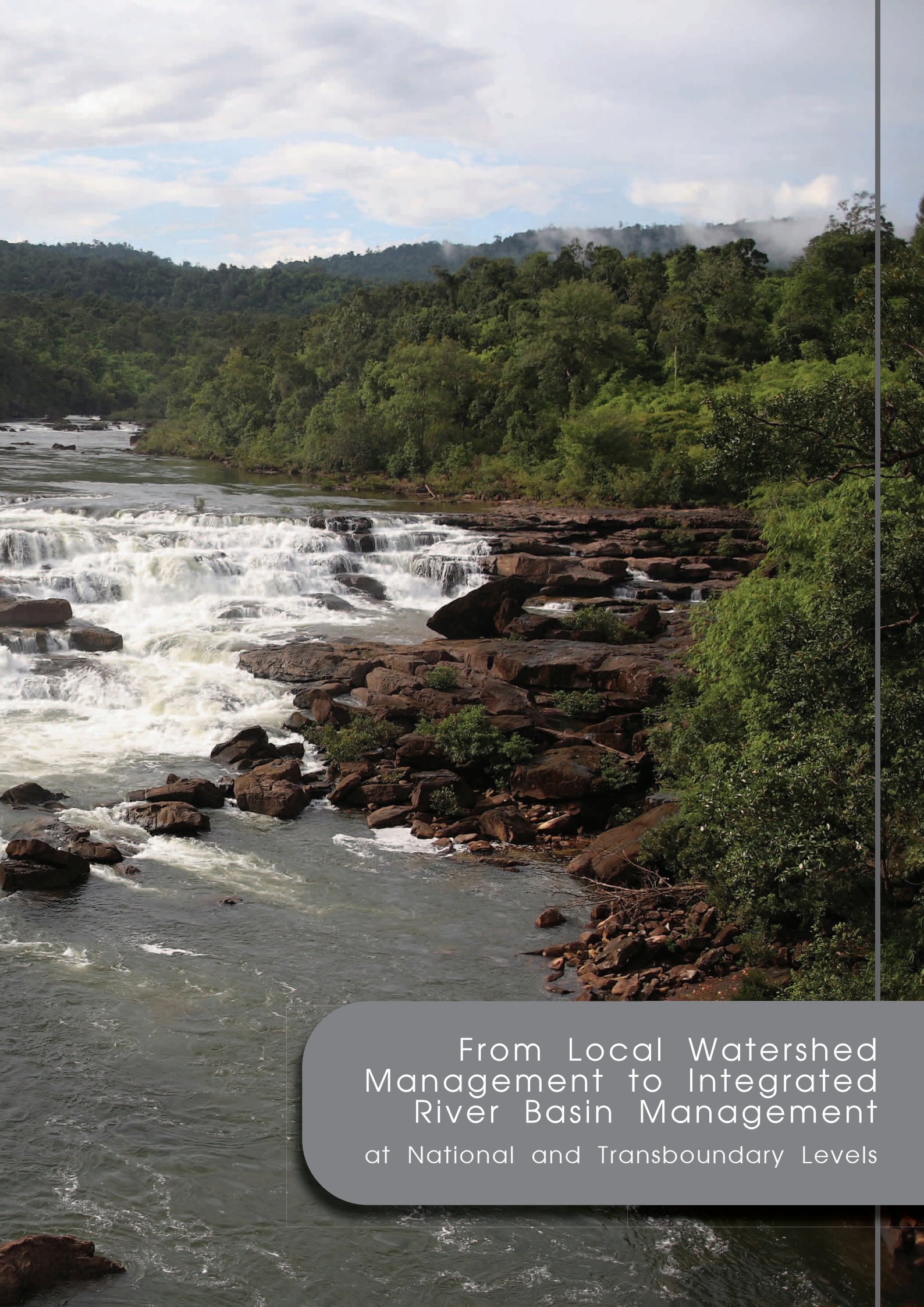




From Local Watershed
Management to Integrated
River Basin Management
at National and Transboundary Levels

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Preface

The vision for the Mekong River Basin, as defined by the four Lower Mekong Basin (LMB) countries (Cambodia, Lao PDR, Thailand and Viet Nam), is an economically prosperous, socially just and environmentally sound Mekong River Basin. This vision is further emphasised in the mission of the Mekong River Commission (MRC), which is to promote and coordinate sustainable management and development of water and related resources for its Member Countries' mutual benefit and the people's well-being. To achieve this, MRC's core function is transboundary river basin management, taking account of basin-wide and transboundary issues. It was realised early on, however, that engagement with the watershed level as the smallest hydrological and management unit of river basins is a prerequisite for success at the basin scale.

Watershed management is a commonly known approach that has been practised for many years in the LMB countries, often with technical and financial support from a range of organisations, including those that have contributed to this publication. Lessons can be learned from these experiences and from those in other countries where examples of good practice can assist future actions. The linkages between watershed and the basin levels are still a challenge as is the engagement between watershed communities and higher planning levels at national scale. Additionally, sustainable financing of watershed and river basin management is another issue of concern.

MRC has engaged in watershed management with support from the German Government through German International Cooperation (GIZ) since 2002. The overall objective of the MRC engagement is to improve the planning and coordination of sustainable management of resources in upstream watersheds at the national and regional levels. The work has occurred in three phases: preparation, including awareness raising, watershed classification and selection of pilot sites; implementation focusing on pilot sites and including training, information management and institution building; and finally, consolidation including replication, institutional integration and handover by 2011. This technical report and the international conference: 'From Local Watershed Management to Integrated River Basin Management at National and Transboundary Levels' on which it is based, summarise the current level of knowledge and provide recommendations to tackle the future challenges.

MRC would like to express sincere thanks to all the partners who have provided assistance over the years to improve watershed and river basin management, thank the authors of this publication for their efforts to disseminate the results and the conference participants for their valuable contribution to a successful event. I'm convinced that this publication will inspire land and water managers at all levels to approach the future challenges based on the lessons learned and ideas presented.

Pich Dun
Officer-in-Charge
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EXECUTIVE SUMMARY

Introduction

Watersheds face a range of degradation challenges associated with human activities, such as pollution, deforestation and changes in sediment generation. The way they are managed has a profound cascading effect on natural resources and communities in the wider basin. Although watersheds play a critical role as the basic hydrological unit within a river basin they are often neglected in river basin management.

Over the past decade, principles and practices have evolved to ensure that integrated water resources management (IWRM) approaches used at the broader basin level to address sustainable development and management of land and water resources also apply at the smaller watershed level.

This technical report is a synthesis of the knowledge, lessons learned and good practices presented and discussed at the International Conference on Watershed Management held in Chiang Mai, Thailand 9-11 March 2011.

Managing watersheds and river basins

The IWRM approach works best when it manages to take the different scales of the river basin into account, embedding watershed management in river basin management. Experiences with watershed and river basin management show that both top-down and bottom-up management approaches are needed and that institutional arrangements must provide for linkages between the local and the national or regional levels. Local communities are often the most affected by management decisions at higher scales and their participation in watershed management planning is essential. However, planning and management authorities at the basin level need to balance local community needs with those of the wider society and environment. Integration can be improved by the establishment of networks and communities of practice across all scales, disciplines, basins and countries, and new information sharing technologies should be used to share information at all levels.

The key to effective management of water resources is an understanding of the inextricable link between the hydrological cycle and the way land resources are managed. The impact of land use on the hydrological regime and water quality downstream varies with the type of land use, watershed size, climate, soil characteristics, topography and geology. Finding a way to incorporate the many diverse factors that influence the functionality and services provided by watersheds, such as economic development, population growth, land use change and climate change, requires integration across scales, sectors and communities — something that has so far eluded natural resource planners. While there are examples of successful small-scale local management efforts, these need more than local-level scaling-up policies if they are to restore and improve watershed goods and services.

Water economies in developing countries are largely informal with little contact between users and public institutions. To reflect this, reform efforts need to use indirect and incentive based approaches. Replicating models from developed economies is not the solution. The long-term success and sustainability of watershed and river basin management initiatives depends on securing ongoing funding and this has often been a problem. Exchange of knowledge and experience among countries that share a river basin can help to develop common policy frameworks and ensure long-term commitment and steady funding.

The Mekong context

The Mekong River system faces several major environmental challenges over coming decades. Planned hydropower developments, expansion of irrigation and waterway transport, together with the impacts of climate change, will have major implications for the environment and the livelihoods of basin communities.

The LMB countries' commitment to IWRM has seen large changes in water resources management over the past five years including progressive establishment of river basin organisations. Watershed management has a longer history in the region and over the past decade the interactions between the ecological and the social and economic functions within a watershed have become better understood. It is now accepted policy in all LMB countries that watershed as well as river basin management must consider all three dimensions.

Good practice in watershed and river basin management

Success in managing competing interests in land and water resources relies on an understanding of the complexity of these systems, which today in the Mekong region clearly is not adequate. The functionality of watersheds to provide essential goods and services continues to decline. Balancing development while maintaining ecosystem integrity requires a concerted planning effort that is inclusive and transparent. An integrated management approach that guides overall planning from the watershed to the basin level recognises the importance of multi-stakeholder negotiations as a means of combining top-down policy implementation and bottom-up participatory processes.

Good data is needed to inform watershed and river basin planning and decision makers need to see that this information is both meaningful and credible. There is a clear need to integrate climate change adaptation and mitigation and disaster risk reduction into the agenda of water and land management at all levels. Sound water accounting systems to assess impacts of interventions at different scales are an essential first step in the overall management of water resources.

The degree of up-scaling of sustainable watershed management in the Mekong region is extremely low. There is no 'one size fits all' approach to watershed and river basin management due to the diversity of issues that are unique to each situation. However, agreeing on a set of tangible outcomes is a good place to start. A number of case studies from the Mekong region and beyond illustrate IWRM in action but implementing these approaches is not easy.

Governance in watershed and river basin management

The degree of up-scaling of sustainable watershed management in the Mekong region is extremely low. The bio-physical, socio-cultural and historical diversity of the region calls for locally and nationally appropriate governance solutions to address its land and water challenges. Governance must be both top-down and bottom-up and watershed governance must be embedded into river basin management. Better governance is about including all those who should have a say, either because of their official position or because they benefit or suffer from the consequences of decisions made.

Over the past decade, all Mekong countries have passed formal water, fisheries, land-use and related laws and created organisations to address watershed and river basin management issues. An important outcome of these reforms is a diverse range of local management bodies based at watershed and river basin levels. However, development of national river basin organisations is still at an early stage in the region.

Economics and financing

Economic forces and conditions underlie many of the activities that impact on watersheds and river basins. Pressing, and often competing, economic demands lead to watershed degradation and significant costs and losses have often been incurred, especially for poorer and more vulnerable groups.

The search for adequate funding to undertake integrated watershed and river basin management is a core concern among government agencies across the Mekong Basin. A variety of economic and financial approaches for integrated watershed and river basin management are already being applied here, including novel ways of analysing economic costs and benefits in decision making, introduction of new prices and markets for watershed goods and services and the development of innovative financing mechanisms.

Decision makers tend to undervalue both the benefits of more sustainable water management and the costs of watershed degradation and loss. In the Mekong Basin, for example, forests and wetlands generate ecosystem services worth billions of dollars a year. These types of benefits are rarely factored into official economic statistics, meaning that decisions about the best way to develop the watersheds of the Mekong Basin have often been made on the basis of only partial information. Over the past decade, however, there has been a progressive shift in the way that watershed values have been calculated and presented to decision makers. The concept of total economic value has become one of the most widely used frameworks for identifying and categorising watershed benefits.

1. BACKGROUND



1.1 Introduction

The starting point for watershed management is recognising that watersheds are the fundamental hydrological unit and thus the basic land unit within a river basin, where biodiversity and ecosystem functions can be sustained and where livelihood opportunities are provided. A watershed is a naturally delineated unit of land that drains water, sediment, dissolved materials, heat, and biota to a common outlet along a stream channel.

Watersheds face a range of degradation challenges associated with human activities and the way in which they are managed has a profound cascading effect on natural resources and communities in the wider basin.

The geographic connection of watersheds as part of an overall river basin is important when considering policies, principles and strategies for the watershed as well as river basins. Over past decades, principles and practices have evolved to ensure that IWRM approaches used at the broader basin level also apply at the smaller watershed level.

In the Mekong Basin, even though IWRM is commonly known and practised, little attention has been paid to

watershed terminology and the importance of watersheds in river basin management. In order to raise awareness about the importance of integrated watershed management as well as sharing experience and learning from water experts and practitioners in and outside the region, MRC and partners¹ joined together to convene an 'International Conference on Watershed Management: From Local Watershed Management to Integrated River Basin Management at National and Transboundary Levels' which was held from 9–11 March 2011 in Chiang Mai, Thailand.

The following topics were chosen as guiding themes for the conference:

- Good practices – the starting point in a process of watershed and river basin management, focusing on the drivers and challenges of sustainable watershed management with the objective of finding solutions; and deliberating the consequences of climate change on watershed management, with a focus on no/low regret adaptation strategies.
- Governance – focusing on key governance problems facing the Mekong Basin aiming at: a) improved understanding of the importance of watershed governance

1 Asian Development Bank (ADB), Challenge Program on Water and Food (CPWF), German Agency for International Cooperation (GIZ), International Union for Conservation of Nature (IUCN), International Water Management Institute (IWMI), Mekong Program on Water Environment and Resilience (M-POWER), United Nations Food and Agriculture Organisation (FAO), World Agroforestry Centre (ICRAF) and World Wide Fund for Nature (WWF).



and the role of formal and informal institutions; b) sharing concepts and experiences with governance mechanisms from different scales and how to improve, coordinate and position watershed management as an integral part of river basin management in the Mekong Basin context; and c) identifying the benefits of multi-stakeholder engagement and participation in watershed and river basin planning, development and management in the Mekong Basin.

- Economics and financing – investigating how financial and economic decision-support information and enabling conditions lend vital support to the management actions, policies and governance arrangements required for integrated watershed and river basin management in the Mekong Basin; sharing practical experiences, lessons learned and providing recommendations about how financial and economic approaches and tools can be used to promote more integrated, sustainable and equitable approaches to watershed and river basin management in the Mekong Basin.

A range of local, national and international stakeholders from different sectors, government and non-government organisations and academia were represented among the more than 250 participants.

This technical report brings together the technical and practical aspects of the state-of-the-art knowledge, lessons learned and good practices presented, debated and discussed during the conference as well as presenting suggested solutions for improved watershed and river basin management in relation to the key topics. It is

intended as a resource for anyone interested in the current debates, practical applications and solutions for watershed and river basin management at different scales.



Figure 1.

A watershed is the natural delineation of a unit of land draining into a common outlet along a stream channel. Source: GIZ.

1.2 Managing watersheds and river basins: top-down, bottom-up, or both?

Integrated water resources management

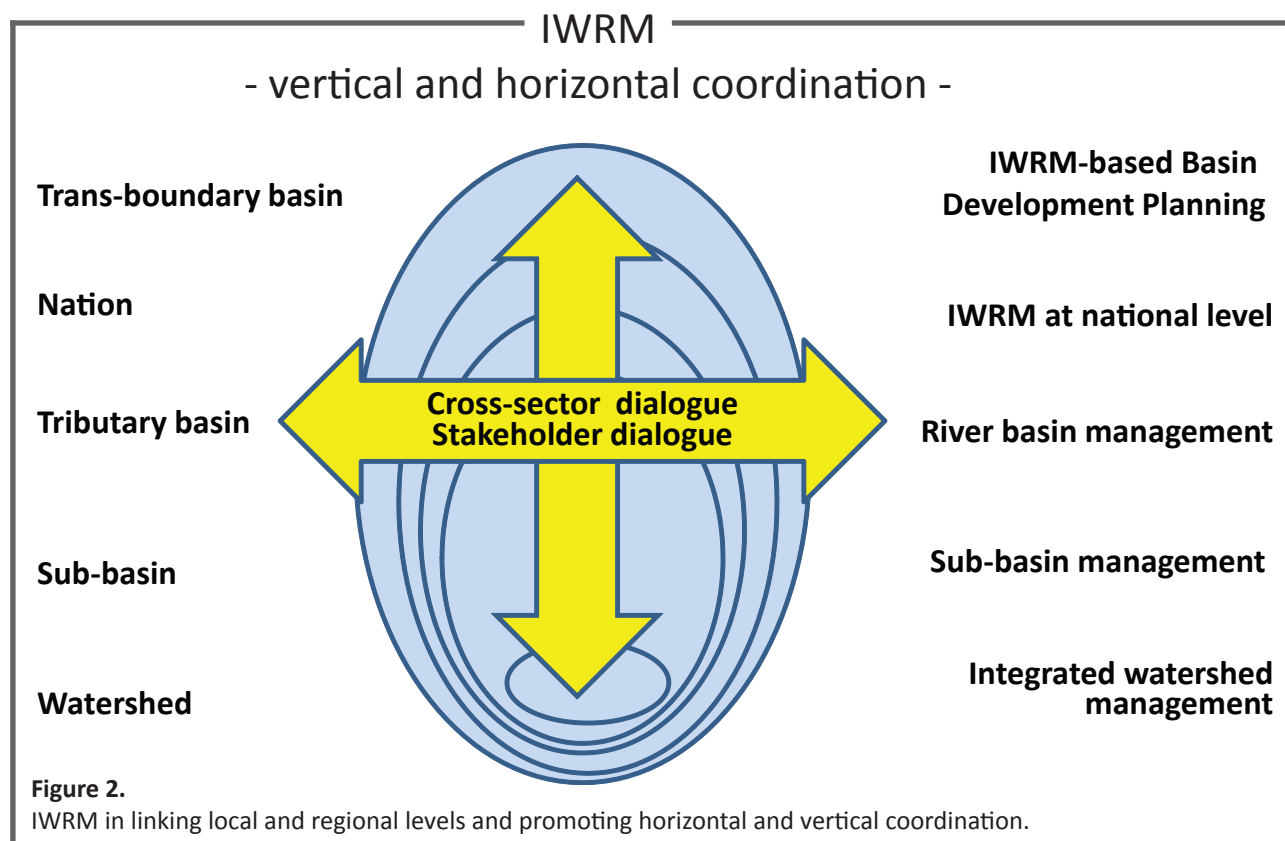
The Global Water Partnership (GWP) defines IWRM as a “process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP 2000). While this definition has a sound theoretical basis, practical implementation of the ideal IWRM scenario presents many challenges, such as: how to think at the basin level and act locally, and what is needed to ensure that water resources management is mainstreamed in economies? IWRM is enshrined in law in many countries but how can rhetoric be turned into good practice?

IWRM is a process that is implemented at all scales, from the watershed through to the basin (Figure 2). The following hierarchy of geographical units is used throughout this technical report: watershed, sub-basin, tributary basin, national and transboundary basin. At all these levels, the IWRM approach is used to address sustainable development and management of land and water resources, striving for a climate of openness and transparency. It is being implemented through a com-

bination of integrated watershed management and integrated river basin management, ensuring appropriate dialogue across sectors and amongst concerned stakeholders. It is particularly successful, when it manages to take the different scales of the river basin into account, making watershed management a key part of river basin management. However, to adequately address the additional challenges that exist at the larger basin scale, managers need to do more than simply expand watershed governance mechanisms. Cross-sector and cross-scale information and dialogue are essential for improving coordination and helping position watershed management as an integral part of river basin management.

Defining the issues

Changes in sediment generation and vegetation cover, pollution and other forms of degradation caused by inappropriate land use within watersheds have a profound impact on the functionality of ecosystems and their provision of critical services. Furthermore, activities associated with extractive industries, such as mining and forestry, along with the development of water resources through the construction of storage structures and



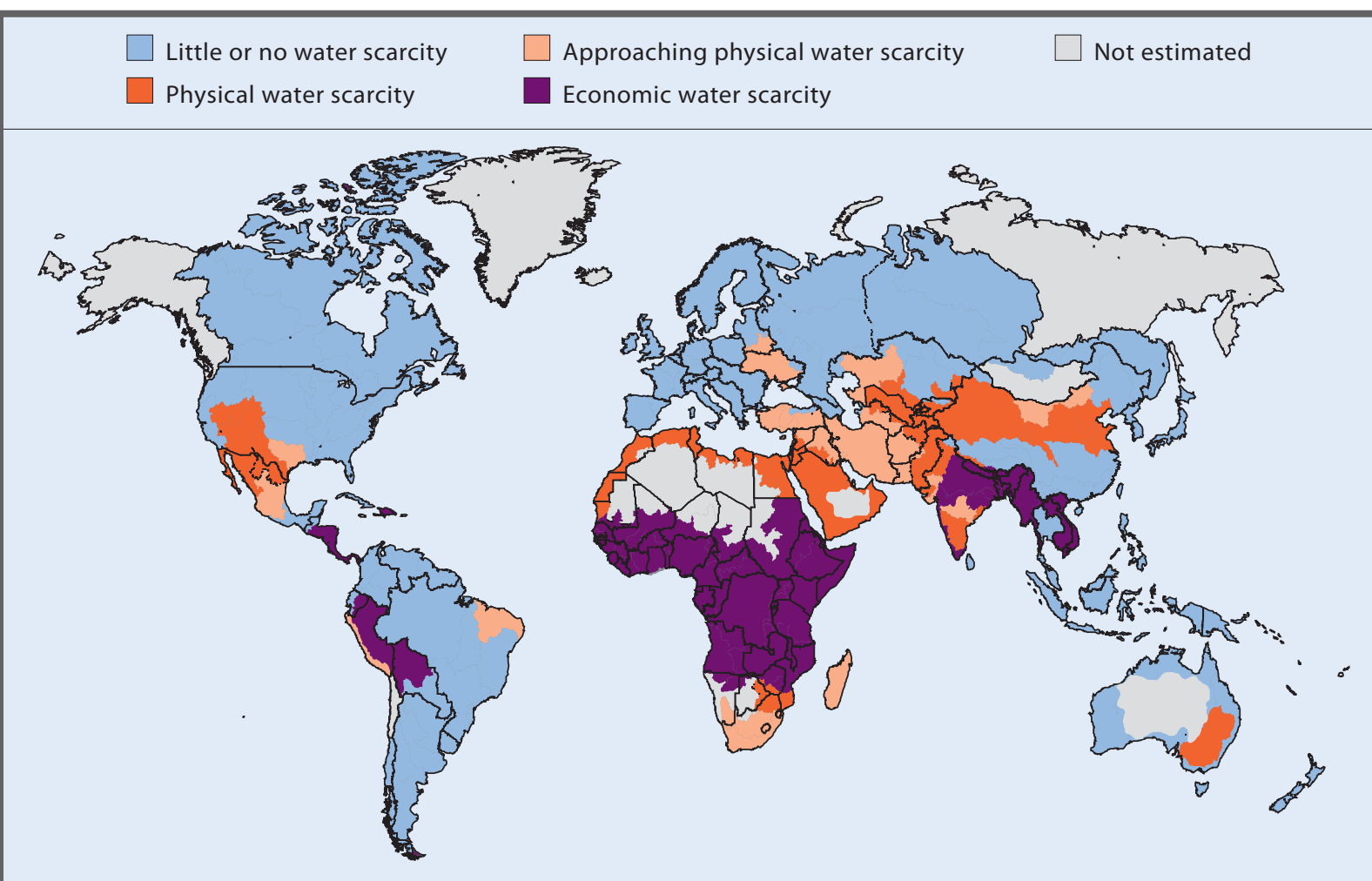


Figure 3.
Global water scarcity.
Source: International Water Management Institute

increasing extraction of groundwater all have implications for watershed functions.

The human-induced changes to watersheds are compounded with increased water scarcity. With its inextricable links to food security and economic development, water scarcity, which is driven by population growth, dietary change, urbanisation, globalisation, biofuel production and climate change, is becoming one of the defining issues of the 21st century (Figure 3).

Watershed degradation, urbanisation and population increase are factors that decrease natural resilience to extreme weather events such as storms and torrential rains leading to flash floods in upland areas and extreme inundation of floodplains. These factors therefore reduce the ability of communities and systems to adapt to climate change.

The governance and institutional frameworks within which watershed and river basin management takes place have a strong influence on how IWRM should be

approached and which tools are most effective. In turn, this is affected by the capacity of individuals and institutions to make the necessary changes to the established management regimes. These issues need to be assessed and taken into account when devising integrated management approaches.

Evidence-based management

Implementing IWRM approaches successfully must be based on sound evidence and sufficient data. Basing decisions on evidence and sound accounting mechanisms will greatly reduce the chance of making bad or harmful management decisions.

Data on land cover and land use, river discharge, groundwater levels, water quality and water allocation, laws and rights are needed to create policy on allocation processes, determine environmental flow regimes, assess water contamination and salinity intrusion, determine sustainable groundwater yields, negotiate transboundary issues and undertake scenario modelling at the basin level.

Land use has an impact on the hydrological regime and quality of water downstream. The importance of this impact varies with the type of land use, the size of the watershed, climate, soil characteristics, topography and geology. The interactions between all these factors are complex and the specific characteristics of each situation need to be considered and the water movement through the basin calculated.

While the adverse affects of sedimentation on reservoirs, waterways, irrigation systems and, sometimes, coastal zones are well known, the impact of land-use practices on the overall sediment yield of river basins is not. Most of a river's sediment load originates from specific locations within the watershed and arrives in the river during extreme climatic events. The delivery of sediment from upstream to downstream is relatively slow and, therefore, any impact from land-use practices will only be felt after several decades, making it very difficult to distinguish between natural and human-induced sediment load and also complicating management decisions.

The importance of scale

The understanding and management of scales in watershed and river basin management is a challenge. When embedding watershed management into river basin management it is important to understand the differences in scale and the implications this has for management. There is a need to re-think scale of intervention, upstream-downstream linkages, temporal and spatial processes, biophysical and socio-economic linkages, and political issues. Extrapolation and up-scaling from watershed to sub-basin or basin scale can have negative consequences if the effects of scale are not well understood (FAO, 2007).

Watershed management decisions are too often based on common myths that disregard the importance of scale and the realities of the complex hydrological cycle. For example, while forests are crucial for the hydrological cycle, as well as the stability and overall ecology of watersheds, they will not prevent large-scale floods in the river basin. Further, while forests are essential for the maintenance of good water quality they use more water, through interception and complex evapotranspiration processes, than other land uses such as grassland or agriculture. Afforestation will therefore reduce total runoff which, especially in semi-arid and arid areas, is of significant concern. The widely held view that 'more trees equal more water' is a misconception in many countries and clarification of this issue is very important (FAO, 2007).

Linking top-down and bottom-up approaches

Experiences with watershed and river basin manage-

ment show that it is important to employ both top-down and bottom-up management approaches and to ensure that institutional arrangements provide for linkages between the local level and the national/regional level. Local communities are often the most affected by water management decisions at higher scales and local 'ownership' of the watershed management planning process is a must. However, it is the responsibility of

Box 1. The importance of both bottom-up and top-down – the Australian Landcare experience

The evolution, success and more recent loss in momentum of the Landcare programme in Australia provides an excellent example of the critical importance of both top-down and bottom-up approaches to watershed and river basin management.

In 1989 the Australian Prime Minister announced that the 1990s would be the 'Decade of Landcare' by providing a 30-fold increase in funding and securing the support of opposition parties, farmer groups and environmental organisations. The movement grew to contain more than 5000 voluntary community groups and more than one-third of all farming families. The programme received significant investments from the private sector, carried out community-based monitoring, worked to raise awareness in schoolchildren and carried out extensive farm and watershed planning linking action at the farm-scale to watersheds. Significantly, Landcare provided a direct link between regional planning and local community engagement.

The second phase of Landcare involved a scaling up to the catchment or regional level, creating 56 regional/catchment bodies, in an attempt to take a more integrated approach at landscape scale. National investment grew from millions of dollars to billions.

The third phase, from 2007, involved an asset-based investment approach, identifying environmental assets and taking a business plan approach to investment in the highest priorities, with competitive tenders to purchase specific environmental outcomes.

Today, Landcare is moribund in many areas and catchment (watershed) organisations are also struggling. The community appetite for water reform is waning. The lesson to be learned is that both top-down and bottom-up approaches are needed. They are complementary, not alternative approaches.

planning and management at the basin level to carefully balance local community needs with those of society as a whole. This is not an easy or rapid process, but it can be facilitated by ensuring communication between all levels of stakeholders and enhancing opportunities for stakeholder involvement.

Integration across sectors, disciplines and institutions

Developing a system that encapsulates the diverse drivers influencing the functionality and services provided by watersheds requires integration across scales, sectors and communities – a challenge that has eluded us to date.

New watershed management paradigms emphasise that watershed management should be part of a local socio-economic development process that focuses on multi-stakeholder participation and linking social, technical and policy concerns from all sectors in a collaborative process (FAO 2006). Mosaics of self-contained, sub-watershed-level efforts embedded in local societies and cultures need more than local-level scaling-up policies

if they are to restore and improve environmental goods and services. Flexible and adaptive national guidelines are needed to define the autonomy of local initiatives and the support they can expect from central government and higher-level institutions.

Integration can also be improved with the establishment of networks and communities of practice across all scales, disciplines, basins and nations while new information technologies can be utilised to share information at all levels. Governments and community groups should strive to build social capital that is capable of diluting rigid divisions. Both the private and public sectors should be invited to participate and multiple programmes (voluntary and non-voluntary) should be used.

The context matters

IWRM approaches must be adapted to the specific context in which they will be applied. For example, the level of formality in any water economy will have a significant impact on what kind of approach will be effective, but most of the current IWRM frameworks ignore the critical

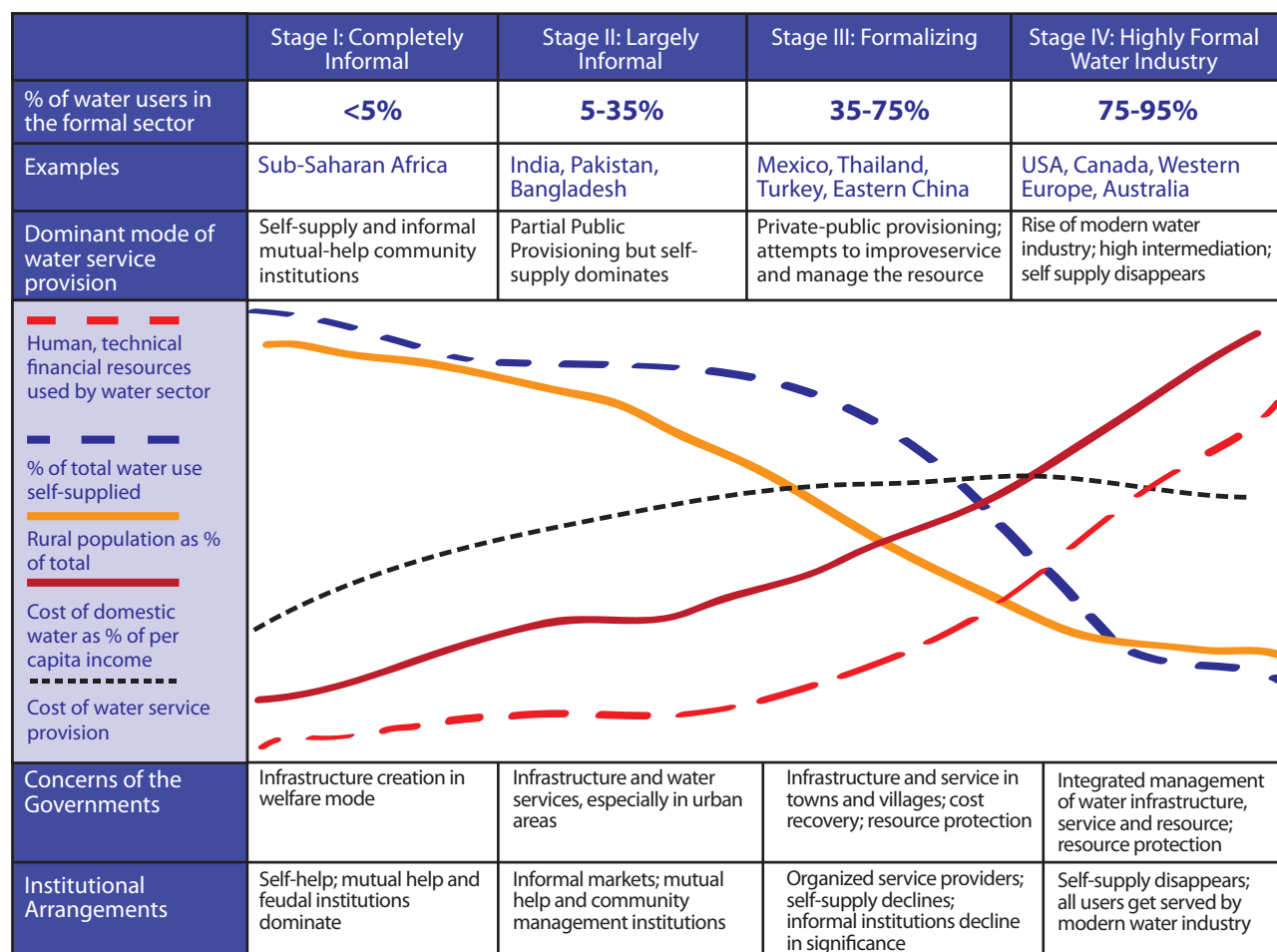


Figure 4.
Transformation of informal water economies in response to overall economic growth.
Source: Shah, 2007

role that formalisation will play (Figure 4). Water economies in developing countries are largely informal with little interface between users and public institutions. Reform efforts focused mainly on direct regulation and management overestimate the capacity of legal provisions and formal institutions to influence water-use patterns. Instead, new indirect and incentive-based approaches are needed in informal economies. Replication of successful models from developed and formal economies is unlikely to work in the largely informal, developing country water economies. Such replication, besides being ineffective, diverts policy attention and scarce public resources away from the real issues.

A completely different IWRM approach is required in highly formalised economies such as those within the European Union. The implementation of the European Water Framework Directive is illustrative, where a range of economic measures are used to reach defined water objectives. An economic analysis of all water users is undertaken as part of the implementation process and fiscal instruments such as water trading are used to protect and save water. Water pricing is used to recover the cost of services and the 'polluter pays' principle is enforced. While there have been some difficulties associated with the implementation of the Water Framework Directive (such as dealing with conflicting policy objectives and encouraging cooperation among countries sharing the same river basin), overall the experience with economic instruments has been very effective in increasing understanding in the natural socio-economic system and facilitating dialogue between users and polluters.

Economics and financing: fundamental to success

There is a chronic shortage of funding for integrated and sustainable watershed and river basin management approaches. Funding is required both to cover the direct costs of watershed and river basin management and to offset the opportunity costs to upstream communities of shifting to more sustainable land and resource uses and/or reducing pollution. Utilisation of market-based mechanisms, such as those provided by the water and energy sectors and the carbon sequestration market, provide promising channels for recovering the operating costs of watershed and river basin management through emerging payment for environmental services schemes. The long-term success and sustainability of any watershed and river basin management initiative depends on securing ongoing funding.

Consistent funding can be achieved by establishing (and continually nurturing) partnerships with a wide variety of organisations, both private and public (although mechanisms are being tested for engaging the non-profit and private sectors in watershed and river basin management, the public-good nature of environmental



services justifies the use of public sector funding). Large donor organisations also have a role to play. Exchange of knowledge and experiences among the countries that share a river basin can help to develop common policy frameworks and ensure long-term commitment and steady funding to relevant institutions.



1.3 Watershed and river basin management in the Mekong context

The Mekong River Basin

The Mekong is one of the World's largest rivers, almost 5000 km long, it runs from the Tibetan Plateau to the South China Sea through six countries: China, Myanmar, Lao PDR, Thailand, Cambodia and Viet Nam (Figure 5).

The multitude of ecosystems within the Mekong River Basin supports a huge diversity of plants and animals. Wetland ecosystems provide a range of valuable services, including flood protection and waste water purification as well as food and material. Monitoring of Mekong waterways shows the river's resilience to the current human induced pressures. Water quality at most sites is good, except in the Mekong Delta where high nutrient levels are a cause for concern. The river's annual flood pulse continues to support a rich fishery despite some reports of declining catches. However, the outlook for the basin's forests is not so positive, with increasing demand for timber and forest land driving deforestation and degradation.

The Mekong has become one of the most active regions for hydropower development in the world. In the upper basin, China is implementing a cascade of up to eight projects, which will significantly redistribute flow from the wet to the dry season. In the LMB, new dams are being planned on both the mainstream and tributaries. The LMB's estimated hydropower potential is 30,000 MW, of which about 10% has been developed, all on Mekong tributaries (MRC 2010).

Most of the 60 million inhabitants of the LMB live in rural areas, where they supplement what they grow with the fish they catch and the food and other material they gather from forests and wetlands. The livelihoods

and food security of most of the basin's rural inhabitants are closely linked to the Mekong and its waterways. This close relationship also means that people are particularly vulnerable if the river and its wetland ecosystems become degraded (Hall and Bouapao 2011).

The Mekong River system faces several major environmental challenges over coming decades. Planned hydropower developments, expansion of irrigation and waterway transport together with the impacts of climate change will have major implications for the river environment and, in some cases, threaten the biodiversity of the basin's aquatic systems and the livelihoods of those that depend on them.

Water resources management in the Lower Mekong Basin

The four LMB countries made a commitment to IWRM at the World Summit on Sustainable Development in 2002. This has translated into large changes in water resources management over the past five years. The MRC's Member Countries developed clear statements of national water-related policies and strategy, as well as the institutional and regulatory frameworks to support these policies. IWRM-related policies have become the responsibility of the respective line ministry governing water in the Lower Mekong countries (MRC 2010). In line with the IWRM concept, their mandate is to guide and coordinate water-related issues at all levels of the basin, and thereby ensure sustainable use of water resources. Progressive establishment of river basin organisations is taking place. Table 1 provides an overview of the prevailing management arrangements at all levels of the basin, from basin scale down to the local watershed level.

Watershed management is institutionally "older" than

IWRM in the LMB countries. In its early days, it was usually seen as an approach to deal with upland issues relating to forestry or land degradation rather than broader water management issues relating to both water quantity and quality (FAO 2006). The ecological functions of watersheds were hence given most prominence in deciding land use and zoning issues. The national level responsibility for watershed management traditionally lay with the line ministry responsible for agriculture and/or forestry. However, the wider scope of integrated watershed management coupled with evolving IWRM policies and institutions in the LMB might suggest that

all levels of the basin should be coordinated by the same policy framework and institutions. However, over the past decade and, in a similar way to the situation for river basin management, the interactions between the ecological and the social and economic functions within a watershed have become better understood. It is now an accepted approach in all LMB countries that watershed management must consider all three dimensions and, through broad consultation with all stakeholders in the watershed, find a suitable balance between the benefits of socio-economic development and the resulting impacts on the watershed's natural resources.

Table 1.

Indicative management arrangements for IWRM in the lower Mekong countries

Management level and strategy	Purpose of strategy or plan	Coordination or management body	Partner, supporting or implementing bodies
<i>Basin-scale:</i> IWRM-based Basin Development Strategy	Guides water-related development and management in the LMB	MRC	National resource management agencies
<i>National:</i> National IWRM Strategy (linked to basin-scale strategy)	Plans the actions to achieve national goals, follows an IWRM approach Takes account of the basin-scale strategy	• MOWRAM*, Cambodia • WREA*, Lao PDR • MNRE*, Thailand, • MONRE*, Viet Nam	National planning and sector agencies, private and non-government stakeholders, National Mekong Committees
<i>Sub-basin:</i> Sub-basin IWRM Strategy	Plans the actions for local-level socio-economic and resource protection, in accordance with the national IWRM strategy.	• River basin organisation • Province level coordinating mechanism	Sector agencies at provincial level, provincial governments
<i>Watershed:</i> Watershed plan of action	Defines the long-term goal for the watershed within the sub-basin and basin context and identifies necessary medium-term actions and solutions to address the most critical watershed issues	• Watershed committees or task forces	Districts and commune sector agencies, local communities, provincial governments

*MOWRAM – Ministry of Water Resources, Agriculture and Meteorology, Cambodia; WREA – Water Resources and Environment Administration, Lao PDR; MNRE – Ministry of Natural Resources and Environment, Thailand; MONRE – Ministry of Natural Resources and Environment, Viet Nam

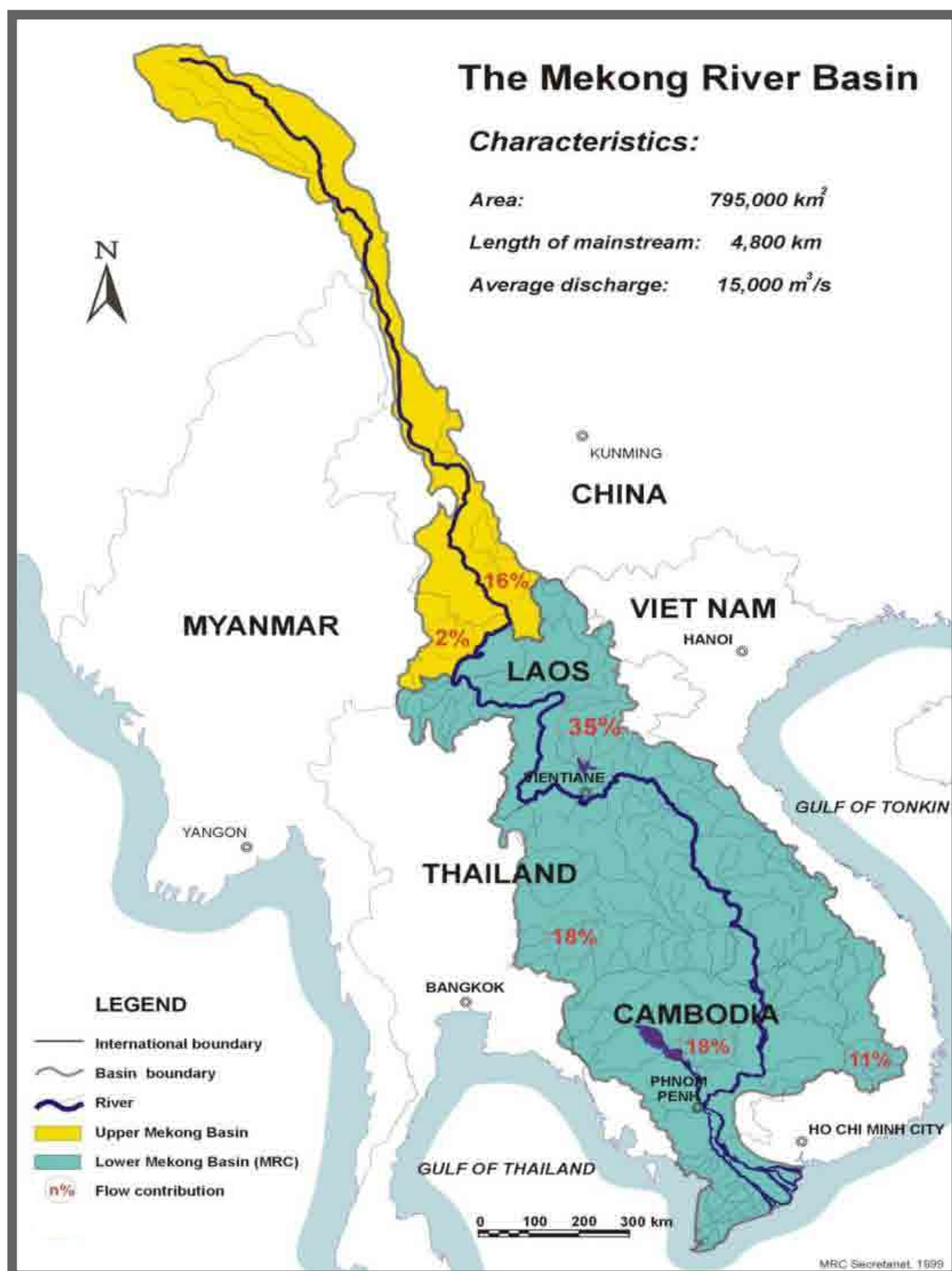


Figure 5.
The Mekong River Basin.
Source: MRC.

2. GOOD PRACTICE



2.1 Introduction

The interface between watershed and river basin management is a challenge for policy makers and institutions responsible for managing inextricably linked land and water resources. Clearly, interventions that are made within watersheds over the coming decades will have profound effects on the services that these watersheds are able to deliver. For example, the planting of new forests and replanting of old forests for carbon sequestration could potentially exacerbate water stress within the context of climate change. Similarly, increased agricultural productivity to enhance food security for a global population of nine billion and to meet the short-term Millennium Development Goals will significantly influence the ability of watersheds to provide water and

sustain natural reproductive processes. Success in managing competing interests in land and water resources is predicated on the understanding of the complexity of these systems, which, to date, is clearly not adequate. The functionality of watersheds to reproduce the goods and services that are critical for people and the environment continues to decline.

Whilst it is not possible to comprehensively discuss the myriad of factors and drivers that influence watershed management and associated good practice, selected issues of particular relevance for the Mekong region are highlighted below.

2.2 Land and water resource challenges for watershed and river basin management

Fundamental to the entire debate on sustainable watershed management is the effect of land cover on water and sediment yields. In the former, watershed yields, when aggregated, control the availability of the water (i.e. runoff and groundwater) at the basin scale and are driven by a range of biophysical and social drivers. Demographic changes in the region (i.e. urbanisation and human-induced deforestation), climate variability and demands for water (i.e. industrialisation) all influ-

ence the quantity and quality of water that has its origins in basin watersheds. Often the discourse on the impact of land use change is clouded by myths and untruths that become the norm (Box 2).

It is widely and independently acknowledged that deforestation, resulting in a reduction in evapotranspiration, increases annual basin water yields whilst afforestation, over the longer term, results in a decline in water yields.



Box 2. Myths associated with land cover

Folklore

- Afforestation increases water yield
- Vegetative cover reduces large floods
- Planting trees reduces erosion
- Roots are sponges

Reality

- Afforestation may decrease water yield
- Vegetative cover has little effect on large floods
- Erosion may be caused by variations in climate and vegetation or spot sources
- Roots are pumps

However, these generalisations need to be clarified by noting that seasonal flows are also a product of soil permeability, soil water storage capacity, and rainfall intensity and the chronology of land cover change. For example, in the case of extreme flood events the impact of afforestation may become imperceptible as, over such short periods, evapotranspiration does not control the runoff response. Consequently, the hydrological impacts of land-cover change at the watershed level do not follow a general rule as they depend on a complex inter-change of climatic, soil and biological factors.

Studies on the hydrological impact of land-cover change over large areas (i.e. >1000 km²) are extremely rare, in comparison with the abundance of small-scale studies. This is due to several factors: over large areas, the heterogeneity of land cover combined with the spatial variability of climate compounds the attribution of observed hydrological changes; and counteracting changes in vegetation cover may occur simultaneously, resulting in an apparent basin-wide stability of the runoff produced. This has led to the conclusion that land-cover

changes associated with deforestation at the watershed level have little if any impact at the aggregated basin scale. This assumption has recently been contested in the LMB through a study of the impact of irreversible bomb-induced deforestation over 50,000 km² which has demonstrated a significant increase in runoff that is measurable in the mainstream (Lacombe et al. 2010). To date, the ability to incorporate land-cover change and its implications for water yields into a hydrological modelling framework for the basin is limited or in its infancy. Addressing this issue would enhance the robustness of modelling capabilities.

Human activities in the Mekong Basin contribute to changing the quantity and delivery of sediment to the river system. Infrastructure development associated with dam construction in the basin is an integral part of the development agenda of several of the countries as demand for energy and food security grows. The Lancang (Upper Mekong) Basin in China already has four mainstream hydropower dams (the Manwan, Dazhoshan, Jinghong, and Xiaowan), with a further three

dams either under construction or planned. Balancing conflicting demands of upstream and downstream stakeholders is a significant challenge within the context of economic development in the basin and a range of future change drivers that include greater climate variability due to climate change.

Hydropower is an important regional development to meet future energy demand.

The functionality, integrity and productivity of both natural and agro-ecosystems of the Mekong Basin are intimately linked to the generation of sediments. In the face of increased economic development in the basin, that will significantly influence sediment delivery, the question arises of how to manage and maintain sediment fluxes at a level that meets these competing demands. This requires greater insights into appropriate levels of sediment to service different needs. The Mekong in its near pristine state maintains near natural levels of sediment fluxes on an annual basis. The suspended sediment load is composed predominantly of silt-sized material transported from highly incised watersheds by rainfall deposited from the southwestern monsoon and snow melt on the Tibetan Plateau. This annual sediment load of more than 160 million tons of silt carries nutrients and carbon that are vital for primary production and the continuity of the aquatic food chain that sustains the inland fisheries of the Tonle Sap and pelagic ecosystems of the delta and associated coastal zone of the Ca Mau peninsula. Further, these sediments and flood waters that transport them are critical for the growth and maintenance of the delta, the functionality of the extensive network of wetlands in the basin and for groundwater recharge in the delta.

As highlighted above, sediment fluxes, along with a range of aquatic ecosystems, are affected by water infrastructure, such as hydropower dams. Using an innovative approach to evaluate the impact of dam configuration on ecosystem connectivity (WWF 2011) it was found that with the current level of large dams in the Mekong Basin (a total of 50 dams), about 46% of the original ecosystem connectivity remains. Incremental dam development will further disconnect ecosystem processes, mainstream dams having a disproportional impact when compared to tributary dams. Whilst the approach focuses on biodiversity and ecosystem processes, adding social and economic valuation for services linked to these processes would further increase its value as a tool for guiding decision makers in basin-wide planning.

A significant area of uncertainty for planners in the Mekong Basin is the impact of climate change on the functionality of watersheds and its aggregated influence on basin water resources. Recent studies indicate that, in the short term, climate variability will manifest itself through greater frequency and more intense extreme

events (intensive storms with associated floods; heat waves and prolonged droughts) with as much as a 5% increase in aggregated water yields at the basin scale (Eastham et al. 2008). Over the long term, permanent shifts in weather patterns and seasonality, and altered structure and function of ecosystems may occur, thus influencing the provision of ecosystem goods and services. These shifts may include the greater incidences of plant, animal or human diseases; a preponderance of invasive alien species; and loss of biodiversity within watersheds. Managing these predicted changes at a watershed level offers opportunities to build resilience within local communities.

Building community resilience to climate change and enhancing adaptation requires a concerted effort in capacity building and linking adaptation to mitigation options. For example, programmes that promote carbon sequestration enable adaptation to occur whilst ensuring mitigation. Strategies that enhance skills in disaster risk reduction will ensure greater resilience amongst communities. There is a clear need to integrate climate change mitigation, adaptation and disaster risk reduction into the agenda of water and land management at all levels. Achieving these outcomes will require planning and coordination between all stakeholders.



2.3 Implementing good practices

Implementing good practices to secure sustainable watershed management is a prerequisite for ensuring cumulative positive impacts at the basin scale. However, as previously stated, the management of watersheds should not be seen in isolation of the river basin.

The necessity for sound accounting mechanisms to highlight different outcomes and assess impacts at different scales cannot be overstated in the overall management of water resources (Figure 6). Such an auditing approach allows managers to estimate the exact nature of what is often a reallocation of water from one user (or group of users) to another. While this is of particular importance in closed or closing basins, such an assessment is an essential first step in assessing the implications of certain interventions associated with watershed management. Sound allocation mechanisms based on the precepts of water accounting will ensure that any reallocation of water is deliberate, and allows for costs and benefits to be accurately weighed. Through this approach, informed and facilitated dialogue can occur, so that those who are directly affected by watershed change can discuss outcomes, benefit sharing, support, financial incentives and future governance.

From a practical perspective, the overarching objective of watershed and river basin management is the maintenance of the ecological health of natural resources as a precondition for both social and economic development. Forest degradation, inappropriate land use change, river degradation, mining and hydro-power development, if not undertaken in an appropriate manner, contribute to a decline in the integrity of the ecosystem and its ability to deliver goods and services. Balancing development whilst maintaining ecosystem integrity requires a concerted effort in planning that is inclusive and transparent. There are numerous examples of good practice in watershed and river basin planning and management in the Mekong region and beyond that meet the desired aspirations of stakeholders whilst maintaining the functionality and integrity of the watershed (Box 3, 4 and 5).

A key element in implementing sound water resources management is an integrated management approach that guides the overall planning from the watershed to basin level. In theory, it is a continuous negotiation process between civil society, the private sector and government institutions to optimise the provision of water resources within the watershed and to maintain

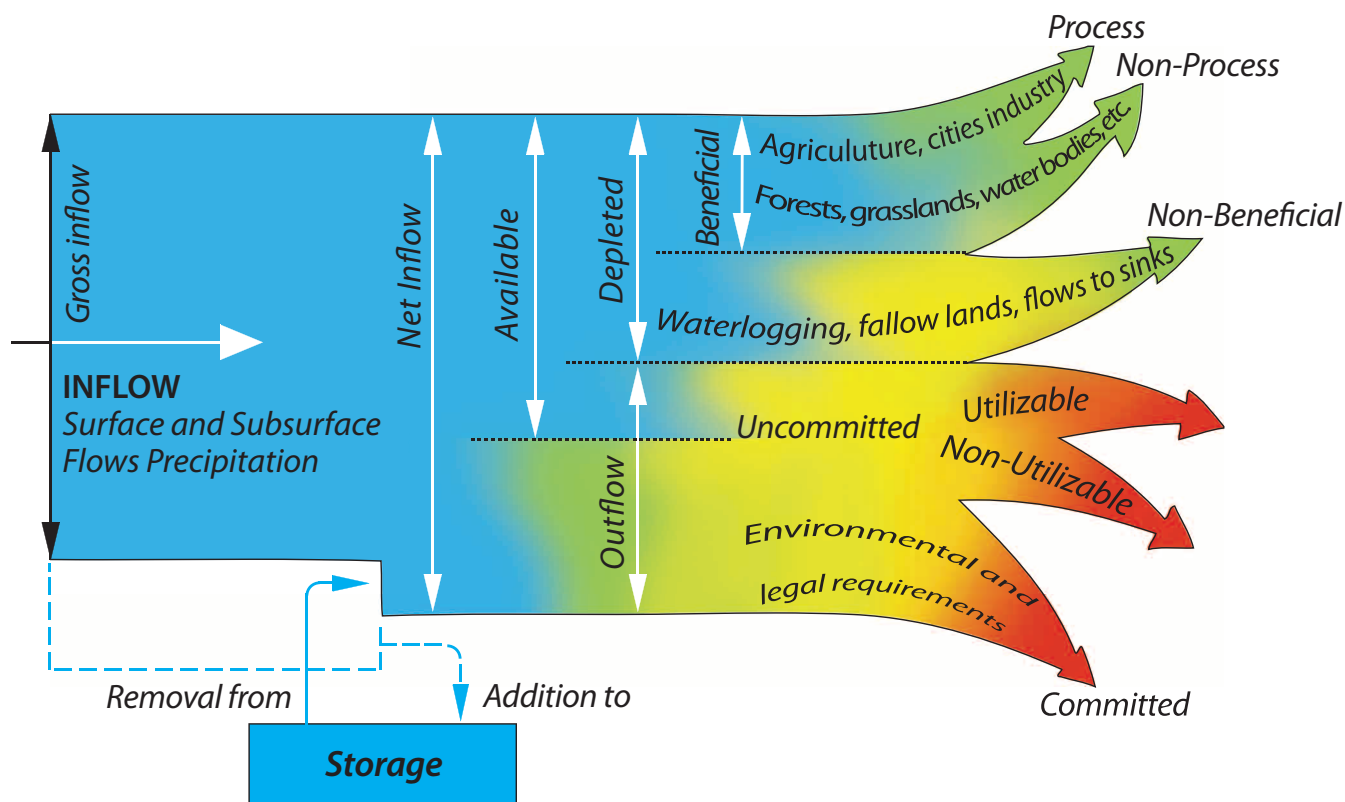


Figure 6.
Water accounting to support management decisions on allocation to stakeholders.
Source: Molden and Sakthivadivel, 1999

ecological integrity. This approach perceives differences of interest as opportunities to negotiate for the better management of resources and recognises that most disputes over access to natural resources are rooted in technical, social and institutional structures. Clearly, there are challenges and no simple solutions. There is no single approach to watershed and river basin management due to the complexity and diversity of issues and drivers that are unique to each situation. One approach that would go some way to secure positive integrated watershed and river basin management is to develop, from the outset, agreement and clarity in a set of tangible outcomes

While the approaches and case studies described above reflect watershed and river basin management and IWRM in action, implementation of these approaches is not easy. Watershed management over the past 50 years has by no means been a resounding success in the region and the degree of up-scaling of sustainable watershed management in the Mekong Basin is extremely low. Overlap, diffuse and ill-defined roles and responsibility between line agencies and ministries at the provincial and national levels lead to confusion, rivalry and inaction. Communities are often more ready to integrate than provincial or national government agencies that tend to be entrapped in bureaucratic structures or vested interests that make them less responsive to change. Often watershed management initiatives rely on external funding that is defined by donors' interests and governments' budgetary cycles and is invariably short term in nature. Watershed management projects can be characterised by three distinct phases: a pilot phase of 2–3 years; a validation phase of 5 years and a 5-year consolidation and institutional phase (FAO 2006). With each phase there is a decreasing dependency on funds from external sources. This would suggest that it takes at least 12 years to successfully implement a watershed management initiative, which may explain the challenges facing scalability of this approach and the rather mixed results to date.

The following indicators could be used to objectively assess success in watershed management implementation over the mid-term (past 10 years):

- Awareness and demand for watershed management as a key element for development at the country level. This requires strong political will and commitment and appropriate policy, institutional and financial mechanisms to support the establishment of organisations that will implement and guide this process. A key measure of success is the continual flow of funds to support these institutions along with effective data exchange between stakeholders.
- Evidence of the consolidation phase in which external financial support for watershed projects is minimal. This includes having functional institutional structures in place at different administrative levels (i.e. national, provincial, district and the local level) and the roles and tasks between different levels are recognised and respected by other government agencies.

Box 3. River basin and watershed management – the Nam Ngum River Basin Development Project

The Nam Ngum River Basin Development Project, undertaken between 2002 and 2010, aimed to introduce IWRM, improve land and watershed management and address poverty within the 16,841 km² basin. More than 40,000 families in 316 villages and 17 districts benefited from the project.

Planning was coordinated at several levels. At the village level, the project supported the government's land-use planning and land allocation programme to promote sustainable agricultural, livestock, agroforestry and forestry management. At the sub-basin level, watershed management plans were prepared for 21 sub-basins and used to inform the village, district and provincial development planning process. National and Nam Ngum river basin profiles were also prepared.

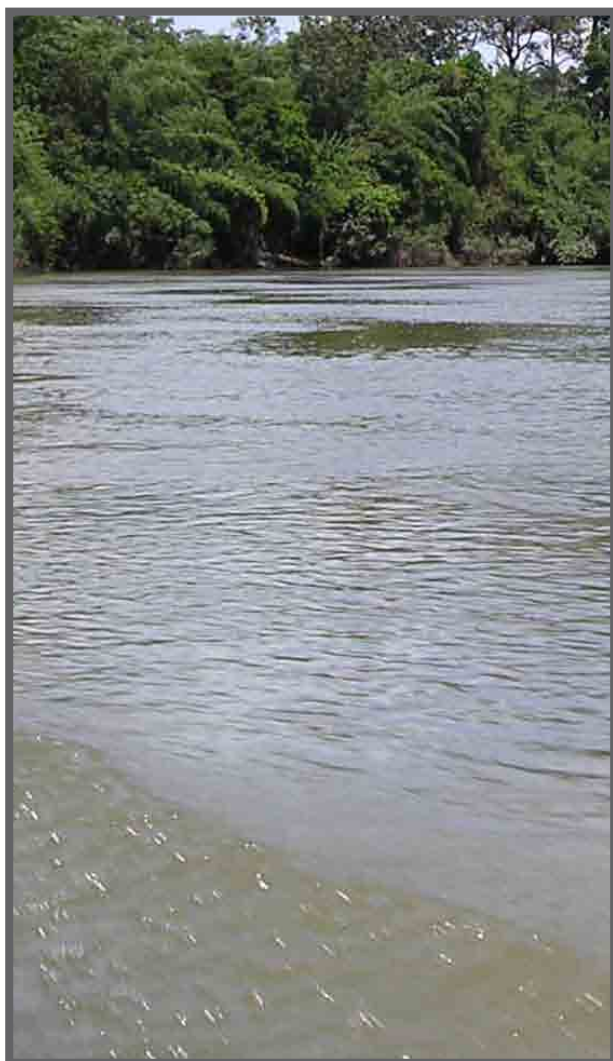
Key policy and institutional initiatives included promoting close coordination between the Ministry of Agriculture and Forestry, the Water Resources and Environment Administration (that was established and supported during the project) and the Ministry of Energy and Mines, and establishing the Nam Ngum River Basin Committee. Much effort was also put into defining and agreeing on the respective roles of these agencies in river basin and watershed management.

Agricultural activities under the Lao Extension Approach promoted good watershed management practices and introduced new technologies to farmers to improve livelihoods and reduce poverty. District extension capacity was strengthened through 29 agricultural centres, and training was provided in livestock and conservation agriculture techniques. Micro-credit enabled farmers to adopt the improved technologies.

In an innovative approach, landscape continuum development plans were created to overcome the traditional overlapping roles of watershed and river basin management authorities. Although the Ministry of Agriculture and Forestry had traditionally seen itself as the custodian of watershed management, this approach recognized that similar land management activities existed for lowland paddy, sloping lands, regeneration forest, and permanent forest, which were undertaken within many watersheds. This concept allowed the Water Resources and Environment Administration to focus on river basin management, and meant that the Ministry of Agriculture and Forestry did not need to distinguish between administrative and watershed boundaries.

Box 4. Planning for hydropower development on the Lancang River (Upper Mekong)

A pragmatic approach by the Chinese Government in the development of Lancang hydropower resources has ensured that environmental concerns are taken into account during the planning process. For example, in order to maintain the migratory passage of fish, the construction of the Mengsong dam was stopped; the operation of the Jinghong dam is synchronised with releases based on downstream navigation requirements and environmental flows; and a stratified water intake approach has been adopted at the Nuozhadu dam (under construction) to mitigate the adverse impact of low-temperature water discharges. Within the upper watersheds of tributaries to the Lancang, soil conservation and reforestation approaches have been promoted to address some of the adverse impacts of land use. These are learning lessons that could assist lower Mekong countries in the planning and implementation of large-scale infrastructure development.



Box 5. Micro watershed development in the Uttarakhand, Himalayas

Himalayan watersheds face a range of change drivers, including population and developmental pressures, deforestation and changing land use patterns. Critical in the overall planning process is that water resources are sustainably managed in the face of such change and that the resilience of local populations and ecosystems is assessed and increased. Past failures in appropriate land management have resulted in increased soil erosion and deforestation, resulting in reduced groundwater availability and seasonal decrease in surface water run-off. There is widespread concern among communities in the region over declining water security with an expectation that this situation will intensify in the future.

The Balkila Watershed, in Uttarakhand State is situated in the upper part of the Ganges river basin in northern India. Descending steeply from an altitude of 4000 m, it is one of the many fragile watersheds in the Himalayas. Villages in the watershed are struggling to deal with declining water security. The causes are complex, but the impacts clearly understood. Villagers complain that traditional springs used for centuries are drying up, forcing women and girls to walk long distances to collect water, leaving less time for other work and keeping girls out of school. This phenomenon is reported widely in the region. It is blamed locally on climate change, but is linked to degradation of native forests in upper watersheds. Solutions lie in implementing IWRM, which requires new arrangements for governance that devolve decision making authority for forest and watershed management from government to communities but with financial and technical support from the government. This is currently being achieved through joint learning and building trust among communities and authorities and the formation of new institutions that can coordinate restoration of native forests and management of water use.

3. GOVERNANCE



3.1 Introduction

Governance is about the way we share power, decisions, benefits and risks. “We” can be a local village community, the population of a watershed, of a nation, or even of a large transboundary river basin. Watershed governance includes the full spectrum of influences, from shaping agendas and deliberating options through the design of institutions and laws to the way these are implemented in the practices of day-to-day management of watersheds. As everything becomes more interconnected, good governance becomes ever more vital, and ever more difficult.

There is no one-size-fits-all solution for the governance challenges facing the Mekong region because “there are many Mekongs”, with a wide range of differing circumstances: bio-physical (from the Tibetan Plateau to the Vietnam Delta); socio-cultural and historical (crossing many kingdoms, tribes and ethnic groups); and political

(different nations, different political systems). This diversity makes it necessary to develop and establish locally and nationally appropriate governance solutions, to address the massive changes taking place through water and land-use related investments in the Mekong region. At the same time this means that ‘copy-cat’ approaches or approaches driven by donors do not usually adequately reflect reality.

The governance debate at the International Conference on Watershed Management recognized that the Mekong is not the same for all its inhabitants.

The four overriding themes presented below are key issues on governance in watershed and river basin management derived and discussed based mainly on experiences in the Mekong region.

3.2 Regulatory frameworks and institutions: the skeleton of governance

Governance is primarily about the management of people, more than the management of the physical aspects of watersheds or river basins. Human behaviour is governed to a large extent by economic incentives and financial disincentives or penalties. Governance mechanisms must reflect and integrate this reality.

People as well as the environment depend on rivers and their associated services. As the exploitation of a river increases, cooperation to establish and enforce a regulatory framework is needed to ensure its use is sustainable. Such a framework ideally comprises policies, laws (both statutory and customary), rules and regulations, and plans (both strategic, and site management plans). The development, decision and enforcement of these 'rules' requires 'executive' institutions.

In the past decade or so, all Mekong countries have passed formal water, fisheries, land-use and related laws and created, adjusted and, in some cases, upgraded organisations and institutions to address water and watershed management issues. Some of these changes have been superimposed upon or hybridised with pre-existing, informal community-based arrangements; in other cases, they filled an institutional gap.

One important outcome of these reform processes is a diverse range of new or modified local management bodies and institutions based at watershed and river basin levels. For example, in Lao PDR and Cambodia there are now several hundred community fishery agreements between riparian communities and local government entities. In Lao PDR, a new and soon to be approved national water resources policy and a strategy and action plan have been developed. The ongoing establishment of the Nam Ngum River Basin Committee (see Box 6) is already part of implementing these regulatory frameworks. Cambodia is trialing concepts of IWRM in river basins (Box 7) but so far has not established formal river basin institutions. In Vietnam, river basin organisations comprise representation from national and provincial authorities (Box 8). Likewise, in Thailand there is a diverse range of watershed networks, committees and river basin organisations in place or being formed (the first were established some 10 years ago).

The importance of strategic, long-term management plans cannot be overstated. Unfortunately, many river basin organisations or committees operate mainly on annual plans and budgets, which do not provide the necessary long-term security and stability.



Box 6. Governance through cross-sectoral dialogue and coordination – the Nam Ngum River Basin Committee



The inauguration of the Nam Ngum River Basin Committee Secretariat Office.

The Nam Ngum River is an important tributary of the Mekong in Lao PDR. It is a large basin, which covers four provinces, flows to the national capital of Vientiane and contributes 14% to the Mekong's flow. Cooperation among water users within the basin is particularly important here, as the Nam Ngum is used for a wide variety of purposes such as harnessing energy from its waters, providing irrigated water to farmers, exploiting a diverse mining base and providing for ecotourism activities. In the Nam Ngum River Basin IWRM plan from 2009, six key result areas were identified: building capacity to manage the Nam Ngum river basin, sustainable water use, optimising hydropower outcomes, developing a sustainable irrigation potential of the basin, river sub-basin management, and reducing risks and impacts from water-related disasters. The basin contains five hydropower projects and an additional nine are planned.

In June 2010, the Government of Lao PDR passed a Decree (No. 293) to enable the establishment of river basin committees which paved the way for the formation of the Nam Ngum River Basin Committee. As the first step, the Nam Ngum River Basin Committee Secretariat has been established. The aim of establishing the Nam Ngum River Basin Committee, a government entity, is to create a multi-stakeholder platform to ensure that multiple sectors and agencies are involved in the management of the basin. This is a new and challenging task for the government and the Nam Ngum River Basin Committee is considered a pilot case whereby lessons learned are expected to be applied to other planned river basin committees (e.g. in the Nam Theun-Nam Kading river basin). As well, with 18 sub-basins in the Nam Ngum Basin, sub-basin committees are expected to help in facilitating watershed management; for three, the Nam Song, the Nam Ko and the Nam Lik sub-basins, preparation is underway.

While the decree specifies that the basin-level committees are chaired by the Provincial Governor and membership would consist almost exclusively of national and provincial government agencies, there are no such stipulations for the sub-basin committees, opening a window of opportunity to create a dialogue platform with a much stronger participation from civil society, including the private sector. The Vice-Governor is expected to chair the sub-basin committee as well as being Vice-Chair of the Nam Ngum River Basin Committee, thus ensuring that the efforts of civil society involvement and decisions will be integrated at the higher, basin level. A Nam Ngum Hydropower and Mining Forum was discussed as well, to encourage engagement from investors, developers, donors and international organisations. A key management discussion has formed around how to fund the river basin committee and whether and how benefits from the immense developments in the basin can be re-invested for management and conservation efforts.

Box 7. Linking watershed management to IWRM – the case of the 4-Ps, Cambodia

The 4-Ps Basin is located in the provinces of Kratie and Mondulkiri, Cambodia. The area, in which most people are subsistence farmers, lacked comprehensive planning for sustainable development. The Cambodia Royal Government in 2007 began pilot activities to implement the concepts of IWRM with the support of the Global Water Partnership and Asian Development Bank.

The key issues to address included: flood and drought risks, high poverty rates among ethnic minority groups; forest, land and mining concessions posing a threat to sustainable development particularly for ethnic minority groups; and limited capacity for effective implementation and enforcement of rules and regulations.

Within a supportive framework of government policies, strategies and legislations, IWRM processes have been implemented to facilitate enhanced water resources management. The IWRM process created strong coordination and a widely participatory process among stakeholders from different sectors and geographical locations (upstream and downstream). IWRM best practices were introduced with significant results and outcomes, forming a supportive political will in the local basin, and an approach to promote local knowledge and capacity building for sustainable water resources management and development.

Success to date is due to three factors: 1) involvement of key institutional stakeholders, such as the two provinces and various national line agencies; 2) an active dialogue between stakeholders with confidence and willingness to collaborate; and 3) a holistic (IWRM-based, multi-sector) perspective. It is important to seek mutual adaptation between the (integrated) basin-level development and the (sector-wise) national and province-level public investment planning.

Box 8. The IWRM implementation experience in Viet Nam

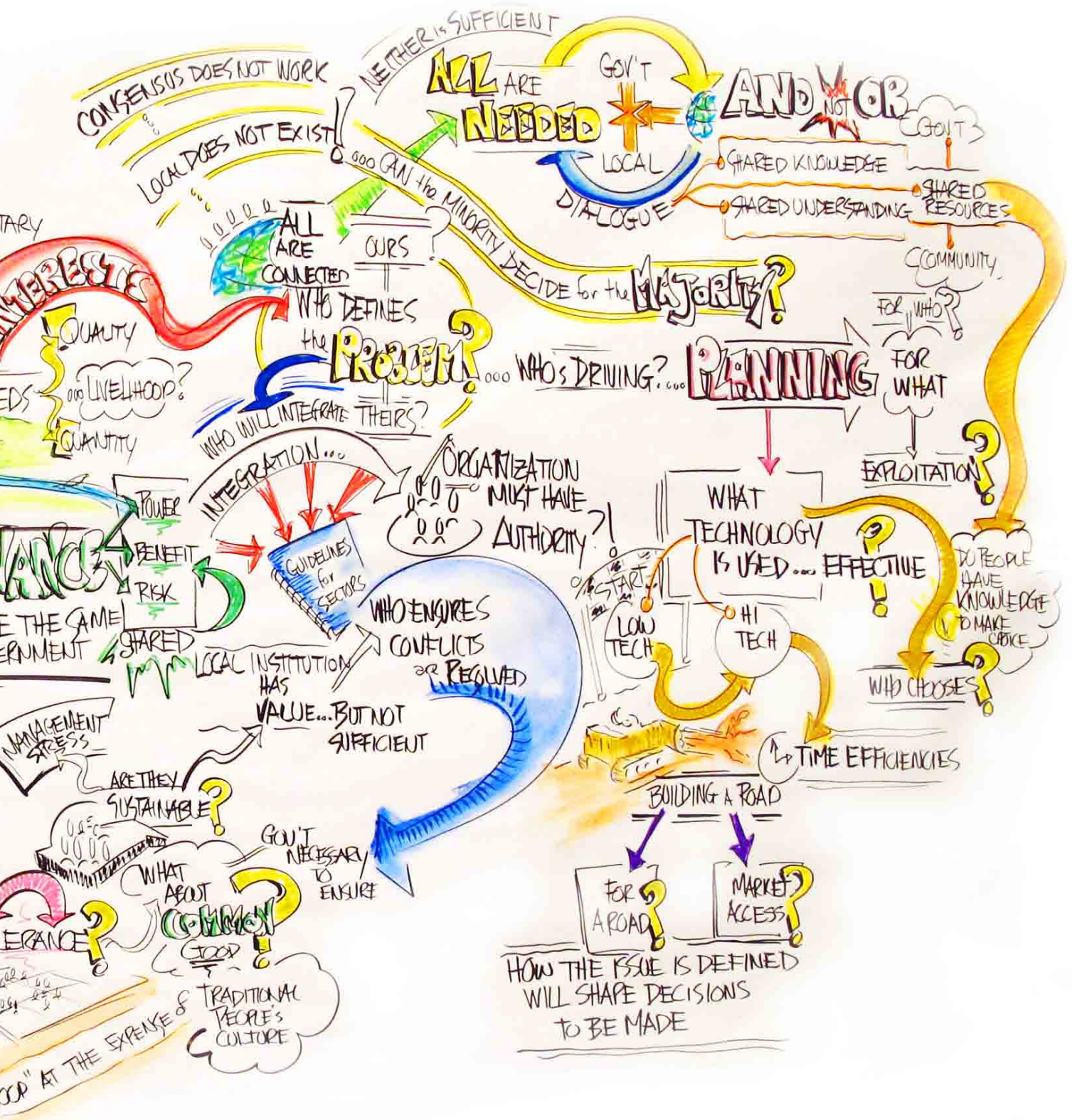
Viet Nam's first river basin organisation, created in 1960, was designed with the twin mandates of flood control and multi-purpose development. However, more recently, Viet Nam has undergone significant legislative reforms in an attempt to better integrate river basin management with water resources management via an IWRM framework.

The Law on Water Resources was adopted in 1998 and the Ministry of Natural Resources and Environment was created in 2002 and given legal control of water resources. There are now 11 river basin organisations in existence and many are mandated to work towards both planning and environmental protection.

However, Viet Nam is still tackling a variety of challenges with regard to IWRM implementation. The new Ministry of Natural Resources and Environment does not, in practice, have full control over water resources. Many river basin organisations lack any real power, with major studies related to river basin planning being assigned directly to the existing line agencies, leaving river basin organisations to perform solely an administrative role. Integrated watershed management has yet to be promoted and the roles and responsibilities between different agencies and institutions overlap in practice.

The Viet Nam experience illustrates that any significant water resources management reform process is continually evolving and requires long-term commitment. Water governance today needs to be implemented at the river basin level by the river basin organisation with inputs from the local watershed levels through community participation and consensus building. Willingness, trust and a sense of shared responsibility throughout the reform process are vital. Strategic environmental assessments and monitoring systems should be used to supplement the process with important technical information and the functions between different institutions clearly defined. Achieving this is a key challenge for the MRC and all the countries of the Mekong Basin.





3.3 Everything is connected: the need for horizontal and vertical integration

“Governance starts where the rain drops fall”. Without strong local institutions, implementation in the field will not happen. There are cases of success at the watershed level that can be scaled up to sub-basins and river basins.

Local – watershed level management in the LMB uses a variety of approaches to the participation of local stakeholders. These range from, for example, watershed areas being managed formally or informally as community forests, to watersheds being co-managed as protected forests by Forestry Departments or Protected Area Authorities together with local communities, to the many watersheds that are also militarily sensitive areas managed directly by the countries’ armed forces.

Local institutions are necessary but not sufficient for managing watersheds in the Mekong region. While community-based informal institutions may have functioned well in the past, the challenges and conflicts of today require the execution of formal legitimacy, authority and power. Formal authority becomes even more important when managing geographical entities larger than watershed, e.g river basins.

In Thailand, up-scaling of experiences from the watershed level to the river basin and even national level is already happening. Experiences there clearly indicate the importance of including civil society in the decision-making processes that involve the natural resources that communities rely upon. Thailand has recently restructured individual river basin committees as well as the national-level body with oversight of all river basin com-

mittees to include increasing civil society membership. Viet Nam is currently enlarging non-state participation in river basin organisations as well.

A critical factor in ensuring good management is the relationship between the various organisations involved, all of which have a variety of mandates and responsibilities. Standing alone, most have little formal or practical authority and insufficient resources, regardless of whether they are community or state-led. Inter-agency competition for budgets and other resources is another real impediment for better coordination.

As competition for watershed resources from different sectors such as hydropower, mining and agribusiness, and from other upstream and downstream users, is ever increasing, major challenges regarding the clarification of mandates, inter-agency coordination and collaboration across sectors, disciplines and administrative boundaries, and multi-sector/multi-stakeholder planning processes remain. Governance must be both ‘top down’ and ‘bottom up’ and watershed governance must be embedded into river basin management.

The Mekong region is in a race to build social capital, to network across organisations and borders, and to address problems caused by global, regional, and national development pressures and changes. The challenge is to win that race by sharing knowledge across stakeholder groups, networking externally, and supporting champions both young and old, and ensuring that lessons are learnt along the way. It is alright to make mistakes, but not to make the same mistakes over and over again.

3.4 Participation: “Enlarging the We”

An important success factor for good governance is inclusion and participation of all relevant stakeholders, i.e the organisations and key individuals who make decisions and/or are affected by those decisions – those who manage and those who are being managed. Management bodies such as river basin organisations instituted by governments usually do not provide sufficient opportunities for civil society (e.g water user groups or other community based organisations) to play a meaningful role in decision-making processes.

‘Participation’ is a popular buzz word for justifying decisions when, more often than not, those bearing the risks of the most adverse impacts of those decisions, may not

have been appropriately included in the discussion (and implementation). On both sides, this often creates an ‘us’ versus ‘them’ situation. Better governance is about enlarging the ‘we’, through inclusion and honest and earnest participation of all those who should have a say, either because of their official role and mandate or because they benefit or suffer from the consequences of decisions at hand.

The shift in participation requires flexibility from all parties, government, civil society and the private sector, with a real interest and commitment to learning from and working with each other. Co-management has been identified as a potential mechanism by which this can

occur, and multi-stakeholder platforms or dialogues are a central tool in enabling these, and ensuring that benefits can be distributed equitably amongst resource interests, as well as an effective method of sustainably managing natural resource bases. A good example is the round-table process of the local watershed management committee in the Doi Inthanon National Park, which succeeded in solving a bitter conflict between upstream (mostly ethnic Karen) and downstream (mostly Thai) communities over resource use, within a period of 5 years (see Box 9). Other examples of tools supporting dialogue at a higher level are the use of the Rapid Sustainability Assessment Tool (RSAT) as a framework for a multi-stakeholder dialogue process and for scoping of the cumulative impact of potential multiple hydropower dam developments (see Box 10).



Box 9. Around the table: collective water management – the Doi Inthanon National Park, Thailand

The Doi Inthanon National Park near Chiang Mai, which was created in 1954, is home to the highest mountain in Thailand and covers an area of 482 km².

Every year we are fighting for water.

A Karen villager living in the upstream community in Doi Inthanon explains that villagers mainly subsist on upland rice, which they grow once a year. In the downstream communities, 80% of villagers are farmers who grow soy-bean and tapioca, among other crops.

In 1997, villagers living downstream held protests as actions taken by upstream hill tribes were causing water-related impacts. The lowland communities fought for water because hill tribe people started growing large plantations, which led to larger scale water utilization. This resulted in downstream communities receiving less water, which in turn worsened when chemical fertilisers were used. People and animals could not tolerate the contaminated water. A campaign to force the hill people in Pa Klauy and other communities within the watershed to move started in January 1997 and escalated in May with the Chom Tong Conservation Club blocking the four access roads to the highlands. With the assistance of other environmental NGOs, the Chom Thong Conservation Club also demanded that the government overturn a series of 1997 cabinet resolutions about the rights of local communities to manage their forests, because the resulting upland activities negatively affected the downstream communities.

After the protests in 1997, communities started to come together around a table. Meetings were organized to discuss how to improve water management and determine how much water villagers need during the dry season and how much they can share. “If we have trouble about water – people have to talk to each other to solve issues. Agreement is very important.” The roundtable was formed to address upstream and downstream water conflicts and is a dialogue space for communities both upstream and downstream to air their concerns, share knowledge and try to find amicable solutions to water-related problems. The roundtable has a watershed leader and has representation by several ethnic groups, National Park officials and Royal project staff, among others. With the help of officials, the hill tribe people were able to understand better the consequences of their actions, the importance of protection of water upstream and the associated impacts downstream.

Now the upland and highland communities are demonstrating a number of positive adaptive responses, including making greater efforts to conserve and protect forestlands, and respond to the management goals of government and lowland communities. Efforts to deal with outside stakeholders through facilitated dialogue have allowed new modes of dispute resolution to evolve. Furthermore, the roundtable dialogue has been discussing how lessons from their experiences can be shared among other neighbouring communities and countries.

Box 10. Rapid Basin-wide Hydropower Sustainability Assessment Tool (RSAT)

The Rapid Basin-wide Hydropower Sustainability Assessment Tool (RSAT) was developed to ensure that hydropower projects in the Mekong region are developed in a sustainable way, i.e with minimal adverse social and environmental impacts, while remaining a viable, profitable and renewable source of energy supporting the region's economic development.

RSAT was designed to allow consideration of the dynamic nature of hydropower development, which often involves several projects in a sub-basin being at different stages of development (proposed, committed, under design, under construction and operating) at any one time. Hydropower sustainability is complex. It does not depend on the performance of one responsible group (e.g. industry or government) but on the capacity, performance, interaction and collaboration of a range of key players, each with different roles. Therefore, multiple aspects of hydropower development, institutional arrangements and basin-wide planning are the subject of the assessment tool.

The primary aims of RSAT are:

- To provide a common basis for dialogue and collaboration on sustainable hydropower between key players;
- To highlight and prioritise areas of hydropower sustainability risk and opportunity in a particular basin or sub-basin for further more detailed study;
- To identify capacity building needs to promote sustainability of hydropower in the basin.

The RSAT does not comprise an exhaustive list of all basin-wide hydropower sustainability issues. It was designed to target the most important issues and assist with dialogue and planning between key players. The range of topics and criteria in RSAT reinforce the inherent multi-disciplinary nature of the sustainability hydropower challenge in the Mekong and the acceptance of a step-wise, comprehensive approach. The tool places emphasis throughout on particular key themes of sustainability that are necessary for a basin-wide approach to sustainable hydropower development.

Link: <http://www.mrcmekong.org/ish/SEA/>

3.5 The importance of transparency, accountability, recourse and compensation

Dialogue and participation are not enough to achieve good governance. They need to be targeted at making the right decisions, based on a clear consensus. However, reaching consensus can take time, so it is important to synchronise decision-making processes with external, and often very rapid, developments, such as the 'management stress' generated by (often external) water and land-use related investments.

There needs to be a mechanism where stakeholders can monitor the quality of the decisions made and how they are implemented. This will improve the likelihood of good decisions being made and implemented well. Transparency is not an end in itself though and authorities that make bad decisions or fail to implement the good

decisions should be held accountable. While not guaranteeing good governance, accountability will make it much more likely.

And in those unfortunate cases where bad decisions have been made, there must be the opportunity for legal recourse. In such cases, and in cases where for the well-being / benefit of the majority the individual or minority group has to suffer, (monetary) compensation has to be made.



4. ECONOMICS AND FINANCING



4.1 Introduction

Economic forces and conditions underlie many of the activities that impact on watersheds and river basins. The land, water and resources of the Mekong Basin have long been subject to intense development pressures. These have been motivated by the need to secure adequate livelihoods, generate sectoral output, earn business profits and achieve macro-level growth and development goals. Economic trends, such as intensifying trade and market integration, expanding infrastructure, rapid industrialisation and urbanisation, and widespread poverty have all driven these demands. In turn, a host of price, market and policy instruments have, over time, been deployed to accelerate development in watersheds and to encourage people to produce, consume or invest in particular ways. This has undoubtedly generated substantial economic gains. Yet such pressing (and often competing) economic demands have also led to watershed degradation, and significant costs and losses have often been incurred – especially for poorer and more vulnerable groups.

At the same time, economic and financial instruments represent key components in the range of tools that can

be used to promote more integrated approaches to watershed and river basin management. The provision of appropriate incentives acts as a powerful stimulus to enable and encourage land and resource users, developers and investors (be they governments, private sector companies or local communities) to participate in, and benefit from, more sustainable and equitable development processes. Meanwhile, the search for adequate funding to undertake integrated watershed and river basin management remains a core concern among government agencies across the Mekong Basin.

A variety of economic and financial approaches and tools for integrated watershed management, which have been developed over recent decades, are being applied in the Mekong Basin and elsewhere. These include novel ways of analysing economic costs and benefits in watershed decision-making, the introduction of new prices and markets for watershed goods and services and the development of innovative financing mechanisms with which to fund watershed and river basin management. These experiences provide valuable insights and lessons learned for planners and managers.



4.2 Watershed and river basin values

There has long been a tendency for decision-makers to under-value both the benefits of more sustainable watershed and river basin management and the costs of watershed degradation and loss. This poses a major constraint to better and more informed watershed and river basin planning. In many cases the economic information that is generated to support decision-making excludes those costs and benefits that do not accrue on-site or are not easily expressed via market prices, most importantly downstream economic effects, ecosystem values, and livelihood impacts.

Yet these values are usually substantial, and their omission constitutes a major gap in decision-making. For example, an ongoing study by the WWF Greater Mekong Programme has found that natural forests and wetlands in the four Lower Mekong countries generate water ecosystem services worth billions of dollars a year – and that if current trends in land-use change continue, local, national and regional economies will inevitably incur substantial costs as a result of watershed degradation and loss. Many other examples from the region also show the economic value of watershed

services. In Vientiane, for example, wetlands offer flood attenuation and waste-water treatment services to city-dwellers to a value of about US\$2 million per year (Gerard 2004). Each hectare of forest in Viet Nam's Da Nhim watershed generates downstream benefits to hydro-power of US\$69 (MARD 2008), while the value of Cambodia's watershed forests for soil and water protection has been estimated at between US\$75–131 per hectare per year (Hansen and Top 2006).

These types of watershed benefits and costs are, however, rarely factored into official economic statistics and measures of growth and development. They tend also not to be reflected in the prices and market signals that people face as they make decisions about how to produce, consume and invest in watersheds. Various examples from the region, including a history of subsidies and other inducements for environmentally degrading land use activities, show the long-standing dominance of economic policies that have favoured commercial and industrial resource exploitation – often at the expense of more sustainable development trajectories, and to the cost of the livelihoods of the poor (Emerton 2005). As

a result, decisions about the 'best' way to develop the watersheds of the Mekong Basin have often been made on the basis of only partial information. At the worst, in the absence of information about watershed values, substantial misallocation of resources has occurred and gone unrecognised and immense economic costs have often been incurred.

Over the past decade however, there has been a progressive shift in the way that watershed values have been calculated and presented to decision-makers. The concept of total economic value has now become one of the most widely used frameworks for identifying and categorising watershed benefits. Instead of focusing only on direct commercial values, it also encompasses subsistence and non-market values, ecological functions and non-use benefits (Emerton and Bos 2004). One example of using watershed valuation to generate economic decision-making support for water-sector investment planners is provided by the case of the Upper Tuul watershed in Mongolia (Box 11).

Economic data is necessary to inform watershed planning and it is of critical importance that this information is perceived by decision-makers as being both credible and meaningful. Information on costs and benefits needs to be set in the context of the sectoral and development goals that drive decisions in watersheds, and combined with social, environmental and institutional information. Experiences gained in implementing the European Union's Water Framework Directive suggest ways of meeting these needs. Most of the work is undertaken by multi-disciplinary teams, and placed firmly in the context of the technical and policy actions that are required to develop and implement river basin management plans and associated programmes of measures – "economic instruments are not the solution, they are part of a solution". This kind of interdisciplinary approach and contextualisation are necessary conditions for economic information to have real impacts on the outcomes of watershed and river basin decisions.

Box 11. Calculating the economic returns to investing in the Upper Tuul Watershed, Mongolia

Ulaanbaatar, the capital city of Mongolia, is facing a looming water crisis. Groundwater tables, fed wholly by the Tuul River, have been declining markedly over the last 50 years. Seasonal water shortages are growing ever more common and it seems that sometime within the next 10–15 years the city will face a critical water shortfall.

In response, measures are being set in place to tap into additional groundwater reserves, and to develop surface water storage capacities. However, no future water supply solution will succeed unless sufficient investments are also made to conserve the Upper Tuul watershed. But decision-makers do not see the economic rationale for investing in natural ecosystems for water supplies. A major challenge is to present hard evidence on this: most basically, that a healthy upstream ecosystem will help to ensure clean, regular and adequate water supplies for Ulaanbaatar.

Although watershed conservation, alone, is neither going to guarantee water security nor remove the need to develop additional supply sources, it will impact the ability of built infrastructure to deliver adequate clean water to Ulaanbaatar. Investing in the watershed has the potential to generate significant downstream benefits and save substantially on costs. If the Upper Tuul continues to be degraded, decline in water services will cost the Mongolian economy around US\$270 million over the next 10 years. By contrast, every US\$1 invested in the conservation of the watershed ecosystem would generate additional water benefits of US\$15 a year for downstream Ulaanbaatar.

4.3 Innovative economic and financial instruments

It is important that as well as demonstrating the costs and benefits associated with watershed investment, land and resource use decisions, the resulting information is used to identify practical measures to create more enabling conditions for integrated watershed and river basin management. Innovative economic and financial instruments need to be developed and used to provide incentives and funding for more sustainable, equitable and efficient management and in support of the functional govern-

ance and institutional frameworks that are used to implement them.

Various forms of payments for watershed services (PWS) schemes are emerging as key tools in the Mekong Basin and beyond for providing financial and economic incentives for integrated watershed management. China has seen a particularly rapid growth in the development of PWS over the past decade (Figures 7 and 8), including

various forms of water use rights trading schemes and watershed ‘eco-compensation’ schemes. Such schemes involve agreements by downstream water users (such as municipalities, irrigation schemes or hydropower facilities) to reward or compensate upstream land and resource managers (such as farmers, forest users or government environmental agencies) for the economically valuable water supply and water quality benefits they provide.

The aim is to ensure sufficient economic incentives and funding for sustainable upper watershed management. For example, in order to protect the Miyun Reservoir (Beijing’s main water supply), Beijing Municipality has been providing PWS to upstream Hebei Province (where per capita incomes are only half that of Beijing residents). Almost US\$60 million is transferred each year to fund land conversion from irrigated rice fields to rain-fed farming, water pollution control, water resource protection, afforestation and forest management. Of this amount, 60% is distributed to forest owners as a basic payment, and 40% channelled as incentive payments for forest management and landscape restoration.

Payments for watershed services have also been emerging in other Mekong Basin countries over the last few years. In Cambodia, for example, the term ‘payments for ecosystem services’ is widely used in public planning and in operational projects for ecosystem conservation (Chervier et al. 2010). Various forms of PWS are being scoped out in Lao PDR, e.g in Houay Xon watershed, detailed work has identified a clear willingness to pay by downstream beneficiaries, which would, in principle, be sufficient to compensate upland farmers for implementing new land management practices to abate some of the negative impacts of soil erosion on water quality (George et al 2009; Mousquès et al 2008). A recent UNDP-sponsored workshop has identified great potential to apply PWS in Thailand (UNDP 2009). A case study on Viet Nam’s progress in developing a legal, policy and implementation framework for payments for forest ecosystem services is described in Box 12.

These schemes are driven by a sound economic rationale: that such mechanisms are often a far cheaper and more cost-effective way of maintaining important water services than bearing the costs and losses that arise once they are lost, or investing in the measures that are required to mitigate or remediate the effects of their degradation. For example, recent studies have found that the Da Nhim Hydropower Station in southern Viet Nam would incur additional operating and plant costs of US\$3.75 million a year if the 45,000 hectares of forest in its upper watershed were converted to agriculture.

In Lao PDR, private-sector hydropower developers have been particularly active in funding watershed management and watershed managers in recognition of the eco-

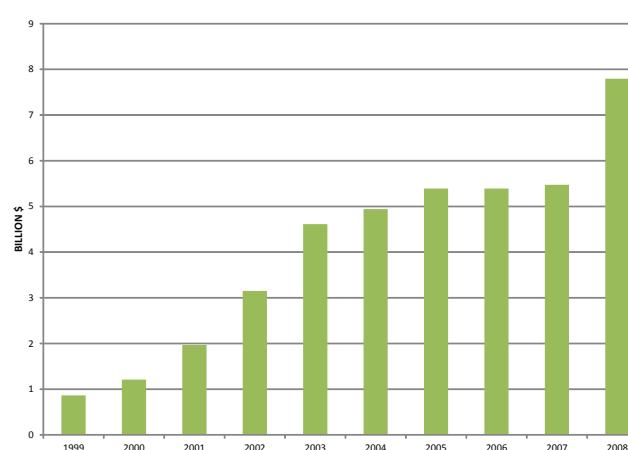


Figure 7.
Annual PWS transactions China

Source: Stanton et al. 2010

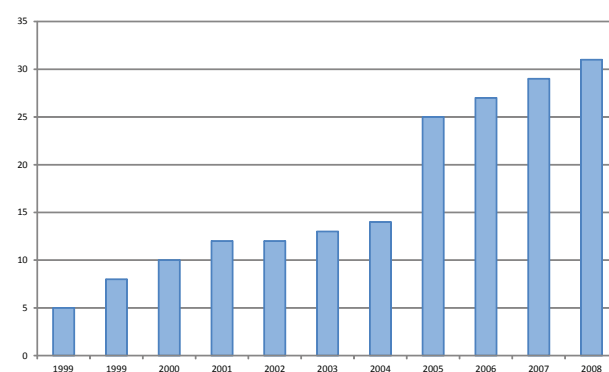
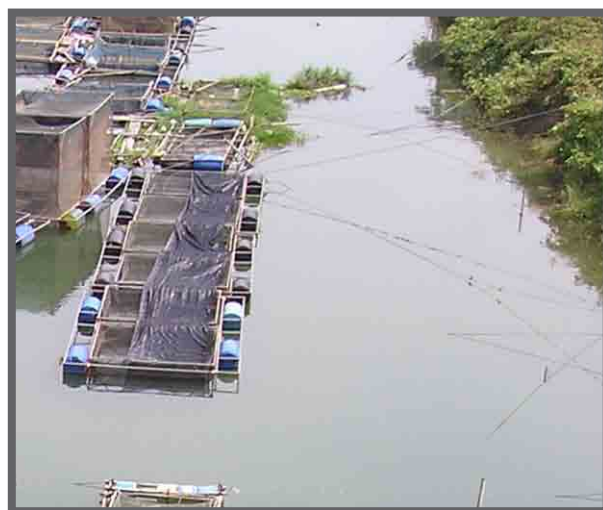


Figure 8.
New PWS schemes in China

Source: Stanton et al. 2010

nomically valuable services they provide for downstream electricity generation. Experiences with the benefit-sharing mechanisms operating under the Nam Theun 2 Hydropower Project and the Theun-Hinboun Expansion Project suggest that by investing US\$1 million per year in the Nakai-Nam Theun Protected Area (in the case of Nam Theun 2) and US\$2.3 million in a Catchment Protection Plan (in the case of the Theun-Hinboun Expansion Project), hydropower developers hope to achieve ‘win-win’ solutions in terms of reduced costs/improved efficiency in power generation, and income/funding for upstream land and resource managers.



Box 12. Payments for forest environmental services

Lam Dong and Son La Provinces, Viet Nam The idea of payments for environmental services began to take hold in Viet Nam in 2005. In 2008, the government issued Decision No 380/QĐ-TTg on piloting Payments for Forest Environmental Services in Lam Dong and Son La Provinces. These two schemes have been developed collaboratively between the Ministry of Agriculture and Rural Development and external donors: USAID/Winrock International in Lam Dong, and GIZ in Son La. Similar systems operate in both provinces.

Cash payments are received from key water users (hydropower, water bottling companies and other urban and industrial consumers). The revenues collected are retained in separate bank accounts as part of Provincial Forest Protection and Development Funds. Between 10–20% is retained by government, and the remainder paid out to upstream forest owners – the environmental service providers. Local households in watershed areas are eligible to receive payments, calculated on a per hectare basis. In Lam Dong Province, almost 10,000 households (or 40,000 beneficiaries) are receiving between US\$540 to US\$610 per year, funded by hydropower plants, water supply companies and tourist companies. It has been documented that, as a result, illegal logging has been reduced by a half. At the same time, the payments made represent an average 400% increase in household income for forest owners. In September 2010, Decree No 99/ND-CP was passed; this scaled payments for forest environmental services up to the national level, and provides the opportunity for such incentive systems to be extended to other parts of Viet Nam.



4.4 Funding watershed and river basin management

An important question, which is generating much debate, is whether such payments will prove to be sufficient to cover the costs and opportunity costs of watershed conservation and sustainable use. As yet, there is not sufficient data to know whether this has been the case – or whether such payments can keep pace with the growing opportunity costs associated with changing land, resource and development patterns in watersheds and river basins. Increasingly, managers are looking to ‘stack’ or ‘bundle’ different types of payments so as to increase the amount of funding that can be made available for integrated watershed and river basin management. Carbon finance is identified as one important emerging market in the region, which in many cases can be used to supplement water-based PWS schemes (Wertz-Kanounnikoff and Kongphan-Apirak 2008). A number of new initiatives in Lower Mekong countries are attempting to mobilise payments for the carbon sequestration services provided by forests and other natural habitats in watersheds. A growing number of Reducing Emissions from Deforestation and Forest Degradation (UN-REDD+) pilot projects are for example starting to be developed in important watershed areas, including Oddar Meanchey and the Southern Cardamom Mountains in Cambodia, and in Dak Nong and Lam Dong provinces in Viet Nam.

The topic of financial and economic incentives is also linked closely to the very important issue of funding government watershed and river basin agencies. This is a particularly pertinent concern, given the recent policy and institutional changes that have been taking place in the region as regards the development of new river basin and watershed management authorities. Most, if not all, lack sufficient state budget allocations to deliver on their mandates, and are searching for additional sources of finance. For example, the search for appropriate funding mechanisms is a major concern for the first two pilot river basin committees to be set up in Lao PDR. Building on the principles of ‘collective responsibility’ and ‘shared vision and ownership’, the Nam Theun-Nam Kading River Basin Management Pilot Project is exploring a ‘cost-counterparting’ mechanism under which each river basin committee member agency or sectoral representative will fund river basin management and development activities within the scope of their respective mandates. The Nam Ngum River Basin Committee Secretariat, which is currently in the process of designing a river basin fund, is scoping out the potential of using various financing mechanisms. These involve raising new revenues from a variety of sources, including – as well as core public budgets – corporate contributions, biodiversity offsets, new service fees and payments for river basin services.

5. CONCLUSIONS AND RECOMMENDATIONS



5.1 Conclusions

Integration in watershed and river basin management

In assessing the challenges for sustainable watershed management in the Mekong region, the fundamental premise is that the water cycle and land management are inextricably linked and that without the notion of spatial scales and the inclusion of all parties with a vested interest in these resources watershed and river basin management will continue to be sub-optimal. Watershed management needs to move from compartmentalised multi-sectoral efforts to full integration between sectors. Different policies – for agriculture, environment, water, planning, land, poverty, etc. – have often worked at cross-purposes or in competition, rather than complementing one another.

Within the context of a multitude of change drivers (i.e. demographic change, economic development, climate change) and unpredictable shocks (i.e. rising food prices, political uncertainty) building resilience into the way land and water resources are managed over the continuum of scales will be imperative to meet the future challenges.

Management of watersheds affects downstream areas, the cumulative effects of which, in the Mekong River context, potentially can lead to effects beyond national boundaries. Hence, regional collaboration in watershed and river basin management is critical.

Top-down and bottom-up approaches

Experiences with watershed and river basin management worldwide show that it is important to employ both top-down and bottom-up approaches and to ensure that institutional arrangements and linkages exist between the local and the national/regional levels. When embedding watershed management in river basin management a key point is to understand the differences in scale and the implications for management. Extrapolation and up-scaling should be carried out with caution and based on a good understanding of the effects of scale.

Balancing landscape management with a focus on livelihood approaches is crucial for developing sustainable watershed management. Numerous examples show that leveraging small changes within the watershed can significantly enhance the provision of ecosystem serv-



ices. The challenge is to understand the unique nature of each community and household in a watershed and their decision-making processes, which when aggregated determines the functionality of the ecosystems in providing the desired goods and services.

Management based on facts not myths

Watershed management decisions are too often based on common myths that disregard the importance of scale and the realities of the complex hydrological cycle, natural and agro-ecosystems. In the Mekong Basin, the generation of sediments is closely linked to the way land and water resources are managed. Ecosystems depend on water flow and quality and are also affected by physical factors such as infrastructure, which can lead to habitat fragmentation. Managing the complexity of competing and interacting demands entails trade-offs and compromises requiring evidence and scientific information. The current understanding of these dynamic systems in the Mekong Basin does not meet these criteria.

The potential impacts of climate change and the implications for watershed functions and services add to the uncertainty and complexity of watershed and river basin management. This calls for adaptive management ap-

proaches which build resilience of communities, economies and natural systems, and implementing measures to adapt to climate change that are robust with regards to achieving positive outcomes.

Economic decision-support information can strengthen watershed and river basin planning by helping to highlight the costs, benefits and trade-offs that are usually excluded from conservation and development decisions. However, the lack of accurate and credible data on watershed and river basin values in the Mekong Basin remains a major gap.

Long-term, secure funding

Funding is required both to cover the direct costs of watershed and river basin management and to offset the opportunity costs to upstream communities of shifting to more sustainable land and resource uses. A chronic shortage of funding exists for integrated and sustainable watershed and river basin management approaches, despite their demonstrably high economic value. Various forms of payments for watershed services are emerging as important mechanisms for mobilising financial resources for watershed and river basin management agencies and for providing economic incentives to encourage and enable upstream communities to use

land and water resources sustainably. However, it is unlikely that these alone would be able to generate sufficient financial and economic resources.

Making watershed and river basin planning more inclusive

Governance is primarily about managing people rather than management of the physical aspects of watersheds and river basins. It is also the way in which society shares power, benefits and risks. An important success factor for good governance is inclusion and participation of all relevant stakeholders, i.e. the organisations and key individuals who make decisions and/or are affected by those decisions.

Watershed and river basin management in the Mekong region ranges from informal to formal institutions and from community-based agreements to government established river basin organisations. Over the past decade or so, all Mekong countries have passed formal laws and established organisations and institutions to address watershed and river basin management issues. Some of these have been integrated with or build on pre-existing informal community-based arrangements whereas others filled an institutional gap.

Strong local institutions are necessary as implementation would not occur without them, but when considering the challenges and potential conflicts of today they are not enough for managing watersheds and river basins within the Mekong region. The resource competition from different sectors such as hydropower, mining and agribusiness, and from other upstream and downstream

users increases the need for formal legitimacy, authority and power. This becomes even more important when looking at managing larger geographical entities, such as river basins. Major challenges remain regarding the clarification of mandates, inter-agency coordination and collaboration across sectors, disciplines and administrative boundaries, and multi-sector/multi-stakeholder planning processes. A critical factor in ensuring good governance is a clear relationship and integration between the various organisations and levels.

Best-practice management

Implementing best practices to secure sustainable watershed management is a prerequisite for ensuring cumulative positive impacts at the basin scale. However, the adoption of best practices amongst communities that depend on natural resources for their livelihoods has been less than optimal. Although examples of successful implementation of best practice through project-based interventions exist, they have not been up-scaled despite decades of effort. The approach to watershed management can best be described as piecemeal with limited coordination between stakeholders, sectors and institutional levels.

The concepts of IWRM that encapsulate appropriate governance, institutional and financial instruments that ensure the implementation of good practice and scalability have been proposed as a possible mechanism to address this issue. Implementation of IWRM, however, faces many challenges, such as overlap of, as well as ill-defined roles and responsibility between line agencies and ministries at the local, provincial and national levels.

5.2 Recommendations

Management of natural resources must take account of the links between land and water and the importance of integration across sectors, disciplines, institutions and scales.

Integrated watershed and river basin management

Policy-makers and industry groups should collaborate with government departments, donors, NGOs and the community to collaboratively move towards a fully integrated IWRM process across scales.

Adaptive management approaches must be applied in watershed and river basin management. The LMB countries should discuss how development and resource protection within watersheds can be managed and balanced in the best way to take account of effects both inside and outside the watershed, and also transboundary

effects, in an open and transparent manner. Strong regional institutions, such as the MRC, can play a key role in promoting negotiation and dialogue between upstream and downstream administrative units or countries, particularly where local interventions affect transboundary watersheds and river basins.

Evidence is needed

Watershed managers and agencies in the Mekong Basin countries must make the collection of scientific data, including monitoring and modelling data, a priority to support and inform the decision making process for integrated watershed and river basin management.

Efforts need to be invested in communication to present economic arguments about the gains from integrated watershed management to decision-makers and policy-

makers. These messages must be targeted to the public and private sector decision-makers who impact on land and water resources and make investment choices in Mekong Basin countries.

Governments and local informal institutions should be flexible and have a commitment to learning from each other. Dialogue needs to occur with all and it is not only local.

Appropriate governance solutions

Innovative institutional arrangements and approaches in watershed management that have proven their value at the local scale should be incorporated in river basin management at the national and regional scale, keeping in mind that the diversity of the Mekong region requires locally and nationally appropriate governance solutions. More efforts are needed to improve transparency, accountability and (legal) recourse/compensation aspects of governance.

Diversity in financial instruments and funding mechanisms

Incentives and financing mechanisms which aim to enhance both the sustainability and equity of economic activities in the Mekong region must be considered as they have the potential to significantly increase the contribution of watershed development to pro-poor economic growth in the LMB.

The provision of new incentives and funding for sustainable development in watersheds must also be accompanied by actions to dismantle the perverse economic incentives and disincentives, which currently reward or encourage watershed degradation.

Economic and financial instruments should be combined with other tools and approaches and take account of the legal, political and governance realities in which they are being implemented.

Watershed and river basin managers and agencies need to look to a diverse portfolio of funding mechanisms and incentives to enhance the financial sustainability of watershed and river basin management.



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