



International Conference on Watershed Management

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

9-11 March 2011

Le Meridien Hotel, Chiang Mai, Thailand

Convened by the Mekong River Commission

Topic 1: Good Practices

Organisers: IWMI, IUCN, FAO, GIZ, WWF, ADB

Introduction

Sustainable watershed¹ management and associated integration into the wider context of the river basin management is a perplexing challenge for land and water resource managers in Southeast Asia. Due to the plethora of drivers (i.e. rapid economic development, population growth, increased urbanization, extensive hydropower and mining development, land use changes, deforestation, climate change, etc.) that directly or indirectly influence the functionality and services provided by watershed, developing a modality that encapsulates these diverse drivers requires integration across scales, sectors and communities, a challenge that has eluded us to date. It is therefore fitting that watersheds and their management form the focus of this conference through three distinct but interlinked Topics that encapsulate the diversity of drivers.

Whilst there are numerous drivers that influence watershed management, Topic 1 focuses on the basic unit of the watershed through the perspective of good practice and appropriate practical solutions to sustainable watershed management. Whilst these drivers of change are largely the result of human induced interventions, the management of watersheds should not be seen in isolation of the river basin where the concepts of integrated land and water resources management that encapsulate appropriate governance, institutional and financial instruments ensure the implementation of good practice. The aforementioned instruments form the subjects of Topic 2 and 3.

Setting the scene

Impressive economic growth of Southeast Asia, largely driven by its abundant natural resource base, has had significant impacts on the livelihoods of 586 million inhabitants and lifted the region to the status of global economic power. The consequences of this dramatic transformation are observable within a single generation. Land conversion, urbanization and industrialization have had a phenomenal impact on biogeochemical cycles and biodiversity that are critical in the functioning of watersheds and the ecosystems that evolved within them. Within the Mekong basin the impacts of this rapid development and over exploitation of these innate resources are clearly evident in the degradation of watershed through accelerated sediment generation, flash floods associated with deforestation and the aggregated influence on regional climate. This brings into question the continuing ability of these systems in providing the goods and services that upstream and downstream communities have enjoyed and depended upon for millennia. The question that is raised is whether we can reverse this seemingly downward spiral.

It is not possible to comprehensively discuss the myriad of factors and drivers that influence watershed management and associated good practice within the context of this concept note. However, selected issues in play in the region will be highlighted in an attempt to generate discourse and debate amongst conference participants. It is anticipated that tangible recommendations and ideas will be forthcoming that will guide and

¹ In this context a watershed is defined as “the area of land that drains water, sediment, dissolved materials, heat, biota, etc., to a common outlet at some point along a stream channel (watershed outlet). A watershed is a naturally delineated unit of land. Watersheds are the basic land unit of the hydrologic cycle”.

influence the MRC, river basin organizations/committees and other relevant stakeholder of the Mekong Basin in implementing sustainable watershed management practices at a range of scales that will result in the provision of goods and services that ensure sustainability for future generations.

Sediments: a double edged sword

An overarching driver of watershed management in Southeast Asia has been the eradication of slash-and-burn farming systems and a move towards sedentary systems that have a focus on both household food security and commercial markets. Key to this shift in farming systems has been the notion that slash-and-burn systems result in greater land degradation through increased sediment generation and that the practice is viewed as 'primitive' when compared to modern industrially based farming systems. Since slash-and-burn based systems rely upon the cyclic removal of forest cover, there is a strong belief that they contribute to deforestation and that regular burning of plots of land has fueled the discourse that it plays a significant role in amplifying the anthropogenic greenhouse effect.

Recent long term studies into the impact of slash-and-burn farming systems in the uplands of Lao PDR would suggest that the aforementioned justification for the eradication of slash-and-burn may not hold true. Under normal rainfall conditions, traditional slash-and-burn cultivation with sufficiently long rotations (at least 8 times longer than the cropping period) tend to keep sediment losses under one tonne per hectare annually, which is well within natural rates of soil regeneration. Reducing the length of the fallow period to only twice that of the cropping period dramatically increases (more than 6 times in the uplands of northern Lao PDR) sediment losses.

Hence these systems are highly sustainable as long as the length of the fallow phase is appropriate and that population densities remain low. They do not contribute to accelerated sediment discharge from a watershed but rather redistribute sediments within the landscape. Further there is supportive evidence that these slash-and-burn systems do generate significant amounts of black carbon which is highly stable and recalcitrant thereby contributing to greenhouse gas mitigation. While it is highly improbable that policies associated with the eradication of slash-and-burn systems will be reviewed, these systems do offer insights into the attributes that future farming systems should impart.

With the move to more sedentary based farming systems and over exploitation of forest resources, sediment generation and associated discharge to water courses is drastically increased particularly where appropriate soil conservation measure are not implement to reduce erosion. This has a profound effect on the hydrodynamic capacity of water storage structures bringing into question the financial viability of these investments. Sediment generation from watersheds will probably accelerate with predicted increased frequencies of extreme rainfall events associate with climate variability, further exacerbating current trends. As Southeast Asia embarks on large water storage infrastructure development, the sediment nemesis of dam operators will increase and the need for appropriate interventions and their adoption will become an imperative to achieve adequate returns on investment.

Sediment generation in the upper watersheds of Southeast Asia is viewed as an unwanted outcome of inappropriate land management. However, for deltas of the major river systems (Irrawaddy, Mekong, Chao Praya, Red River), the deposition of sediments is vital to the growth of deltas and their high level of productivity. The mega deltas of Southeast Asia are key contributors to global rice supply and their productivity is contingent on annual additions of sediment. Balancing these contrasting and competing attributes of sediment is a significant challenge for land and water resource managers, planners and governments.

Trees, forest and water yields

The role of vegetation cover in watersheds and the impact of deforestation on hydrological regimes, although extensively studied, remains a controversial area of hydrological research, particularly when considering aspects of scale. Despite the widespread popular belief that deforestation leads to reductions in groundwater availability during the dry season, and although responses vary widely between sites and situations, a number of hydrological studies show that the removal of forest cover leads to higher water yields. This is associated with trees being highly effective water pumps, extracting water from the soil and transpiring it to the atmosphere, so that the net immediate effect of tree removal is a rise in the water table and increased dry season flows.

Low flow generation from the uplands has been identified as the one of the most important watershed issues in Southeast Asia. Recent hydrological and land use monitoring studies on a small watershed in Lao PDR have concluded that fallow regrowth significantly affects the hydrological regime. In this respect the development of fallow vegetation induced remarkable changes in the annual water balance with lower stream water yields. The effects of changed land use and vegetation structure is not confined to small watersheds as recent studies have shown that the flow of the Mekong river has been influenced by land use changes associated with the Indochina war. Throughout the region reforestation through the establishment of plantation based production systems (e.g. rubber and eucalypts) are being promoted. It is probable that these initiatives will have a significant impact on the hydrological cycle at a range of scales with lower water yields that could influence downstream water users. We have yet to understand the long-term consequences of these developments.

Future challenges

As indicated previously there are a range of drivers that will influence sustainable watershed management in the region. Whilst the situation may appear to be bleak, there are examples of successful implementation of integrated watershed management that have resulted in positive biophysical and social outcomes. Examples will be showcased during the Conference thereby presenting an opportunity to draw upon these experiences.

Finally, the long-term effect of climate variability (El Niño/La Niña phenomena) and associated predicted climate change impacts on watersheds is still debated with a high degree of uncertainty. It is probable that the region will experience an increase in extreme events that will have a profound impact on watershed management. Changes in rainfall intensity and temperature will bring with it significant challenges in meeting global food supplies and environmental sustainability. These changes in climate will necessitate the development of innovative systems that increase resilience. Clearly the current range of technical interventions in reducing land and water degradation within watersheds will not be adequate to address the predicted extremes associated with climate change.

Objectives and expected outcomes of Topic 1

Objectives

The objective of Topic 1 is *to discuss and debate current trends in good practice associated with watershed management, share practical experiences, lessons learned and develop recommendations for sustainable watershed and river basin management in the Mekong Basin.*

Topic 1 should be viewed as the starting point in a process of watershed and river basin management. The manner in which we manage and manipulate the resources within a watershed for economic good has a profound and cascading effect on natural resources and communities in the context of the wider basin. Hence the management of watersheds becomes central to any discourse in integrated land and water resources management. The success of any such approaches to sustainable watershed management is contingent on appropriate governance and institutional structures (Topic 2) and the provision of economic and financial support (Topic 3) that ensure equity and sustainability. These two topics cannot be viewed in isolation of Topic 1 but rather an integral part of river basin management. It is the overall objective of this topic to articulate the

challenges facing good practice in watershed management and the solutions therein that are required to support sustainable integrated watershed management in the Mekong Region.

Outcomes

The expected outcomes of the Topic 1 are:

- A clear understanding of important drivers influencing watershed management and emerging issues that need to be considered when building integrated and sustainable approaches to watershed and river basin management;
- Lessons learnt and information exchanged from within and outside the region on good practice in watershed management that will support the development of integrated and sustainable approaches to watershed and river basin management;
- Improved and innovative good practices presented and discussed and approaches for ensuring their adoption and implementation in a coordinated manner by local, national and regional actors devised.

Content of Topic 1

This topic will focus on: what are the biophysical and social issues influencing sustainable watershed management and what mechanisms are required to overcome these challenges that will ensure more sustainable, equitable and efficient approaches to integrated land and water resources management. This will be achieved by drawing upon current knowledge and examples of best practices; on what works and does not; and be forward looking in assessing the impact of future change drivers (i.e. climate variability) on watershed management.

Topic 1 will explicitly take account of current and future challenges that are affecting watersheds in the region that encapsulate the continuum from the local to the basin level. This will be achieved through two distinct but interrelated sessions that include:

- **Session 1 (Day one)** – *Land and water resource challenges facing watershed management*: identifying current and future biophysical drivers influencing watershed management, their functionality and associated solutions; and
- **Session 2 (Day two)** – *Implementing good practice*: implementing best practices and associated outcomes in securing sustainable watershed management is a prerequisite for ensuring cumulative positive impacts at the basin scale. How is this achieved and what lessons have we learnt?

The Sessions will comprise presentations, dialogue and debate around the contents of the presentation and through a series of structured questions that will stimulate a range of views and position from the audience. A key element in the Sessions is developing informed opinions on the role of watershed management in the context of building an integrated approach to river basin management.

Draft Programme for Topic 1

Topic 1: Good Practice (Conveners: IWMI, FAO, IUCN, GIZ, WWF, ADB)

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Part A (THURSDAY, 10 MARCH 2011):

Land and water resource challenges facing watershed management

Day 1 Facilitator: Dr Robert Mather (IUCN)

1300 – 1310	Introduction to Session	Day 1 Facilitator
1310 – 1330	Sediments: a double edged sword – or a shield?	Dr Erland Jensen (MRCS)
1330 – 1350	Aquatic ecosystem connectivity – an important element in sustainable watershed management.	Nikolai Sindorf and Dang Thuy Trang (WWF)
1410 – 1430	Land cover change and catchment water yields: From local to regional scales.	Dr Guillaume Lacombe (IWMI) and Dr. Alain Pierret (IRD)
1430 – 1450	Implications of climate change on watershed management in the Mekong basin.	Dr Kien Tran Mai (MRCS)
1450 – 1550	<p>Panel discussion: A key focus of the presentations in this session is on the impacts of what may appear as a good practice or those that have a positive outcome at the watershed scale but may have a negative outcome at the basin scale. How do we ensure that what is presented as a good practice at the watershed scale meets overall goods and ecosystem services at the basin scale. What are the key goods and ecosystem services that are desirable when establishing sound watershed management? The discussion will centre around a set of deliberative questions that will stimulate discussion and debate between Panelists and the audience.</p> <p>Panelists: Dr. Ngai, Deputy General Forestry Department of Vietnam. (tbc) Mr. Ken Serey Rotha, Vice Director General of Department of Natural Resource Protection and Conservation of Ministry of Environment. Mr. Thierry Facon, Senior Water Resources Expert, FAO Regional Office, Bangkok. Dr Erland Jensen, MRCS, Vientiane, Lao PDR. Dr Paulo Pasicolan.</p>	Day 1 Facilitator
1550 – 1600	Discussion and summary of the day's session	Day 1 Facilitator
1600 – 1630	Tea/Coffee Break	
1630 – 1700	Return to conference end-of-day plenary: impressions of the day	

Part B (FRIDAY, 11 MARCH 2011): Creating enabling conditions		
Day 2 Facilitator:) Dr Vladimir Smakhtin (IWMI)		
1030 – 1050	Overview of key issues, experiences and lesson learned of Watershed Management in the lower Mekong Basin.	Mr Min Bunnara (GIZ/MRC)
1050 – 1110	Linking watershed management to river basin management by water outcomes: Shaking the tree.	Mr Thierry Facon (FAO)
1110 – 1130	Micro Watershed Development in the Uttarakhand Himalayas: The Balkila Watershed	Dr J S Rawat (IUCN)
1130 – 1150	The Miyun Livelihoods and Landscape Project (LLS) China	Ms Zhuang Hao (IUCN)
1150 – 1200	Reflections on the mornings presentations	Day 2 Facilitator
1200 – 1300	Lunch	
1300 – 1320	IWRM best practices in Pilot 4-Ps Basin towards Integrated River Basin Management.	H.E. Watt Botkosol, Cambodia
1320 – 1340	Watershed management case study Laos	Tbd - NMRC Laos
1340 – 1400	Srepok river basin council and IWRM in the Srepok basin	Mr. Pham Tan Ha, Vietnam.
1400 – 1420	Natural Resources Management by Local Communities: A Case study of Mae Tha Sub-district, Chiang Mai.	Mr. Therdsak Kongprom, Thailand.
1420 – 1500	<p>Panel discussion: Implementing best practices and associated outcomes in securing sustainable watershed management is a prerequisite for ensuring cumulative positive impacts at the basin scale. The question arises how is this achieved and what lessons have we learnt? The discussion will centered around a set of deliberative questions that will stimulate discussion and debate between Panelists and the audience.</p> <p>Panelists: Dr Thomas Hofer, FAO. Mr Min Bunnara, GTZ/MRC. Mr Watt Botkosol, Deputy Secretary General, CNMC. Dr Chris Wensley, ADB Dr Khamlar Phanvilay, Dean Faculty of Forestry in charge of Watershed Management Department of National University of Laos. D. Long, Southern Institute for WRM, Vietnam. Dr Chart, Kasetsart University, Thailand.</p>	Day 2 Facilitator
1500 – 1600	EXHIBITION/POSTER SESSION + Tea/Coffee Break	
1600 – 1700	Return to conference concluding plenary: conclusions and recommendations	

Session Coordinators

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