ISSN: 1683-1489

Mekong River Commission

An assessment of environmental impacts of tourism in the Lower Mekong Basin

MRC Technical Paper
No. 28

December 2010

Meeting the Needs, Keeping the Balance

Mekong River Commission

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Published in Vientiane, Lao PDR in December 2010 by the Mekong River Commission

Cite this document as:

MRC (2010) An assessment of environmental impacts of tourism in the Lower Mekong Basin. MRC technical Paper No. 28 Mekong River Commission, Vientiane. 68 pp.

This report was prepared by agents on behalf of the Mekong River Commission to advise on the policy and strategic direction of the organization and its Member Countries.

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Acknowledgements

This paper was produced as a collaborative effort between a team from the Overseas Development Institute (ODI), consisting of Dr. David Harrison, and a team of MRC Environment Programme, consisting of Ms. Hanne Bach and Mr. Keu Moua.

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Tourists enjoy kayaking in Vang Vieng, Lao PDR.

Abbreviations and acronyms

ADB	Asian Development Bank
AMTA	Agency for Co-ordinating Mekong Activities
APEC	Asia-Pacific Economic Co-operation
ASEAN	Association of South-east Asian Nations
BDP	Basin Development Plan
BMI	Business Monitor International
CCBEN	Cambodia Community-based Ecotourism Network
CBT	Community-based tourism
CNMC	Cambodia National Mekong Committee
EIA	Environmental Impact Assessment
EU	European Union
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
GDP	Gross Domestic Product
GTZ	German Development Aid Agency (Deutsche Gesellschaft für Technische Zusammenarbeit)
GMS	Greater Mekong Sub-region
ICEM	International Centre for Environmental Management
IDRC	International Development Research Centre
INGO	International Non-governmental Organisation
JICA	Japan International Co-operation Agency
Lao PDR	Lao Peoples' Democratic Republic
LMB	Lower Mekong Basin
LNMC	Lao National Mekong Commission
NGO	Non-govermental Organisation
MFDF	Mekong Project Development Faculty
MRC	Mekong River Commission
MTDP	Mekong Tourism Development Plan
MWBCSUP	Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme
NMC	National Mekong Committee
NZAID	New Zealand's International Aid and Development Agency
PATA	Pacific Asia Travel Association
PPT	Pro-poor Tourism
RAMSAR	Ramsar Convention on Wetlands
SARS	Severe Acute Respiratory Syndrome
SNV	Netherlands Development Organisation
TDMOG	Tourism Destination Management Outreach Group
TNMC	Thai National Mekong Committee
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNDP	United Nations Development Programme
UNWTO	United Nations World Tourism Organisation
VNMC	Viet Nam National Mekong Committee
WTTC	World Travel and Tourism Council

Summary

International tourism has developed rapidly over the past three decades in the Lower Mekong Basin (LMB) and riverine environments in particular have become major attractions for tourists. Despite this huge growth, very little is known of tourism's positive and negative impacts on the sub-region's environment, including its water and related resources. This report tries to fill that gap focussing on the impacts of tourism in several case study sites and suggesting possible remedial action for negative impacts as appropriate. The report also offers a platform for outlining possible directions for the MRC in terms of its involvement with tourism related impacts upon the shared water resources it has a mandate to help manage.

The objective of this report is to assess the past, current and predicted bio-physical, socio-cultural and economic impacts of tourism development in the LMB and identify concerns of trans-boundary and basin-wide character.

The report was compiled from four separate reports written by national experts from the LMB countries: Cambodia, Lao PDR, Thailand and Viet Nam, on the topic of tourism impacts within each country. Secondary data was collected from literary sources, whilst primary data was collected from site visits made to eleven case study sites spread across the LMB. Study sites were selected according to their level of tourism development and their proximity to water resources.

Characteristics and context of the Lower Mekong Basin

The LMB is topographically varied and the rich biodiversity of the Mekong and its tributaries is both a regional and global asset. Wetland sites, especially, are a vital natural resource on which the Basin's inhabitants depend, directly or indirectly, for their livelihood. Fish harvesting and rice production are dominant activities throughout the region. However, in recent years there has been increasing concern about human impact on the natural environment and the resulting damage to resources on which people depend. As a result considerable areas of the LMB have been awarded protected status.

Demographically, politically and economically, the LMB is extremely varied. Whereas Lao PDR is relatively ethnically diverse, Cambodia, Thailand and Viet Nam are more homogeneous. Economically Thailand is considerably more advanced than its neighbours, having the highest per capita income and industries contributing more than 40% of its GDP. It is characterised by the World Bank as a Lower Middle Income Country, while the remaining LMB countries are placed in the category of Lower Income. By contrast, UNDP categorises all LMB countries as being at a level of Medium Human Development, but ranks Viet Nam and Thailand considerably higher than Lao PDR and Cambodia in the Human Development Index. Thailand's economic success has been partly attributable to its relatively stable political

situation in recent decades, or at least until 2008, when domestic unrest had, and continues to have, an impact on growth and tourist arrivals in the entire LMB.

Tourism development in the Lower Mekong Basin

Within the LMB, tourism first developed in Thailand, which currently receives the greatest number (70%) and widest variety of visitors. Some 30% of international visitors to the LMB are from North America and Europe. By contrast, tourism in Lao PDR, Cambodia and Viet Nam developed much later due to periods of internal upheaval such as the second Indochina War and the Khmer Rouge period in Cambodia which created instability there until well in to the 1990's. Some LMB governments were initially hesitant of international tourism, but in the past two decades authorities have welcomed the industry to the extent that tourism in Lao PDR, Cambodia and Viet Nam now shows higher rates of growth than in Thailand.

Tourism now makes a strong contribution to the GDPs of all LMB countries, dominating their exports of goods and services. In 2007 they attracted 21.4 million international visitors, some 2.4% of all international tourist trips. Importantly, tourism throughout the sub-region is being encouraged by numerous international agencies, most notably the Asian Development Bank, which to date has provided some US $38.2 million for infrastructural development, pro-poor community-based tourism, cross-border co-operation and institutional strengthening, and is planning further financial support.

Riverine environments figure prominently in much of the sub-region's tourism. In Lao PDR, where backpackers predominate, the most popular destinations are along the Vientiane/ Luang Prabang Corridor, including Vang Vieng, and the World Heritage site of Luang Prabang, and the Siphandone region known as the 'Four Thousand Islands'. In Cambodia, most tourism is centred on the capital Phnom Penh, Siem Reap's ancient Angkor Complex and the Tonle Sap Great Lake. Viet Nam is similarly varied, with a wide range of attractions and hotels, especially in Hanoi and Ho Chi Minh City, many of which are para-statally owned and operated. The Mekong Delta, an area of great natural beauty is an attractive and developing tourist destination. Though much of Thailand's tourism is centred around marine/beach environments and the allures of Bangkok, other popular destinations include Chiang Mai and Chiang Rai in the north where much of the tourism is nature based. All these destinations are located either on or adjacent to rivers or other major bodies of water.

Until the onset of the global financial crisis in the second half of 2008, predictions for tourism growth in the LMB (as elsewhere) seemed very positive, and the United Nations World Tourism Organisation (UNWTO) was forecasting 53 million international arrivals annually by 2020, a 100% increase on 2010 arrivals, with the highest growth to be in Lao PDR and Viet Nam. The global financial crisis has made such forecasting more uncertain, but over the medium and long-term however, prospects are promising. In the past, international tourism has been highly resilient and, provided there is a return to political stability in Thailand, the UNWTO forecasts are likely to prove quite accurate. It is important to note that the growing middle classes within the LMB countries themselves are making a highly significant contribution to the industry.

Case study sites chosen for this study

The impacts of tourism upon four categories of tourism destination are discussed in this regional synthesis report (Figure 1):

- Towns whose development is affected by mass tourism (Luang Prabang, Siem Reap, Chiang Rai);

- Established destinations combining both natural and cultural features where tourism, though not the only economic activity, currently thought to be largely incorporated into residents' economic and social life (Vang Vieng, Thoi Son Island and Chong Mek);

- Nature sites deemed attractive by tourists (or of potential interest to them) and are increasingly susceptible to tourism-induced change (Siphandon, Stung Treng/Kratie, Tonle Sap and Chiang Khan);

- Sites which, currently little visited by tourists, might be considered potential attractions, a category including both 'natural' and 'cultural' sites of interest (Tram Chim National Park, Phnom Da Hill).

Impacts are assessed in terms of their bio-physical, socio-cultural and economic impact. Priority actions for avoiding future problems at the case study sites are indicated, and likely future prospects for the sites are outlined.

Bio-physical impacts

The study found no hard evidence to suggest that tourism has led to widespread large-scale deterioration in the water and related resources of the LMB. However, it was possible to highlight both negative and positive impacts experienced at the case study sites. In towns heavily reliant on tourism (notably Siem Reap, Luang Prabang and Chaing Rai), some negative bio-physical impacts were evident. These included air and noise pollution, overloaded systems of waste water and sewage disposal, and inadequate garbage collection and disposal. Ancient monuments were more at risk, and rivers were polluted by waste water, refuse from restaurants and other tourist facilities, as well as by the discharge of fuel from boats. Similar effects on water and related resources, albeit in embryonic form, were found in the destination of Vang Vieng and less in the Siphandon and the Stung Treng/Kratie corridor.

Although negative impacts seem minimal at present, as international tourism increases it seems likely that fragile trans-boundary wetlands may become increasingly threatened.

Economic impacts

Figure 1. Location of the 11 case study sites.

Economic impacts were largely considered beneficial across the case study sites. Benefits noted include the provision of more jobs and higher incomes. Destinations lacking tourists seem to be looking forward to increased numbers and the economic benefits they were to bring. However, tourism has reportedly led to inflated prices in land, property and foodstuffs in some areas, and some respondents noted that because economic benefits were not always spread widely there was an increase in inequality amongst local residents.

Socio-cultural impacts

Socio-cultural impacts were considered largely beneficial and included increased respect for local culture, arts and crafts, knowledge of the outside world and friendship with tourists. As problems in towns have arisen and facilities consequently improved, often through aid programmes, residents' awareness of environmental matters appear to have grown. In nature areas, tourism has reportedly led to a greater consciousness of the value of the environment. However, in World Heritage sites, disputes arose among different interest groups over plans to reduce tourism's biophysical impacts and further conservation as this would imply restrictions on activities. In Luang Prabang it was felt that tourism had changed the character of the town, a situation that could also emerge if and when there is more tourism development in areas with a very distinct and authentic atmosphere sush as the Thoi Son Island.

Priority actions

The problems that arose from rapid tourism development should be a warning for other destinations in the LMB. However, numerous attempts to minimise negative impacts are already being made. In Siem Reap, for example, new waste water and sewerage systems are planned, along with campaigns to raise local awareness over water pollution. In Luang Prabang there are plans to develop a totally new residential area on the opposite side of the river from old Luang Prabang. The location is however questioned by UNESCO fearing negative effects on key features of the towns status as World Heritage Site. Similarly, development in emerging urban destinations and sites of natural beauty should be planned, scrutinised and regulated, and the quality of river water continually monitored, along with the discharge of waste water, sewage and motor oil into the rivers and wetlands. Other possible remedies include litter prevention and anti-pollution campaigns, better planning, effective management and more stringent enforcement of existing legislation.

Role and responsibilities of MRC

MRC has a clear interest and expertise in tourism's links with the biophysical environment, and trans-boundary issues are inherent in the ownership and management of natural heritage. Many important national parks in SE Asia are on the North-South borders of Vietnam, Lao PDR and Cambodia, where shared species and biodiversity are subject to different national policies and administration. The LMB is an ecological sub-system, in which upstream activities have an impact on downstream regions, irrespective of national boundaries.

The MRC has an active role to play working in partnership with local stakeholders to support the decision making processes regarding the sustainable management of water and water related resources at tourism sites in the LMB.

In a technical capacity, the MRC has a role in the coordination of water quality monitoring and special studies at tourism centres throughout the basin to compile data and information that demonstrate the impact of hotels, guest houses and other tourism facilities on water and related resources.

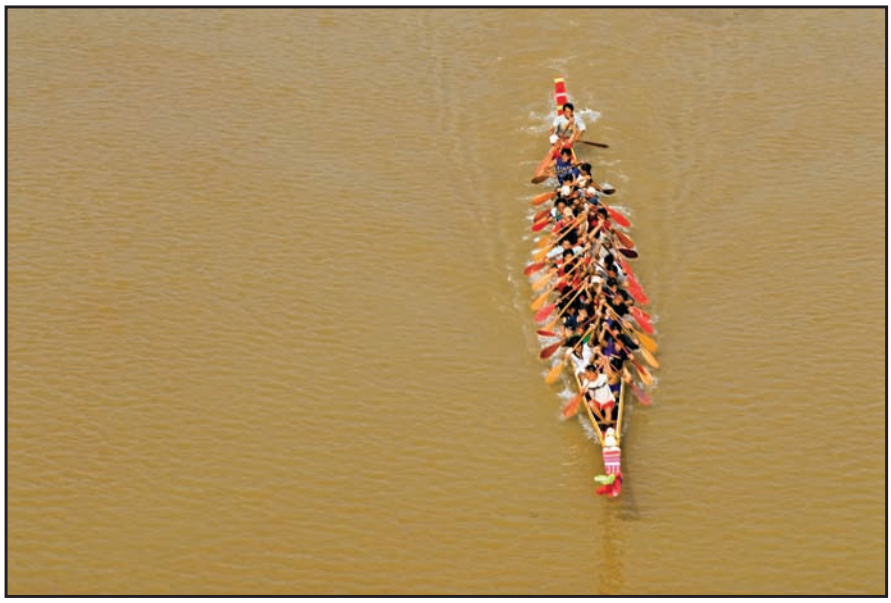
1. Introduction

1.1 Background

International tourism has become a major contributor to the global economy, and the level of export income it generates is exceeded only by fuels, chemicals and automotive products. In 2007, international tourist arrivals exceeded 900 million and receipts from international tourism, including passenger transport, amounted more than US$ 1 trillion (UNWTO, 2009a).

For more than three decades, the UNWTO region of Asia and the Pacific has demonstrated rapid and relatively consistent growth in international tourism, generally exceeding growth rates of other regions. Indeed, in 2007, Asia and the Pacific accounted for more than 20% of all international arrivals and receipts, and the four countries of the LMB were receiving more than 21 million international arrivals (UNWTO, 2009b). The foreign currency this level of tourism provides has undoubtedly improved the lives of many in the region.

As mass international tourism began to grow in the post-second World War period, it was often described as 'an industry without chimneys,' but it has increasingly been recognised that while tourism has undeniable economic benefits, impacts on the physical environment, on economic and social structures, and on cultures might be damaging. In fact, the role of tourism as a 'tool for development' is highly contested, especially in islands and small states, which are often overly dependent on international tourism as a source of foreign exchange and employment (Harrison, 2001). Lists of tourism's possible problematic economic and socio-cultural impacts are now commonplace (Harrison, 1992, 2001; Mowforth and Munt, 2009) as are the outlines of possible negative impacts on the physical environment (Holden, 2000).



Boat race festival at the Mekong River.

Within the LMB, riverine environments are crucial to the economic development of the region, and they are a vital economic resource for local residents, as well as being a major resource for tourism development in particular. Primary tourist attractions are frequently nature and rivers and forests are valued because they are perceived to be visually pleasing. They are also valued by tourists as resources for physical activities, e.g. rafting, trekking and climbing, and as a scenic backdrop for activities on the river banks such as picnicking. However, along with local residents who use rivers and their resources for a variety of economic, cultural and recreational purposes (e.g. agriculture, festivals, fishing, forestry and industrial development), tourists and those who provide them with support facilities have an impact on the physical and built environment. Tourism may sometimes involve competing with local people for access to scarce, shared resources.

1.2 Purpose of the report

Tourists themselves are a water-related resource for the people of the LMB. Properly managed, tourism can be a valuable and sustainable method of assisting conservation, alleviating poverty and furthering economic development. Consequently, attempts to establish tourism's impacts on the environment in the LMB, however indicative the results, would assist in ensuring sustainability, especially as tourism figures so prominently in the sub-region's development plans.

Therefore, the focus of this report is the impact of tourism on water and related resources in the sub-regions of the LMB in Cambodia, Lao PDR, Thailand, and Viet Nam. The report will attempt to shed light on the past, current and predicted bio-physical, socio-cultural and economic impacts of tourism development in the LMB and identify concerns of trans-boundary and basin-wide character.

The conceptual starting point for the report was the recognition that the LMB is part of a wider ecological system, where human societies are inextricably linked physically, economically, socially and culturally to the River Mekong and its tributaries. Human action affects the physical elements of the system and they, in turn, have an impact on societies. The focus is on the water and water related resources of the LMB and their interrelationship with tourism which is of increasing social and economic importance in the sub-region.

This regional synthesis report outlines the characteristics of the LMB and the development and main features of the sub-region's tourism. Chapter 2 focuses on the key findings from the case studies in the four LMB countries, supplemented with relevant and appropriate data from other sources. Finally, Chapter 3 focuses on potential management issues and offers some recommendations and conclusions.

Ta Phrom Temple, Angkor Wat, Siem Reap, Cambodia.

1.3 Methodology

This regional synthesis report is based on the evidence and findings of four national studies which were conducted by experts in each of the four countries of the LMB: Cambodia, Lao PDR, Thailand and Viet Nam, including field visits of international specialists to most of the case study sites.

The aim of the four national studies was to:

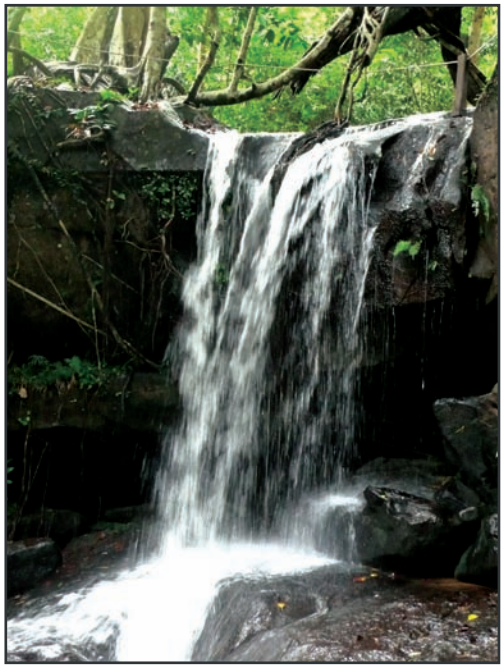
1. Outline past, current and future trends in tourism in the sub-region;
2. Provide a more detailed examination of tourism's bio-physical, economic and socio-cultural impacts at selected Case Study sites.

Data for the national reports was gathered as follows (see also Table 2):

1. Secondary data: Literature review, including examination of maps, national and local statistics, and other publications on the topic.
2. Primary data: Informal and formal (with questionnaires) interviews with stakeholders at all levels, site visits, observations and water quality sampling.

The focus of the primary data collection was to identify perceptions of stakeholders[1] with regard to the environmental, socio-cultural and economic impacts of the tourism sector activities linked to the Mekong River. Furthermore, it should identify priority actions for planning and management (largely based on stakeholders' comments and suggestions) to manage current and potential impacts.

It was intended that the case study sites, selected to reflect a range of tourism scenarios, would identify impacts of tourism which could be representative of similar sites across the LMB.



Waterfall, Cambodia.

There were three sets of criteria for the selection of Case Study sites:

- The level of tourism activity at the site, which could be categorised as high, moderate or low;
- The extent to which the site had been afforded some level of protection at international, regional, national or local levels, and;
- The level of biodiversity exhibited (high, moderate or low).

[1] *For the purpose of this report, the term 'stakeholders', is taken to mean all parties, institutional and otherwise, and from local to national levels, who have an investment, involvement or direct interest in tourism at the Case Study sites.*

These variables were selected to gauge perceptions of the environmental impact of different levels of tourism activity on different areas, to assess whether or not different kinds of protected areas may be 'at risk' from tourism development, and to examine how far there were opportunities for appropriately managed tourism development.

It was proposed that some of the sites selected were protected areas. The level of protection ranged from international (e.g. World Heritage sites) to locally regulated sites. It was anticipated that while current data might not be available as to the impacts of tourism on such areas, there might be anecdotal evidence of impacts at these sites.

In all, eleven sites were chosen with biodiversity values ranging from low to high, and levels of tourism were similarly varied, ranging from low to large-scale (Table 1). Their location is indicated in Figure 1. The aims and activities for the case study sites are shown in Table 2.

Table 1. *Summary of the eleven selected case study sites*

Country	Province	Study Site	Level of Tourism Development	Biodiversity Value
Lao PDR	Luang Prabang	Luang Prabang City	Large	High
	Vientiane	Vang Vieng	Moderate	Moderate
	Champassack	Siphandon Islands	Moderate	High
Thailand	Chiang Rai	Chiang Rai City & environs	Large	Moderate
	Loei	Chiang Khan	Low	High
	Ubon Ratchatani	Chong Mek & environs	Moderate	Moderate
Cambodia	Siem Reap	Siem Reap City & environs	Large	High
	Stung Treng /Kratie	The river corridor	Low	High
	Takeo	Phnom Da Hill	Low	Moderate
Viet Nam	Dong Thap	Tram Chim National Park	Low	High
	Tien Giang	Thoi Son Island	Large	Low

Level of Tourism Development:

Low: Few tourists/facilities; Moderate: a small number of guest houses and hotels, some facilities;

Large: Many hotels and guesthouses, high number of tourists, significant facilities.

This regional synthesis report is based on a further literature review and compilation and synthesis of the major findings of the national reports.

Because of different contexts and field contingencies, the results of the case studies must be seen as tentative and indicative rather than comprehensive. However, when combined with data from other sources, they enable important conclusions to be drawn and useful recommendations.

Table 2. *Summary of study aims and activities at case study sites*

Study aim Identify and Describe:	Investigative Focus	Activities
Main characteristics of the destination area (national & Case Study level)	Bio-physical, demographic cultural, geographic, topographic features.	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations
Characteristics and levels of tourism	Numbers of international & domestic tourists Current and predicted trends Historical profile Categories of tourists Characteristic tourist behaviours: preferred activities & destinations	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations
Characteristics of water and water-related resources	Levels of bio-diversity Habitats for flora and fauna Existence of threatened species Prevalence of fish	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations; and MRC monitoring records
Characteristics of water and water-related resources in terms of human activities (Either directly or indirectly related to tourism)	River used for: Agriculture Fishing Transport Waste disposal - solid and liquid Recreation Location of businesses such as guest houses and restaurants (incl. 'floating' ones)	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations
Water quality in and around the sites	Up-stream and downstream comparisons Perceived and actual impact on river Historic comparisons Relative impacts compared with other industries	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations MRC monitoring records New measurements where appropriate
Methods of solid and liquid waste disposal	How sewage is disposed How household and commercial waste is disposed	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations
Impacts of new infrastructures at the Study Sites.	Have new or improved roads affected river usage? In what ways?	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations

Impacts of 'new build', such as houses, hotels and guest-houses	Change of land-use Effects such as erosion Waste disposal from building itself and when building in use Views on planning and public participation in planning Enforcement of planning regulations	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations; and Examination of local planning records
Levels and types of transport use	How tourists arrive and leave sites Use of transport as activity in itself Levels of local transport use	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations
Water-related economic activities	New forms of employment Impacts on traditional activities Possible water/air pollution Identifying possible areas of conflict	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations
Possible areas of social conflict	Who 'wins' and who 'loses' Cross-cultural interactions – pros and cons Changing family and community life Changing patterns of authority and power	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations
Opportunities for further tourism development	Views on nature and direction of 'new tourism' Views on promoting positive aspects Views on stakeholder participation	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations
Management actions/interventions in place: current and potential	Views on current effectiveness Identifying priority actions Suggestions for future interventions How to implement future interventions Levels of stakeholder participation from conception to implementation	Literature review (incl. maps and national statistics) Interviews with stakeholders* Site observations

**Stakeholders include:*

- *International and domestic tourists*
- *local community leaders such as village heads and village representatives;*
- *local government officials including those working directly in tourism, planning, water quality, health, environmental regulation etc;*
- *residents directly involved in tourism (hoteliers, boat operators, souvenir vendors etc);*
- *residents indirectly involved in tourism (fruit and vegetable growers, market stall vendors etc);*

1.4 Characteristics and context of the Lower Mekong Basin

The Mekong is the tenth longest of the world's rivers. Nearly 5,000 kilometres long, it stretches from the Tibetan Plateau, through Yunnan Province in China, Myanmar, Thailand, Lao PDR, Cambodia and Viet Nam. It has long attracted the attentions of historians and travel writers (Bassenne, 1995, first published 1909; De Tessan, 1918; Osborne, 2000; Gargan, 2002; Keay, 2005) and has been described as 'the people's highway' (Starr, 2004) and regarded as the heart and soul of mainland South-east Asia. Its river basin is approximately the size of France and Germany, and although non-navigable for long stretches, the Mekong is nevertheless the region's major transport hub. Indeed, in the LMB alone, which involves Cambodia, Lao PDR, Thailand and Viet Nam, the river directly affects the lives of 60 million people, a third of these countries' populations, supplying water for agricultural and industrial development and, by supporting subsistence fishing, constituting the major source of protein for millions of families throughout the region.

Characteristic Mekong River bend.

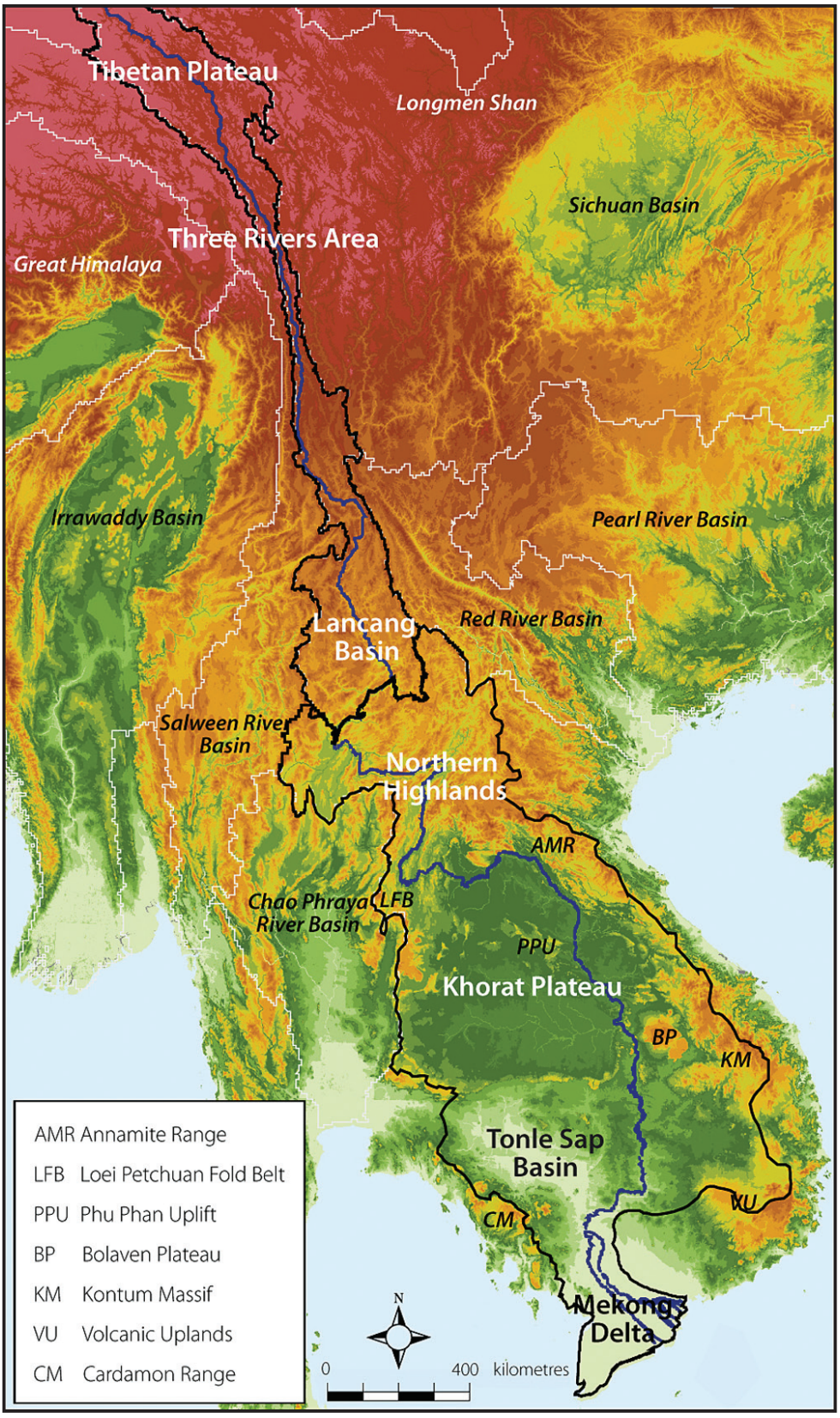


Figure 2. The topography and physiographic zones of the Mekong Basin.

The LMB (Figure 2), is best regarded as an ecological sub-system, in which the people of the region and their social, cultural and economic activities are inextricably linked to the wider bio-physical environment on which they depend for their survival. They influence it by their activities and are in turn, influenced. The LMB commences at the border of Myanmar and Lao PDR, and is made up of five geographical regions. The first is the Northern Highlands, essentially northern Lao PDR and a part of northern Thailand, which is characterised by mountainous terrain and remote, scattered settlements, often of minority peoples. The second, further south, is the Mekong Corridor, a narrow strip between northern Lao and the Mekong which constitutes the Thai border and leads into the Korat Plateau of Northeast Thailand, populated by some 40% of the LMB. The third region extends from southern Lao PDR into Cambodia, while the fourth region, south of the Korat Plateau, is the Mekong Plain, a fertile rice area of the Mekong lowlands and the Tonle Sap Plain of Cambodia, home to nearly 20% of the LMB's population. Finally, there is the fertile and densely-populated Mekong Delta, mostly in Viet Nam but also in Cambodia, which is home to some 25% of the population of the LMB.

Human dependence on this complex system is high, and certain activities put pressure on the bio-physical environment threatening the very resource on which so many depend. Indeed, different economic activities, linked to conflicting political and development agendas, too often result in the resources of the region, including waterscapes, becoming highly contested. The drive for large-scale hydropower and irrigation can threaten downstream livelihoods and have radical impacts on flora and fauna (Molle, Foran and Kakonen, 2009). The threatened Irawaddy Dolphins of Cambodia and Lao PDR have achieved an almost iconic status in recent years, becoming a tourist attraction in their own right. The fragility of the water and related resources of the LMB is not restricted to one species or area, and is certainly not dependent on international political boundaries. It is of regional concern and requires consistent monitoring.

1.4.1. Environment

Protected areas

Since the 1990s, growing concern about environmental issues has been reflected in the LMB through the establishment of an increasing number of protected areas. In all, there are more than 200, along with six RAMSAR sites (ICEM, 2003). Some 35% of the LMB is covered by forest (MRC, 2003), and of this a considerable portion falls under existing or proposed protected areas. Much of this is low-density deciduous forest, especially in the north and east of the Mekong Plain. By contrast, tropical forest characterises the mountain areas of Cambodia and south and east Lao PDR, while the Northern Highlands is largely mixed forest and woodland, considerably influenced by the shifting cultivation.

Clean river tributary, Lao PDR.

Relative to forests, fewer wetland sites have been accorded protected area status, but they are crucial in the LMB. More than 30% of Cambodia is classified as wetland, of which 20% meet RAMSAR criteria of international importance and an estimated thirty sites in Lao PDR are of national or international significance (ICEM, 2003).

Wetlands

Wetlands are important to tourism development in the LMB. According to RAMSAR's broad definition of wetlands, all case study sites utilize wetlands for tourism attraction. The definition by RAMSAR include: "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres" (www.ramsar.org accessed 30/4/2010). The distribution of wetlands in the LMB is shown in Figure 3. There are six designated RAMSAR sites in the LMB two in Cambodia of which one is Stung Treng covered by one of the Cambodian case study sites, two in Lao PDR and two in Thailand, but studies have identified a clear potential for at least 40 Mekong wetlands that would meet RAMSAR criteria (MRC, 2010).

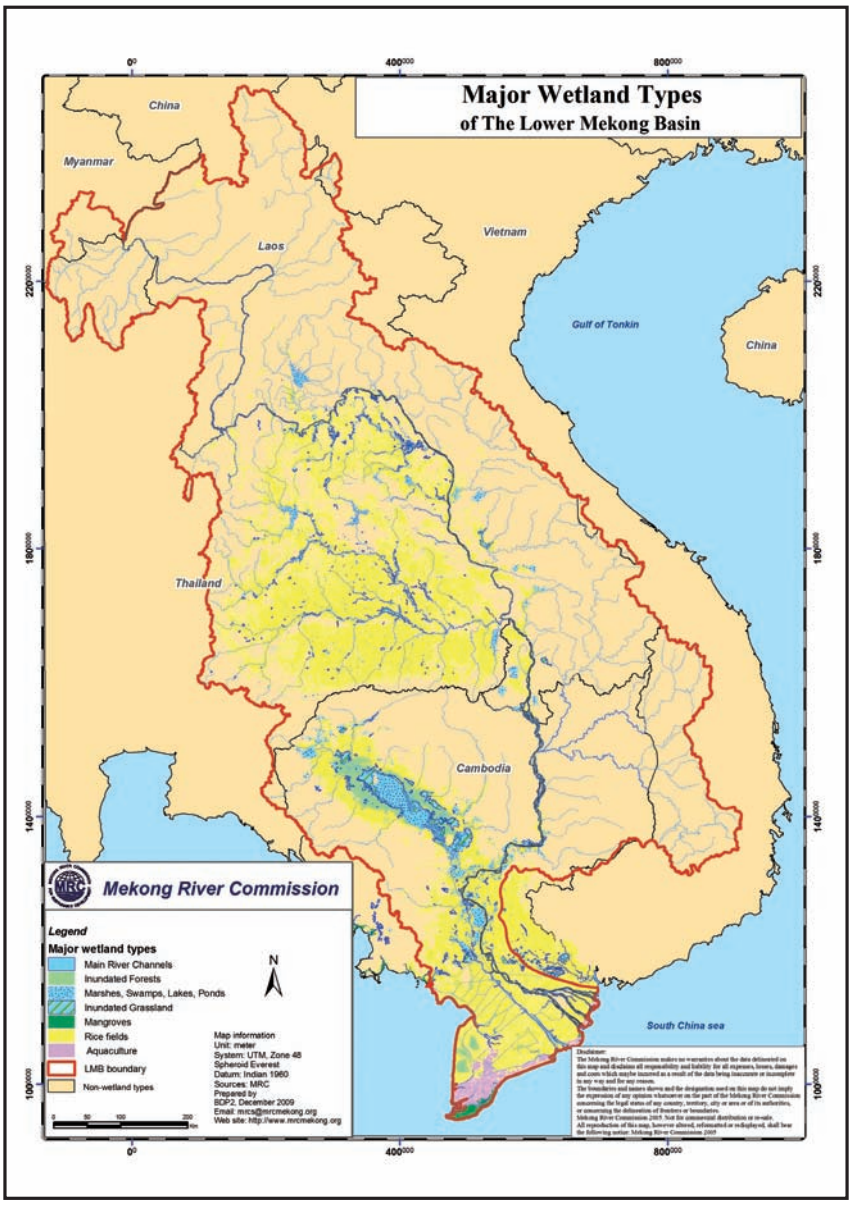
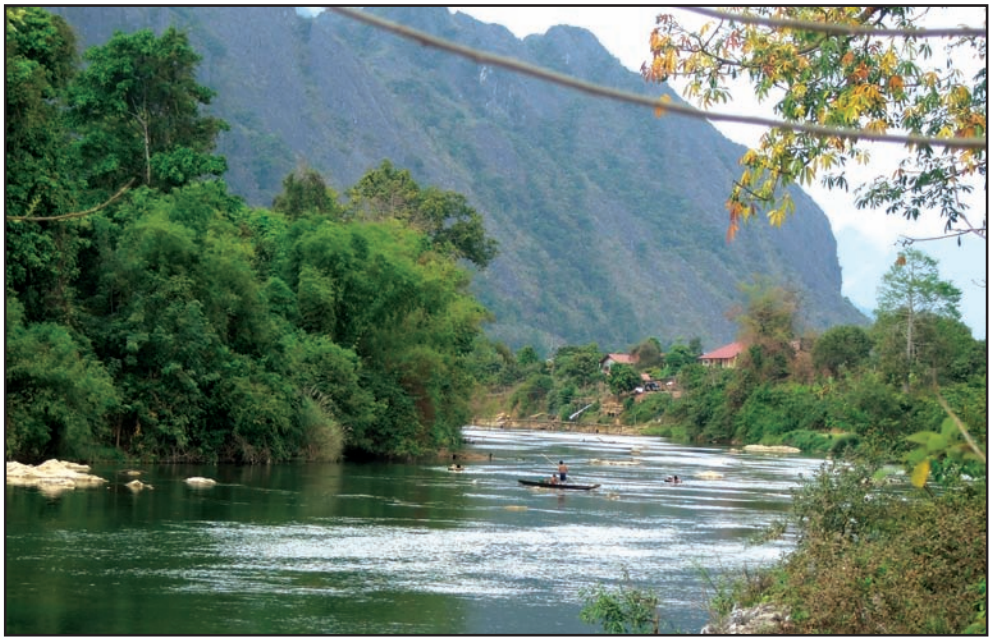


Figure 3. Extent of wetlands in the Lower Mekong Basin.

Biodiversity

The highly differentiated topography of the LMB is reflected in the bio-diversity of the region. While focus is usually on the fish resources in the region, the diversity of such freshwater animals as frogs, snakes, crustaceans, molluscs and insects is also estimated to be high. More generally, as described by the Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme: "The biodiversity of the Mekong River Basin is immense and of truly exceptional significance to international biodiversity conservation even in comparison with other parts of tropical Asia. The river and its numerous tributaries, backwaters, lakes and swamps supports many unique ecosystems and a wide array of globally threatened species such as the Irrawaddy Dolphin, Siamese Crocodile, Giant Catfish and birds such as the Giant Ibis and Sarus Crane. The diversity of the river fauna itself is surpassed only by that of the Amazon and Congo, with over 1,300 species of fish inhabiting the main channels, tributaries, and associated wetlands. (www.mekongwetlands.org accessed 10th August 2009).



Locals carry out traditional fishing practices in Vang Vieng, Lao PDR.

It is estimated that not more than 10% of the species are given scientific names and new species are discovered every year. However, the list of threatened Mekong actual fauna shows that biodiversity of the LMB is under pressure (MRC, 2010). Populations of large mammals and birds, and many fresh water species are in serious decline and there have been major losses in area and quality of forests and wetlands which are the key habitats (ICEM, 2003).

Water quality

MRC monitors the water quality at 87 stations in the Mekong River mainstream and selected tributaries. In total, 19 parameters are measured 12 times per year. In general the water quality is 'good' or 'acceptable' with the majority of sites on the Mekong mainstream reporting

excellent conditions (MRC, 2008a). Only the Delta region with high population density and high intensity of agriculture shows 'moderate' quality conditions. An assessment of 20 years of data from 1985-2005 showed no significant trends in any of the measured parameters (MRC, 2008a).

Despite this generally satisfactory picture however, localized water quality problems still occur close to sites of various human activities. Significant signs of human impact are beginning to be observed in the uppermost part of the basin and downstream of Phnom Penh.

Water quality monitoring is undertaken within or to close to several of the case study areas. These monitoring stations all fall into the 'excellent' or 'good' quality classes.

Ecological health

Similarly, a bio-monitoring programme of MRC assesses the ecological health of the Mekong river. The programme monitors diatoms, zooplankton, littoral macro-invertebrates and benthic macro-invertebrates, monitoring parameters such as richness and abundance. Monitoring campaigns have been conducted during the years 2004-2007 covering in total 51 sites. The results of the surveys were divided into four classes: 'excellent', 'good', 'moderate' and 'poor'. Over the total number of sampling events during the four years, 28 were considered 'excellent', 32 'good' and 17 'moderate'. None were classified as 'poor'. It was concluded that, the principal rivers of the LMB have not yet suffered severe harm from development of water resources or waste disposal. However some rivers are showing signs of stress (MRC, 2008b).

1.4.2. Economics

A detailed socio-economic profile of the countries of the LMB is included in Table 3. Criteria for assessing their levels of development vary. In 2007, for instance, the World Bank categorised Thailand as a Lower Middle Income Country, and the other countries as Lower Income Countries (World Bank, 2007), while UNDP considered they all exhibited the characteristics of Medium Human Development, ranking the two largest in area, and the most populous, Viet Nam and Thailand, at 105 and 78 respectively in the index of Human Development (HDI). It positioned Lao PDR and Cambodia considerably lower, at 130 and 131, in the tables (UNDP, 2007).

By most criteria, though, Thailand, which has openly espoused neo-liberal capitalist development policies, is the most developed; it has by far the highest per capita income and industry contributes more than 40% of its GDP. It also has the lowest proportion of workers in agriculture, and agriculture contributes less to its GDP than in the other countries. In addition, it relies far less on overseas aid, and vital statistics measure ahead of the others - though Viet Nam is not far behind. Access to education, safe water and sanitation is the highest in Thailand and relatively high in Viet Nam. Finally, Thailand is also the most urban of the four countries,

with a smaller percentage of its population than the others living below its national poverty line. It also exhibits the highest level of inequality of income distribution.

Throughout much of the LMB, fish and rice dominate the economic activity. Fish and other aquatic products constitute the most important source of protein for the region's inhabitants, and in much of the LMB, fish is part of every meal. During lean seasons, fermented fish are used in place of fresh fish. Fish sauce is a staple food used by most households all year round. Fish also have high levels of vitamin A and micronutrients essential to human (Sverdrup-Jensen, 2002). Most agriculture in the LMB is focused on rice production, notably the Korat Plateau and the Vietnamese and Cambodian delta regions, as well as around the Tonle Sap, which can legitimately be described as the 'protein basket' of Cambodia.

1.4.3 Peoples

The LMB is as mixed culturally, socially, economically as it is geographically. Across the region there are numerous ethnic groups (in Lao PDR alone more than 40), languages and dialects, different histories, cultures and customs and people live under different political and economic systems. But they also have much in common. Most of the basin's populations live in the rural areas, they are subsistence farmers who supplement what they grow with the fish they catch and the food and other material they gather from forests and wetlands. Poverty is still a very common aspect of people's lives even though Thailand has reached the national goal for poverty reduction. Throughout the LMB, there is a focus on the importance of the family and the precedence of the social unit over the individual. The national languages of Lao PDR and Thailand are broadly in the same language group. And even though the histories are different, many similar historical sites across countries like ancient temples demonstrate historic linkages between the countries.

People use and enjoy the river.

Table 3. *Socio-economic profile of Cambodia, Lao PDR, Thailand and Viet Nam*

Indicator	Unit	Year	Cambodia	Lao PDR	Thailand	Vietnam
Total area	000 sq. km		181	237	514	332
Population national [1]/LMB [2]	Million	2007	14/13.0	5.9/5.2	63.9/23.1	87.4/18.7
Population growth [10]	average % p.a.	2007	1.9	2.1	0.8	1.2
Age structure of population	% 15-64 years	2008	63.2	55.9	70.3	68.6
Ethnic composition [9]		latest available	Khmer 90% Vietnamese 5% other 5%	Lao 55%, Khmou 11%, Hmong 8%, and other 26%	Thai 75%, Chinese 14%, and other 11%	Viet 86%, other 14%
Per capita GDP (nominal) [3]	$ US	2006	648	674	3000	900
Growth rate of real GDP (est.) [3]	%	2007	10.1	7.5	4.8	8.5%
Agriculture	% GDP	2007	32	36	11	20
Industry	% GDP	2007	27	27	45	41
Services	% GDP	2007	41	37	45	38
Employment in agriculture	% of total	latest available	70 (2001)	ND	42	58 (2004)
Tourism in the economy [12]	% GDP	2007	14.9	5.8	8.4	12 (2005) [13]
Overseas Development Aid	% GDP	2005	8.7	10.3	0.1	3.6
Overseas Development Aid	US $ per capita	2005	38.2	49.9	2.7	23.0
Inequality: share of income/exp.	Gini Index *	latest available	41.7 (2004)	34.6 (2002)	42.0 (2002)	35.3 (2004)
Human Development Index (HDI)		2007/8	0.598	0.601	0.781	0.733
World rank in HDI		2007/8	131	129	78	105
Vital statistics	infant mortality (rate per 1000 life births)	2006 [1]	65	59	7	15
	life expectancy	2007 [1]	59	64	71	74
	adult literacy [1], [4]	2007	76	73	94	90
Net Primary school enrolment rate [5]	%	2007	89	86	94	98
Pop. using improved water source [5]	%	2006	65	60	98	92
Pop. using improved sanitation [5]	%	2006	28	56 [11]	96	65
Public expenditure on education	% GDP	2002-2005	1.9	2.3	4.2	ND
Public expenditure on health	% GDP	2004	1.7	0.8	2.3	1.5
Pop. below national poverty line [1]	%		35 (2004)	33 (2003)	10 (2006) [6]	16 (2006)
Urban population [7], [8]	% of total	2005	22	31	32	28

** The higher the index, the less equal the income distribution; ND: No data 1.) UNESCAP 2008. Statistical Year Book for Asia and the Pacific 2008; 2.) MRC Database 2010; 3.) World Bank database 2009; 4.) UN DP 2009 Human Development Report, Viet Nam Country Fact Sheet; 5.) UN MDG Indicators online, http://mdgs.un.org/mdg/SeriesDetial.aspx?srid=665; 6.) NSO 2006. National Statistical Office, Thailand; 7.) GMS Atlas of the Environment, GMS Environment Operations Centre, accessible website: www.gms-eoc.org/Country/Country.aspx; 8.) International Fund for Agricultural Development (IFA D). Rural Poverty Portal Statistic and World Development Indicators; 9.) CIA World Fact Book 2008. Central Intelligence Agency, United State of America, https://www.cia.gov/library/publications/the-world-factbook/geos/cb.html; 10.) ADB 2008. Key Indicator for Asia and the Pacific 2008 (39th Edition): Special Chapter Comparing Poverty across Countries: The Role of Purchasing Power Parities; 11.) UNICEF and WHO 2008. Progress on drinking water and sanitation; 12.) UNWTO 2009b; 13.) WTTC 2009d.*

1.5 Importance of tourism to the LMB countries

Indices of tourism's economic importance to the sub-region are impressive (Table 4). Such figures, subject to the usual uncertainties concerning tourism statistics, indicate that expenditure on travel and tourism, which here includes domestic tourism, makes a substantial contribution to the GDP's and exports of all LMB countries, and accounts for more than 10 million jobs in the sub-region. It seems likely that such trends are set to continue over the following decade and they are certainly welcomed by LMB governments. Development plans for Thailand (Pun-Arj Chairatana, 2006), Lao PDR (Harrison and Schipani, 2007), Viet Nam (Suntikil et.al., 2008) and Cambodia (Kingdom of Cambodia 2006, 2009) all include a prominent role for tourism, and the planning and marketing of tourism is increasingly carried out on a regional basis (Ravinder, 2008).

Table 4. *Tourism's importance to the LMB economies: 2009 and 2019 (forecasted)*

Country	Contribution to GDP (%)		Direct and indirect contribution to employment (% jobs)		Contribution to growth (%)		Contribution to export of goods	
	2009	2019	2009	2009-2019	2009	2009-2019	2009	2009-2019
Cambodia	17.5	15.3	13.7 1,002,000	12.0 1,081,000	-2.0	5.7	23.6	22.3
Lao PDR	10.8	9.3	8.6 194,000	7.4 205,000	-1.2	4.7	21.4	17.6
Thailand	14.7	6.1	11.1 4,040,000	12.1 5,007,000	-3.3	6.1	13.8	11.9
Vietnam	13.1	13.0	10.4 4,862,000	10.4 5,675,000	0.2	6.5	11.6	9.7

Source: WTTC (2009: a-d)

Tourism in the UNWTO region of Asia and the Pacific has increased over the last two decades and now accounts for more than 20% of all international arrivals and receipts. However, international tourism took time to become established in the LMB, largely because of the Second Indochina War and its aftermath, and the period of the Khmer Rouge in Cambodia, but also because some governments tended to view international tourism with hesitation. Other factors led to temporary reductions in the growth of international arrivals, for example, the events of September 11, 2001, the Bali bombings (October 2002), the outbreak of the Severe Acute Respiratory Syndrom-SARS (April and May 2002), the conflict in Iraq (2003), the Tsunami, especially in Thailand (December 2004) and the outbreak of Avian influenza (2004-2005). More recently, the countries of Southeast Asia have exhibited considerable political and social stability, and in 2007 the four countries of the LMB received about 22.3 million recorded international arrivals, or about 2.4% of the world total, and received nearly US $22 billion in receipts (Table 5).

Tourists visit Angkor Wat, Siem Reap, Cambodia.

Table 5. *International tourist arrivals and receipts (US $ million) in the LMB countries in selected years*

Year	Cambodia		Lao PDR		Thailand		Vietnam		LMB countries	
	Arrivals	Receipts	Arrivals	Receipts	Arrivals	Receipts	Arrivals	Receipts	Arrivals	Receipts
1995	220,000	-	346,000	-	6,952,000	-	1,351,000	-	8,869,000	-
2000	466,000	-	737,000	-	10,096,000	7,119	2,140,000	-	13,439,000	-
2001	605,000	380	674,000	104	10,751,000	7,076	2,230,000	-	14,260,000	-
2002	787,000	454	736,000	113	10,873,000	7,901	2,628,000	-	15,124,000	-
2003	701,000	441	636,000	87	10,082,000	10,456	2,429,000	1,400	13,848,000	12,384
2004	1,055,000	673	895,000	119	11,737,000	13,054	2,928,000	1,700	16,615,000	15,546
2005	1,422,000	929	1,095,000	147	11,567,000	12,102	3,468.000	1,880	17,552,000	15,058
2006	1,700,000	1,080	1,215,000	173	13,822,000	16,614	3,583,000	3,200	20,320,000	21,067
2007	2,015,000	1,284	1,624,000	233	14,464,000	20,623	4,244,000	-	22,347,000	21,780
Increase in arrivals 2003-2007	187%		155%		43%		75%		61%	
Increase in receipts 2003-2006		145%		99%		59%		129%		76%

Source: UNWTO (2002, 2007, 2009b)

1.6 Characteristics and attractions of tourism in the LMB

Thai tourism developed after the Second Indochina War and grew steadily throughout the 1990s and 2000s. Thailand appeals to a wide variety of tourists, whom enjoy its beaches, its protected and nature areas (such as Khao Yai National Park and trekking around Chiang Mai) as well as its vibrant nightlife and shopping facilities in Bangkok and other big cities. Thailand's ethnic minorities and numerous cultural centres are also a draw and Thailand has five UNESCO World Heritage Sites. It has a correspondingly wide range of accommodation, ranging from budget beach huts to five-star hotels. Attracting 70% of the sub-region's arrivals, it can be regarded as a developed destination, especially the north-south corridor stretching from Phuket in the south, through Bangkok to Chiang Mai in the north (Cohen, 2001).

Tourism in Lao PDR developed later and less spectacularly but has demonstrated steady growth since the late 1990s (Table 5). Tourism in Lao PDR is largely related to its natural beauty and the hospitality of its people and it appeals mostly to back-packers on low budgets seeking nature-based activities such as trekking to see ethnic minorities, rafting and mountaineering. It has a preponderance of locally-owned guest houses and a relative lack of large, international standard hotels. The Luang Prabang World Heritage site, however, is a frequent destination for all tourists, including the more wealthy tourists, as is the capital Vientiane.

Waterfall in Cambodia

Tourism in Cambodia also developed more recently and more rapidly, following a long period of political instability during the Khmer Rouge period. Like Lao PDR, Cambodia attracts mostly young, low budget tourists, however, the 'jewel in it's crown', Angkor Wat, attracts tourists from all economic brackets. While much of its tourist accommodation is small-scale, Cambodia also has a wide range of large international hotels, mainly in Phnom Penh and Siem Reap; this is on a bigger scale than seen in Lao PDR. Phnom Penh, is a lively capital and visitors enjoy shopping in the busy markets as well as visiting sites of cultural and historical significance such as temples and museums. In the south, Cambodia offers alternative options to the beaches of Thailand at Sihanoukville. There is currently less nature based (and riverine) tourism in Cambodia compared to Lao PDR, but this is an area likely to develop in the future, especially around Ratanakiri in the Northeast and along the Stung Treng/Kratie corridor.

Mass international tourism in Viet Nam developed in the 1990's amidst the beginnings of a period of economic growth for the country. International tourists to Vietnam tend to arrive in Ho Chi Minh City and Hanoi and visit few tourism locations on the coast e.g. Ha Long in the north, Hue and Hoi An in the centre, and the Mekong Delta in the south**.**

Tourism and passenger boats at a landing site along the Mekong.

Rivers and streams are a common feature of tourism sites throughout the LMB. They are sights to visit and photograph, sites for recreation and conduits along which to travel. Tourists are attracted to Luang Prabang, the Tonle Sap Great Lake, the Siphandone area, Vang Vieng, Tram Chim National Park and Thoi Son Island, to name a few. They go to view the scenery, obtain a sense of place, to capture the experience on digital film, to travel by river (often with local residents) across provinces and boundaries, in search of new experiences, new encounters, and new sites for relaxation (e.g. white water rafting, flying foxes, kayaking, tubing, swimming etc). Many capital cities throughout the LMB are situated on major rivers. Vientiane is situated on the banks of the Mekong, whilst Phnom Penh is located at the confluence of three mighty waterways: the Bassac, Tonle Sap and Mekong rivers.

Another factor, is the growth of domestic tourism in the sub-region. In Thailand, especially, an expanding urban middle class has taken advantage of improved transport systems. Rates of car ownership have increased, as has the level of ownership of second homes in rural areas. In 2000 domestic tourist trips were estimated to be six times that of international tourism (Ghimire, 2001). Figures for Thai sub-basins confirm this trend and show that Thai tourists massively out-number international visitors. Similarly, the Vietnamese domestic tourism was growing at more than 8% a year, and totalled 17.5 million in 2006 (five times the number of international tourists), largely focused on traditional festivals and sites of natural beauty in the northern mountains, central plateau and Mekong Delta. In 2007, domestic visitors in Cambodia numbered 5.8 million, nearly three times the number of international arrivals (Kingdom of Cambodia, 2008).

1.7 Regional tourism development

In more recent years a regional approach to tourism development in the four LMB Countries has been taken, through the ASEAN cooperation (involving Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam) and specifically in the Mekong region through the Greater Mekong Sub-region (GMS) programme (covering Cambodia, China, Lao PDR, Myanmar, Thailand and Viet Nam).

The ASEAN governments have increasingly recognised the value of intra-regional co-operation, and understand tourism as an important sector for ASEAN economic integration. Through an ASEAN tourism agreement, the ASEAN countries have committed themselves to (ASEAN 2002):

- Improving cross-border travel e.g. visa arrangements;
- Marketing the region as a series of high quality, sustainable and inter-related products;
- Ensuring that tourism development is sustainable;
- Promoting intra-regional human resource development.

In addition, an ASEAN Tourism Forum is held each year and an ASEAN Tourism Association (ASEANTA established in1971) is also working on tourism promotion. A 'Visit ASEAN' web site is offering 'ASEAN passes', ASEAN cruises and various relevant information about the 10 Member Countries. Recently USAID has agreed to support the ASEAN tourism development and promotion under the brand: 'South East Asia, feel the warmth' by signing an MoU with the ASEANTA. ASEAN has also decided to prepare a Tourism Strategy for the period 2011-2015.

ADB assistance for tourism in the GMS dates back to a 1994 workshop on tourism in the Mekong region, jointly organised with the Economic and Social Commission for Asia and the Pacific (ESCAP) and led to the establishment of a Tourism Working Group for the Greater Mekong Sub-region (ESCAP, 1996). In turn, this commissioned a study in which consultants recommended a focus on tourism 'development corridors' (Horwath Consultants, 1997), an idea that was picked up and further developed. (Pacific Consultants International and Team Consulting Engineering Company Ltd, 1998; ADB, 2005). To date, ADB has provided some US $38.2 million for tourism development in the GMS, mainly through loans on favourable terms (ADB, 2008). The Strategy has 7 programmes including: marketing and product development; human resource development; heritage conservation and social impact management; pro-poor tourism development; private sector participation; facilitation of the movement of tourists and tourism-related infrastructure development in priority tourism zones (ADB, 2005). The focus is on thirteen sub-regional priority zones for tourism in the GMS, seven of which involve exploitation of the Lower Mekong's resources. These are the (ADB, 2005):

1. Mekong River Tourism corridor, involving all GMS countries;

2. Golden Quadrangle, including Lao PDR and Thailand, along with Myanmar and Yunnan Province of China;

3. East-West Corridor, involving Lao PDR, Thailand, Viet Nam and Myanmar;

4. Emerald Triangle with Cambodia, Lao PDR and Thailand;

5. Green Triangle for Cambodia, Lao PDR and Viet Nam;

6. Heritage Necklace Circuit, for all GMS countries; and

7. GMS coastal and River Cruise Lines, which includes Cambodia, Myanmar, Thailand and Viet Nam.

As illustrated above, some of the common goals or strategic directions of the regional tourism development partnerships (e.g ASEAN & ADB), concentrate on promoting the region as 'one destination'. Governments have tried to improve visa arrangements for the region to facilitate internal transportation and improvement of infrastructure to support tourism development. Similarly, the concern for preservation and conservation of natural and cultural heritage and environmental management is shared and also feature strongly at strategic and

implementation level (e.g. through support to waste water collection and treatment facilities and solid waste collection and disposal facilities e.g. GMS & ADB supported projects) (ADB, 2008).

1.8 Tourism predictions

Until recently, it was generally considered that tourism would continue to develop in the LMB at an exponential rate. In 2000, for example, the UNWTO was predicting that by 2020 international tourist arrivals to LMB countries would be 53.3 million (Table 6). By contrast, the more recent predictions for annual growth provided by the WTTC anticipate a decline in arrivals for 2009 and slower than average rates of growth thereafter until 2019. Other sources seem to bolster these predictions.

Table 6. *Forecast for arrivals (000) for Southeast Asia*

	Actual 1995	Forecasts		Market share of.E. Asia/ Pacific		Ave.growth p.a. 1995-2020 %
		2010	2020	1995	2020	
Cambodia	220	855	1,779	0.3	0.4	8.7
Lao PDR	60	501	1,032	0.1	0.3	12.1
Thailand	6,952	17,573	36,959	8.5	9.3	6.9
Viet Nam	1,351	6,048	13,528	1.7	3.4	9.7
Total LMB	8,583	24,977	53,298	10.6	13.4	9.4
S.E. Asia	29,173	66,714	135,789	35.9	34.2	6.3
E.Asia/Pacific	81,355	195,235	397,241	100	100	6.5

Source: UNWTO Tourism Vision 2020 (2000)

It is clear that, in the midst of a global economic crisis, the full force of which has yet to be experienced, forecasts become more uncertain. However, it is important to stress that while there is great uncertainty about the present situation, much reporting does not take account of the fact that tourism has proved incredibly resilient in the past and, if the downturn is expected to be dramatic, the recovery could prove to be even more so (UNWTO, 2009c). In all likelihood, even if the global recession is over in a year or two, and tourism proves to be resilient, international arrivals in the LMB will not exceed the UNWTO predictions (Table 6), but could be substantially lower.

Once out of the global recession, mid and long-term growth throughout the region are likely to continue. With a gradual stabilisation, it can probably be expected to see a reduction in growth rates of tourism in Lao PDR, Viet Nam and Cambodia, as they get established as tourism destinations. At the same time, the importance of the Chinese market will undoubtedly re-emerge and increase in the long term, as will the growth in domestic tourism in the LMB, especially in Thailand and Viet Nam.

1.9 Current knowledge of impacts

Studies on tourism's role in development in the LMB vary widely in topic and range. It is generally agreed that it brings economic benefits to the region, however there is limited material on tourism's socio-cultural impacts. Studies that are available normally focus on Thailand, the most established destination of the LMB. Anthropologists and sociologists have tended to concentrate on tourism's relationship to ethnic minorities, where reported impacts include a decline in traditional authority, a shift in power to a younger generation, increased wealth for marginal families who specialise in catering to tourists, and further integration of ethnic minorities into Thai society (e.g. Michaud, 1993 and 1997). Others have examined the links of prostitution and tourism in Southeast Asia (Bishop and Robinson, 1998; Lyttleton, 2002; Meyer, 1988; Oppermann, 1998; Thanh-dam Truong, 1990) and extensive publications bring together these themes (e.g. Cohen1996).

Empirical examinations of the socio-cultural impacts of tourism figure even less in the literature on other LMB countries. Among the exceptions, studies on Luang Prabang suggest the need for greater local participation in the city's development (Ashley, 2006; Aas et. al. 2004). A study examines the influence of tourism in Cambodia on Khmer women and their silk weaving tradition, (Dahles and Zwart, 2003) and a study on the hill tribes in Sa Pa, Northeast Viet Nam, suggests that the local interests have been neglected in favour of tourists and other outsider stakeholders (Michaud and Turner, 2006).

Hardly anything has been written on the impact of tourism on the physical environment in the LMB and, indeed, even globally, few academics have focused on tourism's relationship to river environments (Prideaux and Cooper 2009). There has been research on lacustrine tourism systems, but this has centred mainly on tourism in the developed world (Hall and Härkönen, 2006). Through publications of such pressure groups as American Whitewater (2009), from the activities of national parks (National Park Service, 2001) and urban authorities, much is known on the relationship of tourism and recreation to riverine environments in Western cities. It is well established that the interests of recreational users of rivers and their resources including river banks and wildlife habitats, frequently conflict with one another, as well as with those of residents, and that perceptions of rivers and their environments may vary considerably (Gobster and Westphal, 1998).

Tatai waterfall, Cambodia.

It is relatively easy to compile lists of potential positive and negative impacts tourists might have on riverine environments, but not always possible to distinguish their impacts from those of local residents. Negative impacts can include the transfer across ecosystems of polluted water or eroded soil, or plants and animals, and habitats disruption to a wide variety of species of fish and birds along river corridors. In addition, riparian fringing vegetation can be trampled and river banks destabilised. At the same time, it is also recognised that a range of techniques can be used to minimise such disruption (Newsome, et. al. 2002).

2. Case studies highlighting tourism impacts

2.1 Introduction

This section presents the Case Studies which highlight the impact of tourism at selected sites. Impacts are assessed in terms of their bio-physical, economic and socio-cultural impacts on the environment but particularly in the context of water and water related resources. The Case Studies are based on primary data collected at the sites and where appropriate, data from other sources has been used to provide context and additional information (see 1.3 Methodology Section).

2.2 Characteristic tourist destination sites

The sites are indicative of distinct tourist destination types (names refer to Table 1):

1. Towns and cities whose development is affected by mass tourism:
   Siem Reap, Luang Prabang, Chaing Rai.

2. Established destinations combining natural and cultural features, where tourism is not the main economic activity:
   Vang Vieng, Thoi Son Island, Chong Mek.

3. Nature and culture sites deemed attractive by tourists and susceptible to tourism-induced change:
   Siphandon, Strung Treng/Kratie corridor, Tonle Sap, Chiang Khan.

4. Sites currently little visited by tourists, which might be considered potential attractions including both ‘natural’ and‘ cultural’ sites of interest:
   Tram Chim National Park, Phnom Da.

2.3 Towns and cities affected by mass tourism

While Hanoi and Ho Chi Minh City, Vientiane, Phnom Penh and Bangkok are gateways for tourists and tourist destinations in their own right, their continued prosperity does not rely on tourism. By contrast, other towns in the LMB are more obviously reliant on visitors, including Chiang Rai, the ancient Thai town which is especially dependent on trekking trips to visit ethnic minorities. Other examples include Siem Reap, whose development depends almost entirely on mass tourism (Kingdom of Cambodia, 2008; JICA 2006a-c and Rabé, P., 2008) and Luang Prabang, the World Heritage city and former capital of Lao PDR. It receives about 15% of the international tourists visiting Lao PDR as well as a similar number of domestic tourists (Harrison and Schipani, 2007).

2.3.1 Siem Reap, Cambodia

Siem Reap is the administrative capital of Siem Reap Province (pop. 750,000) and the nearest town for visitors to the World Heritage Angkor complex and the Tonle Sap Great Lake. The town's population has grown from 10,000 in 1970 to 70,000 in the central municipality and 150,000 in the urban area. More than half the residents are migrants, mainly from other parts of the province, but also from further afield, including Phnom Penh. A third of the work force works in agriculture and fishing, and another third in tourism-related occupations.

Boat racing.

In 2008, more than a million tourists came to the town, mainly by air but also by boat from Phnom Penh and Battambang, and by bus from Phnom Penh and Poi Pet. With more than 100 hotels, 200 guesthouses and 100 restaurants, Siem Reap competes with Phnom Penh as the tourist hot spot of Cambodia, but Siem Reap's tourists stay longer and include a higher percentage of repeat visits. Some estimates of future arrivals anticipate 2.5 million visitors to Angkor Wat by 2010.

Bio-physical impacts

The town retains a vibrant charm but rapid urban development has had a detrimental impact on the biophysical environment, evident especially in the dry season. Continuous building construction creates dirt, noise and air pollution, as does heavy traffic. In the town's back streets there are massive amounts of unsightly litter, and while there is a garbage dump, there is no systematic landfill and leachite is released into water sources, both surface and ground water. For years, the residential/tourist area has had an inadequate system of sewage and waste water disposal. An open sewage canal passes through heavily populated areas, and some hotels and other buildings have been constructed across it. Most residences, guest houses and hotels have bore holes and wells close to the canal, which has a bad odour and is frequently blocked. Large hotels have sewage and water treatment plants, but others discharge directly into the river or

drainage canals. There are also squatters on both sides of the river bank who discharge water and solid waste directly into the river.

The middle and lower sections of the Siem Reap River are polluted, and this feeds into the Tonle Sap, with the possible result of serious pollution and disruption to aquatic species. Wells drilled by the rapidly increasing number of hotels reportedly reduce the water table and destabilise the foundations of the Angkor buildings, which rank as extremely high on the need for protection and are already being damaged by prolonged exposure to visiting tourists and diesel fumes from tourist buses (Watson, 2008).

Economic impacts

Tourism has brought many economic benefits, especially to communes to the west of the Siem Reap River, where most residences and tourist activities are found. About 30,000 jobs are directly in the tourism industry, with 5,000 in hotels and guest houses alone. In 2004, tourists spent an estimated US $97 million, 66% of that remaining in the Province. Housing standards are relatively high in terms of households with toilets, piped water and electricity. Little income from tourism reaches people in non-tourist sectors. Communes in other parts of the District and Province obtain few benefits, and little goes to the Province's agricultural sector. Beef, pork and fowl come from the area around Siem Reap, but vegetables sold at the market are mainly from outside.

Socio-Cultural impacts

Social impacts include disputes involving government, international organisations and local residents that have emerged over the past years over attempts to control tourist numbers and reduce pollution from vehicles. Proposals to concentrate on 'high quality tourism' and for an 'Angkor Tourist City' (to be served by electric shuttles), supported by Government and UNESCO, were intensely opposed by hundreds of transport providers (Winter, 2007). Income inequalities, have increased, along with massive migration from rural areas to the city centre. Medical facilities have been upgraded to cater increased numbers (though tourists are still often advised to go to Bangkok for treatment) and recreational facilities for tourists are also available for local use. However, the inadequate sewage and water drainage systems create the strong possibility of health hazards. E-coli is reported to be seeping into local wells and diarrhoea, dysentery, skin disease, malaria and dengue fever (all water-borne diseases) account for 20-30% of all outpatient diagnoses (although much disease is undiagnosed). There are also (unconfirmed) increases in prostitution (including children) and drug abuse.

2.3.2 Chiang Rai, Thailand

Chiang Rai, is situated in the northern-most province of Thailand, about 785 kilometers north of Bangkok. It is located in the Kok River basin and covers an area of approximately 11,678 square meters. Its average elevation is 580 meters above sea level. The province is located within the renowned Golden Triangle area where Myanmar, Lao PDR and Thailand

converge. Domestic tourism to Chiang Rai increased by an average of 8% a year from 2003 to 2007, while the number of foreign tourists increased slightly from 2005 to 2007.

The tourism sector contributes greatly to the local economy, providing additional income to many local people. It is rich in natural and cultural resources, and is visited by a wide range of international and domestic tourists. Chaing Rai and its environment is home to a number of highland ethnic minorities producing traditional crafts such as hand-woven fabrics and silver jewellery and ornaments.

Bio-physical impacts

In general, the perception of negative impacts of tourism on bio-physical aspects of the environment were considered limited. Most of the waste water and solid waste seems to come from households and factories and only a minor portion is thought to come from tourism development.

Economic impacts

Tourism has brought improvements and developments to the economy of Chiang Rai. Tourism has increased family incomes and increased employment opportunities for many. It was felt that positive spin-offs from tourism development included improved public utilities and infrastructure such as roads, electricity, and water supply and improved transportation facilities for local people such as roads and the airport. Land prices and the cost of living had increased though, and this is having a significant effect on the daily life of local people.

Socio-cultural impacts

As far as social and cultural impacts of tourism are concerned, residents express that tourism has brought many improvements on society and culture, especially related to the opportunity to create more local products such as traditional arts and crafts. Cross-cultural interaction with tourists was also cited as a benefit.

2.3.3 Luang Prabang, Lao PDR

Luang Prabang is the ancient and picturesque capital of the Kingdom of Laos, and a World Heritage site. The historic town has a population of nearly 80,000 with any expansion largely contained by its position on a peninsula, the meeting point of the Mekong and Nam Khan Rivers. The city is noted for its tranquil atmosphere (despite increased traffic) and its 32 temples.

Tourists enjoy elephant riding near Luang Prabang.

Soon after Lao PDR started to promote tourism in the1980s, Luang Prabang became a highly popular destination. From 62.300 visitors in 1997 (49% foreign), in 2008 there were 344,000 (67% foreign), and 2,426 rooms in 36 hotels and 236 guest houses, mainly small and Lao-owned. Foreign visitors are European (40%), American (25%) and Asian and Australian (12%). Visitors are attracted not only by the temples, but also to the Haw Kham Royal Palace Museum, French colonial architecture and the Night Market. Use of water and related resources includes trips along the Mekong to the Kuang Si Falls and Pak Ou caves, and to traditional villages and, in April, the three-day water festival heralding the start of the Lao New Year. Speed boats and ferries go from Luang Prabang to Pak Beng and Houay Xai.

Biophysical impacts

Bio-physical impacts relate to increased pressure on water supply and drainage, especially as tourists tend to use more water than residents. Hotels, guest houses and restaurants discharge waste water directly into the rivers (Mekong and Nam Khan) and the waste collection system is barely adequate. Pollution from oil and fuel discharges of boats also occurs.

Economic impacts

There have been significant economic benefits of the tourism development. An estimated US $6 million annually (some 27% of total tourist receipts) goes to semi-skilled and unskilled

workers, mainly meat and fish producers, transport operators, suppliers of raw materials and textile weavers. Local residents value the increased economic opportunities, higher incomes and higher standards of living, and increased recognition and value of the local handicraft industry. They also however point to increased cost of living and land inflation perceived by local residents as largely caused by influx of outsiders to work in the tourism and heritage sector.

Socio-cultural impacts

Generally there seems to be a high approval among the local population of tourism in Luang Prabang. The social and cultural benefits include an increased respect for culture, arts and crafts, more knowledge of outside world, financial support for religious institutions, improved health facilities, and improvements in local utilities. There are concerns over increased road traffic, accidents and urban development. Reports of sex tourism, including children, and demonstration effects among youth taking up tourist's behaviour and habits exist. High immigration of expatriates and loss of local residents are expressed as negative social and cultural impacts of tourism. In 2004, UNESCO warned that overdevelopment in Luang Prabang was placing 'critical stress on the environment and the historic cultural resources, and threatens to overwhelm them.' In 2008 the Luang Prabang Government Authority stopped foreign investors turning any more old buildings into hotels.

2.3.4 Priority actions

Siem Reap reveals some undesirable economic, social and biophysical effects of unplanned and uncontrolled mass tourism on urban areas, ancient monuments, and water and related resources, and such impacts (albeit to a lesser extent) are also seen in Luang Prabang.

Though current perceptions of negative impacts in Chiang Rai at present may not seem cause for alarm, it must be remembered that the total number of tourists visiting Chiang Rai is estimated to increase from 1,436,435 persons in 2007 to 2,132,556 persons by 2017 (Thai Tourism Authority 2008). If not properly managed, garbage and waste water could become a major concern as pressure increases on Chiang Rai's water and water-related resources.

Such urban areas as Siem Reap and Luang Prabang, both heavily dependent on tourism, and illustrate that while tourism brings considerable economic benefits, it can also lead to social disagreements among stakeholders, often with different perceptions about the need for conservation. Uncontrolled urban development, with high numbers of tourists, result in air pollution from dust, traffic fumes and damage to ancient monuments. In addition, water resources are polluted through the discharge of waste water and solid waste into rivers, the unsustainable operation of tourist boats, restaurants and other tourist facilities frequently produce river bank erosion and water pollution.

Some actions are already being taken to reduce these negative impacts but they need to be maintained and expanded if tourism in Siem Reap, Luang Prabang and Chiang Rai and their environs is to be sustainable.

Some relatively large-scale interventions are to be seen in Siem Reap at present, including:

• US $10.8 million replacement sewage/waste water system for the west end of the town is under construction funded by the USA and ADB. The work began in 2007.

• Euro 4.5 million, 10 km drainage system is under construction in eastern Siem Reap. It is funded by the French Agency for Development, and started in 2007.

• Public campaigns on waste collection awareness have begun in Siem Reap, and are being promoted through media outlets.

In Luang Prabang, current measures to address some of the impacts of increased tourism include the recent introduction of a one-way road system in the town to reduce traffic congestion, and some small-scale improvements to water and sewage outlets. Defferring new building development in the town is a measure possibly in the pipeline, as is the possible construction of a new urban development on the opposite side of the river to cope with increasing local and tourist populations in the old town. The location is however questioned by UNESCO fearing negative effects on key features of the towns status as World Heritage Site.

As the economic benefits of tourism in these three sites do not appear to be equitably distributed, a portion of their tourism derived revenue could be funnelled back to the community through improved infrastructure such as roads, improved market arrangements, and better educational and health facilities for all.

Increased and continued enforcement of environmental legislation to reduce the amount of solid waste and waste water at all three sites is important. Planned and controlled programmes to ensure new hotel and guest house developments conform to clear environmental standards is also necessary. Accurate and continued monitoring of water quality of the Mekong River and relevant tributaries remains a priority.

Measures to ensure that local stakeholders in tourism are not disenfranchised are needed, as support for management decisions is most effective when it has the full support of all stakeholders operating at all levels.

A focus on increased capacity building at all sites is needed to ensure administrative expertise and reinforcement of these kinds of projects and public campaigns mentioned. In reference to the paragraph above, training in participatory planning is recommended in order to fully involve all in the process.

2.3.5 Future prospects

Developing Siem Reap's tourism industry is a continued priority for the Cambodian government. It is anticipated that growth in tourism in Siem Reap (and by extension to the Angkor Wat complex and the Tonle Sap Great Lake) will continue, though it might slow

in 2009 and 2010 before resuming an upward trajectory, even to the point of reaching two million visitors per year by 2020. By any criterion, this is mass tourism. The answer to the key question - how far can tourism be made sustainable - will depend on how far it can be regulated, and on the extent remedial action is taken to address current problems.

Floating village on Tonle Sap Great Lake, Cambodia.

As indicated earlier, it has been estimated that Lao tourism is likely to double over the next decade, though a temporary slowdown is likely in 2009 and 2010. This will be reflected in an anticipated doubling of arrivals in Luang Prabang. Similarly, Chiang Rai's, tourism infrastructure development seems inevitable, as they too expect significant increases in numbers of international and domestic tourists alike in the coming decades. Hence, there is a need to properly plan and manage the infrastructures, facilities, services and activities utilised by tourists to ensure that development and conservation is balanced.

2.4 Established destinations where tourism is not the main economic activity

Tourism is increasingly important for destinations such as Vang Vieng, Lao PDR, Thoi Son Island, Viet Nam and Chong Mek, Ubon Ratchatani, Thailand even though the most important economic sectors are agriculture, aquaculture and industry. In that sense, the three sites have common features, but there are also distinct differences as to how tourism interacts with and affects these communities.

Fishing near Vang Vieng, Lao PDR.

2.4.1 Vang Vieng, Lao PDR

Vang Vieng is in Vientiane Province, 152 km from Vientiane capital. It is a convenient stopping point en route to Luang Prabang by Route 13 North and it is also an easy 2-3 days excursion from Vientiane. With a district population of 46,000, it is on a small bend on the Nam Song River. The main attraction in the region is the karst topography on the west bank of the river, with numerous unexplored tunnels and caves, and limestone cliffs stretching steeply from the river.

Mekong tributary in Lao PDR.

Vang Vieng has developed rapidly over the last two decades and the municipality now has a population of about 30,000. In 2007, it received some 100,000 visitors (three times as many as in 2002), of whom 60% were foreign. Most tourists are relatively young and well-educated backpackers and stay 1-3 days. They participate in river-based activities such as swimming, kayaking, tubing, rafting, and taking trips to minority villages.

Biophysical impacts

Bio-physical impacts are evident and increasing. Waste water from guest houses is deposited in the Nam Song river, and the river bank is being reinforced (with material from the river) for further construction, both opposite the town and also along the river. It has also been indicated that rapid urban development is detrimental, and requires remedial action (Phommavong, 2008).

Economic impacts

As with Siem Reap and Luang Prabang, tourism's economic impacts in Vang Vieng were deemed by respondents to be largely beneficial, and tourism is a key driver of development in the area. Economic impacts are considerable and tourism contributes to 60% of the town's income. In 2006, Vang Vieng District had 52 guest houses (all but a few locally owned), and one hotel with 740 rooms in all. The eight villages in the municipality (and five of the sixty-seven outside it) have a financial stake in tourism. Villagers say that tourism has radically reduced poverty, and there are close linkages with agriculture, as most food consumed in the guest houses is locally sourced. Poverty is also alleviated in numerous outlying villages. For example, 40% of the total income of Ban Pha Thao, a Hmong village 10 km from Vang Vieng, is from the sale of handicrafts made by women and sold either in the village or in retail outlets in Vang Vieng. However, Vang Vieng residents feel that taxes paid to government should be used to further increase benefits to Vang Vieng, and want locals to receive training in hospitality and guiding.

Socio-cultural impacts

Residents value tourism and consider it has led to increased knowledge of the English language, greater pride in local culture and more environmental awareness. It has also increased recreational facilities, improved infrastructure, transport, and the provision of health and educational facilities. However, some socio-cultural impacts are considered negative. Economic benefits have not been shared equally, and land prices and the cost of living have increased. Objection is taken to tourists wearing skimpy clothing, and local people have often been kept awake at night by noise from restaurants, bars and discotheques, to the extent they must now close at midnight. Vang Vieng is gaining a reputation as the party capital of Laos.

In summary, tourism in Vang Vieng is seen to have had mostly positive impacts on the economy and livelihoods in the area. Negative impacts in relation to biophysical aspects include

water pollution, waste and unplanned construction as well as socially related disputes regarding the behaviour of tourists, Lao culture and norms.

2.4.2 Chong Mek, Ubon Ratchatani Province, Thailand

Ubon Ratchathani shares borders with Champassak province in Lao PDR and the Kingdom of Cambodia, and is on a plateau sloping to the east to meet the Mekong River. Other major rivers in the area are the Chee, Moon, Lum Saybok, Lum Domeyai and Lum Domenoi Rivers. The most important natural resources in Ubon Ratchathani are forests and wetland areas. There are 50 national reserved forests, three national parks, two botanical gardens, one wild life preservation area and one botanical park. Ubon Ratchathani has a total population of 1,785,709 inhabitants. People's livelihoods here mostly revolve around agriculture and livestock raising. Tourism development in Ubon Ratchathani is of moderate scale. Tourism related revenue for the province slightly increased from 2003 to 2007.

The tourists who visit the town on the Thai side close to the Mekong River are attracted to the site because of international trade at the border shopping opportunities, sight-seeing as well as the possibility for relaxing at the Mekong River bank. An important commodity for the cross-border trade is wild plants brought from Lao PDR across the river and sold in Thailand.

Bio-physical impacts

Residents express that there is no indication of negative impacts on the bio-physical aspect in terms of soil or river bank erosion and water pollution from tourists. However, waste management problems are increasing. The key concern is that there are insufficient garbage collection and elimination systems in place. In addition, the trading of wild plants from Lao PDR with tourists is an issue. If not properly planned and managed, the wild plant populations may be affected.

Economic impacts

Positive economic impacts are substantial and increasing. Residents say that the development of tourism has led to improved public utilities and infrastructure such as roads, electricity, and water supply, improved medical care and other facilities for local people and tourists. Residents also say that educational facilities and services have been improved as a direct result of tourism and there are now more schools in the Province. These developments have largely benifitted Ubon Ratchathani's economy. On the other hand, economic inequality is cited as a drawback of tourism in Ubon Ratchatani, as those living in tourist areas have better access to economic opportunities than those who do not.

Socio-cultural impacts

Residents perceive that tourism has brought improvements to social and cultural aspects of life in Ubon Ratchathani. Tourists encourage local people to produce more traditional arts, crafts and other local commodities which have led to increased employment, and the expansion

of local markets. With regard to negative impacts, communities find that, there is an increase in drug use and alcohol consumption in the tourism areas.

In summary, the positive social and economic impacts are significantly increasing people's access to livelihoods. The potential bio-physical impacts seem to be largely dealt with through the waste and waste water management systems already in place to cater to all the other economic activities in the area. Tourism seems to have a minor role related to these aspects in the area at the present time.

2.4.3 Thoi Son Island, Vietnam

The 1,212 ha island of Thoi Son, in the Chau Thanh District of Tien Giang Province, Viet Nam, is quite different from any of the other case study sites. On the Tien River, 70 km from Ho Chi Minh City, it is easily accessible by boat from the busy, attractive town of My Tho. The island is a peaceful haven directly adjacent to a busy part of the river. Its population of 6,000 are freehold farmers who specialise in farming fruit, including longans, plums and mangoes in extensive orchards which are cross cut by narrow canals and 11 km of paths that are effectively free of road traffic. They also produce crafts and foodstuffs (for example, sweets and cakes) for tourists sale. The housing is in a traditional style, with standard toilet facilities, and the disposal of waste water, and solid waste is efficient. In short, the island gives every appearance of being prosperous.

Tourism development in Thoi Son has been very much top-down and dates from the early 1990s, when the Tien Giang provincial government decided to upgrade the Island's housing and provide facilities for 'ecotourism,' apparently on the grounds that the longan market was in decline. Farmers were encouraged to become tour guides, traditional musicians were brought in to entertain visitors, and tourism developed rapidly. There were 174,000 tourists in 2000 (27% domestic), and by 2005 there were 294,000 (15% domestic), nearly all day trippers, accounting for 80% of all tourists to Tien Giang Province. Tourists visiting Thoi Son come by bus or boat on day trips from Ho Chi Minh City, and some tours extend over several days with visitors travelling via My Tho and Thoi Son Island to Vinh Long and Cha Doc, to Cambodia. On arrival at Thoi Son, tourists leave their motorised boats on the bank of Tien River and transfer to row boats that then negotiate the intricate network of canals on the Island before disembarking onto the island's paths. In 2006, tourist facilities were few, with a restaurant and reception area, and a small guest house with four rooms. While on the island, tourists sample local fruits and sweets, they experience how it is produced, purchase locally-made crafts, listen to musicians, and generally appreciate the relaxed atmosphere which seems far from the busy River Tien, and even further from the bustle of Ho Chi Minh City (Phuong Lan, 2008).

Biophysical impacts

The biophysical impacts of tourism are low. Air quality is acceptable. Although the quality of the Tien River is poor, (it is polluted from regular commercial traffic, industrialisation, agriculture and aquaculture), the water resources of Thoi Son Island are in good condition,

and the use of row boats on the island is environmentally friendly and adds to its ambience. Generally, the disposal of waste water and solid waste is considered effective.

Economic impacts

Economic impacts are significant. Tourism has led to an estimated 1,600 jobs (in boat services, restaurant, performance arts, gardening, food production and retail) and earnings are significantly higher than in agriculture, aquaculture or transport sectors. An estimated 50% of all households benefit directly from tourism.

Socio-cultural impacts

Socio-cultural impacts also seem to have been positive, and tourism is reported to have increased residents' pride in their island and helped to preserve traditional handicrafts and skills. The residents support tourism, as does the provincial government, a major stakeholder in the para-statal Tien Giang Tourist Company, that leases many of the boats that take tourists to Thoi Son Island and the small canal boats on Thoi Son. Some discrepancies were evident between some local residents and the tourist company, and the former implied the latter never consult them on their plans for tourism development.

Nearly 300,000 tourists a year, visiting a small island population of 6,000, can clearly be considered mass tourism, even if they are mainly day trippers. So far, residents seem to have benefited considerably, with no significant negative effects on the water and related resources, but such a ratio of population to visitor must cause alarm bells to ring.

2.4.4 Priority actions

Remedial activities are so far only relevant in case of Vang Vieng. Currently, the rapid development of Vang Vieng, which is essentially backpacker, water-based adventure tourism, is unsustainable. The Asia Foundation is investigating the river water quality by commissioning a community-based monitoring approach to water monitoring, carried out by members of the Faculty of Science at the National University of Laos. The aim is to develop Lao-specific training materials to train local residents and citizen groups to carry out their own water monitoring (Shull, 2009). As part of the second phase of the Mekong Tourism Development Plan, the ADB and Lao PDR have agreed on a sustainable tourism development project to protect the natural heritage in Vang Vieng. Until these projects have been completed, the situation in Vang Vieng will likely continue to degrade. The actions needed include:

- Guidelines and controls placed upon 'new building' developments need to be put firmly in place. There is a scope for further development opposite the municipality, and further along the Nam Song, but this should be part of a considered and agreed plan, subject to an environmental impact assessment which is then rigorously implemented.

- Awareness of the benefits of a clean and safe environment should be promoted among residents.

- Continued efforts should be made to raise the awareness of tourists to the sensitivities of local residents concerning tourists wearing little clothing and making too much noise.

- A programme of water quality monitoring should be established to record, on a regular and sustained basis, the quality of water upstream of Vang Vieng (which is mainly used for commerce and trade), in Vang Vieng municipality (which is largely for tourism purposes) and downstream, where the impacts of the Nam Song Dam are likely to be most evident.

2.4.5 Future prospects

As indicated earlier, it has been estimated that tourism in Lao PDR is likely to double in size over the next decade, though a temporary slowdown is likely to occur in 2009 and 2010. This will probably be reflected in the anticipated doubling of arrivals in both Luang Prabang and Vientiane, and the numbers of tourists visiting Vang Vieng will probably increase similarly.

In Ubon Ratchathani the existing impacts of tourism seem limited but with anticipation of a significant increase of both local populations and tourists (according to the Thai National Tourism Authority) in the area over the next 10 years, water shortages and garbage issues could become a major concern.

Tourism in Viet Nam is expected to expand roughly in line with UNWTO projections, but the increase in tourism in My Tho and Thoi Son Island is likely to be greater. The opening in February 2009 of the Rach Mieu Bridge near My Tho has created a road link enabling goods and people to be transported more easily by road within the Mekong Delta. This is much welcomed by many business people, and it also reduces commercial river traffic and potentially could take away the jobs of thousands of local people in an estimated 200 households if the river ferry boats are withdrawn. For some time, the Department of Tourism and Provincial Government have earmarked Thoi Son Island for further development. In recent years, secondary attractions for tourists have been added, such as a bamboo monkey bridge. There are plans to zone the island and build a railway line across it, as well as to introduce horse-drawn vehicles. In addition, the provincial government has plans to build a hotel complex of 300-500 on Thoi Son Island. If it proceeds, the impact of a large hotel on the island on all aspects of the environment could be considerable. A strong case has to be made for a detailed environmental impact assessment, including genuine consultation with local residents, before any further action is taken. They is a risk that such a project would radically change the charater of Thoi Son Island.

2.5 Natural and cultural sites deemed attractive by tourists

Of the case studies, two nature sites, in Lao PDR and Cambodia, are within the same ecosystem but divided by national boundaries and at different stages of development. The first is the island of Don Det and Don Khon, in the Khong District of Champassak, Lao PDR. This area is known as Siphandone (Four Thousand Islands), and comprises some 136 villages, 84 of which are on islands of the Mekong River. The second is the Stung Treng/Kratie corridor in Stung Treng, Cambodia, to the north of which is a designated RAMSAR site. The third example is the Tonle Sap Great Lake in Cambodia, an area of natural beauty and cultural significance: a home to a number of minority groups living in floating villages. The fourth nature site is the area of Chiang Khan, Loei Province, Thailand, characterised by national parks and a wildlife sanctuary, thereby attracting tourists interested in trekking and wildlife.

2.5.1 Siphandone, Lao PDR

Don Det and Don Khon are two small islands supporting five villages (total population 2,000) in Siphandone, Champassak, on Lao's southern border with Cambodia. South of the larger island of Don Khong, they are accessed by boat from Ban Nakasang, or from Cambodia by boat and road from the border post at Stung Treng. They are noted for their riverside charm, a quiet, almost traffic-free setting, and way of life that is still highly dependent on rice and fish. They also have several colonial style houses and a railway bridge (still intact, complete with an abandoned engine) constructed by the French to take goods and boats overland to avoid 13 km of un-navigable Mekong rapids.

Siphandone, Lao PDR.

The islands are also in an area of high biological diversity, potentially a RAMSAR site (in effect, an extension from the RAMSAR site of Stung Treng in Cambodia), with extensive wetlands and numerous species of fish and wildlife, especially the increasingly rare Irrawaddy Dolphin.

Don Det and Don Khon started tourism development in the Siphandone region. The first guest house opened in Don Det in 1997. By 2006, there were more than 40 on the two islands, all with less than 10 rooms and all but one owned by local families, catering for an estimated 40,000 tourists a year staying an average of three days. Most tourism development is concentrated in the two villages on Don Det and, to a lesser extent, Ban Khon Tai, on Don Khon. Several tour operators have recently set up a base in the village of Don Det Tok. An emerging range of services is offered, including tubing and kayaking, and boat trips to the Khon Phapheng Falls and the Cambodian border, to see dolphins. There are also several internet cafes. The two other villages on the island of Don Khon have little contact with tourists.

Biophysical impacts

The bio-physical impacts of tourism on water and related resources are most noticeable in the river around Don Det. Guest houses and restaurants are often built jutting over the river, which receives direct discharges of waste water and kitchen waste. A floating restaurant on Don Khon is particularly noted. Pollution from leaking latrines, which tend to be built close to the river, is also likely. Construction of the guest houses exacerbates erosion of river banks, and there has been a noticeable increase in garbage and litter over the last few years, with further pollution caused by the burning of waste. Nevertheless, local residents claim that facilities for waste water and sewage disposal have improved with tourism, though the only interior toilets on the two islands are in guest houses.

Economic impacts

The economic impacts of tourism have been most noticeable in Don Det and Don Khon. Villagers agreed it led to a higher cost of living and land inflation, and sometimes a shortage of certain foodstuffs, but nevertheless were highly supportive of tourism, claiming it increased their incomes, provided a market for their produce and employment opportunities. In Don Det Tok, for example, tourism was the main source of income for 22% of the households and a substantial contributor in another 11%. Nearly US $500,000 is spent annually by tourists in this village of 400 people - a major achievement in a country where a third of the population still lives below the official poverty line. However, while Don Det and Ban Khon Tai, in Don Khon, are clearly benefiting, few benefits appear to reach other villages. It is reported, however, that there are plans to build guest houses in other villages and on other islands. In 2002, at the end of the first phase of ADB's GMS Tourism Sector Strategy, it was suggested that controlled ecotourism development should be encouraged in other islands in the Siphandone.

Socio-cultural impacts

Socio-cultural impacts are most noticeable in Don Det. Like Vang Vieng, it is developing a reputation as a 'party centre' (amply illustrated by tourist blogs on the internet), and tourist (mis)behaviour and dress certainly instigate local comments. Tourism is thought to reduce availability of man-power for harvesting and increase alcohol abuse. Tourists are known to buy and smoke marijuana, a practice known to pre-date tourism in the villages, even though villagers denied tourism increased drug use. Generally, though, villagers strongly support tourism development, agreeing that it increases respect for their culture, leads to better educational and health facilities and more support for the temples, and gives them a sense of freedom.

2.5.2 Stung Treng/Kratie, Cambodia

The Stung Treng/Kratie river corridor is a 190 km stretch of the Mekong with two riverside towns, Stung Treng (population 25,000) and Kratie (79,000). The former is the nearest town to the border with Lao PDR, on the banks of the River San near where it meets the Mekong, while the latter is more of a market town and an overnight stop en route to Ratanakiri and Mondulkiri. Within Stung Treng Province, a 37 km stretch of the Mekong, from north of Stung Treng town to just south of the Lao border, is a designated RAMSAR site. With a population of some 12,000 people, it contains valuable wetlands and a highly diverse range of distinctive vegetation, terrestrial mammals, birds, reptiles, fish and amphibians. Many of these species are threathened by an increased population, deforestation, industrialisation, illegal hunting, and disturbance by tourist boats (in the case of dolphins).

Dolphin viewing is popular among tourists, Cambodia.

There is little tourism development in Stung Treng or Kratie, both of which have but a handful of budget-range guest houses. The former is a departure point and gateway to border traffic. However, treks to minority villages are possible, and a silk factory can be visited. Trips can also be made to the RAMSAR site to seek out dolphins in four deep water pools, but villages have few facilities for tourists and the dolphins are low in numbers. So are tourism statistics, but it is reported that 14,468 tourists went through Stung Treng in 2005 (9,386 domestic and 5,082 foreign), and that in the same year 2,125 domestic and 431 foreign tourists went to the dolphin pools (Bauld and Soriya, 2006).

Most tourists prefer to see dolphins at the Kampi Pool, near Kratie, where they are more accessible. Though Kratie is a bustling town with a pleasant waterfront, it has few other attractions, and the Kampi Dolphin Pool is 14 km away. Trips to the Virachey National Park, one of the most important conservation areas for wildlife and forest conservation in South-east Asia, could be made from Stung Treng or Kratie. There are plans to do develop this possibility. In addition, boat trips to Phnom Penh from Kratie, once common, are possible but irregular, as road improvements have brought about a decline in river traffic.

Bio-physical impacts

The tourism pressure in the Strung Treng/Kratie corridor is too low to have created major problems of biophysical impacts. However, waste water from both towns (including the few guest houses and restaurants) is discharged directly into the river or drains that lead to the river, and litter and waste can be seen in both. At Kampi Pool, Kratie, the river is reportedly polluted by waste and garbage from upstream floating restaurants, and the Anlung Cheutal Pool, near the Lao border, is also said to receive waste from Lao restaurants. Furthermore, dolphin viewing areas most notably Kampi Pool, are considered at risk from tourist boats fuel discharges.

Economic impacts

Similarly, there are few economic benefits from tourism in Stung Treng and Kratie. While there is considerable ecotourism potential, the RAMSAR site is undeveloped, villages are poor, there is a lack of facilities, and there are few facilities for tourists. However, construction of the road to the Lao border from Strung Treng brings employment and is partly due to tourism. Some residents are employed at the handful of guest houses and restaurants in the two towns. Most economic benefits, however, are concentrated at the commune adjacent to the Kampi Dolphin Pool, which in 2006 was visited by 11,000 tourists. Villagers earn money from admission fees to the pool (though how much has been subject of much dispute with the Dolphin Conservation Authority), from the sale of handicrafts, and from providing boat trips to see the dolphins. There are also floating restaurants near Kampi Pool. However, villagers say many jobs serving tourists are taken by immigrants.

Socio-cultural impacts

In the Stung Treng/Kratie corridor, few socio-cultural effects are apparent. It is reported that over the last few years drug smuggling through Stung Treng has increased, with greater tourist involvement.

2.5.3 Tonle Sap Great Lake, Cambodia

The Tonle Sap Great Lake supports much of the Cambodian population, providing 60-70% of all fish consumed in the country, and is a wetland of international significance. It is home for rare water birds and animals, and many species migrate across ecosystems. Tourism to Tonle Sap Great Lake has increased in Siem Reap and the Angkor complex, and there is easy access to the Chong Kneas village on the Tonle Sap from Siem Reap.

Bio-physical impacts

Although biophysical impacts have not been quantified, it is known that pollution is brought into the Tonle Sap Great Lake via the Siem Reap River, and is exacerbated by the discharge of fuel from boats, along with waste and garbage from the floating restaurants and villages. These activities pose a threat to fish and other species dependent on the lake.

Because of its importance to the livelihoods and well-being of Cambodians, and the linkages with other ecosystems, what happens to and in Tonle Sap Great Lake has trans-boundary implications. The health and vitality of the Lake is dependent, in part, on what happens upstream, and there are concerns about a decline in water supply to the Lake, as well as to the Mekong Delta (Mogg, 2005).

Economic impacts

Economic benefits from tourism are considerable. In the high season (September to February), thousands of tourists per day (up to 700,000 in a year) visit the Lake's restaurants and such floating villages as Chong Kneas, Kampong Phluk and Prek Toal. In peak periods more than 300 boats a day may be operating trips of a few hours, but there are also longer trips (up to three days) to floating villages, and trips to and from Phnom Penh.

Most tourists are on pre-paid tours and arrive in tour buses, but independent tourists also come by road to Chong Kneas. Income to operators is considerable. Boat tickets for a short trip are US $15.00, and proceeds are then distributed as tax to provincial government and communities, and as profit to boat operators. Although village populations are of Vietnamese ethnicity, most boat owners are Cambodians (sometimes owning two or three boats), and daily trade for these operators put together ranges from US $900 to $1,600 a day, depending on the time of year. Tourists also spend money at restaurants and several floating villages (with a total of 800 households).

Socio-cultural impacts

The economic benefits are not necessarily equally distributed and this has become a social issue. There are two boat associations, one with more than a 100 boats which caters only to independent tourists, and the other, operating more than 70 boats, which works only with tour companies. While operators of private boats can earn as much from tourism as from fishing, tour boat operators can earn considerably more. This has caused much disagreement between individual boat owners and tour operators.

2.5.4 Chiang Khan, Loei Province, Thailand

Loei province is located in the northeast of Thailand or Isan. With a total land area of 7,063 km^2 there are five national parks, one wildlife sanctuary and 20 reserve areas. The climate of Loei province is relatively warm in the summer and cool in the winter. This is the only place in Thailand where temperature drops below 0^oC. The province is divided into three main areas: the high mountains in the west, the plains at the foot of the hills in the south and the east, and the lowlands in the basins of the Mekong and the Loei Rivers. Due to its geographical diversity and soil composition, agriculture is the basis for the province's economy.

Loei is one of the most sparsely populated provinces of Thailand. It has a population of 615,538 inhabitants with a population density of 54.354 inhabitants per square kilometre. Most of the populations are engaged in agriculture as their main source of livelihood (Department of Community Development Loei Province – 2007).

The number of Thai and foreign tourists visiting Loei increased by an average of 6% and 26% a year respectively from 2003 to 2007 and tourism revenue of the province reached an average of 881 million Baht, (about 26 million US$ per year) from 2003 to 2007 (Tourism Authority of Thailand 2008). Due to the increased tourists and significant revenue, hotels and restaurants were built to accommodate visitors.

Bio-physical impacts

There is no indication of significant negative impacts on biophysical aspects at the tourism area. Problems of landslides and soil erosion on the bank of Mekong River, especially at Kaeng Khud Khu are due to the strong and rapid tide in the Mekong River and the sharp fluctuations of the surface runoff. However, some negative impacts have occurred in terms of waste water from seafood restaurants and from washing released to the Mekong River. Deterioration in the quality of water and scenery has affected tourists intending to join cruises or use the beach. As far as environment is concerned local people have observed that there is an increase of garbage in the villages and pollution in rivers and canals, as well as a reduction in natural resources available from forests and rivers.

Economic impacts

Local people expressed that tourism development at Chiang Khan has brought significant benefits to the local economy, particularly in terms of increased income for families. Improvement of public utilities and infrastructure such as roads, electricity and water supply, increase in the number of recreation facilities for local people and improvement of transportation facilities are all seen as advantageous. With regards to negative impacts, residents claimed that there is some income disparity between those in and outside tourism areas. In addition, it is felt that tourism development had pushed land prices up and increased the cost of living.

Socio-cultural impacts

Meanwhile, it was generally felt that tourism had brought many improvements to social and cultural aspects of Loei Province. Local people felt that tourists expanded the trade of local products and markets. They felt that tourists had facilitated local people learning other languages and about other cultures.

2.5.5 Priority actions

Tourism in Don Det and Don Khon must be regulated, especially in Don Det Tok, where new building is encroaching on paddy land. Subject to constraints on size and environmental considerations, construction of small hotels and guest houses in other islands, and in villages on Don Khon not yet involved in tourism, should be encouraged. Locally-operated, private sector tourism has demonstrably brought economic benefits and seems to have had few negative social or cultural impacts. Both new and existing buildings should be vetted for damaging discharges of waste and sewage into the river system. Similarly, water quality should be continually monitored, to ensure tourism does not lead to its deterioration. Careful ecotourism initiatives should be encouraged on the Cambodian side, especially in the RAMSAR wetlands. Several trans-border issues emerge from this analysis: the wetlands straddle the border of Cambodia and Lao PDR, and tourism authorities in southern Lao PDR and northern Cambodia should be encouraged to see them as a single ecosystem in which both have an interest, in conservation and in tourism development.

Similarly, every effort should be made to co-ordinate the efforts of numerous aid donors and other international organisations in this region. Efforts are already under way in northern Cambodia, for instance, to develop ecotourism, involving the International Development Research Centre of Canada (IDRC), for instance, which since 1995 has been developing indigenous community-based tourism (CBT) around the Yeak Laom Lake in Ratanakiri. GTZ, (the German Aid Agency), has also been involved in developing ecotourism in the area. Since 2005, the ADB, too, in part B of its Mekong Tourism Development Project, has also focused on tourism in Ratanakiri and Stung Treng, while the IUCN's Mekong Wetlands Diversity Programme identified numerous ecotourism opportunities on the RAMSAR site.

UNWTO, SNV and the Cambodian Government are financing a Mekong River (Dolphin) Discovery Trail in Stung Treng as tourism promotion hoping that more than 250,000 tourists will visit Kratie by 2017. This would require an additional 640 hotel rooms and extensive training in hospitality for an extra 1,200 local jobs. However, some local fishermen are said to be discontent with restrictions on their activities to protect dolphins. This clearly indicates a need to encourage local populations to participate and benefit economically from new tourism projects.

Development of sustainable tourism in the Loei Province is focusing on coordination between government personnel as well as local people to sustain its tourism industry and raising awareness on the impacts of tourism to both socio-economic and environmental sectors. It is suggested that a committee be established toward the monitoring and evaluation of tourism impacts in the province. The committee could coordinate with government, local people, public and private industries and NGOs to maintain a clean and green environment in the province, supporting nature based tourism.

2.5.6 Future prospects

Increased tourism to the Champassak-Stung Treng region will reflect national trends, possibly doubling over the next decade - and even more if the Mekong Discovery Trail is as successful as anticipated. If so, the prospects are both challenging and promising. Tourism in the Siphandon region of Lao PDR, both in Don Det and in other islands, is likely to increase substantially, and there may be value in reviving an earlier ADB proposal to develop an inter-village trekking programme centred on Khone Papheng Falls. There are major opportunities to develop tourism in Cambodia on the Stung Treng RAMSAR site, but also major problems to be solved. Successful and sustainable development will occur only if recommendations related to cross-border governmental co-operation, in both controlling and developing tourism are taken up. If such co-operation does occur, the region could be a highly successful tourist destination.

The Tonle Sap Great Lake has a strong relationship with tourism in Siem Reap and the Angkor complex. This is a high priority area for Cambodian tourism development and may serve as a model for ecotourism developments attracting nature lovers and tourists interested in diverse cultural adventures.

Due to the high demand of tourism infrastructures, facilities, services and activities to serve the need of tourists in Chiang Khan Loei Province, it is likely that negative impacts on environment will be evident unless nature conservation is put high on the agenda.

2.6 Sites curently little visited by tourists

While both Tram Chim National Park, in Dong Thap Province, Vietnam and Phnom Da, in Angkor Borei, Takeo Province, Cambodia, currently attract few tourists, they might possibly be appropriate for future tourism development. Though different in several respects, they are alike in that, first, their tourism development is embryonic; secondly, they are both are off the beaten track of tourist itineraries and, thirdly, their water and water-related resources might be affected by future tourism development.

2.6.1 Tram Chim National Park, Vietnam

Tram Chim National Park, in the Vietnamese Mekong Delta, is 45 km due north-west and an arduous drive from the provincial capital of Dong Thap, Cao Lanh, which is itself several hours from Ho Chi Minh City. A more convenient alternative is to stay at a government guest house in Tam Nong, which is much nearer to the National Park. Either way, reaching the National Park is somewhat difficult and time-consuming.

Sarus Crane.

Upgraded from a Nature Reserve to a National Park in 1998, Tram Chim has a total area of 7,588 ha, centred on a core zone of 6,889 ha, with a surrounding 60 km network of man-made canals. A remnant of the Plain of Reeds ecosystem and a mixture of seasonally flooded grasslands, as well as an important site for wild rice, the National Park was established to conserve the natural landscape and environment of Dong Thap Muoi, the cajuput forest ecosystem and its wildlife and aquatic species, including the critically-endangered Red-headed crane. No-one lives within the boundaries of the National Park, but outside the dikes there is a population of 32,000, most of whom are farmers.

In 2000, only 620 visitors (including 98 foreigners) went to the National Park, rising to 4,697 in 2006 (including 100 foreigners). An attractive and peaceful network of waterways with several observation posts, local visitors, often from Ho Chi Minh City, are drawn to the Park mainly because of fishing, while foreigners reportedly go for bird watching and nature research. Thirteen people work at the Park -two administrators and two support staff in ecotourism and education, three guides, three boat operators, and three in the restaurant and guest centre - and facilities are limited to a small education centre, staff offices and a restaurant. There is also a seven-room guest centre that can accommodate twenty-one visitors. It is used by 45% of the overseas visitors and only 9% of the locals.

Bio-physical impacts

From the evidence available, there appear to be few negative impacts of any kind. With reference to biophysical impacts on water and related resources, water quality in Tram Chim National Park is reportedly good, though there are residual problems from the use of insecticides in agriculture outside the boundaries, and undesirable waste water and waste entering the canal system, so far this has had little apparent affect. It would be expected, too, that some oil discharge from boats taking visitors will have an impact on the water, and engine noise clearly disturbs birds, especially in the reproductive season.

Economic impacts

The economic impacts are few at the National Park. According to its administrators, the receipts do not cover the running costs, but there are hopes a programme of ecotourism can be developed.

Socio-cultural impacts

There are few apparent socio-cultural impacts. In so far as the educational programme of Tram Chim National Park is working, awareness of wetland importance is increasing, and a strong support from residents in the buffer zone is reported. In particular, the strong support reportedly provided by farmers and the women's association for conservation in the park might, in itself, be regarded as a very positive socio-cultural response. On the other hand, the benefits of further tourism development might reach people differentially, and that could be seen as a future problem.

2.6.2 Phnom Da Hill, Takeo Province, Cambodia

Phnom Da is a hill situated in Cambodia's Takeo province, and it is also difficult to access. Some 20 km east of the provincial capital of Takeo (which is 80 km from Phnom Penh), it is in the Angkor Borei District which comprises approximately 2,000 people in six villages. Phnom Da has a resident population of about 100, who live by farming and fishing, the latter of which is possible only in the west season (July to September). Although it can be reached by road from Angkor Borei in the dry season, in the wet season Phnom Da is isolated by floods and visitors take a 35-minute trip by speedboat at Takeo, along canal 15.

Few foreign visitors go to Phnom Da. Indeed, in 2006 the entire Province of Takeo Province received only 6,557, with a mere 1,000 visiting Phnom Da. The number of local visitors is not known, however, most visitors are day trippers from Phnom Penh. Whereas locals are likely to visit Phnom Da in the dry season, and reach it by taxi or motor bike, those from overseas generally go from Phnom Penh by bus or taxi via Takeo town, and then on from there by boat. While assessing 'attractions' clearly involves subjective judgements, there seems little obvious tourism appeal at Phnom Da. Once there, visitors can see four small artificial caves in the hillside and the square tower of an ancient temple. As the guidebook says: 'The temple is forgettable...but it's more about the journey to get there' (Ray, 2005: 2006).

Bio-physical impacts

The biophysical impacts at Phnom Da are limited as the insignificant number of tourists has no effect on water and related resources, though litter is obvious at the site.

Economic impacts

Since little income goes to anyone on Phnom Da also the economic impacts are insignificant. The US $2.00 entry fee (for overseas visitors, as locals are admitted free) gives government about US $2,000 a year, and the only other likely expenditure on the site is on a soft drink from the ramshackle shop. Some income may accrue in Takeo town but, although the it is pleasantly laid out and has two or three guest houses, tourists are more likely to stop - if they stop at all - only for a meal at the restaurant before they head off to Phnom Penh. In fact, the only people who benefit in any substantial way are boat owners from outside Phnom Da, who can gross up to US $8,000 a year by taking people to and from the island in the wet season.

Socio-cultural impacts

There are no perceived socio-cultural impacts at Phnom Da.

2.6.3 Priority actions

Apart from providing a more efficient system of garbage control on Phnom Da, there seem few problems that need to be addressed. The focus should be on the effective planning and management of any future developments.

2.6.4 Future prospects

At present, the future development of both sites is uncertain and assessment of their future prospects must be subjective and speculative. However, both are a considerable distance from any major tourism centres, and tourists now wishing to visit them have to make a quite deliberate decision to depart from established tourist itineraries. Any development at either site will require considerable investment in time and money.

For Phnom Da, there is scope for trans-border co-operation in increasing cross-border tourist traffic from Vinh Xuong, near Chau Doc. Tram Chim could be highly attractive to the nature-loving tourist and could benefit from controlled ecotourism development.

Additional and upgraded facilities (perhaps including camping sites) would be required for international tourists to stay a few days. It would be necessary to ensure waste water, solid waste and garbage disposal were effective, and that disruption of birds and damage to vegetation was kept to the minimum (perhaps by using rowing boats and/or canoes or kayaks). Consideration should be given to finding an appropriate conservation NGO and a private sector partner to work, with other stakeholders, to bring about sympathetic and sensitive ecotourism development in Tram Chim National Park.

2.7 A summary of tourism's impacts at case study sites

A number of key impacts are common across the case study sites and some are characteristic for the particular type of tourism destination. A summary of selected impacts is shown in Table 7 and described in the following.

Bio-physical impacts

There is no hard evidence in the case studies that tourism has generally brought about large-scale deterioration in the water and related resources of the LMB. However, in urban centres dependent primarily on large-scale tourism, air pollution from traffic and construction, and inadequate disposal of waste water, sewage, solid waste and garbage, have led to the pollution of wells, rivers and streams. Ancient buildings, are also damaged from increased numbers of tourists.

Other negative impacts on water and related resources were noted, but they were minor in scale. Urban construction can lead to river bank erosion and water pollution, and fuel discharges from boats, and waste matter from restaurants, guest houses and other facilities catering to tourist demand, pollute rivers, streams and wetlands, sometimes transcending national borders.

In emerging destinations, existing public facilities are also placed under pressure, and the need for new or improved systems of waste water disposal, sewerage and garbage disposal becomes evident, as even low-scale tourism can have negative impacts, as in the Stung Treng/ Kratie corridor.

Remedies for such problems include raising public consciousness through litter prevention and anti-pollution campaigns, effective management, better planning and more stringent implementation of controls, improvements to the urban infrastructure, and even new population centres (as planned for Luang Prabang). Damage to ancient buildings can be minimised by rationing visitors by number or time, controlling visitor flow, and reducing access to especially vulnerable sites. Similar measures can be taken to minimise biophysical impacts in such fragile environments as the Sub-region's wetlands.

Over the longer term, if such problems are remedied, the quality of the urban environment and associated rivers is improved and they will become more attractive for residents and tourists. As in tourism destinations the world over, what was once a negative feature of the biophysical environment becomes a positive feature, and provides further attraction to the destination. As a consequence, further efforts are needed to sustain the improvements.

Generally agreed positive impacts of tourism on the biophysical environment include increased pride in and awareness of the need to conserve the LMB's water and related resources. Where tourism is yet to become established this is reflected in the desire for tourists to provide an income which can be used to enhance conservation measures.

Economic impacts

Irrespective of the type of tourism involved - for example, 'cultural tourism' in Siem Reap and Luang Prabang, or 'soft' ecotourism in the Siphandon, Vang Vieng and Thoi Son, stakeholders agreed that tourism brought considerable economic benefits, most notably jobs and incomes to local residents and communities, and increased the standard of living of those most involved in tourism, either by providing food and accommodation or through sales of handicrafts and other commodities and services. Such perceptions are supported by regional and national statistics, as well as by literature and other research in the Sub-region. Destinations not yet receiving many tourists, e.g. Tram Chim National Park and the Stung Treng/Kratie corridor, saw tourism as potentially economically important, and even at the less frequented Phnom Da Hill, boat owners received an annual income much in excess of the average wage.

It was generally agreed, too, that tourism results in inflation of the price of land, property and some foodstuffs, that economic benefits were not always spread equally, and that it led to an increased inequality of incomes. Possible remedial measures include ensuring agriculturalists and others have improved access to tourist markets, redistribution of wealth earned from tourism via improved infrastructure, health and educational facilities, along with an efficient system of taxation that will ensure the costs of excessive growth are met by the tourism sector.

A cluster of guest houses, built in various styles, line the river banks in Vang Vieng, Lao PDR.

Socio-cultural impacts

Any assessment of socio-cultural impacts is inevitably value-laden. However, respondents generally felt there were considerable socio-cultural benefits, including increased respect for arts and crafts, more knowledge of the outside world, friendship with foreigners, and increased financial support for religious institutions. Social costs, though fewer, include (in some areas) resentment towards incoming migrants, because they were perceived to take jobs that would otherwise have gone to residents, and/or they had changed the local ambience (as in Luang Prabang). This is a situation that could occur in Thoi Son Island if it is developed to cater for even more tourists. In addition, there were reported increases in such trans-border activities as drug trading, prostitution, and trade in banned wildlife products. And, as in World Heritage sites elsewhere, in Luang Prabang and Siem Reap/Angkor complex disputes have emerged among interest groups over the merits of conservation and its impact on others working in tourism.

Table 7. *Summary of selected impacts as experienced at case study sites*

Economic	Socio-cultural	Bio-physical
• Alleviation of poverty in tourism areas and surrounding area; • more jobs for people providing services to tourists (boat drivers, restaurants); • increased standards of living; • more jobs in hospitality and 'adventure' tourism; • increased demand for food stuffs; • increased demand for locally made products; • expansion of markets.	• Change in local demographics with in-migration of other nationals and non-nationals for business purposes; • income inequality; • changing views on how taxes levied on tourism business should be spent; • increased border trade; • increased land prices; • increased food and commodity prices; • increased opportunities for cross-cultural interaction; • increased opportunities to learn and practice the English language; • increased pride in local cultures; • increased recognition and preservation of traditional crafts and skills; • increases in alcohol and drug use and smuggling (often trans-border); • increases in prostitution (often in trans-border locales); • inequitable involvement of stakeholders in tourism planning decisions; • changes to traditional family and community life; • shifting dynamics of authority and power.	Rivers and water ways: • pollution due to solid waste; • pollution due to liquid waste (esp. raw sewage); • pollution from oil and fuel for boats; • increased water consumption , more extracted from rivers and groundwater. Infrastructure: • improved roads and bridges; • improved medical and educational facilities; • improved utilities: electricity and water supplies; Urban Development: • new buildings; • increased traffic and congestion; • increase in unplanned building; • erosion of river banks (from increased general use and building of guest houses etc); • wells for hotels lowering water table. Biodiversity: • Increased trade in wildlife at borders.

3. Future management

3.1 Tourism development alternatives in the LMB

As indicated earlier, many types of tourism occur within the LMB, even within LMB countries, ranging from large-scale tourism in urban centres, destinations where tourism is only one out of the livelihood strategies, areas where small scale, locally owned tourism enterprises predominate, to isolated sites exposed only to a few tourist visits. In Thailand, for example, tourism is developed in the south but less in the north-east and the north, triggering policies to increase cultural tourism and ecotourism, respectively. In Vietnam, too, ecotourism is a form of nature-based tourism much promoted, especially in the national parks. Indeed, it is a major focus throughout the LMB.

Three of the four key components in the ADB GMS programme for tourism, infrastructural development, trans-border co-operation, and institutional strengthening and implementation assistance - encourage all forms of tourism development, but the fourth, community-based tourism (CBT), is concentrated on small scale tourism projects outside the main tourism centres. Specifically designated as 'pro-poor,' it has been especially successful in Lao PDR (Harrison and Schipani, 2007 and 2008; ADB, 2008).

Other aid agencies similarly portray CBT and ecotourism as forms of tourism that most benefit the poor (ESCAP, 2001), advocating ecotourism in such rural areas as Pak Beng (Lao PDR), Had Bai (Thailand) and Hung Phong (Vietnam) (CUC UEM, 2001; TDMOG 2002a and 2002b). SNV, in particular, in partnership with ADB, has numerous projects in the LMB, especially in outlying provinces in Lao PDR but also in Cambodia and Viet Nam and CCBEN (the Cambodia Community Based Ecotourism Network), with 33 members, is active throughout Cambodia. In Ratanakiri, Cambodia's 'ecotourism province', Yeak Laom Community-based tourism, funded by Canada's International Development Research Centre and the Australian Aid programme, led the way, but improved air and road links and a recently-opened international border crossing with Lao PDR have created new opportunities and new risks, while in the adjacent province of Stung Treng, the forest conservation area of Virachey National Park (BPAMP, 2006) and the Stung Treng RAMSAR site (Bauld and Soriya, 2006) are also considered ripe for ecotourism development.

3.2 Management issues and recommendations

More work clearly needs to be done on how to most effectively address the particular impacts related to tourism seen at the selected sites and beyond. Some impacts are relatively easy to address, and require quite straight forward (and relatively non-political), practical actions. This category might include the updating of a town's sewage system, like that being undertaken in Siem Reap, for example. Few stakeholders would disagree that such a plan would not benefit the local community significantly or believe that it would produce significant

negative impacts in itself (though some may be evident). Other impacts are much more complicated to address and are complex issues in their own right. Take, for example, the issue of inequality in wealth distribution as demonstrated at the Case Study sites. Stakeholders at all levels are likely to have widely differing views on how to tackle such an issue, or may indeed wish not to tackle it at all.

Similarly reflecting the complexity of resource management of this nature, there is the issue of how to promote impacts deemed largely positive by stakeholders ensuring that popular spin-off's from tourism development remain just that and do not turn in to problems over time. 'Positive' and 'negative' impacts are subjective. They are inextricably linked and not always easily compartmentalised. A new restaurant, for example, though helping to alleviate poverty for some may also be inadvertently promoting it for others by polluting water related resources on which others depend at a more basic level (e.g. for subsistence food). Similarly, improved roads may largely be hailed as a positive impact on local communities, but they may increase access to previously more remote areas bringing unknown effects to vulnerable minority communities and wildlife, for example.

Achieving consensus on how best to address these issues will be a complex task. It will involve much higher levels of coordination and cooperation between stakeholders than currently exists and a corresponding step-up in capacities at all levels.

Identification of priority actions is an important first step toward the formulation of management plans, but this is no guarantee of effective implementation. This is reliant on the strengthened capacity of both institutions and individuals in order to engage fully, and in partnership together, in the management process regarding these shared resources.

With maximised participation of stakeholders at all levels, a feeling of 'ownership' of the issues at stake begin to develop and management interventions are more likely to be fully understood and supported. It is on firm foundations of this nature that more specific interventions may be effectively implemented, monitored, evaluated and adapted as necessary. These may include activities such as the 'priority actions' relating to specific impacts as detailed earlier in the report and other broader actions such as those detailed below.

- Engaging with, and improving capacities of, or in some cases, creating, community groups whose foci include tourism and the impacts of tourism in their community. (Women's and Farmers groups at Tram Chim National Park, Viet Nam have long been exerting positive influence on the park and it's management).

- Forming a committee made up of local-level stakeholders whose sole interest is to engage in the planned management of tourism in their area. Perhaps 'warden' type figures could be given a paid role to oversee such a project.

- Guidelines for all aspects urban and land-use planning (including water and related resources), where possible supported by law, formulated with participation of

stakeholders at all levels and rigorously implemented and enforced, need to be agreed upon.

Certain measures need to be taken to create the kind of management environment necessary to deal with multi-dimensional development scenarios such as these. In order to create a strong platform on which management decisions may be based, the following steps should be taken:

- Increase cooperation between International NGO's, local and national governments and stakeholders operating at all levels, towards effective management at tourism sites.

- Develop capacities of local, national and international partners and staff working in government and non-governmental institutions to be able to effectively engage in the entire management process, from planning to implementation and monitoring and evaluation stages.

- In particular, develop capacities of local level stakeholders in local communities to be able to contribute in an effective and meaningful way to the management process from planning and implementation to monitoring and evaluation stages.

In short, the effective and continued sustainable implementation of planned management interventions is dependent on the existence of a strong institutional base working in partnership with communities effectively representing themselves. This will go some way to ensure approval of and commitment to the on-going management processes relating to the LMB's shared water and water-related resources.

3.3 The role of the MRC

MRC has a clear interest and expertise in tourism's links with the biophysical environment, and trans-boundary issues are inherent in the ownership and management of natural heritage. Biodiversity carries no passport. Many important national parks in SE Asia are on the North-South borders of Viet Nam, Lao PDR and Cambodia, where shared species and biodiversity are subject to different national policies and administration. The LMB is an ecological sub-system, in which upstream activities have an impact on downstream regions, irrespective national boundaries.

The impacts of tourism on the environment of the LMB indicated in the case studies, most notably its water and related resources relate to pressure on waste water and sewerage systems, litter and problems in garbage disposal, and water pollution thus threatening people and ecosystems. The 'nature' sites may see fewer tourists and therefore experience less pressure on their water resources but the ecosystems are on the other hand more vulnerable to pollution and disturbance.

The water quality monitoring system of MRC covers 87 monitoring stations across the basin. This includes monitoring stations at the three major tourism sites mentioned above. With and increasing tourism development pressure on the water resources will increase. MRC could have a role in line the 1995 Mekong Agreement in coordination of water quality monitoring and special studies at tourism centres throughout the basin will enable water quality to be tested regularly throughout the year, including dry and wet seasons, to produce data that demonstrate the impact of hotels, guest houses and other tourism facilities on water and related resources.

As international and domestic tourism increases, it seems likely that fragile trans-boundary wetlands will be increasingly threatened, clearly making their management with regards to tourism an interest area for the MRC. There might be a role for MRC to become involved in promoting certain kinds of sustainable tourism development and provide technical support across the board to help improve the capacity of stakeholders managing these resources.

Boat transport tourists and residents on the Mekong River.

Among the case studies, Tram Chim, in Vietnam, could be highly attractive to the nature-loving tourist, and controlled ecotourism development could bring economic benefits to people in the buffer zones and assist in conservation efforts. Other examples of cases which would benifit from continued MRC support include:

1. At the transboundary wetlands of Siphandone and the RAMSAR site of Stung Treng and Kratie, conservation, tourism and hydrology come together in a fragile environment. Numerous species are under threat, including the Irrawaddy Dolphin, the Mekong Giant Catfish, Sarus Crane and the Siamese Crocodile, especially from the

possible construction of the Don Sahong dam in Lao PDR, upstream from the border with Cambodia. IUCN have argued that if this dam goes ahead it could have severe consequences on the wetlands. The Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme estimated that of 26 mammals at the site, 18 are threatened, along with 17 bird species and 23 reptiles. In such circumstances, tourism is a more environmentally-friendly alternative to other forms of development. This area was selected by the MRC Member Countries as one out of 7 critical areas/issues for dispute prevention and conflict management. One of the aspects of the potential dispute is the sharing of tourism attractions (the Dolphin pool) and the potential impacts of management of other resources in the area (fisheries and wetland management).

2. Tonle Sap also has trans-border implications. The health and vitality of the Lake is dependent, in part, on what happens upstream, and there are concerns about the impact of planned basin development on the productivity and integrity of the ecosystems of the Lake;

3. Wildlife species that are threatened through local consumption or cross-border trade in wildlife products, for example, as reported for Chong Mek in Ubon Ratchathani, and will be more at risk with increased road access in the region to facilitate tourist movement across borders.

MRC participation could also be beneficial in Thoi Son Island, where extensive tourism development could radically change the current balance of tourism and agriculture. In both cases, the MRC would be acting in terms of its mandate, which is protect the LMB's water and related resources and to promote the sub-region's economic development.

3.4 Conclusions

Tourism in the LMB has become an important driver of economic growth and much of it will increasingly be focused on water and water-related resources.

When compared with industrial development, logging, population growth and agricultural pesticides, tourism seems to be having a relatively minor impact on water and related resources of the LMB. The water quality in the Mekong is generally good, referring such problems that do exist on upstream dams, small-scale reservoirs and agricultural fertilisers (MRC 2008a). However, the Case Study sites have clearly indicated a number of significant, if not yet 'large-scale' impacts.

Certain impacts may have an increasingly detrimental affect in future decades unless effective management strategies are put in place now. Preventative or remedial actions are evident only at a few of the sites, and these tend to be the more established ones, such as Siem Reap and Luang Prabang.

Impacts deemed positive by stakeholders need to be encouraged (for example, the promotion of sustainable eco-tourism and improvements in infrastructure) whilst at the same time being aware of their own possible negative knock-on effects if mismanaged.

Management priorities need to be identified and applied. In order to ensure effective management of tourism, capacity must be built at all levels to ensure that all parts of the management process, from planning to evaluation, are efficiently executed. This is the responsibility of goverments and local authorities working with communities. Substantial support is provided through the GMS tourism activities, the ASEAN cooperation and bilateral donor assistance.

The MRC clearly has an active role to play working in partnership with all relevant stakeholders to support the decision making processes regarding the sustainable management of water and water related resources at tourism sites paticularly is areas where transboundary issues are discussed. In a technical capacity, the MRC could have a role in line the 1995 Mekong Agreement, in the coordination of water quality monitoring. Studies of water quality at tourism centres throughout the basin will produce data that will hopefully demonstrate the impact of hotels, guest houses and other tourism facilities on water and related resources and support improved management.

Although the findings of this report cannot, of course, be considered definitive, there are sufficient indications of tourism's growing importance in the sub-region to prompt concern about its impacts, especially if certain trends are unchecked. At the same time, there is great optimism that, if properly planned and monitored, it will lead to benefits in the biophysical, economic and socio-cultural environments.

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