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The World Bank **Asian Development Bank**

WB/ADB JOINT WORKING PAPER ON FUTURE DIRECTIONS FOR WATER RESOURCES MANAGEMENT IN THE MEKONG RIVER BASIN

MEKONG WATER RESOURCES ASSISTANCE STRATEGY (MWRAS)

The Mekong Water Resources Assistance Strategy is being developed by the World Bank and the Asian Development Bank. This working paper is for comment.

June 2006

ABBREVIATIONS AND ACRONYMS

AAA	Analytical and Advisory Activities
ADB	Asian Development Bank
AFD	French Development Agency
ASEAN	Association of Southeast Asian Nations
Ausaid	Australian International Aid Agency
BDP	Basin Development Program (of MRCS)
CAS	Country Assistance Strategy
CEO	Chief Executive Officer (of MRCS)
CMU	Country Management Unit
CPRSC	Country Poverty Reduction Strategy
Danida	Danish Interntional Cooperation Agency
EAP	East Asia Pacific
EP	Environmental Programme (of MRCS)
FFO	Fish Feeding Opportunity Index
GEF	Global Environment Facility
GMS	Greater Mekong Sub-region (Initiative)
GTZ	German Development Cooperation Agency
IDA	International Development Association
IUCN	The World Conservation Union
IWRM	Integrated Water Resources Management
JC	Joint Committee (of the MRC)
LENS	Laos Environmental and Social Project
LMB	Lower Mekong Basin
MARD	Ministry of Rural Development (Viet Nam)
MONRE	Ministry of Natural Resources and Environment (Thailand, Viet Nam)
MOWRAM	Ministry of Water Resources and Environment (Cambodia)
MRC	Mekong River Commission
MRCS	Mekong River Commission Secretariat
MWRAS	Mekong Water Resource Assistance Strategy
MWARP	Mekong Water Resources Partnership Program
NMC	National Mekong Committee
NT2	Nam Theun 2
NTSEP	Nam Theun 2 Social and Environmental Project
OECD	Organization for International Economic Cooperation and Development
RBC	River Basin Committee
RBO	River Basin Organization
SIDA	Swedish Development Agency
SWOT	Strengths—Weaknesses—Opportunities—Threats analysis
TA	Technical Assistance
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
WUP	Water Utilization Program (of MRCS)
WWF	World Wildlife Fund

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EXECUTIVE SUMMARY

The Mekong River is very much present in the social, economic and cultural life of the four countries of the Lower Mekong Basin (LMB), and shapes the economic prospects of these countries and their mutual relations. Similarly, it has a major impact on the south-western part of PR China, especially Yunnan province. It counts among the 20 largest rivers in the world, but stands apart because of the extreme fluctuations in seasonal discharge: very low flows in the dry season, yet extensive flooding in the wet season which nurtures the basin's huge wetlands such as the world famous Tonle Sap in Cambodia. Much of the annual flood pulse along the river in the LMB countries is imported from upstream, so that disruptive flooding in Cambodia may occur while nearby fields at the same time are unproductive—as for long periods of the annual dry season—for want of water.

The goal of the Mekong Water Resources Assistance Strategy (MWRAS) has been to prepare a short to medium-term (5-7 years) operational strategy aimed at the Mekong River Basin, and to outline the principles for a longer-term strategy. The Strategy seeks to only identify additional initiatives that add value to, or stimulate regional sustainable water use and cooperation. It adds to, and gives guidance to the existing or planned country sector programs, but does not supplant these. The riparian countries that share responsibility for the Mekong River Basin (and also the ADB's Greater Mekong Sub-region Initiative) include: Cambodia, Lao PDR , Thailand, Viet Nam, Myanmar and Yunnan Province, China. The first four cover the Lower Mekong Basin (LMB) and are the members of the Mekong River Commission (MRC) that was established in 1995; Myanmar and PR China have Observer status to the MRC.

The bottom line message of this Mekong Water Resources Assistance Strategy is that the analytical work on development scenarios[1] has, for the first time, provided evidence that there remains considerable potential for development of the Mekong water resources. The Mekong basin has flexibility and tolerance, which suggests that sustainable, integrated management and development can lead to wide-spread benefits. This may contrast with the more precautionary approach of the past decade that tended to avoid any risk associated with development, at the expense of stifling investments. The study highlights that development and the ensuing changes in water use may have negative but also important positive impacts. Therefore, the study encourages decision-makers to found their policies on the economic, environmental and social dimensions of the *trade-offs* that emerge when water use is changed. At the same time, the study articulates better what the major risks for the environment and for the livelihoods of communities dependent on the Mekong's fisheries may be. These issues require cross-border cooperation to manage them properly.

"Balanced development" should be the driving principle for the management and development of the Mekong River water resources in the coming years. This will require addressing the trade-off choices—thus far avoided thanks to the buffer potential of the

[1] Modeled Observations on Development Scenarios in the Lower Mekong Basin, The World Bank, Washington, DC, November 2004.

river and the very low development levels—that will need to be made between economic, social and environmental values; between the competing interests of the riparian countries; and between the different sectors and beneficiary groups at the sub-basin level. Importantly, the benefits of investments or water management decisions need to be distributed more equitably, through seeking win-win solutions, through complementary programs, or through compensation. This can be achieved by applying the resource management and planning principles of Integrated Water Resources Management (IWRM). Water resources management capacity is still in development in the four countries and experience with the application of IWRM is limited, although capacities differ between the countries. IWRM focuses on the catchment or sub-basin as coherent unit for planning and management, explicitly recognizes competing interests, and emphasizes the need for community participation, governance, and management at the lowest feasible administrative level. Critically, many of the critical sub-basins cross borders or are otherwise shared by two or three riparians, thus creating the opportunity to seek win-win solutions.

The Strategy emphasizes positive opportunities and the potential to balance the risk- and investment-averse attitudes of the past decade, and to stress the benefits of cooperation. It also argues that (a) much has been achieved in the region that is essential and positive, (b) that these achievements are, however, far from sufficient to address the upcoming challenges and capture the opportunities, and (c) that, unless serious attention is given by the development partners to the present institutional dynamics in the Mekong River management, there is a high likelihood that the progress made in building cooperation among the riparian states will dissipate.

The Mekong River Commission (MRC) is a key regional institution which has shown major strengths but also substantial flaws and weaknesses. If the MRC fails to live up to its members' expectations that it should grow into an organization capable of supporting the countries in making wise decisions for balanced investment and integrated management of the water resources, the current, growing level of trust in regional cooperation will be undermined. It will require both will and capability of all the riparian countries and the organs of the MRC to work assiduously and collaboratively in fulfilling the tasks of developing the basin, providing for watershed and environmental protection, developing the capabilities for integrated water resources management across countries and sub-basins, and strengthening governance in the collective stewardship of the basin. Development partners have a special responsibility to foster and facilitate this cooperation; over the past year the Banks have come to be more perceived as effective champions for this aim, partly because of their professional resources and partly because of their potential to steer investments in appropriate directions.

At present, active pursuit of national interests though their own actions or bilateral deals by the lower Mekong countries and by China, together with the weaknesses that persist in the MRC organization, threaten the viability of the vision and expectations set forth in the 1995 Mekong Agreement among the four lower riparian countries. The construction of dams in the upstream reaches in Yunnan Province and the recent approval of the Nam Theun 2 project have brought public attention to the risks of uncoordinated development of the Mekong. Active planning by Thailand to pursue water diversion of

water from the Mekong and Salween basins, together with Viet Nam's steps towards further dam construction on the Ya Li (Sesan) and Serepok rivers, signal the intentions of these countries to move ahead with development projects, possibly irrespective of regional considerations. Although all the LMB countries are visibly more engaged in the MRC, at the same time there is also a growing impatience and tendency to view the MRC as more a hindrance than a help (with MRC being perceived as a regulatory agency imposing rules, instead of helping solve problems). MRC itself has not yet acquired the expertise, organizational capacity or analytical tools to facilitate the negotiation process among the countries; and, despite good progress in the past five years, to put basic cooperative frameworks and an effective decision-support system together. The new Strategic Plan of the MRC for 2006-2010 provides a better articulated vision and program for moving this agenda forward, although it falls short of being comprehensive and specific, and addressing key development decisions. However, the organization—both at the technical level and at organizational management level—is going to need considerable outside assistance.

To mitigate these risks and seize the opportunity to move the whole system for cooperation and management of Mekong River Basin to a new level and higher standard, leadership will be needed to help the countries and MRC overcome the challenges they face. Thus the conclusion of the MWRAS is that, through a collaborative effort, both the World Bank and the Asian Development Bank should respond to this demand at this critical juncture, complementing the work that is being done by other development partners. This will require a management commitment for at least the next 5-7 years, willingness to build a team and mobilize the resources to develop and implement a multi-faceted program of activities in partnership with the countries, MRC, civil society and other development partners.

The Assistance Strategy for the next 5-7 years would be guided by the following principles:

- A start must be made to set up capacity at the MRC and at the country levels to facilitate planning for "balanced development" of the Mekong Basin water resources.
- Activities are to be initiated—both in terms of capacity building and in encouraging the countries to seek cooperation in the actual management and development of the shared, cross-border sub-basins—with the objective to strengthen trust and cooperation among the stakeholders. The MRC as cooperative endeavor and unique sign of commitment to regional cooperation on international waters deserves to be further supported.
- The IWRM institutional frameworks and capacities must be strengthened at the regional (MRC), national and sub-basin levels.
- Governance and community participation are at the same time key objectives, and instruments to achieve IWRM goals.
- The knowledge base for managing the Basin must be further developed, recognizing the critically important role the MRCS and the development partner-supported programs have played thus far in shaping the regional dialogue.

- Human resources in water resources management are generally weak but especially in Cambodia and Lao PDR need to be developed to ensure that each country can develop confidence that it can engage in negotiations with its riparian neighbors on Mekong management, and is able to manage its share of the resource to its own nation's interest.
- Development partner support is large but would benefit from better harmonization and alignment.

The Assistance Strategy proposes as next step, an implementation plan through a *Priority Action and Dialogue Framework 2006-2010*, that would be supported by the *Mekong Water Resources Partnership Program (MWARP).* The MWARP will need to be further articulated. Its activities would comprise, notably:

- Support to the MRC Secretariat, and the Joint Committee. This would focus on strengthening their capabilities to translate scientific knowledge into information that can influence key decision makers in the four countries and inform resource management policies and programs for sustainable development. A key component would be the successor project to the on-going, successful Water Utilization Program, managed by the World Bank and financed by GEF. Furthermore, the MRC's own IWRM capacity, and its organizational structure and governance, would be supported as well. Importantly, environmental and social safeguards would be mainstreamed in the MRC's activities, strengthening its capacity to carry out strategic and programmatic work instead of approaching investments as discrete isolated interventions.
- Cooperation with each of the four countries, to further strengthen their water sector institutions and regulatory frameworks, River Basin Committees, and IWRM capabilities.
- Preparing for concrete water management and development at the vast scale of the Lower Mekong Basin is, however, cumbersome. For practical shaping of management programs, the sub-basin or sub-regional scale is more appropriate to focus the attention, and allow identification of win-win situations. Three sub-regional areas are identified that, taken together, have the potential to offer fresh perspective for all four countries to move forward: (i) the large Mekong sub-region shared by Thailand and Lao PDR , where both countries have similar interests and that could potentially be managed to address the water shortage in Thailand's North-east, providing water sharing benefits to Lao PDR; (ii) the sub-basins of the Sesan-Serepok shared by Cambodia and Viet Nam, and the adjacent sub-basin of the Sekong shared by Lao PDR and Cambodia, and with economic interest of Viet Nam, where community-driven development and natural resources components can meaningfully complement and add value to "heavy infrastructure" investments such as hydropower; and (iii) the flood/navigation/ agriculture/wetland nexus in the delta, shared by Viet Nam and Cambodia.
- Preparing a Regional Investment Priority Review.
- Gradual engagement with China as upper riparian, through technical cooperation initiatives.

- Developing other regional networks, notably on human resources development.
- Continued, and deepened dialogue, among the development partners, and with the countries, as well as structured dialogue with civil society.

The World Bank and ADB would regularly update the Assistance Strategy, and in general work closely with the other development partners to pursue this overall agenda. The MWARP Framework is in development. The proposed activities are in different stages of preparation, and although some are being initiated, the Framework as such will need to be further developed and clarified further in 2006/2007. WB and ADB are considering supporting selected components, and are initiating studies to test and refine the principles of sub-regional cooperation outlined in this working paper. They will explore interest and readiness of other development partners to support this Framework.

A key issue for the near future, however, is to achieve proper alignment of the regional and the four country sectoral policies, which for the moment is weak. The four countries have committed to further deepen their cooperation, and the international community can provide meaningful support in the articulation of the potential mutual benefits of joint action.

PURPOSE

1. The goal of the Mekong Water Resources Assistance Strategy[2] (MWRAS) is to prepare a short to medium-term (5-7 years) operational strategy aimed at the Mekong River Basin, and to outline the principles for a longer-term strategy. In the longer term, this strategy will also help set the stage for addressing issues with the other water basins of the Greater Mekong Sub-Region (GMS), i.e., the Red River, the Irrawaddy and the Salween. The riparian countries that share responsibility for the Mekong River Basin (and also are comprised in the GMS) include: Cambodia, Lao PDR , Thailand, Viet Nam, Myanmar and Yunnan Province, China. The first four cover the Lower Mekong Basin (LMB) and are the members of the Mekong River Commission (MRC) that was established in 1995; Myanmar and PR China have Observer status to the MRC

2. The Mekong Water Resources Assistance Strategy (MWRAS) is the result of a joint effort of the World Bank (WB) and the Asian Development Bank (ADB) to articulate a coherent strategy to assist the Mekong countries in sustainable management and development of their shared water resources. The report addresses the urgent need for improvements in management of water resources in the Mekong River Basin, building on the achievements of the past 10 years since the signing of the Mekong Agreement in 1995. On one side it stresses a strategic outlook for regional cooperation and development, where international development partners, civil society representatives and agencies can contribute meaningfully in a regional partnership. On the other hand it emphasizes that the countries are the sovereign entities with the authority over their natural resources and taking the ultimate responsibility for the management and investment decisions.

3. The report is based on a series of sector and country analyses (see Annex 1). There are numerous stakeholders in the Mekong River Basin and each is a key decision-maker but on only a part of the water resources, yet none has an oversight over the aggregate basin, or on the impacts of its own actions on its neighbors' interests or on the environmental values. They have limited institutionalized experience with Integrated Water Resources Management (IWRM), certainly not of international rivers. Therefore, the MWRAS relies heavily on stakeholder consultations conducted through Strategizing Workshops[3] carried out in 2004 and 2005 by the Banks, which in turn are informed by

[2] . The preparation of a Mekong Water Resources Assistance Strategy (MWRAS) was endorsed by World Bank management in July 2004.

[3] The MWRAS is based on analytical assessments and intensive stakeholder consultations to evaluate strengths, weaknesses, opportunities and threats (SWOT) for each country and for the region, in future management of the Mekong water resources. The analytical assessments included: (a) analysis of the regional dialogue over the past decade in the MRC context since the signing of the Mekong Agreement in 1995 that established the MRC; (b) institutional assessment of the progress the MRC Secretariat (MRCS) made in supporting an effective basin management organization, in relation to international good practices; (c) assessments of Thailand's, Cambodia's, Lao PDR 's and Viet Nam's frameworks, capacities and policies for IWRM; and (d) evaluation of potential impacts of broad development scenarios on the Lower Mekong Basin using hydrological models developed and adopted by the MRC. The consultations were

studies and policy documents of the countries, the Mekong River Commission (MRC), NGOs and other development partners. This Working Paper is a consolidation of the earlier internal Mekong Water Resources Assistance Strategy drafts and the broader document *Future Directions for Water Resources Management in the Mekong River Basin.* This current report aims at a broad audience; it is intended to reflect the best current thinking on the region, guiding the actions of the Banks and development partners. This is a "living document" to be updated regularly because of rapid changes in the political and economic contexts of the region, and because the governments and the MRC are developing their policies and strategies in an incremental way as they acquire more experience and insight with IWRM in their countries and with the management of international waters.

4. Because of the strong interests of the four LMB countries in the Mekong, and their dependence on its water resources, the MWRAS focuses on these countries. The Mekong is much less of a national concern to China and even less so to Myanmar. The dialogue towards deeper cooperation with China and its Yunnan province on the Mekong is important and is proceeding gradually. Moving forward on the LMB agenda of the MWRAS, and its ensuing actions, need not await the outcome of this on-going dialogue.

THE CHALLENGES IN THE BASIN

5. The Mekong River is very much present in the social, economic and cultural life of the four countries of the Lower Mekong Basin, and shapes the economic prospects of these countries and their mutual relations. Similarly, it has a major impact on the south-western part of PR China, especially Yunnan province. It counts among the 20 largest rivers in the world, but stands apart because of its extreme seasonal discharge fluctuations: very low flows in the dry season, yet vast flooding in the wet season which nurtures the basin's extensive wetlands such as the world famous Tonle Sap in Cambodia. Much of the annual flood pulse along the river downstream comprises imported water from upstream, so that disruptive flooding in Cambodia may occur while nearby fields at the same time are unproductive—as for long periods of the year—for want of water.

6. The Mekong region and the Mekong water issues are complex. Each of the four LMB countries is currently dependent on the resource in different ways and to different degrees. Each country perceives its future water-related opportunities and risks in very different ways. Arguably, Cambodia is potentially most at risk in case of unsustainable management of the river, and that would affect in particular its poor population which depends on local fisheries for 40-70 percent of its protein intake, and on flood protection. Lao PDR, on the other hand suffers much less from floods and still has many sites

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conducted through fourteen Strategizing Workshops in 2004 and 2005 with the governments of Thailand, Cambodia, Lao PDR, and Viet Nam, with the staff of the MRC Secretariat, with regional civil society organizations representing all six riparian country perspectives, and with a group of development partners actively involved in the programs of the MRC. These activities were organized by the World Bank in close collaboration with the Asian Development Bank (ADB) and with support from the MRCS. The support and contributions of all the participants involved in this process are greatly appreciated.

potentially suitable for hydropower. All four LMB countries would be affected, in negative and positive ways, by changes in water use in Yunnan. Technical and financial capacities are also distributed unevenly between the countries. All water in the river currently serves an economic or social purpose, thus, shifting water uses to other activities inevitably will have impacts on current users. Yet, what seems to be abundantly clear is that economic growth in the region will continue at rapid pace, and this development will exert strong influence on the water system and its current users. Because of the high inter-dependencies, uncoordinated or unilateral water development can cause serious harm to the other riparian interests, to the environmental values, and, indeed, to other communities in the own country. Yet, the Mekong basin has major development opportunities, which in many cases can be optimized or come to fruition only, and contribute to the wealth of the region and of each individual country, if the countries cooperate. Thus, Mekong management requires addressing cross-border challenges, but, within each country, cross-sectoral ones as well, and it raises the need for proper IWRM policies and for river-based management at country level.

7. The Mekong River Commission (MRC) and its Secretariat (MRCS), as an endeavor of cooperation of the four LMB countries, have developed as the knowledge base on the Mekong. However, the MRCS and its parent Council, still have a long way to go before they can truly assist their member countries in taking the right decisions on Mekong management and sustainable development. The international development partner community has a long history of supporting the MRCS, and nearly all development partner and UN agencies have now strong stakes in the institution as well as in most Mekong countries. Local NGOs and representatives of civil society are still developing, with the most articulate ones to be found in Thailand, and very little representation outside government and party structures in Lao PDR and Viet Nam. Finally, well-funded international NGOs such as IUCN, WWF and Oxfam, have been active for many years already in the region, working on environmental, governance and social agendas.

8. A strictly regional analysis and perspective would prove poorly informed about the economic, social and political dynamics and priorities at the four LMB country levels. At the same time, analyses and strategies based on country information only would tend to be ill-informed about the risks and opportunities associated with the regional interdependencies. Therefore, the MWRAS has taken an iterative approach, simultaneously exploring the regional as well as the four LMB country dimensions, identifying the trade-offs between alternative water use scenarios, flagging scenarios that create undesired risks, and seeking the opportunities for win-win situations.

OBJECTIVES OF THE MWRAS

9. To respond to this overall assessment, the MWRAS preparation process has aimed to achieve the following objectives:

(i) Facilitate debate to identify opportunities and challenges for water resources management of the Mekong River Basin with the countries, MRC, development partners, and civil society, highlighting the strengths

and weaknesses of the alternative development scenarios, and articulating a vision for a cooperation structure for the future. Build consensus on the need for significant changes in the present practices for managing and developing the basin, and define a shared agenda for selected activities in the short and medium-term.

(ii) Identify platforms for collaborative action—for policy analysis, dialogue and governance, technical assistance, and investments—at the regional, national and selected sub-basin levels. Provide a blueprint for the pursuit of a common strategy and a basis for improved coordination, in a "partnership" context.

(iii) Articulate a framework for intensified support from the international community. Identify ways in which development partner assistance can be more effectively mobilized and harmonized in meeting the future Mekong Basin water resources agendas. Define a future role and possible work program for the WB and ADB in this agenda, and work out the implications for the relationships with major partners.

10. The MWRAS does not attempt to make a comprehensive "technical" analysis of the hydrological and environmental features of the basin and development opportunities in a master plan fashion. Part of such material is described elsewhere through on-going studies by other organizations. The outcomes of these studies remain to be shaped through technical analysis, integration of basic information, and through exhaustive consultation processes to seek financial and political prioritization of actions. MWRAS seeks to provide a framework to guide priority activities, but it does not claim to encompass all initiatives that are pertinent or meaningful to regional cooperation.

THE REGIONAL CONTEXT

The Mekong River Basin: Natural Characteristics and Trade-offs Between Uses

11. The Mekong River Basin (Fig. 1) is a precious resource, notable for its unique hydrological characteristics, environmental values, and economic importance for the 275 million people who live in the Greater Mekong Sub-Region (for salient basin data, see Annex 2). It counts among the largest rivers in the world. Although not the largest river by any measure, the Mekong itself, as well as most of its tributaries, is characterized by extreme discharge patterns: very high flows in the wet season, but reduced to a relative trickle in the dry season. This peaking behavior shapes a critical feature of the basin and, thus, of its "natural economic environment"—it has vast flood plains that are seasonally inundated, creating one of the most productive inland fisheries on earth.

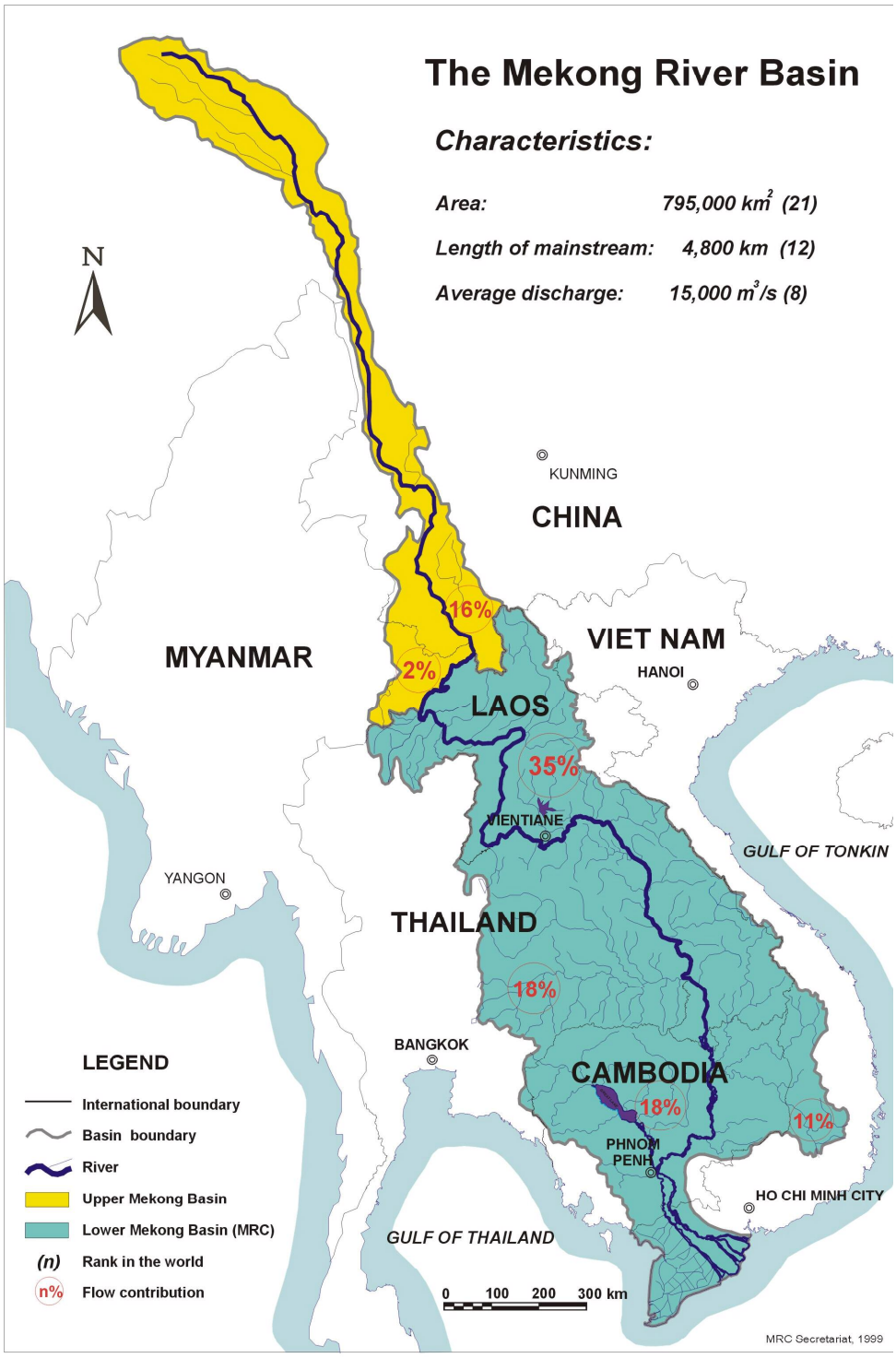

Fig. 1 Hydrographic map of the Mekong basin, with indication of the Mekong River and main tributaries, and flow contribution by country (Source: MRCS).

12. *Floods and droughts*. The hydrographs of the annual flow cycle of the Mekong River at three strategic points—Nong Khai in Lao PDR on the northern part of the Lower Mekong, and Kratie in Cambodia above the Tonle Sap—illuminate the peculiar dynamics of this system (see Annex 3; Tan Chau's hydrograph not shown). Both hydrographs demonstrate the high seasonal volatility in flows, with the peak of the wet season flow amplified by the conjoining of snow melt from the Himalayas with monsoon rains in the Lower Mekong Basin. The pattern is least pronounced at Nong Khai, reflecting the fact that only 18% of the total discharge of the Mekong originates in China and Myanmar. The pattern is most pronounced at Kratie, reflecting the addition of 53% of the total flow in the basin that originates in Lao PDR and Thailand. The mitigating effects of the natural reservoir of Tonle Sap on flows in the Mekong Delta account for the difference in the hydrographs at Kratie and Tan Chau.

13. Flood management and mitigation during the wet season are high priorities for both Cambodia and Viet Nam, but less critical for Lao PDR, Thailand, and the upstream countries China and Myanmar. However, floods have both positive and negative in these countries as they nourish the wetlands sustaining fisheries and biodiversity. Abstraction of water for irrigation during the dry season is a priority for Thailand, Cambodia and Viet Nam, while for Viet Nam this interest must be traded off against the damage caused by saltwater intrusion into the delta. Thailand's latest national policies suggest substantial water diversion from the Mekong basin to its dry Northeast (partly outside the basin). Cooperation on flood prevention and mitigation measures during the wet season, and competition for abstraction of Mekong water resources during the dry season, are thus two major drivers for water resources relations among the lower Mekong countries. To date, an acute sense of competition has not yet materialized; however as most of the "natural buffer capacity" in the river flow has been appropriated, such competition and trade-offs will become inevitable in the near future.

14. *Fisheries*. Fisheries are a particularly important part of the Mekong water resources system and are intricately linked to the wetlands in the basin, the aquatic biodiversity, and the livelihood of numerous communities. The Mekong mainstream and tributaries harbor one of the World's most diverse and prolific natural fisheries. The seasonal flooding of the wetlands and floodplains (covering almost 10% of the basin) are critical determinants of the high productivities of the natural fisheries and also dry season agriculture. These fisheries are the main source of protein intake and key to the livelihood for the 55 million people who live in close proximity to the river. Local communities in particular have a major stake in the way the management of the Mekong impacts fisheries and local ways of life. This is most important for Cambodia where most of the population depends on the fisheries of the Mekong River and Tonle Sap for their food supply, but where large quantities of dried fish are exported to Thailand and Viet Nam as well. Fisheries are economically and culturally important for communities throughout the basin, but many potential developments will affect the flooding patterns and hence the natural fiheries productivity. Therefore, trade offs between flood protection and losses and/or gains in the fisheries must be considered. These are a major reason why regional cooperation among the countries will be necessary. In addition, the

close link with livelihoods implies that national-level development policies will need to be closely tied to participation at the local level to properly address community concerns.

15. *Hydropower and reservoirs.* Another major driver of national interests in the Mekong River Basin is hydropower potential. While China provides only 16% of the total discharge of the Mekong system, the length and elevation of the river through remote areas of Yunnan Province has motivated Chinese plans for a suite of main-stem dams for power generation to meet rapidly growing domestic demand. Since nearly all the drop in elevation of the mainstream occurs in Yunnan, it is understandable that China is pursuing its hydropower dam program on the upper Mekong (Lancang), with firm plans for reservoirs of up to 23 km^3 behind some of the world's highest concrete dams. In parallel, Yunnan province also pursues plans to construct a series of hydropower dams on the Nu, a tributary of the Salween River, which are currently subject to environmental reviews in China.

16. Most of the remaining hydropower potential in the Lower Mekong Basin is on tributaries of the Mekong. Demand for power in Thailand and Viet Nam, and on the South China Grid, has been a major driver for hydropower planning not only on the tributaries in these countries, but also for Lao PDR where domestic demand is low but power trade with neighboring countries is a major foreign exchange earning opportunity. The Mekong River in Cambodia has potential for mainstream hydropower, but even a run-of-the-river dam would inundate a comparatively large area and would have major impacts on fish migration in that stretch of the river. Such development would pose serious ecological, social and economic risks that could outweigh the potential benefits from power generation. Cambodia's rapidly growing needs for power could alternatively be met through cooperation in cross-border hydropower sharing on tributaries that originate in Lao PDR and Viet Nam and pass through Cambodia to the mainstream, such as in the Sesan, Serepok, and Sekong sub-catchments. In the same vein, the headwaters of many of the tributaries lie within Viet Nam where the hydropower potential is being developed. However Viet Nam will increasingly need to cooperate with the downstream countries (Cambodia or Lao PDR) to avoid negative impacts. More importantly, this cooperation could open opportunities for win-win investments, where the design and operational schedule[4] of the reservoirs could support downstream use of the resources.

17. *Navigation*. Navigation interests are shared by the upper and lower Mekong countries alike although the issue comprises different sub-agendas. In the lower Mekong, Viet Nam and Cambodia have a significant interest in inland water transport around the Tonle Sap and the delta, as well as in the access to the sea through the Mekong and

[4] Beside the fact that dams can create barriers to fish migration, reservoir operation can affect downstream water uses. For example, the slower release during the wet season generally means that less floodplain area gets inundated and, thus, less spawning area for fish is available. Diurnal release schedules can cause severe and abrupt changes in river flows which in turn can cause high water velocity, turbulence and turbidity that damages—or stimulates—aquatic life and erodes river bed and banks. If the dam discharges water from the lower layers in the reservoir, this water generally is much colder and anoxic and can contain toxic sulfurous compounds, thus upsetting the oxygen balance of the downstream river stretch. On the other hand, many of these negative impacts can be mitigated and sometimes turned positive if the schedule is adjusted. Discharging large reservoirs can shift flood peaks and augment dry-weather flows. This, however, can mean that some of the power production must be foregone in a trade-off.

Bassac rivers. In the upper Mekong, China and Thailand have a stated interest in the use of the Mekong for supporting their expanding trade, while Lao PDR and Myanmar have an interest in economic development and improving access to their markets for people presently living in isolated areas adjoining the river. China made an effort in 2002 to increase the number of days that the upper rapids are passable by boat, by blasting small channels in these rapids. This stirred controversy among Thai and international NGOs, which claimed that the ensuing changes in water discharge patterns would harm the local fisheries. To date no effort has been made to quantify the trade-offs between the improved navigability of certain river stretches and the assumed negative effects on the fisheries and river bed and bank stability.

18. *River morphology and sediments.* An under-researched aspect of the river system is its sediment transport, which is linked to river bed and bank stability, and the formation of sandbars and other deposits in the river. It is argued that there are two possible sources of sediments: (i) the products of the erosion of the steep valleys of the Upper Mekong in Yunnan province, which are very prone to landslides due to the high gradients, rock composition and seismic activity, and (ii) the erosion of the flatter catchments in Lao PDR, Cambodia and Thailand, that are rapidly losing their protective forest cover. The on-going GTZ-supported catchment management program at MRCS suggests that the impact of land use changes on river morphology in the LMB is relatively small. Developments that affect the balance between sediment delivery to and removal from the river system need careful study. Excess sediment can lead to turbidity, clogging up of wetlands, and formation of sandbars that hinder navigation. On the other hand, reservoirs tend to capture sediment, which lowers their economic lifetime but also reduces the deposition of fine silt downstream that fertilizes the floodplains, and may cause excessive erosion of the river bed and banks downstream.

19. *Finally,* with the exception of China, all the Mekong basin countries have both upstream and downstream interests. As such these countries experience both the benefits and risks of cross-border interdependencies. For example, Viet Nam's interests include the Mekong Delta which lies at the downstream end of the system, and also the headwaters of the Ya Li/Sesan and Serepok rivers in the central highlands which place its interests is this area upstream of those of Cambodia.

20. It is this web of partly competitive and partly synergistic interests in flood management, wetlands protection and fisheries, irrigation, hydropower, navigation, etc., that provides the context for long-term cooperation among the countries that have accepted shared responsibility for management of the basin as a whole.

21. The recently completed analytical study[5] has provided evidence, for the first time, that there exists considerable potential for the development of the Mekong water resources (Annex 3). To obtain the wider-spread benefits that the Mekong basin has the capacity to support will require the adoption of sustainable integrated management and development. The study highlights that while development and subsequent changes in water use may have negative impacts, there can also be important positive outcomes.

[5] *Modeled Observations on Development Scenarios in the Lower Mekong Basin*, November 2004

Therefore, the study recommends that decisions be based on the *trade-offs* in economic, environmental and social dimensions that emerge when water use is changed. The study also offers a better understanding of the major risks for the environment and to the livelihoods of communities dependent on the Mekong's fisheries. Capturing the benefits, and minimizing and mitigating the risks will require cross-border cooperation.

Economic and Social Development

22. The Mekong region today has significant economic potential, as well as significant challenges. Economically, it is one of the fastest-growing sub-regions of the world with GDP growth ranging from 6 percent in Cambodia and Lao PDR to more than 11 percent for Yunnan and Guangxi provinces of China (Annex 4). Lao PDR and Cambodia are still among the poorest countries in the world, and although Viet Nam, Thailand and China enjoy higher levels of income, many rural communities still suffer from poverty particularly in the Mekong region. Lack of rural transportation and limited access to electrification are major impediments to improved health care and education, and for development of the local economies. Compared to the communities in the region those in the Mekong Basin score lower on the indicators for the Millenium Development Goals, particularly low life expectancy, high child mortality and morbidity, poor access to water supply and sanitation, and poor access to education opportunities. Poor transportation and local infrastructure limit the opportunities for rural communities to improve the productivity of their land or to market their produce.

23. The region has a strong, pent-up demand for development. Demand for electric power, for instance, grows at 10-20% per year, depending on the locality. The development and management of the Mekong water can play a critical role in supporting this development; however the challenge is to find a balance between the improvement of the people's welfare and safeguarding the natural functions and productivity of the river.

Regional Institutions and Cooperation[6]

24. Since the creation of the Mekong Committee—the precursor to the Mekong River Commission—in 1957, international cooperation among the lower Mekong countries and development partners has been an on-going process despite the conflicts that pervaded this region from the 1950s through the early 1990s. The MRC was created in 1995, with Cambodia, Lao PDR, Thailand and Viet Nam as members and China and Myanmar as observers, with the objective to deal with water use and related issues in the Mekong basin. The MRC is a system, comprising (i) the Ministers Council that meets annually to take the policy and strategic decisions, and ensure that their respective national governments enact the agreed decisions, (ii) the Joint Committee (JC) at the level of Vice-Minister or Director-General, that acts as a Board, meeting several times each year to make operational decisions and to oversee the Secretariat, (iii) the four National Mekong Committees (NMCs) that liaise between the respective national government and the MRC, and which coordinate national policy and actions with regard to the Mekong

[6] A more exhaustive description of regional institutions and initiatives can be found in *Strategy Note on Economic Cooperation Across the Mekong Sub-Region*, The World Bank, April 2006.

water resources, and (iv) the Secretariat (MRCS), which houses the research and development capacity of the system.

25. Though the MRC Secretariat is still mainly grant-financed by development partners, the four member countries are seen today as taking more ownership of the MRC. Whereas the first 10 years of its existence were dedicated mostly to developing the MRCS as a center of knowledge—largely at the instigation of the development partners—the countries have been lately showing more impatience at the MRCS' weak record in helping the countries identify opportunities for development and helping facilitate investment. The new 2006-2010 MRC Strategic Plan orients the MRCS in this new direction, triggered in part by the outcomes of the MWRAS study on development scenarios. Although the JC members have considerable experience in Mekong water resources issues, the JC has so far been unable to provide sufficient leadership in the regional development debate. Furthermore the MRCS has a greater depth of technical skills than the JC members can muster, as it is staffed by senior local and international experts to carry out the donor grant-financed technical programs. Nonetheless, the JC is lately showing ambition to take greater control, and to ensure better alignment between the interests of the member countries and the work plan of the MRCS.

26. The NMCs are intended to provide the key link between the government and the MRC (their Chairman usually is member of the JC) but—accepting that the situation differs substantially among the countries—they often experience difficulty in mainstreaming the regional policies into the national sector strategies and vice versa, and they do not yet play a strong conceptual role in shaping the regional policies. Similarly, their coordination of national Mekong-related activities within their respective countries is not yet effective. This "partial disconnect" between the regional and the four national water sector strategies is cause of concern and a reason for the limited influence of the MRC in national decision-making. The root causes may lie in the general inexperience of the governments with IWRM concepts, and a lack of capacity in the technical line agencies that have strong vested interests and lack confidence in the merits of cooperation.

27. The MRCS has three core programs: the Water Utilization Program (WUP), which is World Bank/GEF-supported, the Basin Development Program (BDP), and the Environment Program (EP). WUP (closing mid-2007) intends to develop the decision-making framework and tools for the joint use of the basin's resources, including four basic Rules. The objective of BDP (closed mid-2005) was to scope acceptable development and investment opportunities in the basin applying bottom-up planning, and with a strong concern for equitable sharing of local benefits. Most of the BDP "pipeline" concerns local community-based projects and, notwithstanding that it has also incorporated some of the existing larger investment proposals, the proposals generally are discrete and separate initiatives and do not start from an integrated approach to basin planning. The proposals have often not been brought forward to the level of national planning agencies or are not mainstreamed in national investment programs. The Environment Program, which includes a world-class Fisheries Program, strengthens the framework for trans-boundary environmental management by the four Lower Mekong countries. The MRC, which relocated from Cambodia to Lao PDR in 2004, celebrated its

tenth anniversary in 2005. The MRC members requested it to become more meaningful for their national development, and the MRC has responded by emphasizing, in its draft 2006-2010 Strategic Plan, that the MRC needs to prepare itself to facilitate development investment in the Mekong basin.

28. Important outputs of the WUP include robust hydrological simulation models, a Decision Support Framework, and four Rules on Mekong Water. Of the latter, two have been enacted by all four member states without controversy, i.e., the Rule on Notification of the riparian neighbors in case of interventions in the water system that may affect the neighbors; and the Rule on Sharing of Data, which now allows a more comprehensive and reliable collection and use of hydrological information. Through a separate agreement China now also shares Upper Mekong discharge data which allows early warning for flood events. The third Rule concerns the maintenance of the minimum required flow, and, hence, the amount of water in the dry season that is possibly available for additional use while still protecting essential environmental and downstream interests. The planned reservoirs on the Upper Mekong, in Yunnan Province, will shift part of the wet season excess to the dry season flow, substantially increasing the dry-season flow. However, all countries have obvious economic interests in acquiring access to this "excess" flow and yet have no clear concept on how such flow could be fairly shared. After negotiations in 2005 this Rule was changed into a Procedure, which was signed on June 22, 2006. This intensive discussion demonstrated, for the first time, the necessity of the MRC to understand and deal with the political economy of water management in addition to the technical aspects of hydrology, hydraulics and environment.

29. The new Strategic Plan has triggered a debate on the MRC's main function. Some development partners retain reservations with respect to the MRC involvement in project development and want it rather to strengthen its regulatory and conservation roles. The countries on the other hand increasingly call for the MRC to assist in the facilitation of sustainable development. The MWRAS analysis suggests that an institution like MRC, which does not have sovereign status above its member nations, cannot function as a proper regulatory body beyond those regulations and restrictions that the members agree among themselves. Although the countries have not rejected the regulatory and conservation objectives, it is clear that a "regulatory" MRC will fail if it is perceived as unresponsive to the demand to help solve the pressing development problems of the countries.

30. While China is not a member of the MRC it has established regular consultations with the MRC Secretariat and is participating in hydrological data gathering and sharing. China signed an agreement in 2001 on navigation use of the upper Mekong with Lao PDR, Myanmar and Thailand and has recently embarked on a hydropower dam construction program on the upper Mekong (Lancang). Deepening cooperation in the relationship of the lower and upper Mekong countries has thus become increasingly recognized as an important agenda, not only among the governments concerned, but also in the press and general public perception. Similar needs exist in other river basins in the larger GMS geographical area, for example in the Salween River, where China, Thailand and Myanmar have strong interests for cooperative management the hydropower and diversion of water for agricultural use. The proposed cascade of four hydropower dams

on its Nu tributary in Yunnan has been subject to extensive debate inside and outside China during 2005.

31. The Greater Mekong Subregion (GMS) flagship programs sponsored by the ADB have also grown significantly in the past 10 years, and water resources cooperation within the GMS framework is being given more attention. Initial priority is for flood protection and management, but there may be scope for a more ambitious GMS agenda to coordinate water resources perspectives with power and transport programs within the GMS framework as discussed in the following section.

32. The LMB countries are all anxious to move forward with their development plans and are increasingly aware of environmental and social dimensions of water resources management. IWRM is being given high priority in all the lower Mekong countries however the institutional capacity to implement IWRM varies considerably and although each is making efforts to meet international standards of good-practice, more effort and capacity building is required.

THE BANKS' RELATIONS WITH THE REGION, AND LESSONS LEARNT

World Bank Involvement in the Region

33. World Bank involvement in water resources in the Mekong region has been significant but disjointed over the past decades. Historically, the WB has had a long-standing relationship with the former Mekong River Committee, primarily in executing studies that paved the way for WB lending and technical assistance in Lao PDR, Thailand and since the early 1990's, in Viet Nam.

34. The country unit and sector unit organizational structure put in place in 1997 is one factor affecting the disjointedness of the WB's activities in Mekong water resources. There are three separate country directors and sector-driven policies that work against a coherent regional and integrated multi-sector approach to involvement in water resources. The decision in 2002 to establish a regional strategy and program under a coordinating Country Director has provided the impetus for resolving these centrifugal forces, and the MWRAS is intended to help provide coherence and a framework for managing the WB's future involvements in its water-related activities in the region.

35. Some controversial WB projects have been on tributaries of the Mekong, notably the Pak Mun hydropower dam approved in the early 1990's, which was reviewed by the World Commission on Dams and illuminated the issues of fisheries impact on local livelihoods. The recently approved Nam Theun 2 project in Lao PDR is the result of a 10-year effort to ensure a large-scale hydropower project on a tributary of the Mekong could be designed and managed in a way that would ensure proper environmental and social protection, assist local rural communities, and enhance revenue management by the Lao PDR authorities. However, this project was not developed in close coordination with the MRC, leaving the WB and the ADB in a somewhat compromised position as regards perceptions of their commitment to the regional interests and processes of inter-

governmental decision-making. It is also noted that neither Lao PDR nor Thailand sought a meaningful role for MRC in the development of this project.

36. ***Country Assistance Strategies (CAS)***. While the WB has well-established processes through the CAS and Country Poverty Reduction Strategy (CPRS) preparation to integrate *country*-based poverty reduction strategies with the WB's internal work programming, there has not been adequate attention in the past to the processes of integrating overarching *regional* strategies with the respective CASs and ensuring that CASs are mutually reinforcing where there are critical cross-border interdependencies. This is particularly the case for Mekong water resources management and land use in the watershed areas. The MWRAS thus strengthens the mechanism to articulate the WB's regional strategy and goals for impact on water resources management and linkage to the CAS's for the counties involved. This rationalization would promote more efficient use of WB resources and improve development results.

Asian Development Bank Involvement in the Region

37. ***ADB's Greater Mekong Sub-region Initiative (GMS***). The Greater Mekong Subregion (GMS) comprises Cambodia, the People's Republic of China, Lao People's Democratic Republic, Myanmar, Thailand, and Viet Nam. In 1992, with ADB's assistance, the six countries entered into a program of subregional economic cooperation, designed to enhance economic relations among the countries. The GMS Program is pragmatic in its approach to regional cooperation, focusing on activities and results rather than on rules. It recognizes that each activity should contribute to the goal of regional cooperation and development in nine priority sectors: transport, telecoms, energy, environment, tourism, trade facilitation, investment, human resource development, and agriculture. The GMS program celebrated its tenth anniversary in 2002 and ADB has recently launched a new mode of cooperation for that program, with the GMS governments taking more ownership and management of sub-regional programs. This provides new opportunities to the Banks and development partners to work with GMS governments, to access the benefits of increased cooperation to achieve higher economic growth and faster poverty reduction. In addition the new modes of cooperation may provide new opportunities for sustainable management of important regional resources for future generations.

38. ***World Bank's Role and Participation in GMS***. WB's strategy is now articulated in the April 2006 *Strategy Note on Economic Cooperation Across the Mekong Sub-Region*. The WB will support the development of frameworks for joint action; their implementation through AAA, TA, capacity building, dialogue, and investment; and help ensure that what is being proposed and implemented at the regional level complements and reinforces country level activities and programs. The WB's GMS regional assistance strategy will focus on two main areas – *enhancing collaboration on Mekong water resource management*, and continued support to the *development of power trade*. The WB is also ready to provide assistance in other areas, upon discussion with the GMS governments and the ADB. Two areas where work has already been identified and is in the initial stages are support to trade and transport facilitation and analytical work on labor migration in the GMS region.

39. ***ADB's Country Strategies and Programs (CSPs).*** ADB undertakes a 3-year rolling program of CSPs and CSP Updates (CSPUs) for Cambodia, Lao PDR, PRC and Viet Nam. The CSPs for each country includes linkages to the subregional activities included in the Regional Cooperation Strategy and Program (RCSP). ADB has had significant involvement in water resource development at the country level with each of its partners, which includes financing of key infrastructure, supporting institutional development of water resources management capacity and also in promoting development of River Basin Organizations (RBOs), the latter of which also encompasses Thailand.

40. **ADB's Water Financing Initiative.** In 2003 the Camdessus report recommended that official and private investment in the water sector should be doubled. ADB has responded by developing a strong water sector pipeline in the region and, in 2006, announcing the ADB Water Financing Program (WFP) aimed at doubling ADB water investments. The WFP will deliver substantial investments in the sector and also seek to foster reform and capacity development programs.

41. **The Banks' Relations with the Mekong River Commission**. Since the Mekong River Commission was established in 1995, the WB has been among the largest contributors to the MRC. In recent years the WB team supervising the WUP project has worked very closely with the MRCS and National Mekong Committees (NMCs) to ensure successful implementation of the project. As a result, understanding of the benefits of the partnership is good as well as of the constraints faced by MRCS in its relations with the countries and development partners. As the WUP project has moved to address the more sensitive issues such as the negotiations on the Procedure for the Maintenance of the Minimum Flow, it has become apparent that increasing competition for consumptive use of water among countries, sectors and communities, will require making explicit the trade-off choices. The countries of the LMB do not, as yet, have the mutual trust and confidence or a well-developed knowledge-based decision support system to deal constructively with these trade-off choices.

42. The WB and ADB team has worked closely with the MRCS during the preparation of the MWRAS, with the goal of coordinating the MWRAS process with the preparation of the MRC Strategic Plan for 2006-2010. The MWRAS commissioned simulation of basin development scenarios was led by an external expert panel, with technical collaboration of the staff of the MRCS. The desk review of development partner dialogue and relations with the MRC was conducted by an external consultant who collaborated with the MRCS. The MRCS participated in all consultative workshops, two of which were conducted with the senior staff of the Secretariat.

43. The leadership of the MRCS recognizes that the MRC will need to become more responsive to the call from the member-countries for support in identifying and preparing suitable investment proposals, and support in making proper decisions over water management and allocation. The MRC, and the MRCS, will need to become better equipped to support balanced development of the Mekong; the CEO is eager to use the 2nd phase of the Basin Development Planning (BDP2) program to build this capability. Fundamentally this means that the MRCS will give more attention to the development

side of its mandate than in the past when most attention was given to the conservation side. It will be especially important to install mechanisms so that MRCS can assist the Joint Committee and Ministerial Council with their decision-making processes on development initiatives. There are some important questions that have arisen about how exactly to define the boundaries between the MRCS role and that of the countries in preparing investment projects on the Mekong. Both the WB and ADB have valuable perspectives to contribute to the debate and aim to take a more active role in the BDP2 than in the previous phase.

44. With the WUP project drawing to a close, and in view of the challenging agenda ahead for further organizational development of the MRC as a basin management organization, the MWRAS comes at a critical time for defining the future relationship between the Banks and MRC. There are three dimensions to this future relationship. First is deepening support to the development of the knowledge-based decision-making system through extension of the work on database improvements, refinements of modeling capabilities and further elaboration of policies and guidelines for collaborative decision-making among the countries. This includes potential involvement in the BDP2 program, or, taking leadership in the possible new to be established Division of Planning at MRCS. Second is working in partnership with MRC, countries and other development partners in development of high-priority, joint or parallel investment programs at sub-regional scales. Third is extending Bank support to the MRC Joint Committee and Ministerial Council on trust building and management of competitive interests, in addition to the capacity building support provided to the MRCS and the NMCs. It should be stressed that these dimensions are *in addition* to other on-going and highly valuable support programs, such as the Environment, Fisheries and Navigation programs.

45. The MWRAS has encouraged the MRC and the MRCS to revisit the structure of the Secretariat. Strongly influenced by development partner-financed, rather disjointed scientific and technical programs, the MWRAS recommended the creation of more functional Divisions that have specific purposes and assignments, house and integrate externally supported programs preferably, in the longer term, through basket funding. This way the MRCS can be better held accountable by its member countries. The interest of both the WB and ADB is on the interface between the scientific work carried out by the MRCS and its translation into actionable information for development decisions by governments. For example ADB is cofinancing part of the flood management and mitigation program which is expected to use the scientific information as the basis for investment programs to provide greater protection for communities in the flood prone areas of the LMB.

46. ***The experience in Nam Theun 2 (NT2)***. A number of critical lessons have been learned from the NT2 hydropower project in Lao PDR, of which the hydropower component proper is financed by the private sector. While NT2 can be viewed strictly as an energy project, its impact is much broader. The primary benefit from the NT2 project will be the incremental revenues flowing to the Government for several decades starting in 2009, and which are agreed to be used for additional spending on priority poverty reduction and environmental protection programs. Studies were undertaken to address environmental and social impacts of the hydropower plant. ADB's Cumulative Impact

Assessment showed that longer term effects of seemingly unrelated discrete interventions can have significant negative impacts on the downstream water system if not well managed. The project was found to impact on the local natural resources, such as fisheries, overall environment, forestry and bio-diversity, and on social dimensions (such as resettlement, and ethnic minorities). Thus, a comprehensive local management and conservation plan was agreed upon to be implemented by the Nam Theun 2 Power Corporation under stringent monitoring. Furthermore, the WB financed a "suite" of complementary activities in the region to mitigate negative impacts and ensure that local communities receive special support: the Agricultural Development, Khammouane and Xebangfai rural, and community development projects, the Nam Theun Social and Environmental Project, and the broader Lao PDR Environmental and Social Project. Such a multidimensional and integrated approach ensures that all potential benefits are captured and fairly distributed while minimizing the possibilities for negative impacts.

47. The NT2 project also showed the value of a thorough and open consultation process within the country, within the region, and in multiple international fora, to debate controversial issues. This was a key factor in better project and program design, as well as for its acceptance by the global community despite its complexities and potential controversies. In addition, the WB was able to provide value added in improving information sharing among countries and stakeholders, and overall in building trust.

Relations with Other Development Partners

[This section needs further elaboration to reflect the detailed contribution of other development partners to water resources in the Mekong region.]

48. Significant development partners in Mekong water resources are Japan, France, Germany, the Netherlands, Belgium, Switzerland, Sweden, and Finland, representing a diverse range of national priorities spanning navigation, fisheries research, environmental protection, flood protection and mitigation, catchment management, hydrology, and capacity building for water resources management. At region level the relations with these development partners have been essentially cooperative but unstructured, except for a parallel co-financing relationship with France, Finland and Japan in the WUP project. At country level, ADB and WB have undertaken considerable cofinancing of activities with France, the Netherlands, Sweden, Finland and the Japan Special Funds, and other grant resources are used extensively for TA within the GMS.

49. Denmark has been the largest donor to the MRC, with its emphasis on support to the BDP and the environmental and fisheries programs**.** As a second phase of BDP is being considered, and as the WB's continuation of WUP would shift its relationship with the MRC towards support of the development agenda, it could be contemplated for the Banks to develop a closer working partnership with Denmark on BDP. Australia and France are potentially critical partners for the Banks as they have been major supporters of organizational development for water resources management in the MRC as well as in the country programs.

50. At the regional level—and in contrast to the country levels—development partner coordination in general has been less developed, although the annual MRC donor consultation does provide a forum for discussion of issues relating to the MRC program and management. To date the Banks have not played a strong role in the MRC policy context. This is changing, however, as a result of the MWRAS preparation, which has introduced fresh concepts and offered a more comprehensive vision. Managing the much needed development partner alignment and harmonization, including the relationship between the regional and the national agendas will require substantial time and attention.

COUNTRY PERSPECTIVES FOR THE FUTURE

51. Developing the MWRAS included a series of Country Strategizing Workshops that provided the opportunity to articulate and review in detail the country perspectives on the future Mekong River Basin water resources issues and agenda. All consultations enjoyed strong and representative participation from senior level officials, bringing together all relevant national agencies and broad cross-cutting interests. After each workshop an extensive discussion was held with the respective Ministers. Still, the mainstreaming of regional perspectives into the national sector policies, and from there, adjusting the regional agenda to the national priorities, will require longer-term and deeper engagement with the national line agencies, in close cooperation with the respective NMCs. As highlighted before (para. 26), effective alignment inside each government of national and regional priorities has not yet been achieved and additional efforts are needed to strengthen the NMCs.

Core Common Messages

52. Regional cooperation through MRC is at a crossroads. If over the next 3-5 years the cooperation framework can be consolidated—and can be seen by the four countries to have visible, political impact, which it does not yet have—then regional cooperation will have deepened substantially. On the other hand, if this framework does not start to create such benefits, it may begin to unravel, which may in turn threaten broader GMS achievements.

53. The over-riding priority is to build trust among the countries—accepting that there will be trade-offs in Mekong water use. Following the example of the GMS initiative, there is consensus that the best way to build trust is through jointly addressing water management issues, and by cooperating on joint investment programs that are perceived as win-win. The recognition that trade-offs exist, ánd can be resolved to mutual satisfaction, is growing. This calls for more support to assist the countries to analyze trade-off issues and to address them through compromise and reciprocity. Resolving the hard trade-offs will, however, require development of higher levels of trust than exist at present.

54. Countries give priority to pursuing their national interests, but do acknowledge the importance of the regional dimension. Cambodia and Viet Nam have moved to set up bilateral consultation mechanisms to start addressing contentious issues in the Sesan and Delta sub-basins, however, these bodies are still rudimentary and need support. Thailand

is cautiously engaging with China and Myanmar on the impacts of the upstream dams, navigation and water sharing. Lao PDR has keen interests with both upstream and downstream neighbors on hydropower, navigation, dam safety and river bank stability.

55. The countries want to invest—but through "balanced development". Under pressure of strong demographic and economic development, the countries do not wish to delay making greater use of the Mekong resources. MWRAS has concluded that moving forward with water-related investments and projects is a sound way to assist countries to make good decisions for balanced development, develop their water management capabilities, and make good-governance principles operational. The integrated, multi-sectoral perspective is increasingly being accepted as a helpful framework to articulate "balanced development"—in which economic, social and environmental objectives are optimized, political buy-in is consolidated, and concerns about equity and sharing of benefits among riparian countries and among the various socio-economic groups are addressed. This framework also identifies the cases where the negative externalities of a planned investment—either for the implementing country or for the other riparians—may be difficult to mitigate or compensate within the limited planning horizon of one sector or country. In such events the framework can help identify alternative options that still allow moving forward.

56. Developing IWRM capacities in all the countries needs to be given priority. It is widely recognized that it is hard to manage the Mekong water regionally if the countries themselves do not individually have strong water management capacity. It was also recognized that Lao PDR and Cambodia will need significant assistance in developing their IWRM frameworks and capacities. The MWRAS was welcomed by all the countries, who felt this gives a new sense of urgency and additional focus to strengthen national policies and capabilities. The regional agenda supports institutional reform that is common to each nation, such as establishing sub-basin river management organizations and building strong IWRM coordination at the national level. The initiative also has helped focus on the larger strategic and resource management issues at the regional level for which each country must prepare itself to discuss IWRM with the others.

57. There is a critical need to develop knowledge networks and human resources. Managing the river and the basin in an integrated and balanced way is a knowledge-intensive and inter-disciplinary effort. All four countries have made major progress over the past decade, but still experience shortages in their knowledge base, and anticipate persistent shortages of experts as the higher education system is constrained.

Cambodia

58. Cambodia recognizes that from the hydrological, institutional and financial standpoints it is most at risk of the four riparian countries. The country's poor communities rely heavily on the fisheries in vast tracts of wetlands along the Tonle Sap, main stem and delta. The country also stands to benefit much from cross-border management and investments in its tributaries, for which it wishes to cooperate with Viet Nam. A particular feature is also that much of the flood waters are derived from the

upstream countries (including Viet Nam) and that in some provinces floods and droughts occur side by side. This calls for a fresh look at infrastructure provision.

59. The government has made great strides in strengthening its institutional water sector framework. The Cambodian NMC is increasingly integrated in the Ministry of Water, Agriculture and Meteorology (MoWRAM), MoWRAM is strengthened, and the new Water Resources Law is on the docket of the National Assembly for enactment. The government, with ADB assistance, is moving towards setting up some River Sub-Basin Committees (inspired by the Thai example), which would anchor principles of community-based resource management at local levels. ADB's Tonle Sap Initiative is making good progress with establishing a sub-regional, integrated land-and-water management structure, even though many issues remain to be resolved. Despite the plethora of studies and reports, the country has not yet formally adopted a nation-wide water sector strategy that outlines the key threats and opportunities, sets investment priorities, aims for a better integration in its sector development, and draws lessons from a decade of sector development efforts.

60. The government now proposes to proceed with funding irrigation initiatives, a pipeline including some 30 local, small-scale projects that have been prepared over the past years in cooperation with the MRCS in a consultative bottom-up procedure, as well as joint projects with Viet Nam on the Sesan River and in the delta. ADB and other development partners are very active in water programs in the country; but despite the progress, concerns remain that some of this work is too fragmented, and not yet well anchored in local policies and procedures. This issue, as well as coordination between the water and agriculture sectors is currently being addressed through the Government-donor Technical Working Group on Agriculture and Water, co-chaired by AusAid and AFD.

61. Cambodia is now establishing technical commissions with Viet Nam. One is to address better (i.e., more joint) management of the Sesan river (on which Viet Nam has two hydropower plants that affect downstream communities in Cambodia); and one for flood management on the Mekong/Bassac delta (where roads and dikes in the Vietnamese delta can back up water into Cambodia and aggravate flooding there). Both Cambodia and Viet Nam requested the MWRAS to support and guide these efforts at cooperation.

Lao PDR

62. In Lao PDR, the government is pre-occupied with improving the effectiveness of its water sector. However, Lao PDR still has a lot to do to streamline its agencies and policies, with water management currently distributed over nine agencies. Despite ADB's and AFD's support to date, progress is still slow. The inefficiencies—partly resulting from uncoordinated development partner activities—need attention lest the country will be at a disadvantage when engaging with its neighbors on Mekong water sharing. On the other hand, the country has progressed substantially where it concerns decentralized approaches, but weak capacities and lack of "concrete-action-on-the-ground" hamper testing these arrangements, and the learning from practice.

63. More than one-third of the Mekong water originates in Lao PDR, but awareness is still modest that this will bring expectations from the downstream countries with respect to erosion control and maintenance of the catchments. The government, however, now recognizes that water is not any longer a limitless resource.

64. With China, Myanmar and Thailand, Lao PDR has special interest in facilitating navigation as well as prevention of costly river bank erosion. With the Nam Theun 2 project now moving forward, much attention is being focused on hydropower, which brings the risk of unbalanced sector development. The government suggested that the WB and ADB power strategies are leading the country in somewhat different directions. Also, the government is actively seeking cross-border cooperation opportunities in investment projects with Thailand and Cambodia to build trust and acquire experience in cooperation.

Thailand

65. The Royal Thai Government has identified better water provision as its second highest national priority. The overarching concern is water shortage in the North-east, although other regions also face growing seasonal shortages. Thailand is now considering plans to augment its river water flow in the North-east by drawing water from the Mekong, or from the Lao PDR tributary the Nam Ngum. The country is also studying options for water transfer, either from the Mekong or the Salween, to the Chao Phraya basin. As in Lao PDR, Mekong river bank erosion and flood risks are serious and costly issues. River transport is seen as an important means to stimulate trade with Lao PDR, China and Myanmar. For all these activities, Thailand plans to work closely with Lao PDR, and it recognizes that relatively less well developed sector strategies and institutions in Lao PDR are a hurdle in arriving at sustainable cooperation. In March 2005 a delegation of the Ministry of Natural Resources and Environment MoNRE visited Myanmar to discuss the Salween water transfer. MoNRE intends to work at the same time on other options to improve water efficiency, such as water harvesting and conservation, and better water management institutions.

66. The Thai authorities are sensitive to the safeguards issues surrounding water infrastructure (with the experiences with former dam construction still fresh in the local memory) and believe that more integrated water management, combined with stronger local governance, are necessary to move forward. They requested cooperation to strengthen IWRM. Specifically, they requested cooperation to strengthen the new locally based River Basin Committees at the sub-basin level—viewed as key vehicles to translate governance concepts into practice. Established under the 1997 Constitution, which calls for greater local governance over natural resources, the River Basin Committees remain weak and further strengthening is needed. Under the Environment Country Development Partnership, the WB is working with Thailand on the Ping river basin, and ADB is providing support to the Bang Pakong RBC. Replicating this experience into the Mun and Chi (Mekong) sub-basins, would greatly facilitate future debates on water management. Thailand has expressed an interest in sharing its best practices with the other Mekong countries. This would help turn policy into practice, consolidate regional partnerships and build trust.

67. Thailand welcomed the development scenarios report prepared for this strategy initiative because it shows specifically that the Yunnan Province dams would have positive beside the negative impacts (e.g., increased dry-weather flow which would allow navigation and water use upstream, as opposed to the increased erosion of river banks, respectively). Thailand feels that such forecasting at smaller scale (not just across the whole basin as is currently the case with the MRCS-WUP models) is essential to underpin and guide future technical discussions between neighboring countries regarding issues that are of direct relevance to those countries.

Viet Nam

68. The Mekong features much less prominently in Viet Nam, compared to the other countries. On the other hand, Viet Nam is already a large user of Mekong water on the Sesan (Ya Li) and Serepok Rivers in the Central Highlands, and in the delta.

69. Viet Nam's strategic considerations concern among others its internal efforts to streamline its national water sector. Current national policy issues that need resolution include (i) the division of responsibilities between the Ministry of Agriculture and Rural Development (MARD) and the Ministry of Natural Resources and Environment (MoNRE), (ii) the improvement of the weak performance of three (Sub-basin) River Basin Organizations, of which one is located on the Sesan/Serepok rivers, and another in the delta, (iii) the enhanced effectiveness of the corporatized water service entities; (iv) stronger governance, and "ownership" of local governments and users, in sub-basin cooperative arrangements; and (v) resolution of contentious issues on Mekong water with Cambodia notably on the Sesan and Serepok. The government is aware that the regional political dynamics, the GMS agendas, and the role China are starting to play in both the Red River and the Mekong basins, and could in the medium term have important ramifications for the Viet Nam water sector and national development. Finally, for both Viet Nam and Cambodia, navigation and management of the Delta (which they consider to reach up to the Tonle Sap) are a high priority.

70. With respect to Mekong water sharing, the government emphasizes that they are willing to adapt to upstream changes, but insists on very early notification 5 to 10 years ahead of intentions to change flows. The Vietnamese agencies seem willing to consider upgrading existing basic bilateral technical commissions with Cambodia on the Sesan and the Delta sub-regions, but will need support. After the successful Bank-supported Delta Master Plan (1994), a new assessment of opportunities and risks is felt to be needed, possibly taking a broader scale of analysis including the Cambodian part of the delta, and the hydrological regulatory capacity of the Tonle Sap. Coordination of crop diversification between Viet Nam and Cambodia is also an issue to be discussed, with some rice cultivation possibly shifted to Cambodia, and seeking higher-value crops and products on the Vietnamese side. Agricultural development, land drainage and countering subsidence, flood protection, navigation, wetland management, and river bed conservation, would figure in such an agenda.

Civil Society Perspectives

71. The participants at the Strategizing Workshop with regional civil society (NGOs and academics of the six countries, as well as global NGOs), expressed support for "balanced development" of the Mekong River Basin where benefits accrue to all stakeholders. Importantly, they recognized that trade-offs are important. They supported the MWRAS initiative, but wanted to see the establishment of mechanisms that allow them to remain involved on an on-going basis. They will remain critical partners, especially where it concerns large development projects (e.g., hydropower). They will support programs with strong social orientation and that develop regional communication and "mutual learning" among countries. They also favor programs to build the capacity of the National Mekong Committees, and to develop monitoring tools. They value highly the efforts and transparency of the Banks, but they are still to be convinced of the openness of the MRCS, the governments and of some of the other development partners. With ADB/WB support, IUCN and the Thailand Environment Institute are preparing for a second multi-stakeholder workshop in July 2006.

72. The past year has witnessed a rapidly growing general public interest in the developments on the Mekong. Thai, regional and international NGOs, as well as international newspaper articles are increasingly vocal. Some of this interest has negative overtones partly because of poor basic information and lack of communication with the MRCS and the governments. Public involvement is increasing, and it will be important to approach this with two-way dialogue and fact-based communication.

TOWARDS THE MEKONG WATER RESOURCES PARTNERSHIP PROGRAM (MWARP)

STRATEGIC PRINCIPLES FOR MEKONG WATER RESOURCES MANAGEMENT

73. The overarching conclusions of the MWRAS are that the countries and the communities experience compelling pressures to exploit the Mekong water resources to meet various and growing needs; that the Mekong River basin does have flexibility to accommodate much of this development if well planned; that there are environmental and social risks that require careful attention and dedicated mitigation and investments to ensure equitable benefit sharing; that stakeholder interests differ and can be synergistic as well as competitive, yet win-win situations can often be identified; and that national capacities are uneven and incomplete on core competencies.

74. Based on the above analysis, the MWRAS has developed a framework of strategic principles and priority activities that are of direct relevance to “regional” cooperation and development, and focus on a program for each of the riparians, as well as on a regional agenda. This framework for action and dialogue would be implemented through the ***Mekong Water Resources Partnership Program (MWARP)***. MWARP would be, from the perspective of the WB and ADB, a five- to seven-year engagement providing the mechanism to implement and further develop this cooperation framework. MWARP does not provide a comprehensive all-encompassing list of activities. It intends the supplement, and add value to, existing and new valuable programs of MRC and national agencies. Also, in parallel with these MWARP activities, each country will maintain its own sector portfolio, responding to national, internal priorities. The objectives of the MWARP are to

(i) enable the riparian countries (initially focusing on the four LMB countries) to reach balanced judgments on the trade-off choices that are inevitable in a system where inter-dependencies cannot be avoided, through a well-developed knowledge-driven decision-support system, nurturing a culture of cooperation among all stakeholders in the basin;

(ii) move forward with sustainable development of the Mekong water resources, demonstrating that it is possible to prepare for investment while avoiding or minimizing negative impacts on the interests of other riparian countries, or on important environmental and social values;

(iii) ensure each country receives part of the benefits of cooperation across the region, and hence increases its trust in cooperation; and

(iv) create a dynamic framework of cooperation and continuing broad-based dialogue, that also opens up other opportunities for further sustainable development.

75. The MWARP prioritizes only (i) new initiatives that facilitate or stimulate regional cooperation in sustainable water management; (ii) new "packaging" and re-prioritization of country-based sectoral projects/initiatives that have increased relevance and value when promoted as part of cross-border initiatives; and (iii) country-based initiatives that are judged to be of special relevance to remove constraints for, or promote regional cooperation.

76. The MWARP Framework is in development. The proposed activities are in different stages of preparation, and although some are being initiated, the Framework as such will need to be further developed and clarified further in 2006/2007. WB and ADB are considering supporting selected components, and are initiating studies to test and refine the principles of sub-regional cooperation outlined in this working paper. They will explore interest and readiness of other development partners to support this Framework.

77. The impact of MWARP will be measured under four ***strategic results areas***: Balanced Development, Environmental and Social Safeguards, Integrated Water Resources Management, and Governance. The ***main stakeholders*** are the countries themselves, but include the MRC "system", the GMS, and other regional networks, and civil society.

Planning for Balanced Development of the Mekong Basin Water Resources

78. The consultation process for the MWRAS preparation revealed that moving forward with wise development of the Mekong River basin is a high priority for the countries and most development partners. The pressures of population growth, poverty, and regional economic integration are legitimate reasons why the Mekong River basin must move forward with development. At the same time, concerns were clearly expressed by civil society that local communities, (poor) households dependent on the abundant fisheries of the Mekong system, and ecological protection be given special care

in planning future development of the water resources of the basin. The development scenarios modeling exercise demonstrated that the Mekong river system has significant tolerance for development, including for hydropower and water diversion for irrigation.

79. One critical part of the answer to sustainable development lies in better integration of planning at the regional, national and sub-basin levels. This calls for further strengthening of the countries' institutional capacity to carry out IWRM, but also to the future role for the MRC in basin development planning that would add value and assist the countries—not taking over the roles of the countries' own line agencies and sovereignty. While the the BDP and WUP projects have contributed to the MRCS' competency in basin planning their more technical and narrow focus has not yet led to a strategic planning capacity able to guide development priorities of the countries. Neither the WB nor ADB played any significant role in shaping or supporting the BDP program, but both Banks have significant interest in its success as they are potential financiers The MWRAS has identified the need for the Banks to become more closely involved with the MRC's capacities (including its institutional set-up) to play a meaningful role in the scoping and identification of projects or programs by the countries. The MWRAS also identifies the need for the Bank and GEF to consider a successor project to WUP, to support MRCS' and NMCs' capacities to identify and resolve trade-offs in water use, scope scenarios for balanced, sustainable development at basin and sub-regional scales, and mainstream the capability to apply environmental and social safeguards in this planning. Ausaid, AFD, Danida and the Netherlands contemplate complementary management-level support to the MRCS, the JC and the NMCs.

80. The development scenarios modeling exercise undertaken for the preparation of MWRAS has demonstrated its value as a tool for decision-making. The Banks should support the further refinement of such models and also be prepared to work with the MRC in evaluating a core investment program of large-scale projects in the basin identified by the countries over a 15-20 year period to help the basin development planning process move forward. *To ensure a credible and neutral assessment, an MWARP report analyzing a Regional Priority Investment Review would be a critical contribution to this process.*

81. A first review of project and investment aspirations fielded by the countries suggests that overall (i.e., across the region and over time) a balanced mix of projects/investments should be pursued, in which the WB and ADB could be involved, and that is composed of either (i) "large" interventions that have serious externalities over large parts of the basin (requiring special mitigation of any tensions caused by these, and compensatory initiatives), and tend to have a high-technology content; or (ii) more community-based interventions, with a strong natural resources and rural development content, and in terms of geographical scale, best focused on a sub-basin or catchment of the basin. Public acceptance of an investment strategy would be unlikely if it is perceived as top-down and technocratic, and with inequitable distribution of benefits.

82. Preparing for practical water management and development at the scale of the Lower Mekong Basin with all stakeholders is, however, not feasible. The scale is too large, crowding out locally important considerations, The externalities and interlinkages

are too complex and do not allow common platforms for stakeholders to discuss their mutual dependencies and competitions. Furthermore, the key decision-makers, i.e., the countries, would not necessarily have to be involved in all issues. For example, Thailand would be unlikely to have an interest in delta issues, nor would Viet Nam necessarily wish to be involved in discussions about issues in the upper portions of the Lower Mekong. Therefore, the focus of attention at the sub-basin or sub-regional scale would be more appropriate to address such issues. Typically, such an approach would involve cross-border (bilateral or trilateral) project packages that seek win-win situations. Three sub-regional areas have been identified through the MWRAS consultations that would offer fresh perspectives for all four countries to move forward. These include(Fig. 2):

(i) The sub-basins of the Sesan-Serepok shared by Cambodia and Viet Nam, and the adjacent sub-basin of the Sekong shared by Lao PDR and Cambodia, and with economic interest of Viet Nam, where community-driven development and natural resources components can meaningfully complement existing or new "heavy infrastructure" investments such as hydropower;

(ii) The large Mekong region shared by Thailand and Lao PDR , that could potentially be managed to address the water shortage in Thailand's North-east, and that could provide water sharing benefits to Lao PDR; and

(iii) The flood/navigation/ agriculture/wetland nexus in the delta, shared by Viet Nam and Cambodia.

83. These three proposed packages meet following criteria:

(i) Economically and financially attractive to the countries that participate, and generating economies of scale;

(ii) Offer integrated packages that can deliver multiple benefits, thereby distributing the benefits more equitably, also locally, and protecting key social and environmental values;

(iii) Take a sub-basin or catchment as the operational scale, thus allow easier identification of trade-offs, and development of mechanisms to resolve them;

(iv) Create the environment to develop stronger governance institutions, such as sub-basin River Basin Committees;

(v) Aggregate financing capabilities thus not over burdening financing pipelines;

(vi) Have the potential to build regional trust; and

(vii) Broadly endorsable by all stakeholders, NGOs and civil society, thus mitigating controversy.

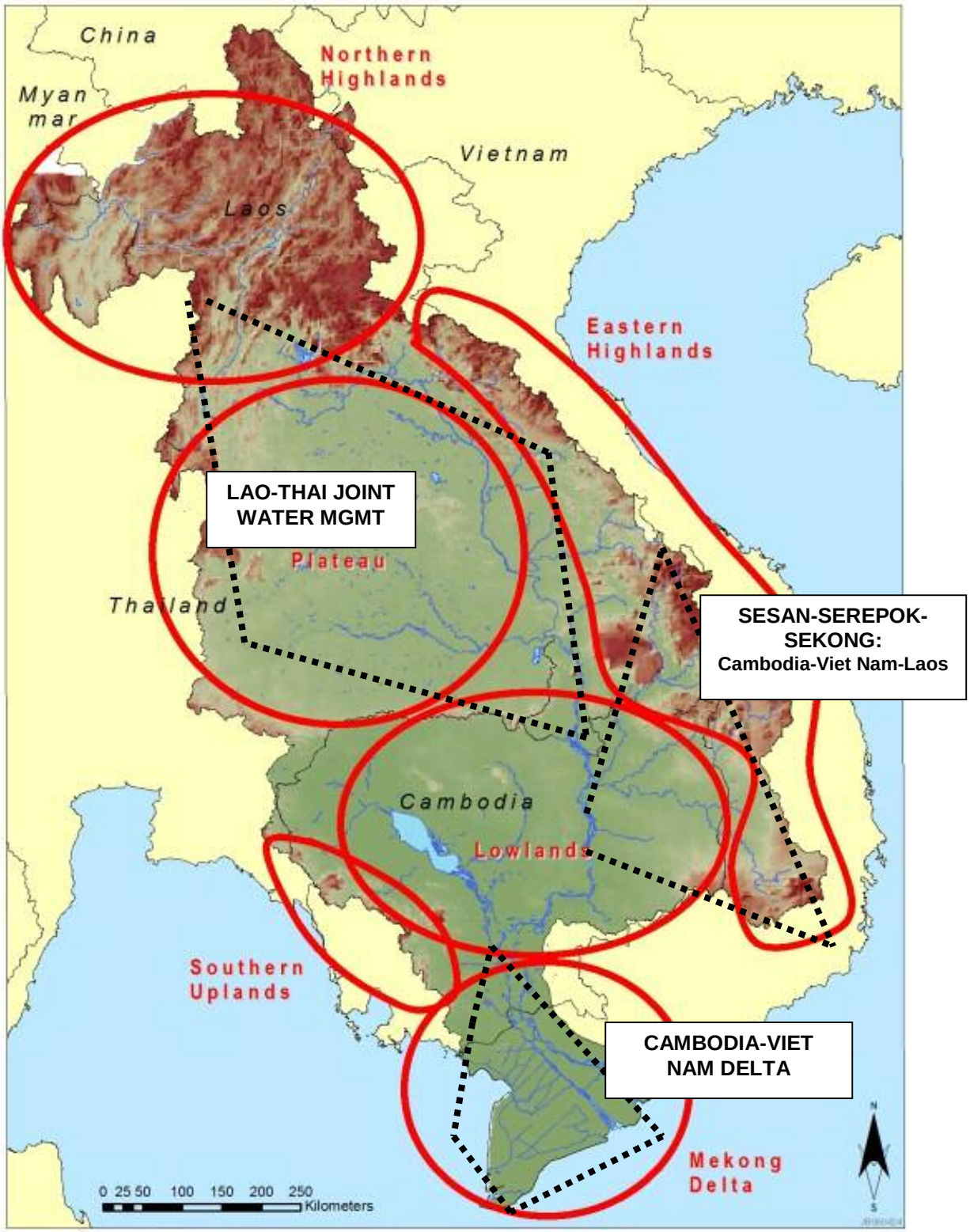

Fig. 2. The Mekong basin and the three sub-regional areas suitable for more detailed analysis and scoping for cross-border sub-regional management and development.

84. A important consideration is the distinction between the MRCS' and NMCs' role compared to that of the countries' line agencies and national planning agencies in development planning, project preparation and implementation. MRCS is not organized or staffed to play a leadership role beyond the programmatic or project (pre-) identification stage, and there is some controversy about how ambitious MRCS should be in developing project development capabilities. The Banks will seek to assist MRC and countries reach an understanding of how best to balance these roles. One way to do this would be by demonstrating, through a Banks-led project development process, how the development partners, countries and MRC could work together with different roles for each at various stages of the program and project cycle. This hands-on demonstration approach would also be useful in integrating hydropower, irrigation and flood protection, in sub-basins such as thedelta, where joint cross-border multi-purpose development of the Mekong Basin water resources is feasible to maximize benefits for the respective countries and for local communities.

85. It is also desirable for the Banks to involve MRCS and NMCs in supervision and evaluation of the implementation of water-related projects such as the Nam Theun 2 project, and to use this experience to illuminate appropriate roles for the MRC in its work with countries and development partners in an implementation phase. Not to do so would be to reinforce the perception that the MRC is becoming irrelevant when it comes to actual development activities.

86. ***Considerations for Hydropower Development*** The hydropower sector is already in full motion and is accelerating development, spurred on by high oil prices and buoyed by the progress on Nam Theun 2. Private capital and the burgeoning markets in Thailand, China, Viet Nam and Singapore provide the momentum. Hence, there is considerable opportunity for the MRC to take the initiative to guide this development in the context of the basin's water resources. This issue requires more thorough study. However, preliminary results of the development scenario studies suggest the following guidelines and considerations:

(i) The Mekong water resources system is still at an early stage of development and, at the overall scale of the basin, can accommodate considerable further development, provided it is done properly.

(ii) Construction of dams and reservoirs will tend to reduce or attenuate floods and to increase dry-season flows, which has both positive and negative impacts.

(iii) Main stem dams on the Lower Mekong are likely to be disproportionately expansive and pose a serious obstacle to fish migration.

(iv) Dams in the Upper Mekong are likely to have less impact on fisheries and other water uses than dams on the Lower Mekong, but such issues need to be assessed on a case-by-case basis.

(v) Many of the negative impacts of dams and reservoirs are local in nature. This calls for measures and programs to compensate local communities that depend on fisheries, wetlands, and the natural cycle of floods and droughts, and thus call for integrated sub-basin development in a socially and environmentally balanced way.

Strengthening Trust and Cooperation Among Stakeholders

87. There are many stakeholders in the Mekong River basin, but the most critical ones for nurturing a culture of cooperation are the national political authorities in the riparian countries; the MRC as the central institution for regional cooperation on Mekong water resources; and the local communities whose livelihoods are most directly affected by developments in the basin. Trust has been a sensitive issue since the formulation of the Mekong Agreement as the different stakeholders have confronted increasingly complex issues in the negotiation of rules under the WUP program, and as they consider how to respond to the implications of the construction of the dams in Yunnan province.

88. The Banks should give priority to building capacity for conflict avoidance at the regional level. Activities should be designed to assist the MRC Joint Committee and Ministerial Council to adopt policies and practices that will help them to (a) acknowledge the complexities and trade-offs in the issues they face, and (b) to overcome difficulties that inhibit joint decision-making. This may include participation in workshops to promote confidence building for cooperative commitments, informal policy dialogue, technical assistance that might be provided through a second phase of the WUP project, and undertaking analyses of specific controversial issues or project proposals that would benefit from an independent assessment.

89. At the national level, the Banks should support the strengthening of policy analysis and technical capabilities in IWRM of Cambodia and Lao PDR to enable them to engage with their technically more advanced neighbors with more confidence. In the case of China, the Banks should: continue and expand support for activities initiated under the WUP project for technical cooperation between the MRCS and local authorities in Yunnan province; support network-building among regional civil society organizations, universities and institutes for information sharing, cooperative research and human resources development; and explore the possibility for locating in the GMS framework a mechanism to facilitate review and resolution of issues at political and strategic level that are potentially controversial and cannot be addressed at the more technical level of the MRC.

90. The Banks should also encourage and support strengthening of communications between the MRC sub-regional River Basin Organizations and local communities, so that they benefit from the MRCS knowledge base and broad basin perspectives, and in turn, can make the MRCS work more effective.

Improving IWRM Frameworks and Capacities at the Regional, National and Sub-Basin Levels

91. IWRM is a relatively new concept in the Mekong region. Sectoral line agencies operate still largely in a mindset that is based on a civil works paradigm. Each country is faced with significant challenges in building the legal and institutional frameworks to improve IWRM capacity. However, in some countries, such as Viet Nam and Thailand, a support program for IWRM is underway and the MWARP thus identifies only those additional initiatives that are now necessary to complete the regional agendas.

92. The IWRM agenda should thus be seen as a long-term goal that requires selective support from the international community in a sustained and coordinated way. Further work is needed to build consensus about the priorities for action, and the support from the development partners to strengthen IWRM capacity at the MRC as a regional organization and in each of the riparian countries. The Banks should provide leadership in this process and, together with the development partners, work with the MRC and the countries to establish a coherent concept and vision, and develop an action plan. The Banks already have extensive involvement in IWRM in Cambodia, Lao PDR and Viet Nam; however, a regional perspective of this support may improve the focus and offer greater leverage.

93. One important tenet of IWRM is managing water resources at the lowest feasible administrative level, and to focus on the sub-basin or tributary catchment as the appropriate scale to apply the IWRM. Typically, this is executed through river basin organizations (RBOs). RBOs provide an effective platform for planning of development and for preparing water management decisions, as well as for generating broad-based support (also financial) from the stakeholders. In addition, RBOs typically require strong involvement of all stakeholders to function properly—local communities, representatives of civil organizations, and local governments. For this, River Basin Committees (RBCs) are established, which need to be empowered to take certain decisions, have access to information, and hold government agencies accountable. Thailand has made some progress in setting up such RBCs from the bottom up that aim to work with the local governments, and is willing to share this experience with other countries. In contrast, Viet Nam has three RBOs that are centrally managed, but have limited effectiveness because of poor buy-in by local authorities. Cambodia has started establishing RBCs building on the Thai experience, and to provide oversight for the development of Tonle Sap. Lao PDR is also in the process of establishing a RBC for the Nam Ngum River Basin to guide watershed protection and other basin investments.

94. Water resources management needs to be based on solid and mutually agreed principles. Although it is desirable to address trade-offs and to make decisions in a flexible manner, building on sound economic principles, a legal framework of fundamental rules and principles is critical to facilitate communication, define expectations, and help ensure equity. The WUP program has supported the MRC with the development of four commonly agreed Rules that define riparian behavior and cooperation, of which the four governments have endorsed three. These include rules on early notification, standardization and sharing of hydrological data, and maintenance of

minimum flow. A last rule on water quality is in preparation. The lengthy discussion required to adopt the rule (procedure) on minimum flows should be seen as a positive signal that the governments do not treat the issues in a purely technical matter. However, as the future will bring more intensive water use within the Mekong basin, this will place increased importance on the adoption of transparent agreements to guide decision-making. In addition, the principles of international law, such as those of the Helsinki Convention on International Waters, may be required to provide a basis for water allocation in relation to "historical" or "natural" rights of access to water. Similarly, agreed processes for conflict mitigation and arbitration will need to be developed and agreed upon over time. This is fresh ground for the MRC.

Governance and Community Participation

95. The goals of improving knowledge-driven decision-making and a culture of cooperation on Mekong water resources can be advanced by improving the accountability of the decisions and actions of the countries, MRC and sub-basin organizations. Transparency and public accountability are reasonably well developed in Thailand, but less so in the other countries. The GMS framework provides a good mechanism for making visible the actions of countries that have consequences for the shared goals of regional development and cooperation, and for this reason water resources issues should be given more attention in the GMS context. China and Myanmar's active participation in the GMS programs complements the MRC's framework of accountability, but these countries currently have only Observer status within the MRC. ASEAN should also be encouraged to take more active interest in the performance and success of the MRC as a sub-regional cooperation organization comprising an important sub-set of its members. These gaps in the broader regional political accountability framework contribute to a low level of public knowledge and appreciation for the achievements in regional cooperation that have been made in Mekong water resources. Increasing public awareness and enhancing the regional political accountability frameworks will be increasingly important as countries come to grips with difficult trade-off decisions.

96. Community participation in basin planning and IWRM processes is an important mechanism to strengthen the accountability framework for national governments and the MRC. Reaching the general public so that it is well informed and supportive should be given high priority in both basin planning and IWRM. Moreover, a well-informed public can help shape the planning processes, and also help to ensure that government line agencies remain accountable for achieving agreed objectives.

97. Since the establishment of the Mekong Committee in 1957, the Committee and now the MRC have sent an annual report to UNESCAP accounting for progress made. This annual report, however, no longer has much meaning as an accountability mechanism. Arguably, ASEAN may offer a stronger framework to MRC for political and supra-sectoral patronage and guidance. Also, from its inception, the MRC has followed a practice of reporting to its development partners annually following the meeting of the Ministerial Council. This reporting has focused more on the performance of MRC and concerns of the development partners than on the needs of the countries themselves. Within the MRC member countries, high level political authorities, elected

bodies, and the general public are increasingly demanding an accounting of the accomplishments of the MRC in furthering their national and regional interests. There is an understandable tension between accountability to development partners, who provide a large portion of funding of MRC programs, and national stakeholders. Strengthening the accountability of the MRCS towards its own local constituencies needs to be given more attention by the MRC country representatives and NMCs. Accountability of the MRC Secretariat would also be improved through more explicit performance compacts between the MRCS and the Joint Committee, and more rigorous performance management practices within the Secretariat itself.

98. The Banks should actively promote the importance of improved accountability mechanisms for Mekong water resources decisions and activities. One way the Banks could help is by sharing information with the MRC and countries about lessons from their own experiences and practices that have built more shareholder and public support for their projects elsewhere in recent years.

99. A valuable contribution to this strategy preparation was the attention drawn by regional civil society organizations to the importance of community participation in the future water resources management of the Mekong River basin. While all countries have embraced the concept of involving local communities, this seems most advanced in Thailand where such consultation is mandated in the new Constitution. One strong point of the BDP project was the bottom-up approach adopted to identify potential development projects, and this has contributed to the quality of the process. The challenges of the future are how to make community participation more systematic, build networks across the region that can assist "learning across country boundaries", and structurally involve regional grass roots organizations in the strengthening of IWRM.

100. The Banks, and the MRC, should advocate expanded community participation in regional, national and sub-basin frameworks as part of their promotion of IWRM. The Banks should also support mainstreaming of regional civil society workshops, both to discuss the MRC activities and for activities in which the Banks become directly involved.

Building the Knowledge Base for Managing the Basin

101. The MRC should be seen as the steward of the knowledge base for the Mekong River basin. While MRC has over the years established good systems for data collection and research, the challenges ahead are to integrate and translate this information so that it is useful for decision-making; further improve the data base and tools such as the hydrological models; and significantly expand outreach and interaction with local communities, sub-basin water resources organizations, and regional universities and research institutes.

102. The Banks should encourage and support this process through assistance provided to the MRC through a possible successor project to WUP—that arguably would need to be directed at more concrete problem-solving and trade-off resolution, and located partly in a new-to-be-established Division of Planning at MRCS, and partly inside each NMC.

Also, activities at the country level should aim to build capacity to use information provided by the MRC meaningfully, and support provided for strengthening of regional networks for water resources research, and human resources training and development.

Human Resources Development in Water Resources Management

103. Developing IWRM in the Mekong region will require a significant expansion and upgrading of trained staff to work within the emerging legal and institutional frameworks at all levels. While Thailand and Viet Nam have the educational infrastructure in place to meet much of this need, Cambodia and Lao PDR will require major efforts to develop the national human resources they will need. Attention also needs to be given to promoting expanded regional programs and networking across countries among educational and research institutions.

104. The Banks should support a water resources development needs assessment based on the MRC Strategic Plan for 2006-2010 and the country IWRM assessments and plans. A survey of capabilities to respond to these needs should be undertaken and a strategy and plan for meeting the needs should be formulated in cooperation with the countries and MRC. Yunnan province of China should be included in this assessment. A region-wide multi-development partner framework for implementing the strategy is to be designed.

Donor Harmonization

105. The broad agenda for Mekong water resources management can be expected to be politically, technically and financially demanding. Conflicts of interests and differing priorities, as well as fresh opportunities for collaboration will shape the attitudes of the countries, the MRC and the development partners in responding to the challenges of this agenda. Alignment is needed both at the regional and at each of the country levels. However, the annual MRC-donor consultation is currently not well designed to meet this broader need. The GMS does not focus on water resources issues other than flood protection and management. National donor-government support coordination mechanisms for water resources are increasingly taking form and effective, but not well equipped to address the regional issues. For these reasons, the initiative of the Banks is required to ensure that consultation and aid harmonization processes are addressed as part of the overall coherence of the MWRAS.

106. Consultation with development partners, countries and the MRC on the MWRAS and its follow up should aim to build consensus on what aid harmonization mechanisms are going to be most meaningful as this agenda is addressed in the coming years. This can include modifications in the MRC-donor consultation and coordination practices, strengthening of country level coordination practices, and introduction of new practices. Development effectiveness best practices that have been recognized through the OECD harmonization and alignment initiatives should be pursued in the context of the Mekong water resources agenda and addressed as part of this consultation.

PRIORITY ACTION AND DIALOGUE FRAMEWORK

107. The MWARP Action and Dialogue Priority Framework synthesizes the proposed activities (Table 1). This Framework is shaped as a set of complementary activities for implementation by the country governments—either separately, or in a bilateral or trilateral cooperation—and the MRC as well as other regional networks, and that can be supported by the development partners. The activities take the form of: dialogue mechanisms; Analytical and Advisory Assistance (AAA) such as sector work and other studies; Technical Assistance (TA) and training; and investments or preparations therefor. The table also highlights a number of important related on-going activities; this list is not meant to be exhaustive as many development partners are already heavily engaged in very valuable support initiatives.

108. The activities identified would be funded partially by the WB and ADB and partially by other development partners that subscribe to and help further develop the operational framework to deliver this program. The MWARP is based on an integrated approach to planning and implementation that crosses not only the borders between the six riparian countries but also those between sectors. The activities under the MWARP would become mainstreamed in the countries and the MRC, and would comprise, notably:

(i) Strengthening basin development capacities of the MRC and the countries, by preparing the second phase of the WUP; this would complement the basin development and environmental programs at MRCS that are being considered for funding by Danida (BDP 2), SIDA and Ausaid;

(ii) Providing TA and capacity building to strengthen the capability of the countries—especially Lao PDR , Cambodia and Thailand—to manage basin water resources in an integrated way, by strengthening their sector institutions—such as sectoral Ministries and river basin committees—and regulatory frameworks.

(iii) Identifying projects and interventions at a sub-regional scale that create synergies, pool resources and yield economies of scale, and that taken together promote “balanced development” through “suites” of complementary investments and programs (e.g. combining hydropower investments upstream with downstream rural livelihoods programs and environmental programs, supported by strengthening of governance structures for sub-basin water management).

(iv) Streamlining and mainstreaming environmental and social safeguards for project preparation and implementation, and notably provide the platform for undertaking Strategic Environment Assessments; this activity is focused on the MRC system, both the MRCS as well as the four NMCs.

(v) Identifying, and quantifying trade-offs in Mekong water management; and developing scenarios that can prevent or otherwise address potential competition.

(vi) Stimulating watershed conservation.

(vii) Preparing for the development of the expertise and human resource base in the countries.

(viii) Supporting the harmonization of donor support.

Table 1. Proposed Mekong Water Resources Partnership Program: (MWARP) Priority Action And Dialogue Framework (2006-2010).

Focus **Proposed Instrument**	**Multi-Country Cooperation**	**THA**	**CAM**	**LAO**	**VIE**	**PRC/MYN**	**MRC**	**Other Regional Networks**
Dialogue Mechanism	**WB/ADB Donor Coord. Meeting**		National Donor Coordination	*National Donor Coordination*	National Donor Coordination	*PRC/LAO/THA issues, esp. navigation, re-regulation, sediment management, dam safety*	Donor consultation RBO Mutual Learning	GMS
Analytical & Advisory Assistance to Country/ Institution	**Regional Investment Priority Review (incl. future directions for irr. Agriculture)**		**Water Sector Study**	**Watershed strategy**	Water Sector Strategy Delta Assessment	TBD		HRD TNA & Analysis
TA & Training		• RBC • Water Allocation Principles & Frame	**IWRM Institutional Development**	**IWRM Institutional Development**	RBO Institutional Development	TBD	GEF 2/BDP 2 incl. safeguard mainstreaming JC Support Principles for trade-off management	
Investments of integrated nature for balanced developmnt	‣ CAM-LAO-VIE "3S" Serepok-Sesan-Sekong sub-basins ‣ LAO-THA Joint Water Dev & Mgmnt ‣ VN-CAM Delta region incl. nav, wetlands, irrigation)	{TBD based on sector review studies}					N/A	*Regional HRD program*
Key <u>on-going</u> related activities	None	• Water Grid • Ping R. TA • Bang Pakong TA	• Tonle Sap Initiative • Flood mgmt & mitigation	• NT 2 • Nam Ngum • Lao Env & Social Proj. • Flood mgmt	• Delta Master Plan • National Power Strategy	Yunnan Rural & Watershed	• Basin Dev Plan. • Environment • Navigation • Flood mgmt & mitigation	Regional Power Strategy

Bold: High priority, shorter-term opportunity. *Italic*: Longer-term opportunity. Grey areas: High regional and cooperation value

Table 2. Proposed MWARP activities and results areas.

	Balanced Development	Environmental Safeguarding	IWRM	Governance
Projects and Grants				
On-going				
WUP	X		X	X
Nam Theun 2	X	X		
Mekong Delta and watershed projects	X	X		
Proposed				
GEF 2	X	X	X	X
Integrated Sub-Basin Development	X	X	X	X
Regional Water HRD	X	X	X	X
Analytical Work				
Regional Water Investment Review	X		X	
Cambodia Water Sector Study	X	X	X	X
Mekong Delta Master plan Implementation Assessm	X	X		
Regional HRD Needs Assessment	X	X	X	X
Technical Assistance				
MRC JC and MRCS support			X	X
IWRM – Cambodia	X	X	X	X
IWRM – Laos	X	X	X	X
IWRM – Thailand		X	X	X
IWRM – Viet Nam		X	X	X
Participation				
Development partner Coordination	X	X	X	
China Dialogue		X	X	

Table 3. Proposed MWARP activities and key partners – as Client (C) or Partner (P).

	MRC	GMS	Countries	Regional Networks
Projects and Grants				
On-going				
WUP	C		P	
Nam Theun 2	P?		C	
Mekong Delta and Watershed Projects	P P?		C C	
Proposed				
GEF 2	C	P	P	P
Integrated Sub-Basin Development	P	P	C	
Regional Water HRD	P		C	C
Analytical Work				
Regional Water Investment Review	P/C	P	C	
Cambodia Water Sector Review	P		C	P
Mekong Delta Master Plan Assessment	P		C	
Regional HRD Needs Assessment	P		C	C
Technical Assistance				
MRC JC and MRCS	C			
IWRM - Cambodia	P		C	
IWRM - Laos	P		C	
IWRM - Thailand	P		C	
IWRM - Viet Nam	P		C	
Participation				
Development partner Coordination	C	C	P	
China Dialogue	C	C	C	P

109. These activities are currently in varying degrees of readiness and commitments. The individual MWARP activities will require further development, clarification and confirmation from the respective Bank or development partner. Alongside these activities, the MWARP intends to establish mechanisms for communities to directly participate in shaping the design and benefit sharing of proposed investments, and strengthen engagement with civil society groups and media to improve understanding of core issues and interests, and facilitate consensus building. The MWARP works together with IUCN and other regional NGOs to convene a series of consultations with civil society and other stakeholders across the region.

110. China has not yet been fully consulted in the MWRAS process and a country consultation should be high priority. The MWRAP proposes to engage with China, which is exploring avenues to deepen its cooperation with its neighbors. Specific ways in which expanded cooperation between the lower Mekong countries and China could be pursued include: (i) Participation in MRC programs through structured cooperation agreements; (ii) Expanding of sharing of knowledge, and cooperation in data gathering for basin monitoring (China currently shares discharge data in the wet season but not the whole year round); (iii) Collaborative research among universities and institutes in the Mekong region; (iv) Development of models that link the upper Mekong to the lower Mekong modeling capabilities to assess impacts, including dams operation; and (v) Joint activities to address issues relating to navigation and environmental protection on the upper Mekong. Of particular concern are land use and erosion control in Yunnan province because it determines sediment transport in the Lancang. This is highly relevant for the Lower Mekong countries, which need a certain import of sediment, and for China itself which will want to prevent silting up of its reservoirs on the main stem. The proposed World Bank Institute program linked to the Mekong initiatives is supporting the first steps of engagement with China. It has facilitated a December 2005 Workshop in Dali, Yunnan Province, and intends to pursue the agreed intention to establish an International Rivers Center, possibly at Tsinghua university in Beijing. This would allow organization of multi-country workshops to discuss technical topics of mutual interest such as sediment transport, and harmonization of flow simulation models, thus creating a platform for technical dialogue.

111. In addition to cooperation with the lower Mekong countries through the MRC relationship, complementary frameworks of cooperation with China should be explored within the context of the GMS Working Groups on Agriculture and the Environment. Also, this cooperation could extend to other river basins in the GMS geographical area such as the Red, Salween and Irawaddy river basins. For example, while Myanmar may be considered a minor stakeholder in the Mekong River Basin, contributing only 2% of the flow from a remote part of the country, it has interests in how China relates to the concerns of downstream countries in the context of its more significant stake in the Salween and Irawaddy river basins. General principles and modalities of cooperation adopted for the Mekong River Basin could become more generally applied to other multi-riparian river basins in the region.

Proposed Agenda for Assistance and Partnership

112. Table 4 offers the current status of tentative development partner support and readiness for the activities of the MWARP Framework. The commitments from these partners are in most cases still to be confirmed.

Table 4. Status and proposed early time lines for activities under MWARP

Activity	World Bank support	ADB support	Other possible development partner support	Proposed time line
WB/ADB Donor Coordination, and dialogue	X	X	Ausaid, AFD, Sida, Netherlands Govt., others	Twice annually
Regional Investment Priority Review	X	X	AFD, Japan Govt	Start early 2007
Lao-Thai Joint Water Mgmt and Development Scoping study	X		Ausaid,	Scoping 2006-2007
Sesan-Serepok-Sekong Sub-basin Mgmt Scoping study		X	Ausaid	Scoping 2005-2007, potentially for Regional IDA.
Cambodia-Viet Nam Delta Scoping study	X	X	In discussion	Scoping 2006-2007
Thailand: River Basin Committee Cooperation, and water allocation	X	X	In discussion	Start: mid-2006
Cambodia: Water Sector Study	X	X	In discussion, potentially Finnida	TBD
Cambodia: IWRM Institutional dev.	(X)	X	In discussion	TBD
Laos: Watershed Strategy	(X)	X	GTZ and others	TBD
Laos: IWRM strengthening	X	X	AFD, Ausaid	Start: July 2006
Viet Nam: Institutional RBO support	(X)	X	In discussion	To be incorporated through on-going sector strategy

Activity	World Bank support	ADB support	Other possible development partner support	Proposed time line
China Dialogue	X (WBI)	(X)	In discussion	TBD
MRC support: MRCS and JC	X (WBI)	X	Netherlands Govt, Ausaid, Sida, GEF	Scoping of successor to WUP: June 2006, effective mid-2007
Other regional network: capacity building	X	(X)	Netherlands Govt	TBD

113. The proposed partnership with Thailand would concentrate on cooperation on the strengthening of its budding River Basin Committees, by extending the experience from the Ping and Bang Pakong to the Mun and Chi sub-basins. Strengthening the capacity to deal with water allocation and possibly water use rights would be part of this. The sub-regional sectoral support (and potentially investment) opportunity is embedded in the Lao-Thai Joint Water Management and Development scoping study that would analyze ways to address chronic water shortage in Thailand's north-east through water savings programs, policy reform, and possible water diversions from areas in Lao PDR or the mainstem Mekong. It is recognized that any cooperation would be dependent on stronger sectoral capacity on the Lao side. The Thailand Environment Monitor 2006 will be devoted to water resources, and focus on the linkages with the Mekong. From this analytical work, recommendations for further work will be derived.

114. The proposed partnership with Lao PDR would focus on the strengthening of its sectoral and IWRM capacity, also in the light of the country's desire to be better able to negotiate with its neighbors. The current ADB/AFD supported Nam Ngum Basin support project offers a suitable starting point to expand into the broader approach. This support will also be oriented to the new natural resources and water ministry that the government will set up in 2006/2007. With its territory making up most of the Mekong basin, watershed management is a priority, for which a new strategy is being developed by GTZ at MRCS. Further work will be necessary to work this out. Lao PDR would benefit from both the proposed Lao-Thai Joint Water Management scoping study as well as the Sesan-Serepok-Sekong Sub-basin scoping study. The experience from NT2 with its integrated approach to sub-basins is expected to prove very valuable. Development partner coordination needs to be strengthened.

115. The proposed support program to Cambodia would complement the on-going national support program but focus on the strengthening of the IWRM institutional capacities, and on the development of a more coherent national water sector strategy that would carry out a full review of the dependence of the country of the Mekong water resources, and identify priority interventions to capture benefits from the Mekong. Finnida has expressed interest in supporting the latter. Cambodia would have a strong

interest in exploring the options for cross-border cooperation in sub-regional management in the Sesan-Serepok-Sekong catchments, where it is highly dependent on water releases from upstream Vietnamese hydropower dams; better cooperation could make available water in the dry season which can be put to use in rural development, environmental and flood protection programs. The Nam Theun 2 "integrated package" of complementary projects is likely able to offer guidance for such design. Similarly, Cambodia has a keen interest to develop its resources in the delta which it shares with Viet Nam, and which requires a thorough rethinking of the development and management approaches to the lower reaches of the Mekong (between Tonle Sap and the coast), and would build upon and expand the highly successful 1994 Viet Nam Delta Master Plan that was prepared with the support of the World Bank.

116. Viet Nam has a vigorous national water sector program and has attracted ample support from development partners. Therefore, donor coordination is less of a priority than in Cambodia or Laos. Also, its sector institutions are under review and already are being strengthened. From the MWRAS perspective, however, just like in Thailand, extra effort would be required to pilot more effective arrangements for catchment management through RBOs that are better embedded in local government and where local communities have a voice. Viet Nam would have an interest in the proposed sub-regional scoping studies of the Sesan-Serepok-Sekong and the delta.

Proposed Roles for Development Partners

117. Both the WB and ADB have provided preliminary funds to start exploring and scoping management scenarios in the three proposed sub-regional programs. Several other development partners, notably the Japanese government and Ausaid have expressed interest to support this sub-regional work. In principle, such work would qualify for WB incremental Regional IDA credits as three IDA countries would execute activities in a joint program. If sufficient support can be found with the Viet Namese government as well as those of Cambodia and Lao PDR , this particular program would lead to the preparation of a Project Concept Note by late 2006 or early 2007. Such program would not necessarily entail “new” investment projects, as many water-resources related proposals have been tabled, in the three countries. The added value would be to provide an integrated concept, linking infrastructure investments with more local community-development ones, and resolving competitive demands on the same water.

118. The MRC would be a key partner institution for MWRAS support. The re-engineering of the Secretariat would be supported with a possible successor project to WUP as a central support program, and for which GEF support is being sought (“GEF2”). This successor project would notably strengthen the capacity of the MRCS as well as the NMCs to translate scientific knowledge on development scenarios and their trade-offs into information upon which the line agencies in the countries can act in their preparation of management and investment initiatives, and for their natural resource policies. In addition, the MRCS and the NMCs would be supported to become better able to mainstream the environmental and social safeguards in this decision-making. As a consequence the MRC would become better able to advise the countries on “balanced development”, designing “suites” of complementary investments and other interventions

that provide an integrated and sustainable approach to watershed management, and seeking win-win solutions. The MRCS should not only advise the governments on "projects" but also, and perhaps most importantly, on their policies and development strategies that impinge on the water resources. It is not clear to what extent it will be possible to synchronize, or ideally, merge, the possible BDP 2 program with the new GEF and Bank supported program. Other development partners have indicated interest to contribute to a consistent and comprehensive Planning Division that is proposed to be set up as a functional unit in MRCS, and that would absorb several development partner-supported discrete "projects".

119. The successor project to the GEF-financed WUP ("GEF2"), or a parallel support, would, i.a., strengthen the capabilities of the MRC to develop a suitable and enforceable legal framework to guide basic decisions in water allocation, and for arbitration of conflicts. The World Bank Institute is initiating a support program to strengthen the national capabilities to apply hydrological flow simulation models and other decision support systems. This support will allow to further tighten the operational relationships between the MRCS and the country sector strategies. Furthermore, the JC would receive support so that it becomes better able to carry out its supervision of the Secretariat, and get a better grip on regional as well as country-based policy development and investment prioritization.

120. The dialogue with China will be pursued cautiously. The proposed activities would entail joint studies on topics of regional relevance (such as sediment transport and management, and flow regulation), sharing of information, and in general broadening the coordination on Mekong water issues. Watershed management and erosion management are areas of mutual interest that could be further explored.

121. Other regional networks—where the MRC acts as a partner with the Banks—include the discussions on studies under the GMS, and the assessment of water sector capacity needs. From the latter, as program to strengthen expert knowledge would be developed to ensure that the respective countries will dispose of the adequate knowledge base to address future challenges. The Netherlands government has expressed a preliminary interest to support this work.

122. To initiate all this work, a *Regional Investment Priorities Review* in collaboration with the MRC is proposed, to examine the feasibility of a package of investments with system impact and also the opportunities for regulation of the system to integrate plans for flood mitigation, drought management, wetlands/fisheries protection, agriculture, navigation and hydropower development. Once this investment priorities review is completed, the Banks would explore which areas would be the best fit to be financed from individual IDA country allocations supplemented by IDA Regional funds. The AFD and Japanese government have expressed initial interest to cooperate in such effort.

Implications for Financing

123. The resources needed to deliver the proposed program outlined above far exceed what the Bank can allocate from its administrative budget and normal trust fund

allocations. As part of the consultation process with the countries and development partners, an assessment should be made of the demand for Bank-led activities, the financing requirement and willingness to organize a funding arrangement that is better pooled in keeping with harmonization and alignment objectives, and to provide a multi-year funding solution to enable smooth implementation of the program.

124. Viet Nam, Cambodia and Lao PDR are eligible for IDA credits and grants. The MRC support is likely to receive continued financing from GEF under its International Waters Program. The WB provides incremental support for investments in the form of Regional IDA under IDA14, however, for IDA14 commitment must be made by mid 2008.

RATIONALE FOR A FUTURE WB AND ADB ROLE

125. The challenges and opportunities facing the six riparian countries which share responsibility for the Mekong River Basin require political will as well as economic capacity to address in ways that will be broadly perceived by the public and international community as leading to results that are fair and reasonable. There are trade-offs between countries, sectors and stakeholder groups that require difficult decisions. The countries and the people whose livelihoods are affected by the management of the Mekong River Basin deserve objective neutral advice and support from the international community.

126. The WB and ADB are well-positioned to provide leadership in offering advice and support on some aspects of basin management because of their multilateral character and stature, ability to mobilize global knowledge and experiences, and operational involvement in investment programs. The WB is able to bring to bear its wide experience in other major regional water initiatives, including the Nile Basin, the Danube, the Black Sea, the Senegal, the Niger and the Aral Sea. The ADB also has considerable regional experience to offer, including its involvement in the GMS initiatives and its work in large regional river basins. The MWRAP activities tie in with WB and ADB country-level and other regional work. And the positive reactions from the countries and other development partners to the MRWAS initiative have confirmed the importance of the Banks' willingness to exercise leadership in this area.

127. Through its complementary and quite unique activities, the World Bank Institute (WBI) can help build essential technical and managerial capacities necessary to establish technical communication mechanisms across the region, facilitate the cooperation among the riparian countries, and to identify and agree on the best course of action. WBI has developed training modules and policy-level workshops for other international rivers initiatives that would assist the MWARP reach its objectives. ADB, too, has the Asian Development Bank Institute (ADBI) which could extend high-quality training to support the MWARP.

128. It is important to recognize the limitations to what leadership the MRC, and particularly the Secretariat, can provide on its own. This is being tested in the process of preparing a new Strategic Plan for 2006-2010 as well as negotiations for the more

difficult rules under the WUP project, such as the one on minimum flow that stalled in 2004-2005. The experience of the Nam Theun 2 dam and Chinese dam building program suggest that there is a real risk of countries proceeding on their own without regard to the consequences for others, if they perceive the MRC as inhibiting their ability to move ahead with development plans or deals with other countries. The MRC has come to a critical stage in its development as a regional basin management organization and will need help from major institutions that have a track record with preparing and financing development, and that have a cross-sectoral perspective.

129. The sensitivities surrounding the relations of China with the lower Mekong countries also reinforce the value of the Banks' involvement in the larger regional agenda. Careful nurturing of the values of shared interests and pragmatic cooperation on water resources issues that cross national boundaries can contribute to building trust and a culture of cooperation among the riparian countries that is essential for the long-term stewardship of the Mekong Basin. The Banks' relations with the countries and reputation for fairness are valuable assets at this critical stage of development of the basin. Multiple frameworks of cooperation with China need to be pursued, including supporting Chinese participation in MRC programs, developing ways to address issues in the context of the GMS flagship programs, encouraging regional civil society networks to include Chinese organizations, and promoting collaboration among universities and institutes in research and human resources development. All these avenues that need to be developed would benefit from leadership provided by the Banks in cooperation with other multilateral partners, particularly the MRC.

130. The Banks, however, cannot proceed on this agenda alone and need to seek a strong partnership with the other development partners, as well as key representatives of the NGO community—the task at hand demands a high degree of conceptual quality, and inclusiveness, and also requires adequate financial support. Although the MWRAS Concept Note suggested that strong donor coordination and harmonization should be sought, including possibly the development of a pooled trust fund to finance related activities, the necessary conditions for this have not yet materialized. Currently, development partners appear in a contemplative mood, and unsure on how to proceed after their first decade of intensive support to the MRC start-up and its "first-generation" activities. It can be argued that those first-generation programs were all essential to build up the basic knowledge base, and thus avoided more controversial decisions on the direction of the Mekong's sustainable development. Sida, Danida, Ausaid, AFD and others are in the process of reviewing their assistance plans.

131. It was hoped that the MRC's 2006-2010 Strategic Plan—prepared in synchrony with the MWRAS—would provide a solid foundation for the shaping of these assistance plans. Although the Strategic Plan is generally found to be a substantial improvement over the previous Plans, it falls short of a comprehensive strategy, and skirts making choices on fundamental strategic questions. However, it is probably too ambitious at this stage of the MRC's development process to expect a full-fledged strategy—in view of the limited capacities of the four countries in IWRM, as outlined before. A few development partners believe that MRC should not be involved in "project facilitation" and rather develop as regulatory agency. Most development partners would prefer to see MRC

develop as an important actor guiding policies and programs for sustainable development, without necessarily getting involved in the implementation of investment projects. In this environment, the role of the WB and ADB can prove critical as they can bring to the table their large experience with sustainable development, and offer the perspective for the "next generation" of MRC support. However, given the environmental and social issues inherent with water management, some development partners may prefer to keep emphasizing different priorities.

Annex 1

List of Reports Prepared under MWRAS

Modeled Observations on Development Scenarios in the Lower Mekong Basin, The World Bank/Mekong River Commission, Washington, DC/Vientiane, November 2004

P. Millington. *Review of the Mekong River Commission (MRC), and Opportunities for Possible WB Support*. The World Bank, Washington, DC, May 2004

Cambodia: Valuation of Rural Water Use, in Particular Around Tonle Sap. FAO, Rome, August 2004

Eric Biltonen. *Retrospective Desk Review of the Mekong River Commission: Progress and Recommendations from 10 Years of Dialogue*. The World Bank, Washington, DC, February 2005

Discussion Paper—Towards a Mekong Water Resources Assistance Strategy. The World Bank, Washington, DC, November 2004

P. Millington. *Water Resources Sector Assessment—Towards an Assistance Strategy for Lao PDR* . The World Bank, Washington, DC, November 2004

P. Millington. *Water Resources Sector Assessment—Towards an Assistance Strategy for Cambodia* The World Bank, Washington, DC, November 2004

Strategizing Workshop with Civil Society: Summary and Recommendations to the World Bank. Thailand Environment Institute, Bangkok, February 2005

P. Millington. *Recent Developments in Integrated Water Resources Management in Thailand – Towards a Water Resources Assistance Strategy For Thailand*. The World Bank, Washington, DC, November 2004

Future Directions for Water Resources Management in the Mekong River Basin. The World Bank, Washington, DC, May 2005

Options for Integrated Development and Management in the Se Kong—Se San— Sre Pok Catchments of the Mekong in Cambodia, Lao PDR and Viet Nam. COWIConsult, Copenhagen/Hanoi, February 2006

S. Seyama. *Inception Report: Scoping Study on Lao-Thai Joint Water Management and Development*. Tokyo/Bangkok, June 2006

Annex 2

Salient Figures on the Mekong River and Basin

(Source: MRCS)

	PR China	Myanmar	Lao PDR	Thailand	Cambodia	Viet Nam
Area: country (km^2)	396,790[1]	676,580	236,800	513,120	181,010	331,100
Area: Mekong basin in country (km^2)	165,000	24,000	202,000	184,000	155,000	65,000
% of area of country in Mekong basin	42	4	85	36	86	20
Population (M) (2002)	42[1]	51	5	61	13	80
Pop. in Mekong basin	?	?	5	22	11	18
% of Mekong Basin area lying in country	21	3	25	23	20	8
% of Mekong river flow rising in country	16	2	35	18	18	11
GNP/cap (2000) (US$million)	565 [1, 2]	?	260	2,000	260	390

[1] Yunnan Prov.
[2] GDP/cap

Annex 3

FUTURE MEKONG MANAGEMENT ISSUES ARISING FROM DEVELOPMENT SCENARIOS[7]

Introduction

A comprehensive Decision Support System is under development at MRCS. The hydrological component is already in place, and has been calibrated, tested, approved and adopted by the Mekong River Commission (MRC). It comprises a suite of models that make it possible to simulate major hydrological aspects of river basin behaviour, which can in turn support and inform the negotiations that are now addressing the water-sharing issues. These models can be considered among the best in the world, and have been reviewed and endorsed by an independent panel of international specialist.

The MRC models offer the capacity to test and evaluate development scenarios defined generically in terms of hydropower development, irrigation development and inter-basin diversions. The output of the models is quite narrowly hydrological, that is, in terms of water utilized for irrigation and power generation; river flow and stage at key locations; volumes; inundated areas, depths and duration of inundation; and salinity levels. These parameters can in turn provide insights into possible impacts on fisheries, flood management, saline intrusion, navigation, and the environment.

The Review Process

In this study, the results of modelled scenarios are summarized on the basis of agreed key indicators. The scenarios have been selected to represent feasible, realistic development scenarios – on which no evaluative comments are made – thus providing a range of realistic impacts on the indicators. The study was carried out by a professional modelers team at MRCS' Water Utilization Program (WUP), with outside expert support. This team was supported by other professionals and by the Environment Programme, the Fisheries Programme and the Basin Development Programme of MRCS. The whole study was guided and overseen by an International Expert Panel, comprising an environmental lawyer/activist and a water economist, and chaired by the CEO of the Murray-Darling Basin Commission of Australia.

The Scenarios: A range of development scenarios was selected to provide a perspective on development opportunities and their impacts. The inclusion of a project within any development scenario does not imply any endorsement from the panel, the countries or the MRCS. The Panel is confident, however, that the range of scenarios tested is

[7] Summary of "Modeled Observations on Development Scenarios in the Lower Mekong Basin", November 2004, The World Bank/MRCS, Washington, DC/Vientiane.

sufficient to illustrate the range of likely salient impacts for the next twenty years.

All scenarios reflect the impact of the few dams that are confirmed to be planned to be developed in China. China is not a party to the 1995 Agreement, and we have accepted for the purpose of these scenarios that some of these dams will be in place. The two run-of-river dams already built have negligible impact on flow redistribution. The two largest dams proposed are likely to cause the most significant seasonal redistribution of flow of any the development scenarios evaluated. Six scenarios were evaluated:

1. Baseline: Representing the development conditions that existed in the basin in the year 2000.
2. China dams: Identical to the baseline scenario but including all the proposed Chinese dams.
3. Low development: Representing a minimum level of development based on population growth to 2020, and including water usage growth in line with population trends and irrigation constraints, dams in Lao PDR and likely dams in China.
4. Embankments: Similar to the low development scenario but including 130,000 ha isolated from the Cambodian floodplain by a variety of structural flood protection measures.
5. Agriculture: Including a substantial amount of growth in water usage and likely hydropower dams in China and the lower basin. This includes maximum likely levels of water usage growth to 2020, constrained by irrigable land availability and water access. The growth in water usage also includes inter- and intra-basin transfers. The hydropower development is similar to the low development scenario.
6. High development: Similar to the agriculture development scenario but has including a substantial amount of hydropower growth. It includes all proposed Chinese dams and a large number of proposed dams in Lao PDR, Viet Nam and a mainstream dam in Cambodia.

A summary of the key model parameters for all of the scenarios are shown in Table A3/1 below.

Table.A3/1 Scenarios modelled

Scenario	Domestic and Industrial usage (mcm)	Irrigated areas ('000 ha)	Hydropower Dams active storage volume (mcm)		Embankment area ('000 ha)	Basin diversions (mcm)	
			LMB	China		Intra	Inter
Baseline	1,620	7,422	6,185	-	0	0	0
China dams	1,620	7,422	6,185	22,700	0	0	0
Low development	3,109	8,316	12,443	10,300	0	0	0
Embankments	3,109	8,316	12,443	10,300	130	0	0
Agriculture	4,194	11,349	12,443	10,300	0	2,200	3,262
High Development	4,194	11,349	26,778	22,700	0	2,200	3,262

The Impact Indicators: A range of indicators to assess impact was selected to show the impacts of flow and salinity changes at key locations throughout the LMB (Figure A3/1). The indicators can be grouped into five broad categories:

- **Mainstream flow indicators** have been selected to look at changes in flow. These indicators are also used to investigate changes in duration of low flow to assess impacts on navigation.

- **Great Lake and floodplain indicators** have been used to look at changes in lake area and durations of inundation. This has a dual purpose for indicating flooding impacts (negative) as well as impacts on fish production (positive). A Fish Feeding Opportunity (FFO) indicator was developed as an initial basis for assessing possible impacts on fish production.

- **Delta indicators** are concerned with salinity intrusion, upsetting the agricultural activity in the delta's rice growing areas. The indicators show three classes of salinity durations. These can be used to assess the impacts of changes in salinity intrusion on rice production.

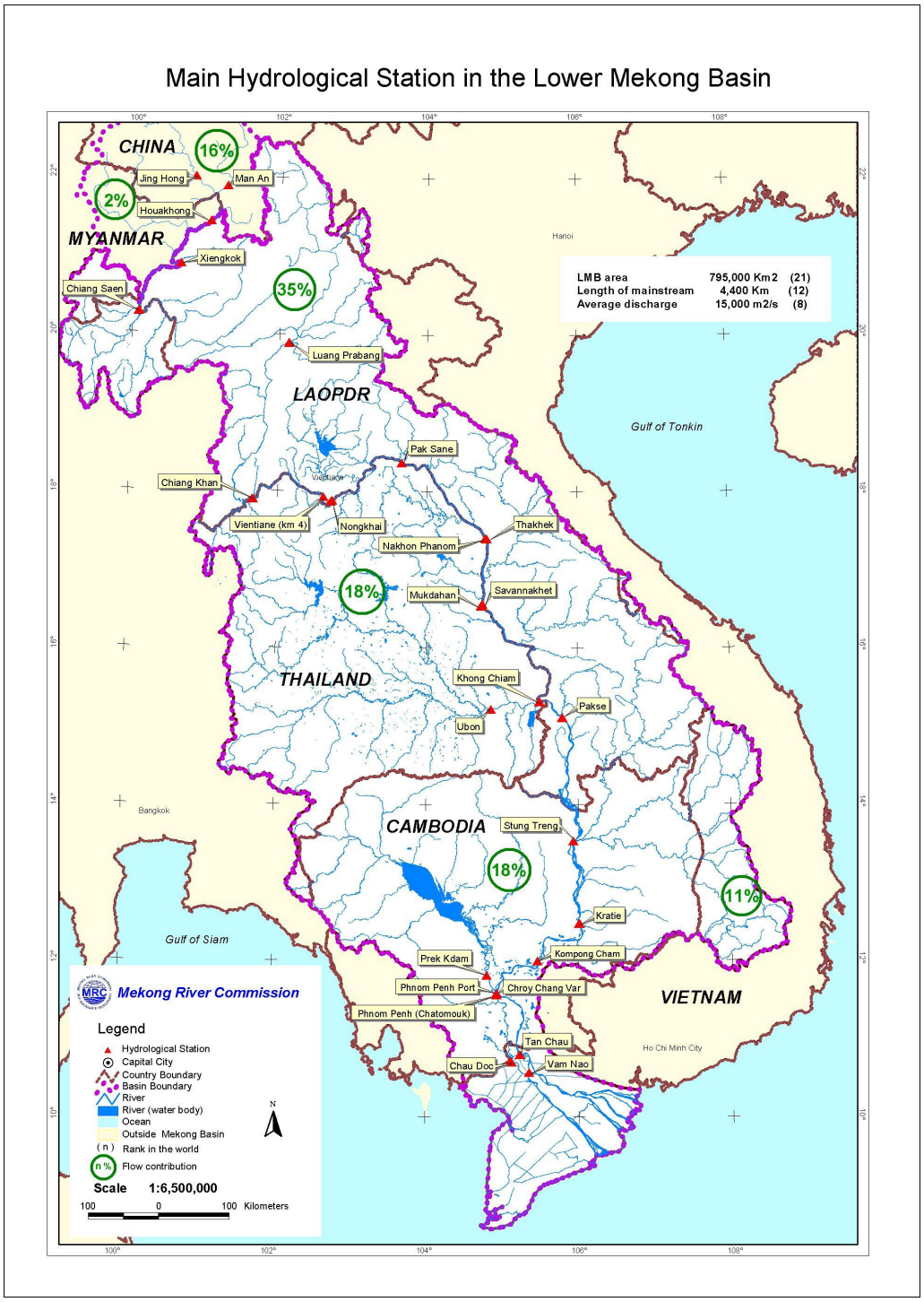

Figure A3/1 Mainstream hydrographic stations and country flow contributions for the LMB

- **Irrigation indicators** are based on irrigable areas, taking into consideration water availability. These data, in combination with yield estimates can be used to assess food production.

- **Hydropower generated** is the average annual total electrical energy produced over the 16 year modelling period at each hydropower station.

CONCLUSIONS AND OBSERVATIONS

Conclusions on Modelling Capacity

The MRC has developed, tested and formally adopted a comprehensive, modern suite of hydrological models. Development will continue, however the studies underlying this report indicate that the models are robust and provide important insights into the hydrological impacts of a wide range of basin development scenarios on river flow, floodplain inundation, flooding, navigation, hydropower production, and salt water intrusion on the delta.

An overall check of the MRC models was carried out. The checks covered the overall mass balance of the model as well as verifying the demands. The tests confirmed that the models preserved mass balance for all scenarios. The magnitude and change in demands was consistent with simple estimates, and in line with the level of development. The distribution of flow and usage within the models was also consistent with the level of development.

Use and maintenance of such modelling capacity is an essential asset for a basin of this size. Ongoing quality assurance is an important responsibility for the MRC.

The information provided by the models will allow specification of key parameters in the inter-country agreements that are required for coordinated basin development. The models can subsequently be used as a part of the monitoring, auditing and reporting program that the MRC will be responsible for as development proceeds.

The models have the capacity to report on a range of environmental indicators once the relationship between flow, water level and area inundated and the particular environmental issue (e.g. fish production/wetland health) is established. During this exercise, we have developed a basic fish indicator to demonstrate what is possible.

The Basin

As stated in the 1995 Basin Agreement, the countries require a set of operating rules that provide scope for national development while protecting the shared resources that they collectively rely on. Such rules define the key, monitorable indicators – in terms of times, locations, flow rates, levels, quantities, water quality or other variables – that are sufficient to define each country's opportunities and responsibilities in the Mekong Basin.

The Countries

The development path chosen by each country will reflect its national policies, investment potential, and investment capacity. The resulting priorities may vary sharply between countries, and within countries over time. The rules set boundaries to the nature and scope of the development such that the interests of other basin states are protected while each state pursues its legitimate goals.

The Commission

The role of the river commission is threefold:

- *Information*: to provide and maintain the information base and analytical capacity to determine fundamental elements of the 1995 agreement, and, as required for additional future agreements;
- *Monitoring*: to monitor, audit and report on the conformity of ongoing basin management to the terms and conditions agreed by the countries and contained within the agreement.
- Shared Asset Management: to own and manage assets which have been created by joint investment and have been agreed to be best managed centrally. This pertains primarily to scientific and technical equipment, such as the hydrological stations.

The Study

This study does not (and was not intended to) compare or evaluate the merits of alternative development scenarios, but rather to demonstrate the likely impacts of a credible variety of single- and multi-sectoral development scenarios. The study confirms that there is scope for significant levels of co-ordinated development with associated benefits to all basin countries.

Hydrological impacts

All development will have an impact and the models reflect the change in the hydrology of the river that would result from that development. Decisions on what is the reasonable balance of development is a matter that can be informed by the model outputs but requires the economic, environmental and socio-political assessments by the country concerned to determine the appropriateness and priority of each investment.

Current development of the Mekong river is very limited compared to almost all large river basins in the world. T he natural flow pattern is essentially intact, as are the highly productive natural fisheries in the river.

Existing storage corresponds to less than 2% of average annual flows at Kratie

and does not significantly redistribute water between seasons. Diversions in the Lower Mekong Basin are 10% of annual flow at Kratie. Diversions in the Mekong Delta constitute some 60% of this total. In consequence, the Mekong retains most of its natural flow characteristics upstream of the delta, and the major environmental impact of water-related development to date is to increase the local problem of salt water intrusion in the delta areas.

However, it is critical to realize when evaluating the results that ongoing and committed developments in the upper basin will result in significant transfers of water from the wet to the dry season. The hydrological implications of this are broadly reflected in the "China Dams" scenario. Any lower Mekong scenario must therefore be evaluated in relation to the expected future situation – independent of lower Mekong development – as well as the historic "Baseline" scenario.

The main body of the study report contains details of the scenario analysis, reported against the broad range of the indicators. An indication of the change in flow regime between the Baseline and the High Development scenarios for Nong Khai and Kratie is presented in Figures A3/2 and A3/3.

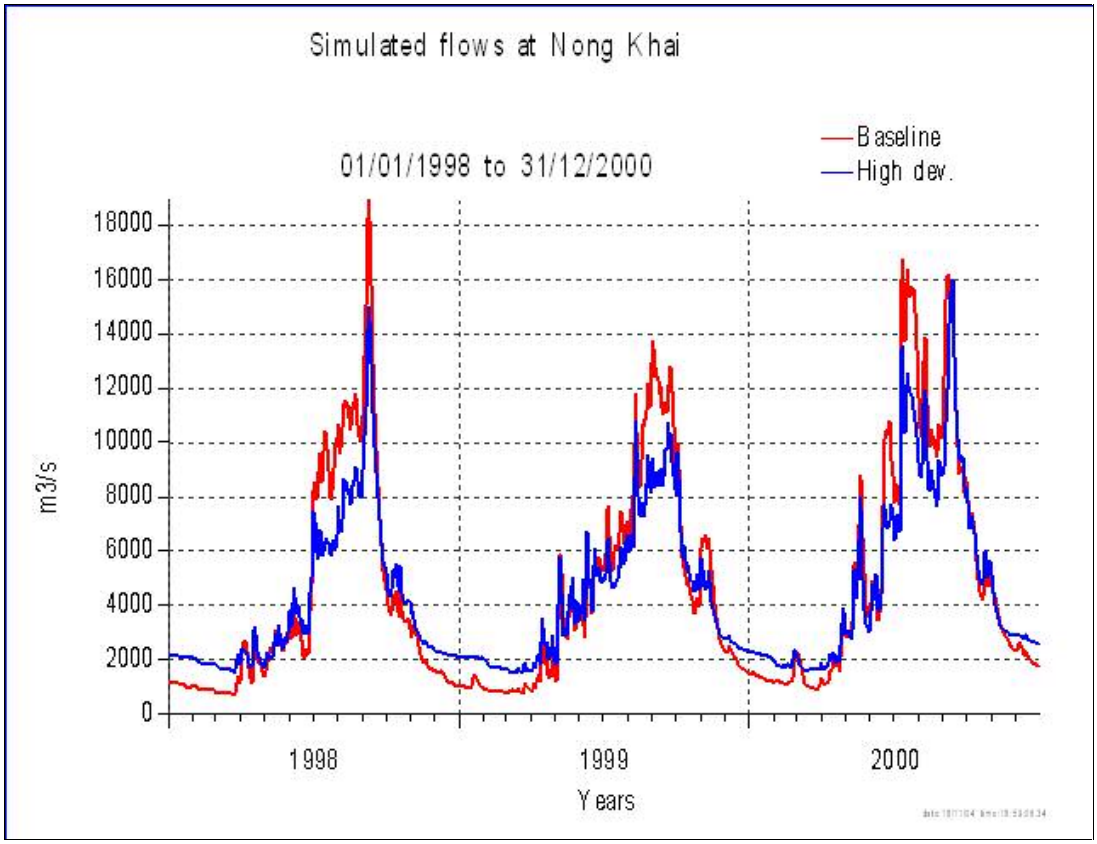

Figure A3/2 Simulated flows at Nong Khai

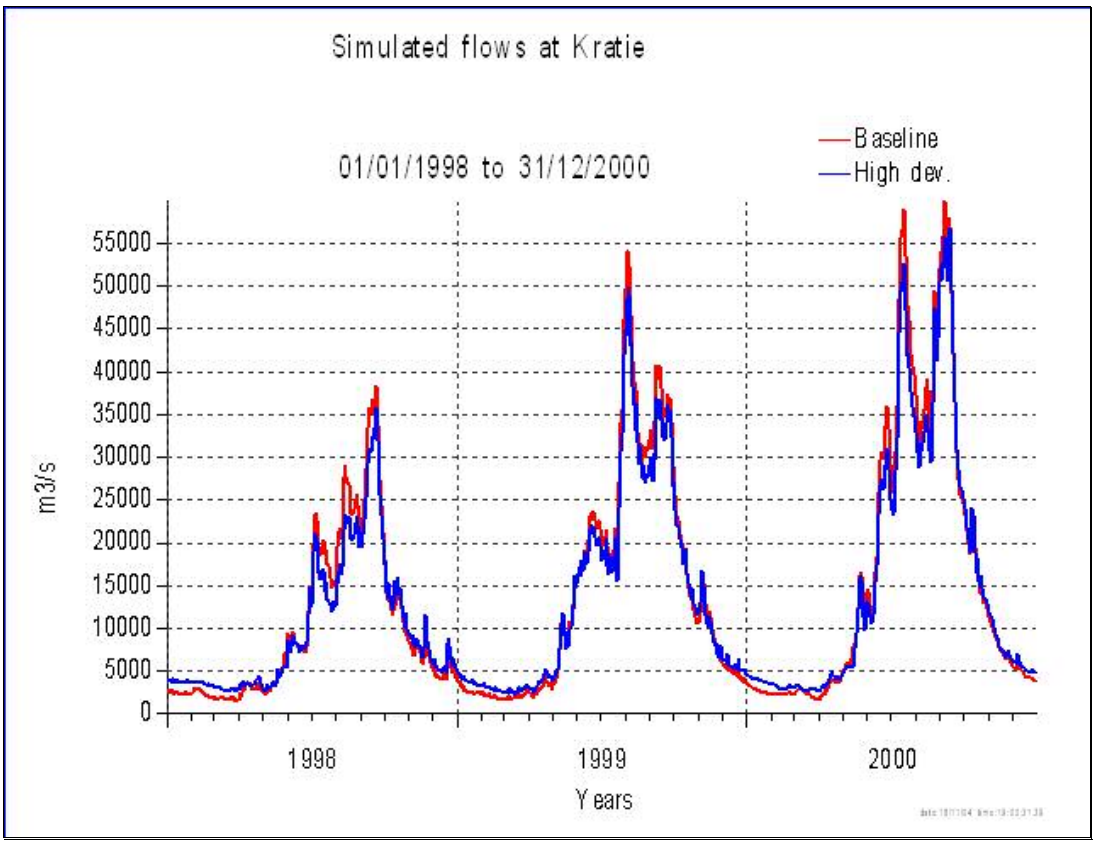

Figure A3/3 Simulated flows at Kratie for the years 1998 (a very dry year), 1999 and 2000. The high ratio between dry and wet season flow is borne out. The red line is the actual, largely natural flow, the blue is the calculated flow in a scenario of high development, which includes all existing and planned dams. (The blue line lies below the red line in the wet season and above it in the dry season, reflecting the effect of the operation of all upstream reservoirs which fill up in the wet season and release flow in the dry season.).

Summary observations are that, despite the "High" development character of the scenario:

- The overall character of the original, baseline hydrograph is maintained.
- Low flows are significantly increased and are higher than the historically observed range.
- High flows are marginally reduced, but within the historically observed range.

Future development must be properly co-ordinated, and managed, to preserve the environmental flows that support the existing Ramsar wetland sites upstream of the delta and the highly productive natural fisheries – which represent 2% of total world fish production. These objectives are consistent with objectives set out in the Mekong River

Agreement.

The results confirm the importance of a balanced and coordinated approach to water management. The results set out here confirm that agreement on access to the waters of the Mekong river is a necessary precondition to provide development security at a country level, ensuring that the benefits of development in one country are not eroded by development in another. Only a coordinated approach provides assurance of sustainable development opportunities.

Impact on Fisheries

Potential impacts on the fisheries sector are a major concern, because fisheries are a primary source of income to the poor and nutrition to the population more generally. The models produce data on flow, height, and area inundated, from which a preliminary indicator of fish production has been developed, based on fish feeding opportunities. This should be a forerunner of more sophisticated indicators, but it does correlate well with available fish catch data from Tonle Sap. All scenarios tested show a small decline in fish feeding opportunities in the order of 1-3% across the region, the most pronounced reduction (of up to 10%) occurring only in the "High Development" scenario and then only in years of very low flow. This figures are aggregated values across the Lower Mekong Basin, and do not reflect more localized effects.

Although the impact is certainly not negligible it appears that it could be manageable – by creating new wetlands for fish spawning, improving wetland and fishery management, or, as an extreme measure, accepting a decline in fishery productivity and providing compensation in the form of alternative income sources in agriculture, and/or through cash payment.

A complicating factor in assessing the impact of potential developments within the basin on the fisheries sector is the difficulty of projecting the future of fisheries: quite separately from any impacts of dams and irrigation facilities. Given the comparatively low impacts that the simulations suggest, it is necessary to accept that fish production is as much if not more threatened by over-fishing, pollution from chemicals, and habitat (wetland) destruction due to pressure on land and poorly conceived roads and flood embankment construction. It can be argued that the best basis for intervening in these "common property" problems is provided by the existence of alternative sources of income (as provided by irrigated agriculture) and development generally (as facilitated by the availability of power).

Nevertheless, any development which directly impedes fish migration in the mid and lower reaches of the river will have significant negative impacts on fish production. Mainstream dams or weirs in the mid and lower Mekong are therefore most unlikely to be a part of any balanced development scenario that complies with the objectives of the

Agreement. It is also clear that floodplain connectivity is fundamental to fisheries production and river health and must be protected.

Impact on Hydropower

The realistic estimate for hydropower is much lower than the figure generally quoted of 30,000MW because this includes 13,000MW on or near the main stream in the lower basin. It is likely that this figure will be further reduced when individual projects have been evaluated for local environmental and social impacts. However, even after these qualifications there is still a very large hydro power potential that could be developed as part of a well structured and integrated program.

The projected hydro-power in the Lower Mekong Basin in the various scenarios ranges is summarized below:

Table.2 Projected hydropower in the Mekong Basin

	Capacity (MW)		Energy (GWh)	
Location	**Lower Mekong**	**China**	**Lower Mekong**	**China**
Minimum	1,290	0	7,500	0
Maximum	6,084	12,550	43,000	68,000

Impact on Irrigation

To support national objectives of basic food security and crop diversification an increase in irrigated area is inevitable. There is currently 7.4Mha irrigated, of which 4.1Mha is in the Mekong Delta. The high development scenario increases the total area to 11.3 Mha, with most of the increase located in Cambodia – where irrigation is planned to triple. This increases the amount of water diverted for irrigation by 15.5 Gm^3/y to 55.8 Gm^3/y. This is a 40% increase in diversions and will in total represent 12 % of annual flows. The presence of large reservoirs for the hydropower dams in some of the scenarios shifts peak wet-season flows to the dry season, and makes available large quantities of water for agriculture.

As modelled, the high development areas in Cambodia did not have fully reliable access to water for irrigation, resulting in some understatement of potential withdrawals. This is not seen as a significant issue in interpreting the results because any higher demands would not coincide with periods of major impact in the Mekong Delta.

The High Development scenario has included an average inter-basin transfer in the wet season of 1.9 Gm^3/y.

Impact on Navigation

All the scenarios generally show substantially improved opportunities for navigation. This is thanks to the redistribution of flow from wet to dry season as a result of the reservoirs of the hydro-power dams, and is particularly significant in the higher reaches of the river, where navigation access that is currently only experienced for 2-3 months each year on average will in future be virtually year-round.

Impact on Flood Damage

While there will be some redistribution of flood peaks, the developments – even those in the high-development scenarios – will not significantly mitigate major floods in the Lower Mekong Basin.

Annex 4

DEMOGRAPHIC AND DEVELOPMENT TRENDS IN THE MEKONG BASIN

Social and demographic features

It is estimated that most of the basin's population of 55 million live in rural areas. They are subsistence farmers who supplement what they grow with the fish they catch and the food and other materials they gather from forests and wetlands. Nearly 40 percent of the people in Cambodia and Lao PDR , the two countries that lie mainly in the basin, have incomes below the poverty line. Poverty rates are also high in the parts of Thailand (Ilsan) and Viet Nam that lie within the basin.

Cambodia and Lao PDR together comprise only about one-quarter of the basin's population, although 80 percent or more of each country's population lives within the basin. Thailand and Viet Nam contribute 43 and 31 percent respectively to the basin's population. However, only a part of the overall population of Thailand and Viet Nam live in the basin. In Thailand, the basin population is about 40 percent of the national population; in Viet Nam, 20 percent of the country's population lives in the Mekong Delta or the Central Highlands.

The average household size in Cambodia and Lao PDR is five or six persons, reflecting a common feature in rural, subsistence households in the LMB. In Thailand, the average household size has dropped from six to four persons due to declining fertility rates. A similar transition is occurring in Viet Nam, aided by government policies to encourage small families. At the same time, the number of households is increasing. For example, between 1993 and 1997 there was an increase of about 20 percent in the number of households in Cambodia. The population of the LMB is very young. More than half the population of Cambodia and Lao PDR is estimated to be below the age of 15 years. The implication is that a high age dependency ratio — each working adult must support other household members who are too young (or too old) to work.

Overall, women head about one-quarter of the households in the LMB. In rural areas, female household heads tend to be widows who lost their husbands in war, or married women whose husbands are away working as migrant laborers. In rural areas of northern Lao PDR , among older household heads, as many as 60-70 percent are women. More detailed information is available in the MRC's most recent 'State of the Basin' report, from the internal and published reports and discussion papers of the MRC's Basin Development Plan and also in its recently completed Strategic Plan (2006 – 2010)(Table A4/1).

The projected annual population growth rates of 2.5 percent for Cambodia and 2.86 percent for Lao PDR respectively is likely to result in additional 4.3 million people by the year 2010. Although the populations of Thailand and Viet Nam will grow more slowly, each country has a large pool of young people who will start their own families. This and increased longevity mean that overall population growth will remain high. In the year 2002 the total population living in the Lower Mekong Basin was estimated at 56.6 million. Projections suggest the 2010 population will reach 63.6 million, which is equivalent to an overall annual growth rate of 1.54%.

Table A4/1: Projected population growth of the Lower Mekong Basin

Portion within Mekong Basin	2002 Population (million)	Annual Growth Rate (%)	2010 Projected Population (million)	Source
Cambodia	13.8	2.5	16.8	www.unescap.org
Lao PDR	5.1	2.86	6.4	www.unfpa.org
NE Thailand	21.1	0.87	22.6	www.nso.go.th
Viet Nam delta	16.6	0.9	17.8	www.geohive.com
Total	56.6	(Average) 1.54	63.6	

Social and economic development

The GMS today has significant economic potential, as well as significant challenges. Economically, it is one of the fastest-growing sub-regions of the world with GDP growth in 2004 ranging from 6 percent in Cambodia and Lao PDR to 7.5 percent in Viet Nam, and more than 11 percent GRP growth estimated for Yunnan and Guangxi provinces of China[8] (see Table A4/2). Figure 1 also shows the relatively strong growth rates over time in the region, with some turbulence around the time of the Asian financial crisis. The sub-region's openness to trade has dramatically improved with openness ratios rising from between 61 percent (Lao PDR) and 90 percent (Thailand) in 1995 to above 125 percent in 2003 for Cambodia, Thailand and Viet Nam[9].

Table A4/2: Greater Mekong Sub-Region: economic indicators

	Cambodia	***Lao PDR***	***Myanmar***	***Thailand***	***Viet Nam***	***Yunnan (China)***	***Guangxi (China)***
GDP (US$ billions)	4.6	2.4	*13.6*	163.5	45.2	*35.8*	*40.1*
Population (millions)	13.6	5.8	49.9	62.4	82.2	44.2	48.9
Per capita income (US$)	320	390	*270*	2,540	550	*810*	*820*
Per capita income PPP (current international $)	2,338	1,934	..	8,179	2,704	..	..
GDP Growth rate (percent)	6.0	6.0	n.a/.	6.1	7.5	*11.5*	*11.8*

Notes: Data for most recent available year, mostly 2004. Figures in italics are staff estimates.
Sources: World Development Indicators database; China Statistical Yearbook 2005

[8] For Myanmar, official government figures show 13.8 percent growth in 2003/4; however, most external analysts estimate growth to be much lower. The lack of certainty on official data on Myanmar exists throughout the paper on all data presented. GRP: Gross Regional Product.

[9] Openness ratios measure a country's trade as a percentage of output, or (Exports + Imports)/GDP using recorded data. Data on Myanmar are not available.

A comparison of the social indicators of the GMS countries (see Table A4/3) also shows that while growth has been strong in the GMS economies and there have been strides in poverty reduction, it has not always yielded commensurate improvements in social indicators for every country. For example, the infant mortality rates (per 1,000 live births) in Thailand and Viet Nam were 23 and 19 respectively compared with a discouraging 97, 82, and 76 in Cambodia, Lao PDR , and Myanmar respectively. An examination of literacy rates (aged 15 and above) shows average literacy rates of 93 percent in Thailand as compared with 69 percent and 66 percent in Cambodia and Lao PDR respectively. While 96 percent of infants aged 12-23 months in Thailand were immunized, this number was a low 69 percent for Cambodia and 50 percent for Lao PDR . The HIV prevalence rate varies considerably among countries with a high of 2.6 percent in Cambodia and 1.5 percent in Thailand; it is a low 0.1 percent for Lao PDR and 0.4 percent in Viet Nam, but with the increase in cross border migration and trade, most of the economies are vulnerable to potentially increased prevalence rates.

Table A4/3: Greater Mekong Sub-Region: social indicators

Country	*Life expectancy at birth (years)*	*Adult literacy rate (%)*	*Infant mortality rate (per 1,000 live births)*	*Improved water source (% of population with access)*
Cambodia	54.0	69.4	97	34
Lao PDR	54.7	66.4	82	43
Myanmar	57.3	85.3	76	80
Thailand	69.3	92.6	23	85
Viet Nam	69.9	92.1	19	73

Note: Data for most recent available year, mostly 2002-2003.
Sources: WDI and EdStats

Household incomes vary widely across the basin. For Thailand and Viet Nam, the LMB has provided the natural resources that have contributed to the economic development within each country. However, there remains a significant and widening gap between incomes within the basin and parts of respective countries that lie outside the basin, and among LMB countries themselves. Incomes in Thailand are three times higher than those in Viet Nam and more than four times greater than those in Cambodia and Lao PDR .

There are also significant differences within countries, between regions and in urban and rural areas. Since the financial crisis in 1997, the North and Northeast Regions of Thailand have experienced significant unemployment and the return of workers who have lost their jobs in urban areas. Urban incomes in Viet Nam are nearly four times higher than rural incomes. In Cambodia and Lao PDR , urban incomes are approximately twice the national average. Incomes in the Mekong Delta and the Central Highlands are, respectively, 20 and 40 percent below the national average. Income levels remain low in Viet Nam, despite strong economic growth during the 1990s. This is also due to very high population densities. In addition, as a consequence of the overall high population density, there is less arable land per capita compared with other LMB countries. Also, benefits from foreign investment and exchange earnings need to be spread over a much larger population.

In general, women in the LMB tend to work at low-paying, more menial jobs. Their overall income levels average 60-75 percent of men's incomes. Data available for Cambodia and Lao PDR suggest that non-agricultural wage levels for women are about 80 percent of those of men, except in urban areas where women's income more nearly equal men's. In Thailand, women

working in the public sector tend to have income levels nearly equal to men, but they earn only about 75 percent of men's wages in private sector, non-agricultural jobs In Viet Nam, women's wages overall are 72 percent of men's, but only 62 percent of men's in the agriculture sector.

A serious challenge consists of the rapid population growth and the ensuing pressures on land use and on the natural resources. The urbanization and the expansion of towns and roads is increasingly encroaching on wetlands and vulnerable ecosystems. The region has benefited the past years of high economic growth rates which suggests that overall incomes are rising.