

Mekong River Commission
Basin Development Plan Programme Phase 2

**HIGH LEVEL STUDY VISIT TO THE
COLUMBIA RIVER BASIN**

Back-to-Office Report

June 2008

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1. Introduction

From April 28 through May 2, 2008, fifteen senior officials of the Mekong River Commission (MRC) and its four Member Countries made a study visit to the Columbia River Basin in the USA. The visit was organized by MRC's Basin Development Plan (BDP) Programme with tremendous support from the US Army Corps of Engineers (USACE). This back-to-office report summarizes the programme and lessons learned from the study visit. The report demonstrates that the study visit was a great success. All expected learning points of the participants were met. It is expected that the outcomes will become visible in ongoing planning activities at the basin and sub-basin levels in the Lower Mekong Basin (LMB).

The BDP team wishes to thank the representatives of the many organizations in the United States (US) that made the study visit an invaluable learning experience for the LMB countries and the MRC. Special thanks go to the USACE, whose technical and managerial support was instrumental during the preparation and implementation of the study visit. The BDP team also would like to thank the US Bureau of Reclamation for the organization of the site visit to the Grand Coulee Project and the Bonneville Power Administration for its valuable contributions to the study visit, including the provision of aircraft.

2. Background

While millions of people are using the Mekong Basin's rich natural resources, water infrastructure development is limited compared to most other large river basins in the world. Governments of the countries in the LMB increasingly recognize that developing some of the economic potential of the water and related resources in a sustainable way for domestic and industrial use, hydropower, navigation, irrigation and flood management can reduce poverty, boost economic growth, increase trade, and help meet the UN Millennium Development Goals.

Hydropower development is currently accelerating throughout the Mekong Basin, driven by markets and the private sector. A broad range of developers is investigating a large number of potential projects, many of which were identified as early as the 1960s. The planning cycle for private sector projects is generally shorter than the conventional public sector approach, and many concession agreements are already at advanced stages of negotiation. "Run-of-river" hydropower projects on the Mekong mainstream are among them, since they are now seen as more viable due to the expected increase in dry season flows that will result from the construction of large storage projects in the Upper Mekong Basin by China.

This development raises a number of challenges that go beyond the scope of any one individual project developer, financing agency or national sector agency. An example of such a challenge is the assessment of the cumulative impacts of the planned projects from a basin perspective to ensure that: 1) projects are sensitive to the maintenance of vital ecosystems and productivity of capture fisheries on which most of the poor population depend for their livelihoods and 2) projects reinforce each other or, as a minimum, do not conflict with one another. For example, one of the most important questions facing mainstream hydropower development is to what extent the barrier effect of mainstream dams on migratory fish populations can be mitigated successfully.

MRC's Basin Development Plan Phase 2 (BDP2) is designed to bring the basin perspective into the national planning and to prepare a Basin Development Plan for the LMB, based on principle of Integrated Water Resources Management (IWRM). It will do so by using a scenario-based and participatory approach to planning. The outcomes of the ongoing assessment of alternative basin-wide development scenarios will enable informed decision making on an acceptable balance between resource development and resource protection in the LMB. The decisions taken will be elaborated in an IWRM-based basin strategy, which will provide: 1) a long-term view of how the Mekong Basin will be developed and 2) a planning framework that brings basin perspective into the national planning and guides the development of multi-purpose projects. The inception report of BDP2 is provided on MRC's website¹.

3. Rationale

The BDP2 inception report scheduled an early study visit to an international river basin to enhance innovative thinking in support of the BDP planning process. The preparatory work started with the definition of a few selection criteria and the review of relevant information from several prospective river basins. Ultimately the Columbia River Basin, shared by the US and Canada, was chosen since it shares some similar natural characteristics with the Mekong Basin and, a few decades ago, faced similar development and management decisions as the LMB countries face at present. In addition, the Columbia River Basin offers opportunities to learn about the cost and effectiveness of mitigating measures that address adverse effects of water and related resources development, such as the barrier effect of dams on fish populations. The Columbia River Basin also demonstrates innovative approaches in basin management and public participation.

It became increasingly evident during the preparation and implementation of the study visit that the experiences and lessons learned in the Columbia River Basin would be invaluable for the MRC and its member countries to ensure that basin development is economically beneficial, environmentally sound and socially just. A more detailed description of the rationale for learning from the Columbia River Basin is provided in the preparation paper of the study visit entitled: "Concept of a High level Study Visit to the Columbia River Basin – Understanding the Eco-Systemic Response in IWRM-based Basin Development" of February 2008.

4. Objectives

The aforementioned concept note defines the following three objectives for the study visit to the Columbia River Basin:

- 1) To learn from the positive and negative economic, social, environmental, political and cultural effects of extensive and large-scale water resources development in order to enhance the shared vision of sustainable water and related resources development in the Mekong Basin.
- 2) To learn about different approaches for water and related resources development and basin

¹ <http://www.mrcmekong.org>

management in order to support the implementation of IWRM in the Mekong Basin.

- 3) To learn about different legal/administrative enabling mechanisms for transboundary basin development and management to further enhance the implementation of the 1995 Mekong Agreement, with a view to maximizing the opportunities of the LMB countries to realize their individual and collective development aims.

During the first day of the study visit the participants defined their expectations for a successful tour, which confirm and extend the learning points described in the concept note. The expectations cover significant issues for the LMB countries and the BDP process, such as:

- International agreements: what is the process of successfully negotiating an international treaty; how benefits are shared in a treaty; how to synthesize differing positions and conflicting interests of the various sectors and agencies, and discuss consolidated national positions at the international level; who is the national focal body with the political mandate and competence to bring parties together and lead international negotiations; how can this body play a neutral role in negotiations; how are data and information shared between countries; and how are transboundary relations maintained and improved.
- Basin-wide planning: how do countries and their stakeholders cooperate in the planning process; which planning tools are agreed and how are they used; how to analyze costs and benefits, and understand long-term trade-offs; what are the cost and benefits of hydropower development; what is the role of IWRM in the distribution of costs and benefits; how can MRC be a neutral party in the basin-wide planning process and the discussion of trade-offs; how to integrate the basin perspective into national planning; and how to use lessons learned into national plans.
- Mitigation of adverse effects: what are the main adverse effects of basin development; what are the most cost effective mitigation measures; how are mitigation measures financed and who implements them; what are the experiences with dam removal and how are the cost recovered.
- Basin management: how is the basin managed and the water infrastructure operated and maintained; what would have been the added value of river basin organizations; how are water management responsibilities decentralized and privatized; and what is the role of IWRM and how is it applied.
- Public participation: what are the public participation models; how is civil society engaged in the basin planning, development and management processes; how are data and information made available to the public; and how to bring the various organizations and interest groups together.
- Leverage of experiences: how to leverage the knowledge and experiences from US/Canada in the Southeast Asian context; and how to establish a process of joint leaning and sharing of expertise among experts and policy makers from the Columbia and Mekong basins.

5. The Programme

The programme of the study visit is provided in Annex 1. It was prepared together with the USACE², which also organized and facilitated the visit. The programme was very rich and engaged many public, private, NGOs, and societal organizations that play a role in the development and management of the Columbia River Basin, including but not limited to several divisions of the USACE, Bonneville Power Administration³, BC Hydro (Canada), the International Joint Commission, Northwest Power Pool, Pacific Northwest Utilities, Bureau of Reclamation, Nature Conservancy, American Rivers, National Marine Fisheries Service, National Weather Service (NOAA), Fish and Wildlife, Columbia Basin Trust, National Marine Fisheries Service, Environmental Protection Agency, Northwest Power Planning & Conservation Council, and representatives from the Columbia Inter-Tribal Fish Commission.

Over sixty representatives of these organizations made excellent presentations, engaged with the participants in informative discussions, and/or facilitated the site visits (see Annex 3). The site visits, such as the visit to the Grand Coulee Dam, demonstrated the benefits and costs of multi-purpose projects and brought the participants together with local organizations, beneficiaries and affected groups, such as representatives of local governments, utilities, and the Colville and Yakima Native Indian Tribes.

6. The Participants

The 15 participants of the Mekong region comprised deputy ministers, the Joint Committee of the MRC, department heads of sector agencies, and senior staff of the MRC Secretariat and National BDP Units. The participant list is provided in Annex 2. All participants are proficient in English, which greatly enhanced the exchange of information and discussions.

7. Lessons Learned

The main lessons learned are summarized below, based on the back-to-office Report of the four participating Member Countries. They are all relevant to the BDP planning process, in particular the formulation of assessment of development scenarios and the IWRM-based basin strategy. At least as important, the lessons offer immediate food for thought for the assessment and development of national priority projects in the LMB.

7.1 Current hydropower plans, if implemented, will transform the Mekong Basin.

When decisions were made to harness the Columbia River as early as 80 years ago, the basin was sparsely

² At the international and federal operational level, the USACE implements the Columbia River Treaty together with the Bonneville Power Administration and Canada's BC Hydro. The Northwestern Division of the USACE leads the coordination of the multi-purpose use of the Columbia River system and is responsible for flood control operations at all reservoirs, maintains navigation channels, and provides operations to accommodate other beneficial uses, such as irrigation, recreation, and fish and wildlife needs.

³ The Bonneville Power Administration is charged with marketing the hydropower generated at the federal dams to wholesale power companies.

populated and one of the poorest regions of the US. The decision to develop the basin for hydropower, navigation, flood control and irrigation was made with a view to transforming the basin from a backwater into a modern, prosperous society. At that time, this vision was shared by the large majority of the population. Trade-offs around the time of the Second World War was straightforward: people wanted jobs, energy, industries, a better life, and win the war. Since then, revenues from hydropower generation have been financing other development activities, such as the improvement of transport infrastructure. Relatively inexpensive hydropower attracted many industries (aluminum, airplane industry, and more recently Google) to the region, which created jobs but also caused some major pollution sources.

The construction of the dams dramatically altered the quality of life of the basin's population, as well as the landscape and ecosystem of the river. Because of the many positive and negative impacts of hydropower on the economy, society and environment, it has been impossible to date to make a useful cost/benefit analysis of dam construction. Currently, a shared vision is absent due in part to the significant impacts of the dams on salmon and trout stocks (see Section 7.3) and other environmental effects. Environmental and tribal values are now much more important than 50 years ago, and a considerable part of civil society supports dam decommissioning.

Similarly, it may be expected that ongoing and planned dam construction in the Mekong Basin will have a significant impact on the economy, society and environment in the basin. As in the Columbia River Basin, the cost and benefits will be hard to determine. An important difference between the two basins is the much higher number of poor people in the Mekong Basin who rely on the river's natural system than was the case 50 years ago in the Columbia River Basin. Much depends on how the revenues of hydropower in the LMB will "trickle down" to alleviate poverty and maintain good ecological conditions. This in turn depends on the policies of the Governments and the abilities of civil society to have a "voice" in these policies.

7.2 Dams built are there to stay.

In the 1990s, large and costly studies were undertaken in the Columbia River Basin to assess the benefits and costs of decommissioning some of the dams that were perceived as particularly damaging to anadromous salmonid fish. The studies were non-conclusive; depending of the choice of indicators used, costs would outweigh benefits or vice versa. It also emerged that decommissioning of dams can result in significant adverse environmental effects, some of which cannot be assessed with confidence.

Thus decisions on possible dams on the LMB must be based on the best possible information, which for mainstream dams would include their effects on migratory fish and the wider (distributional) economic and social impacts. If the necessary reliable information is not available, the Governments may have reason to consider postponing dam construction. Once a dam is built, it is there to stay, even when new information suggests that the dam causes considerable adverse effects. A precautionary approach is therefore prudent.

7.3 Mitigation of the barrier effect of dams on migrating fish is a large and costly undertaking.

The operators of the dams in the Columbia River Basin are being increasingly successful in the mitigation

of the barrier effect for both upstream and downstream migratory fish. The near-term targets set for fish bypass systems for some of the individual dams are above 90%. However, even with these high levels, the system survival rate would only be 60% in a cascade of 5 dams. In the Columbia River system, fish populations are now approximately 10% of pre-dam conditions.

An entire scientific and manufacturing industry has been developed, driven by regulations and financed from hydropower revenues (financed by the Bonneville Power Administration) to invent and test the best technologies for fish passing, including fish ladders, fish friendly turbines, screens to guide fish to bypasses, trap-and-transport systems, and others. The Grand Coulee Dam in the northern portion of the basin and several storage dams on the tributaries entirely block fish migration, and there are no migrating fish on the river above these dams. Some migratory species, like sturgeon, have flexible life history patterns that enabled them to live upstream of these dams. Approximately 5% of annual hydropower revenues of the Bonneville Power Administration (USD 300 to 400 million per year) have been used for fish and wildlife protection during 1970-2007. The USACE expects to spend USD 1.3 billion during the next 10 years to retrofit hydropower facilities and increase fish survival rates.

In the Mekong Basin, the barrier effect of the currently studied mainstream dams on migratory fish populations is much more difficult to mitigate. Traditional fish ladders to enable fish to migrate upstream are not effective for non-salmonid fishes on dams higher than 5 to 10 meters. It maybe that the current high energy prices permit the development of more innovative and complex solutions, such as fish locks and fish elevators, if they are suitable for the range of species in the Mekong region. Existing technologies that enable fish to migrate downstream seem more promising for application in the Mekong Basin. Experiences in the Columbia River Basin demonstrate that a massive research programme is needed to learn more about the behavior of migratory fish species, identify a range of available options for mitigating the barrier effect, and to predict the effectiveness of the individual mitigation options. As demonstrated in the Columbia River Basin, the mitigation costs may amount to more than USD 100 million per year.

7.4 Use policy relevant and measurable criteria to assess alternative development scenarios.

One of the reasons why the aforementioned large planning studies in the Columbia River Basin were not conclusive has to do with the definition of assessment indicators for the evaluation of alternative plans or scenarios. The study shows that many indicators can be defined but not all of them are policy relevant or can be determined within acceptable limits of certainty. Many of the indicators used need to be interpreted by professionals. Moreover, the use of too many indicators obscures the understanding of the big picture and paralyze decision-making.

Also the MRC has tested over one hundred impact indicators during the last several years to assess the impacts of hypothetical changes of the flow regime. The results are informative and facilitate the selection of useful indicators for the assessment of basin-wide development scenarios. Therefore, in BDP2 a relatively small number of policy relevant, user driven, sensitive, and measurable economic, environmental and social and equity indicators have been defined in addition to a few qualitative indicators. Most of these indicators are derived from current regional and national policies, strategies and plans, and can be readily understood by decision-makers and other stakeholders.

7.5 IWRM does not always require River Basin Organizations (RBOs).

RBOs are useful organizations to coordinate, steer and monitor water resources within significant hydrological units. This is particular so if water resources development is accelerating or in situations with serious water scarcity, sectoral competition for water, or water quality problems. Although in its history there has been such a need in the Columbia River Basin, RBOs, as promoted by many international organizations and emerging in Southeast Asia, do not exist in the Columbia River Basin. Instead, water resources are managed by a network of collaborating agencies, civil society groups, NGOs and others, driven by regulations (such as the Northwest Power Act, the Endangered Species Act, and the Federal Green Regulation Commission), and funded by the revenues from hydropower (thus by the Bonneville Power Administration). There are also incentives for stakeholder groups to collaborate. More recently, local watershed councils are being established that are working with various agencies to restore the ecological integrity of their watersheds. In the process, communities have developed social and institutional capacity to work with federal, state, local, tribal stakeholders.

In the Mekong Basin, the experiences with RBOs are mixed. As in most countries, it may take more than one or two decades for RBOs to gain the respect from traditional sector agencies and become the authority for water resources management within their area of jurisdiction. It would be timely to make an assessment of the status of existing RBOs, as well as the pros and cons of other sub-basin management mechanisms. Meanwhile, BDP2's sub-basin activities will support existing RBOs and develop useful sub-basin management mechanisms to produce IWRM-based guidelines and checklists that will assist the long established sector agencies (agriculture, navigation, hydropower, etc.), do the on-the-ground planning and project development, but in a way that is sensitive to the environmental and other sub-basin needs. MRC's watershed programme supports the pioneering watershed councils at the community level.

7.6 IWRM does require the assessment of multi-purpose projects.

The concept of IWRM holds the promise of reconciling goals of economic efficiency, social equity, and environmental sustainability. However, experiences in many river basins show that there is no consensus on how to weigh these goals, or how best to ensure their realization. Since more than 50 years ago, some of these goals are being achieved in the Columbia River Basin through the development of multi-purpose projects and the subsequent balancing of the multiple water demands in the seasonal planning and daily operation of these projects. The process is underpinned by appropriate regulations. However, a challenge has been applying cost/benefit analysis to ecosystem services.

In general, the hydropower locations in the LMB have been identified and assessed solely for the development of hydropower in a rather single sector oriented approach. Therefore, these projects offer less opportunity for traditional multi-purpose operation for flood control, irrigation and environmental flow requirements. As a result, the single-purpose projects may be economically less beneficial and efficient, and may conflict with other projects or beneficial uses. The experiences in the Columbia River Basin suggest that there is a need for better coordination and data exchange between national sector agencies, the formation of multi-disciplinary project teams, and enhanced public participation. This coordination should include the viable and ecologically sound modes of upland watersheds to the benefit of the hydropower plants (less sedimentation) and other usages.

7.7 On the importance of transparent public consultation and civil society participation.

Various mechanisms have been developed by the USACE for public hearings and consultation on the impacts of water resources development on different population groups, including the Native American tribes in the Columbia River Basin. Partnerships have been built with civil society organizations such as the Nature Conservancy, tribal organizations and others for researches and establishing the most appropriate compensation and mitigation measures.

The critical challenge for the promotion of similar mechanisms in the Mekong Basin, where Member states have different political systems, is whether emerging public consultation and participation of civil society organizations will in fact influence the national decision making on water resources development, especially on developments with transboundary implications.

7.8 On the importance of upstream storage and the size of the management area.

In the Columbia River Basin, significant mutual advantages were gained by increasing the size of the management area through inclusion of an entire drainage area in Canada by the signing of the Columbia River Treaty (CRT). The CRT created upstream storage capacity in Canada that resulted in major flood protection benefits in the US and hydropower benefits in both countries. Practical mechanisms were agreed by the two countries to share the costs and benefits of the upstream storages. The CRT was able to capitalize on the large seasonal variation in river flow (as in the Mekong Basin) and the preexisting downstream development of hydroelectric generating capacity in the US that lacked adequate upstream storage capacity. On the other hand, these positive effects regarding hydropower and flood control in the Columbia River system caused further harm to anadromous salmonids and impinged on Native American Treaty obligations, the consideration of which were not included in the CRT.

Similarly, the development of water storages in the Upper Mekong Basin by China make the currently studied “run-of-river” mainstream dams in the LMB more attractive to private developers (the completion during the next ten years of the Xiaowan and the Nuozhadu hydropower projects on the mainstream in China, with 9,800 and 12,400 million cubic meters of active storage, respectively, are likely to cause the most significant seasonal redistribution of flow of any of the foreseeable water resources developments in the Mekong Basin). Until now, collaboration between China and the LMB countries on the planning and design of these projects has been limited. To seize the downstream advantages, while avoiding potential negative externalities stemming from upstream water storage, data and information exchange between China and the LMB countries on the design and operation of the hydropower cascade in the Upper Mekong Basin needs to be enhanced.

7.9 On the principle of equality and equity in the evaluation of alternative development scenarios.

The CRT is based on the principle of equality, instead of broader consideration of equity, despite the historic asymmetry of population and economic power between Canada and the US. Downstream hydropower and flood-control benefits from upstream storage are equally shared. On the other hand, there have been cases whereby downstream benefits were not shared across the international border by either

Canada or the US. It is problematic, however, whether this results in an inequitable situation between copriarians. Differences between Canada and the US on this issue may play out during the upcoming renegotiation of the CRT, which may put more emphasis on the principle of equity, including equity related to societal values (fisheries, tribal, and environment) in addition to hydropower and flood control.

The 1995 Mekong Agreement suggests that each member state must benefit from the further development of some of the basin's resources. Also, the Agreement requires the LMB countries to utilize the basin's water resources in a reasonable and equitable manner. Previous preliminary studies indicate that Thailand and Vietnam currently obtain the greatest economic value-added from the water resources in the Mekong Basin. The studies also suggest that some countries may benefit more than others from future water resources developments. This may open debate on the concept of equitable development, which is usefully elaborated in the 1997 UN Convention on the Law of the Non-navigational Uses of International Watercourses. If needed, MRC could organize a structured debate with stakeholder participation on this issue.

7.10 International water management agreements should have some flexibility.

International water management agreements should have some flexibility, containing provisions for periodic review and assessment so that emergent societal values, changing market conditions, and other unforeseen circumstances may be addressed. The CRT does not contain such provisions and has a sixty year life; although it has provided effective and stable implementation, it also resulted in occasional dissatisfaction among treaty participants or non-participating stakeholders. The CRT's near exclusive concern for hydropower and flood control, and the associated setting of flow rules at the border between the two countries, has made it difficult to address the increased societal value placed on endangered biota, leisure time uses of water, and environmental quality. While innovative management by the CRT parties has allowed some accommodation for values outside of hydropower and flood control, solving emerging issues will be challenging within the existing CRT framework.

The 1995 Mekong Agreement offers sufficient flexibility. It encourages rather than commands transboundary cooperation for the development and management of the basin. Perhaps, the challenge is to implement the 1995 Agreement in ways that capture the advantages of "harder" agreements or treaties, such as the CRT. This would require that the LMB countries are willing to accept for specific operations under specific conditions some limitations on sovereignty over water flowing through their territories to ensure that the mainstream is managed as a common good.

7.11 Agreements over water development should provide means for compensating affected communities.

Such communities may be located in the mountainous headwaters of river systems, where favorable sites are found for storage reservoirs or downstream areas that may have to cope with the degeneration of wetlands and river margins. Plans for adequate compensation were not considered in the US and Canada at the time of early basin development. The Columbia Basin Trust, the Oregon Water Trust and other mechanisms, founded less than fifteen years ago, now derive an important part of their funds from the hydropower revenues (for Canada under benefit-sharing provisions of the CRT). Among the trusts' goals

are training, education, economic stimulation and diversification, in addition to improving the environmental quality of the region.

Similar benefit sharing mechanisms could be considered related to hydropower development in the LMB. Funding could be provided to watershed councils or organizations that represent the local population and can play a useful role in protecting watersheds and the restoration of habitats for fish.

7.12 Basin development dramatically increases transboundary cooperation at the technical level.

The objectives of the CRT and other international, federal and state agreements have been largely met by intensive collaboration between like-minded technical staff with common technical backgrounds. They are employed by many different organizations and sit on various technical committees that perform the day-to-day management of the river system. Staff from the two countries communicate through conference calls, telecommunications and transboundary meetings to remain abreast of changing hydro-meteorological and demand phenomena in a well-informed and coordinated manner. Depth of snowpack, accumulated precipitation, and probable future temperatures and precipitation are assessed and frequently reassessed by sophisticated models. The hydro-meteorological phenomena and data on reservoir storage are meshed with forecasts and models incorporating electric power requirements and system capabilities, which are coordinated by operating plans. The problems that arise in implementing the CRT and other agreements are virtually all solved at the technical level. Only on rare occasions do senior government officials who sit on overseeing treaty councils, need to become involved.

In the LMB, similar levels of collaboration will have to be developed if the current plans of the countries, including for the mainstream, would be implemented. Collaboration with technical staff from China would be needed to make optimal use of the storage releases from the Upper Mekong Basin. Also systems, methods, procedures, standards and tools have to be harmonized to: 1) monitor and forecast weather and water resources, 2) plan the multiple use of water use of the available water resources, and 3) design, operate and maintain water infrastructure. This would create additional building blocks for transboundary water management and the goodwill among the MRC, line agencies, and others to work together.

8. Next Steps

All participants agree that the LMB countries can learn from the extensive knowledge and long-term experiences of the USACE and its many partners in their challenge to sustainably and equitably develop some of the rich natural resources in the Mekong Basin for economic growth and poverty alleviation. At the same time, the leadership of the USACE is enthusiastic about developing a cooperation programme with the MRC and its member countries that would emphasize sharing of expertise and joint learning. Cooperation with the LMB countries would provide USACE experts with other perspectives to address some of the resource management issues in the Columbia River Basin and other river basins in the US.

In this connection, it is important keep the momentum of knowledge sharing. Some participants from line agencies in the LMB countries have been promoting the option to engage USACE experts in independent reviews of sector plans and project preparation reports. The following collaborative activities have been

implemented or being planned:

- Participation of USACE staff in the annual flood forum and the identification of joint activities related to flood mitigation and management (FMMP, May 2008).
- The provision of training by staff of USACE's Institute of Water Resources on the role of governance and IWRM, planning concepts and purposes, integration or harmonization of plans, assessment of scenarios, trade-off analysis and decision-making, public participation and conflict resolution, the assessment and development of multi-purpose projects, and the financing and cost recovery of projects and mitigating measures (BDP, September - October 2008).
- Procurement opportunities of MRC programmes and national agencies, such as the current tender by the MRC Navigation Programme for technical assistance regarding river regulating works for navigation safety and the planning, design, construction and operation of navigation locks in relation to the development of hydropower projects on the mainstream (NAP, ongoing).
- Participation of USACE staff in the MRC Fisheries and Hydropower Programmes Expert Group Meeting. The meeting is to identify the range of available options for mitigating the barrier effect of mainstream dams on fish populations in the LMB and to predict the effectiveness of the individual mitigation options (FP-HP September 2008).
- Participation of USACE staff the proposed MRC Hydropower Regional Consultation. The consultation aims at bringing stakeholder groups together to solicit feedback on the scope of MRC's emerging Hydropower Programme and take stock of fast tracked MRC activities to facilitate dialogue on aspects of hydropower development that require a basin perspective (HP, September 2008).
- Technical assistance to upcoming BDP2 activities, such as the assessment of basin-wide development scenarios and the participation in the Independent Panel of Experts that is being established to ensure the quality of BDP2 outputs (BDP, 2009).
- The development and implementation of a 6 to 12 months on-the-job training programme at the Northwestern Division of the USACE for engineers, ecologists, and economist from the Mekong region in areas such as coordinated reservoir system planning, real-time operation, the design of mitigation measures, and the sharing of benefits and costs.

It is envisioned that these kinds of knowledge sharing opportunities will create additional building blocks for the development of a wider, long-term cooperation plans between the two river basins, and the goodwill among staff of the MRC and sector agencies to work together and share knowledge with the USACE and their partners.

Annex 1: The study visit programme

Start	Monday 4/28--BB4	Tuesday 4/29 --BB4 Buildin	Wednesday 4/30 --BB4 Buil	Thursday 5/1-- RDP Buildin	Friday 5/2 --BB4 Building
	BB4 Building	BB4 Building	BB4 Building	RDP Building --Exec Room	BB4 BuildinQ
8:00	Introductions-Jim Barton Commander's Welcome COL Steven Miles	Regional Flood Forecastil Steve King, RFC	Water Policy Context Jerry Priscoli, IWR	Columbia River Benefits & Costs Jim Fredericks	VTC with HQUSACE Don Kisicki
9:00	Study Tour Overview J. Priscoli, B.Tanovan	Mid-C Coordination & Outage Planning Don Faulkner	International Joint Commi Larry Merkle, NWS	Partnership Discussions Nature Conservancy/Am. Rivers COE Environment Prog.	Ride to the airport
	MRC Expectations MRC			Native American Tribes	Flight to Grand Coulee
10:00	Jerry Priscoli Matt Rea	Bus ride to Bonneville	Columbia River Treaty Jim Barton (US co-chair) Tony White (US Secretary)	Lisa Morales/Leslie Bach Kyle Dittmer/Bob Heinith Jim Adams	
	Columbia River System Overview			Jerry Priscoli/Matt Rea	
11:00	Jim Barton	Stop @ Multnomah Falls Sightseeing	Doug Robinson (Can.Sec.)	Michael Garrity? HDC/HAC Center of Expel -- Brent Mahan	Grand Coulee Site Visit
	Video tape: A River of Many Returns				
12:00	Lunch Break (Jake's Restaurant)	Lunch Break (Multnomah Falls)	Lunch Break (Columbia Room)	Lunch Break (Isaan Restaurant)	Lunch (Lapresa Mexican) Briefings Mid-C PUD's Colville+Yakima
13:00	CB Water Management Jim Barton Bob Buchholz Peter Brooks	Continue ride to Bonneville Project Briefing!Tour Welcome by Jim Mahar John Kranda --Fish Passag	NW Power Pool Jerry Rust, President	Video tape: Journey of the KinQ	Grand Coulee Site Visit (Bureau of Reclamation)
14:00	Bolyvong Tanovan	Jim Runkles Bob Stansell	Pacific NW Utilities CC Dick Adams, Exec. Dir.	Role of SPA in Regional Power Planning and Oper Tony White	David Murillo Leanna Principe Lynne Brougher
15:00	Fisheries Issues/Challeng Rudd Turner, NWD		HEC Models for MRC Use Bill Charley	MRC Opportunities and Challenges -- MRC Delegation Witt Anderson	Flight back to Portland
	Fed Exec Decision-makin	Bus ride back to Hotel	NWPC Fish & Wildlife Peter Paquet, FW Div.	Open (Trip to Coast?) Colorado presentation/Squillace?	
16:00	Rick Mogren, Facilitator				
16:30	Bus ride to hotel		Bus ride to hotel		Bus ride to hotel Colorado Presentation?
18:00	USSD Dinner			Private Dinner	

Annex 2: List of MRC participants

	Name	Title	Organization
1	H.E. Nei Lorn	Under Secretary of State	Ministry of Water Resources and Meteorology, Lao PDR
2	H.E.Mr. Sin Niny	Vice-Chairman of the Cambodia National Mekong Committee, Member of the MRC Joint Committee for Cambodia	Cambodia National Mekong Committee, Cambodia
3	Mr. Watt Botkosol	Director, Planning Department, and National BDP Coordinator	Cambodia National Mekong Committee, Cambodia
4	H.E Mr. Bounthavy Sisoupanthong	Deputy Minister	Ministry of Planning and Investment, Lao PDR
5	Mr. Chanthavong Saignasith	Director General	Lao National Mekong Committee Secretariat, Lao PDR
6	Mr. Aloune Sayavong	National BDP Coordinator	Lao National Mekong Committee Secretariat, Lao PDR
7	Mr. Chaiyuth Sukhsri	Member of Thai National Mekong Committee, Head of Water Resources Engineering Dept.	Faculty of Engineering, Chulaongkorn University, Thailand
8	Mr. Adisak Thongkaimook	Director general, Department of water resources, and Secretary general	Thai National Mekong Committee Secretariat, Thailand
9	Ms. Pakawan Chufamane	Director, Mekong Affairs Branch	Thai National Mekong Committee Secretariat, Thailand
10	Mr. Le Bac Huynh	Deputy Director	Water Resources Management of Ministry of Natural Resources and Environment, Vietnam
11	Mr. Nguyen Hong Toan	Secretary General	Viet Nam National Mekong Committee, Vietnam
12	Mr. Tran Duc Cuong	Deputy Secretary General Coordinator	Viet Nam National Mekong Committee, National BDP Coordinator Vietnam
13	Mr. Jeremy Bird	Chief Executive Officer	Mekong River Commission Secretariat, Lao PDR
14	Mr. Antonious Lennaerts	Chief Technical Advisor, Basin Development Plan Programme	Mekong River Commission Secretariat, Lao PDR
15	Mrs. Pham Thi Thanh Hang	Programme Coordinator, Basin Development Plan Programme	Mekong River Commission Secretariat, Lao PDR

Annex 3: List of agencies and people met

No	Name	Title	Organization
1	Mr. Colonel Steven R. Miles	Commander	Northwestern Division, Corps of Engineers
2	Mr. Jim Barton	Chief of Power Branch	Columbia Basin Water Management Division, Corps of Engineer
3	Mr. Bob Buchholz	Flood centre	
4	Mr. Peter Brooks	Chief, Hydrologic Engineering Branch	Northwestern Division, USACE
5	Mr. Bolyvong Tanovan	Chief, Power Branch	Northwestern Division, USACE
6	Mr. Rudd Turner	Senior Fishery Biologist	Northwestern Division, USACE
7	Mr. Rick Mogren	Federal Caucus Coordinator	Salmon Recovery, NOAA Fisheries, Portland
8	Mr. Steve King	Hydrologist	Northwestern River Forecast Center, National Oceanic & Atmospheric Administration
9	Mr. Donald Faulkner	Mechanical Engineer	Reservoir Control Center, Northwestern, Division, USACE
10	Mr. John Kranda	Fish Program Manager	Portland District, USACE
11	Mr. Jerry DelliPriscoli	Senior Advisor Editor-in-chief Water Policy Review	Corps Institute for Water Resource, VA
12	Mr. Larry Merkle	Hydraulic Engineer	Seattle District, USACE
13	Mr. Tony White	Secretary to the U.S. Entity Columbia River Treaty	Bonneville Power Administration, Portland
14	Mr. Doug Robinson	Secretary to the Canadian Entity Columbia River Treaty	BC Hydro, Vancouver BC Canada
15	Mr. Jerry Rust	President & Director	Northwest Power Pool, Portland
16	Mr. Dick Adams	Executive Director	Pacific Northwest Utilities Conference Committee, Portland
17	Mr. Bill Charley	Sr. Technical Engineer	Hydrologic Engineering Center, Davis, California
18	Mr. Jim Fredericks	Senior Planning Specialist	Northwestern Division, USACE
19	Mr. Matt Rea	Program Manager/Planner	Planning, Environmental Resources, and Fish Policy Division, NWD, Portland
20	Ms. Lisa Morales*	IF Program Coordinator	USACE Headquarters, Washington, DC
21	Ms. Leslie Bach	Director, Freshwater Program	The Nature Conservancy, Portland
22	Mr. Kyle Dittmer	Hydrologist	Columbia River Intertribal Fish Commission, Portland
23	Mr. Bob Heinith	Legal Advisor	Columbia River Intertribal Fish Commission, Portland
24	Mr. Michael Garrity	Associate Director, Columbia Basin Programs	American Rivers NW Regional Office, Seattle, WA
25	Mr. Brent Mahan	Director, Hydroelectric Design	Portland District, USACE

		Center	
26	Mr. Don Kisicki*	Deputy Chief	Interagency and International Services, HQUSACE Washington, DC
27	Mr. Mark Schnabel*	USACE-PACOM LNO (Liason Officer)	PACOM, Honolulu, HI
28	Ms. Leanna Principe	Team Leader, International Affairs	Bureau of Reclamation, Denver, CO
29	Ms. Lynne Brougher	Public Affairs Officer	Grand Coulee, Bureau of Reclamation
30	Mr. Dave Murillo	Manager	Grand Coulee Power Office
31	Mr. Sean Hess	Archeologist/Cultural Res. Officer	Grand Coulee Power Office
32	Mr. Bob Clubb	Chief, Environmental & Regulatory	Douglas County PUD, Wenatchee, WA
33	Mr. Tim Culbertson	General Manager/CEO	Grant County PUD, Eprgata, WA
34	Mr. Rich Riazzi	General Manger/CEO	Chelan County PUD, Chelan, WA
35	Mr. Dennis Rohr	Consultant	D. Rohr & Associates, Inc.
36	Mr. James D. Barton	Chief, Columbia Basin Water Management Div	Northwestern Division, US Army, Corps of Engineers
37	Mr. Robert J. Buchholz	Chief, Reservoir Control Center	Northwestern Division, US Army, Corps of Engineers
38	Mr. Jim Mahar	Operations Manager	Bonneville Dam, Portland District
39	Mr. Jim Runkles	Park Ranger	Bonneville Dam, Portland District
40	Mr. Bob Stansell	Fish Biologist	Bonneville Dam, Portland District
41	Mr. Peter Paquet	Manager, Wildlife & Resident Fish	Northwestern Power and Conservation Planning Council, Portland
42	Mr. Jim Adams	Environmental Biologist	Reservoir control Center, Columbia Basin Water Management Division, NWD, Portland
43	Mr. Witt Aderson	Program Director	Northwestern Division, Portland
44	Mr. Jenkins Washington*	Program Manager	Interagency and International Services, HQUSACE Washington, DC

- Meeting through Video conference

Annex 4: Selected photos



MRC delegation visit fish passages in Bonneville dam, 29 April 2008



MRC delegation and Bureau of Reclamation visit Grand Coulee dam, 2 May 2008



Chairman of MRC Joint Committee for 2007-2008, Mr. Nguyen Hong Toan presented MRC souvenir to COL Steven Miles, Commander of Northwest division, USACE



MRC delegates and staff of NW Division of USACE