M-POWER
Mekong Program on Water Environment and Resilience

Australian AID

CGIAR Challenge Program on WATER & FOOD

WWF

Hatfield CONSULTANTS

SUMMARY NOTES:

Second Visit by a Delegation of Energy Planners and Hydropower Developers from China

Phnom Penh, Cambodia, August 26-30, 2012

September 2012

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1.0 BACKGROUND

The Mekong Program on Water, Environment and Resilience (M-POWER), Challenge Program on Water and Food (CPWF) and World Wide Fund for Nature (WWF) China Upper Mekong Programme have been involved in raising awareness of a new hydropower governance tool, the Hydropower Sustainability Assessment Protocol (HSAP). M-POWER was identified as a key partner in outreaching to Mekong stakeholders to introduce the tool and its potential applicability in the Mekong Region. WWF China Upper Mekong Programme has been involved in working with the Hydro Lancang Company to conduct official HSAP assessment along the middle and lower mainstream of the Lancang River (upper Mekong). A number of national dialogues and capacity development over the last three years have been organized in Cambodia, Laos, Thailand, Vietnam, and China along with a regional dialogue to raise awareness of the HSAP tool and dialogue on sustainable hydropower in the Mekong Region.

Capacity building, sharing of experiences and identifying opportunities for collaboration have been key to our collective efforts in the Mekong in advancing sustainable hydropower. For instance on 26-27 September 2011, M-POWER, CPWF, and WWF China Upper Mekong Programme successfully convened a roundtable under the project Advancing Hydropower Sustainability and Assessment in the Mekong Region with the support from the Australian Government and the Alcoa Foundation. The roundtable allowed hydropower developers, government officials, NGOs, and academia from the upper Mekong and Lower Mekong to share experiences and identify opportunities for collaboration.

More efforts on capacity building, sharing of experiences and identifying opportunities for collaboration are needed as the extent to which hydropower develops is hastened and the attention to social and environment issues is increasingly becoming of interest to many actors.

Building on the successful roundtable and field visit among Chinese and Lower Mekong stakeholders to Laos in late 2011, M-POWER, CPWF and WWF China Upper Mekong Programme organized a second visit to Cambodia on August 26-30, 2012. This project is a joint partnership between M-POWER, CPWF and WWF China. Dr. Sokhem Pech, M-POWER SC Co-chair, and Hatfield Partnership Manager, led the local organization, representing M-POWER, and working collaboratively with WWF China Upper Mekong Programme. The activities are supported by the generous financial assistance by the Government of Australia through the AusAID.

1.1 OBJECTIVES

The exchange visit aimed to:

- Promote effective communication and discussion between hydropower development stakeholders in the upper and lower Mekong countries;

- Enable a better understanding of best practices for environmental and social considerations in hydropower development;

- Strengthen opportunities for sharing of experiences in sustainable hydropower development and explore possible opportunities for collaboration between upper and lower Mekong countries; and,

- Contribute to the overall improvement of water and hydropower governance in the Mekong Region.

1.2 MAIN ACTIVITIES

Visit to the Tonle Sap

The purpose of this visit was to increase understanding of the unique Tonle Sap system and Chatumuk (where Tonle Sap, Upper Mekong, Lower Mekong and Bassac rivers meet) and their connection with upstream (e.g. in China) infrastructure. Prior to the visit, the delegation engaged in discussions with the Inland Fisheries Research and Development Institute, Fisheries Administration, MAFF, Institute of Technology Cambodia, to gain comprehensive pictures of the hydrology, morphology and other water elements (sediment, fisheries, quality) inter-connectivity in the Lower Mekong floodplains.

The field visit to the Chatumuk juncture (Tonle Sap, Upper Mekong, Lower Mekong and Bassac rivers) was organized with group discussion on topics of great interests such as livelihood, water resources management between upstream and downstream, sediment and land use, fisheries, navigation, etc.

Figure 1 Visit and Discussion on the Mekong, Bassac and Tonle Sap.

Discussion with key government agencies

Meetings with Secretary of States of the Ministry of Water Resources and Meteorology (MOWRAM), Director of Hydrology and River Works, General Directorate General of Energy, Ministry of Industry, Mines and Energy (MIME), and the Mekong Flood Management and Mitigation Center (MFMMC), and MRC in Phnom Penh.

Roundtable Dialogue

Dialogue with M-POWER and CPWF Cambodian Partner Ministries/Agencies, Energy Developers, and Researchers/Civil Society Organizations in Cambodia was organized.

The program of the visit is presented in ***Appendix A1*** of this report.

2.0 ORIENTATION MEETING

The Orientation Meeting took place at the Inland Fisheries Research and Development Institute (IFReDI), Fisheries Administration (FiA), Ministry of Agriculture, Forestry and Fisheries (MAFF) on August 27, 2012 from 08.30 to 12.00.

After the introduction to the participants, Dr. Sokhem Pech introduced the background of the exchange visit, the objectives of China and Lower Mekong Dialogue on Sustainable Hydropower Development, and the objectives and expectation of the 2nd visit in Cambodia.

Dr. Sam Nuov, Deputy Director General, Fisheries Administration, MAFF, welcomed the Chinese hydropower developers and planners, AusAID, WWF China and M-POWER representatives on behalf H.E. Nao Thouk, Advisor of the Prime Minister and Director General of FiA. He discussed the importance of the fisheries in the National Strategic Development Plan (NSDP) and the Royal Government of Cambodia's policy platform.

Mr. Chheng Penn, Acting Director of IFReDI made a comprehensive presentation covering:

- Administrative Structure of Fisheries Administration;
- Cambodia inland waters and production;
- Importance of the inland fish and fisheries;
- Key factors driving Cambodia inland fish catch;
- Potential impacts of hydropower dams; and
- How to compensate or replenish the capture fisheries loss?

The presentation by Mr. Chheng Phen is available in ***Appendix A2.1***.

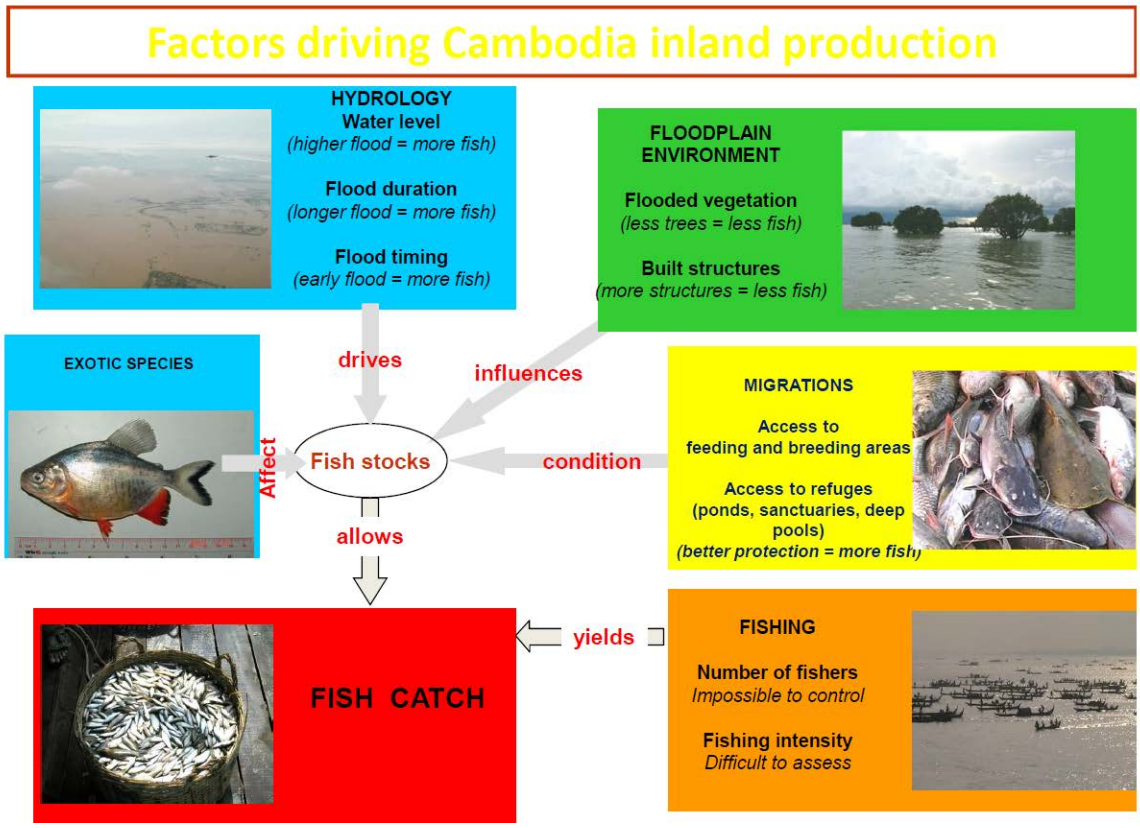
Key Discussion and Suggested Areas for Further Joint Study

The Chinese visitors shared with the host their experience in dams and fishery conservation in China. The two lakes in Yangtze River have a lot of similarity to the Tonle Sap, as there is a close relationship between the river and these major lakes. The positive and negative impacts of infrastructures on ecosystem and

productivity have been observed. China builds dams in upper Mekong/Lacang and they may have impacts on the downstream. The visitor believed that due to its long distance (over 2,000 km from Cambodia) and smaller contribution (13% of the total Mekong flow), the projected impacts should be smaller. Dachaoshan, Manwan and Jinghong dams have been in operation for years now. But the bigger dams will have more significant impacts. The Chinese studies have been conducted, and dams closer to the border would have a flow regulation facility (to regulate the natural flow condition as much as possible). The Chinese visitors also pointed to the need to closely consider similar impacts from the major tributaries dams in the LMB.

It was argued that in addition to the size and timing of the flooding, and sediment flux and other conditions, it needs to consider what does matter more – such as amount of precipitation, rainfall runoff conditions, size and type of sediments, as well as the forest cover changes locally.

Figure 2 Fisheries Productivity Equations (Chheng Pen, IFReDI).



The Chinese visitor stated that the Ecosystem Study Commission of the International Rivers (CSCIR) pays a lot of attention to the Tonle Sap and its importance to Cambodia and the Mekong Region.

The Cambodian host thanked the Chinese visitors for their impression and consideration. He agreed that there is a need for improving knowledge to ascertain impacts and adopt appropriate mitigation measures based on

precautionary principles. The countries have a plan for energy and development of dams on both mainstream and tributaries. As dams have been built and are being built in various parts of the Mekong Basin, the flow and sediment regimes certainly change. From Lancang to the Tonle Sap, the distance is far, but its incremental and cumulative impacts with other development in the Lower Mekong Basin (LMB) are anticipated to be huge. Dams in tributaries in the LMB countries that stores water during the dry season would reduce dry season flow rather than increase it. The 11 planned dams on the mainstream, which do not provide regulatory function, may increase flood peak rather than reduce it (comments of the Chinese delegates). Countries need to work together to minimize the impacts. These are some of the key areas that will need a collaborative study.

The MRC Fishery Program has conducted studies and confirmed that fisheries are important beyond the Cambodian border (fish migration can be up to China border and down to Mekong Delta). It is important to find concerted efforts to ensure that the inland fisheries are managed to allow them to function as they have done so far. Its significant contribution and regional significance will last much longer.

Dr. Sokhem Pech presented the relationship and inter-connectivity between the Mekong and Tonle Sap, as well as the significance of the Tonle Sap. The presentation is attached in ***Appendix A3.2***. The presentation covers the following:

- Tonle Sap Basin within a broader Mekong Regional development context;
- Inter-dependency of Mekong and Tonle Sap, and areas beyond the Mekong hydrological boundary;
- Flood pulse of the Tonle Sap and sediment flux, and their roles in ecosystem productivity;
- Multi-functionality and regional and global significance of the Tonle Sap; and
- Water governance challenges and perspectives.

Key Discussion and Suggested Areas for Further Joint Study

- Sedimentation study is still limited and preliminary in certain parts of the Mekong Basin and more systematic studies, preferably collaborative ones, are required. Sediment is complex and presents in different forms (coarse and fine - silt, sand, clay, rock/gravel - and suspended sediment and bed-load). It is important for the future sediment research for the whole Mekong and Tonle Sap to focus, for example, on how much of them remain and provide nutrient for fish (dynamism). The Chinese study on two major lakes in Yangtze River should provide some lessons learnt.

- The Cambodian host stated that the Chinese envoy in 13th century noted that TLS in dry season was only one- or two- feet deep. Water level remains almost the same nowadays showing that the sedimentation rate in the lake proper is extremely minimal.

- Discussion on Lancang fish species, and how far the migratory species can migrate: The study (tag) shows that they migrate back to Laos and Thailand, and to Viet Nam, but no opportunity for studying in Chinese part yet. Some species are migrating up to the upper part near Laos-Chinese border. IFReDI observed that about 10 giant cat fishes annually (dragnet) and tagged, but never catch the same with tags.

- Chinese delegation said the group came to learn more about fishery and hydrology. To protect fisheries, one needs to understand them better. A lot of studies have been conducted on the Lancang River and the studies identified four types of migratory species. Two hatchery stations near two of the dams are in place to compensate for and contribute to fisheries production. Recently at Jinghong Dam, 3 of the 4 species – 640.000 fingerlings - have been released into nature.

- Both sides discussed the potential for twining project.

Figure 3 Mekong Giant catfish (max. 300 cm).

Next Steps

The Chinese visitor invited IFREDI to visit Yangtze and Lancang for exchange of experience on the river/lake management and fish conservation and enforcement - hatchery stations for native fish species, aquaculture, and hydro-met monitoring and cascade coordination. The invitation was accepted with sincerest thanks. Further communication and follow-up is required.

Figure 4 Group Photo at IFReDI.

2.1 MEETING WITH SECRETARY OF STATE OF MINISTRY OF WATER RESOURCES AND METEOROLOGY

H.E. Veng Sakhon, Secretary of State, MOWRAM, met with the exchange visit delegation in his office on August 27, 2012 from 15.00-16.30. The key discussion points were as follows:

- Importance of Mekong Basin in Cambodia (contributing about 18-20% of the total Mekong flow, and 85% of Cambodian territory is within the Mekong Catchment).

- Water Resources Development Plan was initially studied by the former Mekong Committee through a series of its indicative basin plans and investigations and studies from 1957. But due to the political unrest during the 1970s-1990s, Cambodia could not benefit from those development plans as Viet Nam, Thailand and Laos did.

- Lack of opportunities for developing the rich natural resources due to over three decades of social and political turmoil (1970-1990). Only in 1997, the country was fully reunited under the Prime Minister's Win-Win Strategy after the remaining former Khmer Rouge strongholds had been reunited and reintegrated into the Cambodian society.

- The agriculture is a main user of the water resources, however, the irrigation rate in Cambodia remains low due to lack of proper irrigation systems and the capacity to manage them. Other indirect uses of water are: water supply, navigation, fisheries, and enriching the farm-land from the sediment deposition from the Mekong River.

- While water in the river is abundant, about 10 provinces (out of 24 provinces) have suffered from a long period of a drought spell during this rainy season of 2012.

- So far, efforts were on the restoration of the old irrigation systems (1993-2008). Recently, the focus has been on the improvement and expansion of the systems based on the newly adapted Water Resources Management Strategy and National Water Law 2007). The national focus for the present phase is on the development around the key catchments of the Tonle Sap Basin due to arable land availability and water resources condition. The Mekong mainstream and tributaries will be considered in the next 20 years only.

- Different development partners have different preferences for scale of the irrigation improvement (small, medium vs. large).

- China seems to be the most understanding partner. It is supporting Cambodia in three key sectors – road/bridges, irrigation/water resources, and electricity.

- The Chinese irrigation assistance is focusing on three phases:

    - Stage 1: improvement of diversion and primary canals;

    - Stage 2: development of appropriate reservoirs/storage facilities; and

    - Stage 3: integration of various irrigation systems (multi-purpose, electricity access for pumping, and irrigation infrastructure).

- The total budget of about 1.5 billion US$ estimated for those irrigation projects around Tonle Sap. The Chinese approach is faster in delivering the systems (shorter period from planning, construction to commissioning). It normally takes about 4 years, while the loan from the development bank may take up to 8 to 10 years – sometimes it is longer than the loan grace period.

Key Discussion and Suggested Areas for Further Joint Study

- The visitor compared the complex institutional arrangements in China where more than nine mega ministries are involved in water and related resources management (known as nine dragons). Chinese visitor asked about the inter-agency coordination for water resources development in Cambodia.

- The host explained that:

  Under the ADB Water Sector Development Program (AusAid also contributes to it through its TA for capacity development), the National Water Resources Management Committee will be established with MOWRAM as its Secretariat.

  MOWRAM is in charge of river management, hydrological and meteorological monitoring and early warming, water quality of the river system, and the flood and drought management, as well as multi-purpose reservoirs. While the Ministry of Industry, Mines and Energy (MIME), is in charge of single purpose hydropower dams and water supply. The Ministry of Rural Development is in charge of rural water supply, rural electrification and irrigation water uses. The Ministry of Public Works and Transport (MPWT) is in charge of navigation and road, bridge and drainage infrastructures.

  The Ministry of the Environment is responsible for water quality monitoring from the key industrial establishments and urban waste and reviewing EIA.

- The Chinese visitors stressed the importance of a comprehensive survey/assessment of the water resources, and development of a comprehensive master plan/development and strategic environmental assessment for ensuring optimization of cross-sectoral uses.

- The WWF China asked about the procedures for ensuring that the bio-diversity hot-spots would not be encroached by the development projects in Cambodia. The Cambodian host briefed the guests about the EIA and SIA process in Cambodia. The system is there but improvement is required (human resources and skill to conduct, review and monitor the impact studies). The case is easier, when the projects are funded through the development banks. For example, the China Exim Bank requires applying their stricter environmental and social safeguards.

- The discussion was then on the land use and soil conservation which has become compulsory for dams and other infrastructures in China. The Cambodian host briefed the meeting that the Ministry of Agriculture, Forestry and Fisheries is currently considered the strategy for land classification, land use and soil conservation (to control top soil erosion and loss of land productivity for cropping). He underlined that the soil condition in Siem Reap province was less fertile possibly due to: 1) intensive agriculture practices since the Angkor period (900-1300); 2) top soil wash-away by the open drainage/irrigation canals built during the Khmer Rouge (1975-1979); and 3) absence of or reduction in sedimentation from the Mekong River – the sediment deposition is observed to be concentrated in the floodplains in other downstream provinces around the lake.

- The Chinese visitor briefed the host on the state of hydrological and meteorological observation technology and its application at key stations and dam sites in China. He stressed the importance of this real-time data collection and transmission for the basin planning, monitoring, early warning, and timely coordination among different water users and local communities.

- The Cambodian host emphasized the need for a more comprehensive and long-term plan for improving hydromet monitoring and early warning. He also pointed to the lack of such information made the negotiation with the neighboring countries on the water resources uses and flood mitigation difficult.

- AusAID Beijing informed the host that AusAID has been working closely with the Chinese agencies, such as the Ministry of Water Resources (MWR), Department of Irrigation and Drainage, etc. It was observed that the Chinese assistance to Cambodia and other countries has been focusing on the hardware component (infrastructure). It may help improving that image by supporting the software component as well - capacity development through knowledge/technology transfer, and exchange visit.

Next Steps:

- ***To explore further on the possibility in setting up an exchange/technology transfer in hydromet monitoring and early warning;***

- ***To discuss in more details on the irrigation management exchange visit between AusAID, MOWRAM and other key stakeholders in Cambodia and China. It is expected that such exchange will be beneficial and should be materialized in late 2012.***

Figure 5 Meeting at MOWRAM.

3.0 VISIT TO MEKONG FLOOD MANAGEMENT AND MITIGATION CENTER

The delegation visited the Mekong Flood Management and Mitigation Center on Tuesday, August 28, 2012 from 09.00 to 11.10 to gain first-hand knowledge about flood and drought issues in Lower Mekong, and the flood and river monitoring works. Mr. Satit Phiromchai, ACEO and Head of Office of Secretariat in Phnom Penh, Mr. Sourasay Phoumavong, Technical Support Division Director, and Dr. Son Lam Hung, Manager of Flood Management and Mitigation Program, and the flood forecasting and river monitoring team met with the delegation. The delegation also visited the operational room to observe the flood forecasting and early warming operation.

Key discussion points:

- MRCS has two permanent offices – in Vientiane and Phnom Penh. The Mekong Flood Management and Mitigation Center is located in Phnom Penh Office of the MRCS.

- The host indicated that Myanmar has been seriously considering to join the MRC.

- The host highlighted the increasing collaboration between the MRC and China. A number of key exchanges have been organized through the Ecosystem Study Commission for the International Rivers (SEA, visiting to upper Mekong/ Lancang). April 2012 visit by the MRC was welcomed by the Vice Minister of MWR of China.

- ESCIR looks forward to further improving the collaboration with the LMB.

    - ESCIR is planning a meeting in Kunming (tentatively in October 2012) to discuss the technical guidelines and specific planning for hydropower development. The LMB countries will be invited.

    - Hydro China Corporation is helping Thailand with its flood disaster management plan, and there may be potential for support and knowledge transfer with other LMB countries.

    - Willing to organize the exchange visit to the development and conservation projects in the upper Mekong/Lancang.

- Hydro Lancang works on the hydropower development in the upper Mekong/Lancang, and is looking for its oversea projects (in Myanmar). The Hydropower Sustainability Assessment Protocol is being trialed on two dams in upper Mekong (Dachoashan and Jinghong).

- The FMMP briefed the meeting that its program with a team of 12 professional and administrative staff, is in charge of the flood forecasting, obtaining and managing flood forecasting data from the on-line stations, and from the MRC countries hydromet agencies. Daily data for flood forecasting is received from two stations in Lancang (Jinghong on the mainstream, and Manan – key tributary of Lancang).

- Additional to the flood forecasting for the Mekong mainstream, the team conduct the river low flow monitoring/forecasting as well, and gets request for carrying out the flash/mountain flood forecasting for the critical tributaries and catchment as well.

- The improvement of forecasting accuracy – quality of observed data, data gap filling techniques, and frequency of data provision – was discussed, and found to be very critical for the Mekong Basin.

- The Chinese visitor briefed the host about Chinese experience and tools for automatic/real time data collection and transmission. The Hydro China looks forward to cooperation and exchange in the future.

- The discussion was also about the fluctuation in water level data from Jinghong. It was suspected that it was due to the regulation, storing, and abnormal inflow from upstream catchment of the dams.

- FMMP and Chinese Department of Water Resources work on the flood management in the Yangtze. FMMP is going to request the Chinese partners in providing 6-hourly data for improving the twice daily flood forecasting.

Next Steps:

- ***To explore potential for support and knowledge transfer with other LMB countries in flood disaster management plan;***

- ***To explore possibility for organizing exchange visit to the development and conservation projects in the upper Mekong/Lancang; and***

- ***To explore possibility for collaborative research on the improvement of forecasting accuracy, and collaboration in automatic/real time data collection and transmission.***

Figure 6 Meeting at Mekong Flood Management and Mitigation Center.

4.0 MEETING WITH DEPARTMENT OF HYDROLOGY AND RIVER WORKS, MOWRAM

The delegation was received by Mr. Mao Hak, Deputy Director General (Technical Affairs), and Director of Hydrology and River Works, MOWRAM, at his office on Tuesday, August 28, 2012 from 11.30 to 12.30. The discussion points were as follows:

- The condition of the hydromet stations in Cambodia need to be improved.
- Plan for their improvement for the coming 5 years includes the improvement of 50 hydrological and 34 meteorological stations in key provinces with automatic and real time systems.
- Chinese visitors invited DHRW to visit China and offered to help organize that visit to learn China's experience and technology for real-time hydromet monitoring.

5.0 MEETING WITH THE GENERAL DIRECTORATE OF ENERGY, MINISTRY OF INDUSTRY, MINES AND ENERGY

The delegation visited the Department of Hydropower, General Directorate of Energy, Ministry of Industry, Mines and Energy (MIME) on Wednesday, August 29, 2012 from 09.00 to 11.10 to gain first-hand knowledge about the energy and hydropower development in Cambodia. Mr. Much Chhun Horn, Advisor to MIME in charge of Hydropower, welcomed the delegation on behalf of the Minister of MIME and other senior management who have been busy with the preparation for the coming week ASEAN Energy Minister Meeting. Mr. Heng Kunleang, Director of Energy Development Department, and Mr. Chea Narin, Head of Hydroelectricity Planning Office, Department of Hydro-electricity, also attended.

Mr. Heng Kunleang made an overall presentation on the hydropower and energy development plan in Cambodia. The presentation is provided in ***Appendix A2.3***.

Key discussion points:

- The Chinese visitors asked about the institutional arrangement and coordination between Ministries and Agencies concerned. The host explained that one of the coordination mechanisms is the workshop and task forces where MOWRAM, Ministry of Land, Urban Planning and Construction, MOE, MIME attended to review the proposed study and feasibility study.

- The discussion was focused on the SEA, EIA and SIA practices and process in China and Cambodia. It is clear that there are a lot of capacity development needs in Cambodia in ensuring a more integrating planning process, capacity to conduct SESA at the Planning stage, review EIA and other technical studies to ensure that a full compliance with the existing national and international safeguards and technical guidelines.

- The Chinese visitors shared their experience in coordinating and integrating relevant sectors in their Basin Development – irrigation, navigation, flood, fisheries, and energy, etc. The absence of such comprehensive cross-sectoral plan and the government specialized research institutes in Cambodia is considered to be one of the key obstacles for ensuring proper synergy and multi-purpose.

Figure 7 Meeting at MIME.

- Explanation was provided on the decision-making process/trees for the hydropower development project (See Appendix A2.3) in Cambodia.

- Chinese visitors explained the division of responsibilities between the Central and Provincial Authorities in the River Basin/Energy development – the Central Authorities are in charge of the major rivers and lake basins, and the Provincial Authorities are in charge of a smaller river and lake basins.

- ESCIR offered to assist in organizing the exchange visit for the MIME. There are possibilities for learning from China in the organization and capacity development for basin planning, design and planning of the hydropower, and reviewing and monitoring the compliance with relevant law, and guidelines.

Next Steps

To explore possibilities for exchange visit for the MIME and other Cambodian Agencies to learn about basin planning, design and planning of the hydropower, and reviewing and monitoring the compliance with relevant law and guidelines.

6.0 CHINA-CAMBODIA SUSTAINABLE HYDROPOWER ROUNDTABLE DIALOGUE

A Dialogue with Cambodian Partner Ministries/Agencies, Energy Developers, and Researchers/Civil Society Organizations in Cambodia was organized as part of this visit. 31 hydropower, energy and water resources professionals attended the event. List of participants and detailed program is provided in ***Appendix A3***.

The programme included the following.

- Opening and Introduction to the dialogue by Ms. Wu Yusong, WWF China and Dr. Sokhem Pech, M-POWER, and Hatfield.

- Setting the stage: Energy and Water Resources Development in the Mekong Region by Voradeth Phonekeo, MRC Initiatives for Sustainable Hydropower (not available).

- An overview of hydropower and energy development in China by Gu Hongbing, Secretary General, Ecosystem Study Commission for International Rivers (ESCIR) and Mr. Zhou Shichun, ESCIR Deputy Secretary General (*Appendix A3.2*).

- The environmental protection measures in hydropower development on Lancang River by Mr. Wang Lieen Director of Safety & Environment Protection Department, Hydro Lancang (not available);

- Mekong and Tonle Sap Futures Project – Results from Tonle Sap Team by Paradis Someth (*Appendix A3.3*).

- Discussion – Issues, concern and opportunities for collaboration.

Figure 8 China-Cambodia Roundtable Dialogue.


Key Discussion Points:

- Hydropower development and benefit sharing: a complex undertaking in the Lower Mekong Region starting from local/catchment scale, but need to scale up to the national and transboundary mechanism for benefit sharing, compensation and joint development. Potential for sharing experiences from China and other region on this matter was mentioned.

- Upstream and downstream dialogue: MRC has conducted for the last 16 years the dialogue with the governments of China and Myanmar. The dialogue is an official dialogue channel (track 1) coordinated through the Chinese Ministry of Foreign Affairs and its Embassy in Bangkok; and 2) Since 2007/8, the Chinese Ecosystem Study Commission of the International Rivers (ESCIR) has become a channel for the technical exchange and dialogue between China and Lower Mekong Countries. The Roundtable participants discussed about how these track 1 (formal), and track 2 (semi-formal and technical) can be improved further to allow more voice and opportunities for the non-state stakeholders such as universities, research organization and community.

- Social and environmental safeguards: ESCIR presentation led to an extensive discussion about the decision-making process for and best practice in social and environmental safeguards of the hydropower development project. The discussion was mainly about:

    - How to ensure meaningful public participation and integration of the public inputs into the decision-making? How much such inputs can actually influence the change in the design, construction, and operation, as well as in the resettlement and compensation plans? In China, public involvement in EIA phase is broader, and in SESA, it is mainly involved by relevant

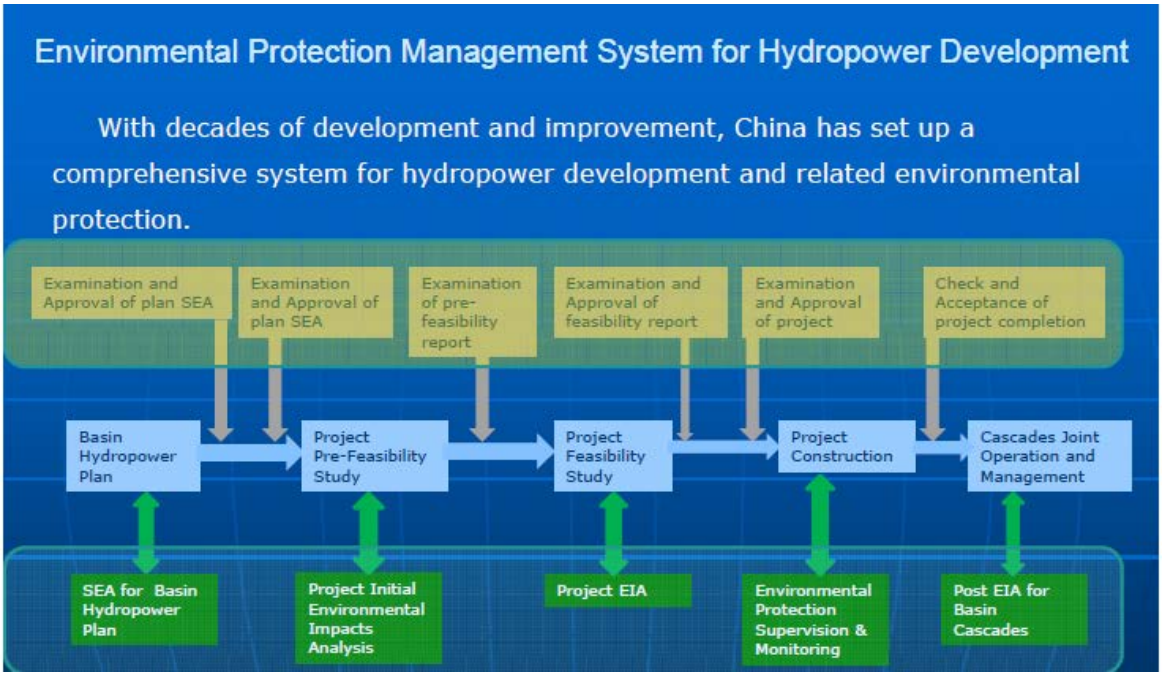
agencies and experts (local researchers from local Institutes under the Academy of Science).

- Summary of the EIA is normally posted on the website of the concerned institutions. Recently the Ministry of the Environmental Protection has tightened its requirement and enforcement under the relevant law and guidelines.

- What kind of social and environmental safeguard policies are applied for the Chinese oversea projects in the countries where such safeguards are least developed: The present practice shows that the concerned company and national authorities of the host country have to decide. Some Chinese Banks require applying its stricter guidelines.

- Lack of applicable transboundary strategic environmental and social assessment (SESA) at policy, plan and program level, and the environmental and social impact assessment (ESIA) at the project level was discussed.

Figure 9 Environmental Protection Management System for Hydropower Development (ESCIR, 2012).



- Role of comprehensive basin development plan in multi-purpose uses of water and related resources was discussed at length. In China, its development is led by the Government with the support from the relevant Institutes within the Academy of Science of China. 9 Central Ministries are involved in managing and developing all major river basins in China. Inter-agency coordination was very critical.

- WWF China shared its experience in trialing the Hydropower Sustainability Assessment Protocol (HSAP) in upper Mekong. The main principle of an international best practice is the livelihood of the impacted community must be better than before the resettlement or construction of the dams.

- Upper Mekong/Lancang Hydropower Dams: Lancang Hydropower Master Plan was developed and SEA was prepared by Hydro China for the whole Lancang section. The Project level EIA was conducted for approval by the Ministry of the Environmental Protection.

  2007, the Ecosystem Study Commission for the Internal Rivers (ESCIR) was formed from the following membership: Asian International River Center, Hydro China, National Institute of Water Resources, and General Institute of Hydropower Design and Planning.

  In 2008, a Green Hydropower Development Plan was commissioned.

  2011-present; Conducting unofficial HSAP assessment on Jinghong (operational stage), and Nuozhadu (construction);

Environmental protection measures in Lancang:

- Layer water intake technology to minimize cold water temperature below the reservoirs was researched and applied at a few dams. 240 million Chinese Yuan for testing and improving the design: *It may be worthwhile checking its practicality and applicability for LMB*.

- Reforestation of the native rare vegetation cover (botanic garden), and hatchery and fishery conservation. *LMB countries are invited to visit*.

- Sediment management: sediment flushing facility, environmental flow and flood prevention. It is important to assess how this coordination among dam operators in the cascade, and realizing sediment flushing, environment flow regulation and flood prevention are implemented to achieve acceptable results.

- Whole Lancang Dam cascades are managed and operated by the Hydro Lancang, that seems to make the coordination and optimization tasks easier than in LMB where numerous companies are involved.

- Purchase of a hydro dam on a major tributary of Lancang River, with the plan to pulling it down and restore the tributary.

- Soil conservation and waste water treatment measures to reduce the environmental impact during construction.

Hydro-meteorological Monitoring:

Hydrological and rainfall monitoring stations with automatic data transmission are set up and transfer data to the Basin Regulation Center for on-time decision on flow and energy production and optimization, and for flood risk reduction and prevention.

Earthquakes and dam failure risk management:

In China, earthquake risk must be considered in the designed and construction phase. The earthquake resistance design technology and construction are among the key requirements.

Geology and seismology are monitored closely. After May 2008 major earthquakes in China, the Chinese Government pays even more attention to this risk. Many of the dams were reviewed.

Tonle Sap Futures:

National participants wanted to learn more about the results of the study. The final workshop planned for November 2012 should provide more opportunities for learning and discussing the results for generating policy relevance recommendation and action plan.

Key Conclusion:

This exchange and dialogue should be continued to create more opportunity to exchange, deliberation and joint learning.

This informal exchange (Track 3) can certainly help improve Track 1 and 2 process if the synergy and communication and quality of such dialogue is sustained/improved.

6.1 NEXT STEPS

- Build on the results of the two exchange visits in 2011 and 2012, AusAID-M-POWER-WWF follow-ups proposal – regional exchange visit, China-Cambodia and China-Laos exchanges in irrigation and water resources, hydropower design and social and environmental safeguard, fisheries and sediments – will be developed for implementing in the next 12-24 months.
- China-Cambodia-others Irrigation and Water Resources exchange.
- Visit to China – Lancang River, Yangtze River, and other great lakes in China.
- Exchange of results of EIA and other studies between Upper and Lower Mekong Countries.

The turn-around of the planning for these activities/exchanges will be very fast. The first exchange should take place by December 2012.