Report from Meeting on Improving Data for Water Resources Management

Vientiane, Lao PDR, November 17, 2017

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Acknowledgements

This meeting served to strengthen the coherency of, and catalyze support for, ongoing efforts to improve the availability, capacity and management of hydrological, hydro meteorological, and natural resources data and information aimed at improving the sustainable management of water resources in the Mekong. The success of this meeting is due to the commitment, dedication, and active involvement of all who participated. We are particularly grateful to the Friends of the Lower Mekong Development Partners from Australia, the European Union, and the World Bank for their expert guidance. We wish to express our gratitude for the officials from the governments of Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam, whose participation in the meeting and contributed insights and observations into the drafting of this report were invaluable. We would also like to thank presenters from Global Change Advisory, PACT, Mekong River Commission, the Asian Disaster Preparedness Center, the U.S. Army Corps of Engineers, the U.S. Geological Survey, and the University of Virginia for their dedication and inspiration. Finally, we would like to thank the meeting facilitators, Dr. Pham Tuan Phan, CEO of the Mekong River Commission, and Dr. Aaron Salzberg from the U.S. Department of State.

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Acronyms

ADB	Asian Development Bank
CEO	Chief Executive Officer
CIA	Cumulative Impact Assessment
DMH	Department of Meteorology and Hydrology
DOS	Department of State
DSS	Decision Support System
DWR	Department of Water Resources
FLM	Friends of the Lower Mekong
GISDA	Geo-informatics and Space Technology Development Agency
GOL	Government of Laos
HIC	Hydro Informatics Center
IFC	International Finance Corporation
IWRM	Integrated Water Resources Management
LMI	Lower Mekong Initiative
MDES	Ministry of Digital Economy and Technology
MEM	Ministry of Energy and Mines
MoAC	Ministry of Agricultural and Cooperation
MoNRE	Ministry of Natural Resources and Environment
MRC	Mekong River Commission
MRCS	Mekong River Commission Secretariat
MST	Ministry of Science and Technology
MWDI	Mekong Water Data Initiative
NNRCBS	Nam Ngum River Basin Commission Secretariat
NREI	Natural Resources and Environment Institute
NWRC	National Water Resources Committee
PDIES	Procedures for Data and Information Exchange and Sharing
PMFM	Procedures for the Maintenance of Flows on the Mainstream
PNPCA	Procedures for Notification, Prior Consultation and Agreement
PWQ	Procedures for Water Quality
PWUM	Procedures for Water Use Monitoring
QA	Quality Assurance
QC	Quality Control
RID	Royal Irrigation Department
SIP	Sustainable Infrastructure Partnership
TMD	Thailand Meteorological Department
TNMC	Thailand National Mekong Committee
UN	United Nations
USG	United States Government
WB	World Bank
WLE	Water Land and Ecosystem
WRM	Water Resources Management

Background

Diverse capacity challenges and cooperative opportunities have often arisen in the long history of integrated water resources management (IWRM) in the Lower Mekong region. In recent years, and with the rapid pace of technology growth, improving access to, management of, and effective use of hydro meteorological and water-related data has become a priority for IWRM. Although some progress has been made, technical and political barriers persist and the pace of modernization of data management practices has varied among lower Mekong countries. These barriers can limit sharing and exchange of essential water data and related information among different stakeholder groups, including regional and national water related agencies and institutions, private sector and industry, academia, and local water users.

However, the prospects to close IWRM capacity gaps and to improve science-based decision for the lower Mekong are emerging at various scales and levels, from regional to local, and across a variety of working relationships. Indeed, we are at a critical juncture for interested actors engaged across the region to coordinate efforts to improve IWRM and water data management capacities for the Lower Mekong region.

Building on the launch and endorsement of the “Mekong Water Data Initiative (MWDI)” by the U.S. Secretary of State and Foreign Ministers at the 10th Lower Mekong Initiative (LMI) Ministerial Meeting held in Manila on August 6, 2017, LMI and Friends of the Lower Mekong (FLM) members recognize the opportunity for additional support through a capacity building initiative that facilitates Lower Mekong countries sharing and making use of water data more freely, aiming to strengthen capacity of the concerned Lower Mekong’s agencies, institutions, and existing initiatives. Through the MWDI, activities will serve diverse concerned stakeholder groups as well as provide coordination platform that promotes inclusiveness and informed decision-making for sustainable use of water resources.

As the inaugural event of the MWDI, this meeting sought to contribute to other regional efforts to improve water data management in the Mekong by improving a shared understanding of the current landscape of data-related challenges and opportunities facing riparian countries. More than 80 individuals with diverse interests and experiences participated in the session throughout the day and contributed to the dynamic discussion. By further advancing a coalition of like-minded partners from the riparian countries, development partners, non-governmental organizations and the private sector, this meeting was intended to be part of a progressive effort to develop a shared vision and to begin organizing diverse inputs into an overarching framework.

Keynote Address: Changing the way we view our water resources through transformative water information services

Presenter: Professor Rob Vertessy
Principal, Global Change Advisory

Professor Rob Vertessy is an international water expert based in Australia. He is the lead author of the recently published UN-WB Guidelines for Water Data Management Policy, a contribution of the World Water Data Initiative. These guidelines provide recommendations to assist societies across the globe to enable more equitable and efficient access to water data, information and tools, and to build capacity for improved water management. Prof. Vertessy provided an overview of his key recommendations based on his previous experiences, for moving forward with water data management in the Lower Mekong region.

Professor Vertessy prefaced his talk by noting that water has three key characteristics that diverse stakeholders need to bear in mind:

1) Water is intrinsically valuable and is used to create value;
2) Water resources are contested because supply and demand are rarely matched; and
3) Water resource management is extremely complex and thus very difficult to manage well.

In Australia, "water security" has become a high political priority since the devastating Millennium Drought (1998-2010). As in many other parts of the world, water demands increased whilst water supply decreased, eventually creating acute stresses for water users and the environment. In 2007, at the height of the drought, the Australian government responded with a AUD$13.9 Billion "National Plan for Water Security", which included a major initiative to reform water data arrangements for the nation.

Professor Vertessy highlighted how good water data, when transformed into useful water information services shaped by end users, can lead to much improved water management outcomes. He noted that users of water data have stressed their strong preference for the information to be:

1) delivered from a trusted source,
2) comprehensible and meaningful,
3) presented in a standard format,
4) timely and regularly updated,
5) easy to find and access, and
6) unencumbered by license restrictions and free to obtain.

Prof. Vertessy emphasized that these requirements are hard to meet without strong institutional arrangements and secure funding.

Professor Vertessy presented a case study focused on Australia's national water reforms. He explained that the Australian Bureau of Meteorology was given a new mandate in water information that included the following five functions:

1) set national standards for water data,
2) mandate the supply of water data from 180 water data collecting agencies,
3) assist water agencies in collecting and monitoring data,
4) invest in research and development, and
5) provide a wide range of valued added water information products and services nationwide.

Professor Vertessy described key lessons learned from his experience, including the need to recruit and train professional staff, to develop clear vision for data services, and to ensure there is meaningful engagement with diverse stakeholders for informing decisions. A decade after implementation, it is evident that the Bureau's water information products and services are highly valued by stakeholders and have yielded a return on investment between two and seven times the cost of the program.

National level capacities and visions for the future of water data

Cambodia:

Contributor: Mr. Hong Chheng
Director, Cambodia National Mekong Committee

Related national policies and governance:

With approximately 86% of the land area of Cambodia lying within the Mekong River Basin, the Cambodian people are highly dependent on water related resources for supporting their way of life. There are 17 Ministries and national agencies as members of Cambodia National Mekong Committee(CNMC) that have roles and responsibilities in water resources management and development including, but not limited to

1. Ministry of Water Resources and Meteorology(MOWRAM);
2. Ministry of Mines and Energy(MME);
3. Ministry of Rural Development(MRD);
4. Ministry of Public Works and Transport (MPWT);
5. Ministry of Environment(MOE);
6. Ministry of Agriculture, Forestry and Fisheries(MAFF);
7. Tonle Sap Authority(TSA); and
8. National Committee for Disaster Management (NCDM).

The Royal Government of Cambodia is committed to devolving as many functions and responsibilities as possible to sub-national levels, and Provincial, district, and commune government is being progressively strengthened to take on these responsibilities. Water management functions, data and information on water resources been centralized and managed by MOWRAM. Cambodia adopted the National Policy on Water Resources since 2004 that guides that management and development of the water resources in Cambodia, with water for agriculture development indicated as the highest priority. In addition, national food security policy has driven Cambodia to expand irrigation areas throughout the country which will require more water storage reservoirs for the dry season. Water and energy security are also highly supported by Cambodia and Mekong cooperation. Cambodia has adopted and promulgated the National Law on Water Resources Management since 2007 by Ministry of Water Resources and Meteorology. The National Law on Water Resources Management covers four key sub-decrees that include

1. River Basin Management;
2. Water Allocation and Licensing;
3. Water Quality and;
4. Farmer Water User Community.

Water resources management (WRM) capacity:

The Cambodian government recognizes that capacity development at the national, provincial, and local levels is still much needed around water resource management. Sustainable management of water will require adequate financial resources, an improved information base, and comprehensive capacity building. Key areas for capacity development focus include infrastructure and system development for water coordination, allocation and warning system, as well as support for developing flood, drought, and disaster management systems. Access to water data and water knowledge are still big gaps for Cambodia, especially when it comes to coordinating different management mechanisms.

Challenges and opportunities:

The Mekong 1995 agreement and five procedures are the primary driving forces for Mekong transboundary cooperation, consideration of trade-offs for sustainable infrastructure development (i.e. balancing social, environmental and economic considerations), and supporting to water, food and energy security. Certain coordination processes require further strengthening, and making use of data gained from different sources is an ongoing challenge. Cambodia sees anopportunity in the potential development of a Mekong Data Center, as efficiency improvement in integrated data and information analysis, real time forecasting, monitoring network, early warning is highly needed. Other key opportunity areas for Cambodia to improve on its water resources management include focusing on: decentralized water management and stakeholder involvement, improvement of irrigation systems, addressing challenges and opportunities of increased hydropower development, water quality issues arising from urbanization, over fishing problems drastically reducing fish stocks, and over-extraction of groundwater and lack of groundwater management capacity.

Lao PDR:

Contributor: Mr. Oulaphone Ongkeo
Head, Natural Resources and Environment Institute (NREI),
Ministry of Natural Resources and Environment (MoNRE)

Related national policies and governance:

The Government of Laos recognizes the importance of and adopted the Integrated Water Resources Management (IWRM) principles into many of its national water management policies and development plans. Laos has just recently celebrated the new Water Law in mid-2017 which stated roles, functions and responsibilities of different concerned ministries and agencies in water resources data monitoring and sharing, knowledge and capacity building, and water resources planning and development. Development of the "National Water Resources Data and Information Center" is one of the key functions stated by the new Water Law.

With support from international development agencies, the GOL and MoNRE have been in a process of identifying a suitable agency(ies) that can play a central role in leading the development and facilitation of the National Water Resources Data and Information Center.Currently, Department of Water Resources (DWR) and Natural Resources and Environment Institute (NREI) are the key agencies that have been performing such roles. Department of Meteorology and Hydrology (DMH) is mandated to monitor and report overall weather, precipitations, hydrological flows and forecast. Ministry of Energy and Mines (MEM) oversees and coordinates hydrological data and information from all hydropower operators across the country. Lao National Mekong Committee coordinates Lao water data and information and capacity building resources back and forth between the MRCS and other international development agencies to Lao agencies. Nam Ngum River Basin Committee (NNRBC) is the pioneer national river basin organization that plays a key role in coordinating for water resources planning and problem solving of six different administrative provinces.

Water resources management (WRM) capacity:

The GOL has been working in close partnership with international development agencies for more than two decades to promote capacity in WRM. Achievements in strengthening Lao human capacity in this field are prevalent, but however, much further support remains needed especially for the younger generations and at academic level. Up-to-date technology and hardware, tools and equipment for water monitoring and forecast across national key river basins need further support. Key areas for future capacity building include:

- Support to DMH in hydrological monitoring and forecasting;
- Identifying water data gaps and inconsistencies for improved water resources planning;
- Groundwater monitoring;
- Water quality monitoring systems; and
- Disaster warning system strengthening around certain key river basins.

Challenges and opportunities:

Despite the rapid development of water resources in Laos, capacity gaps of Lao's WRM still exist, as outlined above. Only limited water data and information still has been shared across the concerned agencies and to public. To implement what has stated in the new Water Law will require extensive human, technology, tool and infrastructural resources, especially in developing the National Water Resources Data and Information Center. Since more than 20 water

related agencies are accounted for, Laos also recognizes the challenge of inter-agencies coordination and has used a trial and error approach to test different coordination modules- but however further efforts are still needed. Building capacity in WRM in Lao should not only focus on governmental staff but also at academic level in order to ensure the sustainability of human resource capacity. Coordination with private and industrial sector that has control with water data and information is still an opportunity as well.

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Myanmar:

Contributor: Mr.Toe Aung Lin
Director, Department of Water Resources and Improvement of River Systems,
Ministry of Transport and Communications

Related national policies and governance:

Myanmar is a water rich nation. It owns a vast landscape and many major river basins of Southeast Asia, which provide high socio-economic development potential. The Myanmar government recognizes the importance of IWRM principles and demand for water resources institutional reform. Myanmar has set the national goal for 2040 "to become a water efficient nation with well-developed and sustainable water resources based on fully supporting of accomplished water data." Based on Conservation of Water Resources and River Law in 2006, Environmental Conservation Law in 2012, and National Water Policy in 2015, the draft National Water Law is now being actively prepared, led by the advisory group of National Water Resources Committee (NWRC). NWRC is the apex governance body on national water resources management planning appointed by the presidential decree in 2013, chaired by the Country's Vice President. NWRC also has the mandate to form and direct the Hydro Informatics Center (HIC) that is planned to be established by the year 2019. HIC will perform a key function in collecting and managing all national water related data.

Water resources management (WRM) capacity:

It is recognized that Myanmar's WRM capacity is still at an early stage but that the country has made an impressive commitment towards fair water sharing and development Hydrological monitoring and forecasting stations have been installed randomly across the country using both manual and telemetry technology approaches. However, the number of those stations is still considered extremely short. Only one or two hydrological forecasting stations are installed in most of the rivers of Myanmar which have resulted in unreliable hydrological forecast information. A few case studies on flood forecast and warning failures, and critical erosion were presented.

Challenges and opportunities:

Myanmar is also facing an identical challenge as the other Lower Mekong countries, namely a lack of coordination among water related agencies, organizations and ministries. It is hoped that the upcoming National Water Law and HIC will be able to provide guidance on water data collection and coordination. Nevertheless, it is accepted that this will be a long term learning process. Myanmar

is under such a great need for capacity building support in both hardware infrastructure and technology, and human resource development in water data monitoring, forecast and management. An annual national budget provided in this matter is still largely inadequate.

Thailand:

Contributor: Mr. Poonsak Wisetsopa
Civil Engineer – Practitioner level, at Thai Department of Water Resources (DWR)
and Thai National Mekong Committee (TNMC),
Ministry of Natural Resources and Environment (MoNRE)

Related national policies and governance:

Thailand has not yet finalized its draft National Water Law. The apex body responsible for water management policy and decision making depends on the latest version of the Prime Minister Regulation on National Water Resources Management, updated in 2007. The Regulation laid out the national water management body through the National Water Resources Management Committee and the River Basin Sub-committee. Department of Water Resources (DWR), Ministry of Natural Resources and Environment (MoNRE) performs the secretariat role for national water planning, monitoring, coordinating, problem solving and capacity building. Royal Irrigation Department (RID) under Ministry of Agricultural and Cooperation (MoAC) is the main agency that performs duties in collecting primary water data, maintaining reservoirs and water supply, and managing and allocating water for flood and drought mitigation, for agriculture, urbanization and industries. Thai Meteorological Department (TMD), under Ministry of Digital Economy and Technology (MDES) is in charge of national weather forecasting and disaster warning. Geo-informatics and Space Technology Development Agency (GISTDA) is a public organization under Ministry of Science and Technology (MST) that provides space technology and geo-information and applications that help improve land use and water resources management and planning for Thailand.

Water resources management (WRM) capacity:

Thailand is considered as one of the highest capacity countries in the Lower Mekong region in water data monitoring. Thailand is developing a national water resources data and information center - and has advanced capacity in remote sensing technology and water and climate modelling assessment. Thailand is seeking to invest in universal and cutting-edge technology in WRM and actively promotes human resource capacity development. It recognizes the importance of international, regional and bi-lateral collaboration in research, technology exchange and training. Thailand addressed during the meeting that the Thai government is very welcome in collaborating with the USG and FLM to provide capacity building support in WRM for the other Lower Mekong countries.

Challenges and opportunities:

There are more than 30 water related agencies under ten Ministries that produce and generate water related data, presenting a significant challenge in terms of coordination across those different agencies. T he government of Thailand has established a multi-agency working group on WRM to prepare and monitor national water related plans. Development of real-time flood monitoring mapping system is also a challenge, particularly in flood plain areas where water monitoring stations cannot well cover the entire flood prone areas. Replacement of old telemetry technology across the country is a critical need that will require significant resources investment. Efficiency improvement in integrated data and information analysis, forecasting, real time reporting, warning is urgently needed. And last but not least, to integrating Decision Support System (DSS) into decision making process directed by policy and decision makers.

Viet Nam

Contributor: Dr. Le Duc Trung
Director General, Viet Nam National Mekong Committee (VNMC),
Department of Water Resources,
Ministry of Natural Resources and Environment (MoNRE)

Related national policies and governance:

The National Viet Nam Water Law is one of the most pioneering laws of its kind in the Lower Mekong region. There are a number of related laws that support the implementation of WRM in Viet Nam such as Hydro-meteorology Law, Environmental Protection Law, Natural Disaster Prevention Law, to name but a few. Similar to the other Lower Mekong countries, there are multiple agencies who are involved in WRM, including more than 20 agencies falling under many different ministries. Viet Nam recognizes the benefits of integration, as the key objectives of national WRM is to provide integrated data and analyzed information to the public in a manner where it becomes conveniently accessible to all.

Viet Nam has planned for highly secure and robust data management system which is consistently updated either in real time and baselines. NRM is one of the national top priorities for Viet Nam.

Water resources management (WRM) capacity:

WRM, and data collection and monitoring in Viet Nam has many strengths. Nation-wide water monitoring networks have been in place and kept being expanded. Essential mechanisms in data exchange and sharing at multiple levels have been developed and well implemented. Viet Nam also has strong capacity in data processing, analyzing and modelling development.

Challenges and opportunities:

While multiple mechanisms on data exchange and sharing have already been put in place, the implementation and coordination around effective data use is still at a learning stage. Certain coordination processes need to be addressed and further improved, and to make use and formatting data gained from different sources is a challenge. Viet Nam has a high concern on transboundary impacts. More open data and information exchange processes at regional and international levels will be very beneficial for Viet Nam. Viet Nam also seeks to take benefits of advanced technologies such as satellite and remote sensing in data collection and processing. Viet Nam supports a proposal of a development of Mekong Data Center or similar initiatives. Free data exchange and sharing should be institutionalized and pragmatic. The center should also be able to provide capacity in strengthening the existing data monitoring networks, introduction of advance technologies, and develop human resource capacity in the region. A strong role in promoting DSS is also another consideration that should be explored for the center.

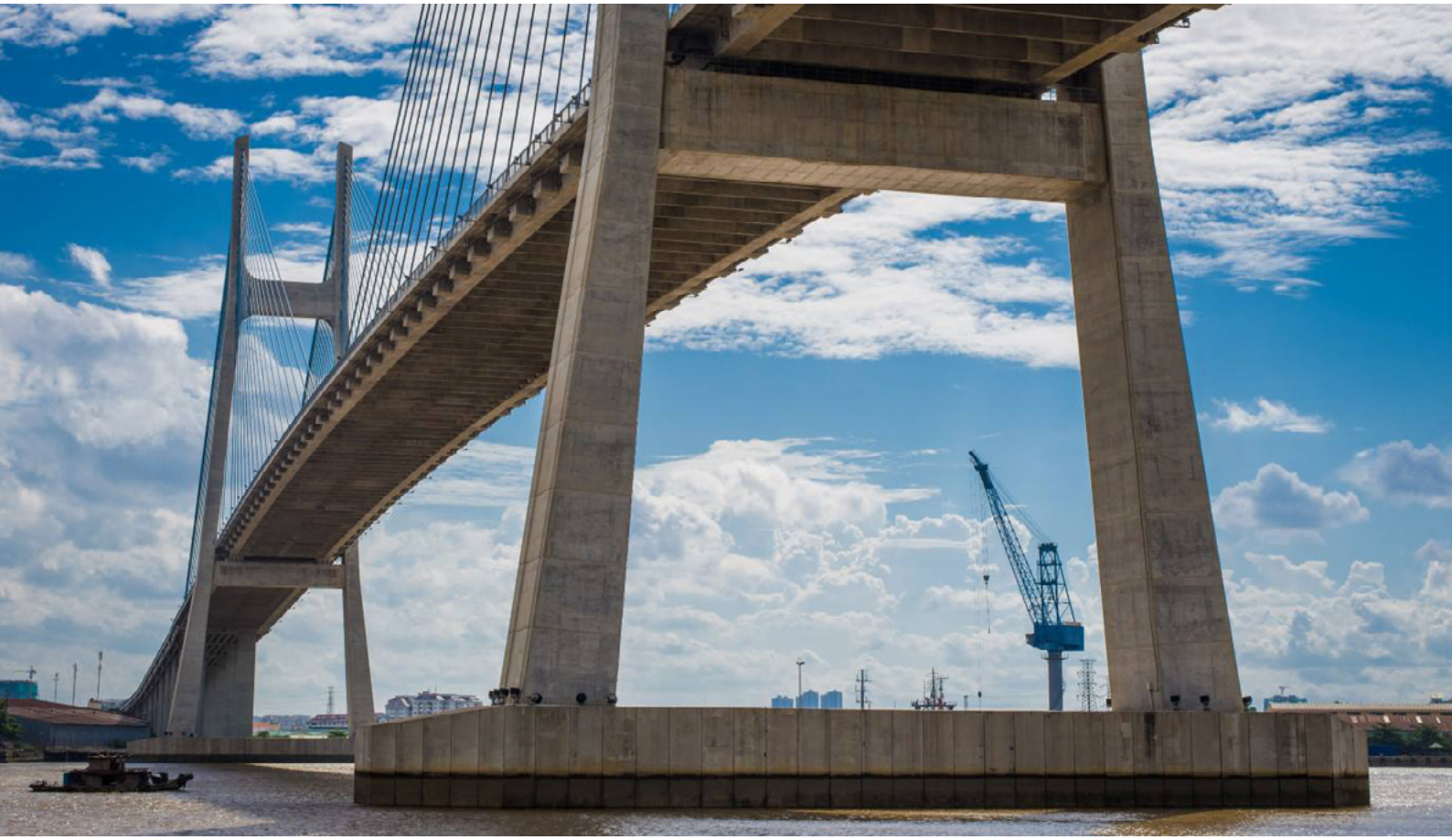


Photo credit: Narut Jarean

Panel on technological advancements for data and water resources management

List of panel facilitator and panelist members:

1. Facilitator, Dr. Rob Vertessy, Global Change Advisory
2. Panelist, Mr. James Ligh, U.S. Army Corps of Engineers
3. Panelist, Dr. Peeranan Towashiraporn, Asian Disaster Preparedness Center
4. Panelist, Mr. Matthew Andersen, U.S. Geological Survey
5 Panelist, Dr. Tho H. Nguyen, University of Virginia

This panel discussion presented diverse perspectives from technical experts on information and data management, lessons learned from their own experiences, and key recommendations on practical measures for potentially improving water data and information exchange in the Lower Mekong region. The panel experts represented views from development agencies as well as research and academic institutions. The key messages that were presented and emerged through discussion are summarized as follows:

Consider incentives of data producers and users around data sharing.

A key foundational question for the panel to discuss was, "What are barriers for the sharing of data, and how can these barriers be overcome?" Responses offered by the panel and other participants were varied, but certain themes did emerge:

Information holds power, and data producers have an incentive to ensure the information is used in a way that they feel is beneficial. It was discussed that data producers should have the right to query how data will be used and to influence those uses.

Data can hold inherent financial value, and therefore issues of compensation to data producers may need to be considered. A lengthy discussion ensued about the complexity of paying for data, with the recognition that some data production is publicly funded and used to provide social benefits (i.e., the development of a disaster warning system), while other data use may be directed at increasing private business profits, making the point that some uses are more suited for direct payment than others.

Data producers should be recognized and given adequate credit for the contributions of information that they provide. Some session participants pointed out that there are various forms of compensation that can be provided to data producers, and not only financial compensation could be considered appropriate.

Politics will play a critical role in directing information sharing. Many data producer agencies work routinely on policies, mandates and rules of procedures for data exchange and sharing processes, but nevertheless, the informal mechanisms for sharing should not be discounted or underestimated. At the country level, trust and partnership building plays a critical role for improving data sharing practices.

Find common purpose to unite people together.

Regional water data management requires a large network of actors coming from different stakeholder groups across the region. It will be critical for the different stakeholders to clearly identify the purpose and needs they see for data usage, and to come to some consensus on that purpose, in order for a coordinated water data

initiative to move forward. Panelists advised that an essential first step will be for various users to identify specific products or services they are looking to access through a data sharing platform, and then to develop a platform, sharing mechanisms and multi-stakeholder relationships that enable those products and services to be actualized. Data sharing should focus on delivering targeted and tangible benefits to a variety of stakeholders.

Data must first be trusted, before it will be used.

A key concern was raised during the session about the integrity of data, and whether users could truly hold confidence that accessible data could be trusted to drive important management decisions. This led to further questioning about data standards, and quality assessment and control processes. Panelists responded to these questions with a key message that there was no way to ultimately guarantee that data collected or used would be the best and most reliable information possible. But however,"trustworthiness" was rather a key indicator that gives confidence for the quality of the data. As a first step, we might need to learn how each government and related key agency decides to assign trust behind various data sets and to the providers – and build an improved management and sharing mechanism from there. It was noted that the initiative does not necessarily need to perform a role as a central data bank, but can also be a facilitator that connects users to trusted data sources.

Regional capacity and vision for the future of water data

Overview of regional dialogue session: Inclusive platform for water and flows data sharing

Presenter: Mr. Suparerk Janprasart
Coordinator, LMI Sustainable Infrastructure Partnership (SIP), PACT

Mr. Suparerk Janprasart from the Lower Mekong Initiative Sustainable Infrastructure Partnership (SIP) shared a summary of the recent relevant dialogue session event, held during the annual forum of Water Food and Energy (WLE) Program in Yangon, Myanmar, in November 2017. The dialogue was one among the 40 parallel sessions of the forum titled, "Inclusive platform for water and flows data sharing." Four key questions were addressed at the session, including:

1) Is there a real need for an initiative that can facilitate shared data and information on water availability and flows situation?;
2) Are there any types of technologies and/or approaches that can access and share reliable data across the region?;
3) Can there be a platform that reliably and inclusively informs about potential threats and benefits?, and
4) What could be entry points?.

There were 55 participants who actively contributed during the session. Through a plenary and small group discussion and exercise and survey questions, a consensus emerged among participants that there is legitimate need for an inclusive platform for water and flows data and ultimate benefit for the lower Mekong region. Participants seemed to understand very well the existing situation regarding this matter, including the issues of diverse political interests, capacity challenges and other obstacles.

Key recommendations gained from the sessions can be summarized as follows:

General recommendations:

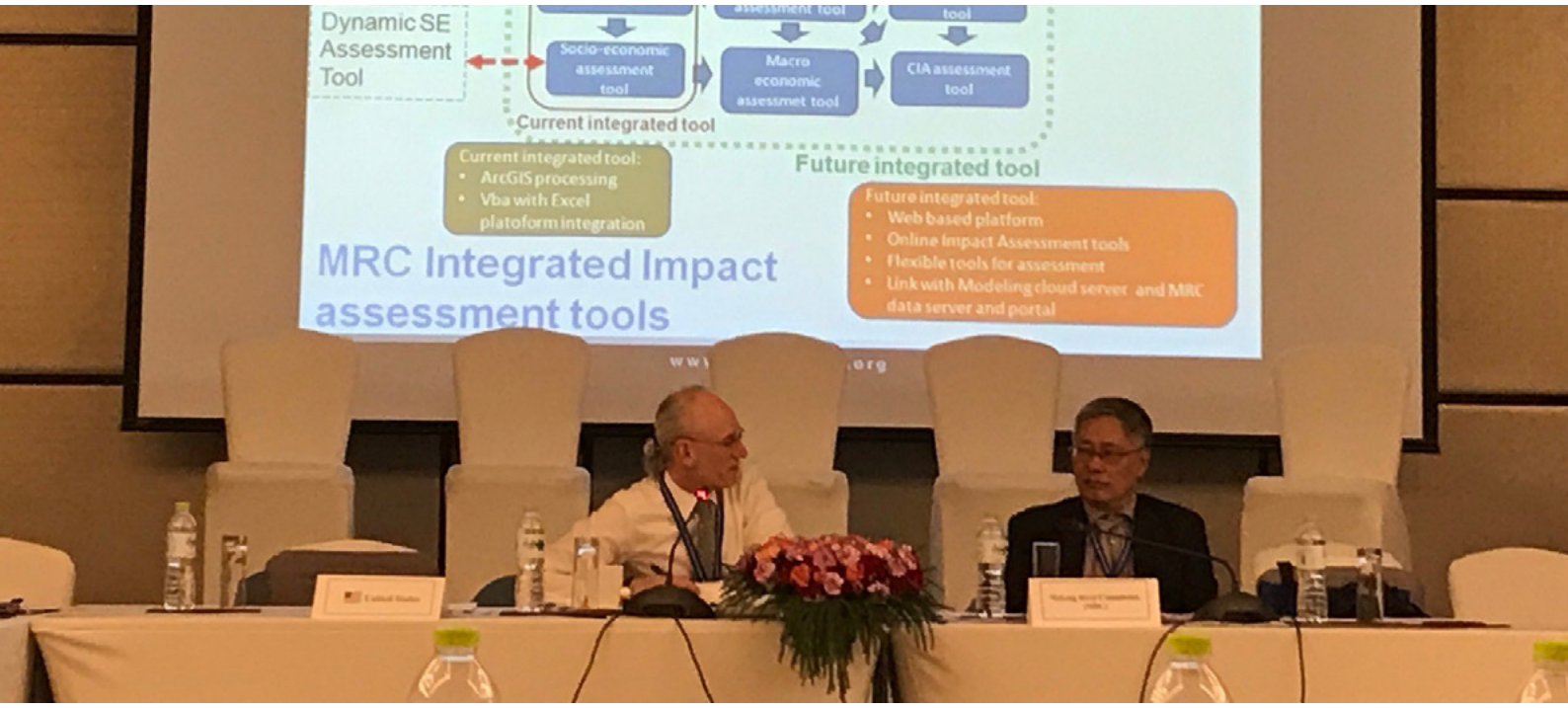
- Build on and create synergy with existing initiatives.
- Learn from past and current challenges to ensure improved and practical ways to constructively move forward.
- Ensure that incentives, objectives and goals are clear and precise.
- Clearly identify geographical and issue based focus, regional, national, local and specific basin levels.
- Ensure connectivity to decisions and measurable benefits to stakeholders.

Technical recommendations:

- Do not overly focus on standardizing data which come from multiple sources, as this can be a daunting task that requires large amounts of time and resources.
- Invest in both human and hardware capacity.
- Consider the opportunities and limitations of radar and meteorological satellite technologies, as these technologies can only respond to certain questions and emergencies.
- Consider the potential for Thailand and Viet Nam to provide technical capacity building support to the other Lower Mekong countries.

An overview on regional data sharing needs and opportunities

Presenter: Dr. Pham Tuan Phan, CEO, Mekong River Commission Secretariat
Mr. Suthy Heng, Regional Coordinator for Council Study, MRCS



A direct case on regional water data sharing was shared by two representatives of the Mekong River Commission Secretariat (MRCS). Dr. Pham Tuan Phan, Chief Executive Officer of the commission, shared with the meeting participants the substance of the 1995 Mekong Agreement and its related procedures on water data monitoring and sharing that included:

1) Procedures for Notification, Prior Consultation and Agreement (PNPCA)
2) Procedures for Data and Information Exchange and Sharing (PDIES)
3) Procedures for Water Use Monitoring (PWUM)
4) Procedures for the Maintenance of Flow on the Mainstream (PMFM) and
5) Procedures for Water Quality (PWQ).

Dr. Phan explained that the commission owns an integrated database system called the “Master Catalogue” that contains water and related data such as hydrology, meteorology, water quality, sediment, spatial, and sectoral based data (e.g., hydropower, fishery, irrigation, and climate change, etc.). These types of data have been collected and shared by the MRCS itself, as well as MRC Member Countries, since early 1900s. Data can be accessed through the MRCS in multiple ways including by: internal users; commercial payment by the private sector for their business use; and research, academic and civil society for their non-business use. He also noted that all data that is collected and compiled for the use of MRCS’ products are required to be approved by the Member Countries. In terms of data confidentiality, there are important differentiations made in types of data groups:

1) data that can be shared
2) restricted data that needs specific approval from Mekong countries before sharing, and
3) strictly confidential data which cannot be shared by any means.

Dr. Phan also presented a wide range of related activities and products through which information and results could be accessed publicly (i.e., the monitoring system on hydrology, water quality, fishery, discharge and suspended sediment, HYCOS network development, and cumulative

impact assessment study or Council Study).

Dr. Phan then addressed several key challenges related to water data monitoring, such as the large amount of time spent on data preparation but very little on data quality control and analysis, harmonization of historical and spatial-temporal data, gaps and linkages of data regarding time-series, etc. He also noted problems on many water monitoring stations (HYCOS stations) that are not functioning due to lack of maintenance budget and the problems of changing technology, and MRCS' institutional challenges such as limited human resources and staff turn-over, and limited certain expertise (e.g., in GIS and remote sensing and hydrometeorology).

Finally, he noted an important upcoming event of MRC that addresses the great commitment of the Lower Mekong Countries, the MRC Summit, which will be held in Siem Reap, Cambodia in April 2018.

Mr. Suthy Heng, Regional Coordinator for Council Study presented a key activity of the Commission in the Council Study and its use of multiple types of data for conducting an impact assessment of water resources development for the lower Mekong basin. He also presented the likely preliminary results of the study which can be summarized as follows:

- The emerging trade-offs between hydropower and fisheries are substantial and suggest a project-by-project assessment to identify the most harmful and the most efficient investment projects.
- Thailand and Viet Nam will benefit from hydropower investments and Viet Nam and Cambodia will experience negative effects due to losses in fisheries and sediments.
- Benefit sharing mechanisms would need to be designed to support development goals.
- Development strategies as defined for the main scenarios would cause substantial sustainability losses, which could be avoided or even reversed by adjusting investment levels in hydropower and agriculture.

A plenary discussion that followed the MRCS representatives' presentations provided key comments on MRCS water data system and the Council Study. Key points raised included:

- The set of MRCS' procedures should be reviewed and can be further improved according to actual circumstances and lessons learned.
- The MRCS should reconsider how its data preparation process and objectives should meet the services that are in demand by stakeholders in the region – and how a wider range of key stake-holders should be better engaged.
- Formatting data from diverse sources could take unnecessary time and financial resources, while the use of data may not be that substantial in this regard.
- It was commented that the results and process of the Council Study still lack a certain social and socio-economic data and the comprehensive social impact assessment.
- The Council Study should not be stopped at this point, but should be continued to keep exploring new relevant scenarios and possibilities.

Takeaways and proposed next steps

The MWDI one day session on improving water resources management provided a platform for representatives from the riparian countries, development partners, civil society, and other stakeholders to openly present and discuss diverse perspectives about the opportunities and challenges for improving management of water data for the lower Mekong basin. Although the purpose of the meeting was not to deliver a set of defined answers to the many complex questions that underlie water data management, it nevertheless advanced a dialogue around the possibilities and openings for taking collective action towards a more effective way of managing water data. Notably, participants agreed that was interest in establishing a shared vision and a cooperative framework for moving forward to improve water data management practices. While the perspectives and constructive arguments made were indeed diverse, the following key messages emerged throughout the day:

Multi-stakeholder interest in moving forward with collaborative action.

There was consensus across diverse perspectives from participants that there is a real need for a dedicated initiative that will work to improve water data management systems and processes. It was agreed that representation from across the Lower Mekong countries will be necessary to ensure that the initiative is responsive to both national and regional developmental needs and visions.

Form will follow function.
The first priority for improving water data management will be to develop a shared vision in the form of specific products and services that will bring practical value for policy and decision making at the national and regional levels. The form of an eventual platform and/or mechanisms for water data sharing will follow from the proposed and agreed upon functions.

Allow for different and innovative models of data sharing.
A recurring discussion theme centered around the consideration of whether data sharing should be built around a central organization that serves as the data 'owner' or 'administrator' (a centralized model), or whether data producers and users should interact in more localized, bilateral contexts, potentially through the facilitation of a central actor (a decentralized model). It was recognized that different models will bring different advantages, and that partners throughout the region should remain open to testing and learning from a variety of potential models for data sharing.

Multiple stakeholders.
Participants acknowledged that there is a diverse and complex range of stakeholders that are deeply and historically invested in producing and using Mekong water data. Any new efforts should learn from past experiences and coordinate with complementary ongoing efforts.

Focused country inputs and continued multi-stakeholder dialogue as next steps. Future activities will include gathering further input on priority needs for water data (including visioning around practical products and services) from riparian country perspectives, and re-convening key stakeholders to maintain momentum for improved Mekong water data and water resources management.

Annex I

Meeting Agenda

Day 1, November 15, 2017		
Time	Program	Responsible persons
19.00 - 21.00	Improving Water Data Poster Session	

Day 2, November 17, 2017		
Time	Program	Responsible persons
08.15 - 08.30	Welcoming Ceremony	
08.30 - 09.00	Keynote: Changing the way we view our water resources through transformative water information services	Dr. Rob Vertessy
09.00 - 09.15	Coffee/Tea break	
09.15 - 11.30	Session 1: National level capacities and visions for the future of water data	
	* Presentations from recent studies/surveys (15 min each)	
	* Riparian country presentations (15 min each)	
11.30 - 13.00	Lunch (Close of LMI Regional Working Group Meeting)	
13.00 - 14.00	Session 2: Panel on technological advancements for data and water resources management	
14.00 - 15.30	Session 3: Regional capacity and vision for the future of water data	
	* Presentation from recent studies/surveys	
	* Facalitated dialogue on the regional level challenges and opportunities	
15.30 - 15.45	Coffee/Tea break	
15.45 - 16.45	Discussion: what are the next steps in moving toward a shared vision and a common work plan for improving data for water resources management?	
16.45 - 17.00	Closing Remarks	

Annex II

Panel on Technological Advancement on Data
for Water Resources Management

Moderator

Professor Rob Vertessy
Global Change Advisory

Rob graduated with a PhD from the Australian National University (1990), specializing in fluvial geomorphology. He joined CSIRO as a research scientist in 1987, and is widely published in the field of hydrology.

Rob served as Chief Executive of the Cooperative Research Center for Catchment Hydrology (2002-2004) and then Chief of CSIRO's Land and Water Division (2004-2007).

In late 2006 Rob was seconded to the Department of Prime Minister and Cabinet to design a national water information strategy. He then joined the Bureau of Meteorology in 2007 to oversee its implementation as a new Bureau service.

Rob served as CEO of the Bureau of Meteorology from 2011 to 2016. During this time he was Australia's Permanent Representative to the World Meteorological Organization (WMO). In 2013, Rob was elected a Fellow of the Australian Academy of Technological Sciences and Engineering.

Rob Retired from the Australian Public Service in April 2016. In January 2017, he took up a part-time role with the University of Melbourne School of Engineering as an Enterprise Professor, conducting research on climate change and water security.

Rob is the Principal of Global Change Advisory, a consulting company he established focused on environmental intelligence. In this capacity, he has recently undertaken missions to India, Pakistan, Iran and Jordan to share experiences on Australian water reforms and water information in particular. He has recently prepared Good Practice Guidelines for Water Data Management for the High Level Panel on Water, due for release in early 2018.

Panelists

Matthew E. Andersen
Senior Scientist for Biology, US Geological Survey

Since April 2015 Andersen has been the Senior Scientist for Biology in the US Geological Survey Director's Office of International Programs (OIP), the first person to hold this position. He works closely with scientist from the USGS Ecosystems Mission Area, other mission Areas, and his peers in the OIP. He is an ichthyologist and aquatic ecologist by training, with biology degree from California State University (With Distinction) and the University of Nevada, Las Vegas. He is certified as a fisheries Professional by the American Fisheries Society. He is the first or second author on a dozen peer-reviewed journal articles and book chapters. He has serves in science administration roles for the State of Utah, as well as for USGS as the Biology Program Manager at the Grand Canyon Monitoring and Research Center (Arizona) and as the Deputy Director of the National Wetlands Research Center (Louisiana). He previously administered increasingly large science programs for USGS, including the 10 million Hurricane Sandy ecosystem supplemental appropriation research program and the 65 million Environments program. Andersen is currently negotiating multi-disciplinary ecosystems research programs for the USGS in Kuwait, Lao PDR, Mexico, Peru, Thailand, and Vietnam, working closely with the US State Department and multiple academic, government agency, and nongovernmental organization partners. He is a leadership program facilitator and volunteer mentor for USGS.

James K. Ligh
Chief of Business management, US Army Corps of Engineers

Mr. James Ligh is the Chief of Business Management at the Pacific Ocean Division (POD) of the US Army Corps of Engineers in Honolulu, Hawaii since 2001. He oversees POD's programs in strategic management, regional governance, quality management, outreach, and workforce & leader development. He also oversees theater security cooperation initiatives, humanitarian assistance programs, capacity building, and technical assistance to other Nation, Federal agencies, and local government & communities. He currently oversees humanitarian projects in South and South East Asia and coordinates USACE International Capacity Development initiative in over 14 nations.

Mr. Ligh's engineering experience includes over 12 years as a Project Manager, Project Engineer, and Civil/Hydraulic Engineer in the Corps's civil works program. He worked on regional water resources planning and engineering design for costal, flood control, deep-draft navigation, and small-boat harbor projects with the New York and Honolulu Districts. He also supported emergency operations as an engineer planner for domestic emergencies, recovery efforts, and disaster planning. He has also served as regional Chief Information Officer (RCIO) where he oversaw POD's information resources management program. He has over 12 years experience of senior level management in information technologies, security, privacy, and infrastructure planning.
Mr. Ligh was a Distinguished Military Graduate from the Army ROTC program and served on active duty and with the Army ROTC Reserve as an Engineer Officer. He supported contingency operations and exercises with deployments to Korea, Germany (in support of Bosnia operations) and Italy (In support of Kosovo operation) as a facilities planner and engineer operations & plans officer.

Mr. Ligh received a MS in Management from Alfred P. Sloan School of Management at the Massachusetts Institute of Technology as well as a MS in Ocean Engineering and BS in Civil Engineering. He completed the Tuck Executive Program at the Dartmouth College Amos Tuck School of Business Administration and the Senior Executive Fellows Program at the John F. Kennedy School of Government, Harvard University. Mr. Ligh's military education includes the US Army War College where he received a Master in Strategic Studies; the National Security Management Course at the Maxwell School of Citizenship and Public Affairs of Syracuse University; and the US Army Command and General Staff Course. He is a licensed Professional Engineer in the state of Hawaii.

Dr. Tho Nguyen
Managing Director, Center for Automata Processing
Senior Research Program Officer, Computer Science Department, University of Virginia

Tho Nguyen is the Managing Director of the Center for Automata Processing (CAP) and Senior Researcher Program Officer in the Computer Science Department at the University of Virginia. Tho is primarily responsible for project and program development as well as managing CAP operations. Tho obtained his PhD from the Department of Electrical Engineering (Systems, Controls & Robotics) at the University of Washington in 2009.

His past work focused on sensing, modeling, and application of controls for large-scale environmental systems. Tho's current research interest is in extending cyber-physical systems theory and technologies to mitigate the impact of disruptions to large scale systems (i.e., resiliency). Tho has had extensive international research experience and was previously funded by NSF and USIAD. Prior to joining UVA, Tho served as a AAAS Fellow appointed to the National Science Foundation, where he worked on the Cyber-Physical System Program (@013-2015). He is also a former J. William Fulbright Fellow and an NSF IGERT Fellow.

Dr. Peeranan Towashiraporn
Chief of Party, SERVIR-Mekong

Peeranan serves as the Chief of Party for SERVIR-Mekong. He specializes in earthquake engineering and disaster risk management practice.

Previously, Peeranan worked as the Head of the Disaster Risk Assessment and Monitoring department of ADPC and implemented projects to scientifically quantify disaster risk in more than 10 countries in Asia. Prior to joining ADPC, he worked as a senior engineer at AIR Worldwide Corporation, a catastrophe risk modeling firm in the United States.

He engaged in work related to seismic vulnerability and risk assessment of buildings, earthquake induced casualty estimation, and post-disaster reconnaissance surveys. Peeranan brings his vast experience in disaster risk management to SERVIR-Mekong. He holds a PhD. in Civil Engineering from Georgia Institute of Technology, U.S.A.