



Mekong₂Rio

International Conference on
Transboundary River Basin Management

1 - 3 May 2012

Phuket, Thailand

Conference Programme

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Conference Brief

This Conference Brief, together with the attached Programme, provides a summary of the background and the objectives of MRC's Mekong₂Rio Conference. It outlines the key topic and issues, focal areas and interests of the conference, as well as desired outputs, aiming at guiding speakers and panelists, as well as the process of producing the Conference Statement and the Conference Publication.

The Mekong₂Rio Conference

The sustainable development and management of water resources is the key to people's lives and development of society, including production of the food and energy on which we depend, and the maintenance of our ecosystems. With an expected two more billion people on our planet by 2040, and the added challenges from climate change and rapid urbanization, the pressure on water, energy and food is growing, and we face increasing challenges to resource availability, management and sustainability. When these resources cross international and state boundaries, their management becomes more complex, calling for greater cooperation and involving a wider range of actors.

Situated in a region facing rapid economic growth, the Mekong River Commission (MRC) is one of the world's leading transboundary river basin organizations facing these challenges. The MRC is playing a key role in ensuring that the joint development and management of shared resources within the Mekong Basin will be made in the most sustainable and efficient manner.

Set to be a contribution on the road to Rio +20, the UN Conference on Sustainable Development to be held in June 2012 in Rio de Janeiro, the MRC will host the "**Mekong₂Rio** - International Conference on Transboundary River Basin Management" to be held in Phuket, Thailand, 1-3 May 2012, as an international gathering of key players, with special focus on international river basin organizations, aiming to share their experience in transboundary water resources management.

This Conference will be the first in a series of biennial conferences of its kind convened by MRC. In the face of the aforementioned growing challenges, it will be a 2½-day platform for discussion on how existing river basin organizations develop and manage their shared resources, and how to strengthen their institutional frameworks governance structures, stakeholder dialogue processes and management practices. The conference will gather some 250 participants, including chief and senior representatives from some 15 transboundary river basin organizations in Asia, Africa, Europe and the Americas, leading representatives of some 15 international and regional organizations, many of which will support the Conference as Sponsoring Partners, and a wide range of stakeholders from the Mekong region and beyond. On the third day, the Ministers of the four riparian countries of the Lower Mekong Basin will attend.

Rio+20 and the Water, Energy and Food Security Nexus

Water has been a concern in international environmental governance discussions, especially since the UN Conference on Environment and Development in Rio de Janeiro in 1992, and its follow-up 10 years later in 2002 ("Rio + 10") at the World Summit for Sustainable Development in Johannesburg. The latter called upon all countries to address Integrated Water Resources Management (IWRM), a call which has been followed by most developing countries and major transboundary basins, including in the Mekong region in which

IWRM plans at national and basin levels are now starting to be implemented. Today, shortly before "Rio+20", the challenge of water will be addressed with focus on the imperative to achieve water, energy and food security for all, particularly the poorest segments of the world population, while achieving sustainable development and growth in approaches fully consistent with solutions for a Green Economy. The Bonn 2011 Conference in November 2011, as a preparatory step for Rio+20, addressed this challenge in the context of what is called the "the Water-Energy-Food Security Nexus" – see box below.

The Water, Energy and Food Security Nexus, as expressed in Bonn:

Water, energy, and food sectors are connected in important ways, and actions in one sector have the potential to either help or harm the other two. For example, the way water is sourced, treated, priced, and distributed can reduce or increase energy requirements; dietary choices can affect water and energy demands; and decisions taken on which way to generate energy can significantly influence water demand or, in the case of biofuels, displace food production. Disconnected approaches and silo thinking are more likely to make matters worse. The real world is characterized by an intricate web of interactions – the nexus.

Based on a better understanding of the inter-dependencies across water, energy and food challenges, the nexus approach provides a more comprehensive base for allocating scarce resources. It helps to identify mutually beneficial responses and provides an informed and transparent framework for determining and resolving trade-offs to meet increasing demand without compromising sustainability.

The nexus approach will enable us to:

- *Achieve access to water, sanitation, energy and food*
- *Create more with less by reducing waste and limiting over-use*
- *Sustain ecosystems and biodiversity*
- *Strengthen resilience to disasters and accelerate recovery*
- *Mobilize consumer and public influence*

For more information, including the Policy Recommendations issued 13 February 2012:

<http://www.water-energy-food.org/en/conference.html>

In the key messages from Bonn the continued focus on integrated water resources management, particularly in terms of horizontal and cross-sectoral integration, is stressed, and it is emphasized that "a true nexus approach can only be achieved through close collaboration of all actors from all sectors". However, the prominence of water resources management transcending the boundaries of nation-states, does remain limited within the Rio+20 process. A continuous and strengthened international focus on transboundary water resources development and management is therefore urgently needed.

Mekong₂Rio will be an important contribution to the transboundary water resources management dimension to Rio+20. Applying the nexus perspective, while still adhering to IWRM principles

as the basic approach to achieve it, helps river basin planners and managers, as well as other involved stakeholders, to exploit synergies and mitigate trade-offs between different development opportunities while maintaining the overall sustainability in a shared basin. While serving as an important dialogue platform between the world's leading transboundary river basin organizations, Mekong₂Rio thus aims at continuing to the development of policy recommendations within the Rio+20 process, and at contributing to specific activities and initiatives that help strengthening the water, energy and food security nexus. Hence, like the Bonn Conference, the Mekong₂Rio with its special focus in the transboundary dimension will attempt to propose concrete solutions to move from rhetoric to practice in operationalizing the nexus perspectives.

Key topics and issues to be addressed

Mekong2Rio focuses on the transboundary water resources management dimension of sustainable development from a nexus perspective. Specifically, it addresses the key topic:

The transboundary dimension of the Water, Energy and Food Security Nexus, with particular emphasis on the challenges that rapid human-made developments and environmental change pose to the sustainable management of transboundary river basins

In addressing this topic the Conference will address the following issues:

- Integrated and inter-disciplinary management, adaptation and mitigation options for ensuring the sustainable development of transboundary river basin to the benefit of the people, the economy and the environment
- International institutions and their role in ensuring the joint, cooperative and sustainable management of shared natural resources, with a particular emphasis on strengthening the role of river basin organizations in the management of shared river basins
- The involvement of a broad variety of stakeholders contributing to the management of internationally shared river basins, and the development of a joint approach to integrated water resources management (IWRM) with the help of, and for the well-being of, all concerned stakeholders

All these topics will be addressed from an integrated, cross-sectoral and interdisciplinary perspective. Conference participants are therefore asked to assess, analyze and discuss the different topics of the conference within the nexus framework.

Expected outcomes of the Conference

Mekong2Rio will address the aforementioned water resources management challenges. It will aim at generating the following three outputs:

- Key messages, including recommendations for action, on the role of transboundary river basins for the overall nexus discussion and the international sustainable development agenda

- A “Mekong2Rio Message” to be sent to the Rio Conference, emphasizing the importance of transboundary water resources management and the role of institutionalized cooperation for ensuring its sustainability
- A “Mekong₂Rio Publication, prepared in an internally peer reviewed process by MRC and Sponsoring Partners, to be launched at the Stockholm Water Week in August 2012

Approach of the Conference

Mekong₂Rio will be a two-day high-level Technical Conference, followed by ½ day Ministerial Segment.

- On **Tuesday 1st May**, nexus challenges for and approaches to transboundary river management in the sectors of water, food and energy are discussed along thematic lines, nonetheless highlighting the interdependencies between these sectors. The discussions will feed into the Panel discussion at the end of day of how to address the challenges of integration across the nexus.
- On **Wednesday 2nd May**, the conference moves on to address the integrated perspective of IWRM and the nexus by applying a cross-cutting approach, addressing the environmental, climate change, poverty, policy and governance, techno-economic and stakeholder involvement aspects
- On **Thursday 3rd May** MRC ministerial representatives will review and discuss the outcome of the technical sessions of the first two days from a political perspective

An exhibition featuring MRC and the Sponsoring Partners of the Conference will be a place for display and interaction throughout the three days. During the first two days one hour is allocated each afternoon for participants to study displays and discuss with MRC and its partners in the exhibition area.

Brief program and session description – the flow of the Conference

Tuesday 1st May

The Mekong₂Rio will be opened in **Plenary 1** by the Royal Thai Government and the Mekong River Commission, and proceed with three stage setting keynote addresses on the water/environment, food and energy aspects of the Nexus. Starting with experiences from the Mekong River Basin

Parallel Session 1, a basin facing important water resources development opportunities as well as challenges, different aspects of water, energy and food security are discussed. Presenters from the MRC and other institutions and stakeholders from the region, inspired by some international basins such as the Ganges, will provide a comprehensive view in light of the nexus of how the Mekong River Basin is dealing with challenges it faces– ranging from fisheries-related food security aspects to sustainable hydropower development, and from regional energy security to the mitigation of environmental impacts in the basin. The emphasis of these presentations will be on the role of the Mekong River Basin as an example for the application of IWRM and the nexus perspective as solutions to the transboundary river basin challenges, contributing to the sustainable development of its riparian populations and states.

Parallel sessions 2 and 3 will provide insights from various different transboundary watercourses around the world, including the Congo, the Danube, the Niger, the Nile, the Indus, the Itaipu/La Plata, the Columbia and the Yellow River Basins, and very different actors involved in their management – ranging from river basin organizations to research institutions, and from international organizations to civil society and the private sector.

Parallel session 2 focuses on examples from these international basins, extending the lessons learned on the nexus from the Mekong River Basin to other international basins. It is structured along the three key aspects of the nexus – water/environment, food and energy – and will discuss how food and energy production in transboundary basins can be managed for mutual benefit sharing while addressing the social and environmental implications.

Parallel session 3 then focuses on potential solutions to the challenges raised in Parallel Sessions 1 and 2 in the form of three issue-specific Panels. The aim of these water/environment, food and energy-specific Panels is to discuss potential solutions to the challenges related to these issues on the basis of an integrated, nexus-driven and sustainable approach that can be promoted internationally for the sustainable development and management of shared river basins.

The first day concludes with Plenary 2, debating the water, energy and food security nexus as it emerged from the parallel sessions, the trade-offs concerned and its particular relevance to transboundary river basins. The Panel, consisting of high-level experts on water resources management, will discuss the issues from previous parallel sessions and the potential for integrating the sector- and actor-specific approaches

into the nexus-perspective. The aim of this Panel will be to show how to move from a sector to a nexus perspective, hence setting the scene for the following day.

Wednesday 2nd May

The second day will start with **Plenary 3** in which the outcome of Day 1 will be summarized, and keynote addresses on the nexus and the green economy will set the stage for the day. The day will address the integrated perspective, bridging the divides between the different water uses and users, and address the interdependencies of the nexus from a transboundary perspective.

Parallel session 4 focuses on environment, climate change and poverty related challenges that challenge the nexus. The environment session of this part of the conference addresses potential means for mitigating the environmental challenges of river basin development for ensuring water, energy and food security; the climate change part of the session investigates climate change adaptation options in light of the nexus; and the poverty-focused part discusses the link between poverty, energy and food security, and environmental governance for ensuring sustainable development and management of ecosystem livelihoods and biodiversity.

Parallel session 5 approaches the nexus topic from an actor-centered perspective, inviting presenters from a policy, science and stakeholder background to discuss sustainable development approaches (including representatives of institutions as diverse as international organizations, MRC programmes, the World Bank, hydropower developers and environmental NGOs, along with the international river basin organizations). This also contributes to engaging a very broad range of actors into the sustainable development process of internationally shared watercourses.

In the sessions of the second day examples and cases will be provided from transboundary basins such as the Mekong, Murray-Darling, the Aral Sea, the Mississippi, the Amazon and the Nile; and from a 'convention perspective' by the Espoo Convention, the transboundary Convention of the UN Economic Commission for Europe, and the SADC Water Protocol from Southern Africa.

The second day concludes with a high-level Panel discussion (**Plenary 4**), which will draw on the outcomes of the Parallel Sessions and will aim to arrive at conclusions and recommendations for actions on how to address the transboundary dimensions of the nexus. The draft "Mekong₂Rio

Message” will be presented as the outcome of the first two days.

Thursday 3rd May

On the third day MRC Ministers and high-level ministerial representatives get together in the Final Plenary to discuss the lessons learned and the approaches developed during the previous two days of the Conference from a political perspective, and address how the region will take these lessons and recommendations forward under the framework of the Rio+20 process.

Additional information for speakers, panelists and participants

The Mekong2Rio Conference is designed with focus on interaction and discussions, the latter mostly as Panel discussions during which a Panel of selected high-level participants interacts with the audience. In these sessions panelists will normally be given 5 minutes for introductory remarks in order to provide time for the audience to raise questions and views.

Each parallel session will consist of up to four presentations. Each presentation is limited to 15 minutes, and speakers are requested to focus their presentation on the topics and issues outlined above, with a view to identify a few key lessons and recommendations. The presentation section of each parallel session will be followed by Q&A as well as a broader discussion between speakers and the audience, aiming at situating the different presentations in the overall IWRM and nexus context and deriving lessons learned for other regions and actors. The different sessions will be facilitated by internationally well-renowned facilitators, working closely with the Sponsoring Partners and MRC programmes in each of the parallel sessions.

Summary of Facts on RBOs participating in M2R

Amazon River Basin

The Amazon River Basin, located in Latin America, is the largest river basin in the world. It stretches over nine countries – Bolivia, Brazil, Colombia, Ecuador, French Guyana, Guyana, Peru, Suriname, and Venezuela and provides riparian states with important opportunities for agricultural and industrial use (including the generation of hydropower) as well as the means for navigation. Boasting over 2,100 species of fish and more than one-third of the world's total species population, the river basin beholds immeasurable ecological value. With this said, socio-economic development is to a large extent, responsible for the basin's environmental degradation. Water resources management challenges such as these are tackled through the Amazon Cooperation Treaty Organization (ACTO).

Established in 1978, ACTO unites its signatories - Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela. Its mission is, "to undertake joint actions and efforts to promote the harmonious development of their respective Amazonian territories in such a way that these actions produce equitable and mutually beneficial results and achieve also the preservation of the environment, and the conservation and rational utilization of the natural resources of those territories" (Amazon Cooperation Treaty).

ACTO is organized around a Meeting of Ministers of Foreign Affairs, the Amazon Cooperation Council, a Secretariat as well as Permanent National Commissions. Special Commissions focus in depth on the different sectors. The organization works primarily in the sectors of development, transport, communication and infrastructure, tourism, science and technology and health.

Columbia River Basin

The Columbia River Basin is more than 1,900 km long. The Columbia River Basin covers an area of more than 660,000km², out of which about 15% are situated in Canada and the remaining 85% in the US. It is shared by the Canadian Province of British Columbia and six US-American states, most prominently in the states of Washington and Oregon.

With more than 100 tributaries, the Columbia River Basin is a water-rich river basin that provides many opportunities to riparian states and people. Sustainable hydropower development is the river's primary revenue source, and hydropower and flood

control developments have led the Columbia basin's current prosperity. Many dams have been built along the river to capture that potential, turning the Columbia River into a highly regulated basin. River transportation and irrigation are other important uses of the river, and navigability has been improved over the last centuries through considerable hydromorphological alterations. The dams on the Columbia have also caused a number of environmental problems for the basin, most notably the decline of salmon runs just as important to the people of the region. A significant share of hydropower revenues are now devoted to a fish and wildlife mitigation and recovery program.

Canada and the United States signed the Columbia River Treaty in 1961, providing for the building of storage reservoirs in the Canadian portion of the Columbia basin, and the sharing of downstream power and flood control benefits. Under the Columbia Treaty the two nations cooperate on a coordinated system operation, exchange information primarily on hydropower generation and flood control activities, and in general cooperate on finding solutions to problems that relate to the shared Columbia River. Through an earlier treaty, the Boundary Waters Treaty of 1909, the two nations have also established the International Joint Commission (IJC), which stands ready to help the two nations solve problems related to all transboundary rivers shared by the United States and Canada. The IJC's role in the Columbia River has been superseded for now by the different coordination arrangements under the Columbia River Treaty, but it may someday prove useful again to the region.

Congo River Basin

With 4,700 km of flowing waters, the Congo River is the 2nd longest river on the African continent, shared by 13 riparian states – Angola, Burundi, Cameroon, Central African Republic, Congo, Democratic Republic of Congo, Gabon, Malawi, Rwanda, Sudan, Tanzania, Uganda, Zambia. It plays an important role in the development of riparian states. Water resources management issues focus on, in particular, water quality, invasive species and navigation.

The Commission Internationale du Bassin Congo-Oubangui-Sangha (CICOS) – International Commission of the Congo-Oubangui-Sangha Basin was established in 1999 through the Agreement Establishing a Uniform River Regime

and Establishing the CICOS. As of today, CICOS has 5 member states – Cameroon, the Central African Republic, Congo, and the Democratic Republic of Congo. CICOS has the goal to improve regional cooperation among riparian states through the coordination of river basin management.

While the organisation originally exclusively focused on navigation, CICOS's mandate expanded in 2007, and now includes non-navigational issues as well. Within this mandate, it covers issues such as water quantity and quality, invasive species as well as regulations on the river's flow regime in order to ensure navigability.

Danube River Basin

Located in Central and Eastern Europe, the Danube River Basin is the most international river basin in the world, shared by 19 countries namely, Albania, Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Italy, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia, Switzerland, and the Ukraine. More than 80 million people call the Danube River Basin their home. It stretches from Central into Eastern Europe, and after a 2,800 km journey through a vast and ecologically important delta, the river empties into the Black Sea.

Since the 16th century, riparian communities have altered the river's flow for navigation, flood defense and hydropower generation. Until today, the exploitation of the river's resources provides many benefits to riparian states. At the same time, the basin is suffering from various negative consequences. Water pollution, for example, is one of the basin's main challenges, which primarily occurs due to the diffuse input of nutrients from the agricultural sector. Water pollution is also caused by the intrusion of industrial and household wastewater that alters the quality of the river as well as the Black Sea, but is also related to accidental spills. Additionally, hydromorphological alterations have led to the interruption of river continuity, the disconnection of wetlands and floodplains from the river, as well as to changes in hydrological flow. Furthermore, floods pose a great threat to people and economies in the basin.

In order to cooperatively manage the Danube River Basin, signatories of the Danube River Protection Convention established the International Commission for the Protection of the Danube River (ICPDR) in 1998. Its members are 14 out of the basin's 19 riparian states – Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, European Union, Germany, Hungary, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia, and the Ukraine.

The ICPDR aims to promote and coordinate sustainable water management for the benefit of all people of the Danube River Basin by implementing the 1994 Danube River Protection Convention and the European Water Framework Directive. Its work focuses, in particular, on improving water quality and the overall ecological state of the basin. For instance, measures for reducing pollution have been identified jointly and required programmes have been implemented. Moreover, in order to prevent harm to the river basin through accidental spills, a Danube Accident Emergency Warning System (AEWS) was established. To improve flood resilience, an Action Programme on Sustainable Flood Protection has been adopted. Based on national flood protection programmes, it works towards improving forecasting and early warning capacities, preparing flood action plans, exchanging expert knowledge and developing a joint approach to transboundary flood-prone areas. Moreover, the ICPDR prepares a Danube River Basin Management Plan that includes a Joint Programme of Measures to improve water quality. The next Management Plan will be available in 2015.

Organizationally, the ICPDR consists of a Meeting of the Contracting Parties to the Convention and a Secretariat. ICPDR's work is supported by and implemented through Expert Groups, each of them focusing on specific river basin management topics, namely pressure and measures (including pollution), monitoring and assessment, information management and GIS, river basin management, and public participation. The ICPDR collaborates closely with different stakeholders, including civil society, the scientific community and the private sector.

Ganges River Basin

The Ganges-Brahmaputra River Basin covers areas of Bangladesh, Bhutan, China, India, Myanmar and Nepal. The Brahmaputra River, originating in Western Tibet, and the Ganges River, coming from Eastern Tibet, join forces in India before continuing to the Bay of Bengal. The basin is one of the key basins in South Asia, providing important resources to riparian states and populations in Agriculture dominates water use patterns in the river basin, although the river also serves other uses such as navigation, fisheries, hydropower generation and tourism. High population growth and density in India and Bangladesh are constantly increasing the riparian population's dependency and pressure on the river's resources. At the same time, however, it is also among the world's most polluted rivers. In addition, it suffers from a number of other environmental problems.

The India-Bangladesh Joint River Commission

(IBJC) was established in 1972 between India and Bangladesh as an international bilateral RBO. It has the task to foster cooperation over the river by ensuring joint efforts in the areas of flow monitoring, flood control, flood warning, mutual information on national project and coordinated research. It consists of commissioners from both Member States.

Within India, the Ganges-Brahmaputra is managed by the NGRBA, established in 2009. The NGRBA's objective works towards the effective reduction of pollution in the river and the conservation of the river and its basin through integrated and comprehensive planning and management.

Indus River Basin

The Indus River Basin is part of the great river system flowing from the Himalayans into South Asia, depending largely on glacier melt and monsoon rains. It is shared by five countries – Afghanistan, China, India, Nepal, and Pakistan. From Tibet, it flows over 3100 km through China, Afghanistan, Pakistan and India before emptying into the Indian Ocean. Its waters are highly important to riparian countries, especially in areas further downstream, providing water resources for irrigation and thus feeding these countries' growing populations.

The main challenge in the Indus River Basin concerns water allocation between riparians, most notably between India and Pakistan. Both states have established a number of water resources development projects along their stretches of the river but are, at the same time, worried about the consequences of co-riparian developments, most importantly in the form of dams and water diversion projects. In addition, floods pose a major threat to populations in the basin.

The Permanent Indus Commission (PIC) was established under the 1960 Indus Water Treaty between India and Pakistan, aiming to jointly manage water quantity and allocation problems between its members. Activities in this field include the maintenance of cooperative arrangements required for the successful implementation of the Treaty, studies and reports about the development of water resources on shared rivers, study tours and inspections for ensuring compliance with the Treaty, as well as dispute-settlement for issues arising between Member States on Treaty-related questions.

Organizationally, PIC only brings together the Commissioner from each state and ensures their regular meetings as the Commission. This reflects its role as a coordination mechanism between India and Pakistan.

Mississippi River Basin

The Mississippi River is part of the largest river system in Northern America, covering the states of Minnesota, Wisconsin, Iowa, Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana. It is more than 7,300 km long including its tributaries, it drains over parts of more than 30 states. Ten states are direct tributaries to the Mississippi.

The river has a history as an important axis for transport in the US. In order to improve navigability, it has undergone massive hydromorphological alterations, significantly changing the river's ecosystem. Aside from navigation, river control works are also largely justified by the constant threat of the river changing its channel and overflowing inhabited areas while drying up in other areas where people are equally dependent on the river's resources. For decades, the river has faced a number of environmental problems, most notably pollution from agricultural sources, affecting not only the river, but also the Gulf of Mexico.

Established in 1879, the Mississippi River Commission (MRC) aims to develop recommendations for water resources management, flood control, navigation and environmental projects, and to study the river's systems and assess the necessity for engineering works for both navigation and flood control. Based on these assessments, the US Army Corps of Engineers implements the required projects. The MRC consists of representatives of the US Army Corps of Engineers, the National Oceanic and Atmospheric Administration as well as civilians, all nominated by the US President.

Murray-Darling River Basin

The Murray-Darling River Basin is located entirely in Australia. It consists of the Murray and the Darling Rivers and covers an area of more than 1 million km², which is 14 percent of Australia's land area. It includes the states of New South Wales, Victoria, the Australian Capital Territory, Queensland and South Australia. Generating 39 percent of the entire country's agricultural income, it is of great importance to the sector. Products cultivated from the basin include grains, fruits, vegetables and livestock. Water availability varies greatly throughout the year and inter-annually. Therefore, large water storage schemes have been developed. Some of these storages also provide hydroelectric power.

The Murray-Darling Basin Authority (MDBA) is the successor of the Murray-Darling Basin Commission (MDBC), established in 1993 based on 1985 Agreement, bringing together New South Wales, Victoria, the Australian Capital Territory, Queensland

and South Australia. The MDBC itself is built on even earlier cooperation efforts, namely the initial River Murray Commission, and is established under the 1915 River Murray Waters Agreement.

The MDBA, established under the 2007 Water Act, is a statutory authority of the Australian Government, unlike its predecessors that were authorities established by an agreement between riparian states, territories and the Australian Government. The MDBA aims to promote and coordinate planning and management for the sustainable use of the land, water and the environmental resources of the Murray-Darling River Basin. These functions include advising the Minister on accreditation of state and territory plans; facilitating water trading; constructing and managing River Murray assets such as dams and weirs; measuring, monitoring and undertaking research; and engaging the community in Basin management.

The MDBA is embedded in a broader water governance network within Australia, including the Commonwealth Water Minister and the Ministerial Council. It consists of two permanent and four part-time members, appointed by the Australian Governor General.

Niger River Basin

The Niger River flows over 4,000 km through Western Africa. The Niger River Basin, more than 2 Mio km² in size, is shared by nine countries (Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Guinea, Mali, Niger, Nigeria), covering more than 7% of the African continent. It is an important lifeline for riparian populations and states, especially against the region's poverty challenge. Water resources management is closely linked to socio-economic development and poverty alleviation. The river's resources provide important opportunities for agriculture, fisheries, food supply and navigation. At the same time, the basin is threatened by various environmental problems, most notably land degradation and erosion, deforestation, water pollution from agriculture and households, biodiversity loss and the intrusion of invasive species. These issues hamper water resources development opportunities for riparian states.

The Niger Basin Authority (NBA) was established in 1980 under the Niger Basin Convention, but relies on a long history of cooperation, dating back to 1964 with the establishment of the Niger River Commission. Its Member States include Cameroon, Chad, Benin, Burkina Faso, Côte d'Ivoire, Guinea, Mali, Niger, and Nigeria. Its goal is to promote cooperation between Member States and ensure integrated development of the river basin. Its focus

is thus largely on socio-economic development and its work covers a large number of sectors, including agriculture, energy, fisheries, forestry, transport, industry and communication.

In order to achieve this goal, the NBA is mandated to undertake a number of activities, including the gathering, standardization and dissemination of data, the development of joint plans for infrastructure development and transport, the establishment of norms and activities for preventing and reducing environmental threats, especially in the field of water pollution, and the promotion of agricultural, forestry and fisheries activities through joint programmes and projects.

Nile River Basin

Running through 10 percent of the African continent for 6,700 km, the Nile is the world's longest river. It brings together a considerable number of riparian states – Burundi, Central African Republic, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, and Uganda. Riparian states and populations are highly dependent on often very scarce water resources, making sustainable water resources management a key focus for the basin. The Nile River Basin is facing challenges related to water quantity and questions of allocation. Egypt is highly dependent on the Nile's water resources and has so far benefited from a very favorable water allocation regime that was established in 1959 with Sudan. With increasing socio-economic development in upstream states, water demands and abstraction in these regions have increased, igniting disputes on the recent water allocation regime.

Established by Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda in 1999, the Nile Basin Initiative (NBI) is a transitional and informal mechanism. Over the last decade, a Cooperative Framework Agreement was developed, which was signed in 2010 by seven riparian states. This aims at transforming the NBI into a full RBO. Egypt and Sudan, two of the key players in regional water management, have still not formally joined the cooperation.

The NBI has the goal to achieve sustainable socio-economic development through the equitable utilization of and benefit from the common Nile Basin water resources. In order to achieve this goal, a number of activities are undertaken, focusing on capacity building; water resources management activities such as regional policy development and basin-wide planning; data and information management; and the provision of technical support

to Member States for strengthening national water policies.

The NBI is governed by the Nile Council of Ministers (Nile-COM), and is assisted by the Nile Technical Advisory Committee (Nile-TAC) and its Secretariat, based in Entebbe, Uganda. In addition, specific programme management bodies have been established, which include the Eastern Nile Subsidiary Action Programme (ENSAP) and the Nile Equatorial Lakes Subsidiary Action Program (NELSAP).

Parana-LaPlata River Basin

The Parana-LaPlata River Basin is more than 4,500 km long and is shared by five countries – Argentina, Bolivia, Brazil, Paraguay and Uruguay. The basin supports regional inland navigation, and delivers water supply and hydropower generation to millions that rely on it. Intensive use of the basin and its resources has led to a number of river basin management challenges, namely water quality problems, as well as issues related to navigation and the environment.

One of the central hydraulic structures on the river is the Itaipu Dam. The dam is one of the world's largest hydropower facilities with a capacity of more than 10,000 MW, generated on the basis of 20 turbines. Initiated in the 1970s, the project was jointly developed between Brazil and Paraguay. A result of the 1973 bilateral treaty between Brazil and Paraguay, the mega-project helped the two countries overcome previous disputes over the river and its resources. Today, Itaipu's mission is to provide quality electricity through socially and environmentally responsible practices, and to foster a sustainable economy, tourism industry and technological development.

In addition to Brazil and Paraguay's bilateral treaty on the basin, a number of institutionalized political cooperation mechanisms exist: the Administrative Commission for the Rio de la Plata (CARP), the Comision Technica de Mixta de Salto Grande (CTMS) and the Comision Binational Puente Buenos Aires Colonia (COBACIO) established by Argentina and Uruguay; the Trilateral Commission for the Development of the Riverbed of the Pilcomayo, bringing together Argentina, Bolivia and Paraguay; and the Administrative Commission of the River Uruguay (Comision Administradora del Rio Uruguay, CARU) for the tributary Uruguay, established by Argentina and Uruguay in 1975. The Parana-LaPlata Basin is thus characterized by a high density of institutionalized cooperation, indicating riparian states' strong commitment to the cooperative

management of their shared resources.

Southern African Development Community – Protocol on Shared Watercourses

The Southern African Development Community (SADC) has 15 member countries – Angola, Botswana, the Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, the Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Together, this region is home to more than 250 million people. Established in 1992, SADC aims at establishing a regional community that fosters economic well-being, improves the living standards of people, and promotes freedom, justice and peace. It therefore engages in promoting sustainable growth and development through regional cooperation and integration.

The SADC Region includes 13 transboundary river basins – the Buzi, Congo, Cuvelai, Incomati, Kunene, Limpopo, Maputo, Okavango, Orange-Senqu, Ruvuma, Save, Umbeluzi and Zambezi River Basins. Every SADC member state – except for the islands of Madagascar, Mauritius and the Seychelles – shares a part of its water resources with neighbouring countries. This comes with a number of water resources management challenges.

In order to better manage these shared river basins, the SADC Water Division was established. The SADC Water Division is situated under SADC's Directorate for Infrastructure and Services. Its goal is to ensure that water in southern Africa becomes a sustainable resource through the coordinated management, protection and equitable use of shared waters. It is in charge of coordinating and facilitating the implementation of regional activities in the SADC region. This includes development and consolidation of water policies, implementing activities and strengthening the institutional environment for cooperative water resources management.

Under the SADC framework, a number of basin-specific RBOs exist, namely the Inco-Maputo Tripartite Permanent Technical Committee, managing the Incomati and Maputo Rivers between Mozambique, South Africa and Swaziland; the International Commission of the Congo-Ubangi-Sangha Basin (CICOS); the Kunene Permanent Joint Technical Commission, bringing together Angola and Namibia to jointly manage the waters of the Kunene River; the Lake Tanganyika Authority (LTA), managing Lake Tanganyika, which is shared by Burundi, the Democratic Republic of Congo, Tanzania and Zambia; the Limpopo Watercourse

Commission (LIMCOM) which manages the waters of the Limpopo River between Botswana, Mozambique, South Africa and Zimbabwe; the Orange-Senqu River Commission (ORASECOM), which unites Botswana, Lesotho, Namibia and South Africa over the Orange-Senqu River; the Permanent Okavango River Basin Commission (ORASECOM) established between Angola, Botswana and Namibia; the Ruvuma Joint Water Commission established by the governments of Mozambique and Tanzania; and the Zambezi Watercourse Commission (ZAMCOM), bringing together seven riparian countries of the Zambezi River.

Mekong River Basin

The Mekong is the tenth-largest river in the world. The basin of the Mekong River drains a total land area of 795,000 km² from the eastern watershed of the Tibetan Plateau to the Mekong Delta.

The Mekong River flows approximately 4,909 km through three provinces of China, continuing into Myanmar, Lao PDR, Thailand, Cambodia and Viet Nam before emptying into the South China Sea.

The Mekong River Basin includes seven broad physiographic regions featuring diverse topography, drainage patterns and geomorphology. The Tibetan Plateau, Three Rivers Area and Lancang Basin form the Upper Mekong Basin. The Northern Highlands, Khorat Plateau, Tonle Sap Basin and Mekong Delta make up the Lower Mekong Basin.

The Mekong River Commission (MRC) is the only inter-governmental agency that works directly with the governments of Cambodia, Lao PDR, Thailand and Viet Nam on the joint management of the Lower Mekong Basin.

As a regional facilitating and advisory body governed by water and environment ministers of the four countries, the MRC aims to ensure that the Mekong water is developed in the most efficient manner that mutually benefits all Member Countries and minimises harmful effects on people and the environment in the Lower Mekong Basin. Serving its member states with technical know-how and basin-wide perspectives, the MRC plays a key role in regional decision-making and the execution of policies in a way that promotes sustainable development and poverty alleviation.

Since its establishment in 1995 by the Mekong Agreement, the MRC has adopted a number of rules and procedures, such as the Procedures for Water Quality, to provide a systematic and uniform process for the implementation of this accord. It also acts as a regional knowledge hub on several key issues

such as fisheries, navigation, flood and drought management, environment monitoring and hydropower development.

The MRC Secretariat is an operational arm comprising about 150 staff members based in two Secretariat offices in Phnom Penh, Cambodia and Vientiane, Lao PDR. Its focal points in the four countries, the National Mekong Committee, coordinate work at the national level.

The agency engages a wide range of stakeholders into its programme work and strategic planning. The two upper states of the Mekong River Basin, the People's Republic of China and the Union of Myanmar, are dialogue partners with the MRC.

Aral Sea

The Aral Sea, together with its main tributaries Amu Darya and SyrDarya, is of considerable importance for its riparian states: Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan and Afghanistan. The Amu Darya and Syr Darya Rivers are among the most important rivers in Central Asia. The lake's basin used to cover an area of 68,000 km², but has been reduced to about 10% of its original size by today – largely due to man-made environmental change and the overuse of water resources.

Consequently, the opportunities for riparian states to benefit from the lake's resources have been reduced over the past years. Problems include water shortages and droughts and the drying up of wetlands, water pollution from fertilizers used in the agriculture around the lake, soil erosion and salinization. Since the 1980s, the lake has become a symbol for the negative consequences of human overuse of water resources.

Since the end of the Soviet Union, no central planning authorities existed for the Aral Sea and its tributaries. Instead, riparian states came together to jointly manage the lake's resources and to tackle its tremendous environmental challenges under the framework of various international institutions. The start was made with the Aral Sea Basin Programme (ASBP), established with the help of UNEP, UNDP and various other donors in 1991. Its main aim was to tackle the different environmental problems on the basis of a transboundary approach, including strengthened water management and land use capacities.

In 1993, another joint water resources management body was established by five riparian states, the Interstate Commission for Water Coordination (ICWC) – underlining riparian states' commitment to joint environmental and water resources management. It

focuses on the joint management of water resources on the basis of an integrated management plan. Additional governance attempts followed in form of the International Fund for the Aral Sea (IFAS), established in 1993 and revived in 1997 by the World Bank. It brings together the Deputy Prime Ministers in charge of agriculture and water from riparian states, aiming at reconciling their water resources plans and allocating financial means accordingly.

Yellow River Basin

The Yellow River, Huang He in Chinese, is the 2nd largest river in China, with a length of more than 5,400 km. It flows through nine provinces – Xinjiang, Qinghai, Sichuan, Gansu, Ningxia, Shanxi, Shaanxi, Henan, Shandong, and Inner Mongolia, forming a basin of more than 742,000 km². Its basin is inhabited by more than 100 million people, many of them depending considerably on the river's resources. At the same time, the river basin is facing a number of environmental trials, including water shortages challenging the agricultural and industrial potentials of the river, as well as water quality problems. Another challenge for riparian people is its frequent floods, often coming with devastating effects for riverine communities and their livelihoods.

The Yellow River Conservancy Commission (YRCC) was established in 1999 by the government of China's Ministry of Water Resources. The Commission is responsible for the administration of water resources management among its riparian provinces. This includes tasks such as the implementation of the Chinese water law in the Yellow River Basin, the development of a management plan for the basin, the evaluation of water resources planning and management activities, the monitoring of soil erosion, the protection of water resources and the development of a flood management plan.

The above information was taken from each respective organisation's website and presented to provide the Conference participants with basic information only.

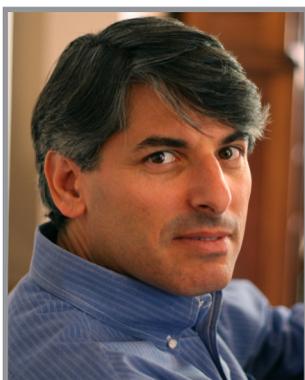
Four facilitators



Conference Facilitator: Prof. Torkil Jønych Clausen

Torkil Jønych Clausen is currently Water Policy Adviser to the DHI Group, Chair of the Scientific Programme Committee for the World Water Week in Stockholm, Senior Adviser to the Global Water Partnership, and Advisor to the Water Resources Department of Lao PDR

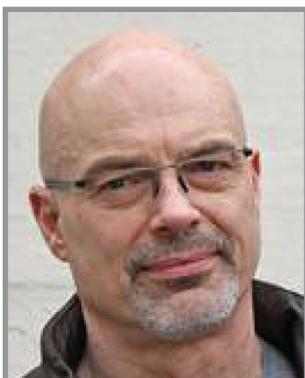
Previously he has been Deputy CEO of the DHI Group, Founding Chair of Danish Water Forum, Senior Adviser to UNEP, Founding Chair of the GWP Technical Committee, CEO of the Danish Water Quality Institute, and Counsellor in the Danish Ministry of Foreign Affairs/Danida.



Sessions Facilitator: Prof. Aaron Wolf

Aaron Wolf is a professor of geography in the College of Earth, Ocean, and Atmospheric Sciences at Oregon State University, USA. His research and teaching focus is on the interaction between water science and water policy, particularly

as related to conflict prevention and resolution. A trained mediator/facilitator, he directs the Program in Water Conflict Management and Transformation, through which he has offered workshops, facilitations, and mediation in basins throughout the world.



Sessions Facilitator: Mr. Kurt Mørck Jensen

Kurt Mørck Jensen is a Senior Adviser in the Danish Ministry of Foreign Affairs and a Senior Analyst at the Danish Institute for International Studies. He has worked on the developmental aspects of

water resources management in different countries and river basins in Asia, Africa and the Middle East. As a social scientist his research work has focused on transboundary water governance in the Mekong.



Sessions Facilitator: Mr. Jeremy Bird

Jeremy has an extensive background in policy development and governance issues related to water resources management and hydropower development. He was Chief Executive Officer of the Mekong River Commission Secretariat (2008-2011) and has worked with institutions such as the Asian Development Bank, World Commission on Dams, the United Nations Environment Programme and Hydraulics Research, Wallingford. As an independent consultant, he has experience of policy compliance assessments on

proposed hydropower projects in Southeast Asia, facilitation of multi-stakeholder dialogue processes and assignments to update water policy and law in India and Africa. He was appointed outcome ambassador of the Bonn2011 Nexus Conference on Water, Energy and Food Security. In October 2012 Jeremy will join the International Water Management Institute as its new Director General. A UK national, Mr Bird holds qualifications in Civil Engineering, Irrigation Engineering and a Master's degree in Water Law and Policy, specialising in international water law and shared river basins.

Editor and Conference Coordinator



**Managing Editor of the
Mekong2Rio publication:
Ms. Hanne Bach**

Hanne Bach is chief consultant at the Danish Centre for Environment and Energy (DCE), Aarhus University, Denmark. Her focus is on environmental studies including integrated environmental assessments, environmental policy analysis, environmental impact assessments and environmental

monitoring and reporting. She has previously worked in the private sector, at the Danish Ministry of Environment and as Chief Technical Advisor for the MRC Environment Programme and in a supporting role for the MRC Climate Change and Adaptation Initiative. Her background is chemical engineering with a focus on environmental aspects.



**Conference Coordinator:
Dr. Vitoon Viriyasakultorn**

Dr. Viriyasakultorn is currently working at the Mekong River Commission Secretariat (MRCS), Vientiane, Lao PDR as Technical Coordination Advisor in the Office of the CEO of MRCS. Prior to his current position at the MRCS, he worked as Senior Environmental Governance Specialist for ECOAsia, a regional programme of USAID.

His previous work at the Regional Community Forestry Training Center (RECOFTC) in Bangkok for 12 years included different positions from trainer to top level management of the organization. He was a Regional Facilitator for Asia-Pacific for Forests, Trees and People Programme (FTPP) of FAO for 10 years.

Plenary 1

Keynote: From Rio to Bonn to Rio+20 – challenges and solutions

Dr. Fritz Holzwarth, German Water Director, Co-convener of Bonn Nexus Conference



Fritz Holzwarth was appointed Deputy Director General for Water-Management in the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in 1991. His professional responsibilities, are inter alia Head of the German Delegation, Baltic Marine Environment Commission (HELCOM), Head of the German Delegation for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), Head of the German Delegation for International Commission for the Protection of the Danube River (ICPDR), President in 2003 and President of the International Commission for the Protection of the Rhine (ICPR) (2004-2007), President of the International Commission for the Protection of the River Elbe since 2008. He is a Member of the Board of Advice of the European Water Partnership, of the External Advisory Group of WATCH (Water and Global Change), of the Board of Advice of the Institute for Technology and Resources Management in the Tropics and Subtropics, Cologne University of Applied Sciences, of the Supervisory Board of the GKSS Research Center (Member of the Helmholtz Association).

Mr. Holzwarth has been actively involved in transboundary cooperation in international river

basins. Together with the World Bank he was one of the initiators of the "Petersberg Process on Transboundary Water Management", a global initiative. In his position as German Water Director he has been actively involved in developing EU-Directives such as the Water Framework Directives, the Marine Strategy Directive and other water related regulations. Furthermore he jointly initiated with EU-Commission and the Joint Research Centre the discussion process on Climate Change and the European Water Dimension and was Chair of the Conference under the German EU-Presidency "Time to Adapt - Climate Change and the European Water Dimension Vulnerability – Impacts – Adaptation" in February 2007. He also was part of the discussion process on "Marine and Coastal Dimension of Climate Change in Europe".

Fritz Holzwarth studied Economics, Law and Political Science at the University of Freiburg/Breisgau and holds a Diploma (1977) and Ph. D. (1984) in Economics and a Diploma in Business Administration (1973) from the College of Economics, Pforzheim.

Keynote: Water, food and energy security in the Mekong Basin

Mr. Hans Guttman, CEO of MRCS



Hans Guttman is a Swedish national who has spent most of his professional career in Southeast Asia. Hans was interested in water and environment from an early age and his undergraduate is in Marine Biology/Geography from James Cook University in Australia. Hans has spent most of his adult life in an international setting, gaining his MSc from Asian Institute of Technology (AIT), Thailand, and worked for 10 years with the AIT Aqua Outreach Programme promoting aquatic resources management and rural development in mainland Southeast Asia.

In 2001 Hans joined the MRC Environment Programme as coordinator, after having been

central in establishing the new programme in conjunction with the reorganization of the MRC Secretariat in 2000, and spent the next 6 years with MRC Secretariat both in Phnom Penh and in Vientiane. Heading the Environment Programme provided him with a thorough understanding of the MRC cooperation as well as the challenges. In late 2007 Hans left the MRC Secretariat to take up the position as coordinator for the Wetlands Alliance, a network of some 30 agencies working on rural poverty in Cambodia, Laos, Thailand and Vietnam. Hans joined the MRC as the CEO in November 2011.

Parallel Sessions 1: Water, food and energy security - the Mekong basin challenges

1.1 Water and environment challenges

Session Keynote Speaker: Dr. Mark Smith, Global Water Coordinator, International Union for Conservation of Nature (IUCN)



Mark Smith directs the IUCN Global Water Programme. He leads IUCN's work on water, environment and development at the global level, providing strategic leadership on water policy in international forums. He coordinates the flagship Water and Nature Initiative, which works through regional IUCN teams worldwide to develop integrated solutions to water problems.

Prior to IUCN, Smith was a scientist with areas of specialisation in agriculture, forestry and hydrology. In the past, his work focused on

agroforestry, first in the Sahel in West Africa, then in Kenya. Smith has also led an interdisciplinary research group at CSIRO Sustainable Ecosystems in Australia, which applied integrated social, economic and ecological tools to support sustainable development in tropical river catchments. Smith also acted as a policy advisor on climate change and poverty at the UK development NGO, Practical Action.

Holding a PhD in Ecology, he is the author of, *Just One Planet* (2006).

Abstract

Nature is the unseen dimension of the water-food-energy nexus. Services from ecosystems underpin each of the three securities of water, food and energy, whether in terms, for example, of abundance of fish, flows to turn turbines or water stored to mitigate scarcity and supply irrigation. Nature helps mediate the nexus links, by storing, moving, cleaning and buffering flows of water, making drought and flood less severe and food and energy production more reliable. Without healthy ecosystems in well-functioning watersheds, the infrastructure built for irrigation, hydropower or municipal water supply does not function sustainably, and is unlikely to achieve the economic returns necessary to justify investments. With its functions integral to the three securities and their inter-dependence, nature is part of the infrastructure needed to manage the nexus and its resilience. Ecosystems and well-functioning watersheds thus comprise 'natural infrastructure' for water and sustainable development.

The 2011 Bonn Nexus Conference gave explicit recognition to the need to understand and act on the value of natural infrastructure. Investing in securing, improving and restoring natural infrastructure was one of six key 'nexus opportunities'. Putting nature in the nexus hence changes the picture of what investment is needed to ensure water, food and energy security. Nature and ecosystem services then become part of the investment focus for the nexus and for economic development, as a complement to built infrastructure rather than a competitor, and thus as a keystone of a future green economy. In transboundary river basins, factoring natural infrastructure into basin development plans and investment frameworks will be just as important, while opening opportunities and options for benefit sharing that could otherwise be left unrecognized. As for any infrastructure investment, mechanisms for investment in natural infrastructure will have to account for economic returns, as well as, critically, social equity and resilience.

1.1 Water and environment challenges

a) Basin development planning process

Speaker: HE Mr Watt Botkosol, Deputy Secretary General, Cambodian National Mekong Committee (CNMC)



Watt Botkosol is a Deputy Secretary General of the Cambodian National Mekong Committee and national BDP Coordinator for Cambodia. He has various experiences involving in natural resources management, capacity building, policy and planning. He has coordinated for ADB and World Bank Mekong IWRM Support project, and ADB 3-Ss project (Cambodia-Lao-Vietnam), MDBC and Australian Assistance through MRC and bilateral cooperation. He has organised, facilitated and acted as resource person in national workshops, consultations, dialogues. He

published some research papers related to gender issues, basin development planning process, integrated river basin management, watershed management and integrated water resources management.

He got an Executive Master of Business Administration on Human Resources Management from the Asian Institute of Technology, Bangkok, Thailand in 2002; and a Master of Science on Forestry Science from the Technical University of Wood Technology and Forestry in Zvolen, Slovak Republic in 1994.

Abstract co-author: Mr. Antonius Lennaerts, CTA, Basin Development Plan Programme MRC Secretariat



Ton Lennaerts has 30 years of experience as a consultant and international official in surface and groundwater management at the transboundary, national and local levels in various countries and regions in Europe, Central Asia, the Caucasus, the Middle East and Southeast Asia. Since 1995, he has specialized in the implementation of integrated water resources

management (IWRM) in international river basins, involving multi-sector assessments, scenario assessment, public participation, negotiation and facilitation, and river basin planning and management. Currently, he is the Chief Technical Advisor to the Basin Development Plan Programme of the Mekong River Commission.

Abstract

Basin planning history: Extensive Mekong River planning was undertaken between 1956 and 1995, but mainly due to insufficient political stability in the region, very little development resulted in comparison to most other large river basins in the world. At the time, when the long-run social and environmental costs of water infrastructure in other river basins became clearer, societal values shifted with growing wealth in the industrial countries, and major emphasis was then placed on achieving environmental and social objectives. As a result, there are strong pressures today on the Lower Mekong Basin (LMB) countries to adopt a different development path than those previously taken by industrial countries in other river basins. This path in the LMB is largely untried.

The Basin Development Plan: The 1995 Mekong Agreement was the start of a new era of Mekong Cooperation. The Agreement clearly frames the development of a basin development plan. Despite this, it was not until late-2001 when the BDP process finally began. The BDP Programme Phase I (2001-06) developed the participatory and rolling 7-stage basin planning process. By 2006, significant changes in the Mekong Basin began, with water investments in national programmes taking place, due to rapidly growing water, food and energy demands and growing private sector involvement. BDP Programme Phase 2 (2007-10) had to move beyond process alone, to focus on water related development at national and regional levels. This approach moved beyond the earlier (pre-1995) almost exclusive focus on water infrastructure.

The nexus perspective: The main products of BDP2 include a basin-wide cumulative impact assessment of the Lower Mekong Basin countries' ambitious development plans (scenarios) and a negotiated IWRM-based Basin Development Strategy. The scenario assessment demonstrates the considerable inter-play between water, energy, food, environmental and climate security and how, through coordinated national planning, benefits can be realised for all MRC member countries. The Basin Development Strategy describes how synergies

between these development goals can be exploited, trade-offs resolved, and potential downsides avoided or mitigated by adhering to IWRM principles and addressing knowledge gaps. The Strategy was adopted by the MRC Council in January 2011 and is now being implemented.

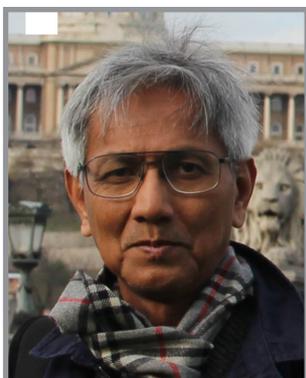
A strengthened planning framework: BDP 2011-15 supports the implementation of the Basin Development Strategy, which will also result in a strengthened planning framework. The latter includes: an improved knowledge base, tools and processes; strengthened cooperation between all Member Countries on planning and operation of water infrastructure to secure benefits, minimise harm, and provide early warning; a Mekong multi-sector mechanism for mitigating transboundary costs and sharing benefits; and a hierarchy of practical indicators for basin-wide monitoring of water and related resources, updated basin-wide development scenarios, and state of the basin reporting. This comprehensive and holistic approach, embodied within the Strategy, matches the nexus perspective well, by applying IWRM principles to realise mutually beneficial responses. The approach will also provide an informed and transparent framework for determining and resolving trade-offs, in order to meet increasing demands without compromising sustainability.

Future of the Basin Development Plan: Much of the basin development can and should be undertaken at the national level, with the BDP acting as the instrument for impact analysis and consultation. Its implementation can explore ways to minimize transboundary costs and to achieve transboundary benefits, through the adaptation and modification of national investments. However, there are almost certainly transboundary opportunities, where two or more LMB countries could develop joint projects that provide substantive shared benefits. The only mandated instrument for identifying and promoting such development opportunities is the BDP. This is an area largely unexplored since the 1995 Mekong Agreement that has created a strong basin development framework.

1.1 Water and environment challenges

b) Ecosystem Service Implications for Sustainable River Flow Management

Speaker: Dr. Chaiyuth Sukhsri, Department of Water Resources Engineering, Chulalongkorn University

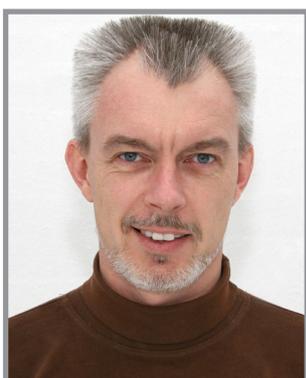


Associate Professor Chaiyuth Sukhsri is currently working in the Department of Water Resources Engineering, Chulalongkorn University, Thailand. He is also a Member/Technical Advisor of the Thai National Mekong Committee (TNMC); Member of the Thai National Committee on Irrigation and Drainage (THAICID); Member of the Thai National Committee on Large Dams (TNCOLD); Member of the Scientific Committee, the Society for Social Management Systems, Kochi Technical University; Member of the Scientific Advisory Council for the European Union Water Initiative (EUWI-ERANET). He has worked as a Senior Engineer, Project Planning Division of the Royal Irrigation Department (RID), as a Project Fellow

on the Interim Mekong Committee (IMC), and as Team Leader of the Water Utilization Program of the Mekong River Commission (MRC).

He graduated in Civil Engineering from Chulalongkorn University, Thailand; and Water Resources Systems from Colorado State University, USA. He has also done a lot of research namely, Floods and Droughts Analysis in the Chao Phraya River Basin; Impacts of Climate Change on the Irrigation System in the Chao Phraya River Basin; Water Resources Decision Support System for local authorities/communities; and Multi-Criteria Decision Analysis in Water Resources Planning and Management.

Abstract co-author: Mr. Henrik Larsen, CTA, Environment Programme, MRC Secretariat



Henrik Larsen is a specialist in environmental and water resources management and holds the position of Chief Technical Advisor with the Environment Programme at the Mekong River Commission Secretariat. By training he is an environmental engineer with almost 25 years of combined experience in environmental and water resources management, monitoring, modelling and assessment activities, environmental impact studies, and climate change adaptation assessment. The majority of his work has been through consultancy

projects in developing countries working with public authorities, UN organisations, private sector stakeholders and NGOs in water resources management.

He started his career as a water quality modelling specialist. Over the past 20 years he has worked as a consultant and advisor in more than 20 countries around the world to help develop policies and plans for the implementation of Integrated Water Resources Management at national and river basin level.

Abstract

The most prominent exponent of the water, energy and food nexus in the Lower Mekong Basin (LMB) is the planned development of hydropower dams on the Mekong mainstream. The energy implications are obvious with 12 planned hydropower projects, expected to increase annual state revenues of Cambodia and Lao PDR significantly and to contribute to fulfilling increasing energy demands, particularly in Thailand and Viet Nam. However, the revenues and energy benefits come at a cost; potential negative environmental impacts and threats to food security. Those potential impacts and threats are the focus of this presentation, and the Strategic Environmental Assessment (SEA) of Mainstream Dams from 2010 will be a key source of information. In addition, the presentation will draw on findings from the first baseline survey of MRC's Social Impact Monitoring and Vulnerability Assessment (SIMVA) system. Almost half the population of the LMB lives within 15 km from the mainstream Mekong and most depend on water resources for food and income generation. Therefore, environmental impacts from hydropower dams that would affect fisheries in the Mekong would have potentially far-reaching consequences for the food security and livelihoods of the population of the LMB.

An additional driver of change is the anticipated increase in irrigated agriculture. In order to meet increasing food demands from a growing population, more water from the Mekong for irrigating crops might be needed. This might also lead to negative environmental impacts in terms of deteriorating water quality, reduced biodiversity, etc. From a governance point of view, one of the particularly complicating factors in addressing the nexus in the LMB is the asymmetrical transboundary nature of the nexus: Whereas the energy benefits, for example, may be created and harnessed in the upstream reaches of the LMB, the environmental impacts may accumulate and present themselves further downstream, sometimes in a different country (e.g. reduced sediment and nutrient flows reaching the Mekong delta, giving rise to decreased agricultural production or fish catches, or to increased erosion and flooding risks). Also social and equity challenges may appear: Those groups that suffer from the negative impacts of hydropower development are typically the most poor and vulnerable whereas those benefitting from hydropower development are typically the better-off.

1.1 Water and environment challenges

c) Environmental and social impacts

Speaker: Mr. Robert Speed, Water Security Advisor, World Wildlife Fund (WWF)



Robert Speed is a water security consultant advisor to the WWF for Nature with 15 years experience in environmental and water policy and management. His areas of expertise include water resources planning, the implementation of environmental flows, and river health assessment. Robert has qualifications in science and environmental law and previously worked for the Queensland

government. Robert has been involved in a major international review of basin planning practices and has been working with the Chinese government in developing guidelines for revision of the master plans for China's major river basins.

Abstract

Transboundary rivers pose major challenges in terms of sharing the benefits and impacts of water resources development. This paper focuses on the possible environmental consequences of existing and future development of the Mekong River, and the implications for different riparian nations and their dependent human communities. It considers mechanisms for identifying and valuing a river basin's environmental assets and services, and for understanding the possible impacts on those assets and services from development in the basin. In particular, it discusses approaches to incorporating environmental considerations within master basin planning processes, and considers tools

for reconciling issues related to environmental assets and services with other demands on the basin, such as water for agriculture and energy production. The paper draws on various studies in the Mekong, undertaken by WWF, its partners, and others, including:

- An assessment of ecosystem fragmentation and flow regulation as a result of past and proposed damming of the river,
- An assessment of delta stability, and
- The 2010 Strategic Environmental Assessment.

1.1 Water and environment challenges

d) Asia: the Ganges basin

Speaker: Mr. Ajay Raghav, Deputy Director, National River Conservation Directorate, Ministry of Environment & Forests, Government of India.



Ajay Raghav is Deputy Director of the National River Conservation Directorate, Ministry of Environment & Forests, Government of India. His directorate is primarily responsible for conservation of important rivers and lakes in the country. He is currently involved with the implementation of the National Ganga River Basin Authority's programme, which focuses on pollution abatement measures for improving water quality of the Ganga River. He has considerable experience in policy formulation

and the implementation of river conservation programmes in India. Ajay has also served in the Central Pollution Control Board and has worked in the area of environmental planning, industrial pollution control and environment management. Ajay holds degrees in Civil Engineering, Environmental Planning and Energy & Environment Management. He is also a recipient of the British Chevening Scholarship for Environment Management and the Fulbright Fellowship for Environmental Policy & law.

Abstract

The Ganga River Basin accounts for 26 percent of the Indian sub-continent and impacts more than 40 percent of India's population. Over the years, pollution on the Ganga has increased due to limited available sewage treatment capacity. The contribution of industrial pollution, volume-wise, is approximately 20 percent, but due to its toxic and non-biodegradable nature, this assumes much greater significance. Extraction of water for irrigation, industrial, power and drinking purposes is exacerbating the problem. Recognising these threats, the Government of India initiated the Ganga Action Plan (GAP) in 1985. Consequent to the pollution abatement works under GAP, river water quality has improved at most of locations, except for the stretch between Kannauj and Varanasi in Uttar Pradesh.

The National Ganga River Basin Authority (NGRBA) was established in 2009 to ensure effective abatement of pollution and conservation of the Ganga River, by adopting a holistic river basin approach. The Authority has decided that under the

Mission Clean Ganga project, the river will be free from untreated municipal sewage and industrial waste. Projects amounting to nearly US\$500 million have been sanctioned under the NGRBA for development of sewer networks and sewage treatment plants, among others. The Government of India has also secured World Bank assistance of US\$1 billion, which plans to assist in infrastructure development and setting-up the Ganga Knowledge Centre, an automatic water quality monitoring system, capacity building of environmental regulators, and urban local bodies. Further, a comprehensive River Basin Management Plan for the Ganga is being prepared, which would identify projects to be undertaken, policy interventions required and other non-project investments.

Parallel Sessions 1: Water, food and energy security - the Mekong basin challenges

1.2 Food security challenges

Session Keynote Speaker: Dr. Colin Chartres, Director-General, International Water Management Institute (IWMI)



Colin Chartres holds a Ph.D. on soil development from the University of Reading, UK. He is currently the Director General of the International Water Management Institute (IWMI). IWMI's vision is Water for a Food Secure World and involves solving water scarcity by increasing water productivity, reducing poverty and promoting sustainable natural resource management. He has played a leading role in alerting the world to an emerging water crisis that will impact all water users and food security in many developing

countries. Prior to joining IWMI in 2007, he was Chief Science Advisor to Australia's National Water Commission. Previously he held senior research and research management positions with CSIRO, the Bureau of Rural Science and Geoscience Australia. He has published over 120 journal articles, technical papers and book chapters on natural resources management and is the senior co-author of the recently the book "Out of Water", published in 2010.

Abstract

Food security and water are intimately connected. During the next 40 years a complex set of drivers, some of which are highly tangible and measurable, others less tangible will interact on food production and water use in the world's major basins. A common pattern will be for increasing demand for water from industry and domestic users at the expense of agriculture. Patterns of water use now being established such as the expansion of hydropower in the Mekong will have major impacts on future food production potential. Similarly, trajectories in development, that will vary from basin to basin, and that include changes in population and GDP will also greatly impact water use and food production. Regionally, there will be many river systems that come under further stress and in some cases demand will exceed supply in the next few decades. This presentation will present some scenarios for water demand that take into account different population and growth trajectories and climate change impacts at the global/regional level.

A recent modeling exercise undertaken at IWMI using the WATERSIM model has been used to revisit some previous scenarios used in the Comprehensive Assessment of Water Management in Agriculture. The model estimates food demand as a function of population, income and food prices. Crop production depends on economic variables such as crop prices, inputs and subsidies on one hand and climate, crop technology, production mode (rain fed versus irrigated) and water availability on the other. Irrigation water demand is a function of the food production requirement and management practices, but constrained by the amount of available water. Just how we cope with changes in water demand will depend on a number of factors including continued water productivity gains, liberalization of trade, whether we start to value water for its true worth and improved education of the public and politicians about the criticality of water access and availability for most aspects of development.

1.2 Food security challenges

a) Regional food security challenges

Speaker: Dr. Peter McCornick, Assistant Director General, International Water Management Institute (IWMI)



Peter McCornick is Assistant Director General and Director for Asia at the International Water Management Institute (IWMI). As a widely published professional, his career has focused on developing a knowledge base and solutions for improving the sustainable management of water resources. His PhD focused on managing water for crop diversification in rice-based irrigation systems in Indonesia, and he has

subsequently led inter-disciplinary water, agricultural and environment research and development programs in Africa and Asia. His present areas of interest include water and food security, water reuse, irrigation management, and water and climate adaptation. Peter is a Licensed Professional Civil Engineer, and a member of the American Academy of Water Resources Engineers (AAWRE).

Abstract

For the countries of Southeast Asia the economic, demographic and environmental changes are, among other things, increasing demands for food, feed, fiber and bio-fuels. In addition to meeting the basic food requirements for the population, diets are shifting to more water intensive foods, including animal products such as milk, meat and eggs. These changing characteristics of agricultural production are increasing competition for reliable water supplies in a region where hydropower development, climate change and other drivers are also significantly altering water resources availability.

Management responses to these changing conditions must take into account the interactions and trade-offs between these sectors to reduce conflicts and capitalize on synergies. With respect to food security, rice and fish, with their dependence on the annual flood pulse and natural aquatic ecosystems are increasingly under pressure. Migratory fisheries and consequently regional food security are threatened by disruptions to habitat coherence and ecosystem connectivity (Johnston et al, 2012).

In Southeast Asia, rice and fisheries are critical to regional food security, especially for the rural poor in Lao PDR and Cambodia. While the growth in demand for rice is slowing, it is projected to continue

to increase for the next two decades (Timmer and Dawes, 2012). Intensifying and sustaining these water-dependent food production systems requires significant increases in productivity in both irrigated and rain-fed systems, especially in areas where yield gaps present significant opportunities.

Improved agricultural water management in rain-fed systems offers the opportunity to reduce water-related risks and support diversified production where 75 percent of the region's food is produced (Johnston et al, 2012). There is also a need to think beyond large-scale rice irrigation systems, to more flexible and sustainable approaches. These approaches include small-scale, on-farm solutions and the use of groundwater, offering opportunities to increase production, reduce water demands and, in some cases, minimize the demand for energy. Interventions, including education, research and market access facilitation are projected to sustainably reduce the number of people at risk of hunger in 2050 by 30 to 40 percent (Rosegrant, 2012). As the case of the Mekong Delta has demonstrated, intensification and diversification of this nature means a shift towards irrigation in the dryer seasons, when competition for water resources is at its greatest.

1.2 Food security challenges

b) Fish for food security in the Lower Mekong Basin

Speaker: Mr. Nguyen Van Bang, National Coordinator for Fisheries Programme, Viet Nam National Mekong Committee (VNMC)



Nguyen Van Bang is currently working as national coordinator for Fisheries Programme at the Viet Nam National Mekong Committee (VNMC). He got a lot of experience in fishery-related fields. He used to work as lecturer in Nha Trang University of Fisheries of Viet Nam, as Fisheries Specialist at the Ministry of Fisheries, as Manager of Consultancy and Outreach Group at Asian Institute of Technology Center in Viet Nam, as

well as consultant in fisheries area.

Mr. Van Bang was graduated in Master of Science in Aquaculture and Aquatic Resources Management from the Asian Institute of Technology in Bangkok, Thailand in 1999. He also holds a Bachelor of Science in Aquaculture from Nha Trang University of Fisheries, Viet Nam.

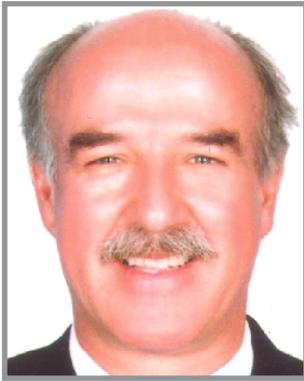
Abstract co-authors: Mr. Peng Bun Ngor, Programme Officer and Mr. Peter Degen, CTA, Fisheries Programme, MRC Secretariat



Peng Bun is a Capture Fisheries Specialist to the MRC Fisheries Programmes. Between 1998 and 2011, he worked as the Deputy Head of the Biological Division of the Inland Fisheries Research and Development Institute of the Cambodian Fisheries Administration. After that, he became the Head of the Monitoring and Evaluation Division of the Fisheries Administration.

Mr Peng Bun has also been involved in various fisheries related projects, notably the Project for the Management of Capture Fisheries

(1988-2002), Assessment of the Mekong Capture Fisheries (2003-2005), Natural Resource Management and Livelihoods Programme (Danida/NZaid/DFID) and the Regional Fisheries Livelihoods Programme. Peng Bun has two master's degrees, one in Environmental Management and Development from the Australian National University in Canberra and another in Science Information Management from the Asian Institute of Technology in Bangkok. He earned his bachelor of Fisheries Science at the Royal University of Phnom Penh.



Peter Degen is Chief Technical Advisor to the MRC Fisheries Programme. He has been working in Cambodia since 1997 when he joined the MRC in Phnom Penh as senior socio-economist and technical advisor to projects to manage capture fisheries in Cambodia and reservoir fisheries in the Lower Mekong Basin. Before that, he worked in Ecuador and Peru for nine years, primarily as a small-scale fisheries and coastal resources management advisor.

Since leaving the MRC in 2002, he has worked with several fisheries-related projects in Cambodia,

notably as a community fisheries and rural livelihoods specialist for FAO and ADB-funded projects around the Great Lake Tonle Sap. Before returning to the MRC in January this year, he worked as team leader on a World Bank-funded livelihoods project in Siem Reap. Mr Degen is a full member of the Asia Fisheries Society and the International Association for the Study of the Commons. He has a MA in Anthropology and Rural Sociology from the Universities of Cologne, Sevilla, La Paz and Bonn.

Abstract

Food and food security are at the very heart of peoples' well-being and nations' development. The right to sufficient food is a basic human right as specified in the Universal Declaration of Human Rights of the UN (Art.25).

The Lower Mekong River Basin (LMB), situated in one of the poorest regions in the world, produces about 2 million tonnes of fish and other aquatic animals from rivers, lakes, floodplains reservoirs and a vast area of anthropogenic 'rain-fed' rice fields and associated habitats. Together with aquaculture production, the total inland production is about 3.9 million tonnes valued at US\$3.9 to 7.0 billion per year representing around 10 percent of total world freshwater fisheries.

Fisheries provide a major element of livelihoods, income generation and food security for the largely rural population of the LMB. Inland fish and Other Aquatic Animals (OAAs) contribute between 48 (Lao PDR) and 82 percent (Cambodia) of animal protein intake for people in the LMB and constitute a very important source of micronutrients.

The importance of natural capture fisheries to the region cannot be overstated. It is a free resource, which needs to be managed both locally and with a basin-wide transboundary perspective. Some countries have been introducing fisheries co-management mechanisms involving local communities into fisheries planning and

implementation of management measures, including the protection of fish conservation areas. The transboundary nature of the fisheries – characterized by long distance migrations along the Mekong mainstream and its tributaries– requires a commonly harmonized cross-border management framework.

Hydropower developments pursued by national governments pose a direct challenge to regional fish productivity as dams may be barriers between important habitats and also alter the hydrologic regime and water quality. It is argued that a transparent process of IWRM, which balances the demands for water, food and energy to reduce poverty regionally, can achieve direct and indirect synergies and ensure availability and access to inexpensive fisheries products for the future.

This paper explores the overarching importance of fisheries for food security in the LMB and promotes a basin-wide development approach to people's food security and poverty reduction at the starting point for water resources development, particularly hydropower. The presentation localizes the role of fisheries within MRC's vision of an economically prosperous, socially just and environmentally sound Mekong River Basin through coordinated regional planning.

1.2 Food security challenges

c) Food security in the Mekong Basin

Speaker: Mr. Prasong Jantakad, Programme Coordinator, Agriculture and Irrigation Programme MRC Secretariat



Prasong Jantakad is a Programme Coordinator for Agriculture and Irrigation Programme of the MRC. He graduated with Masters degree on Agricultural Science from Central Luzon State University, the Philippines and also finished a Bachelor Degree on Crop Science from Maejo University, Chiang Mai, Thailand.

Mr. Prasong has worked for various international development organizations such as GIZ, UNDP, UNCDF, UNOPS, UNFDP. He has more than 20 years extensive working experience in the field of integrated rural development projects in Southeast Asia particularly in Thailand, Laos, Vietnam and Myanmar.

Abstract co-author: Mr. Itaru Minami, Technical Advisor, Agriculture and Irrigation Programme MRC Secretariat



Itaru Minami is Technical Advisor to the Agriculture and Irrigation Programme of the MRC. Disciplined in agricultural engineering, Minami holds a MS in Agricultural Science and a MA in Development Policy and Public Administration. Mr. Minami has worked for various domestic and

international institutes and agencies for 25 years. He is a registered Professional Engineer in Japan in the area of agriculture including the Japan Water Agency and the World Bank.

Abstract

To set the scene for debates on how to tackle transboundary food security issues in the Lower Mekong Basin, the presenter will discuss issues surrounding agricultural development in each Mekong country, in juxtaposition with MRC's regional agenda.

Firstly, the presenter will address the importance of the region, dynamism of agricultural development in the region, and further needs for increased food production. Needs for irrigation development in conjunction with hydropower development in the

basin will be highlighted, based on findings from the MRC's Basin Development Planning process. Secondly, daunting challenges for agricultural development in each Mekong country will be discussed, comparing differences in natural settings. Thirdly, the roles and relevant institutions of MRC that work towards long-term food security in the LMB will be described with information on MRC's initiatives in the area of agricultural development under the framework of Integrated Water Resources Management.

1.2 Food security challenges

d) Challenges in managing hydropower development projects and livelihoods relations in the Lower Mekong Basin

Speaker: Ms. Rutmanee Ongsakul, Challenge Programme for Water and Food (CPWF)



Rutmanee Ongsakul is a Senior Researcher at the Asian Institute of Technology (AIT), Thailand. She is currently the Programme Manager and researcher of Mekong Project 4 on Water Governance, a project under the Challenge Program on Water and Food in Mekong River Basin. She has worked in coordination with government and non-government agencies

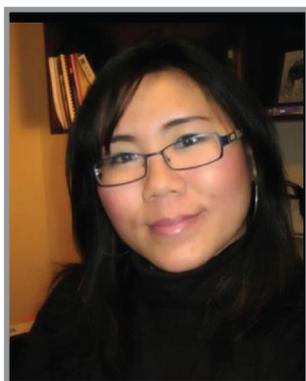
in various field sites in Southeast Asia. Her research focuses on water management policy and governance, emerging inter-sectoral competition for water resources especially in urban and peri-urban areas of developing countries and water users' participation in river basin management.

Abstract co-authors:



Sonali Senaratna Sellamuttu is a Senior Researcher at CGIAR's International Water Management Institute (IWMI), based in their Southeast Asia Regional office in Lao PDR. She is responsible for leading social science research with a special focus on sustainable livelihood approaches. Her research has included surveying livelihood portfolios, exploring ways of improving livelihoods for communities impacted by hydropower dams; incorporating livelihoods considerations into participatory community planning processes and using qualitative approaches to assess the impact

of irrigation infrastructure on livelihoods options. Sonali also contributes to IWMI's international policy work on the Ramsar Convention and represents IWMI on Ramsar's Scientific and Technical Review Panel (STRP) as a member of the Task Group on Wetlands and Poverty Eradication. Sonali has been responsible for leading and managing 6 multi-disciplinary projects since joining IWMI in May 2006, and has worked in field sites in East Asia, South Asia and Africa. She is the Project Leader for the CPWF Mekong 1 Project.



Surapha Viravong obtained a Bachelor's Degree in Civil Engineering from Lao National University in 1998; a Master's of Business and Administration from Australia in 2002; and completed her postgraduate work in Public Policy in 2008 in New Zealand. Surapha's work experience mainly involves planning and management of rural development projects in the socio-environmental sectors in addition to hydropower, agriculture and public

policy development. Currently, Surapha works for Theun-Hinboun Hydropower Company (THPC) as the Deputy Manager of the Social and Environment Division. Surapha also works as a spokesperson, resource focal point and trainer for the company on related issues. She also holds trainings organised by the government and international organizations, and often works with educational institutions.

Abstract

Water for energy and livelihoods are closely interrelated. Hydropower development, in particular, has induced changes to local livelihoods in project areas in various ways. The extents of the impacts are also very much associated with how hydropower development and livelihood relations are understood and managed by concerned stakeholders.

This paper discusses the nexus of water used for hydropower development, livelihoods and poverty reduction, based on case study projects in the three countries of the Lower Mekong Basin: Cambodia, Lao PDR and Viet Nam. Data is drawn mainly from two CPWF-Mekong projects (MK1 on optimizing reservoir management for livelihoods and MK4 on water governance), as well as from first-hand experiences of one of the main hydropower development projects in the region. Comparisons among countries are made and common issues are identified. Key questions covered include, but are not limited to, the following:

- What are the relations between hydropower development projects and local livelihoods, and what changes have these development projects brought into local livelihoods?
- How do authorities address livelihoods in hydropower development and management?
- What are the challenges that remain to enhance livelihood opportunities from hydropower development and management?

While our research is still ongoing, preliminary results of our studies have indicated that the distribution of costs and benefits of hydropower projects can vary across social groups and localities, i.e. among upstream-downstream communities, gender and ethnic groups. A key aspect of one of our research projects has been, to consider reservoirs as multiple use systems that can contribute to local livelihoods in addition to generating hydropower, thus ensuring that local people derive benefits from hydropower developments.

Key challenges remain, however. Moving away from the livelihood activities people were familiar with and adapting to new opportunities can often be difficult. Ensuring that new livelihood opportunities are technically viable is also important. Moreover, to ensure long-term sustainability and success, it is critical that these livelihood opportunities are also socially and economically suitable and take into consideration local cultural contexts and also the institutional constraints both within and between the countries. Management of these challenges requires careful analysis of the different impacts faced and/or understood by various stakeholder groups and their direct participation in planning and management processes. Mechanisms to enable these practices and minimize institutional constraints need to be incorporated simultaneously.

Parallel Sessions 1: Water, food and energy security - the Mekong basin challenges

1.3 Energy security challenges

Session Keynote Speaker: Ms. Gauri Sing, Director, Knowledge Management and Technology Cooperation International Renewable Energy Agency (IRENA)



In 2011, **Gauri Singh** joined The International Renewable Energy Agency (IRENA), as Director of Knowledge Management and Technology Cooperation. An Indian national, Ms. Singh has over 20 years of experience in the field of Renewable Energy. She Joined the Indian Administrative Service in 1987, and held various positions at the policy level, in the field of finance, industrial policy and renewable energy.

Ms. Singh was the Joint secretary in the Ministry of New and Renewable

Energy, Government of India, from 2006 to 2011 and was responsible for policy formulation, planning and International cooperation. Some of her professional focuses include: Developing a policy framework for the National Solar Mission, which reflects a long-term vision to build solar power capacities; creating a level playing field for independent power producers in the wind sector; and advocating policy with the Regulators of Electricity at the Central and Federal levels.

1.3 Energy security challenges

a) Regional energy security

Speaker: Mr. Anthony Jude, Director, Energy Division Southeast Asia Regional Department, Asian Development Bank (ADB)



Anthony J. Jude is presently the Director of Energy Division in the Southeast Asia Department of Asian Development Bank. He is responsible for overseeing the design and implementation of energy projects (power generation, transmission, distribution, energy efficiency, and renewable energy) in the Southeast Asia (SEA) Region, including undertaking country sector assessments and strategies and developing the sector road maps for each country. The SEA region comprises of Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand and Viet Nam.

In addition, he is the Chair of the Greater Mekong Subregion (GMS) Regional Power Trade Coordinating Committee that supervises the

implementation of the regional power interconnection activities in the GMS and the GMS Energy Forum.

He has worked for over 20 years with ADB in various positions. As the Director of Energy Division, he oversees the implementation of over \$3.0 billion of ongoing infrastructure projects in the energy sector, and the preparation of \$1.5 billion in new investments for ADB Management approval in 2012. Key tasks involve identifying new investments in energy efficiency, renewable energy (biomass based projects, mini-micro hydropower projects, geothermal, and wind), clean technology transfer (combined cycle gas power plants, supercritical, ultra supercritical, and IGCC power plants), and developing climate change mitigation plans for SEA countries.

Abstract

Rising oil prices and the current imbalance between reserves, production, and consumption of oil caused national concerns about the reliability of energy supply in the region. Underpinning this concern are the high cost of economic disruptions associated with supply shortages, soaring oil prices and the uncertainty of its duration, and the heavy dependence on oil imports from the Middle East. The complex nature of the energy situation has triggered multifaceted responses from countries within the region. These responses vary depending on macroeconomic conditions, economic structure, financial resources, and impacts on trade, fuel pricing policies, and climate change.

The GMS has enormous energy resource endowments - even just half of its hydropower potential represents generating capacity about four times the current total electricity generation in the sub-region of about 180,000 GWh. There are in addition coal deposits and promising gas and petroleum reserves but the geographic distribution of these energy resources in the sub-region is uneven.

Like the rest of Asia, growth of the GMS economies more than doubled between 1992 and 2010, which fueled a significant rise in energy demand. Although growth slowed down in 2011 due to the global financial situation and weakening exports coupled with domestic policy tightening, energy demand will continue to rise between 5%-7% per annum. Per capita energy consumption also witnessed significant increases from 1998 to 2011 in the GMS. Sustainable energy use must be promoted by intensifying regional power cooperation, development of renewable energy sources, and instituting sound public policies on reducing carbon emissions and greenhouse gas emissions associated with energy use. The development of hydropower and alternatives such as coal and nuclear power must be circumscribed by the imperatives of minimizing environmental and social impacts, safety and clean coal technologies. In extending regional cooperation to the rational use of energy, GMS countries can slow down the rate of energy utilization even while maintaining a desired level of economic activity in pursuit of their development and poverty reduction objectives.

1.3 Energy security challenges

b) Sustainable hydropower development

Speaker: Mr. Voradeth Phonekeo, Task Leader, Initiative on Sustainable Development, MRC Secretariat



Voradeth Phonekeo holds a Masters of Science in Hydropower Engineering and has served the Government of Lao PDR for twenty years in the field of hydropower. He has extensive experience in assembly and maintenance of hydro generators and hydro turbines and has been involved with feasibility studies of large hydropower projects. In many projects in Lao PDR, he has also been an active participant in all

stages of hydropower development such as with power purchase negotiation, concession agreement and public consultation at all levels. His other involvement includes collaborating in the preparation of the EIA and EMP guidelines for hydropower, as well as civil standards for hydropower dams in Lao PDR. Prior to joining the MRCS, he worked as an IWRM National Planning Expert.

Abstract

Demand for power is growing – both globally and regionally. In the Mekong Region, this is driven by the desire of countries to foster economic growth, raise living standards, reduce poverty and secure food and energy supplies. So far, natural resources are considered abundant in the region, with a particularly high potential for hydropower development. Hydropower will therefore be a key contributor to regional power supply. Its importance and value can be expected to further increase as stronger interconnections and integrated energy markets develop in the Mekong Region.

However, in order to develop hydropower sustainably, the wider river basin implications (or, the “nexus perspective”) need to be taken into consideration. Hydropower development can have a direct impact on food security if these developments block fish passage and reduce significantly the river’s fish production capacity on which many millions of riparian residents rely. On the other hand, well-planned and implemented hydropower projects can enhance the water management in the basin, contributing to flood management, irrigation and domestic water supply and allow affected communities to share access to infrastructure and financial benefits.

Sustainability in hydropower development is now well understood and can be ensured through

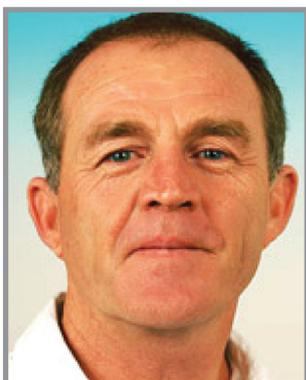
various approaches, including the early deployment of sustainability assessment tools. These tools include the Hydropower Sustainability Assessment Protocol (HSAP), the Rapid Sustainability Assessment Tool (RSAT), the principles set out by the World Commission on Dams (WCD), and the establishment of environmental and social impact mitigation measures. In addition, mechanisms are being widely adopted to ensure that affected communities are able to directly share in the project benefits either through access to infrastructure services (e.g. electricity, roads etc) or through access to a share of the project revenues deployed, for example, through local development funds.

The presentation addresses the question of sustainable hydropower development in internationally shared river basins from a holistic perspective. It focuses on future ways to integrate sustainability tools into the entire hydropower planning, development and operation process. The presentation argues that this approach can be readily absorbed in the economics of all hydropower projects and has only a minor impact on the prices paid by end use customers while providing significant broader economic, social and environmental benefits.

1.3 Energy security challenges

c) Future Energy Perspectives for the Mekong Region

Speaker: Dr John Ward, Senior Researcher, The Commonwealth Scientific and Industrial Research Organization (CSIRO)



John Ward is a natural resource and behavioural economist whose research focuses on the ex ante testing of institutional settings and policies to manage natural, common pool resources. John's current research explores responses to governance architectures, the cost effectiveness of hybrid policy instruments, and evaluating the alignment of incentives with community value orientations.

John is a senior researcher with the Environmental Development Group of CSIRO Ecosystem Sciences and is currently deployed in the Mekong region researching the nexus of food, water and energy security. He has a background in the biological sciences, natural resource and institutional economics, the forest industry and academia.

Abstract

Between 2011 and 2025, scenarios for the Mekong region energy system see a doubling in primary energy demand, and a 138% in electricity demand. Such high levels of growth are a result of a number of drivers including increases in GDP per capita and the importance attached to growth and modernization. This presentation begins by summarizing the Mekong energy system according to eight dimensions drawn from the energy security literature. We then draw attention to challenges associated with current policy dynamics in the electricity sector, including (i) the uncertainty of

investment & fuel costs; (ii) higher-order impacts on food and livelihood systems; and (iii) potential under-investment in renewable technologies. We argue that policy responses may be improved by modelling approaches that are (a) regionally-based, participatory and deliberative; (b) bottom-up, drawing on current best-practice system design benchmarks; and (c) able to provide longer-time scale perspectives that model energy and economic activity out to 2100, allowing stakeholders the ability to look beyond the fulfillment of current economic development objectives.

1.3 Energy security challenges

d) The role of the private sector

Speaker: Mr. Robert Kay, Executive Vice President, GMS Power



Robert Kay has 25 years of international work experience in institutional analysis, management, privatization and banking. He has an extensive background working for the private and public sector alike, and is most notably responsible for green field hydropower development in Lao PDR. Currently, he serves as the Executive Vice President of the Greater Mekong Sub-region Power Public Co., Ltd., providing energy to

markets throughout Thailand. In the past, Robert served the Asian Development Bank as a Senior Financial Analyst advising on the privatization of utility assets in the Indo-China Region. His professional experience in utilities and financial analysis extends from Thailand to Viet Nam, Papua New Guinea and the Philippines.

Parallel Sessions 2: Water, food and energy security - international transboundary basin challenges

2.1 Water and environment challenges

a) The trans-boundary water challenge

Speaker: Mr. Anton Earle, Director, Capacity Building Programmes, Stockholm International Water Institute (SIWI)



A geographer with an academic background in environmental management, **Anton Earle** specialises in transboundary integrated water resource management, facilitating the interaction between governments, basin organisations and other stakeholders in international river and lake basins.

He is experienced in institutional development and policy-formation for water resource management at the inter-state level in the Southern

and East African regions, the Middle East and internationally. In 2010 he was the lead editor for the Earthscan book, *Transboundary Water Management: Principles and Practise*. Earle is the Director of Capacity Building programmes at the Stockholm International Water Institute (SIWI) and is completing a PhD in Peace and Development at the School of Global Studies at the University of Gothenburg. His thesis investigates the role of non-state actors in transboundary water management processes.

Abstract

Over the past 60 years the 264 international transboundary watercourses in the world have had more than twice the number of cooperative than conflictual events associated with them. The conclusion is that states cooperate over water precisely because it is such a precious resource; it does not pay to fight over water at the inter-state level. Cooperation implies willingness between parties to change their behavior for an improved mutual outcome. However, despite this history of inter-state cooperation, the problems associated with the world water crisis have not diminished over the past 60 years. Environmental, social and economic problems related to water are more pressing now than ever. Although states do not go to war over water; and may engage in some degree of cooperation, there are relatively few examples of transboundary watercourses being optimally and sustainably managed to provide development to the basin states.

In the context of the water, food and energy security nexus it will become ever more important to optimize the benefits derived from transboundary watercourses. Managing and developing these watercourses at the international basin scale holds potential benefits in achieving greater security in terms of this nexus. Agricultural products can be produced in the area of the basin best suited to

their plant physiological requirements and traded amongst basin states to achieve regional food security. Energy resources can be developed and traded to promote regional energy security (or be exported to earn income). All this being done in a way which facilitates the ability of ecosystems to continue delivering the services which they supply.

That the development of international watercourses is not proceeding in the way described above has a lot to do with the persistence of state sovereignty. States hold ultimate responsibility for the management of water resources, with a loss of sovereignty perceived to hold risks higher than the envisaged gains of cooperation. Needed is an approach to managing these basins which goes beyond state sovereignty – not negating it, but rather recognizing it while involving a range of non-state actors in the development and implementation of mutually-beneficial basinwide projects to promote the objectives of food and energy security. Many of these actors have great capacity to contribute to these objectives. This paper will explore possible institutional models through which these actors can work with states and basin organizations to achieve these objectives. By way of illustration the presentation will draw on the case of the Orange-Senqu River in southern Africa.

2.1 Water and environment challenges

b) Europe: The Danube case

Speaker: Prof. Wolfgang Stalzer, President, International Commission for the Protection of the Danube River (ICPDR)



Wolfgang Stalzer has served in numerous senior government roles in the water sector in Austria throughout his career. From 1992-2006 Stalzer held multiple positions as Director General for Water Management at the Federal Ministry for Agriculture, Forestry, Environment and Water Management, Austrian Water Director within the European Union, Head of the Austrian Commission for Large Dams, and Head of the Austrian Delegation in

the International Commission for the Protection of the Danube River, of which he was appointed President in 1998-99 and again since January 2012.

Stalzer is also engaged as a Professor and Senior Expert for Water Management at the University of Natural Resources and Applied Life Sciences in Vienna.

Abstract

The Danube River Basin is the catchment area of the second largest river in Europe and covers over 800,000km² with more than 81 million people. Connecting Eastern and Western Europe, the Danube and its basin includes portions of 19 countries, making it the world's most international river basin. The Danube and its over 300 tributaries serve many demands, including water supply for irrigation, drinking water, power production, and fisheries. Although many agricultural and industrial activities have depended upon the Danube waters these activities have also led to increased water pressure. Water pollution has drastically undermined the Danube's biodiversity. To address the problems of the river the countries of the Danube signed the Danube River Protection Convention in 1994 to strengthen the cooperative management and ensure sustainable use of the water resources. The International Commission for the Protection of the Danube River (ICPDR) was formed by the convention and since its establishment in 1998, the ICPDR has grown into one of the largest and most active international bodies of river basin management in Europe.

ICPDR deals not only with the Danube itself, but with the whole Danube River Basin, which also includes

its tributaries and ground water resources. An important milestone was reached in December 2009 when the countries completed the Danube River Basin Management Plan, which specifies the existing conditions of the river and the actions needed to restore good water quality. The Danube River Basin Management Plan was adopted at the Ministerial Meeting 2010.

The Ministers in adopting the Plan acknowledged that good status of water resources cannot be reached if water managers do not engage in dialogue with other sectors which influence water resources, navigation, hydropower and agriculture. Since this time, the ICPCR has been accelerating its cooperation with these sectors and engaging in specific inter-sectoral dialogue to ensure protection of water and appropriate development in the region.

The ultimate goal of the ICPDR is to implement the Danube River Protection Convention and make it a living tool. Its ambitious mission is to promote and coordinate sustainable and equitable water management, including conservation, improvement and rational use of waters for the benefit of the Danube River Basin countries and their people.

2.1 Water and environment challenges

d) Africa: The Congo case

Speaker: Mr. Simon Sakibede, General Secretary, International Commission for Congo-Ubangi-Sangha Basin Congo (CICOS)



Simon Sakibede has been Secretary General of the International Commission for the Congo-Ubangi-Sangha Basin (CICOS) since 2009. He previously served as Minister of Infrastructure and Transportation in the Central Africa Republic. Prior

to that Mr. Sakibede was General Manager of SOCATRAF, the Central African River Transportation Company.

Abstract

The Congo River Basin at 3,822,000 km² discharging 41,000 m³/s at Kinshasa, is the second largest river basin in the world. The Congo Basin's tropical forest is second largest to the Amazon rainforest as it harbors 60 percent of the continent's biodiversity.

In 1999, the Heads of State of Cameroon, Congo, the Central African Republic and the Democratic Republic of Congo formed the International Commission for Congo-Ubangi-Sangha Basin (CICOS) to revitalize the inland waterway's transport sector, which was crucial to open up access throughout the region. The four CICOS Member Countries cover 83 percent of the Congo River Basin. Angola, an observer at CICOS sessions since 2007, covers 8 percent. The other basin countries include Zambia and Tanzania and to a lesser extent, Burundi, Rwanda, and finally Gabon with only a very tiny portion of its territory in the Congo Basin.

The water resources in the Congo Basin play a more than significant part in a series of fundamental issues:

Ecosystem: In addition to their role in supporting biodiversity, these ecosystems also support socio-economic activities, which closely depend on habitat quality (e.g., indigenous people living in the forest of the Central Congo Basin).

Human activities: mainly fishing and navigation, but also drinking water supplies and irrigation (currently very little exists).

Hydropower potential: a major socio-economic issue that is very important for Africa as a whole, due to the regional electrical network. To make use of such potential, the construction of large-scale hydraulic infrastructure is imposed, but this can cause serious downstream effects. Considering that for the moment, the Basin is largely free from man-made constructions, it is the duty of decision-makers to:

- 1) Optimize the choice of facilities to attain the best possible, sustainable, consistent, equitable development for the river basin as a whole, taking into account the principles of integrated water resource management;
- 2) Assess the accumulated impact of such facilities on water resources and their associated ecosystems to limit adverse effects and make decisions in full awareness of the consequences, especially when it comes to transboundary projects;

Take due account of any potential climate change related impact, since the planning process is one of long-term, sustainable development.

Parallel Sessions 2: Water, food and energy security - international transboundary basin challenges

2.2 Food security challenges

a) Africa: the Niger River case,

Speaker: Mr. Collins R.U. Ihekire, Executive Secretary, Niger Basin Authority (NBA)



Retired Major General **Collins Remy Umunakwe IHEKIRE**, was appointed Executive Secretary of the Niger Basin Authority (NBA) by the decision of the 9th Summit of Heads of States and Government held in Abuja, Nigeria. His duties focus on ensuring the implementation of the

strategic framework for the Action Plan for Sustainable Development of the Basin (SDAP) and the Investment Program 2027. Ihekire's work also includes mobilizing the necessary financing for the implementation of the SDAP.

Abstract

The active Niger River Basin covers an area of 1.5 million km², and is shared by 9 countries – Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Guinea, Mali, Niger, Nigeria and Chad. In 1980 the Niger Basin Authority (NBA) was established with the goal to promote cooperation among Member Countries and ensure integrated management of the basin to develop its natural resources, particularly in the areas of energy, water, agriculture, livestock breeding, fishing and fish farming, forestry and forest exploitation, transport and communication and industry.

The impact of climate variability and change, coupled with a high population growth, has led to a significant degradation of the basin's environment of up to 20 to 25 percent, depending on the area. The changing climate, coupled with the fight against food insecurity is one of the priorities of the strategic framework of the NBA. Regulating the flow of the river to construct three new dams in the basin will induce a 1.6 million ha manageable irrigated area out of the Basin's 6 million ha potential.

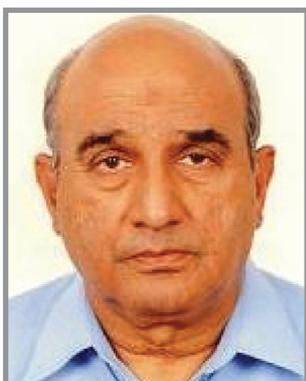
Current initiatives in the basin that can contribute to improving food security include: the project for the building of the multipurpose dams in Fomi, Taoussa and Kandadji; other dam projects on the Upper and the Middle Niger; dams on the downstream part of the basin (Mambila, Zungueru, Katsina Ala, Onitsha, Lokoja and Makurdi dams); future infrastructures of Rehabilitation Fund for public irrigation schemes in Niger; and the actions of the Silting Control Programme (SCP).

The management of transboundary river basins, particularly the design and implementation of development plans to fight, among other things, against food insecurity, requires advice support tools in making decisions for the choosing management options. The Niger River Basin has a high socioeconomic development potential, especially in the matters of improving food security. To this end, it is still important that the NBA mobilizes the necessary funding for the development of infrastructures such as dams and irrigation schemes.

2.2 Food security challenges

b) Asia: the Indus case

Speaker: Mr. Sadar Muhammad Tariq, Regional Chair, Global Water Partnership - South Asia (GWP-SAS), Indus Basin 'Track 2' Process



SARDAR MUHAMMAD TARIQ

Born on 15 May, 1939, graduated from Engineering College, Peshawar in 1962 and Post-graduated from University of London, UK in 1966.

Mr. Tariq possesses 45 years of international experience in water resources development and management, over the last 20 years in the Indus Basin he has led the design, construction and commissioning of medium and large dams in Indonesia and Malaysia. Other key projects include the rehabilitation of medium and large dams in Indonesia and Sri Lanka, controlling seepages from the foundation of the Tarbela Dam

Pakistan and redesigning the Krian Irrigation Scheme, Malaysia. Mr Tariq is a critical player in water resources development in Pakistan, including heading the Water Wing of the Water and Power Development Authority (WAPDA), Pakistan and the author of 'Pakistan's Water Vision 2025', the 'Water Chapter of 5-Year Development Plan of Pakistan 2010-15' and more than 50 technical papers and lectures. He has remained an important member of the President of Pakistan's Technical Committee on Water Resources Development and is presently the Regional Chair of the Global Water Partnership-South Asia (GWP-SAS).

Abstract co-author

Khalid Mohtadullah is a civil engineer by training with vast experience in water resources policy, strategy, institutional development, planning, project preparation, research, implementation and management. He holds an advanced degree and diploma in engineering and management from MIT, USA and the Harvard Business School, USA. He retired as Managing Director and Member of Water of Pakistan Water and Power Development Authority, WAPDA, and remained Director of Research at IWMI. He has also acted as IWMI's Deputy Director

General, and has served as the Executive Secretary of GWP in Stockholm, Sweden. He is currently serving as the Country Director IWMI Pakistan and as a Senior Advisor to GWP. He has primarily worked in multidisciplinary environments to incorporate economic, social and environmental considerations in water resources management. More recently he has been engaged in transboundary water issues between India and Pakistan through the Track II Dialogue process.

Abstract

Indus Basin, historically single unified basin was split into two falling between sovereign states of India and Pakistan in 1947 and resulted in serious water sharing issues. Tough negotiations brokered by the World Bank resulted in the Indus Waters Treaty of 1960. As a result of this transboundary agreement, both India and Pakistan developed massive infrastructure for their water, food and energy requirements in their respective basin areas and increased the irrigated land from 31 Mha to 73 Mha. The hydropower production increased manifolds and both countries suffering from frequent famines, achieved the green revolution and became food exporting countries.

Whereas both countries created strong nexus between water, food and energy in their respective parts of the Indus basin, ignored the facts that strong nexus exists across the borders where there are still

tremendous potentials to secure water, food and energy security for the sub-continent as a whole. The combined basin potentials include 247 BCM of water of which 50% is under-utilized or wasted, has 93, 628 MW of hydro potentials of which 18% have been developed, contains 73 Mha of irrigated areas where productivity per unit of water and land is the lowest in the world.

The Track-II Diplomacy between India and Pakistan has been initiated involving broader spectrum of stakeholders to create conducive environment in establishing transboundary nexus between water, food and energy. There also exist tremendous opportunities in energy development and sharing, research in water use efficiency, enhancing food productivity, combating jointly the impacts of climate change and building resilient communities and networks.

2.2 Food security challenges

c) Land acquisition: how will they impact transboundary waters?

Speaker: Dr. Anders Jägerskog, Director, Stockholm International Water Institute (SIWI)



Anders Jägerskog holds a Ph.D. and is Director at the Stockholm International Water Institute (SIWI) where his work focuses on international water issues and in particular, transboundary water and water governance. He is also an Associate Professor at the Peace and Development Research, School of Global Studies, University of Gothenburg where his work focuses on global water issues. In 2003, he finished his PhD on water negotiations in the Jordan River Basin at the Department of Water and Environmental Studies

at the Linköping University, Sweden. He has published over 60 scientific articles, book chapters, debate articles and reports. His experience combines strong academic credentials (Associate Professor, extensive publications record) as well as wide experience from policy advisory services (SIWI, UNDP water governance advisor, private consultant) and government services - at the policy level (Ministry for Foreign Affairs), as well as from the field (SIWI, Sida and Embassy of Sweden in Nairobi).

Abstract

International land investments for the production of food and biofuel is a trend that has increased in recent years, not least after the food price crisis 2008. The rising cost of food, coupled by water scarcity in countries in the Middle East and in parts of Asia has led to an increase in investments in agricultural land in foreign nations where they could produce food and agricultural goods. This has raised a series of concerns. Domestic food security in host countries may be under threat and local populations with customary access to land are often evicted or excluded when large scale agricultural development projects are ushered in. As land rights are being put into question, water rights are also coming to the fore.

The aim of this presentation is to explore how the current surge in land acquisitions will affect transboundary water management. Key questions relate to the nexus between land acquisitions and transboundary water management but also how it links to food and energy (bio-fuel) - issues of prime relevance for the Mekong.

The key messages of the presentation are:

- Land investment is a water investment. Water is often presumed to be included without explicitly being mentioned in land lease agreements.
- Regional Economic Communities (RECs) and River Basin Organisations (RBOs) have little or no role in the land acquisitions on record to date. Large land deals will, however, very likely impact their mandate and ability to function.
- Water needs should be put into the land acquisition contracts in order to clarify the water requirements of the projects and to regulate their water use.
- Sustainable water use should be acknowledged explicitly in the international standards for responsible agro-business investments.

Parallel Sessions 2: Water, food and energy security - international transboundary basin challenges

2.3 Energy security challenges

a) South America: the La Plata/Itaipu case

Speaker: Dr. Nelton Friedric, Director, Itaipu Binacional



Nelton Miguel Friedrich is Director of Coordination and Environment at ITAIPU Binacional, where he is responsible for the Socio-Environment Program, Cultivating Good Water, developed since 2003 in 29 municipalities of Hydro Basin Parana 3, the region concerning the reservoir of the Itaipu project. Mr. Friedrich has undertaken numerous functions at the Brazilian

Environment Council and Brazilian Parliament, where he served as Secretary for Energy, Environment, Erosion Control, Sanitation and Popular housing; and at state level, including President of the Council of Environment and Sanitation of Hydro Resources for Parana state.

Abstract

Concerns about limited access to water, sanitation, energy and food – often primarily a consequence of inappropriate governance structures and poor management - and thus inequalities in distribution – are compounded by growing concerns about their future availability and sustainability:

- About 0.9 billion people lack access to safe drinking water,
- 2.6 billion people lack access to adequate sanitation,
- 1.3 billion people lack access to electricity,
- 2.7 billion have no access to modern and healthy forms of cooking,
- Close to 1 billion people are undernourished.

Adding two more billion people to an increasingly urbanized and wealthy planet will put significant additional pressure on energy, water and food demands with growing trade-offs among these three development goals; and will accelerate ecosystem degradation. Water, energy, and food sectors are interconnected in important ways, and actions in one sector may either help or harm the other two. Disconnected approaches and silo thinking are more likely to make matters worse.

Action is urgent. If we continue with business as usual we will have – in less than two decades – globally 40% less freshwater resources available than we need for ensuring water, energy, and food security for all and a global development beyond poverty alleviation. Realizing long-term water,

energy and food security for all is possible within planetary boundaries. Business as usual cannot achieve this – a transformation is necessary and new opportunities must be identified. We must move towards a nexus perspective:

A nexus perspective increases the understanding of the interdependencies across water, energy, food and other policies such as climate and biodiversity. The nexus perspective thus helps to move beyond silos and ivory towers that preclude interdisciplinary solutions. It opens the eyes for mutually beneficial responses and the potential of cooperation. We need to think and act interlinked to realize direct and indirect synergy potentials.

Understanding the nexus is needed to develop policies, strategies and investments to exploit synergies and mitigate tradeoffs among these three development goals with active participation of and among government agencies, the private sector and civil society. In this way, unintended consequences can be avoided.

In sum, the nexus perspective provides an informed and transparent framework for determining and resolving trade-offs to meet increasing demand without compromising sustainability. It is thus important to incorporate the nexus perspective in Rio + 20 as well as in local, national and other international planning activities focusing on either water, food, or energy.

2.3 Energy security challenges

b) North America: the Columbia case

Speaker: Dr. John Shurts, General Counsel, Northwest Power and Conservation Council



John Shurts is the General Counsel for the Northwest Power and Conservation Council in Portland, Oregon. The Council has eight members appointed by the governors of the states Idaho, Montana, Oregon and Washington to develop a regional power plan for the Pacific Northwest and fish and wildlife mitigation program for the Columbia River Basin. Much of Shurts' recent work for the Council involves transboundary matters related to the Columbia River Treaty between the United States and Canada. His 2009 paper, "Rethinking the Columbia River Treaty" and a co-

authored chapter on transboundary Canada-US water issues will soon be available. Shurts holds a law degree from Lewis and Clark Law School and a Ph.D. from the University of Oregon with a concentration on environmental and legal history. He is the author of the seminal book, *Indian Reserved Water Rights* (2000). With an extensive background in the Nile and Mekong among other basins, Shurts also often speaks on indigenous water rights and law issues. Most recently he has worked for the Yukon River Inter-Tribal Watershed Council.

Abstract

The Columbia River Treaty of 1964 between the United States and Canada is considered a classic example of a successful, benefits-sharing international river treaty. The Treaty was part of a coordinated and cooperative effort by the two nations to build dams and storage reservoir along the length of the Columbia and its major tributaries so as to turn the abundant water of the Columbia River into dependable, abundant, low-cost hydroelectric power – power that is also carbon-free. Since the development of the upriver reservoir storage, the region has not experienced a significant flood event. This was made possible by international cooperation, further benefitting the region's economy by securely protecting valuable agricultural and urban land.

Over the past 30 years, the Northwest Power and Conservation Council has worked to preserve energy benefits resulting from domestic and international development of the Columbia. In particular, 1000s of megawatts of energy have been added to improve region-wide efficiency. The NPCC has plans to meet most of the load growth in the next 20 years in the same way. Energy efficiency has proven to be the lowest-cost and least-risk resource to add to a low-

cost hydrosystem, delaying or reducing the need to build more expensive and dirtier generating and transmission resources. This significantly reduces economic, social and environmental risks from an evolving energy system. One lesson from the Columbia experience from the last few decades is not only the overriding value of aggressive investments in energy efficiency, but also the need to create planning mechanisms and policy incentives to make these efficiency investments happen – without subsidies.

The basin is now challenged to preserve what is more than a half-century of secure energy and flood protection benefits, while also reversing as much of the environmental damage of 'big river basin development' as possible. The challenge includes figuring out how to update a 60 year-old power and flood control agreement in a 21st century Columbia Basin that equally considers the river's ecosystem and other environmental attributes of the river. It also considers the voices that request to be heard in the modification and implementation of cooperative international management, including local communities and native nations that once had no say in the dam development of the Columbia.

2.3 Energy security challenges

c) The Nile Basin Initiative's role in facing energy security challenges in the Nile Basin

Speaker: Dr. Wael Khairy, Executive Director, The Nile Basin Initiative (NBI)



In 2010, **Wael Mohamed Khairy** was appointed by the nine Nile Basin Countries as the Executive Director of the Nile Basin Initiative Secretariat based in Entebbe, Uganda. With over 20 years of academic and professional experience in water policies, politics and environmental engineering, Khairy's current work primarily focuses on managing multi-government river basin environments for a Secretariat boasting over 400 staff and 20 regional projects.

As a Senior Environmental and Water Resources Engineer, Khairy holds a Ph.D. in Engineering from the

University of New Orleans.

Before his current post, Khairy served as a Assistant Professor at the National Water Research Center in Cairo, Egypt, as well as several US-based universities. Additionally, he has published in approximately 25 journals on topics related to environmental management. Central to his regional work, Khairy acted as a senior official representing the government of Egypt for the Ministry of Water Resources and Irrigation.

Abstract

NBI Member Countries are home to approximately 370 million inhabitants and rapidly increasing. The region has the highest level of poverty on the continent, very low access rate to modern energy and a corresponding low level of per-capita electricity consumption. Recognizing the tremendous benefits that can be achieved from cooperation, yet fully aware of the challenges ahead, the Nile riparian countries in 1999 came together within the Nile Basin Initiative (NBI) and by consensus agreed on a common shared vision, "to achieve sustainable, socio-economic development through the equitable utilization of, and benefits from, the common Nile Basin water resources", and further resolved to work together to translate this shared vision into tangible investments projects on the ground at sub-regional and regional levels. To achieve this, NBI launched a Strategic Action Plan made up of two complementary programs: a basin-wide Shared Vision Program (SVP) to build confidence, capacity across the basin and to plan for the shared water resources, and Subsidiary Action Programs (SAPs) to initiate concrete investments and action on the ground at sub-basin levels.

For over 12 years, the NBI has been working with Member States and development partners, delivering

benefits to Nile riparians especially in power generation and transmission, agriculture, river basin management and development.

However, the region needs to aggressively mobilize not less than USD 60 Billion to adequately meet its electricity needs by 2020. In just 12 years of existence, the NBI power programme has shown great leadership in addressing power development challenges at the regional level by a proper balancing and optimization of its power program activities. This has been achieved through a four pronged approach; facilitating power market development and grid integration, and enhancing regional dialogue; completion of a regional power development strategy, spanning a 35-year planning horizon; promoting power development projects with a regional perspective; and building regional analytical capacity. Additionally, NBI facilitates power development for its Member States to realize power infrastructure projects. Currently, numerous power development projects are under preparation, few are completed and several are at level of tendering for construction.

2.3 Energy security challenges

d) Nexus experience in Africa and Mekong

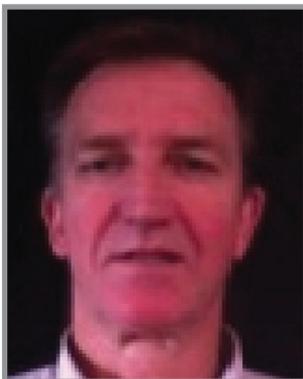
Speaker: Mr. Gavin Quibell, CTA, Mekong-Integrated Water Resources Management Project (M-IWRMP), MRC Secretariat



With approximately 27 years of experience in the water and environment sector, **Gavin Quibell** has worked in Southern Africa, Latin America, India, Pakistan, Kenya, and now Southeast Asia. His expertise covers all facets of integrated water resources management including the role of River Basin Organisations, water quality management, environmental flows, aquatic ecosystem health assessment, water resources policy development, analysis of water legislation and basin planning processes. More recently, he has focused his attention on transboundary water resources management.

Quibell has contributed to the development of water allocation reform approaches for South Africa, and spent 4 years working with the Orange-Senqu River Commission. He has also contributed to the development of transboundary water allocation procedures for WWF China, gaining experience from a number of international transboundary basins. He joined the MRC in 2011, and is currently working as Chief Technical Advisor for the Mekong – Integrated Water Resources Management Project.

Abstract co-author: Mr. Simon Krohn, CTA, Initiative for Sustainable Hydropower, MRC Secretariat



Currently, **Simon Krohn** is the Chief Technical Advisor for the MRC's Initiative for Sustainable Hydropower. Prior to joining the MRC in 2011, Krohn was a General Manager at Hydro Tasmania, a hydropower utility and consulting firm on the island of Tasmania, Australia.

In the past, he has been involved in all aspects of hydropower management including feasibility

and economic assessment, operational water management, water and electricity trading and asset management. In addition to his experience in Australia and Southeast Asia, Krohn has worked as a consultant in the hydropower and water supply field in Southern Africa.

Abstract

One of the more significant advances in transboundary water management in recent years has been the growing recognition that national water security is often best enabled through shared regional water, energy and food security. Water can be transported across borders as direct river flows, as virtual water trades, or may be physically transferred as inter-basin diversions. The benefits associated with water use may also be similarly shared across borders, while the impacts of this use on ecosystems and people may be felt across the whole basin or region.

Regional power pools allow energy to be shared and traded across entire geographic regions, while growing middle class populations demand more energy and food resources; often beyond the production capacity of any one nation. A global shift towards regional economic bodies and free trade areas provides an economic vision for greater integration and resource efficiency, while emerging 'Green Economies' provide a sound basis for shared sustainable growth. Together, these issues could support increased security across the water, food and energy nexus. However, while the benefits

of regional integration across all three sectors are clearly evident, countries are often hesitant to tie national security on strategically vital issues to regional security. Navigating the water, food and energy nexus is, therefore, inevitably linked to wider regional stability.

This paper applies experiences from Southeast Asia and Southern Africa to show that geo-political stability and shared water, food and energy security are two sides of the same coin. The paper outlines the water, food and energy nexus in both regions, and highlights the underlying dynamic between national versus regional interest in these rapidly developing regions of the world. The paper, nevertheless, postulates that increasingly limited natural resources, a greater emphasis on greener development, and constraints on the ability of the natural capital of basin to absorb infrastructure must drive greater integration across the nexus. This will in turn contribute to greater geo-political stability, while longer histories of regional stability will assist with a growing political willingness to share strategic resources.

Plenary 3: Water, food and energy security: from a sector to a nexus perspective

Keynote: The Green Economy and the water, food and energy nexus

Keynote Speaker: Dr. Dechen Tsering, Deputy Regional Director for Asia and the Pacific, UNEP



Since 2006, **Dechen Tsering** has worked with United Nations Environment Programme (UNEP). She has held the position of Deputy Regional Director at the organisation's Regional Office for Asia and the Pacific since 2008. Dechen's work with UNEP operates in 44 countries and covers the six cross-cutting thematic priority areas namely, i) Climate Change; ii) Disasters and Conflicts; iii) Ecosystem Management; iv) Environmental Governance; v) Harmful Substances and Hazardous Waste; and vi) Resource Efficiency.

Additionally, Dechen has over 20 years of experience in national government and intergovernmental organizations including work with the World Bank. She has considerable experience in international environmental negotiations and has been involved in the Rio processes, particularly with the United Nations Framework Convention on Climate Change (UNFCCC). Dechen holds a Ph.D. from the Federal Institute of Technology, Zurich; a Masters Degree from Georgetown University and Undergraduate Degrees from UC Berkeley.

Abstract

The speaker highlights the key issues, opportunities and prospects for the upcoming Rio+20 UN Conference on Sustainable Development. The speaker makes a case that unsustainable growth over the past 50 years can be attributed to misallocation of capital. The status, issues, challenges of access to water including safe drinking water and adequate sanitation is discussed. The speaker states the importance of protecting natural ecosystems of river basins and restoring degraded catchment areas as crucial to securing the world's water supplies, maintaining their quality, regulating floods and mitigating climate change. The existing inadequacies, social costs and economic inefficiencies are also highlighted and examples are drawn from the Asian region. The interconnectedness of water, food, energy and climate change is highlighted. She makes a case for "Green Economy" as a driver towards not a replacement for sustainable development. The speaker draws

on UNEP's recent report Towards a Green Economy and brings some of these examples to light and highlights their scope for wider application. The speaker underlines the importance of attributing an economic value onto ecosystem services and the need for a functioning governance system. She highlights some of the key aspects of the ongoing discussion on International Environmental Governance. She states that improving governance arrangements is one of the biggest opportunities to speed the transition to a greener economy. In any area where there is a water crisis, it is critical that governance arrangements are put in place to prevent over-use and over development of the available water resources. She also highlights the proposals that are being discussed in the run up to Rio+20 designed to achieve better coordination and effectiveness of the global and regional institutions charged with catalyzing and assisting in the implementation of sustainable development.

Plenary 3: Water, food and energy security: from a sector to a nexus perspective

Keynote: Cross-cutting dimension of the nexus

Keynote Speaker: Mr. Johan Kuylenstierna, Executive Director, SEI



He holds an adjunct professorship in international water resources issues at the Department of Physical Geography and Quaternary Sciences at the Stockholm University. **Johan** has previously worked as the Chief Technical Advisor to the Chair of UN-Water, based at FAO in Rome.

Before joining the United Nations, he served as Project Director at the Stockholm International Water Institute with the overall responsibility for the World Water Week in Stockholm. He also

established the Swedish Water House initiative and served as its first manager.

He has experience from international policy work through professional positions at the World Meteorological Organization in Geneva and the Division on Sustainable Development (CSD) at the United Nations Headquarters in New York. His academic background is in Palaeoclimatology.

Abstract

Despite substantial progress in human development over the past decade, the poorest “bottom-billion” (numbers vary) still lacks food, water and energy security. Moreover economic development is still based on a rapid acceleration of resources use, degradation and CO₂ emissions. The emerging middle class of the world strives to replicate the consumption patterns of the high income countries. When following this development trajectory, humanity risks exceeding critical thresholds at all scales up to planetary boundaries, with often unknown but potentially severe consequences.

Conventional sectoral approaches for increasing resource productivity are no longer sufficient to tackle these challenges. Instead, a precautionary approach is required in which water, land and energy are recognized as linked resource systems that need to be co-developed and integrated with the broader “development agenda”. Such an integrated (nexus) approach can reduce tradeoffs and build synergies, e.g. through multi-functional systems, recycling,

reduced wastage, sustainable intensification and more conscious consumer choices. Building blocks for the implementation of context-specific nexus solutions include: cross-resource life cycle assessments, integrated technologies and management tools, capacity building, institutional development, policy coherence, enabling conditions and incentives for and investments into a green economy.

Rio+20 and the development of new Sustainable Development Goals (SDGs) provide a window of opportunity for integrating the planetary boundaries with development goals such as the MDGs. These new sustainability goals need to be developed in a dialogue between actors from civil society, private and public sector international and intergovernmental institutions and science. We propose a consolidated effort to translate, synthesize and utilize current knowledge, development scenarios and decision-support tools into clear policy and management strategies.

Parallel Sessions 4: The environment, climate and poverty perspectives of the nexus

4.1 Environmental perspectives

a) The Espoo Convention

Speaker: Dr. Timo Koivurova, Research Professor, The Northern Institute for Environment and Minority Law, University of Lapland, Espoo Secretariat



Research professor **Timo Koivurova** has specialized in international law, in particular international environmental law, and leads the Northern Institute for Environmental and Minority Law. He has been involved as an expert in several international processes globally and in the Arctic region. Professor Koivurova was a co-leader of a global research project on the theory and practice of transboundary

environmental impact assessment and is a member of the IUCN's Commission on Environmental (CEL). He is an editor-in-chief in the Yearbook of Polar Law (Brill) and an editor in the Nordic Journal of Environmental law and Nordic Journal of International Law.

Abstract

The Convention on Environmental Impact Assessment in a Transboundary Context was adopted over twenty years ago and is seen as one of the key international treaties to implement sustainable development. The Convention has been supplemented by a Protocol on Strategic Environmental Assessment, having only entered into force in 2010. Although the Espoo Convention is a regional Convention, it has also contributed to the development of transboundary EIA practice globally, resulting in that the International Court of Justice of the UN recently affirmed that transboundary EIA is part of general international law (in particular as regards shared watercourses) and thus legally binds all states of the world. It is many times forgotten that the Espoo Convention and SEA Protocol (Espoo regime) require their parties to establish national EIA and SEA procedures, the Espoo Convention focusing on organizing transboundary EIA and the SEA Protocol on harmonizing national SEA procedures. Together EIA and SEA try to ensure that all possible projects, plans and policies undergo a rigorous evaluation and planning process together with the civil society and relevant authorities.

The Espoo regime clearly makes possible to take into account the nexus between water, energy and food, given that EIA and SEA enable us to broaden our horizons over the proposed development activity. Environmental and social impact assessments, when these are done together with relevant public

authorities and the public, enlarge our view of the horizon of impacts to the environment and the human communities. The requirement to also include public and authorities in another state in case there are likely transboundary impacts means that all impacts (possible alternatives and mitigation measures) of the proposed activity are examined and channeled to decision-making. The vast experience gathered in applying the transboundary EIA of the Espoo regime has led to several developments that are relevant to all regions of the world, including that of the Mekong River basin.

Even if the Espoo parties include most UN Economic Commission for Europe members - parties spanning from Canada to Europe and even to Central Asia - actual co-operation has moved to sub-regional groupings. The experience shows that pragmatic co-operation between neighboring regions is the best way to implement the Espoo Convention. By learning the way other national EIA procedures function in reality, who are the responsible officials, etc., countries are building trust with each other while also improving the possibility to actually take into account transboundary impacts. As the cases demonstrate, sub-regional co-operation has led also to broadening of transboundary EIA procedures, as, e.g. took place in the transboundary EIA of the Baltic Sea Gas Pipeline, where altogether five states were origin states and nine took part as affected states. This was largely due to the fact that states had

been co-ordinating the implementation of the Espoo Convention in the Baltic Sea subregional group. Experience shows that mere soft-law co-operation has problems in creating lasting structures for transboundary EIA for several reasons, e.g. because legal form creates trust between parties and soft-law co-operation has problems in securing institutional continuity (domestic officials tend to not pass their experience on transboundary EIA to their followers when the co-operation is only soft).

The argument in this presentation is that now when the Espoo regime is gradually opening to all member states of the UN - and the ICJ has emphasized that all states are legally obligated to undertake transboundary EIA - it would be also important to think whether the soft-law transboundary EIA co-operation in the Mekong River Basin could be translated into a sub-regional grouping functioning under the overall umbrella of the Espoo regime.

4.1 Environmental perspectives

b) Transboundary EIA in the Mekong

Speaker: Mr. Nguyen Van Duyen, Environmental Governance Specialist, Environment Programme, MRC Secretariat



Nguyen Van Duyen is an environmental governance specialist and holds a position of Environmental Policy and Management Specialist at the Mekong River Commission Secretariat. One of his duties is to facilitate the development of a framework and technical guideline for environmental impact assessment in a transboundary context. He has over 20 years working experiences in various field including more than 15 years working in legal development and environment areas in different positions. Notably, he has have been working in a comprehensive legal reform program in Vietnam with the aim to improve access to justice for the poor as well as wider public. He later on studied environmental law

and working on different issues such as dioxin, POPs, and climate change and desertification.

Over the past years he has worked as consultant and manager in Vietnam, Australia and Laos on natural resources management and environmental governance. His most recent position is to support Vietnam in revising its regulations on EIA. He was awarded the Australian Alumni Award for Sustainable Social Development in 2011 for outstanding contribution for researching the effects of climate change, especially desertification, on the livelihoods of poor communities at the Australian Alumni Awards held in Hanoi, Vietnam, on 11 November.

Abstract

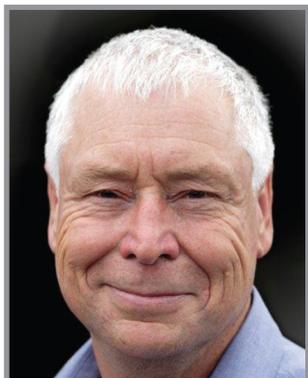
Many of the developments planned for the LMB are likely to have transboundary implications and significant environmental impacts: hydropower dams on the mainstream (energy production), large-scale irrigated agriculture (food supply), extension of port facilities etc. Unfortunately, in some cases the positive impacts on the water-energy-food nexus (e.g. more energy supply) may appear in one country, whereas the negative impacts (e.g. reduced fish catches or deteriorated environmental quality) appear in another, requiring complex trade-off negotiations between sovereign states. This presentation looks at Transboundary Environmental Impact Assessment (TbEIA) as a tool to facilitate such negotiations and mitigation activities to achieve balance between the elements of the nexus. Each of the MRC Member Countries has its own national regulations on EIA, and a different level of experience in implementing its regulations. However, these regulations typically do not require transboundary impacts to be considered in the

assessment process. Therefore, the MRC facilitates a process, launched in 2004 and still in progress, to establish a framework for conducting TbEIA. The TbEIA framework builds on and supplements the MRC Procedures for Notification, Prior Consultation and Agreement and other MRC procedures, as well as the existing national EIA legislations. This presentation will highlight the steps and progress of the TbEIA framework development process. It will also look at some of the obstacles experienced during the development process and explain the current approach whereby development of technical guidelines is the first priority, whereas the politically charged framework discussion is the second priority. It is concluded that TbEIA is an indispensable tool for addressing the water-energy-nexus of the LMB in a balanced way – but also one that requires significant time, capacity building, and mutual trust among the Member Countries to develop.

4.1 Environmental perspectives

c) Murray-Darling Australia – the ecosystem challenges, political and practical

Speaker: Dr. Daniel Connell, Historian (Water Governance), Australian National University



Daniel Connell is an environmental historian working in the Crawford School of Economics and Government at the Australian National University. He has written extensively about Murray Darling Basin issues, most recently in *Basin Futures* co-edited with Quentin Grafton and published by ANU-EPress in 2011. Since publishing *Water Politics in the Murray-Darling Basin* in 2007, Daniel has been conducting a comparative study of contemporary policy and

management applying to rivers in federal systems focusing in particular on Australia, South Africa, United States, Mexico, European Union (Spain), India, China and Brazil. Themes include water reform, environmental justice, public participation, cultural change, institutional design, the distribution of costs and benefits across borders, water markets and risk created by the interaction of different levels of government.

Abstract

The Murray-Darling Basin is currently at the centre of the sort of debate that every hydrological system has to go through before integrated water resource management can be implemented. Every system is different but the core challenge for IWRM is the need to balance tensions created by competing demands for water, energy and food against the imperative to preserve options for future generations within the special circumstances of the hydrological system being considered. Answers vary from basin to basin but all share similar questions about institutional design. How should responsibilities be distributed between governments? What does the concept of ecological sustainability mean in this particular basin? Which disputes should be resolved in courts and which left to administrators? How and to what degree should research and monitoring be integrated with policy and management? What levers for change can be used to promote reform in a particular cultural, social, economic and political context? How can the need to provide stability for

communities and investors be balanced against capacity for flexible responses to emerging issues such as climate change? Who are the politically marginal groups most at risk from proposed developments? What is the best way to involve a wide range of stakeholders and the wider public? How can the many costs and benefits involved in water management be made explicit so that outcomes can be maximized for the many different interests interacting in this basin? These issues are central to the public policy process now under way in Australia. The aim is to prepare the comprehensive Basin Plan for the Murray Darling catchment which will be submitted to the national parliament later this year. This presentation will describe that process, explain how key institutional issues are being managed and discuss the relevance of the Murray-Darling Basin example for water managers in other countries and basins.

4.1 Environmental perspectives

d) Nam Ngum River Basin Committee

Speaker: Mr. Phonechaleun Nonthaxay, Director of the Secretariat of Nam Ngum River Basin Committee



Phonechaleun Nonthaxay is currently Director of the Secretariat of Nam Ngum River Basin Committee. He was the Director of the Secretariat of the Water Resources Coordination Committee from 1997-2007; and also Director General of Water Resources Department; Head of the Lao National Mekong Committee Secretariat and on the Alternate Joint Committee of the MRC for Lao PDR from 2007-2011.

Abstract

The 17,000 km² Nam Ngum River Basin is situated in the upstream part of the Lower Mekong Basin. It hosts Vientiane, the national capital, and comprises the Vientiane plain, the country's main rice production area. The basin offers ample opportunity for hydro-power generation. A number of hydropower plants are on line and others will follow in the near future. Investment in other sectors is growing rapidly: mining, plantations, processing of agriculture products (cassava), and potash mining. Applications for new factories have been received, some of which are potential water resources polluters.

However, polluting incidents in some production operations have been harming production operations by others, including by rural communities. In 2011, a large flood seriously damaged rural settlements and destroyed crops and cattle, raising questions about the operation of the reservoirs. The effects of climate change on water

and food security is an additional worry. Alleviation of poverty is the Lao Government's main goal. In the light of the above, the government has set a target for bringing five large basins under IWRM by 2015. Bringing together the representatives of different, and often conflicting, interests, and making information available to all, future risks will be earlier recognised and anticipated better, applying the twin principles of user pays and polluter pays. Piloting of a suitable IWRM mechanism is underway in the Nam Ngum Basin.

Bringing each sub-basin under better management means that 35% of the Mekong River's inflow will be better managed. Each sub-basin IWRM arrangement will be linked to the national government. This offers possibilities for stronger overall monitoring and management, a pre-condition for effective management of the LMB nexus, characterised by high capacity for energy production upstream and high capacity for food production downstream.

Parallel Sessions 4: The environment, climate and poverty perspectives of the nexus

4.2 Climate change perspectives

a) The Hindu Kush Himalayas and Climate Change

Speaker: Ms. Neera Shrestha Pradhan, Hazard and Community Adaptation Specialist, International Centre for Integrated Mountain Development (ICIMOD)



Ms Neera Shrestha Pradhan, a Nepali national, joined ICIMOD in July 2010 as Hazard and Community Adaptation Specialist. Ms Pradhan has more than 13 years of experience in the field of environmental management, freshwater conservation and management, and climate change adaptation. At ICIMOD, Ms Pradhan is responsible for developing, coordinating, and implementing programmes related to socio-economic and physical vulnerability and adaptation to multiple risks and hazards; contribute to strengthening linkages between disaster risk reduction and adaptation; and reducing vulnerability and

enhancing community resilience. Ms Pradhan holds a Masters degree in Environmental Management from the Asian Institute of Technology (AIT), Bangkok, and a Bachelor's in Civil Engineering from the Regional Engineering College, Durgapur, India. Before joining ICIMOD, Ms Pradhan led the Freshwater Unit of WWF-Nepal as Programme Manager. During her tenure at WWF-Nepal, she established the Freshwater Programme and initiated an adaptation programme in the Koshi river basin, Nepal. Prior to this, she worked for the World Conservation Union (IUCN) Nepal Country Office and the Regional Environmental Assessment Programme of IUCN Asia.

Abstract co-author: Dr. David Molden, Director General, International Centre for Integrated Mountain Development (ICIMOD)



Dr. David James Molden joined ICIMOD as Director General in 2011. As a development specialist with more than 30 years experience in water management, livelihoods, environment and ecosystem services, Molden has worked in river basins such as the Ganges, Yellow, Mekong, Yangtze, Amu and Syr Darya.

Formerly, Molden was the Deputy Director General for Research at the International Water Management Institute (IWMI) in Sri Lanka, the Chief of Party for the Irrigation Management Project in Nepal, as well as the Chief of Party for a water resources research programme in Egypt.

Molden holds a Ph.D. in Civil Engineering from Colorado State University and has contributed to nearly 200 published works. Over the years his research interests have developed into integrating social, technical and environmental topics into water resources management. He has received many awards including the Outstanding Scientist Award of the Consultative Group on International Agricultural Research (CIGA).

Abstract

The mountains of the Hindu Kush Himalayas (HKH) provide numerous goods and services which deserve special attention in discussions of the water–food–energy nexus. As the mountain ecosystems and people are experiencing rapid socioeconomic and climate-related changes, provision of these goods and services are under question. The HKH, also known as ‘the third pole’, contains the world’s highest mountains and is the source of ten of the largest rivers in Asia, where more than 1.3 billion people’s life and livelihood depend. More than one-third of the arable land in the HKH region is irrigated, mainly by rivers originating in these mountains. Changes in these rivers challenge food security at country, regional, and global scales. Mountains also play a vital role in energy security and could produce vast amounts of hydropower that transforms the lives of people living in the HKH countries.

Global warming has a severe impact on the amount of snow and ice, which in turn has implications for the downstream communities. The most severe climate-related impacts are probably related to the altered frequency and magnitude of extreme weather events. Given the livelihood, food, and energy dependency on water, the question for future water availability is of the utmost concern.

In spite of tremendous pressure on resources, mountains provide new opportunities and the people have their own indigenous ways of adapting

to these changes. Adaptation and resilience need to be built on local and evidence based knowledge with focus on the differentiated impacts on women and men and their adaptive capacities. Mountain goods and products such as medicinal and aromatic plants, non timber forest products, high valued fruits and vegetables, ecotourism, and the storehouse of agrobiodiversity have special values and have niche markets. Mountain people are custodian of numerous ecosystem services and biodiversity. Compensation mechanisms for the provision of these services would provide an important means for mountain communities to adapt and prosper, and serve the global community.

Regional cooperation is required for many of the water-food-energy solutions. In spite of the negative side of climate change and disasters, they have also opened the door to regional cooperation to deal with the problems. There is increasing scope for scientific exchange to share methods and information that play an important role in regional cooperation.

Ultimately good science is required for filling data gaps, monitoring and downscaling climate change impacts, establishing regional forecasting and early warning system, and understanding the role of black carbon on glacier melting, and more capacity is required to meet new needs. This will require regional platforms for data sharing and developing common methodology for data collection. The water–energy–food nexus perspective focuses

4.2 Climate change perspectives

b) A nexus of adaptation: implications of climate change for sustainability of the water, food, energy in the Lower Mekong Basin

Speaker: Dr. Nguyen Huong Thuy Phan, Programme Coordinator, Climate Change and Adaptation Initiative, MRC Secretariat



A specialist in water and environmental management, **Phan** is currently the MRC's Climate Change and Adaptation Initiative. Programme Coordinator. The Initiative aims to assist Mekong countries in policies and actions concerning climate change adaptation issues related to the Lower Mekong Basin.

As a hydraulic engineer and a hydrodynamic and morphological modeller, Phan holds a PhD of Engineering in Water Resource Development. She has approximately 20 years of experience in hydropower development projects in southern Viet Nam, coastal

engineering projects in the Gulf of Thailand, and climate change related flood risk assessment projects in the Red River Delta of Viet Nam.

Phan has an extensive background in environmental governance, climate change responses, disaster mitigation and management and renewable energy development. She has namely worked as a research scientist at University of Twente, a research engineer at Asian Institute of Technology, and a water resource engineer at Ministry of Energy, Viet Nam.

Abstract

In the Lower Mekong Basin (LMB), climate change will directly affect the water, food and energy nexus by modifying the future availability and sustainability of these components. Recent studies by MRC and other organisations reveal that increased temperature, less reliable rainfall patterns, sea level rise and increased floods and droughts due to climate change will alter river flow regimes, magnify water demand and pressures on irrigation and agricultural production systems, reduce food security and affect sustainability of hydropower development.

The connection between water, food and energy implies that adaptive capacity in one sector will automatically affect the others, and long-term, multi-sector approaches are needed for the LMB that mainstream climate change adaptation with development.

Adaptation requirements for the water-food-energy nexus vary between the LMB countries because of differing climate change risk profiles: while sea level

rise and increased flood potential threatens the Mekong Delta in Vietnam, pockets of high level water stress remain during the dry season in some areas of northeast Thailand. Heightened flood risk is expected in areas adjacent to the Mekong River in Lao PDR, while in Cambodia the storage volume of the Tonle Sap system will rise and low-lying areas downstream of Kratie will be at particular risk of increased flooding (MRC 2009, MRC 2011).

LMB countries also vary in their capacity and readiness to tackle these emerging climate risks. A key aspect of the adaptation nexus in the LMB is its transboundary nature; the common resource of the Mekong River means that adaptation in one country will affect the adaptive capacity of others. Regional collaboration under MRC's Climate Change and Adaptation Initiative aims at enhancing the adaptive capacity of the MRC countries in all components of the nexus, while assisting them in tackling transboundary impacts with regional information systems, planning and decision making tools.

4.2 Climate change perspectives

c) The nexus and adaptation in Mekong

Speaker: Dr. Ram Chandra Bastakoti, Senior Research specialist, Asian Institute of Technology (AIT)



Ram Bastakoti is currently a Senior Research Specialist at Asian Institute of Technology (AIT), Thailand. His main research interests include institutional dynamics and performance of irrigation systems; robustness of socio-ecological systems; climate change adaptation, and water governance. At present, he examines robustness of irrigation systems to external disturbances, including climatic variability, with special focus on a South and Southeast Asia context. Bastakoti recently completed a Post-Doctoral Research Programme on Adaptation to Climate Change, implemented by UNESCO-IHE

in collaboration with partners throughout the Mekong region. There, he focused on assessing climate change adaptation in the Mekong region. He analyzed how local institutions assist people with climate change risks.

In the past, Bastakoti worked as Coordinator of the Mekong Program on Water Environment and Resilience (M-POWER). While working with M-POWER, he was involved with various initiatives related to water governance throughout the region.

Bastakoti holds a PhD from AIT, Thailand.

Abstract

Climate change adaptation requires close interaction between local actions and policy support. Thus, focusing on an institutional perspective, this paper undertakes a comparative analysis of climate change adaptation in rural areas of the Mekong River Basin. Using Young's analytical framework, it analyses the effects of multi-level policies on existing autonomous measures taken by local farmers in China, Thailand and Viet Nam, based on household interviews. The paper concludes that all three countries emphasise disaster relief over preparedness, have not fully exploited the potential of using micro-credit facilities, and have not fully explored developing crop varieties that are adaptive (e.g. drought/flood resistant) as well as high yielding. A number of country specific conclusions have been drawn and solutions are proposed.

To begin, the paper reviews ways in which the government of China could focus on deploying specific market-based mechanisms to deal with drought related problems. Existing policies could adapt to increased stakeholder engagement in policy implementation processes. At the local level, there are considerable social capital and government policies that could focus more on supporting local capital rather than zeroing-in on households as a unit. In Thailand, the decentralization of powers

and resources to strengthen local social capital is critical. For example, farmers are using 'expos' for trading local drought resistant seed varieties. Such autonomous actions of the farmers need more support from the state and this could be done through the creation of a fund that offers micro-credit. Likewise, one vehicle for implementing water related adaptation strategies could be to use the existing infrastructure of the Water Users Associations (WUAs). Furthermore, the policy of the King of Thailand on sufficiency economy and organic agriculture is adaptive and successful.

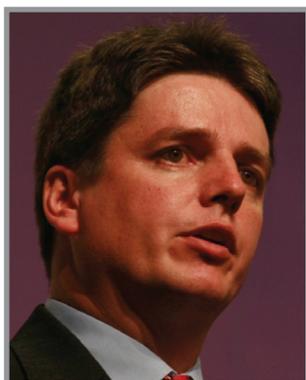
In Viet Nam, capacity building plans in combination with disaster preparedness plans could be routed through the WUAs (or even the RBOs) to enhance their effectiveness. Likewise, existing autonomous measures of farmers can be supported through support for field-level water infrastructure via possibly small-scale credit and improved coordination between committees and other agencies. Overall, it is recommended that the three countries invest more in reducing risk than in disaster management; provide access to cheap micro-credit facilities; and explore ways to combine local knowledge to develop resilient and productive crops.

Parallel Sessions 4: The environment, climate and poverty perspectives of the nexus

4.3 Poverty perspectives

a) Dams on the Mekong River: Lost fish protein and the implications for land and water resources

Speaker: Dr. Jamie Pittock, Director of International Programs for the UNESCO Chair in Water Economics and Trans-boundary Water Governance, Australian National University



Trained in science, **Jamie Pittock** has worked for non-government environmental organisations since 1989, including as Director of WWF's Global Freshwater Programme from 2001-2007. His doctoral research examined conflicts and synergies between conservation of freshwater ecosystems and climate change policies. Since 2010, he has held the position of Program Leader, Australia and US Climate, Energy and Water for

the US Studies Centre. He is also the Director of International Programs for the UNESCO Chair in Water Economics and Transboundary Water Governance at the Crawford School of Economics and Government at The Australian National University in Canberra.

Abstract

Proposed dam construction in the Lower Mekong Basin (LMB) will considerably reduce fish catch and place heightened demands on water and land resources necessary to ensure the replacement of protein and calories. Two main scenarios cover projections of increased demands on water and land from replacement of lost fish protein from animal-based sources. Scenario 1 extends only to the 11 mainstream dams and estimates a 4 percent to 7 percent increase overall in water use, with much higher figures for Cambodia (30 percent to 66 percent) and Lao PDR (13 percent to 26 percent).

Land increases run to a 15 percent to 32 percent increase. In Scenario 2, covering all 88 proposed dam and reservoir fisheries development by 2030, projections are much higher: 6 percent to 17 percent for water, and 22 percent to 74 percent for land. In addition, imports of livestock feed by LMB countries would increase. These spreads will be addressed as variables driven by seasonal, cultural and economic factors, yet it is clear that trade-offs between energy and food security must be more closely examined prior to any further development.

4.3 Poverty perspectives

b) Linking poverty and MRC Procedures

Speaker: Dr. Phoumin Han, Programme Coordinator, Mekong-Integrated Water Resources Management Project, MRC Secretariat



Phoumin Han has 15 years of experience working with various international and inter-governmental organizations and multi-disciplinary research consortiums related to poverty, governance, economic analysis and development. He is currently the Programme Coordinator for the Mekong – Integrated Water Resources Management Project at the MRC. His specialization focuses on development economics and policies and applied econometrics for policy implications.

He has held a number of key positions during his service for

the United Nations Development Programme in Cambodia and elsewhere. His previous positions include working as a Poverty Monitoring Specialist, a Governance Specialist, and a District Officer at the United Nations for Transitional Authority in East Timor (UNTAET). He has served as a research fellow and research coordinator for the Social and Human Development Department at the Cambodia Research Institute (CDRI), and as an Economist and Planning Specialist at the Mekong River Commission Secretariat (MRCS).

Abstract

Principle 2 of the Dublin Statement on Water and Sustainable Development entreats us, “to ensure that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects”. An Integrated Water Resources Management approach also requires water to be governed in the broader public interest. This is reflected in the Mekong River Commission’s vision for, “An economically prosperous, socially just and environmentally sound Mekong River Basin”. The MRC Member Countries are collaborating towards this end through Objectives and Principles agreed in the 1995 Mekong Agreement, and have committed to 5 Procedures, which together with joint basin planning and a commitment to cooperate in all fields of sustainable development enable regional transboundary collaboration towards these objectives.

However, implementation of these Procedures also needs to put people, and particularly the poor, first. The Procedures must therefore both secure and accelerate sustained access to water, food and energy resources for the poor in all four countries. The Procedures are consequently relevant to water resources management at the inter-linked regional, national, tributary, watershed, and local levels. This paper examines the role of the Procedures across these levels; exploring the extent to which they enable the Member Countries to cooperate across the whole basin, while protecting resource based livelihoods in each Mekong Country. The authors will show how communities acting locally to secure water, food and energy resources, can form the basis for implementing the Procedures. The presentation will draw on several transboundary (bilateral) pro-poor IWRM projects to illustrate the links between local level pro-poor initiatives and transboundary cooperation on a basin scale.

4.3 Poverty perspectives

c) Addressing the tensions of developing hydropower while improving livelihoods and caring for the environment

Speaker: Lilao Bouapao, Coordinator, the Mekong Programme on Water, Environment and Resilience (M-POWER)

Lilao Bouapao is the Coordinator of the Mekong Program on Water, Environment and Resilience (M-POWER), a network of collaborators undertaking action-based research and facilitating dialogues and knowledge brokering to improve water governance in the Mekong Region in ways that support sustainable livelihoods and healthy communities and ecosystems. He has more than 20 years of experience in impact assessment and statistics, specializing in social sciences, water resources science and rural development.

Lilao has recently completed his two-term assignments at the Mekong River Commission (MRC) Secretariat as a Senior Social Science Specialist. He is currently working as a consultant on social and policy topics related to water resources for a number of international organizations, including the International Fund Corporation (IFC) of the World Bank group and the MRC. He is managing the Mekong Development Center (MDC), a consultancy firm, based in Vientiane, Lao PDR.

Abstract

M-POWER stands for the Mekong Program on Water, Environment and Resilience. We are a network of collaborators undertaking action based research, facilitated dialogues and knowledge brokering to improve water governance in the Mekong Region in ways that support sustainable livelihoods and healthy communities and ecosystems. Our Mekong₂Rio presentation will focus on the links between rural poverty and water resources. One of the clearest links between poverty, water and energy is the dependence of people on water resources for consumption and income generation from fish, other aquatic animals, and aquatic plants. Change in the status of the resources – by whatever driver, including hydropower – affects the dependence and poverty/wealth status, recognizing that poverty and wealth is not static. Some people move in and out of poverty from time to time and by season. While many are vulnerable, recovery varies. It takes some people years to recover to the status before a negative event. This depends on a number of factors, including their non-affected assets such as livelihoods and food sources other than water-related resources. The complexities of the dynamic nature of poverty and resilience present challenges

for policymaking. Evidence suggests that a large proportion of the rural population in the corridor of the Lower Mekong Basin could easily fall below the poverty line if there is a significant decline in the availability of water-related resources, such as fish. Different pictures and policies emerge depending on what aspects of poverty/wealth are focused on by various groups of people and organizations. For example, the definition of poverty as \$1 per day can lead to a (worthy) focus on increasing cash income, but other dimensions can be missed. Life style opportunities, health, education are also all important. There is no perfect method to address all concerns and expectations across cultures and countries. However, our research has shown that improvement in water governance, more holistic approaches, and meaningful participation of affected stakeholders in decisions that affect their lives, can assist in addressing more aspects of poverty. Major public decisions deserve fully informed decision-making processes. Drawing on Mekong experiences, we will present pro-poor and pro-ecosystem suggestions for improving hydropower governance.

Parallel Sessions 5: The policy-governance, techno-economic and stakeholder perspectives of the nexus

5.1 Policy-governance perspectives

a) Rethinking the role of River Basin Organizations: Facilitating Development through Investments

Speaker: Mr. Chaminda Rajapakse, Natural Resources Management Professional, Global Water Partnership (GWP)



Chaminda Rajapakse is a natural resources management professional, with 13 years of experience in trans-boundary water management in the Okavango, Mekong, Zambezi and elsewhere. Mr. Rajapakse has a background in managing regional programs and research initiatives, while forging effective relationships between regional water user representatives through his experience as the Senior Institutional Specialist first and then the Chief Technical Advisor for a key project in the Okavango. In this role he facilitated the setting up of a River Basin Organization

and the development of a Strategic Action Program for the basin. He has significant experience in policy formulation and collaboration with high level government officials, multi-and bilateral donors, nongovernmental organizations and academia. Mr. Rajapakse holds Post Graduate Degrees in Public Administration (Harvard Kennedy School) and International Development (Brandies Heller School), and has training in resource economics, multi-party negotiation analysis and strategic management. Currently he serves as a Senior Officer with the Global Water Partnership.

Abstract

Within the last 30 years there has been a significant shift in the mandate of River Basin Organizations (RBOs). A survey of RBOs started before the 1990s show that they were instituted with a narrow mandate to provide a specific service to the contracting countries. These services which included the implementation of water sharing protocols, information sharing, the management of infrastructure, water quality management and even defense, were discrete activities required to fulfill specific requirements. But with the adoption Integrated Water Resources Management principles the RBOs were mandated to implement integrated river basin management. This greatly expanded their mandate to include overall river basin planning and management, including in some cases, decisions

regarding the establishment of infrastructure. By virtue of geography and economic efficiency it is evident that the river basin should be managed as a single indivisible whole irrespective of political divisions but this requires states to forfeit a certain level of sovereignty and evidence shows that states are reluctant to do so. This paper suggests an alternative. Starting with an acknowledgement of the distribution of power in the basin and the national interests of contracting parties, RBOs could be established as multi-sector investment facilitating mechanisms that promote sustainable development as required by contracting states. This may not only better serve the strategic interests of the contracting states but also add relevancy to the current planning and environmental and social management services.

5.1 Policy-governance perspectives

b) How an international legal framework for transboundary water cooperation can help to address the water – food - energy nexus: The experience under the Helsinki Convention

Speaker: Ms. Francesca Bernardini, Secretary to the Convention, United Nations Economic Commission for Europe (UNECE) Secretariat



Francesca Bernardini is the Secretary of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes of the United Nations Economic Commission for Europe (Water Convention).

A chemical engineer by training, she has been working in UN multilateral processes for more than 12 years. In her current capacity, she services

water negotiations and supports countries in the implementation of the Convention, in particular in the negotiation and implementation of river basin agreements. She also facilitates the development of strategic and technical documents, and develops and manages implementation projects on the ground.

Abstract

For the last 20 years, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (also known as Water Convention or Helsinki Convention) has been a strong legal and political driver for transboundary water cooperation in the pan-European region. The Convention, which has been in force since 1996 and counts to date 39 Parties, including the European Union, is the basis for many agreements on transboundary waters and for the work of many river basin commissions and other arrangements for transboundary water cooperation.

On the basis of the results achieved and with the aim to also benefit from experience in other regions of the world, the Convention was amended in 2003 to allow accession to all UN Member States. It is expected that the amendment will enter into force by the end of 2012, transforming the Convention into a global framework for transboundary water cooperation.

The Convention is rooted on the understanding that water is at the cross-roads of social and economic development and that societies depend on it for their well-being and sustainable development. However the increased awareness of

the interdependencies across water, energy, food and other policies such as climate and biodiversity, together with the objective to maximize synergies and mitigate trade-offs, introduce additional levels of complexity in transboundary water management.

The presentation will analyse experience to date on transboundary water cooperation in the pan-European region and aim to respond to the following questions:

- Is the existing legal and institutional basis for transboundary water cooperation fit to embrace and support a nexus approach?
- Can the Water Convention help in this respect? If so, how?
- What are the benefits for countries to accede to the Water Convention and participate in its activities? What are the challenges?

The presentation will also suggest a number of opportunities for cooperation between the Water Convention, the Mekong River Commission and other international commissions, for strengthening transboundary water cooperation in general and in particular for enhancing the application of a nexus approach.

5.1 Policy-governance perspectives

c) The MRC Agreement Procedures

Speaker: Mr. Kongngeun Chounlamounry, Division of Legal Affairs, Lao National Mekong Committee (LNMC)



Kongngeun Chounlamounry is currently working at the Division of Legal Affairs of the Lao National Mekong Committee (LNMC). He previously worked for the Mekong River Commission Secretariat (MRCS) as a member of the Legal Studies Team. He has also held various positions in Lao government offices such as Acting Director of the Division of Legal Studies at the Office of the Foreign Investment Management Committee, Committee for Planning and Cooperation; as Director of the Division of Water Utilization and Management at

LNMC; as a Member of the Technical Drafting Group and Technical Review Group for the Procedures and Technical Guidelines for water utilization in the Mekong River Basin; as a Member of the Task Force for the Organization of the MRCS; as Chairman of the National Working Group on Mekong Region Dialogue dealing with Lao IUCN on water resources and wetlands; and as Assistant Director General of the Department of Water Resources under the Water Resources and Environment Agency of Lao PDR.

Abstract co-authors: Dr. Phoumin Han and Mr. Gavin Quibell (bios previously listed)

Abstract

The 1995 Mekong Agreement between Cambodia, Lao PDR, Thailand and Viet Nam represents a significant commitment to transboundary cooperation in the Lower Mekong Basin. However, transboundary governance towards this goal is both challenging and complex. This paper will explore how these challenges are being addressed by the Mekong River Commission.

By signing the Mekong Agreement the four Countries have agreed to;

- The reasonable and equitable use of water;
- Notification and Prior Consultation processes;
- The maintenance of flows on the mainstream;
- Prevent, cease and take responsibility for harmful effects; and
- Notify one another of emergency situations.

Cooperation in this regard is achieved through 5 Procedures, each supported by Technical Guidelines. Together these instruments are the tools that enable transboundary governance. However, a number of challenges to the routine uptake of the Procedures have emerged over the last few years. The development of each of the Procedures has occurred in isolation, which has largely lead to the Procedures being developed as an 'ends', rather than as a 'means to an ends', and without a consistent view of their collective contribution to better transboundary governance. This has also contributed to the Procedures expanding beyond what is immediately critical to transboundary cooperation. Moreover,

until recently, there has been no framework linking the Procedures together so that they collectively give effect to the principles and objectives of cooperation. Implementation of the Procedures has also proven to be a significant governance challenge at the national level, requiring input from several Line Agencies, often outside of the water sector, and with limited human and financial resources and incentive to support the process.

This paper will firstly outline some emerging thinking around how the Procedures not only ensure the reasonable and equitable use of the water resources of the basin, but also how they must collectively be an integral part of the basin planning and management processes. The authors will then outline how the development of a Joint Platform, which for the first time brings the on-going development of the Procedures under the auspices of one body, addresses many of these governance challenges. The establishment of this Joint Platform as a standing body under the provisions of the 1995 Mekong Agreement, with well-defined functions and responsibilities and clear 'Rules of Procedure' will establish a sound basis for good governance in this regard. The authors will show that this ultimately ensures that the Procedures give effect to the core objectives and principles of the Mekong Agreement. The authors will show how this holds benefits for all the Member Countries, thus providing incentives for implementation.

5.1 Policy-governance perspectives

d) Asia: the Aral Sea case

Speaker: Dr. Vadim Sokolov, Regional Coordinator, Scientific-Information Center of the Interstate Coordination Water Commission of the Central Asia (SIC ICWC)



Vadim Sokolov is acting as the Deputy Director of Scientific-Information Center of the Interstate Commission for Water Coordination in Central Asia. He also holds the position of Director for the “IWRM – Fergana Valley” project, executed

under financial support from the Swiss Agency for Development and Cooperation. He is also the Regional Coordinator of the Global Water Partnership for Central Asia and Caucasus (GWP CACENA) and is an IWRA member.

Abstract

Central Asia includes territories of 5 post-Soviet Socialist Republics including Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan. It also includes the northern most part of Afghanistan. Challenges for water security in Central Asia could be grouped according to “type of problem” as some problems have a technical (technological) character that are easier to approach, but some problems revolve around “governance” issues which are most difficult to tackle.

Future intervention goals include, but are not limited to facilitating policy and governance mechanisms through wider Integrated Water Resources Management (IWRM) implementation. For example,

- reform institutional structure for water resources management with aim to subdivide functions – one section will be responsible for water delivery services, the other will oversee water use, while the third should provide control (inspection) of the first two. Division of functions will create stimulus for minimization of unproductive water losses;

- institutional set up for water delivery should be created only on hydrographic principles to avoid administrative pressure; and
- institutional set-up for water use and control could be organized within administrative boundaries, because economic and public activities are structured on an administrative basis in participating countries.

Preconditions for improved governance systems include;

- bottom-up policy-making avoid sectoral ‘hydro-egoism’, and puts process into a democratic practice with involvement the key stakeholders;
- investments for improvements of infrastructure will not be effective without adequate above-mentioned institutional reforms; and
- institutional changes without improvements of managerial instruments will not be also effective.

Parallel Sessions 5: The policy-governance, techno-economic and stakeholder perspectives of the nexus

5.2 Techno-economic perspectives

a) Economic aspects of the nexus: tradeoffs in the Ganges Basin

Speaker: Dr. Claudia Sadoff, Lead Economist, The World Bank



Claudia Sadoff is a Lead Economist at the World Bank, and Leader of the South Asia Water Initiative, which works towards cooperative management and climate change adaptation on the rivers of the Greater Himalayas. She has served as leader of the World Bank's global Water Resources Team, Coordinator of the World Bank Nile Team, and Economic Advisor on joint appointment to the International Water Management Institute (IWMI)

and the International Union for Conservation of Nature (IUCN). She was a founding member of the World Economic Forum's Global Agenda Council on Water Security and of the Water and Environment Federation's International Programs Committee. She is a member of the Global Water Partnership's Technical Committee and the Asia Pacific Water Forum's Steering Group on Water and Climate Change. She holds a PhD in Economics.

Abstract

The Ganges is the most populous river basin in the world, presenting both great opportunities and great challenges for its 650 million inhabitants. The river is rich in cultural and religious significance; ecosystem diversity ranges from the heights of Mount Everest to the world's largest mangrove system fringing the Bay of Bengal; it has vast power and agricultural potential – as well as the potential for devastating floods and droughts. It has long been thought that there is significant potential for multipurpose hydropower development in the Nepal Himalaya headwaters of the Ganges, and that these reservoirs could also be used to deliver significant downstream benefits in agricultural, flood control and ecosystems services. The Ganges River system is so large (over 1 million square kilometers) and so complex (with thousands of tributaries fed by glacier and snow melt, monsoon rains, and groundwater base flows) that it simply cannot be understood intuitively. To understand the water-energy-food nexus in the Ganges requires an integrated basin-wide perspective of future development options in the Ganges Basin.

The Ganges Strategic Basin Assessment (SBA) developed a set of basin-wide hydrological and economic models that examine the physical

dynamics of the basin including the surface water system, water balance, irrigation use, water quality, climate change implications, floods and glacier melt; as well as the economics of different potential developments in the basin, i.e., the magnitude of potential economic benefits, tradeoffs among uses, and the distribution of benefits from different developments options. The mosaic of information produced was used to examine alternative scenarios across a range of possible Ganges' futures.

The objective of the SBA was to build knowledge and encourage dialogue on the opportunities and risks of more cooperative basin-wide management of the river, and evaluate several critical questions related to the development in the Ganges River Basin, including: Is there substantial upstream reservoir storage potential in the basin? Can upstream water storage help control basin wide flooding? Can low-flows be augmented by upstream water storage? Are there good alternatives or complements to reservoir storage? How will climate change impact the basin? What is the magnitude of potential benefits? And what are the dynamics and tradeoffs across the water-food-energy nexus in the Basin?

5.2 Techno-economic perspectives

b) The 2011 Flood in the Lower Mississippi Watershed

Speaker: Mr. Timothy Stephen Gambrell, Executive Director, The US Army Corps of Engineers /Mississippi River Commission



Since 1999, T. **Stephen Gambrell** has served as Executive Director for the Mississippi River Commission. In this position, he participates with and acts on behalf of the President, MRC, and Command General, MVD. He acts as a contact with congressionals, MRC Commissioners, state officials, local organizations, and private interests. He serves as principal advisor to the Commission in administrative and legislative matters and manages Commission meetings, hearings, and inspection trips. Gambrell also serves on a team that

is building a collaboration that seeks solutions for the multiple demands on the vast and complex Mississippi watershed system.

Gambrell served as a construction engineer with the U.S. Army Corps of Engineers' Savannah District at Ft. Bragg, N.C.; Elberton, Hartwell, and Savannah, Ga.; and Belton, S.C., for five years before moving to Vicksburg. He also served as project manager for the construction of locks and dams on the J. Bennett Johnson Waterway.

Abstract

The USA has long recognized the value of the lower Mississippi Valley. Nineteenth century capitalists coined it the "Alluvial Empire" for its untapped potential, fertile lands, and abundant natural resources. Frequent and devastating Mississippi floods were the main impediments to the realization of that potential. Following the Great Flood of 1927, the nation united behind a bold vision to prevent another similar tragedy from happening again. The Mississippi River and Tributaries (MR&T) system that controlled the 2011 flood is the result of that vision. The MR&T system has prevented roughly one-half trillion dollars in damages prevented since its

inception. The estimated value of the total benefits to the nation is many times greater if consideration is given to the fact that not all can be calculated and captured in bland, one-size-fits-all formulas. Despite the overall success of the MR&T project, we have yet to realize the vast benefits of the Alluvial Empire, the additional under-developed resources of America's Great Watershed. The high-value economic engine in the heart of the country has been long overlooked, or undervalued, by many as a true difference maker in national and global collaboration and healthy competition.

5.2 Techno-economic perspectives

c) Transboundary Decision Support Systems

Speaker: Dr. Anthony Green, Senior Modelling Advisor, Information and Knowledge Management Programme MRC Secretariat, and Dr. Guna Nidhi Paudyal, Team Leader Water Resources Department DHI Group



Anthony Green is currently the Senior Modelling Advisor for the Mekong River Commission Secretariat in Phnom Penh Cambodia. As a Chartered Engineer and Environmental Manager, he has 28 years experience of river hydraulics, modelling and environmental assessment and real-world model applications. He has managed many water related projects and has extensive experience of large rivers such as

the Mekong in all the lower Mekong countries, the Ganges in Bangladesh, Indus in Pakistan, Thames Estuary and Broadlands in the UK and numerous smaller rivers. His interests include applied hydrodynamic modelling, research for river restoration, sediment modelling and the application of models to resolve planning and design issues. He has been involved with MRC projects to develop and apply Decision Support Systems since 2001.



Guna Paudyal holds a Ph.D. in Integrated Water Resources Management and post-doctoral training in design of hydraulic structures, modelling of water & environmental systems and climate change impact. He has built up some 30 years of academic and professional experience in multidisciplinary development

working mostly in South and Southeast Asia, with local authorities and donor agencies. His current professional interests and expertise are in integrated flood disaster management, river hydraulics, water resources management, water supply, and climate change impact studies and adaptation.

Abstract

A basin-wide Decision Support System (DSS) that promotes the sharing of a common pool of data, analysis and modelling tools and results can be a key instrument in addressing the transboundary challenges of food and energy production developments and is thus at the heart of the nexus. In creating an effective DSS the challenges of data, of linking multi-sector specialisms, and of differing levels of capacity and experience must all be addressed. In bringing the different parties together and working to create, use and improve a common system, potential areas of conflict can be reduced, resulting in a better understanding between riparian countries and water users.

To begin, features of DSS in various parts of the world with applications in river basins will be highlighted. This will include applications of DSS in Indian River Basins and for the Lower Mekong Basin, covering applications in water resources planning, flood management, environment, food and energy, as well as in real time operational forecasting and management. The emphasis will be on, the sometimes unexpected, experiences gained, and future directions for DSS.

5.2 Techno-economic perspectives

d) Navigation, water and environment

Speaker: Sub. Lt. Preecha Phetwong, Deputy Director General, Marine Department, Ministry of Transport of Thailand



Sub. Lt. **Preecha Phetwong** RTN is currently Deputy Director General of the Marine Department of the Ministry of Transport of Thailand. He supervises the Department's work on maritime safety and security, port development under regional/sub-regional cooperation frameworks, seafarers' education, training and certification, pilotage, ship registration, marine environment protection and international maritime affairs. His varied

experience includes the Fishery Department, Sanko Steamship Co. Ltd. and Waterway Transport Inspection Division (became the Marine Safety and Environment Bureau under the new Marine Department in 2002).

Sub. Lt. Preecha Phetwong RTN graduated from the Royal Thai Naval Academy in 1974 specialising in navigation and hydrography.

Abstract co-author: Captain Lieven Geerinck, CTA, Navigation Programme, MRC Secretariat



Captain **Lieven Geerinck** is a Master Mariner holding a Masters Degree in Nautical Sciences. Having been in command of maritime tankers, container vessels, bulk carriers and multi-purpose vessels around the world for twelve years, he returned to shore in 1994 from the private sector to take a position with the Ministry of the Flemish Community, Administration Maritime Affairs. In 1996, Lieven joined the MRCS, as a navigation specialist, and became the Unit Chief of the River Works and Transport. He managed the

Navigation Programme after the formulation of the MRC Navigation Strategy and is now Chief Technical Advisor. His contribution to the Navigation work for MRC included the formulation of the Navigation Agreement between Cambodia and Viet Nam that was signed in 2009, development of the 'Master Plan for Waterborne Transportation on the Mekong River System in Cambodia', installing the channel markers on the river, and establishing safety standards for the transportation of dangerous goods.

Abstract

Inland navigation is considered environmentally friendly compared to other means of transport. Less fuel is required to move one metric ton of cargo than road and rail and it is ideal for transporting large volumes of cargo; a single inland navigation vessel in Europe can carry the same volume of goods as 93 railway wagons or 173 trucks. Globally the inland waterway network remains under utilised, there is a real potential for developing carbon mitigation strategies and to ease increasing pressure on road networks. To realise its full potential inland navigation must form part of a modern multi-modal chain integrating maritime, road and rail networks and meet the highest safety and environmental standards to prevent pollution and reduce accidents. Riparian livelihoods depend to a large extent on the environmental health of rivers, lakes and wetlands; water quality is a key determinant of environmental health. Water quality is essential to maintain aquatic ecosystems which in turn provide vital sources of nutrition for local communities from capture fisheries, aquaculture and agriculture; water is used for local and bulk supply of drinking water. Oil spills and hazardous wastes are emerging threats to water quality from inland navigation. Ports, terminals and shipping are potential sources of point source pollution from operational spills, sewage, solid wastes and inadequate or illegal waste treatment and disposal of hazardous wastes.

Fixed facilities and vessels are major sources of oil spills in river basins; there is an increased probability of oil spills contaminating water supplies affecting public health and aquatic ecosystems. Once oil or liquid chemicals have been spilled they cannot be

completely contained and recovered. Whatever means are deployed to combat spills; some products will always escape recovery and remain in the aquatic environment. There are many cases documented around the world where pollution incidents have led to trans-boundary impacts. Globally RBOs have an important role to ensure harmonised standards for ports, terminals and vessels are implemented to enhance safety and environmental protection and to ensure effective emergency response mechanisms including incident notification, early warning and monitoring systems are established.

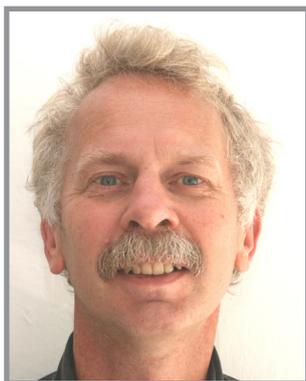
In the Lower Mekong Basin (LMB) elevated levels of heavy metals and inorganic pollutants in the water have been found in areas with significant navigation and/or with high population densities. In December 2010 the Mekong River Commission (MRC) Navigation Programme (NAP) commenced 'Risk Analysis of the Carriage, Handling and Storage of Dangerous Goods (DG)'. Further coordination in the LMB is required between at the regional level with all the national line agencies responsible for transport; environment and water resources to ensure sustainable development and enhance water quality monitoring of increased navigation activities including transport of DG, port developments, dredging and sand mining. Enhancing the legal framework, harmonising standards, institutional strengthening, identifying carbon mitigation measures, trans-boundary EIA and coordinating regional emergency response are important roles for the MRC to play as a RBO in the inland navigation sector.

Parallel Sessions 5: The policy-governance, techno-economic and stakeholder perspectives of the nexus

5.3 Stakeholder involvement

a) Stakeholder involvement- Promoting dialogues for stakeholder involvement in trans-boundary water resources management

Speaker: The nexus multi-stakeholder dialogue, Mr. Frank van der Valk, Project Director, Bangladesh-India Initiative, IUCN



Frank van der Valk is Project Director of IUCN's Ecosystems for Life: A Bangladesh-India Initiative. He is currently based in Dhaka, Bangladesh. The Initiative aims to promote civil society dialogues for sustainable management of trans-boundary water regimes in South Asia. Frank holds a M.Sc. in Environmental Chemistry and a B.Econ. He has worked in

international water management and sustainable development since 1986, at first for the Dutch government, later for international NGOs such as Oxfam Novib, where he was the Head of Advocacy and Strategic Advisor for China, and most recently as Chief Operations Officer of Wetlands International before he joined IUCN.

Abstract

Transboundary water resources management processes are invariably complex and conflict-prone. Early and strategic engagement of a wide range of stakeholders can help achieve better management outcomes, prevent or reduce damaging conflicts and increase the benefit sharing achieved. It should not be seen as a straight-forward linear process of shared visioning, consensus building, institution building, identification of interests, and engagement. Rather, the complexities of stakeholder engagement suggest a mosaic of approaches and sub-stages, often overlapping according to who is being brought into the process, when, and how.

Transboundary water governance involves a wide range of stakeholders ranging from political leaders and policy makers through sectoral interest such as water storage and delivery authorities, community-based water user associations, farming communities, fishing communities, navigators, ecologists, urban and rural dwellers, and the energy and security sectors to universities, research institutions, international organisations, and river basin organizations and the media. An important way of getting all these stakeholders on board for effective water management is through dialogue processes.

Civil society has a large potential to organize such multistakeholder dialogues to build platforms for generating knowledge and mutual trust for settling issues or resolving disputes. While the actors in such processes remain outside the government or state apparatus, it is of prime importance to establish and maintain links to government agencies to keep these informed and feed into governmental processes. Dialogues should be designed to develop a long term relationship between various stakeholder groups within the country and between the countries and initiate the consensus building process on critical trans-boundary issues. Involvement of media representatives can be very important in view of their role in providing communication opportunities between various stakeholder groups. The IUCN Ecosystems for Life: A Bangladesh-India Initiative aims to initiate civil society dialogue processes between Bangladesh and India for sustainable management of trans-boundary water resources. An over-arching purpose of the dialogues is to develop a shared vision for effective and integrated management of trans-boundary water regimes in the region.

5.3 Stakeholder involvement

b) The role of the private sector

Speaker: Mr. Nicolas le Clerc, Director in the Project and Structured Finance Team ANZ



Nicolas Le Clerc is a Director in the Project and Structured Finance Team at Australia and New Zealand Banking Group Limited. He joined ANZ in 2006.

Prior to joining ANZ, he accumulated over 8 years of experience in

Asian energy project finance and investment banking while working at SMBC, CSFB and Banque Paribas. During the past 14 years, Nicolas has specialized in Asian power sector projects and he has acted both as lead arranger and financial advisor in a number of relevant transactions.

Abstract

Equator Principles at the Crossroad - the Equator Principles, launched in 2002 by the IFC and a group of North American and European banks, have had a successful start. In Asia, however, adoption by local financial institutions has been slower than in other regions. Four years after the beginning of the financial crisis, the relevance of the Equator Principles is increasingly in question, particularly in Asia, as Asian financial institutions make large market share gains on their European competitors. To remain relevant, the Principles will have to evolve in their content and gain wider acceptance among Asian financial institutions.

5.3 Stakeholder involvement

d) Africa: the Nile case

Speaker: Mr. Wesley Chirchir, Vice Chairperson, The Nile Basin Discourse (NBD)



Wesley Chirchir is the Vice Chairman of the Nile Basin Discourse (NBD), a regional network of civil society organizations established to facilitate and support civil society involvement and participation in the planning, implementing and monitoring of development processes in the Nile Basin Region. Its primary focus is on the Nile Basin Initiative (NBI) and sustainable socio-economic developments in the Region.

Wesley Chirchir is a holder of an MBA (International Public Service)

from the University of Birmingham, UK as well as a Post Graduate Diploma in Development (Public) Administration. Presently he is the Director of the Wareng Institute: a training and research institute that works on the promotion of peace building, democracy and good governance. The Institute supports democratic processes at the local level by ensuring that political participation by the population is an important element in a country's democratic development.

Abstract

The most outstanding socio-economic development challenges facing the Nile Basin region are food insecurity, limited access to water, sanitation and energy shortage. While these issues are interrelated, food security and climate change assumes a greater dimension at both national and regional levels. It is widely recognized that many Nile countries are vulnerable both to climate change and increased climate variability, which in turn affect water availability and energy security within the region.

Lack of access to modern energy services is a major factor for the slow progress in poverty reduction and attainment of other millennium development goals in the basin. Sadly, the poorest segments of the population often pay the highest costs (in money, time, and health) for the worst-quality energy services.

The presentation reveals the situation for obtaining food security and compares the main causes of food insecurity amongst nine Nile Basin countries, and the contribution of a lack of proper utilisation of water

and lack of access to clean energy sources to spur and boost economic growth and food security.

The presentation will pitch for the role and power of civil society and local CSOs in influencing the policy debate on the water, energy and food security as a nexus issue, thereby ensuring a policy paradigm shift that reflects and responds to the needs of the people, particularly poor farmers, pastoralists and fishing communities in the basin.

Given its major regional status in Africa, NBD is positioning itself to address these issues within Nile basin region. In order to do this effectively, considerable civil society and stakeholder input will be required from the local levels where the brunt of climate change impacts are likely to be felt. In addition, local communities must have improved access to information about current understanding both of how climate change might affect them and of the options for diminishing its adverse effects.

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