FROM THE CHAIR: SUPPORTING A REFRESHED NATIONAL WATER INITIATIVE Supporting a Refreshed National Water Initiative



From Greg Claydon, eWater Limited Chair and Independent Director

There has been long recognition of the importance of building knowledge, capacity and capability if we are to have an efficient and sustainable water industry in Australia. That has often been inferred and regularly stated during Australia's water reform journey. There are likely varying views among stakeholders regarding the extent to which such recognition and importance have been underpinned by adequate resources and actions.



eWater Group regards the building of water knowledge,

capacity, and capability, especially in hydrological modelling and other decision support tools, processes and products within the Australian and international professional water management community, as fundamental to our mission, subject to resource practicalities.

Australia's Productivity Commission is currently undertaking an inquiry into the reform progress of Australia's water resources sector. This inquiry, which follows reports of previous inquiries by the Productivity Commission in 2017 and 2020, is expected to provide advice about the progress of all Australian governments in achieving the objectives, outcomes and timelines anticipated under the 2004 Intergovernmental Agreement on a National Water Initiative (NWI) and, where practicable, on key aspects of water security for Australia.

The Productivity Commission has noted that reform of the Australian water sector has been ongoing over several decades, reflecting the fundamental importance of water to all aspects of our society and environment, and the significant challenges involved in managing a shared natural resource impacted by climate change and periods of

scarcity.

Water reform at a national level accelerated in 1994 when the then Council of Australian Governments (COAG) agreed a water reform framework. That framework recognised that decision making should be determined on the best available scientific information. Although not expressly stated in the framework, it was also recognised at the time that knowledge, information and understanding about Australia's water resources needed to improve. That was being supported through the Cooperative Research Centres program, among others, including the CRC for Catchment Hydrology (CRCCH) and the CRC for Freshwater Ecology (CRCFE).

In 2004, COAG agreed that the NWI include knowledge and capacity building as a key element to assist in underpinning implementation of the agreement. Supporting that, further requirements, identified by the earlier work of the CRCCH and the CRCFE and others, lead to the establishment of the eWater CRC in 2005. These CRCs provide the heritage for eWater Ltd, a not-for-profit (and also a "not-for-loss"!) company owned by all Australian Governments, to, among

other things, be the trustee of the intellectual property developed through the investment under the CRC and other programs of well over \$100 million of public money.



In 2008, COAG agreed that a National Hydrological Modelling Strategy (NHMS) was needed to support better water planning and management in Australia, including to support implementation of the NWI. A key output and product of the NHMS has been the adoption of the eWater Source hydrological modelling platform as the National Hydrological Modelling Platform (NHMP).

eWater Group is the custodian and manager of Source. We are also the custodian and manager of other important

software-based hydrological modelling tools and services, including eWater MUSIC, the urban stormwater modelling product used by more than 120 Local Governments across Australia to support their decisions about urban developments. As a part of these roles and responsibilities, we aim to ensure the security and integrity of these tools are guaranteed and satisfy industry standards and government cybersecurity requirements.

Source, as the NHMP, has been integral to many governments', and their agencies' and utilities', decision-making processes for sustainable water resources planning and management; granting of water entitlements and announcements of water allocations; assessment of water security and water infrastructure developments; and, increasingly, river and water infrastructure operations and compliance activities. These may be multi-billion-dollar decisions, so Source system performance, reliability and resilience are fundamental for it to be "fit-for-purpose".

Source provides an integral tool to link science to help inform water policy, planning, management, operations, accounting, and compliance. Importantly, water policy, planning, management, operations, accounting, and compliance are adaptive in the Australian context. They need to be, as our population, climate, land uses, water using behaviours and community expectations and attitudes change. So too then, Source has to be adaptive, and it needs to have proper upkeep, modernisation and maintenance as a critical asset to support decision making.



Arguably, the same is true for water reform in Australia. So, in that respect, it is pleasing that the Australian Government has committed to renew the NWI. No doubt, that renewal or "refreshing" will be informed by the report of the Productivity Commission's inquiry. Hopefully, that includes a commitment to a culture of evidence-based decision making, innovation and continuous improvement to underpin successful implementation.

Adaptive management is not possible without adequate modelling of Australia's water resource systems and their interconnections. eWater Group wants to continue to have Source develop and evolve as the needs of our government owners, customers and communities evolve and as methodologies and technologies change and improve. Of course, to do that well requires adequate and responsible funding to meet necessary and efficient costs.

As I have mentioned previously, there are pressing imperatives to address our increasingly variable and changing climate in coherent and effective ways; to better integrate our approaches to water management, including between water quantity and water quality, surface water and groundwater; land use planning and water planning, water use and energy use, and other nexuses, recognising the water "cycle" and how water policy and programs "seep" into many other policy and program areas; and to meet cultural water provisions and the rights, needs and aspirations of First Nations people in water management. These and, no doubt, other matters will need to have a place in a renewed NWI. Similarly, to support future decision

making and implementation, they should be considered integral to updating and modernising eWater's hydrological modelling and other decision-support tools, processes and products.

THE
AUSTRALIAN
WATER
PARTNERSHIP

It is also instructive to note that activities under the Australian Water Partnership (AWP), managed by eWater Group with funding provided by the Department of Foreign Affairs and Trade (DFAT), involve the building and sharing of knowledge about water reform through capacity building activities with regional water organisations, industry sectors and civil society, especially in the Asia-Pacific, by supporting access to Australian water reform policy, management expertise, and innovative approaches and technologies. So, how we go about water reform in Australia has implications beyond our shores. But more about the AWP in a future

article.

In any event, to have an efficient and sustainable water industry, it continues to be important to invest in science and knowledge, skills and capacity and decision-support tools, processes, and products and to build capabilities in using them efficiently, effectively, equitably and respectfully. eWater Group looks forward to supporting a refreshed NWI on that basis.

Who are we?

Jointly owned by all Australian governments, eWater Group provides stewardship, management, development, enhancement, skills-building, research, access, and transparency in water management and modelling tools, capability, and capacity.

We do this in the interests of our government members, stakeholders, clients, and customers and on behalf of the Australian people who have invested in us.

At eWater Group, and through our divisions, eWater

Solutions and the Australian Water Partnership, support governments, organisations, and water managers to use our tools and products, expertise, and international development program management capabilities, including in their pursuit of integrated water resource management objectives and poverty reduction.

AUSTRALIA AND THE ASIAN INSTITUTE OF TECHNOLOGY COLLABORATE WITH LAO PDR ON WATER MODELLING

Australia and the Asian Institute of Technology collaborate with Lao PDR on water modelling

This week, officials from the Lao People's Democratic Republic are working with modelling experts from Australia and the Asian Institute of Technology to exchange knowledge on how water modelling can be used to build climate resilience.

Both Australia and Lao PDR share the challenge of high variability in available water, despite the seasonality of water availability being very different in the two countries. Modelling provides one mechanism for understanding existing water availability and use, and how this may change into the future.

Experts from Western Sydney University, the Asian Institute of Technology, National University of Laos, and eWater Solutions are providing training in water modelling, data analysis, and equitable water management. Led by Western Sydney University's Dharma Hagare, the training draws on the experience and understanding of water management in Lao PDR through co-delivering with knowledge brokers from the Department of Water Resources and Lao National Mekong Committee Secretariat.



Funded by the Australian Government's Department of Foreign Affairs and Trade through the Australian Water Partnership, the training comes at an important time with Lao PDR's Ministry of Natural Resources and Environment currently delivering on its mandate to develop river basin plans across the country.

One of the models included in the training is the Australian

eWater Source model at the direct request from the Government of Lao PDR. eWater Source is Australia's National Hydrological Modelling Platform, which supports utilisation of available data and best practice science to support water management and planning.

Mukta Sapkota, Hydrologist, eWater Solutions, helped run a customised training program focusing on the applications of eWater Source in Laos.



"These training sessions in water modelling are crucial to assisting Lao PDR's water departments. They are an essential tool for planners and decision-makers for planning and developing resilient and sustainable infrastructure,

taking into consideration future flood risks associated with changing climate as well as projected development of irrigation and hydropower, expansion of urban areas, population, and land use changes," Ms. Sapkota said.

"By using water modelling tools, like eWater Source, local water managers can develop a more informed understanding of current and future river basin flows and water availability to guide infrastructure development and the supply of water for agriculture and energy generation."

The training is an important component of the broader collaboration between the Government of Lao PDR and Australia, and we were delighted to have participants from within Lao Ministry of Natural Resources and Environment, including the Department of Water Resources, Department of Hydrology and Meteorology, Lao National Mekong Committee Secretariat, and the National University of Laos.

Laura Beckwith, Mekong Coordinator, Australian Water Partnership, said "AWP seeks to build partnerships between Australian technical experts and partners in the Asia Pacific

to facilitate this type of knowledge exchange."

"This shared learning about successes and challenges related to water management in Australia and the Mekong, strengthens... [our collective] ability to deliver on the sustainable and resilient management of water resources, in the context of climate change."



MEKONG RIVER COMMISSION REGIONAL STAKEHOLDER FORUM eWater Group attends the 13th MRC Regional Stakeholder Forum

The impact of climate and human activities in the Mekong River Basin continues to have a detrimental impact on the lives of millions of people and communities in the region and requires experts across government, the private sector and community organisations to work together for a sustainable future.

eWater Group was delighted to participate in the recent 13th Mekong River Commission Regional Stakeholder Forum, in Luang Prabang, Lao PDR, with representation from Trudy Green, Hydrology and Partnerships Lead, and Dr Paradis Someth, Principal Hydrologist.

A highlight of the forum was the release by the Mekong River Commission and Lancang-Mekong Water Resources Cooperation Center (LMC Water Center) of the Phase 1 findings on Changing Hydrological Conditions of Lancang-Mekong River Basin and Adaptation Strategies. We congratulate the MRC and LMC on this significant achievement.

For eWater, the Forum provided an opportunity for all stakeholders to contribute to the outcomes of the Joint Study and engage in insightful conversations with our partners in the Mekong.

Trudy Green, Hydrology and Partnerships Lead, said:

"Attending the workshop was a fantastic opportunity to understand the diversity and complexity of issues in the Mekong Region and will allow eWater Group to continue to improve and refine the technical support we provide to the MRC and the Member Countries."

At this regional forum, we were excited to reconnect with our valued Mekong partners, including Mekong River Commission Secretariat, National University of Laos (NUoL), Lao Department of Water Resources (DWR), Laos National Mekong Committee (LNMC), Cambodia National Mekong Committee (CNMC), Thai Office of the National Water Resources (NOWR), and Viet Nam National Mekong Committee (VNMC).

eWater Group is thrilled to offer a world-class water resource modelling tool, empowering transboundary water management.

Learn more about the Forum > https://www.mrcmekong.org/news-and-events/consultations/regional-stakeholder-forums/mrc-rsf-13/

To read more about the MRC Joint Study >
https://www.mrcmekong.org/news-and-events/news/pr-2023
0910/?fbclid=IwAR3wAhpldrLocWbuwyksmsMcER3S5efCBwf
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A RECAP ON MODSIM 2023

With MODSIM 2023 now done, we are taking the opportunity to recap our time at this critical conference and how important it is for modellers from a diverse range of fields to showcase the latest science and technology and how it is applied by the global water modelling and community.

Last month, Darwin played host to the 25th International Congress on Modelling and Simulation – otherwise known as MODSIM – where modellers from across Australia descended on the balmy city to talk about water modelling, including

the use of emerging technologies to improve modelling practice and the use of modelling to find new solutions to solve the growing impact of climate change in our waterways and environment.

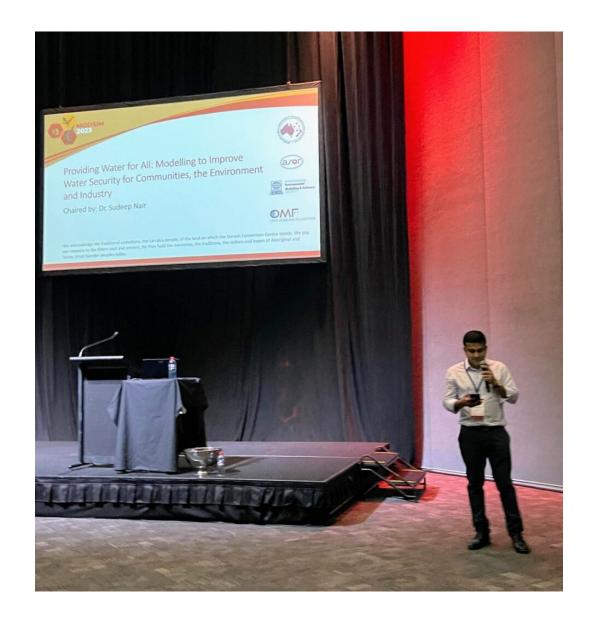


eWater Group Hydrologists, Dr Jin Wang and Sudeep Nair represented our organisation at MODSIM, where we were a sponsor, to facilitate sessions related to hydrological modelling and showcase the new functionalities of Australia's National Hydrological Modelling Platform, eWater Source, and how it helps water managers to meet the changing needs in water resources management.

Sudeep said "it was great to see how various users unravel the many facets of eWater Source and understand how it is helping the users to achieve their objectives. We heard their experiences and feedback, which helped us to understand the strength of Source as a hydrological modelling tool and areas for potential enhancement."

"MODSIM was also a great opportunity for us [hydrologists] to introduce eWater Source to a wider audience who were not so familiar with the tool, and a chance to update ourselves on the latest trends and techniques in water and environmental modelling."

One of the more interesting observations from our hydrologists was from other presenters at the conference who demonstrated the versatility and agility of Source as a hydrological modelling tool and how modellers were using it for bespoke applications.



"One of the many advantages of eWater Source is that it can handle both water quantity and quality aspects and has many functionalities specific for Australian purposes," Sudeep said.

With any science-based software and technology tools, there is also room for improvements in areas such as stability, accuracy, and performance improvements, and eWater

Group is diligent in improving our software platforms to enable our owners, partners and water experts have an enriched user experience.



For our hydrologists, Dr Wang and Sudeep Nair, MODSIM provided a great back drop to generate interest and discussion on hydrologically modelling methods in general

and eWater Source in particular.

Both Sudeep and Dr Wang co-presented a session with Rachael Holden from Power and Water Cooperation: Providing Water for All: Modelling to Improve Water Security for Communities, the Environment and Industry, which helped spearhead conversations on the impact of water modelling to inform decision-makers and the role of eWater Source.

To read the full abstract from Sudeep Nair > https://lnkd.in/eDzNiybjhttps://ewater.org.au/3443-2/ and for Samira Azadi (who was unfortunately a last-minute cancellation) > https://ewater.org.au/3443-2/.

Conferences like MODSIM play a significant role in the water space. It is an avenue for learning, networking, and informing of the latest research and modelling outcomes in Australia and beyond; and an important opportunity for eWater Group and our people to showcase who we are and what we are doing to address the new challenges in the hydrological modelling realm.

Who are we?

eWater Group is owned by the Australian Federal, State and Territory governments to further develop Australia's world-class modelling tools and to provide support and training nationwide and internationally.

Our organisation is comprised of three divisions – eWater Solutions, the Australian Water Partnership and the Mekong Water Solutions to deliver water management solutions for communities in Australia and overseas.

We also partner with the Australian Department of Foreign Affairs and Trade, and research groups and institutions to provide expertise and support for sustainable water management solutions in Australia and internationally, now and into the future.



MEET CHANNPISEY NOP, MEKONG WATER SOLUTIONS Channpisey Nop, Irrigation Engineer, Mekong Water Solutions

Water sustainability and scarcity is a real challenge for communities around Australia and internationally every single day. At eWater Group our role is to provide governments, decision makers, water managers, researchers and modellers the tools and expertise to make the right decisions when it comes to protecting our most precious

resource: water.

Our people are multi-talented and made up of hydrologists, software developers, water industry experts, international development professionals, and innovators, with a strong commitment to supporting sustainable water management.

Our reach is far and wide within Australia and internationally. eWater Group is responsible for the management of three divisions – eWater Solutions, the Australian Water Partnership, and Mekong Water Solutions.

Mekong Water Solutions, which is funded by the Australian Government, works closely with the World Bank, the Asian Development Bank, and the Royal Cambodian Government, with the skills and tools necessary to provide sustainable and accessible water to communities, farmers and industry across the region. We do this through innovative solutions, collaborative partnerships, and with local knowledge at the heart of everything.



Channpisey Nop, Irrigation Engineer, Mekong Water Solutions, is responsible for water balance analysis for irrigation system design, and water management system for river basins in Cambodia and brings a special understanding of how important of river managements are to the people of Cambodia.

With an Engineering Degree in Water Resources and Rural Infrastructure supported by the Asian Development Bank from the Institute of Technology of Cambodia, and a master's degree in water resources engineering with a Japanese Government scholarship from Kyoto University, plus years of experience in water resources engineering and infrastructure in both Japan and Cambodia; Channpisey brings a wealth of knowledge to Mekong Water Solutions.

"I am grateful as a specialist on water resources engineering because I have a chance to share my knowledge and experiences for the development of water resources in Cambodia and in the Mekong region or even internationally through Mekong Water Solutions."

"I enjoy going to the field to study the real issues that provide a better understanding to solve those problems. The main inspiration for my role is when I can directly support the farmers who could get benefit from our work."

One key project Channpisey has been part of is the World Bank Cambodia Water Security Improvement Project which is focused on improving water security and increasing water productivity in river basins in Cambodia.



"This project is a real challenge for us [Mekong Water Solutions] to deliver quality work and solutions for our partners and safeguard water availability for Cambodia's economic development – it is a very important project that will ensure water security for the whole of Cambodia."

Water scarcity is a major concern for the region which faces many challenges including the reliability and variation of water flow, erosion, and of course climate change.

"Mekong Water Solutions with technical support from

Australian expertise in combination with local experiences could effectively solve water issues in the country and in the region. We have many tools developed in Australia that can help with in-country issues such as eWater Source."

eWater Source is Australia's own National Hydrological Modelling Platform, developed over thirty years and underpinned by world-class science and technical innovation to provide real-time information on water scarcity and resources. eWater Source is used by governments, decision-makers, water managers, modellers and researchers, in Australia and internationally.



Channpisey is a real champion of support more women and girls into the water sector in Cambodia and in the life of

society.

"The woman performs the role of wife, partner, organizer, administrator, director, re-creator, disburser, economist, mother, disciplinarian, teacher, health officer, artist, and queen in the family at the same time. Apart from it, woman plays a key role in the socio-economic development of society."

"Globally, women have become engines for economic growth. Achieving gender diversity in enterprises is of critical importance to improving business outcomes. Women are often under-represented in the academic and professional fields of engineering, and not enough women have contributed as much as they should be able to the diverse fields of engineering historically and now."

"For example, at Mekong Water Solutions, I am the only female engineer, so more work needs to be done to support more women and girls in engineering, but we are committed to doing that."

"We need to encourage women and girls to feel supported to

be innovative in the water space, need more value from people around them for their skills by providing more benefits for their hard work, encouraging them to believe in themselves."

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MEET SAMIRA AZADI, HYDROLOGIST

Understanding the movement of water in rivers, lakes, dams, and seas, together with the effects of climate change on an increasingly changing environment requires a wealth of knowledge... and a Master's or other higher degree can help.



Meet Samira Azadi, one of our hydrologists with a Masters in Water Engineering from Iran's Shiraz University and a Master of Philosophy (MPhil) in Civil Engineering – Water and Environmental – from the University of Newcastle. As an experienced Water and Environmental Engineer, Samira plays a key role in supporting our National Hydrological Modelling Platform, eWater Source.

After completing her MPhil, Samira decided to make Australia her home and moved to Canberra to join eWater Group in 2021 and has been making her mark ever since.

"I wanted to live in Australia because I found Australians are very friendly and welcoming. It feels like a big diverse community. I love that we love our jobs, but it is part of what we do, not everything we do. There is so much more to explore."

For Samira, working as an eWater Group Hydrologist, enables her to continue her passion for hydrology and eco-hydrologic modelling, and offering support and advice to our partners across each state and territory to deliver innovative solutions to support sustainable water for cities and communities across Australia and the world.

"I love my job. I am passionate about what I do. And if I want to describe eWater in only one word I would say eWater is a dynamic organisation."

"I am able to learn new things every day, and share my knowledge and experience with my colleagues, including fellow hydrologists and developers, but also support our partners to deliver water solutions for their communities."

"My fellow hydrologists empower me and create opportunities for me to learn so I can be the best at my role. I love that my team is so supportive."

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"I think eWater Source is an incredible tool. Being the national hydrological platform means that everyone is getting consistent data and information to make informed decisions about hydrology, catchments, and river systems."

"From the moment that the first raindrop comes from the sky to where it lands and how it seeps through the soil, we can show our partners this critical information through dynamic data. This helps them make the right decisions regarding how our water resources are used and where."

Source helps water experts with all climates and environments and is adaptable and readily updated to include new policy, data, knowledge, and management approaches. It offers the flexibility and ability to link to new and existing models and other information systems; and has been built in partnership with governments, industry, and research organisations.

For Samira the critical issue facing water sustainability and hydrology is data, and ensuring we continue to have the right data with real-time information for our partners and clients. By continuing to invest in Source, we can deliver the best information available to make the right decisions to enhance our ability to manage water sustainability, scarcity, and resilience.

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UNDERSTANDING THE WATER RESOURCES OF THE AYEYARWADY BASIN, MYANMAR

The Ayeyarwady River is Myanmar's largest and most commercially important river but its water resources are not well understood.

With the support of the Australian Water Partnership, the Government of the Republic of the Union of Myanmar commissioned the first integrated assessment of the natural resources of the Ayeyarwady Basin. eWater lead the surface water assessment for the State of the Basin Assessment (SOBA).

The Ayeyarwady Basin

With an area of just over 675 000 km², the Republic of the Union of Myanmar is the second largest country in South-East Asia, after Indonesia.

The Ayeyarwady River starts in the Himalayas, flowing for approximately 2 000 km in a north-south direction through Central Myanmar. The river basin has a total area of 413,700 km² and covers about 61% of Myanmar. About 5% of the Basin extends into the neighbouring countries of India (to the west) and China (to the east).

The Ayeyarwady River Basin is dominated by a monsoonal rainfall regime, associated with the south-western Indian monsoon. It is also affected by convectional systems and cyclones from the Bay of Bengal. Groundwater flows to the streams and snowmelt from the northern regions are also important contributions to basin flows.

The Ayeyarwady River Basin is still a relatively undeveloped basin. Like the majority of Myanmar, most of the Basin is

characterized as rural, with agriculture the main use of water.



Ayeyarwady River, view from Bupaya bagan (credit: tuanjai62/ Adobe Stock)

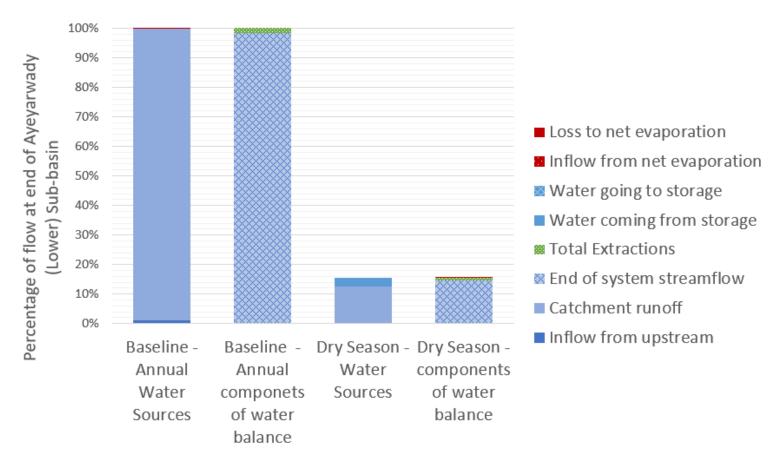
Project overview

The SOBA provides a baseline assessment of the basin's water and other natural resources, from which future management options can be compared against.

eWater developed a preliminary baseline Source water system model for the Ayeyarwady Basin (north of the delta), from which a baseline assessment of the basin's surface water resources was undertaken.

The model is run with historic climate data for 1982 to 2016, land use in 2014 and storage capacity in 2016. It represents agriculture, domestic, urban and hydropower water use.

For the first time, the baseline assessment gives water managers a description of the hydrology of the Ayeyarwady River Basin according to 5 Hydro-Ecological Zones and 13 sub-basins, significantly increasing the understanding of both water availability and water use in the basin. For example, in the figure below, we can see the different components that contribute to flow at the end of the system as an annual total and during the critical dry season, it shows how much water is provided by different sources and how much of this water is used or lost to evaporation.



Flow components at the end of the Ayeyarwady Basin, annually and in the dry season

The water system model is a first cut at drawing together the information required to adequately understand and simulate the complexities of the Ayeyarwady River Basin. The baseline model will be a key tool to support the future management of the basin's water resources, making it possible to:

 Combine outputs from the model together with observed values, to provide an overall assessment of water availability and uses across the Ayeyarwady River Basin.

- Understand baseline water availability and use, to support the ongoing assessment of the Basin's water resources and to examine possible future scenarios and possible implications, for example with climate change or increased agricultural use.
- Simulate components of the hydrological cycle at locations where observed values are not available.
- Identify information gaps and inform future data collection initiatives.

Scoping Study

Following the completion of the SOBA, eWater was engaged to undertake a scoping study of potential development options for the mainstream of the Ayeyarwady River and tributary flows. The study was also supported by the Australian Water Partnership.

The scoping study sought to demonstrate how water resource models can be used to assess management scenarios and provide valuable outputs to support

stakeholder consultation.

The surface water system model was adapted to allow it to provide information on the likely changes in the Ayeyarwady mainstream and tributaries from different development scenarios. The scoping model can assess the likely flow changes from different development options, to consider the impact on water dependent outcomes such as irrigation, hydropower production, surface water flow heights and and flood magnitude. It is not intended to evaluate specific development proposals.

The scoping model was used to compare a High Development Scenario of hydropower on the tributaries and some irrigation development in the Central Dry Zone against a baseline scenario. The baseline scenario included 'current' irrigation demand and hydropower dams representing 2000 megawatts of hydropower, it does not include some 30 irrigation storages where data was not available.

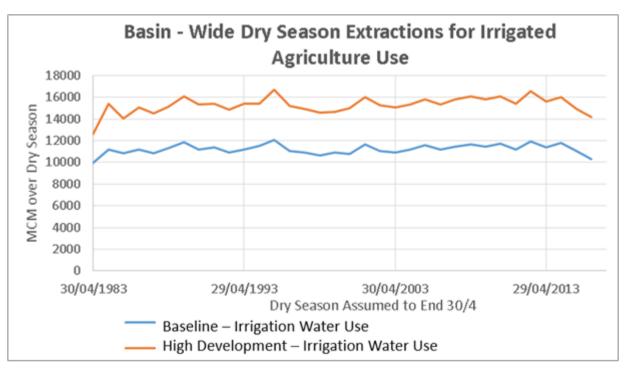
The results compared include:

· Change in hydropower generation on an annual and

seasonal basis, inter-annual variability was also assessed.

- Agriculture water use and availability assessed on an an nual and inter-annual basis.
- An assessment of changes to hydrographs at Sagaing,
 Pyay and Monywa, including changes in flow volume as well as surface water level.

An example of the scoping model outputs is shown below. In this, dry season irrigation extraction under the baseline and high development scenarios are compared.



Dry season demand for water under the baseline and high development scenarios.

Capacity Building

eWater conducted face to face training programs to introduce water managers in Myanmar to the principles of hydrological modelling and the use of Source. The training used the new Ayeyarwady Source model, providing participants with hands-on experience in the use of the model.



eWater's Geoff Davis presenting Source training in Myanmar