



# NEXUS DIALOGUE ON WATER INFRASTRUCTURE SOLUTIONS

Building Partnerships for Innovation in Water, Energy and Food Security



The Nexus Dialogue on Water Infrastructure Solutions is a call to action to those leading transformations in water infrastructure planning, financing and operation. The Nexus Dialogue will be future-focused. It will use experience in operating and optimizing infrastructure to set state-of-the-art, support building of investment pathways and enable novel partnerships needed to accelerate action worldwide on water infrastructure solutions for the water-energy-food security nexus.

Water, energy and food security rely on water infrastructure. Recognition of the closely bound interaction between water, energy and food production and use – the nexus – has led to new demands for water infrastructure and technology solutions. The vision is coordinated planning,

development, optimization and operation of portfolios of water infrastructure for benefits across sectors, including combinations of man-made infrastructure and technology with nature-based infrastructure. Solutions will bridge divides – among agriculture, ecosystems, energy, industry and cities – and strengthen the resilience of economic growth.

Improved practice is making this vision achievable, but solutions and success stories are not widely known or shared between sectors. The Nexus Dialogue on Water Infrastructure Solutions will bring together the key actors required for building new investments in innovative water infrastructure and technology that address the inter-dependencies of water, energy and food.

## Activities

**State-of-the-art knowledge.** Contributions are invited on best practices, guidelines, tools and technologies relevant to the operation and optimisation of water infrastructure to enable inter-sectoral and inter-regional exchange.

**Anchor workshops.** A series of three regional workshops – in Africa, Asia, and Latin America – will bring together innovators and thought leaders from the water, food and energy sectors.

**International conference on nexus solutions.** The Nexus Dialogue will culminate in the 2014 International Conference on Water, Food and Energy. The conference will feature the state-of-the-art in water infrastructure and technology solutions for optimization across the nexus.

**Coalitions for action.** The Nexus Dialogue is outcome-oriented and forward looking. The process will actively move existing policy concepts at the water-food-energy nexus into actionable programmes, investments and commitments.

## The Dimensions of the Nexus Challenge

The Water-Energy-Food Security Nexus represents a shift in thinking. It moves a sectoral approach to managing key resources into a new focus on integration of sector-based systems. Doing so enables us to better understand and manage the impacts of and linkages between water and the production and use of energy and food. As the demand for energy and food continues to grow, we have become increasingly aware that water is integral to ensuring food and energy demands can be met. Agriculture uses 70% of the world's water to irrigate only 20% of the world's cropland, yet produces 40% of all food. The energy sector is responsible for withdrawing 8% of all the world's water, and in some cases up to 40% as in the USA. Food and energy production are inextricably linked to, and dependent on the availability of and access to water resources. With growing demand and shrinking availability of natural resources, more needs to be done to develop and mobilize unconventional ways to produce and deliver water to fields, powerplants, industries and cities.

Equally, moving, storing and cleaning water is an energy intensive process. Often the entry point into developing or expanding existing energy generation, irrigation, or even public water supply systems is through infrastructure. Infrastructure helps to unlock the value water resources bring to societies, but can also contribute to the degradation of natural ecosystems, impacting downstream production and people. Consequently, the nexus - the links and impacts among water resources, food production, and energy generation - creates the opportunity to work across sectors to ensure the best management and infrastructure principles are applied for a more water secure future.

IUCN and IWA offer a space for the linkages across water, energy and food to be discussed through the Nexus Dialogue. The Dialogue will help to identify and share water infrastructure and technology solutions for the Water-Energy-Food Security Nexus. More complete and broad cross-sectoral thinking is required to deal with the challenges around water, energy and food production efficiencies, trade-offs, and cross-sectoral impacts. The Nexus Dialogue on Water Infrastructure Solutions will provide a forum for sharing experiences, lessons, tools and guidelines on how portfolios of water infrastructure and technologies can address nexus challenges. It is designed to build a common understanding of innovative planning, management and operational approaches that provide shared benefits across sectors. It will share ways forward for optimizing both man-made and nature-based infrastructure and technologies and create both short-term benefits and long-term sustainability.

Innovative professionals in farming, energy-production, natural resource management, and engineering have the experience and hold solutions to address the nexus challenge. Working



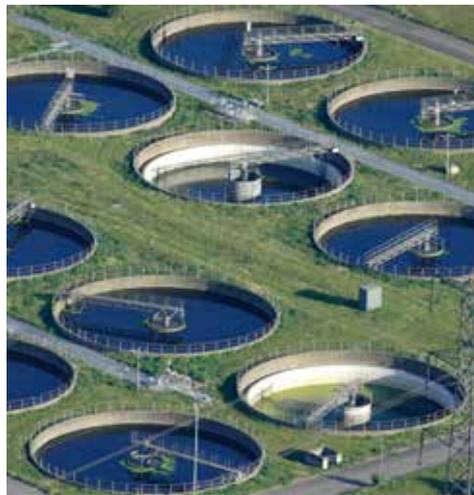
across sectors, the Nexus Dialogue provides a unique opportunity to share these experiences and the solutions emerging around the world.

## Water Infrastructure Portfolios in the Nexus Dialogue

The Water-Energy-Food Security Nexus ties three mutually dependent securities together. Their inter-linkage is not new, but vitally important in our changing world. With population increase, land-use changes and climate change having rapid and drastic impacts on water resources, the management and governance of water resources needs to be approached in a coherent and improved cross-sectoral way, across scales and with a sense of urgency.

At the heart of the nexus debate are water infrastructure and technology. How is water infrastructure currently being used? What technologies are available to optimize across water supply sources? How can infrastructure be made more functional and sustainable to secure water supplies, food production and energy generation, without compromising the ecosystems we all rely on? Development of infrastructure plays a pivotal role in making water available for agriculture, electricity generation and water supply. This infrastructure includes engineered structures such as dams, reservoirs, canals and irrigation systems. But it also includes ecosystems and watersheds that act as 'natural infrastructure': mangroves that buffer against severe storms, floodplains that absorb flood waters, forests that stabilize soils, lakes and wetlands that clean and store water. If this natural infrastructure is healthy and well-functioning, it supports built infrastructure to protect, store, clean and deliver water for cross-sectoral nexus water requirements.

Optimizing infrastructure for the nexus will mean mixing portfolios of engineered and natural infrastructure. Each component complements the other, with benefits in terms of cost-effectiveness, risk reduction, sustainable development and benefit sharing.



## Nexus Thinking: Ways Forward

IUCN and IWA will convene a series of discussions on good practice and innovations for optimizing infrastructure to secure water, energy and food production. Workshops are planned which will enable better understanding of nexus thinking and integration into management and operation of infrastructure, as well as into policy and planning at national levels. IUCN and IWA invite you to join this process by contributing your knowledge, experiences and ideas:

What type of water infrastructure and technology is being used to provide water for multiple uses including water supply, food production and energy generation?

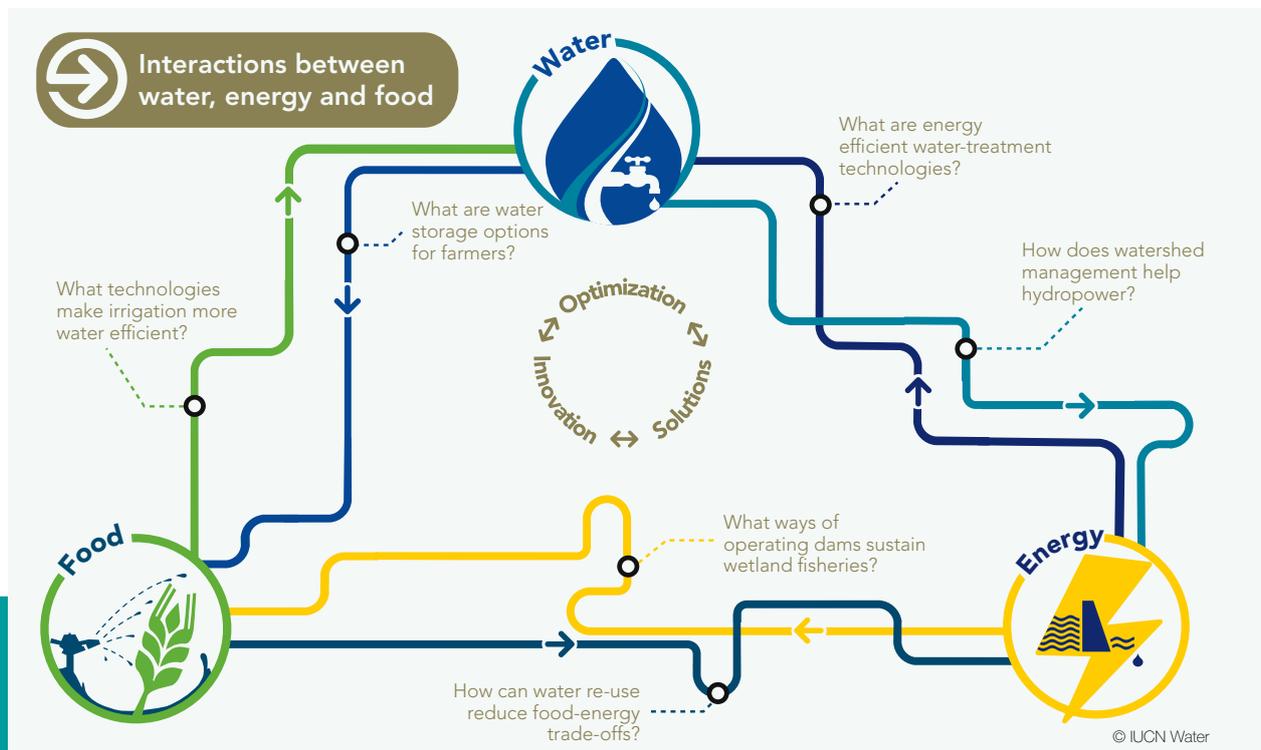
How is water infrastructure being optimized to share benefits across sectors? How are trade-offs negotiated? How does this change operation of existing infrastructure and planning of new developments?

What elements (social, political, ecological, economic, technical, etc.) are needed for infrastructure to have improved functionality while sustaining water, food and energy security?

## Some Facts and Figures

- In 2030, 47% of the world's population will be living in areas of high water stress
- By 2050, global population is expected to be 9 billion people. 70% more food will be needed
- Agriculture accounts for roughly 70% of water use
- Hydropower provides 20% of the world's electricity and is the main energy source for more than 30 countries
- By 2030 we will need 30% more water, 40% more energy, and 10% of existing crop land for biofuels

What have been obstacles to optimizing water infrastructure for multiple uses of water supply, food and energy, and how have these been navigated?



## Timeline

JANUARY 2013

### Launch Water Nexus Solutions

#### Call for Contributions

Submit your solutions online:

[www.waternexussolutions.org](http://www.waternexussolutions.org)

28-29 MAY 2013

Nairobi, Kenya

### 1<sup>st</sup> Workshop Africa

25-26 SEPTEMBER 2013

Bogota, Colombia

### 2<sup>nd</sup> Workshop Latin America

12-13 NOVEMBER 2013

Bangkok, Thailand

### 3<sup>rd</sup> Workshop Asia

MAY 2014

Beijing, China

### 2014 International Conference on Water, Energy and Food

## Getting involved

- ➔ Visit the Nexus Dialogue website:  
[www.waternexussolutions.org](http://www.waternexussolutions.org)
- ➔ Take part in anchor workshops
- ➔ 2014 International Conference
- ➔ Join us on **twitter** – @WaterNexus  
and Facebook **f**
- ➔ Take part in online discussions with experts  
Contact us: [info@waternexussolutions.org](mailto:info@waternexussolutions.org)

## Activities

 **State-of-the-art knowledge** – Contributors will submit guidelines, tools and technologies applied to the operation and optimisation of water infrastructure, to enable inter-sectoral and inter-regional exchange. Case studies will be invited on experience of multi-purpose use of water infrastructure, including through re-operation of dams, optimisation of water cascades and integration of portfolios of built and natural infrastructure. Contributions will be accessible in an online knowledge compendium at [www.waternexussolutions.org](http://www.waternexussolutions.org) and provide the basis for a set of thematic synthesis papers. The dialogue will be backed by outreach through multi-media communications, online dialogues, a video interview series and feature articles.

 **Anchor workshops** – A series of three regional workshops – in Africa, Asia and Latin America – will bring together innovators and thought leaders from the water, food and energy sectors. The workshops will build on 'best-practice' success stories in water infrastructure operation, re-operation and innovation to create a shared, cross-sectoral vision that combines best available technology, know-how and experiences. Participants will be invited to build new coalitions and partnerships for follow-up action in technology demonstration, investments in portfolios of water infrastructure and national-level dialogues on policy and implementation.

 **International conference on nexus solutions** – The Nexus Dialogue will culminate in the 2014 International Conference on Water, Food and Energy. The conference will feature the state-of-the-art in water infrastructure and technology solutions for optimization across the nexus. Through a series of technical sessions and focused workshops, the conference participants will develop a series of evidence-based policy recommendations. The conference will be a major milestone in creating new pathways for water infrastructure planning, investments and operations to meet the integrated challenge of water, food and energy security.

 **Coalitions for action** – The Nexus Dialogue will be outcome-oriented and forward looking. The process will actively move existing policy concepts around the nexus to actionable programmes, investments and commitments. The key to success will be the participation of change leaders from across sectors building new coalitions and partnerships for follow-up initiatives and investments. The Nexus Dialogue will anchor innovative ways of using water infrastructure and technology as the cornerstone of optimization across the water-food-energy nexus.



#### Photographs

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