

# Water challenges for a changing world

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Last Updated on Monday, 15 February 2016 14:49

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2016



## EDITORIAL

The value of wetlands for human health and prosperity is celebrated every year on 2 February. Lakes, lagoons, streams and inland waterways provide freshwater which is essential to ensure food supply, sustain biodiversity, protect land against flooding and enable tourism, transport, industry and employment. The World Wetlands Day is promoted each year by the Ramsar Convention since 1997 to raise awareness about the importance of protecting these vital ecosystems which are endangered by degradation and loss. It is estimated that 64% of the wetlands in the planet have disappeared since 1900. That's why the new Sustainable Development Goals underline the need to protect and restore ecosystems such as wetlands to reduce poverty in the world.



## PROGRESS ON WATER JPI ACTIVITIES

### Kick off meeting of the new ERANET Co-fund supporting the JPI

The new ERANET-Cofund WaterWorks 2015 supporting the implementation of the Water JPI from the period 2016-2020 was launched in Paris on 27 January 2016. WaterWorks2015 is a collaboration between the Water JPI ("Water Challenges for a Changing World") and FACCE-JPI ("Agriculture, Food Security and Climate Change"). Achieving a "Sustainable water use in agriculture, to increase water use efficiency and reduce soil and water pollution" is at the intersection of the two JPIs, contributing to the implementation of their respective Strategic Research Agendas.

WaterWorks2015 aims at pooling resources from the 25 participating research programme owners and/ or managers of 22 countries to implement a joint call for proposals, with EU co-funding in the area of "**Sustainable management of water resources in agriculture, forestry and freshwater aquaculture sectors**". WaterWorks2015 brings together 6 organisations belonging to both JPIs, 15 countries from the Water JPI, 3 from the FACCE JPI, as well as 9 organisations from associated and third countries, in an effort to reinforce international cooperation in this area. The joint call opens on 16 February 2016 with a closing date for pre-proposals on 19 April 2016. More information on the LinkedIn Group "[Water JPI - Researchers Forum](#)".

### Outcomes of the WaterWorks 2014 call

The 41 proposals presented for the second step of the call launched by the ERA-NET Cofund WaterWorks 2014 were evaluated by an evaluation panel composed of a chair, vice-chair and several internationally renowned members, privileging an adequate gender, country, and professional background balance. An independent observer reporting to the European Commission followed the evaluation process since the first step, and was also present in the final evaluation meeting. All proposals were made available to all evaluation panel members. Each proposal was allocated to three members of the evaluation panel, who agreed on a final scoring attributed to the three criteria: scientific excellence, impact and quality of implementation. The chair and vice-chair assured the consistency, coherence, and fairness of the process. All evaluation panel members participated in the discussion that led to the elaboration of the consensus reports for the full proposals and the establishment of the final ranking list.

Approximately half of the proposals were focused in the first topic covering water "**Treatment, reuse, recycling and desalination**", a quarter of proposals in topic 2 dealing with water "**Resources management**", and the remaining in topic 3 on "**Mitigate impacts of extreme events (floods and droughts)**".

At this stage, 16 full proposals are recommended to be funded, with a similar distribution of topics covered. It is important to highlight the efforts made by the funding partner organisations participating in this call, which guaranteed the maximisation of the allocated EC funds (ca. 4.8 M€).

There are still formal processes that need to be finalised at national level. The evaluation report and formal national funding commitments are going to be submitted to the EC soon. Detailed information on the funded projects, and in the whole evaluation process (STEP 1 and STEP 2) will be announced in due time.

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### Next Meeting of the JPI Advisory Boards

The members of the Scientific and Technical Board and of the Stakeholder Advisory Board will meet together in Dublin on next 21 March. They will review and comment the new updated version of the Water JPI Strategic Research and Innovation Agenda (SRIA) and discuss how best to involve the stakeholders of European water research and innovation in the process of alignment of national programmes and agendas. A presentation of the first implementation plan and first achievements of the initiative is also in the meeting agenda as well as a collection of suggestions for topics on which focalize next joint calls.

### The 8th Governing Board

The meeting of the representatives of the Water JPI member organisations in charge of policy and strategic issues within the joint programming initiative on water challenges will take place on 14-15 April 2016 in Malaga (Spain). The Governing Board will formally approve the SRIA 2.0 to be officially presented in Rome on 19 May 2016 and will define the JPI future strategy for the period covered by the Implementation Plan 2017-2019.

### Participation in the annual Joint Programming Conference

The Water JPI Coordinator, Dominique Darmendrail, attended this conference organized by the European Commission and the [ERA-LEARN](#) project on 14-15 January in Brussels. Main issues in the agenda were the alignment of national systems, programmes and projects in order to facilitate cross border collaboration and the cooperation with countries outside Europe and open access to research results. The next Joint Programming Conference will be held on 22-23 November 2016.

### Info Day dedicated to water

This event took place in Paris on Friday 29th January 2016 and gathered almost 70 participants coming from academic, research and industrial structures. The Water JPI coordinator presented the governance set-up of the JPI focusing on the pre-announcement of the ERA-NET Cofund WaterWorks2015 while Patrick Flammarion (IRSTEA-AllEnvi) gave the audience information about the finalization process of the SRIA 2.0, reasserting the ambition of this document to become the European reference regarding research and innovation policies.



### FOCUS ON WATER RESEARCH AND INNOVATION IN LATVIA

Three different RTD programmes fostering research in all fields of science are owned by the Latvian [Ministry of Education and Science](#) and managed by the [Latvian Academy of Science](#). These programmes differ in the balance between research and innovation orientation and in the focus on cooperation between Latvian institutions.

The programme for basic and applied research projects serves the purpose of strengthening Latvian research potential. In line with this aim grants are primarily and in greater volumes allocated to applications by high-performance research groups and groups involving young scientists, as well as post-doctor fellows. The main beneficiaries of the programme are research groups at public research organisations. The National Research Program "[Climate Change Impact on the Water Environment of Latvia](#)" (2006-2009) was the result of Latvian researchers joining forces to investigate how climate change will potentially influence Latvian lakes, rivers and the Baltic Sea coast and coastal waters. Science-based proposals are being funded if they propose solutions to adapt to foreseen scenarios and to mitigate adverse impacts.

The [Support for Joint Research Projects](#) Programme provides grants for networking among research groups of different research institutions of public sector. This programme is a specific extension of the Basic and Applied Research Projects Programme. The goal of the programme is to promote collaboration between several research organisations jointly applying for and implementing projects of economic relevance.

The programme supporting market oriented research aims at promoting integration of science and industry through development of technologically oriented sectors, promotion of industrial research and job creation. The goal of the programme is to encourage researchers from universities, research institutes and SMEs to develop new competitive products and facilitate the development of new start-ups. Industrial research and pre-competitive research projects are eligible for support within this programme. Grants range between 28 and 200 k€. Funding is allocated to higher education institutions, research institutes and companies.

### INTERVIEW WITH GAETANO CASALE



Liaison Officer at the UNESCO-IHE Institute for Water Education. He has a Master specialization in Water Services Management. He is chair of the WssTP initiative "Water beyond Europe".

#### **How is UNESCO-IHE responding to the grand challenge of "Achieving sustainable water systems for sustainable economy in Europe and abroad"?**

The UNESCO-IHE Institute for Water Education is an academic institution whose core activities are research, innovation, and capacity building specifically on water related topics. The Institute is actively involved in many research and innovation projects, for examples EC-FP7 and already few EC-H2020 projects. The ability of UNESCO-IHE of being active in research and innovation actions within Europe allows us to be active in the EU water research arena, to engage in key European partnerships and platforms, and more importantly to be able to use the results achieved in EU research projects in our educational programs. By doing so, we allow students and water professionals from all over the world to learn from European solutions and thereafter to try and apply those solutions, with proper adaptation, to contexts related to their own country (outside Europe).

#### **How relevant is for UNESCO-IHE international cooperation in water research and innovation?**

International cooperation is part of the DNA of our institution. Most of the activities UNESCO-IHE conducts are performed in cooperation with partners. UNESCO-IHE has more than eighty institutional agreements with key water sector institutions all over the world. We believe that working with the organizations that are closer to the real problems can help the Institute design a strategy that allows to respond to existing and emerging needs and challenges that are specific of certain countries and/or regions.

#### **Success in meeting the societal challenges related to water requires the involvement of all relevant stakeholders. What kind of tools does UNESCO-IHE recommends to facilitate science- society policy- business interactions?**

We are proponents of a variety of mechanisms to suit various settings. Serious gaming, both ICT-facilitated and more traditional forms, provide excellent means to convene the diverse range of stakeholders around specific water-related challenges and help them identify and move towards solutions. Knowledge networks are another way in which we bring scientists and policy makers together for joint agenda setting and knowledge creation. Over the years, UNESCO-IHE has helped to set up a number of such networks in Africa, Asia etc., many of which are still active. Our citizen science activities in Europe and Africa present new and innovative means to engage civil society as a key actor in water management, to strengthen

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water stewardship and to help identify local challenges on the ground. We are also witnessing increasing interest by the private sector to interact with the institute because of our proximity to local needs and demands in the Global South, via our students and via our capacity development projects. Joint projects between public, private and civil society stakeholders but also more structural platforms can help to link suppliers of potential solutions with those best placed to identify local needs and challenges.

**The development of a common strategic research agenda and joint calls plays a central role in the JPI activities. Which other joint actions should be performed, in your opinion, to improve the alignment required by the European Commission?**

I believe that, in terms of international cooperation activities on water, it would be very crucial to align the European water sector actors including the decision makers, on actions that are aiming at addressing the sustainable development goals. We have already received clear signals from some of the relevant institutions (e.g. EC DEVCO) that the sustainable development goals will play a key role in guiding the actions of European water sector institutions. There are simultaneous efforts between different players to update/revise research and innovation agendas on water, for example the WssTP is also revising its own agenda, and it would be essential to frame those agenda within the broader context of the Post-2015 agenda since water is one of the most prominent challenge identified in the Post-2015 agenda. This will help addressing water challenges in a broader context.

**What is the strategic approach of the WssTP initiative "Water beyond Europe" you are chairing?**

Often in internationalization of organizations the risk is that institutions take the "supply driven" approach, namely they recommend what they are good at, and/or their own product. However, solutions developed by products and service providers are not always "one size fits all" and do not consider specific challenges of certain context. Such challenges may be purely technological, but can also be societal, cultural, and political. Often we talk about an "enabling environment" within which solutions need to be applied. In the WG "Water Beyond Europe" we wanted to have an initial assessment of what are the drives beyond certain water research agendas worldwide, which are the result of combined efforts from local, regional, international organizations. For example, a first result we obtained is that in many regions outside Europe water research agendas and actions are dictated by development goals rather than by market/ economic factors as it can be in Europe.

**Which are the next envisaged phases in the progress of your initiative?**

Although the Working Group has been formally created more than one year ago, so far we only have conducted an initial analysis (mentioned earlier) within the UNESCO-IHE alumni community and with few supranational organizations. Meanwhile, one of the two project proposals that emerged within the Working Group (related to the Water and Climate international cooperation action in H2020) has been awarded and will start March 1st. The implementation of the project (whose acronym is AfriAlliance) will support part of the Working Group aims, in particular as concerns water sector and related networks and platforms in Africa and will strengthen the links between EU and Africa on water and climate. Other activities within the Working Groups concern analysis on how the EU research and innovation activities and networks approach international cooperation activities, whether they respond and match the current needs set out by "outside EU" policies and research agendas, and what are the recommendations to EU organizations (within WssTP) as well as policy makers should take into account the beyond Europe demands.

**How could the Water JPI improve the collaboration with the most relevant international water related networks?**

First of all, it is important to make a critical assessment on what are the relevant international networks. There are many water networks around the globe and with different agendas and focus. As mentioned earlier, though, it appears that outside Europe most of the organizations that are very active in water are of development cooperation nature (e.g. development banks, research institutes with development focus, or public sector organization). It is important to understand the nature of the demand these networks are tackling and try to synchronize with them. Secondly, UNESCO-IHE experience in building cooperation with water shows that often it is important to have a shared agenda, but very often is at least as important to start cooperation with responses to specific needs, even if done with small and quick wins (small joint projects).

**RESEARCH HIGHLIGHTS**

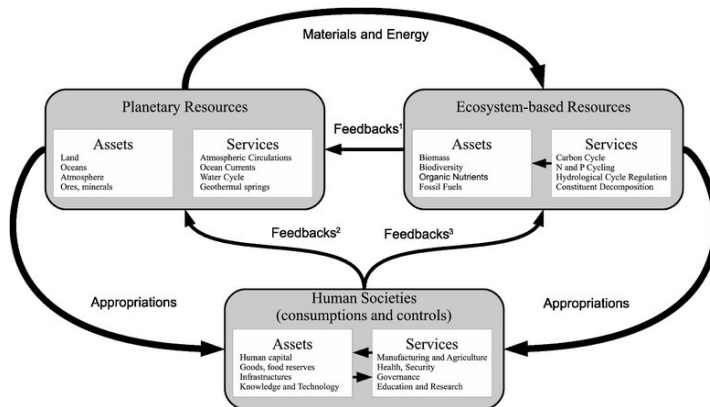
**The role of engineering in sustainable water management**

Scientists have recognized the potential of reaching and possibly transgressing the Earth's limits to provide resources that satisfy the needs of human societies. Water resources in particular receive growing attention given its uneven distribution in many parts of the world.

Engineering solutions to address water management challenges played significant roles in the past in areas such as access to clean water and sanitation, providing water for irrigation, offering protection against floods, allowing power generation, etc. Despite their proven benefits, engineering solutions are receiving increasing criticism due to their negative environmental and societal impacts and the high cost of their implementation and operation. More reliance on ecosystem services as an alternative is often advocated as a means to achieve more sustainable water management solutions.

Fekete and Bogárdi (2015) examined key water services that human societies rely on and the feasible roles that ecosystems can play in lieu of engineering solutions. Their paper applies the "balanced triangle" of the planetary (abiotic), ecosystems (biotic) and human societal (anthropic) resources and assets as a basis for evaluating different water management strategies.

The balanced triangle distinguishes resources as "assets" (or stocks) versus "services" (or fluxes) which can serve as a means to define sustainability. Intuitively, only services (or fluxes) can be used sustainable unless the stocks are abundant beyond possible exhaustion. In the balanced triangle planetary resources (both assets such as the land, oceans, atmosphere, ores and minerals, etc.) are appropriated by both the ecosystems and human societies. Human societies also appropriate ecosystem resources, and the appropriations have feedbacks on the donor vertices (abiotic planetary or the biotic ecosystem resources) of the balanced triangle (see figure).



Engineering solutions offer human societies means to bypass ecosystem services and appropriate planetary resources directly to replicate the desired service. As an example, one could consider waste water treatment that takes external energy to operate and requires building engineering infrastructure, but in return could remove water contaminants just like freshwater ecosystems do without the need to reserve vast areas to perform the said ecosystem service and with much greater efficiency due to the specific design for that particular task. In the context of a balanced triangle, one could contrast the resource utilization (including land appropriation) of both engineering and ecosystems solutions to find optimal tradeoffs.

To know more

<http://www.earth-perspectives.com/content/2/1/2>

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## DROPLETS

### European research to tackle grand challenges

The 230 delegates from all over Europe (high-level conference) identified in a 2nd [Lund Declaration](#) (signed in Lund, Sweden last December) four priority areas in science and innovation, which should be implemented by European member states and European institutions in the future. The declaration concluded that "Europe must speed up solutions to tackle grand challenges through alignment, global cooperation and achieving impact".

### EEA report on flood risks

This [publication](#) explores the synergies between floodplain restoration, water policies and thematic policies in Europe. Its aim is to support the implementation of the EU Floods Directive (EU, 2007), in particular with regard to environmental impacts and how these can be linked to climate change adaptation and disaster risk reduction. Floodplains once covered wide stretches along European rivers, but today only fractions of them remain. These ecosystems have an important role to play in reducing flood risks and are also the natural habitat of many endangered species. This EEA report also provides an overview of significant floods in Europe and looks at the role of floodplains in flood protection, water management and nature conservation.

### EU water status is slowly improving

The first pan-European overview [report](#) on Preliminary Flood Risk Assessment (PFRA) and on Flood Hazard and Risk Maps (FHRMs) is available from the website of DG Environment. According to the Floods Directive (2007/60/EC) PFRAs and FHRMs are two important steps towards reducing the risk of flood damage in Europe.

### Danube water quality

According to a [press release](#) of the European Court of Auditors dated 25 January 2016 there has been little improvement in the ecological status of the Danube for "lack of ambition" of the plans adopted by the four Member States in the Danube basin: Czech Republic, Hungary, Romania and Slovakia which should improve their monitoring and diagnosis systems for water pollution.

### LIFE integrated projects on water

The European Commission announced an investment of € 63.8 million for the first-ever "Integrated Projects" to be funded under the [LIFE programme](#) for the environment. "Integrated Projects" were introduced to implement environmental legislation on a wider scale and increase the impact of funding for plans developed on the regional, multi-regional or national level. The six projects selected have a total budget of € 108.7 million, including € 63.8 million of EU co-financing. The Integrated Projects in Belgium, Finland and Italy will help conserve Europe's nature, on a far wider scale than has previously been the case. The Integrated Projects in Germany and the UK will contribute to the implementation of [River Basin Management Plans](#), while the project in Poland will support implementation of a regional air quality plan. To know more see this [Annex](#).

### Citizen science tools for improved water resource management

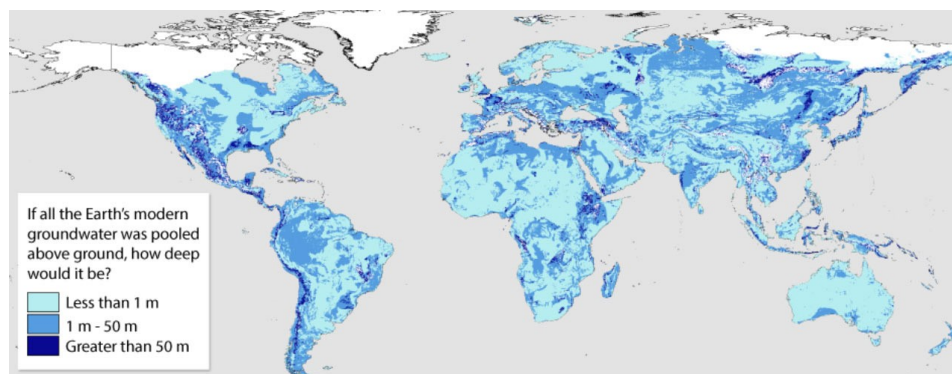
The Water Research Commission of South Africa together with GroundTruth and WESSA (Wildlife and Environment Society of South Africa) have developed a suite of citizen science tools to monitor water resources and integrate civil society into the routine monitoring of water resource management in South Africa's major catchments including trans-boundary management. The idea is that if citizen's knowledge of water resources (and associated impacts) is improved, the greater understanding and insight as to the state of their resources empowers them to interact with authorities and co-manage their resources in a more meaningful way. A workshop to demonstrate the application of these tools and showcase their capability to collect robust scientific data in a simplified manner was held on 11-12 February 2016. [To know more](#)

### EURO-INBO Declaration of Thessaloniki

The 13th "EUROPE-INBO 2015" international conference, organized by the "Group of European Basin Authorities for the Implementation of the European Water Directives", was held in Thessaloniki (Greece) on 21-24 October 2015. The declaration released after the conference works is available [here](#).

### Mapping Earth's groundwater

For the first time an international group of hydrologists led by the University of Victoria, has produced a data-driven estimation of the Earth's total supply of groundwater, one of the planet's most exploited and most precious natural resources. Using multiple datasets and more than 40,000 groundwater models, the total volume of groundwater estimated, is of nearly 23 million cubic kilometers, of which 0.35 million cubic kilometers is younger than 50 years old. The study's maps show most modern groundwater in tropical and mountain regions. Surprisingly, the least amount of modern groundwater is not in most arid regions such as the Sahara. Considering the growing global demand for water, this study provides important information to water managers and policy developers as well as scientists from fields such as hydrology, atmospheric science, geochemistry and oceanography to better manage groundwater resources in a sustainable way. [To know more](#)



## OPPORTUNITIES

### Call for evidence on the economic benefits of water

The Commission is looking for empirical evidence, studies and concrete feedback on the economic benefits of EU water policy and the costs of non-implementation with a view to launching an open call for tenders for contracting a study, which aims at generating new and solid economic arguments to promote effective protection and efficient use of water resources for the well-being of European nature and citizens. Deadline of this survey is 11 March 2016. For more information click [here](#).

### EIT's 2016 Call for Knowledge and Innovation Communities

The European Institute of Innovation and Technology (EIT) 2016 Call for Knowledge and Innovation Communities' (KICs) is now open. The EIT invites applicants to submit their proposals with a view to selecting and designating a Knowledge and Innovation Community (KIC) in each of the following thematic areas: 1. Food4Future - Sustainable Supply Chain from Resources to Consumers; 2. Added-value Manufacturing. The deadline for the submission of proposals is: 14 July 2016 (17h00 local time in Brussels). [To know more](#)

### First call for proposals HYDRALAB +

[HYDRALAB](#) is a network of research institutes with world-leading hydraulic and hydrodynamic experimental facilities. The HYDRALAB+ project is funded by the European Commission through the Horizon2020 program to strengthen the coherence of experimental research by improving the infrastructures with a focus on adaptation to climate change issues. This call invites all European scientists to submit a research proposal to undertake experiments in one of the 16 unique experimental facilities in the field of hydraulic, environmental, oceanographic and ice engineering research.

### Call for research and innovation staff exchange

Deadline for applying funds for this Marie Skłodowska Curie action is 28 April 2016. [To know more](#)

### Access to research results from FP7 completed projects

The European Commission launched the FP7 Post-Grant Open Access Pilot early in 2015 to fund Open Access publishing fees for publications arising from finished FP7 projects through the OpenAIRE project. This Pilot provides funding for Article Processing Charges (APCs) and for Book Processing Charges (BPCs) for FP7 projects up to two years after they have ended. The FP7 Post-Grant Open Access Pilot provides an additional instrument to improve access to research results from FP7 projects, but it does not affect authors' choice on how their project publications are made Open Access. [To know more](#)

### FLAG-ERA Call

This joint transnational call is open from 22 January 2016 to 31 March 2016. More information is available [here](#).

### Summer School on knowledge co-production and public participation

It will be held in Montpellier (France) from 27th June - 1st July 2016. All those interested in developing and improving skills and knowledge of participatory methods to engage in knowledge co-production and public participation are encouraged to apply till 15 April 2016. See the [program](#).

### ACQUEAU spring call

This call of the EUREKA cluster for water is a two-stage submission and evaluation process, open to any project idea in the context of the water cycle and the [Blue Book](#). It delivers the EUREKA Label and thus facilitates access to national funding (but does not guarantee it). Deadline for project outline submission is **March 1st 2016, 17:00 CET**. The cut-off deadline for full project proposal submission is **April 15th 2016, 17:00 CET**. Details are provided [here](#).

### Open Consultation on PRIMA initiative

The European Commission has launched a public consultation on the future of PRIMA, the Partnership for Research and Innovation in the Mediterranean area focused on the development and application of innovative solutions for food systems and water resources to be carried out through an Article 185 TFEU initiative under Horizon 2020. The European Commission services are now performing an Impact Assessment of the PRIMA initiative to analyse the need and opportunity for a dedicated action of the European Union in this domain and the potential economic, social and environmental impacts of the alternative policy options. This [consultation](#) will run until 24 April 2016.

## UPCOMING EVENTS



This conference to be held in Brussels on the 3<sup>rd</sup> March 2016 is targeted at all stakeholders interested in the Science with and for Society Programme of Horizon 2020. The aim of Science with and for Society is to build effective cooperation between

science and society, to recruit new talent for science and to pair scientific excellence with social awareness and responsibility.

[To know more](#)

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## SMAGUA 2016

This international water and irrigation exhibition will take place in Zaragoza (Spain) on 8-11 March 2016. See the [programme](#).



## C3C user consultation workshop

This workshop will take place in Brussels on 11 March 2016 and is organized by the European Commission to identify specific needs and expectations and future scenarios of the Copernicus services. [To know more](#)



## Global water summit

This international event focused on water in 2050 will take place in Abu Dhabi on 19-20 April 2016. The sustainability of water as a source of business and economic growth will be a core of the summit. Details are provided [here](#).



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