

Synthesis Report on
IMPLEMENTATION ROADMAPS 2015-2018

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March 2018



Ministry of Land,
Infrastructure and Transport



KOREA WATER FORUM
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“Catalyzing Action towards the Sustainable Development Goals”

Water is inextricably linked with social, economic and environmental aspects of the world. Adverse effects caused by the problems of water supply such as famine, migration, natural disasters including droughts, floods as well as inequality of allocation directly related to human life. Serving as a crucial linkage between the climate system and human society, water is also a key factor at the heart of adaptation to climate change today. The international community continues to pay more attention to collective actions as coming up with solutions to these challenges is neither a responsibility of a particular group nor a goal of a single nation.

The 7th World Water Forum held in 2015 where multi-stakeholders discussed practical solutions to addressing global water challenges with the core value of ‘Implementation’ under the slogan “Water for our future” produced a number of notable outcomes.

Different parties from 168 countries throughout 400 sessions and various multilateral meetings made significant results in generating solid political commitments. The representatives from more than 120 governments, parliamentarians, and local authorities provided the guidelines on implementing water solutions highlighting scientific and technological methods. Those methods were elaborated by publication of Science and Technology White Paper and shared by the innovative program through prioritizing global water challenges and identifying the best solutions to them.

The Implementation Roadmap, among all those valuable results, is a praiseworthy outcome derived from the Daegu-Gyeongbuk Implementation Commitment (DGIC) that has led practical cases of applying Champions’ solutions. In the last three years, a variety of water experts from governments, international organizations, academia, and NGOs have been standing together in the forefront of taking up water challenges while implementing effective solutions driven from sixteen themes designed by Champions.

Most importantly, carrying out Implementation Roadmaps together with action monitoring system has provided us with great hope that those involved with water sector can stand and work together for a series of firm goals to secure water resources for the next generations. It is everyone’s responsibility, including nation states, international organizations, private sectors and civil societies, to partake in efforts to improve the condition of water issues through the sustainable management of water resources. In this regard, I am confident that the international water community is already taking initiative in addressing water challenges beyond the status quo, equipped with tangible local and global level of solutions suggested from the Implementation Roadmaps. The synthesis report on Implementation Roadmaps contains description of notable outcomes of each Implementation Roadmap and shows progress achieved in both action and objective for the past three years. The policy recommendations from Champions in line with the Implementation Roadmaps are highlighted, directed to delivering further in-depth discussions at high level political forum in 2018.

I am profoundly grateful to the DGIC Champions and Core Group members for their continued commitment and voluntary actions to the Implementation Roadmaps. This report could not have been completed without their devotion and professionalism.

I sincerely believe that the international water experts including policy makers will be able to have deeper and substantive discussions based on the findings presented in this report. Furthermore, the lessons learned from the three year of ‘Implementation’ will serve as a great catalyst for achieving the Sustainable Development Goals (SDGs). I dedicate this report to all those interested in water sectors to realize our bold vision together for sustainable development aimed at creating a future where everyone lives in dignity built on water security.



Jaeheyon Park

Assistant Minister

Ministry of Land, Infrastructure and Transport, Republic of Korea

A vehicle for collective action towards water for sustainable development.

Water is a multi-dimensional issue and also a prerequisite for achieving human security, from the individual to the international level. Securing sufficient amount of water is as important as having a good level of health, safe food and sound environment, which means that these are all related to fulfillment of fundamental human rights.

In light of the intertwined characteristics of water, it is necessary to address water challenges and identify practical solutions through collective action. I cherish all the paths and efforts of respective actors joined in activities of Implementation Roadmaps throughout more than two years since after the 7th World Water Forum.

Thanks to the members of the IRs, the global water community witnessed utmost efforts of major actors carrying out the plans jointly set through the forum process and finding breakthroughs in resolving water challenges with their know-hows and technologies as well as policies.

In this regard, the Implementation Roadmap is a truly powerful engine for the collective efforts towards 'Action', which made the global water community united as one when it comes to tackling key issues of water.

Designed to facilitate implementing solutions, the objectives of the Implementation Roadmaps are to create a common vision on specific water issues and encourage actions with practical methods and policy development for ensuring water security and sustainability. As a voluntary tracking mechanism, it contributed to catalyzing long-term collective action for water.

In the process of carrying out IRs through the last three years, two Implementation Roadmap Review Meetings (IRRM) were held in Korea in 2016 and 2017. Daegu Gyeongbuk Implementation Commitment Champions put their heads together and discussed progress of the IRs and developed its pathway forward. Themes of the IRs were integrated into the thematic process of the 8th World Water Forum thanks to support of the 8th Forum thematic process and the aforementioned efforts by Champion organizations and core group members as well as the leadership of the World Water Council.

With all these in mind, I would like to thank all members of the DGIC Champions and Core groups who strived for continuous implementation of their commitment. This Synthesis Report on the Implementation Roadmaps is a result of partnership and concerted efforts of DGIC Champions and Core group members, for which I am deeply grateful.

The report has been further enriched by thematic and regional perspectives, providing best practices and highlighting notable outcomes of implementation. I believe that this report will contribute significantly to provide insights to different stakeholders of local and international water community on ways to stepping towards the sustainable development, with water at its heart.

It is my fervent hope that the report inspires effective strategies, actions and policies for water sustainability of years to come. I expect this report will be a meaningful contribution to the discussions of the High Level Political Forum with in-depth review of SDGs as well.

Lastly, I once again appreciate members of the IRs for their relentless commitment to producing best practices on different water solutions and bridging the World Water Fora.



Jung-moo Lee

President
Korea Water Forum

“We must act together for water security – and we are”

In the spirit of cooperation that embodies the World Water Forum and the World Water Council, collaborative thinking is central to making progress on water-related challenges. This final report on the Implementation Roadmaps draws on experiences from influential and inspiring organizations and experts worldwide to implement innovative water solutions. I am confident that this three-year effort is a valuable contribution to shaping the water security and sustainability agendas.

In alignment with the World Water Council’s work, this endeavor has sought to catalyze collective action across the wider water community, and beyond, for better shared responsibility in enabling water security.

Water is a local issue. Water security, therefore, depends on specific conditions and on the needs of specific water users. World Water Forum participants can all offer insight into parts of this map – fine-grained data, local perspectives, and sectoral understanding. This is beneficial, as long as we act together in full awareness of the ways water connects us.

The World Water Forum exists to be a facilitator for this action, bringing together, every three years, the world of water and mobilizing decision makers at the highest level. We focus on the need for institutions, policies and legal frameworks that can give form to the management of water resources within the multitude of our planet’s local contexts.

With the Implementation Roadmaps we looked at the problems, envisaged a better future and decided to take action, together. The Implementation Roadmaps embody the strong determination of the global water community, articulated at the outcome of the 7th World Water Forum, to implement actions that move forward on water and to continuously monitor progress. Because we are all responsible, we addressed how to share responsibility and action collectively through this initiative. Such achievement would not have been possible without the dedication of DGIC Champions and the strong involvement of members from Core Groups.

There are many technical solutions available today, and innovations emerging every day. During the 7th World Water Forum and the three years that followed, new thinking was stimulated, and many actors engaged in the debate. Over three years, the Implementation Roadmaps have contributed to building enduring relationships between organizations from every horizon. We have successfully reached across geographic and sectoral boundaries. These roadmaps did not only guide our collective actions but helped us hold each other more accountable for the commitments expressed in Daegu-Gyeongbuk Implementation Commitment.

By harmonizing efforts to move forward on the global water agenda, Implementation Roadmaps have also provided a much-needed framework to help achieve water security and ensure a sustainable, resilient world for future generations. I firmly believe that these ongoing efforts continue to lend depth and clarity to the voice of water, from Korea, to Brazil and beyond.



Benedito Braga

President
World Water Council



The Daegu-Gyeongbuk Implementation Commitment was signed in the presence of champion organizations during the 7th World Water Forum on 17 April 2015 and launched the process of the Implementation Roadmaps.

INTRODUCTION

Implementation Roadmaps (IRs) are a formal mechanism for tracking and monitoring progress between each triennial gathering of the World Water Forum. Following numerous discussions inside and outside of the Thematic Process in the 7th World Water Forum, including an IR workshop held in Paris in 2015, sixteen themes related to water issues were articulated and declared through Daegu-Gyeongbuk Implementation Commitment (DGIC).

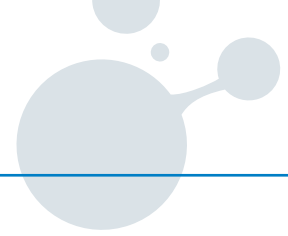
Embracing three objectives (to ensure continuity between each world water forum, to catalyze collective action, to contribute to global processes), the Implementation Roadmaps have intended to provide a framework to help achieve water security for future generations with adherence to water related dimensions of the expected SDGs from Goal 6 (*'Clean Water and Sanitation'*).

Consisted of nineteen organizations that took a lead in implementing sixteen different themes, DGIC Champions and core group members were determined to execute voluntary actions to achieve their goals and objectives identified in the Implementation Roadmaps.

IR progress reports have been published twice a year since March 2016, by the World Water Council and Korea Water Forum on behalf of the Government of the Republic of Korea. By displaying progress provided by DGIC Champions available on the Action Monitoring System (AMS) website from 2015, the IR progress reports have reflected extensive efforts made by the global water community.

The synthesis report on IRs aims to update and highlight the whole progress achieved based upon consistent efforts of Champions and the members of Core groups after the 7th World Water Forum towards the 8th World Water Forum.

Distinguished from the previous IR reports, the synthesis report delivers Champions' policy suggestion aligned with IRs to High Level Political Forum 2018 (HLPF 2018) in a way to moving forward global water agenda.



Themes and Goals

The Implementation Roadmaps were designed by Champions and Core Group members around the 7th World Water Forum Thematic Framework. They embody the water community's determination to move forward on water-related issues covering 16 themes. Specific goals were identified for each theme at the outset of the Implementation Roadmaps process and summarized in the Daegu-Gyeongbuk Implementation Commitment (DGIC) as follows.

1. WATER SECURITY FOR ALL



1.1 Enough Safe Water for All

To enhance water security towards ensuring 'enough' 'safe' water for all users and all uses through the dissemination and sharing of knowledge, appropriate technologies, scientific innovation, best practices and policy tools on: improving water quality by reducing all types of pollution and improving wastewater management; augmenting water supplies through both demand management and the use of non-conventional water resources such as safe wastewater reuse, desalination and rainwater harvesting; and expanding access to water services to those lacking access to safe water.



1.2 Integrated Sanitation for All

To advocate for the improvement and development of sanitation and wastewater services and management considering the whole sanitation chain; access, evacuation and treatment (for both non-collective systems and for collective systems), reuse and resources recovery.



1.3 Adapting to Change: Managing Risk and Uncertainty for Resilience and Disaster preparedness

To respond to the dynamic, evolving nature of the water cycle highlight sustainable approaches to water resources management, disaster management, climate adaptation and economic development.



1.4 Infrastructure for Sustainable Water Resource Management and Services

To strengthen and maintain existing water systems and further develop new water storage infrastructure, and to develop adaptable management strategies for ageing of water infrastructures, especially dam facilities, through sharing and exchanging of knowledge and experiences of both developed and developing countries, eventually to provide all stakeholders of ageing dams how and what to do for securing our life and property against threats by nature such as climate change.

2. WATER FOR DEVELOPMENT AND PROSPERITY



2.1 Water for Food

To help encouraging private investments in technologies and management practices that enhance the sustainable production of crops, livestock, and fish by both smallholders and larger scale producers, and address the excessive use and degradation of water resources in key production regions that threaten the sustainability of livelihoods dependent on water and agriculture.



2.2 Water for Energy

To deliver water and energy for all while minimizing environmental impact, through enhancing efficiency, improving sustainability and strengthening governance in resource management.



2.3 Water and Cities

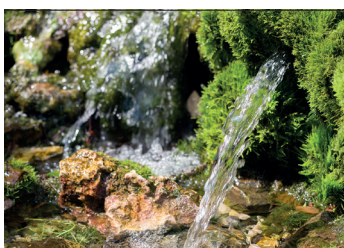
To encourage approaches to urban water management that ensures water security while also fostering inclusive, healthy, livable, risk-resilient and sustainable cities. This agenda looks beyond water as a service and recognizes how water shapes urban landscapes. It is regenerative, aiming to reduce, reuse, recover, recycle and replenish water, nutrients and energy within the city.

3. WATER FOR SUSTAINABILITY: HARMONIZING HUMANS AND NATURE



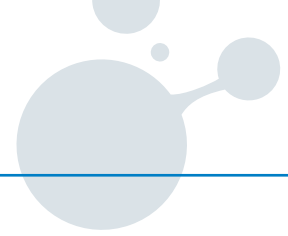
3.1 Green Growth, Water Stewardship and Industry

To ensure coherent policy to enable green growth; foster the long-term engagement of a variety of stakeholders in water management; and recognize economic value of water to avoid business risks and protect ecosystem services.



3.2 Managing and Restoring Ecosystems for Water Services and Biodiversity

To draw attention to, slow, stop and reverse the continuous loss of ecosystems, especially wetlands, as a fundamental basis for resilient and successful societies, and to recognize their multiple values as an essential contribution to global policy objectives such as mitigation and adaptation to climate change, and sustainable development.



3.3 Ensuring Water Quality from Ridge to Reef

To improve water quality management in situations where water quality degradation or inappropriate use of water qualities is responsible for reducing the quantity of water available for the various uses it is needed for.



3.4 SMART Implementation of IWRM

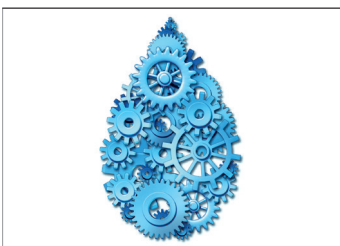
To implement integrated water resources management (IWRM) globally at all levels, including transboundary, as a means to achieve water security and the Sustainable Development Goals (SDGs).

4. CONSTRUCTING FEASIBLE IMPLEMENTATION MECHANISMS



4.1 Economies and Financing for Innovative Investment

To ensure that adequate financial resources are made available for implementing measures to: protect and develop water resources; sustainably extend and improve water services to households, agriculture, industry, ecosystems and other users; and achieve the global goal of water security.



4.2 Effective Governance: Enhanced Political Decisions, Stakeholder Participation and Technical Information

To guide decision-makers across levels of government to strengthen institutions' capacity in order to reap the economic, social and environmental benefits of good governance; to inform public debate and actions; and to contribute in facilitating change and reform where and when needed.



4.3 Cooperation for Reducing Conflict and Improving Transboundary Water Management

To provide guidance to decision-makers across all levels of government in different relevant fields (international law, policy, diplomacy, institutional and technical engineering) on how to develop and improve transboundary management in order to reduce conflicts and ensure an optimal use of water resources for socio-economic development.



4.4 Water Cultures, Justice and Equity

To create and maintain an implementation network of the design group members and session participants/ convenors on water, cultural diversity, justice and equity and raise the awareness among water professionals and decision makers about the intricate but yet often ignored relevance of cultural diversity, justice & equity for water management and development and include these aspects into policies, programmes and practice.



4.5 Enhancing Education and Capacity Building

To provide guidance to decision-makers across all levels of government on how to develop and improve water education, professional training and capacity building and to promote the creation and development of training centers for water professionals and the integration of capacity building activities (including Training of Trainers programs –ToT) in the budget of development projects.



Policy Recommendations for the High-Level Political Forum 2018

Implementation Roadmaps (IRs), as a voluntary tracking mechanism to monitor progress on various water-related challenges, aim to catalyze long-term collective action for water. They are living documents that have been reviewed and updated regularly since 2015. Designed to help implement actions articulated at the 7th World Water Forum, the world's largest water-related event, the objective of the IRs is to create a common vision on specific issues and encourage action and policy changes in view of ensuring water security and sustainability.

The following 14 policy suggestions, based on input received from a wide variety of stakeholders, represent a pathway forward for ensuring resilience and sustainability for our water resources. These recommendations should help identify priorities for decision-makers and structure future debates and discussions. It is only through equitable, optimal, sustainable and integrated approaches described below that water security and the Sustainable Development Goals can be reached.

- 01 Water security is a prerequisite to the achievement of all the Sustainable Development Goals (SDGs), not only SDG 6. Without water, there can be no food, energy, production, development, equity, climate resilience, or urban or environmental harmony, and poverty reduction is impossible. Therefore, water resources should be managed and regulated in a holistic, systemic, and consultative way across silos and at different levels, ensuring that interdependent management choices yield the most positive outcomes, drive technological, institutional and financial innovations across sectors, and enable collaboration between institutions and stakeholders, both inside and outside of the water sector.
- 02 Stronger political leadership and commitment are essential to promote water as key for economic growth and environmental sustainability, enhancing socially-inclusive development.
- 03 Although achieving the SDGs is a country-level responsibility, national urban policies should, where appropriate, define delegation of authority and channel financial flows to sub-national and local governments, owing to their knowledge of local contexts and proximity to end beneficiaries that will contribute to more sound decision making. Again, a holistic approach at the city level addressing water in conjunction with land planning, solid waste management, energy and transport, will help identify co-benefits resulting in more elegant and efficient solutions that address multiple challenges at once.
- 04 Integrated Water Resources Management (IWRM) policies, strategies and plans will help ensure this cross-cutting approach in the context of the achievement of the SDGs. In addition, fostering IWRM in transboundary settings, based on international water law and their key principles, is cost effective and enables benefit sharing across administrative borders.
- 05 Sustainable and environmentally sensitive multi-purpose water infrastructure, be it natural or man-made, is crucial to support sustainable development and respond to multiple demands on the resource. While new infrastructure needs to be developed in line with local realities and contexts, it is urgent to maintain and adapt existing, ageing infrastructure as well.

- 06 A lack of investment in water security can limit growth and prosperity in the face of complex pressures including population growth, urbanization, increasing water pollution, and climate change. Financing must be increased to improve water security, including through new and innovative mechanisms and market-based instruments. However, existing funds must also be used better, so that finance or financial incentives adopt an inter-sectoral approach, reaping exponential benefits in multiple domains.
- 07 Water for agriculture remains one of the greatest consumers of water resources and where some of the greatest gains can be made along the entire value chain.
- 08 Innovative technologies and practices such as increases in efficiency and safe water reuse can help bridge the gap between water needs and water availability, while potentially recovering nutrients and energy at the same time. Different water qualities need to be appropriately matched to their use, for greater efficiency and economy, thus contributing to appropriate and economical multi-sectoral water resource management.
- 09 Sanitation coverage represents specific challenges, especially in rural areas. At the city level, the complementarity between sewerage and non-sewered sanitation services is key in providing safely managed services to all.
- 10 Frequent and intensified water-related disasters (floods, droughts, sea level rise, etc.) and climate variability and change are fundamental threats to water security for all on the planet. National policies need to enable increased visibility about future risks and their limitations through multi-level and multi-stakeholder dialogue, so as to increase preparedness and resilience amongst communities.
- 11 Governance and strong institutions at every level (local, regional, national, basin, international, transboundary) must work together to shape, design and implement public policies, strategies and plans that will enable countries to achieve the full range of SDG targets, including IWRM. It must also rely on multi-stakeholder cooperation with relevant public, private and non-state stakeholders and a whole-of-society approach for citizens to fully reap expected benefits. Policy responses will only be viable if they are coherent; if stakeholders are properly engaged; if well-designed regulatory frameworks are in place; if there is adequate and accessible information, and if there is sufficient capacity, integrity and transparency.
- 12 Research, scientific knowledge and information on water and sanitation access, quality and management, including regional and gender specificities, provide a basis for sound policy making and sustainable solutions. Efforts to strengthen and share knowledge through science, research, and best practices should be reinforced and made available to all.
- 13 Education, awareness raising and capacity building on water issues, specifically for women, children and youth, can help reduce inequalities, ensure that all stakeholders' voices are heard, and create job opportunities. Vocational training centers and their networks are important for encouraging exchanges of technical experience and knowledge, including on IWRM. In addition, city-to-city learning and cooperation are useful to enable peer exchange and solidarity mechanisms for financing to scale up learning and innovation.
- 14 Since water is life, we share a moral responsibility to manage water not only wisely, but ethically, for the well-being for all.

Highlight of Overall Progress on Implementation Roadmaps (2015-2018)

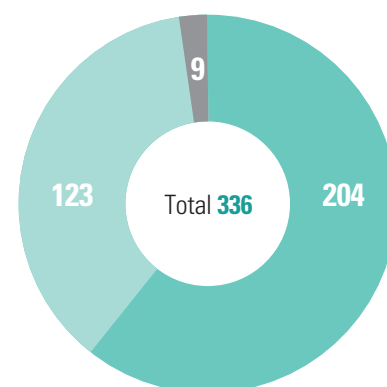
The 16 Implementation Roadmaps reflect the progress made by a wide range of stakeholders across different spheres in the water sector. Many objectives and actions, aligned with international frameworks, have been accomplished. The pace at which these objectives and actions have evolved may vary but progress is consistently being made. Implementation Roadmaps are living documents. They are constantly evolving over time and further recommendations, changes and improvements have been made.

As of March 2018, at the action level, out of total 336 key focus areas in the sixteen different themes of the IRS, 204 key focus areas are completed. 123 are still ongoing and. By proportion, this means 61 percent of the key focus areas are totally completed, and 36 percent are still under implementation. Once the remaining 123 key focus areas completed, 97 percent of the key focus areas will be accomplished. In October 2016, during the early stages of the IRs, the first report on IR progress indicated that only 55 key focus areas (about 16 percent) were completed. Considering this figure, the current progress is remarkable.

Progress on Action Level in Sixteen Themes

March 2018

■ Not executed ■ Ongoing ■ Completed

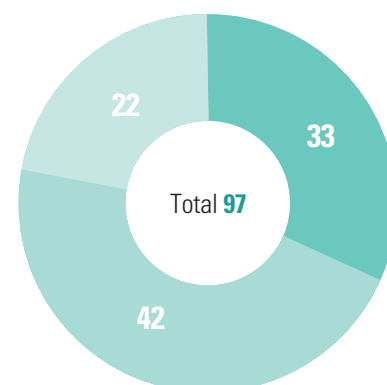


As of March 2018, at the objective level, out of total 97 objectives in sixteen different themes of the IRs, 33 objectives are 100 percent completed. 42 objectives have a completion level between 51 and 99 percent. Hence, about 35 percent of objectives are totally achieved in the current stage. 43 percent of the objectives are more than half completed and 22 percent of the objectives are half completed or less than half completed.

Progress on Objective level in Sixteen Themes

March 2018

■ 1-50% ■ 51-99% ■ 100%



Synthesis Report on
Implementation **Roadmaps** 2015-2018

March 2018



Progress report on Implementation Roadmaps

2015-2018

- 1.1 Enough Safe Water for All
 - 1.2 Integrated Sanitation for All
 - 1.3 Adapting to Change: Managing Risk and Uncertainty for Resilienc and Disaster preparedness
 - 1.4 Infrastructure for Sustainable Water Resource Management and Services
-

- 2.1 Water for Food
 - 2.2 Water for Energy
 - 2.3 Water and Cities
-

- 3.1 Green Growth, Water Stewardship and Industry
 - 3.2 Managing and Restoring Ecosystems for Water Services and Biodiversity
 - 3.3 Ensuring Water Quality from Ridge to Reef
 - 3.4 SMART Implementation of IWRM
-

- 4.1 Economies and Financing for Innovative Investments
- 4.2 Effective Governance: Enhanced Political Decisions, Stakeholder Participation and Technical Information
- 4.3 Cooperation for Reducing Conflict and Improving Transboundary Water Management
- 4.4 Water Cultures, Justice and Equity
- 4.5 Enhancing Education and Capacity Building

1.1 Enough Safe Water for All

Water security is essential for sustainable development. The main goal of the Implementation Roadmap 1.1 “Enough Safe Water for All” is to contribute to water security and the Sustainable Development Goal (SDG) 6 on water, by facilitating knowledge sharing and providing technical and policy guidance on appropriate technologies, scientific innovation, sustainable policy approaches and best practices on access to safe water, improved water quality and wastewater management, non-conventional water resources, as well as on water monitoring for the SDGs implementation.

Part 1. Overall Progress

Notable progress

Contributing to water security and sustainable development has been, over the three years, a key objective for UNESCO’s International Hydrological programme (IHP) and the members of the Core Group of this IR. As the DGIC Champion, UNESCO-IHP, has reached its objectives with remarkable results by contributing to improved access to clean water, water quality management and water monitoring, and enhancing water security globally for sustainable development.

International activities and innovations

International Initiative on Water Quality (IIWQ)

To address strategic issues and challenges on water quality, the UNESCO-IHP International Initiative on Water Quality (IIWQ) was launched. This initiative facilitated knowledge dissemination and science-policy discussions on a wide variety of water quality issues, such as access to safe water, water quality monitoring, emerging pollutants, wastewater management and reuse. This was done through scientific symposiums, technical workshops and experts meetings.

Special sessions at major international events also marked a key step in knowledge dissemination, promotion of scientific innovation, sustainable policy approaches. Examples of such events include the annual Stockholm World Water Weeks and UN Climate Change Conferences (COP).

Several events involving a wide range of stakeholders was organised across the world, at global, regional and local level. The goal was firstly, to increase awareness and bridge the gap between science and policy. Secondly, the one of the aims was to facilitate science-policy discussions on the impact of climate change on water quality and adaptation responses. Thirdly, the events aimed to address lack of water quality regulatory and monitoring frameworks; and improving

water quality monitoring and wastewater management. The meetings also provided a platform for sharing and promoting national case studies on best practices to address specific water quality and wastewater challenges.

Improving global water quality monitoring : The International Symposium

The UNESCO International Symposium on “Scientific, Technological and Policy Innovations for Improved Water Quality Monitoring in the Post-2015 SDGs Framework”, organised by UNESCO-IHP IIWQ in Kyoto-Otsu, Japan, in July 2015, aimed to instigate progress on global water quality monitoring. The Symposium provided an international platform not only for knowledge dissemination and capacity building on water quality monitoring, but also for sharing and learning from country experiences. This Symposium led to the development of a new UNESCO project on innovative tools for water quality monitoring.

Other contributions

- An innovative global water quality monitoring tool to support the SDG 6 implementation and monitoring was established. This was done through the project on “Use of earth observation (EO) and satellite data for water quality monitoring”.
- The IR 1.1 supported the development of a UN Integrated Monitoring Initiative for the SDG 6. This initiative is building on and expanding the experience and lessons learned during the Millennium Development Goals (MDGs) period. The long-term goal is to establish and manage, by 2030, a coherent and unified monitoring framework for water and sanitation in the 2030 Agenda.

Successful outcomes

Increased knowledge and assessment of emerging pollutants

The launch of a new series on emerging pollutants by UNESCO showcases the new knowledge and assessment of available scientific data on emerging pollutants generated by the 16 IIWQ technical. It also represents the most comprehensive scientific evidence and research on emerging pollutants based on contributions of a multidisciplinary research network from around the world. The report also illustrates policy case studies on emerging pollutants in water and wastewater and including three global, two regional and 11 national case studies covering 20 countries.

The World Water Quality Portal

The new World Water Quality Portal (www.worldwaterquality.org) provides information on freshwater quality at the global scale using remote sensing (satellite) data. The Portal provides data on five key indicators of the state of water quality: turbidity and sedimentation distribution, chlorophyll-a, Harmful Algal Blooms (HAB), organic absorption and surface temperature. These indicators also provide information on the impact of other sectors and land uses such as urban areas, fertilizer use in agriculture, climate change or dam and reservoir management. It also includes training materials to facilitate capacity building and raise awareness of all stakeholders, including water professionals, policy-makers, and the public at large.

Conclusion

The IR 1.1 achieved significant accomplishments in enhancing capacity, raising awareness, facilitating knowledge and experience sharing, and fostering international cooperation to support the development of sustainable water policies for enhanced water security.

A major contribution was made to the promotion and dissemination of best practices and innovation on wastewater reuse and resource recovery at the global level. The UNESCO-IHP IIWQ promoted best technical and policy practices on water reuse and resource recovery and disseminated them through various reports¹. Other major contributions were also made concerning international cooperation on cooperatively addressing water quality challenges at the 6th Africa Water Week in Dar Es Salaam in July 2016.

1) United Nations World Water Development Report 2017 "Wastewater: The Untapped Resource" by: leading chapters on "Water reuse and resource recovery" and "Knowledge, innovation, research and capacity development"; and contributing to chapters on "Technical aspects of wastewater", "Agriculture" and "Creating an enabling environment".

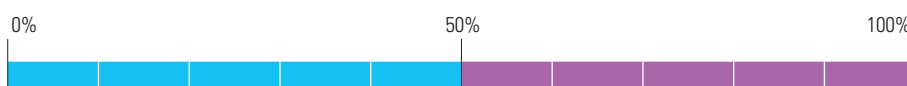
Part 2. Progress Data

Objective level

Progress : ■ 2016/03 ■ 2016/10 ■ 2017/04 ■ 2017/10 ■ 2018/03

• **Key focus area** Technical and policy approaches to improved access to safe water, water quality, nonconventional water supplies

• **Objective 1.1.a** Promote scientific innovation, appropriate technologies, sustainable policy approaches, and best practices on access to safe water, improved water quality and wastewater management, and non-conventional water resources, including safe water reuse and resource recovery.



• **Key focus area** Water monitoring to support SDGs implementation

• **Objective 1.1.b** Improve global water quality monitoring to support the implementation of SDG 6 on water and other water-related goals.



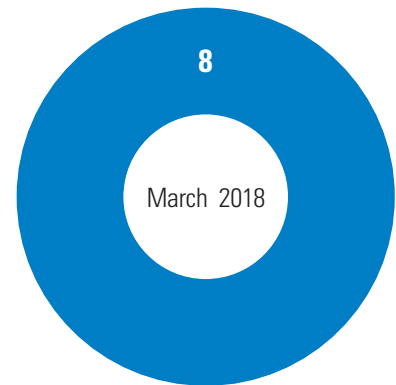
• **Key focus area** Capacity building, awareness raising, experience sharing and international cooperation on water security

• **Objective 1.1.c** Enhance capacity, raise awareness, facilitate experience sharing and foster international cooperation to support the development of sustainable water policies for enhanced water security.



Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- UNESCO International Hydrological Programme (IHP)

CORE GROUP MEMBERS

- African Development Bank Group (AfDB)
- American Water Works Association (AWWA)
- Freshwater Action Network Mexico (FANMEX)
- Graduate School of Water Resources, Sungkyunkwan University (SKKU-GSWR)
- Swiss Agency for Development and Cooperation (SDC)

1.2 Integrated Sanitation for All

Access to basic sanitation, and its implementation as a basic human right, is crucial. But to ensure an impact on public health, environment and water resource quality, we must consider the whole sanitation and waste water management chain: access, evacuation and treatment (for both non-collective systems and for collective systems), reuse and resources recovery. The failure to manage water after use is one of today’s world’s most neglected and serious sustainability challenges that needs urgent attention.

Part 1. Overall Progress

Notable progress

The progress made by the DGIC Champions of the IR 1.2 can be seen through the adoption of SDGs and their targets and elaboration of indicators in line with the expectations of the IR. Through this approach, the whole chain sanitation approach is clearly recognized, helped by the definition of “safely managed sanitation services.” New tools and trainings were developed to improve the capacity of practitioners in the field of sanitation and wastewater management.

Part 2. Progress Data

Objective level

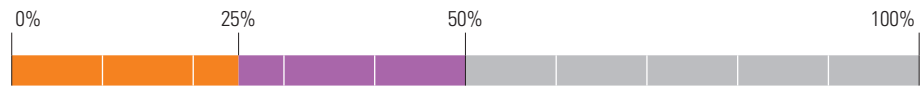
Progress: ■ 2016/03 ■ 2016/10 ■ 2017/04 ■ 2017/10 ■ 2018/03

• **Key focus area** Universal access to sanitation (containment)

• **Objective 1.2.a** By 2016, present the overall status and challenges faced in achieving the sanitation MDG and positioning universal access to sanitation to be adopted as a priority issue in the proposed SDGs.



- **Objective 1.2.b** By 2020, help countries to develop adequate strategies and action plans to ensure equitable sanitation and hygiene for all.



- **Key focus area** **Fecal sludge management**

- **Objective 1.2.c** By 2025, present and foster implementation of innovative technologies, management approaches and business models that are attractive to city managers, utilities and private sanitation service providers.



- **Key focus area** **Wastewater management**

- **Objective 1.2.d** By 2020, ensure an appropriate regulatory framework and standard, leading to the progressive development of wastewater transport and treatment and the absence of discharge of contaminated wastewater into water bodies that are sensitive to microbiology.



- **Key focus area** **Wastewater resource recovery and reuse**

- **Objective 1.2.e** By 2030, development of wastewater reuse (e.g. for irrigation) must be balanced with preservation of water flows needed by neighboring ecosystems.



- **Objective 1.2.f** By 2030, the level of treatment before reuse must be adapted to protect the health of downstream neighbors and users, and irrigated crops consumers, with confidence and acceptance from the public but without excessive technology and energy wasting.



- **Objective 1.2.g** By 2030, recycling of organic matter (and/or biogas), nitrogen and phosphorus from sanitation by-products, using hygienic and energy-saving techniques must be generalized.



• **Key focus area** Integration of sanitation planning and urban development

• **Objective 1.2.h** By 2020, help policy and decision makers in evaluating options for managing the whole sanitation service chain and choosing the best appropriate sanitation options in the various areas of a city.



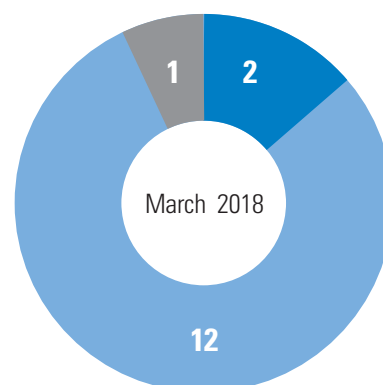
• **Objective 1.2.i** By 2020, cities and towns should recognize and have a clear vision of their needs, and be engaged in integrated sanitation planning taking into account the importance of universal access, faecal sludge management, wastewater management, and resource recovery and reuse.



Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- Programme Solidarité Eau (pS-Eau)
- AquaFed – The International Federation of Private Water Operators

CORE GROUP MEMBERS

- American Society of Civil Engineers, Environmental and Water Resource Institute
- Asian Development Bank (ADB)
- Korean Society of Water and Waste Water (KSWW)
- Sanitation and Water for All (SWA)

OTHER STAKEHOLDERS

- Swiss Federal Institute of Aquatic Science and Technology (EAWAG)
- Bremen Overseas Research and Development Association (BORDA)
- Greater Paris Sanitation Utility (SIAAP)
- Agence de l’Eau Seine-Normandie
- International Water Management Institute (IWMI)

1.3 Adapting to Change : Managing Risk and Uncertainty for Resilience and Disaster Preparedness

Following the Sendai Framework targets, Theme 1.3 is intended to respond to the dynamic, evolving nature of the water cycle and highlight sustainable approaches to water resource management, disaster management, climate change adaptation and economic development. Theme 1.3 promotes innovative methodologies and technological applications worldwide, especially in developing countries, and helps further reduce potential damage from natural hazards by sharing state-of-the-art technologies in addressing water-related risk.

Part 1. Overall Progress

Water-related disasters are increasingly frequent worldwide, and they seem to be aggravated in intensity due to climate change. To strengthen preparedness for such disasters and to respond adequately for prevention and mitigation of socio-economic damage, the members of the Core Group have implemented many significant actions and projects since the 7th World Water Forum. This section highlights and introduces some of this progress.

Notable progress

Enhancing the understanding and recognition of water-related disaster

Training, meetings and workshops aimed at enhancing the understanding and recognition of water-related disaster. This was done by employing a participatory approach to include local communities and policy and decision makers. This resulted in the increase in capacity building as well as the enhancement of the capability of government authorities and local communities in managing risks and uncertainties. The development of practical guidelines for extreme events has also been worked on in consideration of the capability and skill level of users.

Research and technological innovation

Results and output of research and technological innovation should be incorporated even more into water-related disaster risk reduction. Improved monitoring systems for meteorological and hydrological phenomena have enabled more accurate estimations of flood discharge and inundation areas, assisting local municipalities more effectively in issuing early warnings and evacuation advisories and orders. Such monitoring information has been proven useful to increase the public understanding when it is made available to the public and shared among all stakeholders.

Moreover, it has been found that using the latest information and communications technology (ICT) and the Internet of Things (IoT) can be efficient and useful. These forms of technology

enhance monitoring data. They also optimize water resources allocation and water-related disaster management. When collected, accumulated and integrated, the data can be used efficiently. More research and development of innovative technology have been promoted to create and disseminate more accurate inundation risk maps. These actions aim to support local communities in more effective emergency response and policy makers in more practical decision making.

Networking and partnerships

Networking and partnership should be strengthened through global and regional initiatives, which are exemplified by UNESCO International Hydrological Program (IHP), International Flood Initiative (IFI), International Drought Initiative (IDI), Global Network for Water and Development Information for Arid Lands (G-WADI), and the Typhoon Committee.

These initiatives have developed various activities on water-related disaster risk reduction, and diverse efforts have been made to share and utilize information and knowledge among relevant stakeholders and organizations. In addition, they have been playing a key role in promoting dialogue and cooperation with the scientific community, policy and decision makers, and other stakeholders.

Successful outcomes

To develop and progress water-related disaster risk reduction policies and projects at all levels, concrete actions are needed, involving various stakeholders and organizations concerned. The members of the Core Group have elaborated networking activities through global and regional initiatives such as UNESCO-IHP, IFI, IDI, G-WADI, and the Typhoon Committee.

The International Flood Initiative (IFI)

Among those initiatives, IFI has been promoting a worldwide effort to establish a Platform on Water and Disaster in each country to implement more effective water-related disaster risk management. The Platform envisions a future wherein decisions and actions for reducing water-related disaster risk are well supported by coordinated, comprehensive and sustained risk communication.

The Platform also works to connect the demand for sound and timely decisions and actions taken by policy-makers and local communities with the supply of disaster risk information that is generated from integrated risk assessment and risk change identification based on well archived data and statistics. By strengthening the experts' capability of data collection and archiving, it aims to provide an integrated assessment and risk change identification.

Moreover, increases in stakeholders' capacity for making the best use of these data and information help contribute to facilitating institutional and infrastructural design and investment regarding land use management and climate change adaptation (static approach), and to promoting more effective response and recovery (dynamic approach). A Platform on Water and Disaster has been established in the Philippines, Sri Lanka, Pakistan, and Myanmar, involving various government agencies.

Flood and inundation mitigation and prevention

Another example of research on water-related disaster risk assessment, is that which has been conducted for five major river basins in Asia (the Mekong, the Chao Phraya, the Indus, the Pampanga, and the Solo). It includes the statistical analysis of present and future climate and the assessment of flood and drought risk in the river basins.

Inundation depth, inundation area, and inundation period caused by 100-year precipitation were estimated using the scenario of the present-day climate and the future climate. Agricultural damage was estimated by applying a damage curve on rice and quantified by using the unit of current shipment value on rice in the region. In another case, flood contingency planning was elaborated for a community located in one of the most flood-prone areas in the Philippines. Flood hazard maps and inundation water charts were developed by using simulation results from a hydro-meteorological model, and a chronological list of community-level actions during flood disasters was created.

Conclusion

Research and development in the field of meteorology and hydrology play an important role particularly in water-related disaster risk reduction, adaptation and mitigation. Analysis and assessment of possible climate change impacts are indispensable in planning practical risk reduction measures. One of the powerful methods includes ensemble rainfall forecasting. This process has been used in several projects and enables users to provide rainfall forecasting for the next several days. Flood and inundation forecasting shows the possibilities of hourly changes in floodwater level and inundated areas. Therefore, these novel systems give authorities enough time to plan ahead by increasing resilience and disaster preparedness.

Part 2. Progress Data

Objective level

Progress: ■ 2016/03 ■ 2016/10 ■ 2017/04 ■ 2017/10 ■ 2018/03

- **Key focus area** Understanding disaster risk
- **Objective 1.3.a** By the end of 2017, encourage governance bodies at all levels to share the applications of innovative methodologies and technologies in hazard management to quantify flood resilience and mitigate vulnerability.



- **Objective 1.3.b** By the end of 2017, raise awareness of the importance of climate change adaptation and disaster risk reduction, and support governments in their implementation.



- **Key focus area** Strengthening governance to manage disaster risk

- **Objective 1.3.c** By the end of 2016, incorporate a long-term climate change adaptation perspective into national/local disaster risk management policies.



- **Objective 1.3.d** By the end of 2016, support enhancing the capacity of policy makers to respond to extreme water-related hazards.



- **Key focus area** Investing in disaster risk reduction and resilience

- **Objective 1.3.e** By the end of 2016, suggest several approaches to managing economies and ecosystems through infrastructure "re-operated" to track emerging changes, and to accommodate a range of potential shifts in the water cycle, with indicators to guide us through effective decision making.



- **Objective 1.3.f** By the end of 2016, support targeted and cost-effective disaster risk management through the exchange of experience in risk-based approaches.



- **Key focus area** Enhancing disaster preparedness for effective response, and promoting "Build Back Better" in recovery, rehabilitation and reconstruction

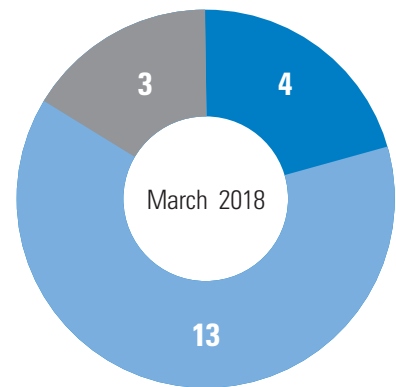
- **Objective 1.3.g** By the end of 2018, strengthen international cooperation between developed and developing countries in applying new science and technologies and improvements to current systems, linking up with local practice and knowledge, focused on "Build Back Better".



Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- International Centre for Water Hazard and Risk Management (ICHARM)

CORE GROUP MEMBERS

- Action Contre la Faim (ACF)
- Alliance for Global Water Adaptation (AGWA)
- Alterra Wageningen University and Research Centre
- American Society of Civil Engineers, Environmental and Water Resources Institute, International Participation Committee (ASCE-EWRI-IPC)
- Deltares
- Korea Institute of Construction Technology (KICT) International Office for Water (IOWater)
- Ministry of Forestry and Water Affairs, Turkey
- Solidarités International
- UNESCO International Hydrological Programme (IHP)
- United Nations Economic Commission for Europe (UNECE)
- Water Resources Agency, Taiwan, China

1.4 Infrastructure for Sustainable Water Resource Management and Services

Throughout the world, appropriate water infrastructure has been shown to reduce hunger and malnutrition, transform rural economies and create employment. Provided that the social and environmental dimensions of water infrastructure are taken into account, water infrastructure plays a vital role in strengthening water security and resilience in the face of climate change and population growth.

Part 1. Overall Progress

Notable progress

IR 1.4 has advanced the case for Multipurpose Water Storage Infrastructures globally. Through regional conferences, the crucial necessity for those infrastructures and their corresponding equipment has been promoted. There has been an increase in understanding and cooperation between key stakeholders such as leaders, in governmental, technical and financial institutions.

Successful outcomes

Africa 2017

A regional conference, Africa 2017 organized in Marrakech, has been a tremendous success for demonstrating the validity of IR goals. The "Water Storage and Hydropower Development for Africa", which took place from 14 to 16 March 2017 in Marrakech, brought together experts from 67 countries to focus on practical issues relating to water resources development, climate resilience, and hydropower in Africa.

The conference, jointly hosted by Aqua-Media International of the UK and the International Commission on Large Dams, was honored by the High Patronage of His Majesty King Mohammed VI. It was also strongly supported by Morocco's Ministry of Energy, Mines, Water and Environment, ONEE, and the Moroccan National Committee on Large Dams. A total of 703 delegates participated. Of the 67 countries represented, 31 were African nations, which led to a constructive international dialogue and exchange of experience.

During the regional conference, leaders stressed the importance of hydropower as the leading source of renewable energy. Particular attention was drawn to its multiple benefits, and the need to support its development even more intensely. The huge unexploited potential of hydropower in Africa was highlighted. At present, about 50 per cent of the African population are still in the dark, waiting for a reliable supply of electricity.

In commending the initiative of the conference, Mrs Charafat Afailal, Morocco’s Minister for Water, expressed the hope that hydropower would help encourage a new African strategy by enhancing capacity and ensuring the sustainable development of the continent.

Water-Food-Energy across climate discussions

It is to be noted that the Moroccan Government has been actively joining efforts with the World Water Council to ensure that Water issues were considered during the Climate talks. This has been achieved in both in COP 22 and COP 23. This central issue of Water-Food-Energy-Climate nexus has been at the center of all the meetings with government officials held by ICOLD since the 7th World Water Forum in Korea. Thanks to joint efforts, it is now a well-established fact that one cannot plan a project on energy and climate without dealing with their interdependencies with water.

Part 2. Progress Data

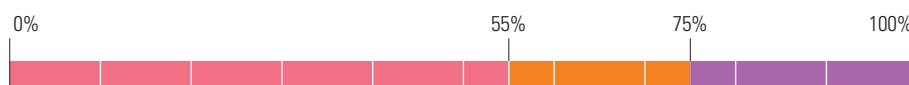
Objective level

Progress : ■ 2016/03 ■ 2016/10 ■ 2017/04 ■ 2017/10 ■ 2018/03

- **Objective 1.4.a** By 2018, establish targets in terms of per capita water storage, as an indicator of well-being and development. Translate those targets into a list of concrete projects, at regional and national levels.



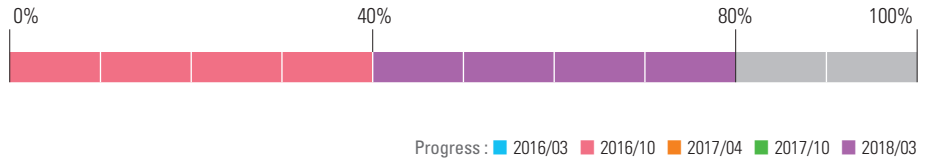
- **Objective 1.4.b** Convince the political leaders of world’s nations of the need for water storage for sustainable human development.



- **Objective 1.4.c** Establish a special international task force on the Future of Global Waterborne Transportation Infrastructure, Working Group (WG) 181, investigating the needs of waterborne infrastructure and the best practices to meet these.

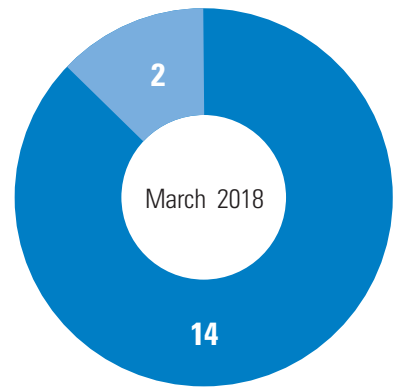


- Objective 1.4.d** Develop an international program for the implementation of “adaptable” strategies for the management of ageing water infrastructures in which both developed and developing nations participate.



Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- International Commission on Large Dams (ICOLD)

CORE GROUP MEMBERS

- American Society of Civil Engineers, Environmental and Water Resources Institute (ASCE-EWRI)
- Development Research Center, Ministry of Water Resources, China
- Federal Institute of Hydrology, Germany
- Korea Water Resources Corporation (K-water)
- Wetlands International

2.1 Water for Food

Public policies and investments must help encourage private investments in technologies and management practices that enhance the sustainable production of crops, livestock and fish by both smallholders and larger scale producers. Public policy will need to effectively and urgently address the excessive use and degradation of water resources in key production regions that threaten the sustainability of livelihoods dependent on water and agriculture.

Part 1. Overall Progress

Notable progress

Water and its interdependencies, such as food and energy, have been dealt with consistently by the DGIC Champion and members of the Core Group. With increased data availability, decision-makers are able to make informed decisions across several spheres including irrigation, water governance, agriculture and remote sensing.

Data availability

Significant progress was made in making precise data available to decision-makers. Examples of this are the Global Yield Gap and Water Productivity Atlas by the Water for Food Institute (WFI) and the University of Wageningen. The Water Productivity and Open Access Portal (WaPOR) database by FAO is also a notable example. The latter uses remote sensing in data processing.

There has also been additional constructive work on planning and management of irrigation command areas executed by Water Land Ecosystems-CGIAR. Furthermore, the International Water Management Institute (IWMI) and International Food Policy Research Institute (IFPRI) added a variable on water quality degradation to the Earth Security Index. This data is gradually improving a) SDG monitoring, b) national planning and management of resources, as well as c) water governance at national, basin and irrigation scheme level.

Irrigation

Irrigation modernization remains an important focus of work. There is an urgent need for improving water use efficiency and productivity in the irrigation sector. International Commission on Irrigation and Drainage (ICID) has been a vocal advocate at international events, such as the 2nd World Irrigation Forum. In many countries, ICID has also been providing training, technical guidance and know-how.

All partners have implemented projects to modernize irrigation schemes. International Society of Paddy and Water Environment Engineering (PAWEES) has drawn particular attention to the importance of wetland restoration.

Water Governance

Since the 7th World Water Forum, the DGIC Champion and members of the Core Group, also expanded their work on water governance. Countries were supported in identifying, assessing and adopting integrated and multi-sectoral approaches for ecosystem valuation, management and restoration. Support was also provided for the analysis of governance issues while options for sustainable agricultural production and natural resources management were also examined. Drought risk management was a particular concern and needs to be tackled further.

Successful outcomes

The Global Framework for Water Scarcity in Agriculture (WASAG)

One of the key achievements of the last three years was the establishment of Global Framework for Water Scarcity in Agriculture (WASAG). This represents a partnership of forty-eight organizations and institutions, responding to the increasingly urgent issues of water scarcity. WASAG was launched at the COP22 of the United Nations Framework Convention on Climate Change (UNFCCC) in Marrakesh in November 2016. The Global Framework seeks to catalyze international cooperation on water scarcity in agriculture in the context of climate change and growing competition for water resources.

Remote-sensing

New technologies, particularly remote sensing, are changing the way we monitor water resources. Satellite data combined with portable ground remote sensors and model data can enhance current monitoring activities. They can also provide faster and more cost-effective information on water availability, flows and in some cases, even quality.

Part 2. Progress Data

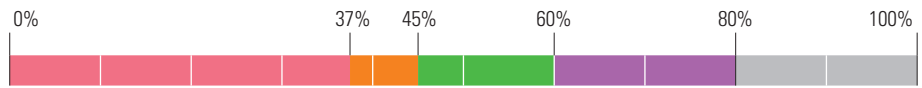
Objective level

Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

- **Key focus area** Best available technology to make efficient use of water in agriculture
- **Objective 2.1.a** By 2030, substantially increase water-use efficiency and ensure sustainable withdrawals of freshwater to address water scarcity.



- **Objective 2.1.b** By 2030, substantially increase agricultural water productivity and the incomes of small- and medium-scale food producers.



- **Key focus area** Water quality management for agriculture and environment

- **Objective 2.1.c** By 2030, improve water quality by reducing pollution and minimizing the release of hazardous agro-chemicals, halving the proportion of untreated wastewater and increasing recycling and safe reuse.

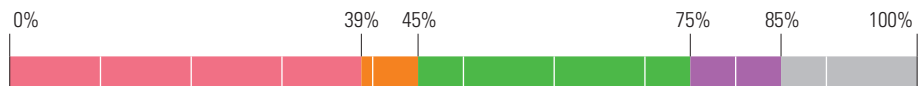


- **Objective 2.1.d** By 2030, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.



- **Key focus area** Modernization of irrigation schemes

- **Objective 2.1.e** By 2030, implement modernization plans for large-scale irrigation schemes taking into consideration the multiple uses of water.



- **Key focus area** Adapt to changing environmental circumstances to increase sustainability

- **Objective 2.1.f** By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, and that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters.

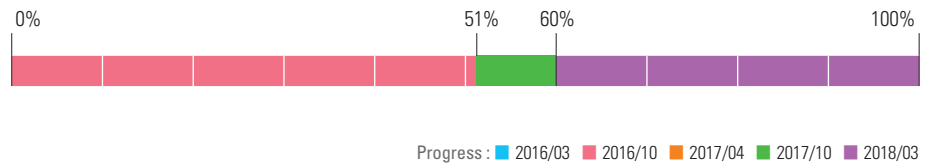


- **Key focus area** Increase farmers' capacities in water use for agriculture

- **Objective 2.1.g** By 2030, expand capacity-building support to developing countries in water-related activities and programs, including irrigation, water harvesting, desalination, water productivity, wastewater treatment, recycling and reuse technologies.

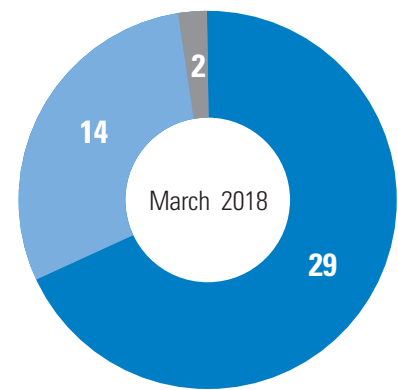


- **Key focus area** Governance and policies to manage transitions in water use for agriculture
- **Objective 2.1.h** By 2030, reduce hunger and ensure improved access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round, by increasing incomes originating from new opportunities in off-farm employment.



Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- Food and Agriculture Organization of the United Nations (FAO)

CORE GROUP MEMBERS

- Global Water Initiative (GWI)
- International Commission on Irrigation and Drainage (ICID)
- International Food Policy Research Institute (IFPRI)
- Korean Rural Community Corporation (KRC)
- University of Nebraska Water for Food Institute (WFI)

OTHER STAKEHOLDERS

- International Water Management Institute (IWMI)
- Ministry of Development GAP Administration Turkey
- International Society of Paddy and Water Environment Engineering (PAWEES)
- State Hydraulic Works (DSI) of Turkey

2.2 Water for Energy

Ensuring water security while managing the world’s rapidly growing demand for energy is a major challenge. Better integration of water and energy policies can help to balance these competing demands, in addition to increased efficiency, better supply and demand management, and harmonization between sectors.

Part 1. Overall Progress

Notable progress

Cross-sectoral cooperation, communication, data sharing, and technical approaches are needed to maximize synergies and minimize trade-offs across the water–energy nexus. A number of tools and guidance are available from the focus areas. These can be used to identify how to effectively assess, plan and improve water and energy efficiency across sectors. Putting these approaches into action to reach the objectives has been and is an ongoing process for the DGIC Champion and members of the Core Group.

Throughout the last 3 years, the approach of linking water and energy (and food) has become more mainstreamed across policy dialogues. Consequently, this is permeating into how resources are managed and planned for future purposes. These steps are milestones in achieving water security and sustainability.

Part 2. Progress Data

Objective level

Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

- **Key focus area** Energy efficiency in water systems
- **Objective 2.2.a** Improve efficiency across the whole water cycle, moving away from a sub-systems perspective to a holistic approach.



• **Key focus area** Impact of energy production on water

• **Objective 2.2.b** Improve water efficiency in the energy sector to enhance water allocation to other uses, such as the manufacturing industry and agriculture and domestic withdrawals, as well as the environment.



• **Key focus area** Policy and financial incentives for improved water and energy sustainability

• **Objective 2.2.c** Increase awareness and develop economic and policy incentives which maximize benefits and minimize trade-offs across the water–energy (and food) nexus.



• **Key focus area** Multipurpose energy infrastructure

• **Objective 2.2.d** Improve the design and operation of multipurpose energy infrastructure to serve beyond electricity generation for one or more other purposes (water quantity and quality management, environmental issues, improved human services and regional development).



• **Key focus area** Decentralized (off-grid) solutions

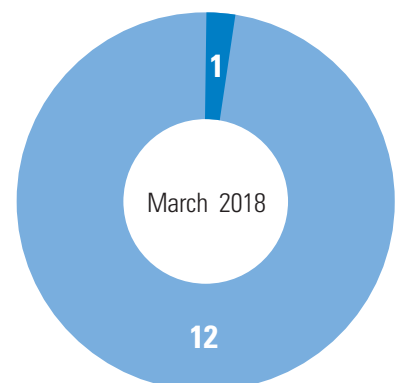
• **Objective 2.2.e** Improved access to water and sanitation as well as energy in remote and economically challenged areas.



Progress : ■ 2016/03 ■ 2016/10 ■ 2017/04 ■ 2017/10 ■ 2018/03

Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- International Water Association (IWA)

OTHER STAKEHOLDERS

- Arup
- Asian Development Bank
- China Institute of Water Resources and Hydropower Research
- Conagua
- CRC for Water Sensitive Cities
- Electriciens Sans Frontières (Electricians without borders)
- Freshwater Action Network
- German Development Cooperation
- Global Energy Initiative

CORE GROUP MEMBERS

- Eléctricité de France (EDF)
- Itaipu Binacional
- The World Bank
- United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)
- World Wide Fund for Nature (WWF)

- International Hydropower Association
- International Union for Conservation of Nature (IUCN)
- International Water Management Institute
- ISRBC Secretariat
- Itaipu
- K-water
- Ministry of Energy and Water Resources of Tajikistan
- Nepal Water Conservation Foundation
- SE4ALL
- Shell
- Suez Environnement
- UN Environment Programme (UNEP)
- United Nations Economic Commission for Europe (UNECE)
- Veolia
- Wetlands International
- World Energy Council
- World Youth Parliament for Water
- Water Footprint Network

2.3 Water and Cities

In light of continued urban growth, the goal is to provide water security for cities by embracing an urban agenda that fosters inclusive, healthy, livable, risk-resilient and sustainable cities. This agenda looks beyond water as a service and recognizes how water shapes urban landscapes. It is regenerative, aiming to reduce, reuse, recover, recycle and replenish water, nutrients and energy within the city. Finally it requires integration between different sectors and scales within the urban landscape and the basin.

Part 1. Overall Progress

Notable progress

From the level of international policy frameworks to local implementation, more regenerative approaches to water in cities are undeniably taking root. On one hand, change is taking hold from both the top and the bottom, with a growing number of visionary leaders championing this transition. On the other hand, change is also being initiated by direct implementation.

Internationally, several major inter-governmental frameworks have come into place since the 7th World Water Forum. They rely on or reinforce notions of integrated approaches to water in cities as means to achieve sustainable development, climate change mitigation and adaptation, disaster risk reduction and inclusive urbanization respectively. The SDGs, Paris Climate Agreement, Sendai Framework and the New Urban Agenda provide much congruent political, financial and policy orientation. These enable the transitions towards inclusive, integrated, resilient, resource efficient and even regenerative cities called for in this theme.

Cities and their actions

Locally, cities are experimenting, and coming together to learn from each other about how to implement these innovations. A growing number of them have signed on to IWA Principles for Water-Wise Cities. Launched in 2016, these principles articulate the essential components of any holistic effort to improve urban water security.

Networks and initiatives such as the Megacities Alliance for Water and Climate, the Urban Waters Hub or the collaboration of IWA and C40 Cities, all aimed at supporting the exchange of knowledge and best practices in this growing arena. The number of networks and initiatives dealing with these themes and issues have also multiplied in these past 3 years. These notions are also central in the Urban Theme and Local and Regional processes of the 8th World Water Forum.

Governance and adaptation

Adapting governance frameworks to meet the requirements of these new imperatives on water, cities and urban resilience has been a slower process, and progress has not been as fast here. There again, tools have emerged and strengthened to support cities. Examples of such tools include, the OECD governance principles, or the City Blueprint framework by KWR, an independent water research institute, which provides a governance assessment associated to each specific water challenge.

There has also been the development and implementation of tools such as the Water Resilience Framework developed by Arup for Rockefeller and 100RC or the Water Sensitive Cities Framework developed by the Cooperative Research Center for water sensitive cities in Australia. These tools and initiatives are coming together to support cities in better understanding their challenges and prioritizing action.

Successful outcomes

The New Urban Agenda

In December 2016, the United Nations General Assembly endorsed the New Urban Agenda (NUA) in Resolution A/71/235. The NUA sets out new global standards for sustainable urban development, and aims to help rethink how we plan, manage and live in cities.

Central to the approach outlined in the NUA is the strengthening of capacity at the local level. Increased decentralization and a clearer definition of roles, responsibilities and resources through national urban plans is also vital in the NUA. The NUA also directly supports a water-wise agenda by calling for fit-for-purpose water systems, and water-sensitive approaches in planning and urban design. Moreover, the NUA highlights the need for consideration of water in housing and construction. It is essential for relevant authorities and stakeholders to adopt housing densities to minimize energy and resource expenditures in view of protecting ecosystems and building resilience.

Water-Wise Cities

The International Water Association (IWA) Principles for Water-Wise Cities are part of the association's effort to, not only support the work of city leaders towards safer water and sanitation services, but also towards using urban design to enhance security and well-being. These steps are undertaken while restoring ecosystems and considering basin-wide management.

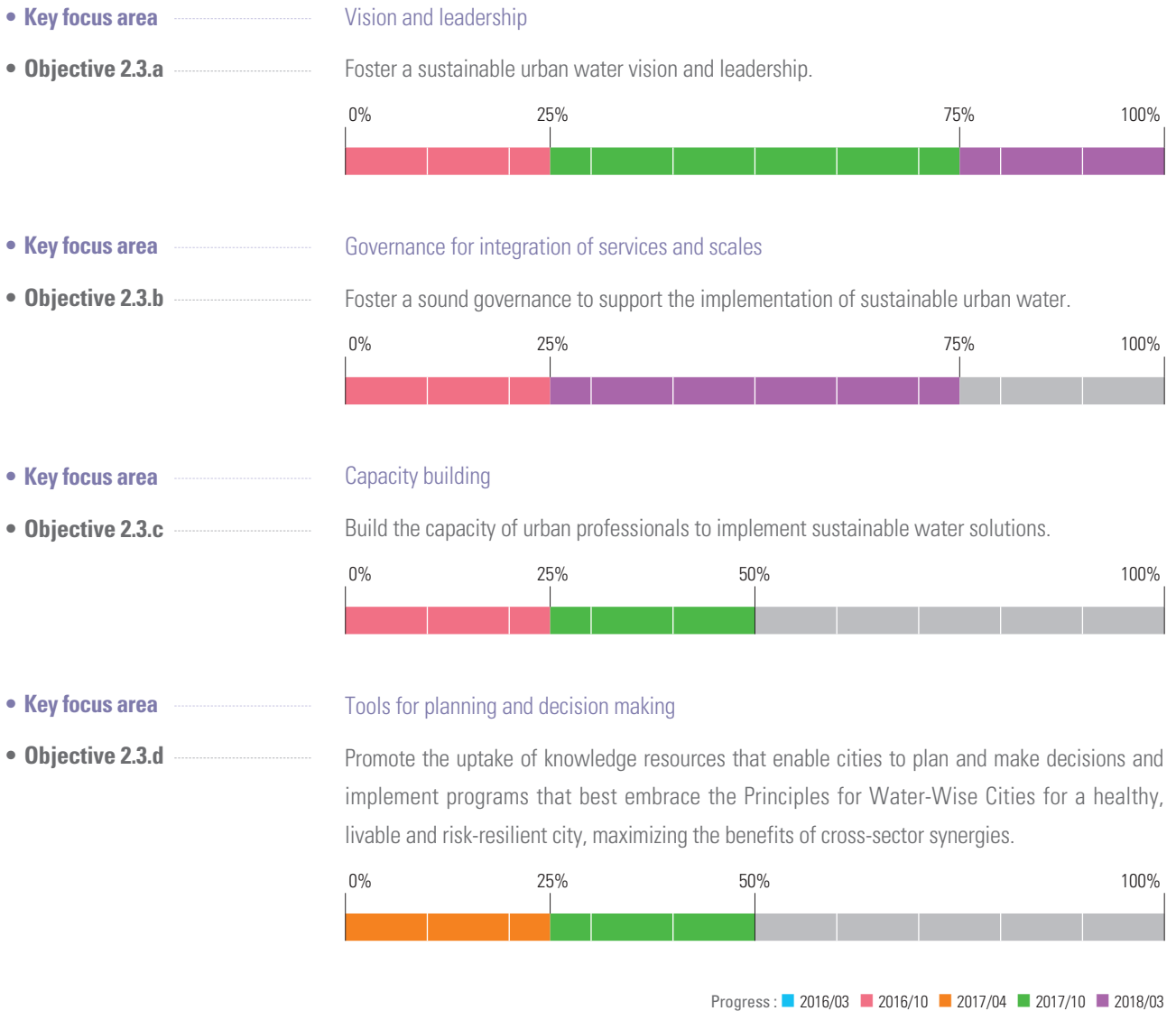
The Principles for Water-Wise Cities focus and underscore the need to ensure that water is considered as early on as possible – it should be considered during the planning and design stage of cities. This results in quality, efficient and more sustainable services and increased resilience and livability for inhabitants.

The goal of these Principles is to encourage collaborative action. These actions should themselves be supported by a shared vision. As a result, local and regional authorities, urban professionals, and individuals will actively engage in addressing and finding solutions for managing all waters of the city. The 17 Principles are grouped into four categories: Regenerative Water Services, Water-Sensitive Urban Design, Basin Connected Cities and Water-Wise Communities.

Part 2. Progress Data

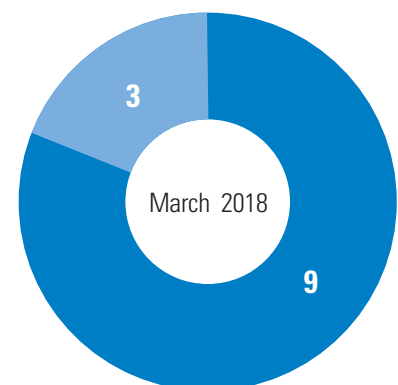
Objective level

Progress : 2016/03 2016/10 2017/04 2017/10 2018/03



Action level

Not executed Ongoing Completed



CHAMPIONS

- UN Habitat
- International Water Association (IWA)

CORE GROUP MEMBERS

- Asian Development Bank (ADB)
- Cooperative Research Centres, Australia
- Korea Land and Housing Institute
- Nairobi City Water and Sewerage Company
- United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)
- United Cities and Local Governments (UCLG)
- Veolia Environment

OTHER STAKEHOLDERS

- Urban Waters Hub

3.1 Green Growth, Water Stewardship and Industry

“Growing first, and cleaning up later” is no longer a viable option for sustainable development. Growing concerns on population projections, rapid urbanization and unpredictable climate change will put humans and ecosystems at greater risk by causing various water problems. In this regard, green growth has emerged as a new development strategy to respond to an unsustainable business-as-usual approach. Moving forward, it is necessary for major water users to understand their water use and impacts. Theme 3.1 aims to manage water for green growth with different tools and actions, and raise awareness of water users on the importance of socially and economically beneficial water use. It explores effective policies, fosters the long-term engagement of a variety of stakeholders in water management and recognizes the economic value of water.

Part 1. Overall Progress

Notable progress

Since the conclusion of the 7th World Water Forum in 2015, IR 3.1 helped ensure an increasingly coherent policy to enable green growth in the water sector, foster the long-term engagement of a variety of stakeholders in water management, and recognize the economic value of water to avoid business risks and enhance cooperation for environmental sustainability activities.

“Water & Green Growth” (WGG)

A follow-up research project on “Water & Green Growth (WGG)” was launched by K-water in April, 2016. This project aims to ensure institutional arrangements through an operating scheme. It was designed to elaborate on policy guidelines published at the previous World Water Forums, provide a roadmap enabling green growth in the field of water, and fulfill K-water’s responsibility for IR 3.1 at the 8th World Water Forum.

The research results will be presented at the 8th World Water Forum to show the evolution of WGG. The purpose of the presentation is also to receive feedback and advance the value of WGG, while simultaneously fulfilling the Daegu-Gyeongbuk Implementation Commitment (DGIC).

Policy development through case studies

Over the past three years, policy changes towards sustainable development were promoted. This was done by providing real case studies for policy makers and making stronger links between water and other themes such as energy and food production. As of February 2018, seven case studies have been completed to demonstrate the effectiveness of WGG in sustainable development.

Smart Water Management (SWM)

Launched in 2016 as an international collaborative research project, SWM has been proposed as a new paradigm of water management. During the 2017 World Water Congress in Cancun, a session was held which focused on SWM's contributions to realize WGG and reach the SDGs goals and targets. The outcomes of SWM will be shared at the 8th World Water Forum in order to show how SWM can be valid in accelerating the green transition and enhance the engagement of various stakeholders in water management.

Bridging the gap

IR 3.1 has bridged the gap between research, stakeholders and policy makers. For example, members of the WGG research project participated in international water events such as Asian International Water Week, Korea International Water Week, World Water Week in Stockholm, and IWRA World Water Congress, etc. This was done to receive diverse ideas and opinions from various stakeholders.

Other relevant examples

IR 3.1 has also been showcased by UNEP's continuous efforts to build robust environmental governance and the ongoing endeavor of the Alliance for Water Stewardship (AWS) to establish an international water stewardship standard with the efforts of World Wildlife Fund (WWF) in promoting good water governance, protecting freshwater ecosystems, and advancing corporate water stewardship.

Other examples include the World Business Council for Sustainable Development (WBCSD)'s constant action to promote circular water management and raise the business sector's awareness on water from the view of business sustainability. Several examples of good governance were also found in the case studies during the progress of IR 3.1.

To achieve sustainable business development, best practices and knowledge have also been shared between countries and organizations. For instance, K-water's Water Academy has presented its experiences and lessons to other countries such as Laos, Thailand, and Vietnam, etc. Through collaboration and cooperation, ways to improve awareness on the role of water through public campaigns were documented.

Successful outcomes

One of the most successful outcomes of IR 3.1 is the establishment of an operating mechanism which can continuously work until the 8th World Water Forum. This achievement has been done with the view of fulfilling the Daegu-Gyeongbuk Implementation Commitment (DGIC).

Tracking mechanisms in fulfilling the DGIC

In 2015, during the design phase of IR 3.1, one key idea that was left out was that the 'Action monitoring system should be institutionalized'. When it comes to the working process of international cooperation, it usually takes a significant amount of time to realize institutionalization or legislation.

Also, many activities in international cooperation rely on voluntary participation which makes it difficult to provide incentives or enforce penalties. However, K-water Institute reached the level of institutionalization by conducting a follow-up research project on WGG. This was done in April 2016, after the institute found that it would be difficult to carry out its responsibility without an institutional mechanism. Indeed, the research project has provided a clear pathway which aims to help implement IR 3.1, manage human resources, and enable K-water to perform relevant tasks.

Core Group Members* are paving the way forward

Another successful outcome is the unceasing efforts of all members. The DGIC Champion and members of the Core Group of IR 3.1 are continuously putting their efforts to achieve the goals of each area. For example, WBCSD has demonstrated to stakeholders in the industrial sector and the private sector how sustainable business models can be operated by disseminating the results of case studies.

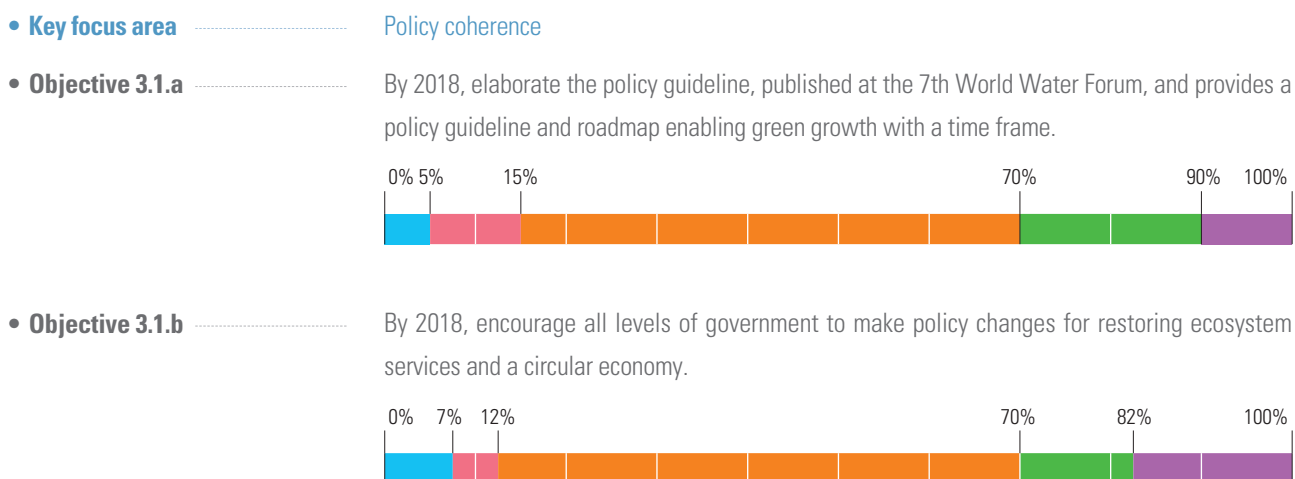
Furthermore, UNEP has constantly put in a great deal of effort to build sound water governance to enhance the involvement of all levels of stakeholders. Additionally, the AWS Standard system has become fully operational over the last three years and there are now 12 sites certified to the AWS Standard. AWS has gained significant industry commitments to AWS certification, e.g. from Nestle and German supermarket chain Edeka, with around 100 AWS members in total from the public, private and non-profit sectors. As well, WWF published its own report to contribute to the AWS International Water Stewardship Standard in 2016.

* Please refer to P. 45 for the list of Core Group Members.

Part 2. Progress Data

Objective level

Progress : 2016/03 2016/10 2017/04 2017/10 2018/03



• **Key focus area** Involvement of stakeholders

• **Objective 2.3.c** By 2018, institute an appropriate legal and institutional framework for the participation of all levels of stakeholders in water management.

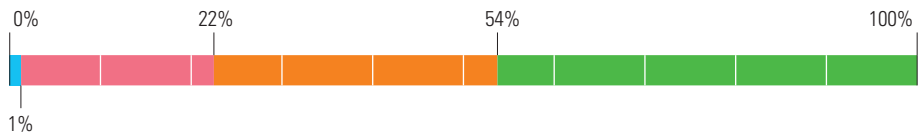


• **Key focus area** Sustainable business models

• **Objective 3.1.d** By 2018, find sustainable business cases and best practices for a sustainable economy to overcome a silo approach to water management.

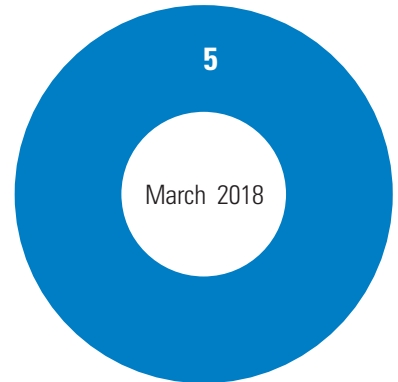


• **Objective 3.1.e** By 2018, increase awareness on the role of water in sustainable business models.



Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- Korea Water Resources Corporation (K-water)

CORE GROUP MEMBERS

- Alliance for Water Stewardship (AWS)
- United Nations Economic and Social Commission for Asia Pacific (UNESCAP)
- United Nations Environment Programme (UNEP)
- World Business Council for Sustainable Development (WBCSD)
- World Wide Fund for Nature (WWF)

3.2 Managing and Restoring Ecosystems for Water Services and Biodiversity

Nature forms a vital component of the water cycle, including critical benefits from water storage, filtration and risk reduction. Degrading ecosystems damage the delivery of water services to people. Hence, there are vital opportunities to improve both the sustainability of water services and the conservation of biodiversity by restoring watersheds, wetlands or rivers, as well as by using nature in engineering designs.

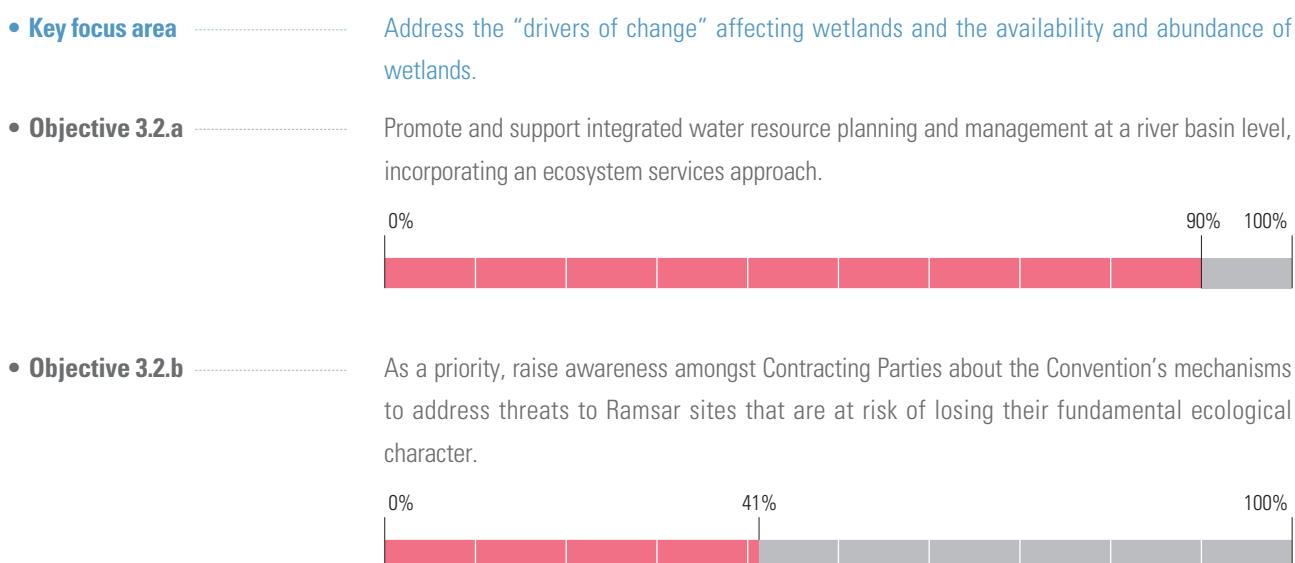
Part 1. Overall Progress

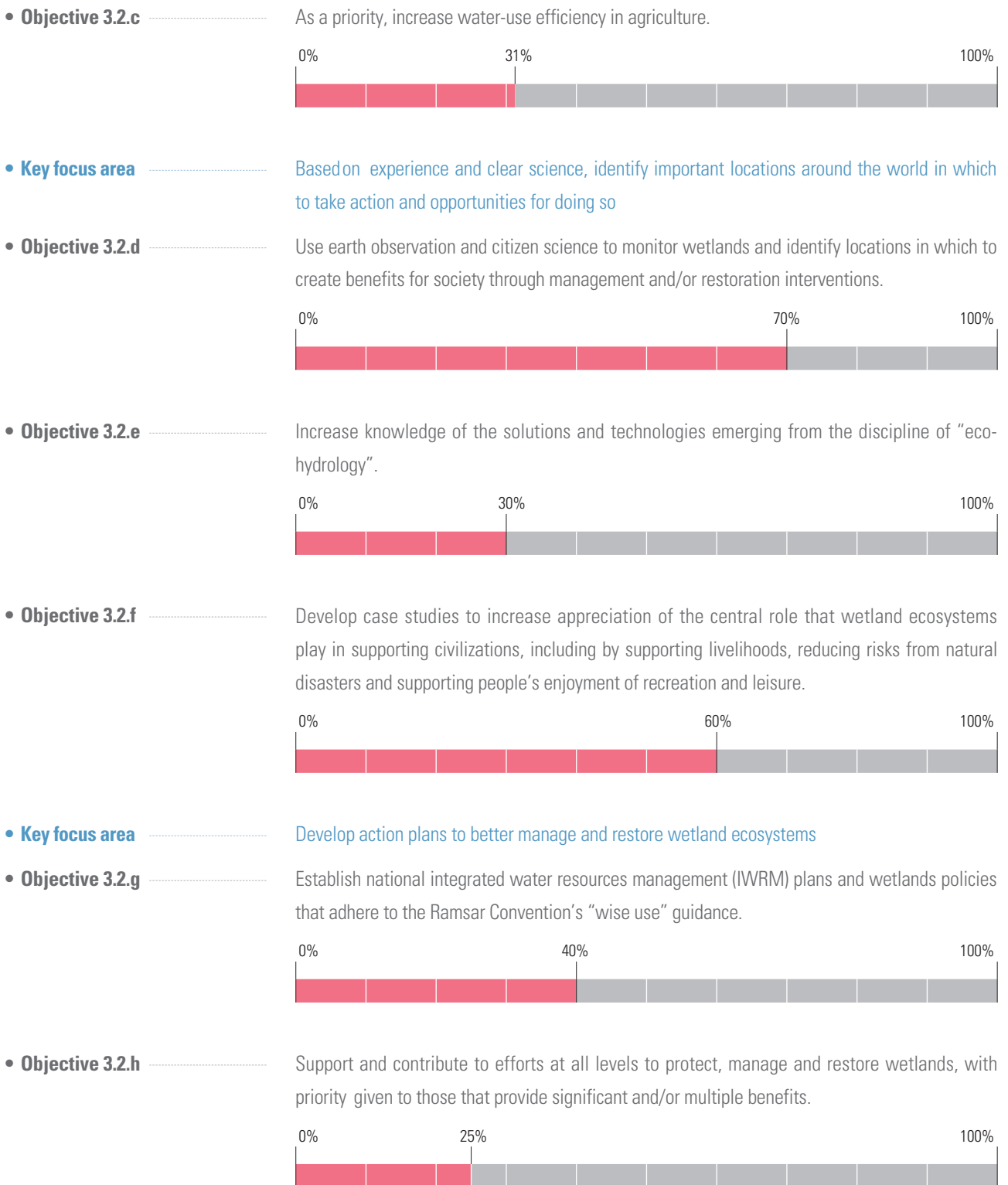
Due to time constraints and limited data availability qualitative data on this IR was not collected in time for publication. For more information please contact representatives of the DGIC Champion and members of the Core Group.

Part 2. Progress Data

Objective level

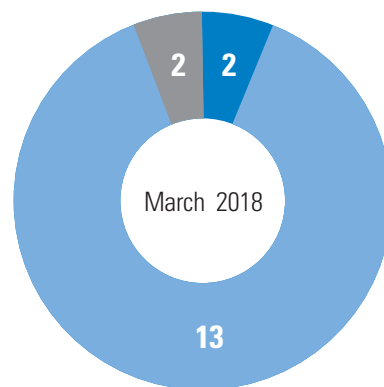
Progress : 2016/03 2016/10 2017/04 2017/10 2018/03





Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- Ramsar Convention Secretariat

CORE GROUP MEMBERS

- Association Scientifique et Technique pour l'Eau et l'Environnement (ASTEE)
- Development Research Center, Ministry of Water Resources, China
- European Regional Centre for Ecohydrology, Poland
- International Union for Conservation of Nature (IUCN)
- National Institute of Environmental Research (NIER)
- UNESCO International Hydrological Programme (IHP)
- World Wide Fund for Nature (WWF)

3.3 Ensuring Water Quality from Ridge to Reef

Water quality is a crucial consideration for efficient water resources management. With increasing pressures on available resources, water quality management is increasingly seen as essential for a more balanced and multidimensional approach to the research, policy making, governance, operations and management of water resources. In order to improve water security, water quality management must improve. This is particularly evident in situations where water quality degradation or the inappropriate use of water is responsible for reducing the quantity of water available for the various uses it is needed for.

Part 1. Overall Progress

Notable progress

The issue of Water Quality is still one of the core themes being tackled by the International Water Resource Association (IWRA), both during major international events and through dedicated projects. The members of the Core Group have also been continually striving to advance discussions and research in the field of water quality.

XVI World Water Congress

First, the XVI World Water Congress was held in Cancun, Mexico, from 29 May to 3 June 2017 co-hosted by IWRA, the National Association of Water and Sanitation Utilities of Mexico (ANEAS) and the National Water Commission in Mexico (CONAGUA).

One of the Congress' main themes focused on "Water Quality, Wastewater and Reuse", tackling water quality and pollution management "from ridge to reef": contaminants of emerging concern, water technologies and the circular economy – reduce, remove, reuse. Moreover, it collaborated with the Action Platform for Source to Sea Management (S2S Platform) in hosting a dedicated Special Session: Towards SDG Implementation – Ensuring Water Quality from Source to Sea. This successful session, focused on managing seawater and freshwater jointly, not separately. This crucial issue brought together international actors working on the governance and management of water quality both from oceans and freshwater sources. As a result, this event raised awareness within the water community, including lawyers and policymakers. A new framework when approaching water pollution was suggested.

Other projects undertaken

As part of the role of DGIC Champion, IWRA was also chosen as topic lead on the 8th World Water Forum topic "Ensuring Water Quality from Ridge to reef », under the Theme "Ecosystems".

The IWRA will coordinate the organisation of three sessions on the topic at the 8th World Water Forum.

On top of being visibly involved on the Water Quality issues during major water events, IWRA also dedicates time and human resources to deeply address the issue of water quality at other levels. For instance, recently, the association was glad to launch the debut of its Task Force on Water Quality (WQ). With an open call for panellists, IWRA sought experts from around the world to join its WQ Task Force and to make a meaningful contribution to Water Quality through the WQ Project with strong support from the World Water Council.

The WQ Task Force is made up of selected IWRA members, supported by its Board and Secretariat. Panellists will have the opportunity to:

- (1) Contribute to a Compendium on Global Water Quality Guidelines. This will be done by helping in the review and completion of the report entitled "Global Compendium on Water Quality Guidelines: Which quality for which use?" to be published in early 2018;
- (2) Help scope the development of future projects related to water quality;
- (3) Interact and create meaningful networks and relationships with other IWRA members, as well as to contribute to projects and initiatives that otherwise would be inaccessible for individual professionals in the field.

After an open call to IWRA members to join the WQ Task Force, almost 40 applications representing 25 different countries were received, with great representation from both women and developing countries.

Finally, IWRA is also partnering with K-water to better understand and promote the benefits of Smart Water Management (SWM) solutions. Through the SWM Case Studies Report, IWRA aims to achieve the continued implementation of SWM. This is expected to be done by sharing the knowledge and insights gained by exemplary SWM projects from around the world. These relevant projects also address the issue of water quality.

Successful outcomes

The Cancún Declaration

With over 1,140 people on site from 70 countries, the World Water Congress had a fantastic turnout, with over 100 distinct sessions. One important output from the Congress is "The Cancún Declaration - A Call for Action to Bridge Science and Water Policy-Making for Sustainable Development".

This declaration is the product of a fully collaborative process and encompasses inputs from all the sessions and participants. Moreover, it calls for urgent mobilisation of knowledge generators, governments, donors, professionals and civil society to join their efforts to achieve the 2030 Agenda for sustainable development. It also stresses that "Business as usual" in science, policy and implementation is not an option. In a time where science often feels like it is under attack from both policy and funding perspectives, there is an urgent need for stronger efforts in creating new interdisciplinary knowledge and its efficient dissemination.

The achievements of the World Water Congress

A major event like the World Water Congress is a place for dialogue and knowledge sharing, for all water stakeholders. It has contributed to various key focus areas from the 7th World Water Forum IR in that it has contributed to improve data collection and information exchange. It has also encouraged the use of the tools created by international organisations to gather policy information and expand perspectives on water quality (Objective 3.3c). Additionally, it encouraged participants to put the SDGs into practice (Objective 3.3d), with the focus on bridging the gap between science and policy.

Further projects

IWRA was glad to find additional resources to follow up on their project on Water Quality which was a report entitled "Global Compendium on Water Quality Guidelines: Which quality for which use?". This report will be published in early 2018, and the association is currently scoping the development of future projects related to water quality, including the creation of an online database gathering the content of the Compendium. Furthermore, this project has a very participative focus: with the creation of a Task Force of Experts made up of selected IWRA members. The content of the project is enriched with the expertise of the members. It directly contributes to the key focus area "Strengthening frameworks for governing and managing water quality".

Part 2. Progress Data

Objective level

Progress: ■ 2016/03 ■ 2016/10 ■ 2017/04 ■ 2017/10 ■ 2018/03

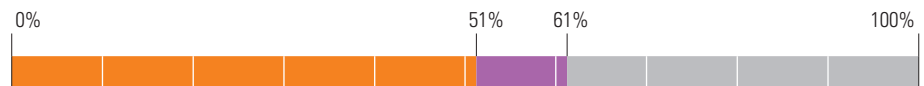
- **Key focus area** Using water smarter to contribute to water security
- **Objective 3.3.a** Within a context of global changes and limited water resources, contribute to ensuring the availability of water resources in accordance with the different water uses and their associated water quality needs.



- **Key focus area** Monitoring and reporting of water quality
- **Objective 3.3.b** Provide enormous opportunities to bring about a data revolution in sustainable development (goals), and support national governments and non-governmental and civil society organizations in improving water quality monitoring and reporting. It is crucial to gather and distribute good quality, credible water-quality data.



- **Key focus area** Strengthening frameworks for governing and managing water quality
- **Objective 3.3.c** Improve data collection and information exchange on water quality in the different regions of the world and among countries. Use the tools of international organizations to gather policy information on water quality and expand perspectives on water quality. Use existing partnerships and develop new ones to share knowledge and web-based databases to enhance regional cooperation.



- **Key focus area** Sustainable wastewater management and reuse
- **Objective 3.3.d** Promote wastewater as a resource of water and nutrients. Showcase that it is possible to manage wastewater in an environmentally and economically feasible way by identifying and promoting best practices, policies and financial mechanisms. Furthermore, help to put the Sustainable Development Goals (SDG 6.3) into practice.



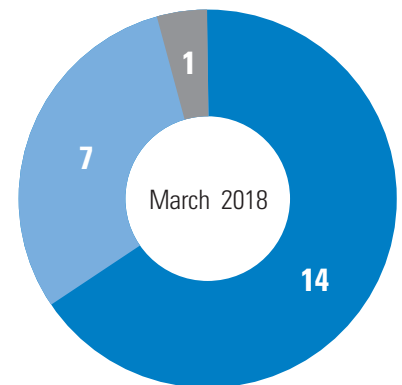
- **Key focus area** Managing sources for coastal and marine water quality improvements
- **Objective 3.3.e** Contribute to the enhanced sustainability of investments in the land–river–coast–sea continuum, including water quality management initiatives. Increase collaboration, knowledge sharing, innovation and action to address the links between land, water and coastal areas.



Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- International Water Resources Association (IWRA)

CORE GROUP MEMBERS

- Action Platform for Source to Sea Management (S2S Platform)
- Korean Environment Institute (KEI)
- Netherlands Water Partnership (NWP)
- Texas A&M University, School of Law (TAMU)
- Turkish Water Institute (SUEN)
- United Nations Environment Programme (UNEP)

3.4 SMART Implementation of IWRM

When we consider the multiple uses of water resources, be it for food and energy, industry and environment, or inland navigation and recreation, an integrated management approach is necessary to balance supply and demand. But how is achieving that balance implemented in practice, while safeguarding the sustainability of surface and groundwater sources?

Part 1. Overall Progress

The overall IR 3.4 reached and in some points surpassed the expected targets. Over the 3 years span, the Champion organizations and members of the Core Group implemented various activities that went beyond the expectations of the initial design of the work envisioned for the IR 3.4.

Notable progress

A significant volume of publications was published. These publications explored various aspects of IWRM and explored the new knowledge provided by smart water systems, water quality and wastewater use and flood risk management to name but a few aspects. More than 30,000 people were made aware of the various aspects of smart water systems and other water-related subjects. Furthermore, tools such as the UNESCO-IHP Water Information Network System (WINS) were developed to facilitate the implementation of IWRM at national level.

The exchange of case studies facilitated by GWP has occurred through a number of channels, including the UNFCCC Nairobi Work Programme, the Asia-Pacific Water Forum, OECD's Water Governance Initiative and a range of GWP programmes and events. The link and share of responsibility of other sectors in IWRM has been promoted via presentations and publications.

In addition to the support provided by the Core Group as part of the WWC IWRM Task Force, efforts were made to support the successful implementation of SDG target 6.5.1 on IWRM, also aiding UN Environment and countries to supply their baseline data and deal with issues of transboundary cooperation (SDG target 6.5.2).

Successful outcomes

Worldwide outreach

UNESCO's Water Family represents an expanded network of experts, counting more than 1,500 members around the world. The experts are situated in Universities and/or Research Centers and played an instrumental role in the training of experts in various aspects of IWRM.

Furthermore, both the co-champion, UNESCO International Hydrological Programme (IHP) and the Global Water Partnership (GWP), organized and participated in numerous high-level events and significant global conferences advocating for IWRM. The same can be stated for the members of the Core Group, namely: American Water Resources Association (AWRA), Department of Water Affairs and Forestry (DWAF), South Africa, Korea Water Resources Association (KWRA), Network of Asian River Basin Organizations (NARBO) who operated at a Regional and National levels.

Country-level outreach

Following on from similar initiatives conducted to review the application of integrated approaches to water resources management as input to the Rio +20 conference and the round of national stakeholder consultations in support of the Post-2015 Development Agenda, Global Water Partnership (GWP) has in 2017 leveraged its stakeholder network to advance the SDG reporting process in 30 countries. Together with UN Environment, the custodian agency of SDG 6.5.1 (IWRM), the GWP convened 30 workshops to collect the official country data for the indicator. The results of the workshops will form part of the SDG 6 baseline data to be included in UN-Water's SDG 6 Synthesis Report 2018 on Water and Sanitation, which will serve as an input to the High Level Political Forum on Sustainable Development (HLPF).

In alignment with the principles of IWRM, the workshops brought together diverse stakeholders, including government agencies, research institutions, and civil society organizations. Participants discussed the status of water resources management in their respective countries.

Part 2. Progress Data

Objective level

Progress : ■ 2016/03 ■ 2016/10 ■ 2017/04 ■ 2017/10 ■ 2018/03

- **Key focus area**
- **Objective 3.4.a**

IWRM for sustainable water resources management

By 2018, promote/support initiatives designed to incorporate relevant policies and scientific issues through cross-cutting approaches on water management for the implementation of IWRM.



- **Objective 3.4.b** By 2018, support knowledge generation on IWRM aspects at all levels.



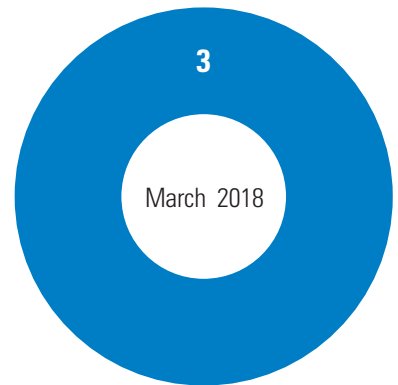
- **Objective 3.4.c** By 2018, promote/support knowledge transfer via the training of human resources.



Progress: 2016/03 2016/10 2017/04 2017/10 2018/03

Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- UNESCO International Hydrological Programme (IHP)
- Global Water Partnership (GWP)

CORE GROUP MEMBERS

- American Water Resources Association (AWRA)
- Department of Water Affairs and Forestry (DWAF), South Africa
- Korea Water Resources Association (KWRA)
- Network of Asian River Basin Organizations (NARBO)

4.1 Economics and Financing for Innovative Investments

Investment needs for improvements in water, for both hard and soft measures, are increasingly daunting, while official development assistance (ODA) remains stagnant. But the heart of the issue is not simply about figures and amounts, but about improving flows and ensuring financial feasibility and viability for improvements. In this perspective, how will the Sustainable Development Goals be financed? What role can the private sector play?

Part 1. Overall Progress

Notable progress

Various actions aligned with the roadmap objectives have been undertaken by the DGIC Champion and members of the Core Group. Significant progress has been made in improving procurement policies to provide more innovative financing modalities that ensure adequate financing, delivers results, and allows for increased private sector participation.

Procurement policy

In March 2017, African Development Bank (ADB)'s Procurement Policy has incorporated performance-based procurement, also called output-based procurement. This refers to competitive procurement processes resulting in a contractual relationship where payments are made for completion of specific performance-related outputs instead of inputs provided.

Design-build-operate (DBO) modality has also been increasingly adopted in water and wastewater projects, and recently in irrigation as well. DBO contract modalities have extended operation and maintenance contracts that ensure adequate resources can sustain the initial operations period and enable sufficient time for knowledge transfer. An example is ADB's first public-private partnership in irrigation in Bangladesh.

Payment for ecosystem services

Payment for ecosystem services (PES) is now being applied for forest and watershed protection in several countries including in Nepal, the People's Republic of China (PRC), and Viet Nam. While the methodology and criteria for PES and Green Infrastructure projects have not yet been fully harmonized, they adhere to the same basic principles. The schemes are adapted to local conditions and situations.

New financing mechanisms

New financing modalities to extend access to water and sanitation services in rural areas and poorer urban districts are also being made available. Small town water supply and sanitation projects have been implemented by ADB in Nepal and Sri Lanka. These projects utilize explicit performance-based grants to deliver water supply and sanitation services primarily to poor and vulnerable groups. Output-based aid provides grants/subsidies to service providers for water supply connection to households and for individual toilets. These subsidies ensure affordability and access to better services. In the Sri Lanka project, the tariff structure includes a lifeline tariff subsidy for water supply that will ensure continuous affordability of water user charges by poor households.

Local water users

Local water users associations are enabling efficient collection of payment from small communities, as well as the handling of funds for system maintenance. Such is the case in Burkina Faso where the responsibility for maintenance of rural water points has been transferred to village water associations, and this has contributed to the long-term financial and physical sustainability of the system.

Financing water resources management in the PRC

Progress is also being made in testing new methods for financing water resources management. In the People's Republic of China, there are ongoing reforms of water resource prices and creation of water service markets to reflect such factors as scarcity of water resources and externalities associated with water services. The seven river basin commissions, with support from the central government, will jointly develop and issue a technical handbook on allocating river basin water resources for local government users. The handbook would contribute to more consistent preparation of water resources allocation plans and agreements at local levels, which is the basis for functioning water markets. Plans will be based on scientific accounting of water availability, water consumption, and the amounts that must be retained or returned to the environment.

Successful outcomes

The most progress has been made on applying performance-based procurement and innovative contracting modalities that encourage private sector participation. These have been applied in both water supply and sanitation service provision as well as irrigation.

Water and Sanitation in Georgia

The Urban Services Improvement Investment Program in Georgia will improve water and sanitation services in six secondary towns. The Investment Program, with a total cost of \$625 million, includes:

- infrastructure improvement to rehabilitate, improve, and expand WSS services;
- institutional effectiveness to improve the service utility's technical and management

- capabilities to provide efficient WSS services, and develop the capacity of sector regulators to regulate tariffs, services standards, environmental protection, and drinking water quality in the long-term; and
- investment Program implementation support. A water utility operator has been engaged under a 3-year performance-based management consultancy contract, along with a financial expert to improve asset and financial management, O&M, and commercial efficiency of water supply and sanitation assets.

The project also includes DBO contracts for sewage treatment plants.

The Integrated Participatory Development and Management of Irrigation Program

ADB has recently approved the Integrated Participatory Development and Management of Irrigation Program in Indonesia, which is the first results-based lending project in the irrigation sector. The program, with a total project cost of \$1.679 billion, will support the Government of Indonesia in implementing its Irrigation Improvement Program (IIP), which advances the overarching agenda of food security and rural poverty reduction through increased and improved water delivery.

This operation will be delivered using the Results-Based Lending (RBL) modality because of (i) the strong government ownership of and commitment for the IIP; (ii) the nature of the program, which requires a results and system approach; (iii) the opportunity to leverage ADB financing by influencing key results under a large program; and (iv) the potential for harmonization among development partners through a mutual focus on results.

Part 2. Progress Data

Objective level

Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

- **Key focus area** To ensure that adequate financial provision is made to achieve the global goal of water security
- **Objective 4.1.a** Capture the benefits of ecosystems for water resources and services in economic and financial terms in order to generate finance for their preservation and enhancement. Specifically, to increase the numbers and range of payments for environmental services Payment for Environmental Services (PES) and green infrastructure Green Infrastructure (GI) projects in all regions, to develop an agreed methodology and criteria for PES and GI projects and to involve private and other non-governmental partners in these schemes.



- Objective 4.1.b** Using performance-based contracts (PBCs) and other forms of Results-Based Contracting to create incentives for contractors to achieve cost efficiencies, timely deliveries or enhanced benefits of other kinds. Specifically, to increase the numbers and range of PBCs in operation and to build a casebook of the implementation of value to potential public clients, contractors and regulators.



- Objective 4.1.c** Promote new financing and implementation mechanisms to extend access to water and sanitation services both in rural areas and in poorer districts of cities. Specifically, to examine the financial provision for small-scale water and sanitation service providers, the potential of microfinance and the use of other pro-poor techniques, such as prizes and solidarity systems.



- Objective 4.1.d** Present recent work on tracking financial flows into the water and sanitation sector and showcase innovative financial approaches. Specifically, finance models based on the enhanced value of land due for development and that facilitate access to local lending sources and the greater use of bankable business models adapted for the private sector.



- Objective 4.1.e** Present a crucial assessment of traditional means of financing agricultural water use. Present and assess experiences of the use of public-private partnerships (PPPs) in irrigation management, and consider other options for agricultural water finance. Specifically, use this evidence to assess the scope for PPPs in the finance of irrigation, and related to this, the scope for using water pricing as a management tool in this sector.



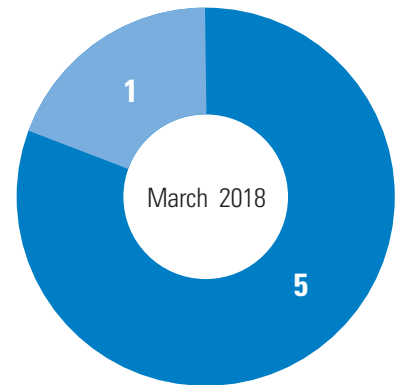
- Objective 4.1.f** Present different methods and sources of finance for water resources management, with cases studies from specific countries, and consider the scope for making such practices more widespread.



Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- Asian Development Bank (ADB)

CORE GROUP MEMBERS

- Agence Française de Développement (AFD)
- Islamic Development Bank (IsDB)
- Korea Research Institute for Human Settlements (KRIHS)
- Secrétariat International de l'Eau - International Secretariat for Water (SIE-ISW)
- The World Bank

4.2 Effective Governance: Enhanced Political Decisions, Stakeholder Participation and Technical Information

The international community now recognizes that the world's "water crisis" is largely a "governance crisis". Many solutions to water problems are well-known and exist. What is often at stake is their implementation. This is why Theme 4.2 aims to guide decision makers across levels of government to strengthen institutions' capacities in order to reap the economic, social and environmental benefits of good governance, to inform public debate and actions, and to contribute to facilitating change and reform where and when needed.

Part 1. Overall Progress

Notable progress

Since 7th World Water Forum, the OECD Water Governance Initiative (WGI) has been championing the IR 4.2 on Effective Governance. Twelve objectives echo the OECD Principles on Water Governance adopted in June 2015.

From 2015 to 2018, activities of the WGI have put a high premium on the implementation of IR 4.2 across countries, basins and cities by:

- (1) Raising the profile of water governance in the global agenda (contribution to COP21, 22 and 23, Habitat III, SDGs monitoring process, etc.);
- (2) Providing a platform to share experiences on water governance topics (organisation of 50+ events, workshops and sessions on water governance during the 2015–2018 period);
- (3) Producing new knowledge (publication of over 30 reports, publications and articles on various water governance topics); and
- (4) Collecting and showcasing solutions (compilation of over 200 case studies, success stories, evolving practices on governance).

Up to the 8th World Water Forum in Brasilia, the WGI will have been fully dedicated to deliver a framework of water governance indicators and a database of water governance evolving practices that will further help realising the goal of IR 4.2: guiding decision makers across levels of government to design and implement better policies that reap the economic, social and environmental benefits of good water governance.

Successful outcomes

As part of the activities conducted from 2015 to 2018 to progress on the Implementation Roadmap 4.2, two in particular stand out:

Water Governance Indicators Framework

The OECD Water Governance Initiative has developed an indicator framework that allows a self-assessment of water governance systems. This framework is composed of 36 water governance indicators measured by a traffic light system, 19 key output indicators, a checklist containing 100 questions on water governance, and an Action Plan for discussion of future improvements. The Framework is conceived as a self-assessment tool to collectively identify whether framework conditions are in place for each OECD Principle on Water Governance, and if they are implemented and properly functioning, based on a multi-stakeholder dialogue. The Framework is intended to be applicable at different scales (city, basin, national or other) and for different water management functions (water resources, water services, water disasters). It will be introduced during a dedicated session at the 8th World Water Forum.

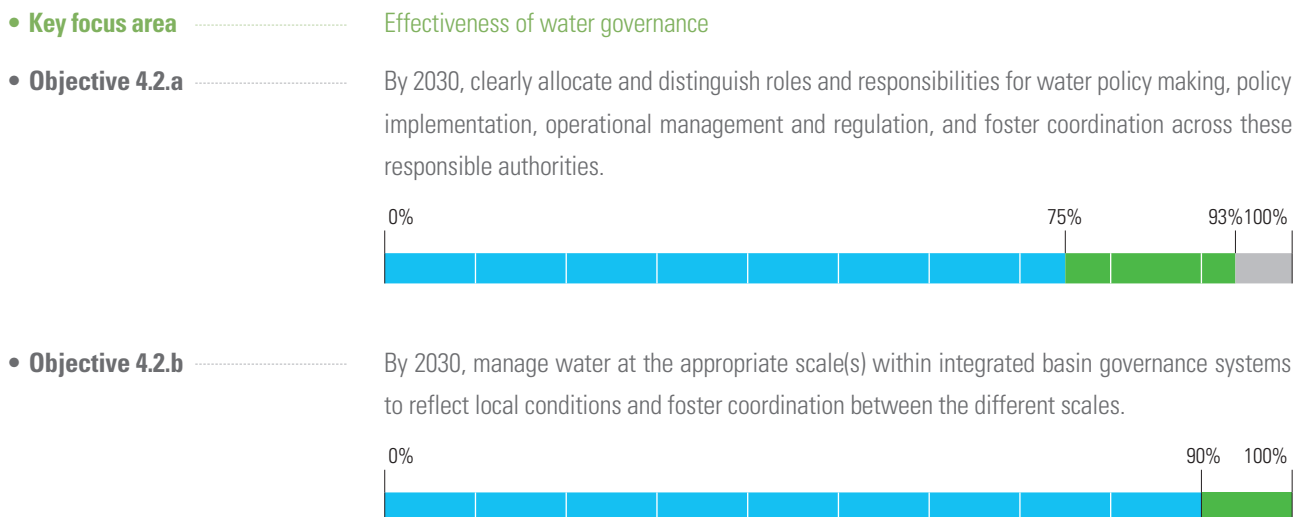
Repository of evolving water governance practices

The OECD Water Governance Initiative has built a repository of evolving practices to support the implementation of the OECD Principles on Water Governance, and by extension the 12 objectives of IR 4.2. This initiative identified, collected and helped scale-up water governance practices that can help governments and stakeholders move from vision to action. The evolving practices show experiences of countries at various levels (local, basin, national) from OECD and non-OECD countries. They can assist decision-makers and stakeholders in their implementation efforts, by learning from strategies to improve outcomes of public policies. Lastly, evolving practices provide a vehicle for peer-to-peer dialogue and learning. The repository, and a selection of evolving practices, will be presented during a dedicated session at the 8th World Water Forum.

Part 2. Progress Data

Objective level

Progress: ■ 2016/03 ■ 2016/10 ■ 2017/04 ■ 2017/10 ■ 2018/03



- **Objective 4.2.c** By 2030, encourage policy coherence through effective cross-sectoral coordination, especially between policies for water and the environment, health, energy, agriculture, industry, spatial planning and land use.



- **Objective 4.2.d** By 2030, adapt the level of capacity of responsible authorities to the complexity of the water challenges to be met and to the set of competencies required to carry out their duties.



- **Key focus area** Efficiency of water governance

- **Objective 4.2.e** By 2030, produce, update and share timely, consistent, comparable and policy-relevant water and water-related data and information, and use it to guide, assess and improve water policy.



- **Objective 4.2.f** By 2030, ensure that governance arrangements help mobilize water finance and allocate financial resources in an efficient, transparent and timely manner.



- **Objective 4.2.g** By 2030, ensure that sound water management regulatory frameworks are effectively implemented and enforced in pursuit of the public interest.



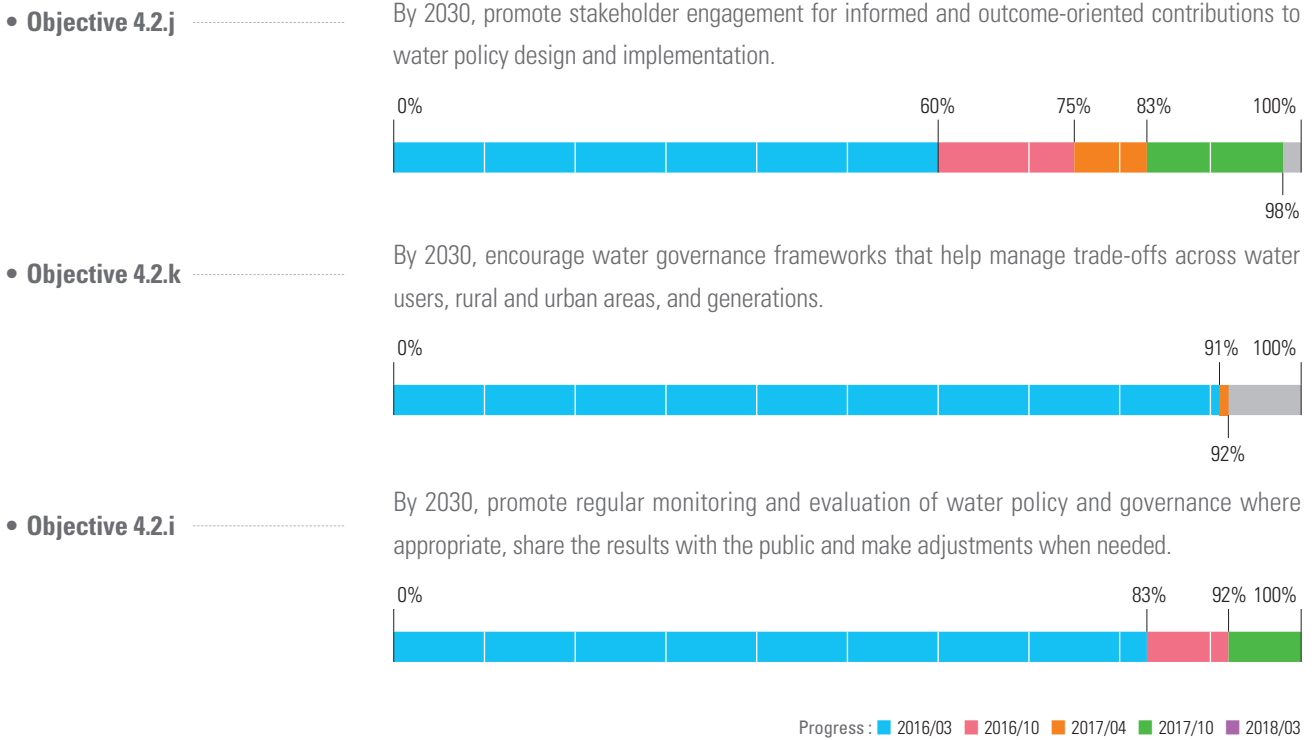
- **Objective 4.2.h** By 2030, promote the adoption and implementation of innovative water governance practices across responsible authorities, levels of government and relevant stakeholders.



- **Key focus area** Trust and engagement in water governance

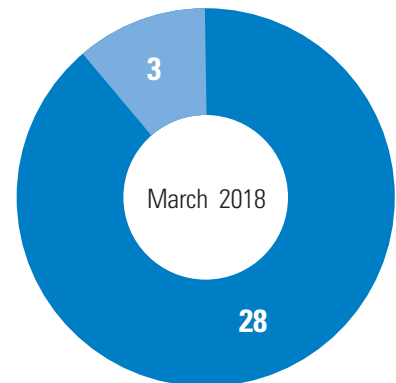
- **Objective 4.2.i** By 2030, mainstream integrity and transparency practices across water policies, water institutions and water governance frameworks for greater accountability and trust in decision making.





Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- Organisation for Economic Co-operation and Development, Water Governance Initiative (WGI)

CORE GROUP MEMBERS

- Association Scientifique et Technique pour l'Eau et l'Environnement (ASTEE)
- Food and Agriculture Organization of the United Nations (FAO)
- International Office for Water/International Network of Basin Organizations (IOWater/INBO)
- Korea Water Resources Corporation (K-water)
- Stockholm International Water Institute (SIWI)
- SUEZ Environnement
- The ASAN Institute for Policy Studies
- Transparency International (TI)
- UNESCO International Hydrological Programme (IHP)
- Water Integrity Network (WIN)
- Water Youth Network

4.3 Cooperation for Reducing Conflict and Improving Transboundary Water Management

Just under half of the world's population lives in transboundary river basin areas. Indeed, water is a potential catalyst for cooperation and peace from local to international levels. The enabling environment for sound and sustainable cooperation can be achieved through legal arrangements, joint management practices and institutions and capacity building. Inter-governmental agreements at the global level, such as the UN Watercourses Convention and the UNECE Water Convention, should have an increasing role to play in facilitating more effective water cooperation in the future.

Part 1. Overall Progress

Notable progress

Transboundary water cooperation has significantly progressed since the 7th World Water Forum. As illustrated below, throughout the 3-year period, several events such as general meetings, global networks and international events marked positive changes in the field of hydro-diplomacy.

SDG 6 and the 1992 Water Convention

The 2015 United Nations General Assembly marked the adoption of the SDGs. This represented a key milestone, with recognition of transboundary water cooperation as an objective (target 6.5 and indicator 6.5.2).

The 1992 Water Convention recorded its 41st Party (Macedonia in 2015) and formally became a global instrument in 2016. Its Secretariat, United Nations Economic Commission for Europe (UNECE), promoted globally the benefits of transboundary cooperation derived from its implementation (i.e. workshops: Jordan in 2015, Mexico in October 2016, Chad in March 2017). A reporting mechanism on the implementation of the Convention was established (2016) and includes questions to review progress on the SDGs target 6.5 and feed indicator 6.5.2.

Hydrodiplomacy

UNESCO-IHP's Water Information Network System (WINS launched in 2017) also indicates the progress on target 6.5 with data collected at several levels: local, basin, regional and national levels.

Its training manual "Hydro-diplomacy, Legal and Institutional Aspects of Water Resources Governance" highlights best practices on transboundary water cooperation with application in several workshops in Southern Africa, Central America and Central Asia.

Groundwater governance was not forgotten with UNESCO-IHP trainings and the development of a Geographic Information System (GIS) web-based platform. The platform encompassed the 3 transboundary aquifers of three regions: Southern Africa, Central America and Central Asia. This was done with the support of the Swiss Agency for Development Cooperation (SDC).

Water and Climate Change Adaptation in Transboundary Basins

The UNECE and the International Network of Basin Organizations (INBO) disseminated their trilingual (English, French, Russian) publication “Water and Climate Change Adaptation in Transboundary Basins.” It was launched at the 7th World Water Forum online and at major water/climate-related international events.

The publication references 58 case studies and 63 lessons learnt, providing practical information for adaptation to climate change in transboundary basins. The subjects tackled include legal frameworks, monitoring networks, water information systems, impact and vulnerability assessments, financing, capacity building and stakeholder involvement.

Paris Pact for basin adaptation

INBO's Paris Pact for basin adaptation involves over 350 organizations in 94 countries. The UNECE and INBO lead global networks of transboundary basins which work on climate change and promote transboundary water cooperation for adaptation in international events (COP21, Paris, 2015; COP22, Marrakesh, 2016; COP23, Bonn, 2017; International Summit on Water and Climate, Rome, 2017) and in field projects (i.e. IOWater projects in the Mekong, Congo, Sava, Chira-Catamayo).

Global Alliances for Water and Climate

The Global Alliances for Water and Climate (GAfWaC) focused on its Incubation Platform on technical assistance of project holders to develop adaptation project proposals up to the standards of the climate finance donors (in 2017, 4 out of 9 projects targeted transboundary basins: Sava, Senegal, Congo and Chu-Talas).

In June 2017, GAfWaC, UNECE and the World Bank co-organized, in Senegal, a training workshop on how to prepare bankable projects for financing climate change adaptation in transboundary basins.

Other events

Experiences in transboundary cooperation were shared through INBO's events and projects globally (i.e. World General Assembly in Mexico in 2016) and regionally (i.e. 2015-2016 EU Peer-Review Mechanism: best practices exchange between Member States on the transboundary implementation of Water Framework Directive (WFD); Europe-INBO General Assemblies: Greece in October 2015, France in October 2016 and Ireland in September 2017).

Successful outcomes

Global network of transboundary basins

The global network of transboundary basins working on climate change was created by the UNECE, in cooperation with INBO. Over the last three years, it brought a concrete contribution to the Sendai Framework for Disaster Risk Reduction (UNISDR) and the adaptation component of the Climate Paris Agreement (UNFCCC).

With the support of the UNECE, INBO, the Organization for Security and Co-operation in Europe (OSCE), the United Nations Development Programme (UNDP) and other partners, pilot projects of basin-wide adaptation were carried out in transboundary basins such as Chu Talas (Kazakhstan and Kyrgyzstan), Dniester (Moldova and Ukraine), and Neman (Belarus, Lithuania and Russia).

The network also provided a platform for comparing methodologies and approaches, fostering exchange of experience and promoting a shared vision between the participating basins on transboundary water cooperation for adaptation and financing of adaptation measures. Some 14 transboundary basins from Europe, Asia and Africa participated in the activities.

The EcoCuencas project

At a regional level, the International Office for water (IOWater) led the EcoCuencas project. This was implemented in Brazil, Columbia, Ecuador and Peru with the support of the European Commission (in particular France, Germany, Italy and Spain).

The project provided technical assistance to strengthen transboundary cooperation at different levels:

- (1) between riparian countries in the case of the Chira-Catamayo basin (Ecuador and Peru);
- (2) between States of the Federative Republic of Brazil in the case of the Piracicaba-Capivari-Jundiai basin;
- (3) and between Provinces of Colombia (called "Departments") in the case of the Rio Grande II reservoir-dam.

The project also pilot-tested financial redistributive instruments as relevant tools for funding adaptation to climate change in these transboundary settings. This resulted in the production of a guide for implementation of financial mechanisms. A participatory approach was adopted to produce the diagnosis of the basins (qualitative and quantitative status of water resources and aquatic environment) and the results were disseminated through capacity development activities including training sessions.

Transboundary cooperation in the Congo river basin

A major effort to facilitate transboundary cooperation was carried out at the level of the Congo river basin to support the International Commission of the Congo-Oubangui-Sangha and its Member-States. It aimed to strengthen the monitoring networks and Water Information System (WIS) of the riparian countries and overarching International Commission.

The project was highly innovative in nature. The participation of the French National Centre for Space Studies (CNES) in the project implementation provided novel techniques. The team helped complement the classic solution of in-situ hydrometeorological monitoring stations with the use of earth observation satellites. This was a pilot-phase for the NASA-CNES spatial mission

aiming for the launch of the SWOT satellite (Surface Water and Ocean Topography) in 2021. This combination improves the reliability and territorial coverage of the data collected at the scale of the basin. The outcomes included improved knowledge and better-informed decision-making on how to optimize sharing of the water resources of the transboundary Senegal river basin.

Part 2. Progress Data

Objective level

Progress : 2016/03 2016/10 2017/04 2017/10 2018/03



- **Objective 4.3.e** By 2030, support in transboundary basins and groundwater the development of water documentation and information systems and the interoperability of data and databases.



- **Key focus area** Strengthen international law and diplomacy related to transboundary water management

- **Objective 4.3.f** By 2030, foster the accession of additional states to the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention) and the UN Convention on the Law of the Non-navigational Uses of International Watercourses (UN Watercourses Convention), as well as promote their implementation on the ground and their further development in a coherent manner.



- **Objective 4.3.g** By 2030, foster the establishment of new basin agreements in transboundary basins and for groundwater, the implementation of existing agreements and, where necessary, their revision to address emerging challenges



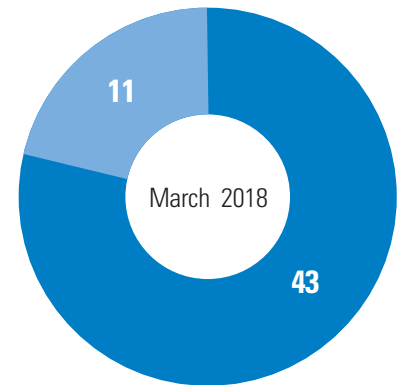
- **Objective 4.3.h** By 2030, support inter-sectoral cooperation and the sharing of the benefits of transboundary water cooperation across sectors and borders.



Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- International Network of Basin Organizations (INBO)

CORE GROUP MEMBERS

- Dundee University
- Global Environment Facility (GEF)
- Green Cross International (GCI)
- International Union for Conservation of Nature (IUCN)
- Organisation for the Development of the Senegal River (OMVS)
- Stockholm International Water Institute (SIWI)
- UNESCO International Hydrological Programme / Internationally Shared Aquifer Resources Management (IHP/ISARM)
- United Nations Economic Commission for Europe (UNECE)

OTHER STAKEHOLDERS

- Basin Organizations (including but not limited to: CICOS, OMVS, NBA, OMVG, LCBC, NBI, VBA, MRC, OSS, Mono Basin Authority)

4.4 Water Cultures, Justice and Equity

Create and maintain an implementation network of the design group members and session participants/conveners on water-related cultural diversity, justice and equity. Raise awareness among water professionals and decision makers about the intricate, yet often ignored, relevance of cultural diversity, justice and equity for water management and development and include these aspects in legislation, policies, programs and practice.

Part 1. Overall Progress

Notable progress

The Women for Water Partnership (WfWP) intensively promotes the human rights to safe water and adequate sanitation. Under the framework of the Protocol on Water and Health, several WfWP member organizations implemented national assessments for equitable access to water and sanitation. They also developed Action plans to improve access for vulnerable and marginalized groups of the population (Mama-86, AWHHE, Earth Forever, etc.).

Projects for Women

Many WfWP member-organizations mobilized local communities to foster sustainable water and sanitation services for the underserved in remote rural areas (TWG, etc.) or towards minority groups. They also encouraged them to address poor school sanitation, menstrual hygiene and child marriage issues (Earth Forever, Mama-86).

Another area where significant advances were made is in the collection and application of gender-disaggregated data in strategies, policies, programs and projects, as well as the issue of unpaid labor of women linked to water, sanitation, hygiene, subsistent agriculture and fishery (WOFAN, UWWS, WEP, etc.). These factors are often obstacles for improved education and career development of women and girls (CSW 61, World Water Week 2017, etc.).

Furthermore, "Water Ethics" is becoming a more accepted concept (though still not very well known) and the related concepts of "stewardship" and "water values" are better known today than 3 years ago.

Policy on Engaging with Indigenous People

Indigenous people's issues benefitted from the approval of the UNESCO Policy on Engaging with Indigenous People by the Organization's Member States at its 202nd Executive Board and 39th General Conference (2017), and from a joint presentation to the IWRA World Water Congress in June 2017 (by members of the Implementation Roadmap platform on water rights from an international and indigenous perspective).

Successful outcomes

All objectives have been advanced through the launch and development of the integrated information tool IHP-WINS. This facilitates access to relevant information.

The work on the report of the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) (to be published on September 2018) also indicates progress in the sector. This report, covers water issues in their entirety while focusing on the ethical imperatives of justice and equity. Furthermore, it aims to influence policy and decision making.

Finally, Theme 4.4 is a topic of the 8th World Water Forum’s theme, “Sharing”, of which UNESCO-IHP is lead coordinator.

It is also noteworthy that some of the ideas of “water ethics” and cultural diversity are being mainstreamed into discussions of “water values”. The latter has become a popular topic just in the past 2 years

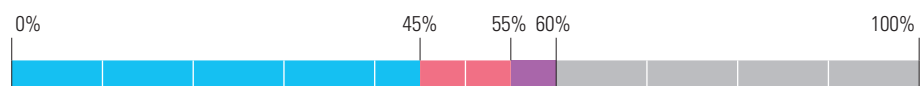
Part 2. Progress Data

Objective level

Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

• **Key focus area** Water cultural diversity, justice and equity

• **Objective 4.4.a** Foster actions inspiring water policy makers to raise attention to water and heritage in dialogues about the SDGs and assessment instruments, including Environmental Impact Assessments; quantifiable goals are the roll-out of publications, tools and relevant meetings foreseen in the period until 2018.



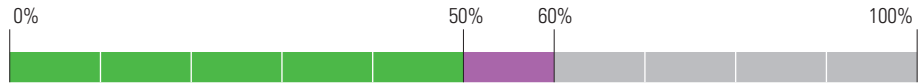
• **Objective 4.4.b** Confirm commitments, including at the highest political level, to involve indigenous peoples’ perspectives for better water governance; quantifiable action relates to the implementation of envisaged actions to strengthen networks, foster publications and integrate related issues into policies at the level of participating organizations (e.g. contribution to establishing the UNESCO Policy on Engaging with Indigenous Peoples).



• **Objective 4.4.c** Foster leadership and the involvement of women at all levels of management and implementation of water policies and programs.



- Objective 4.4.d** Foster a recognition and understanding of the diverse perspectives on water, water rights and legal frameworks and how they can be better understood and embedded in cooperative mechanisms, from public participation to international conventions.



- Objective 4.4.e** Present the concept of water ethics as a practical tool for setting higher standards for the water sector, and to collect ideas and suggestions from participants about the content and strategy of the Water Ethics Charter; quantitative data refers to the progress of the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), advisory body to UNESCO, in establishing a new global report and recommendations on water ethics with the contribution of IHP.



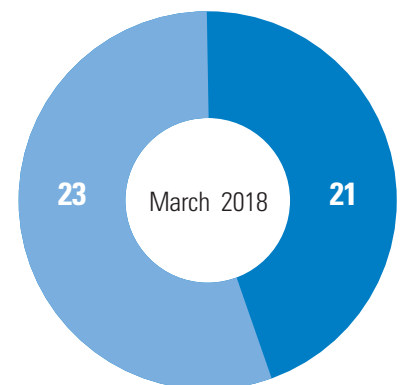
- Objective 4.4.f** Consider the complex cultural, religious, economic and environmental functions of water to demonstrate how these can contribute to improving water management, water security and sustainable development.



Progress : 2016/03 2016/10 2017/04 2017/10 2018/03

Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- UNESCO International Hydrological Programme (IHP)
- Women for Water Partnership (WfWP)

CORE GROUP MEMBERS

- Research Institute for Humanity and Nature (RIHN)
- Water–Culture Institute

OTHER STAKEHOLDERS

- Indigenous World Forum on Water and Peace

4.5 Enhancing Education and Capacity Building

To provide guidance to decision-makers across all levels of government on how to develop and improve water education, professional training and capacity building and to promote the creation and development of training centers for water professionals and the integration of capacity building activities (including Training of Trainers programs-ToT) in the budget of development project.

Part 1. Overall Progress

Notable progress

Significant progress in the field of technology, education and capacity building has been made since the 7th World Water Forum. However, “classic” forms of capacity building remain highly relevant and are still an inherent part of global and national systems

The digital era

The sector has fully embraced digital transformation. Design group members and other organizations in charge of initial education and vocational training for water professionals have gradually strengthened their web-based services, digitalized their pedagogical program and developed e-learning services such as « Massive Open Online Courses ».

IOWater and its Water Training Center celebrated their 25th-year anniversary and their 100,000th trainee with the digitalization of most of its training sessions and the launch of a comprehensive training catalog of “Massive Open Online Courses” (including “Sanitation and wastewater treatment”, “Innovative public markets” and “reduction of water losses in supply systems”).

After the launch of its Virtual Campus, Cap-Net (UNDP’s global network for capacity development in sustainable water management) has turned its Secretariat fully virtual since January 2018. Now, members of the staff can contribute to the animation of the network from their respective locations throughout the world: Argentina, Malaysia, Portugal, South Africa, Sri Lanka and Thailand.

This trend of digitalization of capacity building is set to continue and allow greater accessibility to knowledge and know-how throughout the world.

“Classic” Capacity building ...

“Classic” forms of capacity building remained highly relevant, particularly for the achievement of the Water-related SDGs.

The International Network of Water Training Centers and partners of the design group have all

implemented such capacity building activities to the benefit of water professionals worldwide. Water training centers were created and strengthened.

Québec'Eau organized training sessions in Canada for water supply and sanitation services' managers, engineers, technicians and manual workers. In Sao Paulo and Brasilia, Hydrus-Brazil was launched and trained managers of IWRM at basin level as well as regulators and technicians of Water and Sanitation Services (WSS).

... and training programs

Training programs (including "training of trainers", e.g. Stung Sen, Cambodia) were carried out on IWRM (in Brazil; Cuba; the basins of Hai, China; and in Pawn-Pilu, Myanmar), on WSS (ONEA, Burkina Faso; Rand Water, South Africa; Palestinian Water Authority) and trending priority topics were addressed as well.

Following the same trend, capacity building programs were also delivered on Water Information Systems (Nam Ngum Basin, Lao PDR). Innovative energy production techniques in water production/wastewater treatment plants (IOWater for Suez and Agbar) and financial mechanisms for climate change adaptation (EcoCuencas) were also tackled in view of IWRM.

The legacy of the 7th World Water Forum in this respect is invaluable, with the launch and development of the Andong 7th World Water Forum Commemoration Center. Furthermore, the yearly Training of Trainers Workshop on Integrated Water Resources Management (IWRM) held in Daegu in conjunction with the editions of the Korea International Water Week, also marks the importance of the objectives of the IR.

Successful outcomes

Hydrus-Brazil training center

The creation and development of the Hydrus-Brazil training center is one of the most successful outcomes achieved since the 7th World Water Forum.

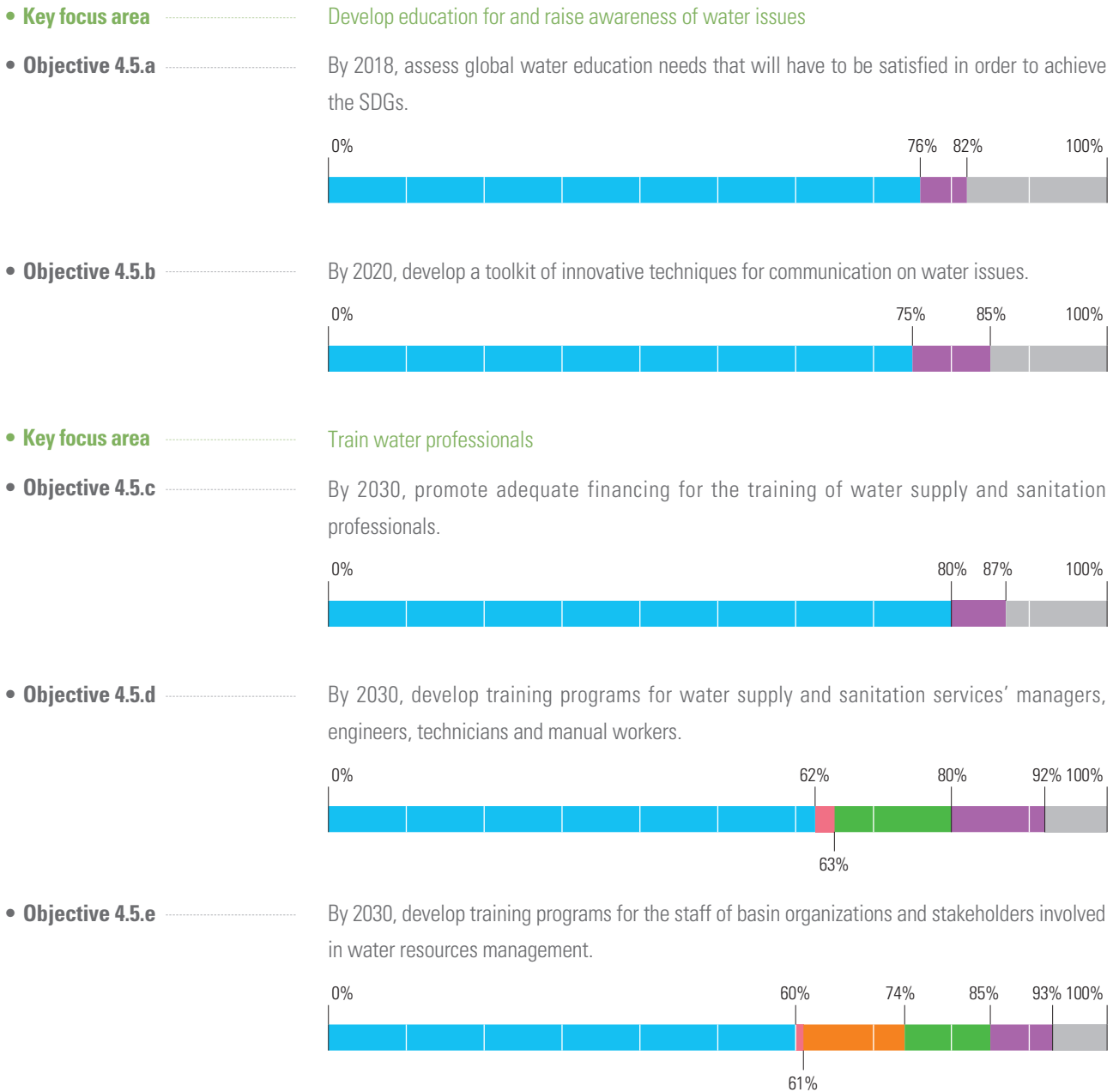
Initially launched in Sao Paulo in 2015 with the mandate to train technicians and manual workers to design, operate and maintain water and sanitation services, the training center for water professionals opened another branch in 2017 in the capital, Brasilia, aiming at capacity building of managers and engineers of basin organizations, basin committees and regulatory agencies. This rapid development was made possible by a fruitful cooperation between Brazilian partners (LIMA AZEVEDO and ADASA) and the International Office for Water (IOWater).

IOWater has around 25 years of experience in the creation and strengthening of training centers for professionals of the water sector. It piloted the step-by-step upscaling of Hydrus-Brazil: assessment of training needs, definition of the targets of the capacity building programs, production of a training catalog, mapping the training equipment required, and design of the institutional framework and business model (economic operation, investments, funding sources). It also supervised the 2017 training programs (on adaptation of water resources management to climate change, performance indicators of water and sanitation services, basin contracts) and the creation of digital training sessions (on water networks efficiency and leakage detection, energy savings in water and sanitation services).

Part 2. Progress Data

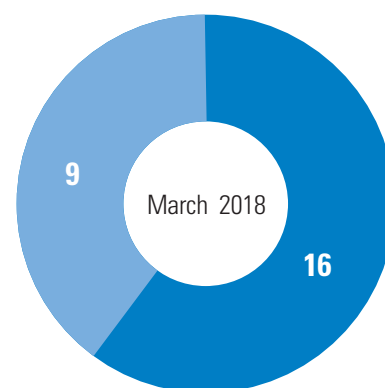
Objective level

Progress : 2016/03 2016/10 2017/04 2017/10 2018/03



Action level

■ Not executed ■ Ongoing ■ Completed



CHAMPIONS

- International Network of Water Training Centers (INWTC)

CORE GROUP MEMBERS

- Capacity Development in Sustainable Water Management (CapNet)
- International Institute for Water and Environment Engineering (2iE)
- Korea Water Forum (KWF)
- UNESCO-IHE Institute for Water Education
- World Youth Parliament for Water (WYPW)

OTHER STAKEHOLDERS

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> ■ ActionAid ■ AquaFed ■ Gdansk Water Foundation, Poland ■ Gender and Water Alliance (GWA) ■ Global Water Project (GWP) ■ Greater Paris Sanitation Utility (SIAAP) ■ Hydrus-Brazil ■ Latin American Alliance of Water Funds | <ul style="list-style-type: none"> ■ Mexican Institute of Water Technology (IMTA) ■ Office National de l'Eau et de l'Assainissement (ONEA), Burkina Faso ■ RALCEA, Latin America ■ Rand Water, South Africa ■ Sénégalaise des Eaux ■ Société des Eaux et de l'Assainissement d'Alger (SEAAL), Algeria | <ul style="list-style-type: none"> ■ UN Environment Programme (UNEP) ■ UNEP Collaborating Centre on Water and Environment ■ UNEP-DHI Centre for Water and Environment ■ UN Water ■ USAID Partnering for Adaptation and Resilience – Agua (PARA-Agua), Latin America and Caribbean |
|---|---|--|

Policy Suggestions for High-Level Political Forum 2018

1.1 Enough Safe Water for All

Recommendations for improving research, scientific knowledge and information on access to safe water, water quality and wastewater management:

- Promote research on innovative solutions and appropriate technologies to ensure access to safe water and improved water quality and wastewater management.
- Improve global water quality data and information through open access data generation and sharing systems such as the new UNESCO World Water Quality Portal using Earth Observation (satellite) data, developed under the UNESCO-IHP International Initiative on Water Quality (IIWQ).
- Enhance further scientific knowledge and understanding on water issues of emerging concern (such as emerging pollutants), building on the knowledge base developed in the framework of the UNESCO-IHP IIWQ Project and case studies on Emerging Pollutants and the policy recommendations proposed by the UNESCO Emerging Pollutants in Water Series.
- Prioritize specific regional needs and challenges for improving access to safe water, water quality and wastewater management, with particular focus on developing country regions and SIDS.

Policy measures for sustainable solutions on access to safe water, water quality and wastewater management:

- Promote science- and evidence-based (informed) policy-making in order to develop sustainable solutions on access to safe water and improved water quality and wastewater management.
- Disseminate, share and promote best practices and successful cases on access to safe water and sustainable water quality and wastewater management.
- Promote safe (waste) water reuse and resource recovery as a reliable alternative water resource and to recover valuable resources such as nutrients and energy.
- Raise awareness of all stakeholders, especially for policy-makers, on the key role of improving access to safe water, the global water quality and wastewater management in the SDGs achievement and enhancing water security.

1.2 Integrated Sanitation for All

At the level of a city, the complementarity between sewerage and non-sewered sanitation service is a key to reach all the population with safely managed service

We need to have a specific attention for the small towns where the viability of the sanitation service chain is difficult to achieve.

1.3 Adapting to Change : Managing Risk and Uncertainty for Resilience and Disaster Preparedness

- 1) It is necessary to recognize that frequent and intensified water-related disasters (extreme floods, droughts, high tides, etc.), glacier melt, sea level rise and depletion of water resource associated with climate change are fundamental and common threats to all living in this planet.
- 2) It is necessary to improve our understanding of the changing society and climate; build integrated assessment capabilities; optimize the output of the advanced science and technology, and create and share evidence-based usable and actionable information and knowledge for policy-making and community of practice.
- 3) It is necessary to introduce and implement a holistic, concerted and regionally collaborative approach based on a long-term perspective to reduce and prevent water-related disaster and environmental risks intensified by climate change. The global and regional partnership and networking with all concerned will be the key.

To strengthen the capability for water-related disaster risk reduction and to realize a resilient society:

- 4) Each country should establish a Platform on Water and Disaster as part of its national platform for facilitating dialogue among all stakeholders from national, local and community levels and scaling up pre-disaster investment and community-based practices into basin-wide and/or nation-wide solutions.
- 5) Policy makers should be aware of the process of disaster risk management and climate change adaptation, and of the possibilities and limitations of the science and technology behind climatological and hydrological projections on which vulnerability assessments are based.

1.4 Infrastructure for SWRMS

Water storage is crucial for sustainable development. It is absolutely necessary to answer the combined challenges of population growth, malnutrition and climate change. Too often, other uses of water, like water ways, are neglected and their infrastructures ageing or non-existent. The role of those infrastructures was more or less ignored during the 6th World Water Forum, while they are central to reach the Sustainable Development Goals. That's why during the 7th World Water Forum, the Theme 1.4 fought to ensure a much larger recognition of the crucial role played by the infrastructures, be they natural or man-made. This was required to convince decision-makers to engage in new projects, but also to take the necessary steps to protect the existing infrastructures, natural or man-made. Successes have been registered with a growing awareness of the need for new projects, especially in developing countries. We recommend to further develop this awareness around ageing infrastructures.

The financing of developing and maintaining Water Storage Infrastructures remains a problem.

2.1 Water for Food

Given the increasing complexity of pressures on water resources, it is important that our water management and governance systems deal with them in a holistic manner, thinking of possible trade-offs and building on synergies. For agriculture – including crop and livestock production, fisheries and aquaculture, and forestry - this means solutions need to be sought across traditional silos and working with food systems from production along value chains all the way to the consumer.

Water management today requires making difficult choices and learning to deal with tradeoffs. Win-win situations are

difficult to find, but a consultative and inclusive process for reaching decisions can help ensure that trade-offs do not have inequitable effects.

The Theme 'Water for Food' shows how interconnected the Sustainable Development Goals (SDGs) and the paths to achieving them are. SDG 2 on eliminating hunger and malnutrition cannot be achieved without thinking about SDG 6 on water, SDG 12 on sustainable consumption and production, SDG 13 on climate action, SDG 14 on oceans, SDG 15 on land and forests.

2.2 Water for Energy

Water and energy are closely interdependent. Almost all forms of energy production need water, such as cooling, biofuels and hydropower; while water abstraction, treatment and distributions require energy. Due to the inter-linkages between water and energy, crisis in one sector can quickly diffuse to the other and thus cause serious ecological, economical social and political ramifications. Energy and water security are key to social and economic development and individual well-being. Improved energy and water services are a necessary input for achieving the sustainable development goals (SDGs).

To secure water and energy for a sustainable future there must be a continued evolution of cross-sectoral dialogue that drives technological, institutional and financial innovations within and between water and energy resource management.

Water and energy systems are dynamic and complex, which is further exacerbated by increasing population, urbanization, land use and climate change. The complexity of water and energy systems means moving to a more systems based approach that reflects the interaction between sectors and includes developing technology that is both energy and water efficient, negotiating agreements between riparian countries that are informed by long term implication of water and energy developments upstream, or developing incentives for resilient and robust water-energy provision.

2.3 Water and Cities

Governance

National Urban Policies should be promoted to prioritize, guide and coordinate urbanization. Importantly, urban policies define delegation of authority to sub-national and local governments and financial flows which are essential for ensuring that the various stakeholders contributing to regenerative urban water approaches are capacitated and coordinated across scales and disciplines.

Owing to their knowledge of local contexts, autonomy and financial empowerment must be given to the level of government closest to end beneficiaries. These beneficiaries should be consulted to better frame the problems and support enabling legislation and sound decision-making.

Urban water is influenced by policies well beyond the water sector, including land planning, solid waste management, energy and transport. Reviews of all related policies and means for coordination between them should be reviewed at local and nation level. Holistic approach rather than sub-systems approaches should be used. For example, when an authority defines a new investment project, a holistic approach in which related sectors are invited to explore its potential co-benefits, can result in more elegant and efficient solutions that address multiple problems in one go.

Regulation

Apply and enforce rules and regulations for water across sectors (water regulation, solid waste, building codes etc.), which recognize co-benefits, enable collaboration between institutions, encourage innovation, permit progressive transition to regenerative services by setting achievable requirements, and consider local context. Review existing regulations with an eye to their influence on water.

Financing

As the benefits of wise urban water management go beyond water services, utility tariffs may be insufficient to cover the costs of many interventions, at least at first. New financing mechanisms including taxes and transfers that tap into the greater public and private benefits of such transitions should also be explored among the options for financing transitions. Green and water bonds and climate finance are among the new mechanisms that cities can explore to achieve these ends.

Capacity Development

Enable the potential of city-to-city learning to scale up learning and innovation in new approaches. Cities inspire and learn well from their peers. Efforts like Water Operators Partnerships (WOPs) or City networks setting up “water-wise” capacity building and knowledge exchange can be made possible by 1) encouraging and legally permitting decentralized solidarity between cities and their service providers 2) establishing “1% laws” which allow utilities and other local public water institutions to apply a fraction of their revenue to international cooperation

3.1 Green Growth, Water Stewardship and Industry

1. “To achieve sustainable development, Greening the water sector is necessary”.

- Environmental protection and economic growth can be parallel
- Water is the key for economic growth and environmental sustainability, enhancing socially-inclusive development.

2. “Stronger political leadership and commitment are essential”.

- Policy’s successful implementation depends on how much passionate and spontaneous participants can be secured.
- It is also essential to establish an institutional mechanisms which can working autonomously.
- The successful water-related institutions and policy instruments do not miss a ‘the devil is in the details’.

3. “Solving water challenges worldwide cannot rely on only policy responses”.

- Market-based instruments need to be used, properly.
- Raising awareness of all levels of stakeholders on the importance and wise use of water cannot be emphasized enough.

3.3 Ensuring Water Quality from Ridge to Reef

The 2030 development agenda is a holistic ambition and the SDGs are strongly interlinked: water specialists could benefit from and contribute more to other sectors. They must engage with civil society to assert the role of water in human rights and nature. Therefore, along with our role of IR Champion, and following the Cancun Declaration elaborated at the XVI World water Congress, IWRA urges:

- Policy makers and donors to assimilate science into the decision-making process and to finance and facilitate programs and processes to build evidence-based policies.

- Scientists and professionals to respond to the needs of civil society and to make new knowledge available for public debate and to commit themselves to the implementation of adaptive solutions.
- Civil society to adapt its own behaviour to new challenges and to share its knowledge of realities and take part in the design and implementation of adaptive innovative solutions.

Finally, IWRA would like to highlight that a better understanding of water quality demands, appropriately matched to use, can contribute to appropriate and economical multi-sectoral water resource management. The extensive degradation of water bodies and aquatic ecosystems, combined with emerging recognition of the water quality requirements of different sectors (e.g. agriculture, industry, energy, and ecosystems), has highlighted the critical need for a more integrated approach to water quality management. Directing water to the most appropriate use for its quality introduces greater efficiency and economy into the management of water resources across competing uses and aids in securing sustainability and security for future water use. As climate change and emerging pollutants both have the potential to exacerbate current stressors and interfere with water resource planning and governance, it is important to acknowledge those two raising issues in water quality management to ensure adequate adaptation and resilience of water quality considerations.

3.4 SMART Implementation of IWRM

It has been demonstrated that Integrated Water Resources Management and its principles can be applied in practical and sustainable water management. The Sustainable Development Goals, via target 6.5 call on countries to implement integrated water resources management at all levels, including through transboundary cooperation as appropriate by 2030. It is suggested that national IWRM policies and strategies have operational plans developed with specific timelines on targets to be achieved in order to facilitate their efforts.

This will require institutional development and coordination and human resources trained to deliver the desired results.

But this cannot be accomplished by the water sector alone. Awareness raising

in other, water-consuming sectors need to be championed by the water sector in order to ensure their participation in achieving IWRM.

Last but not least, awareness needs to be risen at all levels to ensure ownership of decision-making processes, ensuring all voices are heard, so implementation is resilient and sustainable.

4.1 Economics and Financing Implementation Roadmap

More than 75% of countries in the region face serious water shortages, which if left unmanaged pose a real threat to continued growth and prosperity, because of complex pressures including population growth, urbanization, increasing water pollution, climate change. There is a need to sustainably manage water resources to meet competing needs of water for food, energy, and environment.

Addressing the water-food-energy nexus has become increasingly urgent, specifically, the need to determine how to implement integrated planning across these sectors, and how to identify, develop, and finance (or provide financial incentives for) investments that adopt an inter-sectoral approach.

4.2 Effective Governance-Enhanced Political Decision Stakeholder Participation and Technical Information

The adoption of the SDGs created a unique momentum for policy makers and stakeholders to mobilise collective efforts, create shared global understanding and commit to action to improve the lives of people and the environment by shifting the previous paradigm focused on solving individual situations and beginning to connect the dots between actors, policy fields and scales to address development challenges in a systemic way. The interconnectedness of the SDGs implies that their implementation should be considered in a systemic way. This requires particular attention on:

- **Multilevel governance:** the SDGs explicitly recognise the importance of governance in shaping, designing and implementing public policies. Both local and subnational governments have a key importance in the design and implementation of policies, strategies and plans worldwide, on a broad range of themes covered by the SDGs, from carrying out public investment, to eradicating poverty, to ensure universal access to quality public services.
- **Multi-stakeholder engagement:** the implementation of SDGs should rely on a whole-of-society approach for citizens to fully reap expected benefits. Achieving such universal standards is a shared responsibility across multiple actors that require engagement with relevant public, private and non-profit stakeholders.

Implementing the water-related SDGs requires countries to translate global goals into concrete actions on a number of water topics (i.e. water and sanitation; water resources management; water quality; and water-related disasters). However, to do so, countries will have to address a number of shortcomings related to water policy design, regulation and implementation.

Better governance is instrumental to tackle these shortcomings and make political will effective on the ground. Policy responses will only be viable if they are coherent; if stakeholders are properly engaged; if well-designed regulatory frameworks are in place; if there is adequate and accessible information, and if there is sufficient capacity, integrity and transparency. Institutions need to adapt to changing circumstances, and policy continuity is key in the transition towards more inclusive and sustainable practices.

4.3 Cooperation for Reducing Conflict and Improving Transboundary Water Management

Integrated Water Resources Management at basin level has demonstrated its effectiveness to make the most of water resources and optimize its uses. It needs to be applied in transboundary settings as well, to make sure the decision-making process is based on sound information and planning, taking into account the natural reality of a basin rather than the administrative borders it crosses. Transboundary water cooperation needs to be applied for pragmatic reasons, and in particular its cost-effectiveness and benefit sharing dimensions (pooling knowledge, data and resources from the entire basin, facilitating dialogue between riparian countries and stakeholders, enlarging the planning space for locating measures and sharing benefits and costs).

Fostering such regional and transboundary cooperation should be built on international water law (incl. UNECE Water Convention 1992, UN Watercourses Convention 1997, UNILC's Draft Articles on the Law of Transboundary Aquifers) and their key principles (incl. rules of no significant harm, of equitable and reasonable use, and of cooperation).

Transboundary water cooperation helps to deliver the best possible solutions and the biggest benefits when done:

- based on the scale of transboundary basins of rivers, lakes and aquifers
- based on integrated information systems, allowing knowledge on resources and their uses, polluting pressures, ecosystems and their functioning, the follow-up of their evolutions and risk assessment
- based on management plans or master plans that define the medium and long-term objectives to be achieved
- through the development of Programs of Measures and multiyear priority investments

- with the mobilization of specific financial resources, based on the « polluter-pays » principle and « user-pays » system
- with the participation in decision-making of the concerned Governmental Administrations and local Authorities, the representatives of different categories of users and associations for environmental protection or of public interest

The establishment and development of local, national or transboundary basin organizations is to be supported as the strengthening of institutional and technical cooperation between counterpart basin organizations from the same region and other parts of the world, especially within the existing networks, to give them the necessary capacities to improve water resources management, limit the risks of conflict and maximize the benefits drawn from cooperation.

4.4 Water Cultures Justice and Equity

It would be helpful for the High Level Political Forum to state very explicitly that, since “Water is life” we, the water community have a moral responsibility to manage water not only wisely, but also ethically, just as we have a moral responsibility for the health and welfare of people (bioethics) we have similar responsibilities with water. This message needs to come from the highest levels of water leaders.

4.5 Enhancing Education and Capacity Building

Education, awareness raising and capacity building on water issues should be promoted at all level to reduce inequalities and mobilize civil society.

Implementing education programs specifically aiming women, children and the youth is required.

It is important to support job creation in the water sector and to build capacities and expertise in water management, including irrigation, fish farming, hydropower, drinking water supply and sanitation.

Vocational training for water jobs must be strengthened. It should be supported by sustainable financial mechanisms and by the creation and development of national or international specialized training centers.

International cooperation organizations should implement these recommendations and promote the assessment and exchange of know-how in professional training and education, including via support to capacity building operators and networks developing experience sharing between existing training centers and new ones.

Daegu-Gyeongbuk Implementation Commitment (DGIC) Champions

1.1

- UNESCO International Hydrological Programme (IHP)



3.2

- Ramsar Convention Secretariat



1.2

- Programme Solidarité Eau (pS-Eau)
- AquaFed – The International Federation of Private Water Operators



3.3

- International Water Resources Association (IWRA)



1.3

- International Centre for Water Hazard and Risk Management (ICHARM)



3.4

- UNESCO International Hydrological Programme (IHP)
- Global Water Partnership (GWP)



1.4

- International Commission on Large Dams (ICOLD)



4.1

- Asian Development Bank (ADB)



2.1

- Food and Agriculture Organization of the United Nations (FAO)



4.2

- Organisation for Economic Co-operation and Development, Water Governance Initiative (WGI)



2.2

- International Water Association (IWA)



4.3

- International Network of Basin Organizations (INBO)



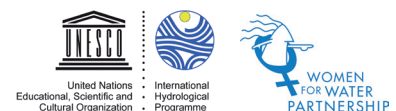
2.3

- UN Habitat
- International Water Association (IWA)



4.4

- UNESCO International Hydrological Programme (IHP)
- Women for Water Partnership (WfWPP)



3.1

- Korea Water Resources Corporation (K-water)



4.5

- International Network of Water Training Centers (INWTC)



Further information available at:
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