



United Nations
Educational, Scientific and
Cultural Organization



International
Hydrological
Programme



WATER FOR LIFE
2001-2015



Proceedings on

Water Education and Capacity Building

Key for Water Security and Sustainable Development

7th World Water Forum



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Proceedings Series No. 15
Published by UNW-DPC, Bonn, Germany
June 2015
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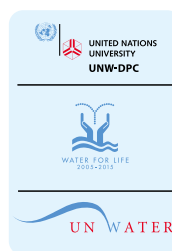
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The International Hydrological Programme (IHP) of UNESCO is the only intergovernmental programme of the UN system devoted to the scientific, educational and capacity building aspects of water. IHP facilitates an interdisciplinary and integrated approach to watershed and aquifer management, which incorporates the social dimension of water resources, and promotes and develops international research in hydrological and freshwater sciences.

The UN-Water Decade Programme on Capacity Development (UNW-DPC) is a Programme of UN-Water and strengthens the capacity development activities of UN-Water Members and Partners, supporting them in their efforts to help Member States achieve the Millennium Development Goals (MDGs) and other international goals and commitments related to water and sanitation. It is hosted by the United Nations University.

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Abbreviations

CAWST	Centre for Affordable Water and Sanitation Technology
CSO	Civil Society Organisations
DESD	UN Decade of Education for Sustainable Development
ESD	Education for Sustainable Development
GAP	Global Action Programme
GIS	Geographic Information System
IGO	Intergovernmental Organisation
IHP-VIII	Eighth phase of the UNESCO-International Hydrological Programme
K-12	Primary and secondary education
MDG	Millenium Development Goals
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental Organization
SDG	Sustainable Development Goals
ToT	Training of Trainers
TVET	Technical and Vocational Education and Training
UNESCO-IHE	United Nations Educational, Scientific and Cultural Organization- Institute for Water Education
UNESCO-IHP	United Nations Educational, Scientific and Cultural Organization- International Hydrological Programme
UNW-DPC	UN-Water Decade Programme on Capacity Development
WASH	Water, Sanitation and Hygiene
WWC	World Water Council

FOREWORDS

UNESCO-IHP

**Dr Blanca Jiménez Cisneros, Secretary of the International Hydrological Programme/
Director of the Division of Water Sciences, UNESCO**

Fresh water is a key resource for human health, prosperity and security, and is deeply interlinked with poverty eradication, gender equality, food security and the preservation of ecosystems. It is thus in recognition of the importance of water that significant efforts have been made over the last few decades to create widespread access to services and the sustainable management of freshwater resources. In 2010, access to clean water and sanitation was declared a human right by the United Nations General Assembly. That same year, halving the number of people without sustainable access to safe drinking water was the first Millennium Development Goal (MDG) target to be met. The progress achieved through the International Decade for Action, 'Water for Life', 2005–2015, and the Decade of Education for Sustainable Development (DESD) is also noteworthy. Despite these important developments, improvements are unevenly spread around the world and across communities and sectors. Many challenges remain in ensuring universal access to a reliable and adequate quantity of good quality water, reducing the lack of sanitation services and, most of all, in reaching water security.

The current eighth phase of the International Hydrological Programme (IHP-VIII) has been designed to improve water security in response to local, regional and global challenges. Water security is defined by UNESCO's Member States in IHP-VIII as the capacity of a population to safeguard access to adequate quantities of water of acceptable quality for sustaining human and ecosystem health on a watershed basis, and to ensure efficient protection of life and property against water-related hazards – floods, landslides, land subsidence and droughts. IHP-VIII has also been conceived to help implement the post-2015 Development Agenda and the forthcoming Sustainable Development Goals (SDGs).

The provision of education on water-related issues, at all levels and for all, is essential to reach water security and sustainable development. This entails the promotion of

transdisciplinary approaches and the provision of the required knowledge, skills and values necessary to attain water sustainability. A holistic approach encompassing all levels of water education is needed, addressing its tertiary and professional dimensions and providing training for policy makers and the mass media, as well as school, vocational and technical education. As women and particularly girls are key stakeholders and also the most affected by the provision or lack of water, efforts should also be made to provide them with opportunities to enhance their capacities and engagement. This also means alleviating the water-fetching burden and providing dignity for girls through adequate sanitation services, as these elements often prevent them from attending school and developing the means to empower themselves at other levels of water management. The 'Water Education and Capacity Building: Key for Water Security and Sustainable Development' session provided a perfect occasion to reflect on current best practices and obstacles in order to address existing challenges, identify changes needed and devise solutions so that education on water-related issues can reach its full potential and contribute to the achievement of the post-2015 Development Agenda objectives and water security.

UNW-DPC

Dr Reza Ardakanian, Founding Director/Officer-in-Charge, UNW-DPC

Water education and capacity building are key elements in providing the knowledge and skills required to face some of the current most pressing water challenges, and as such are essential components of any meaningful strategy towards sustainable development. While technical solutions are of great importance for development and need to be further explored, the past has shown that technical solutions alone – in the absence of education and capacity development – have often failed to lead to lasting and sustainable change. Both water education and capacity building have been of great importance in making progress towards the achievement of the Millennium Development Goals, within the International Decade for Action, 'Water for Life', 2005–2015, and will remain just as relevant as 'means of implementation' in ensuring progress towards the upcoming Sustainable Development Goals, which we expect in September 2015.

This publication presents a summary of the intense discussions held in Korea around these topics and provides an excellent starting point for deepening the discussion on the role of water education and capacity development for sustainable development, to motivate further research and to stimulate the development of projects and initiatives on this important issue for the achievement of water and water-related targets in the upcoming SDG framework.

On behalf of UNW-DPC, I would like to thank the experts, rapporteurs and moderators who contributed to this session, and, most importantly, the active participants who shared their valuable knowledge, views, ideas and recommendations in the different roundtable discussions.

I wish you an enjoyable read.



Chapter 1

BACKGROUND

1.1 Water Education and Security at the Heart of Sustainable Development

Sustainable development remains today a top priority of the international community's agenda. From Agenda 21 to Rio+20 'The Future We Want', emphasis has been placed on reorientating education towards sustainable development. In 2002, the UN Decade of Education for Sustainable Development (DESD – 2005–2014) was also proclaimed by the United Nations General Assembly, highlighting the key role of education in overcoming challenges to sustainable development. At the conclusion of the DESD, the Aichi-Nagoya Declaration on Education for Sustainable Development (ESD) was adopted, stressing the urgent issues that still need to be tackled, calling for 'urgent action to further strengthen and scale up Education for Sustainable Development (ESD), in order to enable current generations to meet their needs while allowing future generations to meet their own'¹

With water being an essential element of human and natural life, sustainable development can only be reached by addressing challenges to water security, which often result from lack of the capacities needed to manage the resource rather than real water scarcity. In that context, water education is an essential element that needs to be promoted and improved; it should be inclusive and touch upon all uses of and roles fulfilled by water, from agriculture and urban areas to the industry and energy sectors, and from domestic use to hygiene. Education and capacity building are lifelong processes and should also involve all

¹ Aichi-Nagoya Declaration on Education for Sustainable Development (ESD), <http://unesdoc.unesco.org/images/0023/002310/231074e.pdf>.

types of actor and user, putting specific focus on the developing world and giving women the means to be involved in all aspects of water management and governance as a tool for their further empowerment. Promoting knowledge and capacity building, in a culture- and gender-sensitive way and adapted to meet local needs, is the most efficient way to tackle water security and thus sustainable development challenges at the roots, by directly changing the way people think and their subsequent behaviour. Only by enhancing the capacity of individuals and communities to tackle the water issues that affect them can we give both current and future generations the tools to empower themselves and become actors for change.

1.2 The Strategic Environment of the 7th World Water Forum

Tackling water challenges has become a global topic for the twenty-first century. Water has been a political issue in many nations, while interested parties (governments, the academic world, private organisations and interest groups) have strived to find solutions to address global water challenges. Indeed, the World Water Council (WWC), an international organisation consisting of water-related organisations, governments and international organisations was founded in 1996 to provide a forum on global water-related issues.

In 1997, the year following its foundation, WWC created the World Water Forum so that interest groups from all over the world could gather together and jointly discuss water-related issues. The World Water Forum is one of the world's largest gatherings on the subject of water. Every three years, since 1997, WWC has held its forum on or around World Water Day (22 March). The World Water Forum consists of at least three processes – political, thematic and regional – and involves officials, legislators and local and regional authorities from more than 150 nations. Each topic is developed in cooperation with the private sector, governments, industry, intergovernmental organisations (IGOs), non-governmental organisations (NGOs) and academic groups in order to produce a common framework of goals and concrete targets to reach.

From 12–17 April 2015, the Republic of Korea hosted the 7th World Water Forum, 'Water for our Future', where stakeholders from about 170 nations gathered in Daegu and Gyeongbuk to discuss water-related issues and challenges. The Science & Technology Process was newly included in the 7th Forum in order to ensure the implementation of solutions drawn from previous forums. The different thematic processes developed implementation roadmaps based on the topics covered in the respective streams.

Serving as a stepping-stone towards global collaboration on water challenges, the Forum is a unique multi-stakeholder platform whereby the water community, policy- and decision makers from all regions of the world can work together to find joint solutions. In this strategic framework, the UNESCO International Hydrological Programme (UNESCO-IHP) and UN-Water Decade Programme on Capacity Development (UNW-DPC) co-organised the T.4.5.1 session on 'Water Education and Capacity Building: Key for Water Security and Sustainable Development'. This publication builds on the discussions that took place during the session, and aims to share with water sector professionals, decision makers, stakeholders, local communities, mass-media professionals and others the issues, tools and solutions for the attainment of water security and internationally agreed development goals relevant to water education and sustainable development in the post-2015 context.

7th World Water Forum

2015 대구·경북 세계물포럼

Daegu & Gyeongbuk



Chapter 2

SESSION: WATER EDUCATION AND CAPACITY BUILDING: KEY FOR WATER SECURITY AND SUSTAINABLE DEVELOPMENT

Water education and other forms of capacity building remain critical areas for achieving water security and sustainable development. This session focused on the current status of water education, including the progress achieved during the International Decade for Action, 'Water for Life', 2005–2015, and the Decade of Education for Sustainable Development (DESD), and contributed to the identification of the necessary tools to advance water capacities in the context of internationally agreed development goals and the post-2015 Development Agenda. For this purpose, water education is considered in all forms (formal, non-formal and informal) and at all levels (K-12, Technical and Vocational Education and Training, higher education, community and lifelong learning approaches), for water sector professionals but also for decision makers, stakeholders, local communities and mass-media professionals, among other target groups. Special attention was paid to water education as an empowerment tool for children and youth, encompassing also a focus on gender equality and Africa.

The session presented an opportunity to operationalise the concept of water Education for Sustainable Development (ESD) and water security through clear results-based objectives. Water education and capacity building must ultimately be the tools that will provide the

knowledge, skills and values needed to achieve positive and sustainable behavioural changes.

Around 100 participants gathered at the session and contributed a comprehensive range of perspectives to the seven roundtable topics that were organised, addressing the main issues and themes linked to education for water security and sustainable development. The issues and ideas presented in the following section are organised according to the thematic areas of each roundtable, thus conveying views that are cross-generational, geographically diverse and multi-disciplinary. Indeed, all age groups contributed to the discussions, from high-school students to senior water professionals, with individuals coming from all geographical regions, as well as from a large range of institutions.

Following keynote presentations, participants engaged in discussions on specific thematic areas in roundtables that focused on:

- Higher education
- Technical and Vocational Education and Training (TVET)
- K-12 and youth
- Community education
- Education for Sustainable Development (ESD), water security and the post-2015 Development Agenda
- Water education and gender equality
- Capacity building in Africa

Building on the solutions identified during the 6th Forum, and with the focus on implementation, the objectives of the session included assessing the current status of water education at all levels and in the context of DESD and setting a roadmap for the way forward. Further, the aim of identifying tools and solutions for the attainment of internationally agreed development goals relevant to water education and sustainable development, as well as in the context of the post-2015 Development Agenda, was pursued through the roundtable discussions.

Output targets included solution-based tools to define and implement water-related elements of the post-2015 Development Agenda, specifically as related to the areas listed above. In this context, target issues were sought and corresponding solutions described using roadmaps/timelines (including milestones); strategies for monitoring and accountability were also specified. This publication contains the key highlights and recommendations resulting from these discussions.

Finally, through its focus on water education and capacity building as critical elements for water security and sustainable development, the session contributed towards the global implementation roadmap by providing a clear and evidence-based plan for the role of water education and capacity development in the implementation of a SDG on water and water-related targets in the final SDG framework.



Chapter 3

WATER EDUCATION AND CAPACITY BUILDING: CURRENT STATUS, CHALLENGES AND THE WAY FORWARD

3.1 Higher Education

3.1.1 *Description of the issue*

Chair: Stefan Uhlenbrook, UNESCO-IHE

Higher education is going through tremendous changes, for example globalisation, e-learning, internationalisation, costs etc. More graduates from water-related programmes are needed to achieve the SDGs; however, the 'system' does not produce well-qualified graduates.

New partnerships (including those with the public and private sector as well as NGOs and CSOs) might be needed to develop more effective programmes that are tailored to the needs of society (demand side) and at the same time address the interests of students. Innovative didactic approaches, which include the latest IT, serious games, field experiences as well as classical learning approaches, are needed to attract interested students to water-related programmes. Understanding and being able to perform at the science–policy interface is a critical challenge for current and future graduates. Thus the question emerges: how can related innovations in education be stimulated and introduced sustainably in

water programmes? In relation to this question, the roundtable discussed key challenges in order to elaborate on how we can make higher education programmes in water sciences more attractive; considered how to ensure that water studies are integrated to address holistically the water–energy–food nexus; and identified the required competencies for water graduates of the future.

3.1.2 Summary of discussions and main conclusions

Rapporteur: Anne-Sophie Ste-Marie, World Youth Parliament for Water

There is an increasing demand for water professionals in order to achieve the SDGs. Higher education is thus key to meeting this demand by training a sufficient number of students in water-related programmes, so as to provide them with the necessary skills and expertise to become active in this field. At the same time, new challenges and opportunities arise from the development of new technologies and the process of globalisation. Those in charge of planning and developing programmes for higher education need to consider a variety of questions, for example: how can universities integrate multidisciplinary programmes in their curricula, thus improving those programmes and attracting new students? How can science reach more effectively policy makers and communities in order to improve implementation and practice? How can job opportunities be created in order to attract graduates of water-related programmes, thus also raising the profile of the educational programmes?

The following challenges were identified and regrouped to form three integrated perspectives:

- First, there is a lack of an integrated vision of and education on water-related issues, for example in non-water-related programmes. Although the need for water specialists is prominent, there is also a need to raise awareness on water-related issues among a broader range of higher educated students.
- Secondly, the attractiveness of water studies needs to be addressed in order to make water-related programmes more interesting and thus more attractive to a higher number of students.
- Finally, there is a need for more water-related fieldwork to be conducted by students. The gap between the community and the university needs to be tackled and a dialogue established.

The roundtable devised the following solutions to these three issues:

- First, the integration of water issues in non-water-related programmes should be informed by the success of gender studies, which have succeeded in mainstreaming the subject. Gender equality issues are now incorporated in almost all subjects.
- Secondly, regarding the attractiveness of the curricula, suggestions included incorporating ‘serious’ gaming in classes. The younger generation is familiar with IT, the web and gaming, so using fun educational but modern tools would be a good way to attract these students to water-related programmes, and also to prepare them for more serious IT technologies such as GIS.
- Finally, the fieldwork issue is related to that of making water-related programmes of study more attractive to students. Mandatory fieldwork with local communities would not only make curricula more appealing but would also tackle the gap between universities and the communities they are working for. In addition to providing job opportunities, fieldwork would also ensure a grounded vision of relevant issues through working with the new form of governance that water basin communities represent and provide a chance to establish a long-term dialogue with actual people regarding actual issues and solutions.

3.2 TVET

3.2.1 *Description of the issue*

Chair: Deborah V. Chapman, University College Cork, Ireland

Technical and Vocational Education and Training (TVET) refers to ‘the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life.’² It is, therefore, more than general education but includes regular programmes delivered by higher education institutes such as universities. Essentially it is lifelong learning that facilitates occupational knowledge and skills for all levels from technical to educational training, including teachers and trainers. For people already in employment, TVET can enhance professional development through expanding skills, increasing relevant knowledge, keeping pace with new developments, using new technologies and so on.

² UNESCO (2002) Technical and Vocational Education and Training (TVET) for the Twenty-first Century, <http://www.unevoc.unesco.org/go.php?q=UNEVOC+Publications&lang=en&akt=id&st=&q=243&unevoc=0>.

TVET should aim to promote environmentally sound sustainable development. In the context of this Forum, this means the role of water in sustainable development, and sustainable use of the water itself. Effective use and management of water resources requires understanding of the water cycle and the many different ways humans interact with it. In order for TVET to contribute to the future Sustainable Development Goals for water, it will need to address many different skills in a wide variety of occupational settings such as safe drinking water, maintaining ambient water quality and water resources planning, among others. Although training at a practical level can address specific aspects of the water cycle (for example, sewage treatment or monitoring water quality), a wider community engagement and appreciation of the need for sustainable use of water is also necessary. Practical skills training should therefore be accompanied by the provision of sufficient information to develop an understanding of the reasons for using specific processes or techniques and the benefits they provide for the environment and local communities.

A possible challenge for TVET providers, with respect to sustainable use of water resources, is to identify the most appropriate learners across the broad spectrum of involvement with the water cycle, in particular those that will ensure that the vision of sustainable use of water is transmitted more widely. One option that could contribute to ensuring sustainability in the long term could be to include training of trainers, who will be the TVET providers of the future.

3.2.2 Summary of discussions and main conclusions

Rapporteur: Anaïs Chagankerian, UNESCO-IHP

The chair of this roundtable, Ms Deborah V. Chapman, opened the discussion by pointing out the variety of TVET programmes at different occupational and educational levels, as well as their relevance for the achievement of the future Sustainable Development Goals. A holistic approach is needed to design programmes that manage to combine the development of practical skills with an in-depth understanding of the broader context of their application and identify with the goal of environmentally sound sustainable development related to water. The definition and presentation of the scope of TVET highlighted a key problem related to the topic. TVET is a concept still unknown to most people, which thus means it fails to reveal its full transformative potential.

- The first challenge is thus linked to the need to raise awareness of this form of education. The lack of information on existing capacity building opportunities should also be explored as a possible reason for the capacity gaps in some regions.
- The second challenge is linked to the fact that, even if some people know about these educational opportunities, they might not have the financial means to access them, which can be another explanation for capacity gaps in some regions.
- The third challenge is the difficulty of identifying the key TVET needs in the water sector in order to ensure effective and efficient delivery and to identify the most appropriate learners across the broad spectrum of those involved with the water cycle, in particular those who will ensure the vision of sustainable water use is transmitted more widely.
- The fourth challenge is that TVET is viewed as a less prestigious form of education in comparison to university programmes. The profile of TVET thus needs to be raised to increase enrolment on such courses.

Regarding the difficulty of identifying the key needs of TVET, participants of the roundtable agreed that a solution would be to carry out needs assessments at the local level in order to identify key local water issues and gaps in capacity so as to better target and adapt the scope of TVET according to local settings. It was also highlighted that, since practices, knowledge and technologies are dynamic elements, there is a necessity to monitor the evolution of knowledge and technology in the water field in order to identify existing TVET programmes that need to be updated.

In order to address the problem of financial obstacles to accessing TVET, mechanisms should be put in place to provide funding opportunities for regions in need so as to enable their inhabitants to access key TVET adapted to their local water issues and which provide missing transferrable skills relevant to their local settings. The roundtable participants emphasised the importance of promoting and raising the profile of TVETs since they might be perceived as less appealing than university programmes and the professions attached to them might simply be unknown.

The roundtable participants also highlighted the need to organise awareness-raising sessions in high schools and businesses, stressing the importance and relevance of water-related TVET in the context of sustainable development, in particular to achieve the upcoming Sustainable Development Goals, and underlining the importance of the capacities acquired through TVET for the wider benefit of society.

Finally, the participants agreed on the relevance of ensuring that the vision of sustainable water use is transmitted more widely. They also confirmed the need to carry out training of trainers (ToT) activities for those involved in TVET, in order to enable them to properly integrate and explain the concepts of sustainable development and water security and their relevance within their courses.

In conclusion, TVET is a key component of water education and can play an important role in promoting sustainable development and achieving water security if challenges related to them are addressed, in particular through the solutions highlighted as part of this roundtable and by gathering additional ideas through further cross-generational and international discussions involving a wide range of stakeholders.

3.3 K-12 and Youth

3.3.1 *Description of the issue*

Chair: John Etgen, WET Foundation, USA

The term K-12 encompasses primary and secondary education. As such, the main thematic focus of this roundtable is on the importance of customising water education materials and curricula to effectively transmit key water sustainability messages to school-age audiences and beyond. The foundations of water sustainability are grounded on an awareness of how to manage and conserve precious water resources. This awareness in turn derives from education, societal norms and a person's individual skills in terms of sustainable water use, or the relative availability of clean water in every person's community depending on their location.

With 26% of the world's population under 15 years of age, this cohort of children remains a key target for future water sustainability. Building awareness and understanding of sustainable water use in these school-age audiences takes a tailored approach and is best delivered by the local education experts – teachers – who both reside in every community and are trained educational professionals. However, it can be assumed that a one-size-fits-all approach to water education curriculum delivery does not account for the many cultural, language and institutional differences in educational settings between countries and communities. Customising water education curricula is the key to effective water education implementation and the subsequent uptake by young learners of critical water messages and skills.

3.3.2 *Summary of discussions and main conclusions*

Rapporteur: Kenzya Patterson, World Youth Parliament for Water

The roundtable discussed the common challenges faced by individuals attempting to implement projects. The challenges differed in intensity or prevalence according to the different countries and contexts of their implementation.

The first and most challenging issue raised was the engagement of youth. The participants reflected on the difficulty of stimulating engagement and involving youth in issues that concern them, mainly due to a widespread lack of interest regarding water issues in their respective communities. This condition extends to the entire society and then reveals a bigger issue: the lack of interest of individuals in the sustainability of the environment. The discussion revealed that, if youth are indifferent to the water situation and by extension to the current environmental situation, the security of water resources will be under threat, since youth are the future generation of responsible adults.

The following challenges were identified in relation to tackling the issue of a lack of youth engagement in some communities:

- It is crucial that individual projects suit their audience. The key for success lies in tailoring the project to fit the context and, in this case, the country. Since each country is different, one idea or method of implementing an idea may not be transferrable to all because the context is not the same. The context thus plays a crucial role when deciding where and how to implement a project.
- The global spread of digital technology means that the call for e-learning may become more urgent. More traditional learning techniques may become outdated and fail to secure the attention of students. To ensure efficient outcomes, learning techniques need to be adapted to satisfy modern demand.
- This transition may be costly and time-consuming, since project innovators have to assess carefully the needs of their audience and devise a variety of flexible solutions in order to accommodate everyone. Understanding what the audience wants is crucial to implementing education that will be both engaging and informative.

In response to these challenges, the following, both general and concrete, solutions were proposed.

The proposed solution to the first challenge – creating projects to suit the context – was youth action. The roundtable agreed that youth must be active in the implementation process and outlined the benefits that could arise from such an approach. One example was that a hands-on approach can facilitate faster learning. Here, youth would garner experience in creating their own projects and successfully seeing them through. Concrete actions, which seek to increase youth action, include the implementation of water audits and the creation of competitions. Water audits allow students to experience their water situation in a conscious way and to take active part by allowing them to monitor the use of water throughout their school. After the audit, students think of creative and innovative ways to reduce the amount of water used in the school, ultimately decreasing the level of water usage in the country. The competition seeks to encourage students to raise awareness of current water crises and to develop ideas to address them. The roundtable proposed ideas for a poster competition, alongside a gaming competition, which requires students to create posters on water issues in their schools or distribute information regarding water sustainability on posters throughout their schools.

The second and third challenges – provision of digital technology and tailoring provision to the audience – were deemed similar and, as a result, the proposed solution aimed to address both. The roundtable proposed educating children about water and the management of water resources through interactive gaming and customising educational materials to specific contexts. This idea took into consideration the global shift towards digital technology and informal education. Children are more engaged by video games and are more inclined to learn doing something they enjoy. The interactive video games would focus on water management and water security, hoping to inform children about the importance of water while simultaneously having fun. The education materials may include textbooks that are unique to the country or subject being taught, for example a book on climate change in South Korea, as opposed to general information on climate change. This solution aims to provide children with in-depth knowledge of their own country, which may be more interesting to them than a broader discussion on water issues since they can more easily relate to it.

3.4 Community Education

3.4.1 *Description of the issue*

Chair: Phillip Xie, Shangri-la Institute for Sustainable Communities, China

This topic attempts to address various strategies for educating communities, building their capacities, and engaging them in the process of water conservation. The main focus is on the importance of combining indigenous knowledge with modern scientific knowledge, together with building on the tradition of communities regarding the stewardship of their natural environment, in order to create a community-based educational approach. This integrative process of learning has the potential to facilitate community empowerment by giving local people the toolset and platform to manage and take charge of their watersheds, protecting their local water sources from both local sources of pollution and challenges from outside of the community. As even the largest watersheds, such as the Yangtze River, are created from many small tributaries, starting from the community level has the potential to create a real impact on a larger scale.

3.4.2 *Summary of discussions and main conclusions*

Rapporteur: Heejung Son, K-water, Korea

The main challenge identified by the participants of this roundtable was the conflict between the knowledge possessed by indigenous communities and scientific knowledge learnt in school or acquired through professional practice. Even though scientific education provides evidence-based knowledge, it is very hard for practitioners to neglect the traditional knowledge embraced in different indigenous communities. Water issues cover a variety of topics, including conservation of the watershed at the community level, securing enough drinking water and providing better sanitation. The use of scientific methods to address these issues rather than traditional knowledge or behavioural custom can be a major source of conflict.

Respect for the culture and knowledge of indigenous communities is thus a key element of community education. To avoid conflict and engage all community members, traditional knowledge and culture must be valued and integrated in educational strategies. One example is the 'small watershed conservation campaign' currently practised by most communities.

The second challenge identified is the balance between the growth of community education and the development of a community itself. Without the existence of a healthy community, growth of community education will not be realised in the long term. This issue is directly related to the final challenge of continuity within community education. It is different from formal education, which supports systematically the participation of students and teachers, thus only voluntary participation in educational activities can be expected on the part of community members.

This challenge could be addressed by a series of activities that enforce community autonomy and improve the quality of life of community members. These activities could include supporting community practitioners and learners, encouraging greater participation in the voluntary management of community education and pursuing useful partnerships with various sources. A plan for supporting community practitioners and learners includes providing training programmes for adults and engaging students in community activities from primary school upwards. For the adults, various programmes could be provided; for example, CAWST provides training programmes on water, sanitation and hygiene and consultancy support for communities in need in several countries. K-water provides training and certifying programmes for water sommeliers. To engage students, the Shangri-la Institute developed the idea of 'One Community, One School', which nurtures future community members by encouraging young people to become involved in community activities at a young age.

Another suggestion was the establishment of community learning centres managed by elected members of local communities. If successful, these centres could be expanded nationally and internationally through networking with various partners such as similar organisations or companies with useful resources such as funds, technologies or best practices. This approach would result in community education and communities themselves growing together over the long term.

In conclusion, for community education to be successful, indigenous cultures and knowledge must be respected. It is also important to provide education on water-related issues for all ages through practical training and activity programmes in order to secure the sustainable development of the community and empower its members to make the best use of the resources and partnerships available.

3.5 ESD, Water Security and the Post-2015 Development Agenda

3.5.1 Description of the issue

Chair: Ángel Cajigas Delgado, MAGRAMA, Spain; **Author:** Anaïs Chagankerian, UNESCO-IHP

Since the advent of sustainable development as one of the top priorities on the international community's agenda, Education for Sustainable Development (ESD) has materialised as a concept in its own right and has been at the heart of international initiatives such as the United Nations Decade of Education for Sustainable Development (DESD, 2005–2014), led by UNESCO. The Global Action Programme (GAP) on ESD, endorsed by UNESCO's General Conference in 2013³ as the official follow up to the DESD⁴ and acknowledged by the United Nations General Assembly in 2014,⁵ now provides concrete contributions to the post-2015 Development Agenda in the form of its roadmap for implementation.⁶ As the Millennium Development Goals (MDGs) of the current Development Agenda are reaching their target date in 2015, the international community is currently discussing proposals for Sustainable Development Goals (SDGs) to replace MDGs beyond 2015 and help set targets and indicators for the post-2015 Development Agenda. As part of the SDGs, Target 4.7 of Goal 4 on Education specifies that, by 2030, all learners should acquire the knowledge and skills needed to promote sustainable development, including through education on sustainable development.⁷ The GAP is set to contribute to this target, as well as to other goals, in two ways: (1) reorientating education so that everyone has the opportunity to strengthen their capacities and contribute to sustainable development; and (2) strengthening the educational component of all agendas, programmes and activities that promote sustainable development.⁸

In this context, efforts have to be made prepare the way for the GAP in all areas related to sustainable development and, in particular, to establish water security. As Goal 6 of the SDGs is also entirely dedicated to water for all, Target 6.a specifically mentions the need to expand cooperation and capacity building in water- and sanitation-related activities

³ UNESCO General Conference Resolution '37 C/Resolution 12'; see Appendix.

⁴ United Nations General Assembly Resolution 57/254, 20 December 2002.

⁵ United Nations General Assembly Resolution 69/211, 19 December 2014.

⁶ See UNESCO Roadmap for Implementing the Global Action Programme on ESD, <http://unesdoc.unesco.org/images/0023/002305/230514e.pdf>.

⁷ Open Working Group proposal for Sustainable Development Goals, <https://sustainabledevelopment.un.org/sdgsproposal>.

⁸ Global Action Programme on ESD, UNESCO, <http://www.unesco.org/new/en/unesco-world-conference-on-esd-2014/esd-after-2014/global-action-programme/>.

and programmes. Since access to sufficient and clean water is often related to inefficient water resource management (that is, economic water scarcity) rather than absolute water scarcity (that is, inadequate natural water resources), education is indeed a pivotal element in promoting sound water governance and management and ensuring that individuals of all ages and backgrounds acquire the capacity to deal with their water resources in a sustainable way. Indeed, while 1.7 billion people currently live in river basins where use of water is exceeding recharge, water demand is expected to rise by 55% in the next 35 years, thus further exacerbating the problem. For that matter, ESD is crucial in encouraging behavioural changes and providing skills to improve water management and governance at all levels; in promoting water sustainability with access to safe water and sanitation facilities in learning environments; and, finally, in making sure education, policy and management actors work to ensure institutionalised educational responses to water-related challenges.

3.5.2 Summary of discussions and main conclusions

Rapporteur: Collins Tweheyo, World Youth Parliament for Water

The key questions and challenges related to water management and future water challenges, which were discussed at the roundtable and will affect children, youth, women and men, were the following:

- Water scarcity caused by prolonged dry seasons.
- Health problems caused by consumption of polluted water.
- Conflicts among people, mostly in connection with shared water sources.
- Increased flooding.
- Poorly educated children because they spend most of their time looking for water – a highly relevant issue in most developing countries.
- Food insecurity caused by floods and droughts, resulting in malnutrition and increased mortality in children.
- Loss of biodiversity (both terrestrial and aquatic life).
- Poverty resulting from people having to spend a great deal of money on controlling water-borne diseases.

The participants agreed that the majority of these problems will most immediately and harshly affect poor people who have no access to safe water. However, lack of access to safe drinking water concerns everyone, including the government and the private sector as a result of the costs associated with water-related health problems.

The intense discussion on education for water security resulted in the formulation of a range of solutions to the challenges described above, such as:

- Policy makers need to be educated on and sensitised to water-related issues so that they can draw up/create relevant regulations that will have an effect beyond their term of office.
- Youth need to be educated on the subject of water security because they will be the key players of tomorrow.
- Water-related policies need to be improved at the national and global level in order to address existing gaps.
- National and/or regional goals need to be set because many countries lack sustainable development goals in relation to water.
- People at the grass-root level need to be educated about and engaged in different water-related activities such as research because they are also key players.

In order to achieve these goals, capacity-building packages should be developed and tailored to fit different target areas. Those suitable for rural areas will clearly be different to those needed in urban areas since each faces different challenges. The roundtable shared a case study on Saudi Arabia, where water security is mostly needed in urban areas because 78% of the population live in cities. However, this is not the case in most developing countries, where most people live in rural areas and villages and depend on untreated water.

The following capacity-building packages, tailored to fit different target audiences, were suggested:

- Use of social and electronic media for educating and updating policy makers on the latest developments in the field.
- Provision of short and extended courses for youth.
- Provision of agricultural extension services, demonstration farms, exchange visits and local media radio programmes for farmers.
- Provision of adult learning programmes.

In conclusion, capacity building is crucial to ensure water security at the community level. However, different capacity-building packages must be applied to specific stakeholders to ensure more efficient outcomes.

3.6 Water and Gender Equality

3.6.1 *Description of the issue*

Chair: Mariet Verhoef-Cohen, Women for Water Partnership

Capacity development and education is one of the recommendations of the Women Pre-Conference for the 7th World Water Forum, entitled 'Gender Equity for a Water Secure Future', which took place in Gyeongju on 10 and 11 April. Here, recommendations to strengthen the role of women in water and sustainable development were formulated. The audience was very diverse; participants were representatives from women's organisations, governments, the private sector, non-governmental organisations and academia.

Participants at this pre-conference were privileged to witness female leaders in the water sector who inspired them with their stories and demonstrated how to examine and voice the perspective of women in all of the subjects discussed. It became clear that one of the recommendations had to be that women are included as pivotal actors in the establishment of water security and safety and that they need to be involved from day one. For that to happen, a culture change is needed. A further discussion during the high-level session with UNESCO-IHP on gender, equity, justice and culture highlighted another recommendation, which is to ensure women's full economic participation in the world's economy and to use women's potential fully, as women are a force to be reckoned with. Most of the recommendations concern implementation. Since Beijing, much has been said but implementation is lagging behind – now it is time for action.

3.6.2 *Summary of discussions and main conclusions*

Rapporteur: Natalia Uribe, UNESCO-IHP

The roundtable discussion began with the introduction from the chair, Mariet Verhoef-Cohen, President of Women for Water Partnership, who set the scene by highlighting that water is an important entry point for positioning women as active leaders, partners and agents of change in the water, gender and development nexus. Education and capacity building are ways to enforce empowerment.

The key questions and challenges discussed in the roundtable were:

- How do we increase women's professionalisation in the water sector?
- How can we enhance women's participation in decision-making processes in their communities and also at national and international levels?
- How can monitoring improve gender equality?

Participants reflected on the challenge of women's professionalisation in the water sector, a sector that has traditionally not been considered a place for women. Participants from Korea shared that women's professionalisation in the water sector is being promoted in their country. However, there is still an important challenge regarding culture expectations applied to women and their role in society and the lack of policies to support women working outside their homes. This challenge is also related to the need to promote women in the water sector, higher education and academia, since the scientific community is male-dominated. Participants agreed that the challenge goes beyond the water sector. This has to do with cultural processes in male-dominated societies. Even though the trend is changing and women are more involved in society, changing cultural norms is difficult and requires long-term processes that should involve both men and women.

Regarding the challenge of increasing women's participation in decision-making processes, participants shared the need for policies to facilitate women working outside the home. Work should also be done to increase men's participation in activities that have been feminised, such as fetching of water, which in most countries is an activity carried out by women. Another proposal is forming village Water, Sanitation and Hygiene (WASH) committees in which half of the representatives are women and half men; such committees already exist in some countries. The importance of involving and raising awareness among men was stressed; it is important that men do not feel menaced and instead feel part of the solution.

Specific recommendations to tackle the identified challenges were:

- A budget for capacity development, vocational training, empowerment of women and design of an appropriate governance structure.
- The inclusion of women in the decision-making process by setting a quota of a minimum 40% women in water-governing bodies at all levels.
- Collection of gender-disaggregated data, which is both quantitative and qualitative; for example, going beyond measuring women's presence at certain

meetings to assessing whether they are really able to express themselves at such meetings.

- An acknowledgement that gender equality is not just about women; increased action is therefore necessary to raise the awareness and engagement of men. Work needs to be done to change the mindsets of both men and women, to talk to men in their own language and to make these changes together.
- Processes and progress need to be monitored on an ongoing basis, rather than at the end of projects so that adjustments can be made as needed. Monitoring could provide a perfect opportunity for women to get involved and simultaneously learn and build capacity at all levels.
- Partnerships should be instigated across sectors, levels and generations.

3.7 Capacity Building in Africa

3.7.1 Description of the issue

Chair: Jean Patrice Roger Jourda, Université Félix Houphouët-Boigny, Côte d'Ivoire

Water education and capacity building are key elements in contributing to water security and sustainable development in Africa. Efficient water management must be implemented to achieve water security and meet sustainable development expectations and is intimately linked to the following issues:

- People's perception of water resources. As the Constitution of UNESCO states, 'Since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed', so too can it be said that 'since problematic behaviours related to water use originate in the minds of men, so efficient management of water resources must be constructed in the minds of men'. People's mentality, that is, the way in which they view water security and sustainable development, will only change as a result of education. The environmental, sacred, social and economic values of water must be recognised and acknowledged. Scientific knowledge on water-related issues must be disseminated and the capacity of professionals and policy makers increased.

3.7.2 Summary of discussions and main conclusions

Rapporteur: Abou Amani, Regional Hydrologist for Africa, UNESCO Nairobi

The roundtable discussions highlighted the urgency of addressing capacity gaps in Africa. Existing capacity-building institutions, including national and regional institutions, UNESCO Centres and Chairs and the network of NEPAD Water Centres of Excellence, all need to be built on and strengthened. Indeed, a rapid survey conducted by UNESCO-IHE a few years ago indicated that Africa needs to increase by at least 300% its number of water professionals in order to achieve the MDGs. The actual demand for water professionals is much higher, considering the strategic importance of capacity building for African countries. The need for capacity building does not concern water professionals alone; it concerns everyone, including those at the community level.

The discussion was organised based on the following questions:

- How can African policy makers and stakeholders become engaged with capacity-building projects?
- How can information sharing be used to enhance water education in Africa?
- How can successful partnerships among NGOs working on water-related capacity building in Africa be established?

The first challenge that needs to be tackled is the necessity of creating interest in and attracting attention to the importance of water-related issues among policy makers and stakeholders. It is crucial that those involved in water-related projects are aware that expertise needs to be available in order to successfully implement projects.

The development of a platform for knowledge sharing, which provides decision makers with regular updates on the importance of capacity building for water-related issues in Africa in order to stimulate engagement, addresses this specific issue. A further element consists of promoting the training and monitoring of decision makers to ensure a shared perspective on important water-related issues. The NEPAD Water Centres of Excellence in Africa were discussed as a possible role model for capacity building projects and also as a means of demonstrating to decision makers the significance of expert knowledge.

The second challenge relates to the identification and selection of appropriate means of communication to best reach target groups. Emphasis needs to be placed on new technologies. Since many people have smart phones, social media platforms such as

Facebook, Twitter and so on can be used to share information related to water. In order to address those without smart phones, who are particularly broadly represented at the local community level, other communication channels need to be established. Radio and television broadcasting can be used to share information at the community level. Furthermore, schools and particularly local training programmes can play an important role. It is essential to offer seminars that are tailored to the needs of local communities and are developed with the support of local mediators. To ensure the success of these educational efforts at the community level, it is necessary that the training offered and the trainers themselves be accepted in order to build a sense of trust.

The third challenge, how to build successful partnerships among NGOs working on water-related capacity building, is related to the coordination of the process. The credibility of NGOs is crucial for building successful partnerships. Furthermore, the government needs to set the standards for and aims of such cooperation. Recommendations include establishing platforms for information sharing in order to facilitate cooperation and sharing of best practices related to water.





Chapter 4

CONCLUSION

Session rapporteur: Miguel Doria, UNESCO-IHP

This session attracted participants of varying ages, genders and disciplines and from diverse geographical backgrounds. It addressed many stakeholders' interests and expectations regarding current needs and the way to move forward. This session enabled participants to analyse current water-related issues in a comprehensive manner and to share experiences as well as new ideas on water education, water security and sustainable development, including the intersections among these issues.

The discussions highlighted that all levels of water education were often exposed to common challenges. Several common recommendations on which to concentrate efforts were thus identified:

- Adapting water education to local settings and cultures, and also valuing indigenous communities' approaches to water.
- Raising the profile of water-related capacity-building opportunities so as to present water-related programmes as attractive options to individuals and communities.
- Promoting water-related programmes by disseminating information on their existence and addressing financial obstacles to enrollment.
- Promoting the relevance of water-related education in the daily lives of individuals and communities so as to emphasise sustainable development and water security.

- Adapting water education as societies evolve and integrating innovative elements such as the use of digital media and other interactive activities adapted to younger audiences.
- Promoting water-related issues within other disciplines beyond the traditional subjects in which they are currently taught.
- Involving both women and men at all levels of education and, in particular, in community education.
- Promoting women's career opportunities in the water sector and providing gender equality tools at all levels in the water sector, higher education and academia.

These global and local action ideas are key elements that stakeholders must address together in order to move from discussions to concrete action for the improvement of water education and its contribution to water security and sustainable development.



K-12 and Youth

TWT

APPENDIX

Session Programme

Keynote speakers

Ing. Víctor Javier BOURGUET ORTIZ
Mexican Institute of Water Technology (IMTA)

Dr Blanca JIMÉNEZ CISNEROS
Secretary of the International Hydrological Programme/Director of the Division of Water Sciences, UNESCO/ Vice-Chair of UN-Water

Dr Jens LIEBE
UN-Water Decade Programme on Capacity Development (UNW-DPC)

Parallel Thematic Roundtables

Roundtable on Higher Education

Chair: Prof Dr Stefan UHLENBROOK
UNESCO- Institute for Water Education (UNESCO-IHE)

Rapporteur: Anne-Sophie STE-MARIE
World Youth Parliament for Water

Roundtable on TVET

Chair: Dr Deborah V. CHAPMAN
University College Cork, Ireland

Rapporteur: Anais CHAGANKERIAN
UNESCO- International Hydrological Programme (UNESCO-IHP)

Roundtable on K-12 and Youth

Chair: John ETGEN
WET Foundation, USA

Rapporteur: Kenzya PATTERSON
World Youth Parliament for Water

Roundtable on Community Education

Chair: Phillip XIE
Shangri-la Institute for Sustainable Communities, China

Rapporteur: Heejung SON
K-water, Korea

Roundtable on ESD, Water Security and the Post-2015 Development Agenda

Chair: Ángel CAJIGAS DELGADO
Spanish Ministry of Agriculture, Food and Environment (MAGRAMA)

Rapporteur: Collins TWEHEYO
World Youth Parliament for Water

Roundtable on Water and Gender Equality

Chair Mariet VERHOEF-COHEN
Women for Water Partnership (WfWP)

Rapporteur: Natalia URIBE
UNESCO- International Hydrological Programme (UNESCO-IHP)

Roundtable on Capacity Building in Africa

Chair: Prof Jean Patrice Roger JOURDA
Université Félix Houphouët-Boigny, Côte d'Ivoire

Rapporteur: Dr Abou AMANI
Regional Hydrologist for Africa, UNESCO Nairobi

Plenary

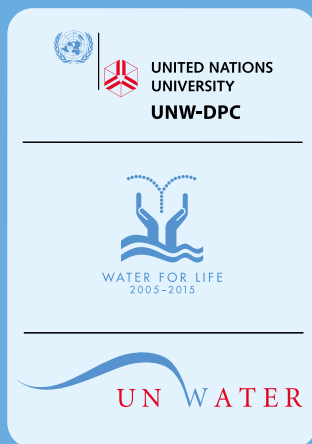
Presentation of roundtable outcomes and plenary debate

Concluding overview

Miguel Doria
UNESCO- International Hydrological Programme (UNESCO-IHP)

Adding Value in Water-Related Capacity Development

The UN-Water Decade Programme on Capacity Development (UNW-DPC) is a Programme of UN-Water and strengthens the capacity development activities of UN-Water Members and Partners, supporting them in their efforts to help Member States achieve the Millennium Development Goals (MDGs) and other international goals and commitments related to water and sanitation. It is hosted by the United Nations University.



UNW-DPC was established in August 2007

Funded by the German Federal Government through the Federal Ministry of Education and Research (BMBF) Federal Ministry for Economic Cooperation and Development (BMZ)

UNW-DPC contributes to the International Decade for Action, "Water for Life" 2005-2015

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