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Al Akhawayn University, Morocco



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



**Recommendations for the future of water-related Education for
Sustainable Development**

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Recommendations for the future of water-related Education for Sustainable Development

Outcomes of the workshop held at the UNESCO World Conference on Education for
Sustainable Development Aichi-Nagoya, Japan, 10-12 November 2014

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Foreword

Our world has many pressing needs, among them the urgent need to eradicate poverty and provide universal access to fresh water. Sustainable development is seen as one of the most viable paths, offering economic and technological solutions to tackle those vital needs while contributing to the progress of mankind. The challenge remains how to achieve development today without exhausting the fundamental and finite resources of our planet and without compromising the capacity of our future generations to meet their own needs.

More than ever, engaging in dialogue on sustainable development is necessary. There needs to be a truly global engagement to transform our current habits and patterns of consumption that hinder our ability, as well as the ability of future generations, to lead healthy and productive lives. There also needs to be global recognition for our common and shared responsibility regarding the environment and each other. Finally, there needs to be the establishment of new and perpetual sustainable values, which will become ingrained in our actions and help us shape the future we want.

Education is our most powerful tool to generate this change. It has the capacity to mobilize and empower every individual in a long-lasting way. It is a crucial means to promote conscious and well-founded change. It can positively transform individuals and societies.

Water is a crucial resource to every form of life on our planet. We depend heavily on the resource to ensure our own survival, but also to carry out many important economic activities and provide proper sanitation, which are crucial elements for our well-being and health. Water also plays a critical role in poverty eradication, gender equality, food security and ecosystems preservation. Uniting the importance of water with capacities for sustainability, water education is necessary to promote the change we want.

This report aims to promote a reflection on the current status of water education and propose changes in the current approaches and methodologies employed to seek improvement and effectiveness. We hope to inspire our readers and substantially contribute to the work done in Education for Sustainable Development with a focus on water.



A handwritten signature in blue ink that reads "Blanca Jimenez-Cisneros". The signature is written in a cursive, flowing style.

Blanca Jimenez-Cisneros

Director of the Division of Water Sciences of UNESCO
Secretary of the International Hydrological Programme

Introduction

Fresh water is a vital resource for life and development, which needs to be managed and governed sustainably at different levels. Human capacities are fundamental to ensure the sustainable and universal access to water, its adequate use for the eradication of poverty and green growth, while ensuring the preservation of the planet's ecosystems. Education for Sustainable Development (ESD) provides a critical lever for advancing the practices and policies needed to provide an adequate education in water, including the acquisition of values, knowledge and skills related to water security. In many countries, lack of access to water largely results from the lack of capacities to access it, rather than from the lack of the resource.

Two concurrent decades were designated by the United Nations to raise awareness, advance capacities and support Member States' actions: the United Nations Decade of Education for Sustainable Development (DESD, 2005-2014) and the International Decade for Action "Water for Life" (2005-2015). Significant advancements took place in both areas during this period, contributing to the attainment of the water-related target under the Millennium Development Goals (MDGs). At a time when both decades are coming to an end, together with the deadline for the MDGs, new initiatives to coordinate action for sustainable development have been conceived in the form of the Global Action Programme (GAP) and in the broader context of the Sustainable Development Goals (SDGs).

As part of the preparations for the GAP, the UNESCO World Conference on Education for Sustainable Development was held from 10 to 12 November 2014 in Aichi-Nagoya, Japan. Among its objectives, the conference aimed to assess the current status of ESD and discuss future actions, which address the priority action areas of the GAP. In the case of water, the GAP priority action areas are interconnected with the objectives of the eighth phase of the International Hydrological Programme (IHP-VIII, 2014-2021), targeted at improving water security in response to local, regional, and global challenges. The current report is based on the main outcomes of the Conference workshop on "Water Education and Capacity Building: Key for Water Security and Sustainable Development" coordinated by the UNESCO International Hydrological Programme (IHP) and the UNESCO Chair on Water, Women and Decision-making in Morocco. The conclusions of these processes, several of which are shared in this publication, can provide a valuable perspective on how to advance water education and capacity building as critical instruments to reach water security and sustainable development.



Mongolian Herders Practice Sustainable Resource Management

Background

Sustainable development has become a widespread concept since it was first introduced in 1987 in the so-called Brundtland Report. Given the pressing need to increase human access to vital resources and to reduce negative impacts on the environment, a number of major events and initiatives on both water and sustainable development have been organised, including the International Year of Water Cooperation and the UNESCO World Conference on Education for Sustainable Development. The importance of water and sustainable development can also be gauged by the inclusion of a specific goal and over twenty targets on water among the Sustainable Development Goals, comprising a target on the expansion of capacity-building support to developing countries in water and sanitation. In addition, IHP through its different phases has prioritised water education as a central theme. In the current phase, education is regarded as key for water security, proposing a multi and interdisciplinary approach while considering a broad range of direct beneficiaries and target groups. These target groups not only include water technicians and other professionals, but also decision-makers, school students, youth, communities and media professionals, among others.

The International Decade for Action “Water for Life” (2005-2015), among other achievements, emphasised the direct correlation between water and human life quality: water directly impacts health through hydration, waterborne diseases and hydrohazards, as well as indirectly through sanitation and food security, among others. The correlation highlights the importance of managing the resource in an integrated, holistic way as conceptualized in Integrated Water Resources Management (IWRM).

The action plan of the UN Decade of Education for Sustainable Development (DESD, 2005-2014) included a thematic area entirely devoted to water with a focus on all levels of education. This process gave a new emphasis to water education, and highlighted water education’s role and purpose as a means to achieve sustainable development.

The MDGs and the abovementioned Decades come to an end in 2015 thus highlighting the need to assess achievements and plan future actions. It is in this context that the UNESCO World Conference on Education for Sustainable Development was organized in Aichi-Nagoya, Japan by UNESCO and the Government of Japan. The Conference had four main objectives: (1) to celebrate a decade of action (with the end of DESD); (2) to reorient education to build a better future for all; (3) to accelerate action for sustainable development and (4) to set the agenda for ESD beyond 2014. The workshops during the Conference were organized into four clusters in accordance with each of the objectives. The workshop “Water Education and Capacity Building: Key for Water Security and Sustainable Development”, which findings have inspired this publication, was held on 11 November 2014 and was categorised under Cluster III – Accelerating Action for Sustainable Development.

The Global Action Plan (2015-2020)

The conference and its workshops prepared the basis for the future Global Action Programme as a follow-up to the DESD. The GAP takes into consideration the rapid-changing nature of modern societies, enhanced by shifts in the demographics, urbanization and globalization. It proposes a radical change in our values, actions and interactions to achieve a world that is more just, sustainable and peaceful. In this context, sustainability is crucial: it allows for a better and shared use of available resources. With a more conscious pattern of consumption, values in cooperation thrive. More justice and peace are achieved. Education plays a fundamental role here: it is a powerful means to raise awareness on environmental issues, empowering and compelling others to take action and make a difference. It is a first step to put sustainability into practice.

The GAP on ESD has five priority areas: (1) advancing policy to mainstream ESD into both education and sustainable development practices; (2) transforming learning and training environments to integrate sustainability principles into their settings; (3) building capacities of educators and trainers to more effectively deliver ESD; (4) empowering and mobilizing youth to act for sustainable development and disseminate practices that sustain ESD; and (5) accelerating sustainable solutions at the local level, engaging communities, stakeholders and media professionals. These priority areas were central to the structure and development of the workshop “Water Education and Capacity Building: Key for Water Security and Sustainable Development”.



Women in Chiapas, Mexico

Assessing progress in water education

The workshop “Water education and capacity building: key for water security and sustainable development” was the first of eleven workshops in Cluster III and aimed at discussing ESD as a critical lever for advancing policies and practices in different areas such as water education for water security and sustainable development, marine knowledge, renewable energy, health, food security, biodiversity, climate change, disasters, youth, green economies and cities. The primary objectives of this workshop were to assess the current status of water education, including the progress achieved during the DESD and Water for Life, and to identify the way forward in the context of internationally agreed goals, the objectives of the eighth phase of IHP, the GAP priority areas, and the preparations for the post-2015 development agenda. It was structured into three main themes to be considered in order to accelerate action for sustainable development:

- (a) tertiary education of water professionals;
- (b) water education in schools; and,
- (c) water education for decision-makers, water technicians, communities, stakeholders and mass-media professionals.

The workshop was coordinated by UNESCO’s International Hydrological Programme and the UNESCO Chair on Water, Women & Decision-Making, based at the Al Akhawayn University in Ifrane, Morocco. Approximately 30 participants from different backgrounds and countries attended the workshop, including Ministers of Education, members of National Commissions for UNESCO, staff from diverse associations devoted to the environment, university professors and media representatives. Mr Rachid Belmokhtar, Minister of Education and Professional Training of Morocco, acted as the keynote speaker. Mr Jim Taylor, Director of Environmental Education at WESSA South Africa, was the rapporteur of the workshop. In addition, the workshop also benefited from contributions from the following persons: Ms Forzeya Al Mahmoud (Environmental Outreach, Environment Agency - Abu Dhabi, United Arab Emirates), Ms Aurelie Charpentier (World Youth Parliament for Water, Canada) and Mr Katsunori Suzuki (Environment Preservation Centre, Japan).

The participants sought to formulate their observations and recommendations in the field of water education, in particular regarding the GAP, and targeted each of the three main abovementioned themes of the workshop.

Accelerating actions towards sustainable development

Access to sufficient, safe and affordable water, together with appropriate sanitation, was declared a human right by the United Nations General Assembly in 2010. However, over 750 million people do not yet have access to the resource, a total of 2.5 billion do not have access to adequate sanitation, and six to eight million people die annually from the consequences of disasters and water-related diseases (UN-Water, 2013). Moreover, water management impacts some individuals more than others. In Africa, women are mainly responsible for fetching water, spending up to six hours a day to fetch the resource in some areas. Women and girls in general also have to perform house chores and resolve sanitation issues in Africa (UN Water for Life, 2007). These responsibilities can compromise their personal development by affecting, for example, their attendance to school. In addition, women are underrepresented in decision-making processes: they cannot exert their full potential and bring their own views to solving pressing issues.

These examples demonstrate the complex range of issues involved in managing water. Water education plays a crucial role in transforming values and habits that promote a sustainable management of the resource. It is crucial that water education includes the appropriate range of actors and disciplines involved in the process. It also needs to consider the economy, wealth distribution, geography and gender implications, among others. In addition, it needs to count on the participation of governments, institutions, corporations, civil society and individuals to address economic and gender discrimination and manage water in accordance with sustainable principles. The following sections will analyse the current situation of water education and propose changes to increase its impact and accelerate action towards sustainable development.



Coordinators of the workshop, Nagoya, Japan: Asma El Kasmi, Chairholder of the UNESCO Chair on Water, Women and Decision-making, and Miguel Doria, Programme Specialist at the International Hydrological Programme of UNESCO.

Guiding the future of water education

Speaker: Mr. Rachid Belkmokhtar, Minister of Education and Professional Training, Morocco

Water is not only crucial as a source of life, but also as a source of knowledge. It is fundamental to attend our biological needs, both by being consumed as a fundamental component of our organism and indirectly, by its participation in the food production – agriculture and livestock. It is directly related to our hygiene and health habits, carrying not only potential for cure, but also being a bearer of diseases. It plays a fundamental role in our modern life, being extensively used for energy production, transportation and diverse industries. It is a substance with remarkable properties and chemical structure, which needs to be studied and understood scientifically, in all its forms. Water can also be a cause of cooperation, as well as of conflict, among diverse societies. It is a source of power and can have mythical, religious and spiritual meanings, besides being a source of inspiration for all the arts. Hydrologic systems, water use and abuse, as well as water's environmental and cultural significance, are all linked to human wellbeing.

Scarcity of water and climate change are further issues to be considered, as the phenomena affect many people and compromise their physical and mental health, as well as their economic opportunities, relations to other communities and human development. At school, access to or scarcity of drinkable water even influences children's attendance. Scarcity can also be economic – i.e. there is water available in a given region, but its inhabitants do not possess adequate resources to access it (technological expertise, financial means, etc.).

However, it was found that the current education systems do not dedicate due importance to the resource. In fact, the beginning of agriculture, and indeed evolution, was closely tied to water. There are successful examples of co-management of the resource through customary law, in places where it is scarce (such as semi-desert oasis locations in North Africa), illustrating the importance of cooperation to achieve a sustainable use of the resource. This approach, however, does not work in modern states, where economic issues, elites, power gradients and external policies define how water is supplied, distributed and managed, all of which can also result in conflict.



Participants during the workshop, Nagoya, Japan

All those examples and issues emphasize the role of water education. It is crucial that all actors involved in water management (users, administrators, governments, specialists, etc.) learn cooperative methodologies, being also aware of the need to use and manage the resource wisely, as a way of alleviating future conflict and bringing us closer to universal access to this vital resource.

There is an inherent need to rescue our primordial links to water, where not only biological evolution but also human development have always had strong ties to the resource. It deems necessary to adopt a holistic approach to understand and manage the resource. All its dimensions and meanings need to be taken into account in a multidisciplinary effort. Similarly, water education needs to be encompassing, as it is the crucial means to empower people and grant water sustainability. Past methodologies and concepts of water education need to be rethought and reformulated, while innovative and more pedagogically sound approaches need to be adopted.

In that context, three over-riding points were made, to guide the future water education for sustainable development work. These are:

1) Water cannot be managed in isolation – solutions may be outside the water system and lie in other fields.

Water involves multi and interdisciplinary approaches, such as in the water and energy nexus, where great amounts of energy are used to secure water and water is much used to generate electricity. Thus, water and energy management cannot be considered in isolation from one another. There is a similar strong need to integrate other sectors in water management. During the DESD, there was an evolution on water understanding, from hydrology to multidisciplinary. Now this concept needs to be applied to water education.

2) Water knows no boundaries – it is beyond time and space.

Considering the resource in isolation is not only an incomplete approach, it is also misleading and elusive. Politics, international affairs, sanitation issues and disparities amongst the rich and the poor are all part of this struggle.

3) Migration flows also have a marked influence on water management.

This is true especially regarding the rural-urban flows which place urban infrastructures under strain.



Participants at the workshop, Nagoya, Japan



Roundtables on Water Education, Nagoya, Japan

A. Tertiary education of water professionals

1. Higher education should not be isolated from other levels of education.

The experience gained during the DESD generated a set of positive outcomes. For instance, water issues became better understood at different levels with international cooperation playing a crucial role from the sharing of water to the sharing of the benefits of water. Higher education has played an important role in the capacitation of professionals, the development of pedagogical tools and the dissemination of information to communities. However, work still remains to create dialogue among education institutions, and among those and other stakeholders, as well as local communities. More dialogue, cooperation and information exchange in this context would be beneficial to all.

2. The benefits related to water management are not shared widely enough, as focus is on sharing water, not its benefits.

Economic scarcity hinders whole populations' ability to access, manage, study and enjoy the benefits of water. In addition, dissemination of water knowledge has been patchy and scarce, determined by the economic situation of communities, the goodwill of leaders and the traditional training of water professionals (usually very technical, specific and non-holistic), resulting in great inequality of access to both knowledge and water. Therefore, access to water has become increasingly conditioned by economic realities. Knowledge is generally shared on the basis of power, not of global benefits. Many universities and research centres keep their research and knowledge in the academic environment without engaging with local communities.

Water education requires dialogue with political leaders and can be hindered by the interests from the private sector. To illustrate this point, it is not possible to modify school curricula without a willingness from the government to implement and regularize modifications. In addition, some powerful companies can have conflicting interests to those of sustainability, thereby becoming reluctant to support desired change. While it is commonplace that everyone needs water to ensure their survival, access to knowledge and the benefits it brings (medicinal use, profits) are concentrated in the hands of a few. This knowledge can come later, once those values become organic and are naturally embedded into everyday actions.

3. Sustainable values have yet to be addressed properly.

Attitudes, behaviours and patterns of water consumption also need to be sustainable. Sustainability cannot be an abstract concept, but needs to become an everyday reality. Other approaches to water are very often prioritized (e.g. when handling scientific, political and geographic issues) to the detriment of the teaching and encouragement of sustainable values. Such negligence compromises peoples' awareness and willingness to act sustainably.

B. Water education in schools – shaping principles for the GAP

Schools are excellent places to foster water education since they are well structured and are linked to the parent community. Some countries, especially in Africa, have a great proportion of their population at school ages – so projects can reach over 50% of a country's population by reaching schools in some locations, thus having a great potential to catalyse change.

Nevertheless, the current situation of water education at schools is inadequate. The following issues were brought up during the workshop:

4. Health, diseases and sanitation are very significant issues and need to be approached at school.

Health, diseases and sanitation affect human life in many contexts. In many parts of the globe, they are areas of great concern even though they are not always adequately taught in the learning environment. Furthermore, children learn about water and sanitation in some schools, but do not always have access to them – neither at home nor at the school itself. The contradiction facing students when learning about a topic that is alien to their everyday lives needs to be addressed.

5. Teachers often lack the training and capacities to conduct lessons and activities in line with ESD principles.

This issue may occur because teachers are either unfamiliar with ESD principles, do not understand the importance of adopting a holistic and multidisciplinary approach to teach about water, or they lack effective training and knowledge of new and multidisciplinary methodologies. Besides understanding how water relates to their fields of expertise and sustainable principles, teachers must be aware of their role in catalysing change and be able to disseminate sustainable values. Promoting sustainable values is even more successful in promoting change than isolated knowledge on water itself, so priority should be given to the dissemination of sustainable values. Teachers can provide knowledge later, once sustainable values become organic and are naturally embedded into everyday actions.

6. The current methodologies for water education often only consider children with more academic profiles.

Old-fashioned and fragmented methodologies have dominated water education. They have often been very technical, specific, and focused on a single discipline. In addition, the concept of sustainable development has been broad and general and the various disciplines involved (such as water education, chemistry, physics and geography) are not usually addressed with due importance. When addressed, the different fields are considered in isolation. It is not always clear how they relate to each other and how important it is to consider each one of them individually as well as in a cross-cutting way.

Not engaging children in a way that enables them to connect their own realities to what they are learning often results in excessively technical approaches to water. Water is often taught in geography (rivers, lakes, etc.) or natural sciences (chemical characteristics, solid, liquid and gas states, etc.) courses with very little information offered in other disciplines. Such limited approaches reduce children's understanding and overview of the processes related to water. Only a small percentage of children (those who have a real interest in the subject or those who possess more academic skills) profit in depth from the information.

C. Water education for decision-makers, water technicians, communities, stakeholders and mass-media professionals

7. The role of other water professionals in ESD is often unclear or disregarded.

When thinking of education, the classical teacher-student relationship is usually the first image that springs to mind. Other sources of education, even if informal, are forgotten. A similar tendency is observed in water education. Water technicians, media professionals and companies, among others, are rarely seen as potential value-builders. Therefore, their role in water education is often unclear or disregarded. As a result, many of them have not received holistic water education themselves, and their approach to the resource very often focuses solely on their own fields. They are unable to make use of their potential as promoters of sustainable values. For example, the media rarely advertises sustainable patterns of water consumption, whereas they often show advertisements selling water bottles and broadcasting environmental hazards such as river floods. While there is a focus on the "tragedies", almost no information is provided on the human actions that lead to them. Little is said about sustainability.

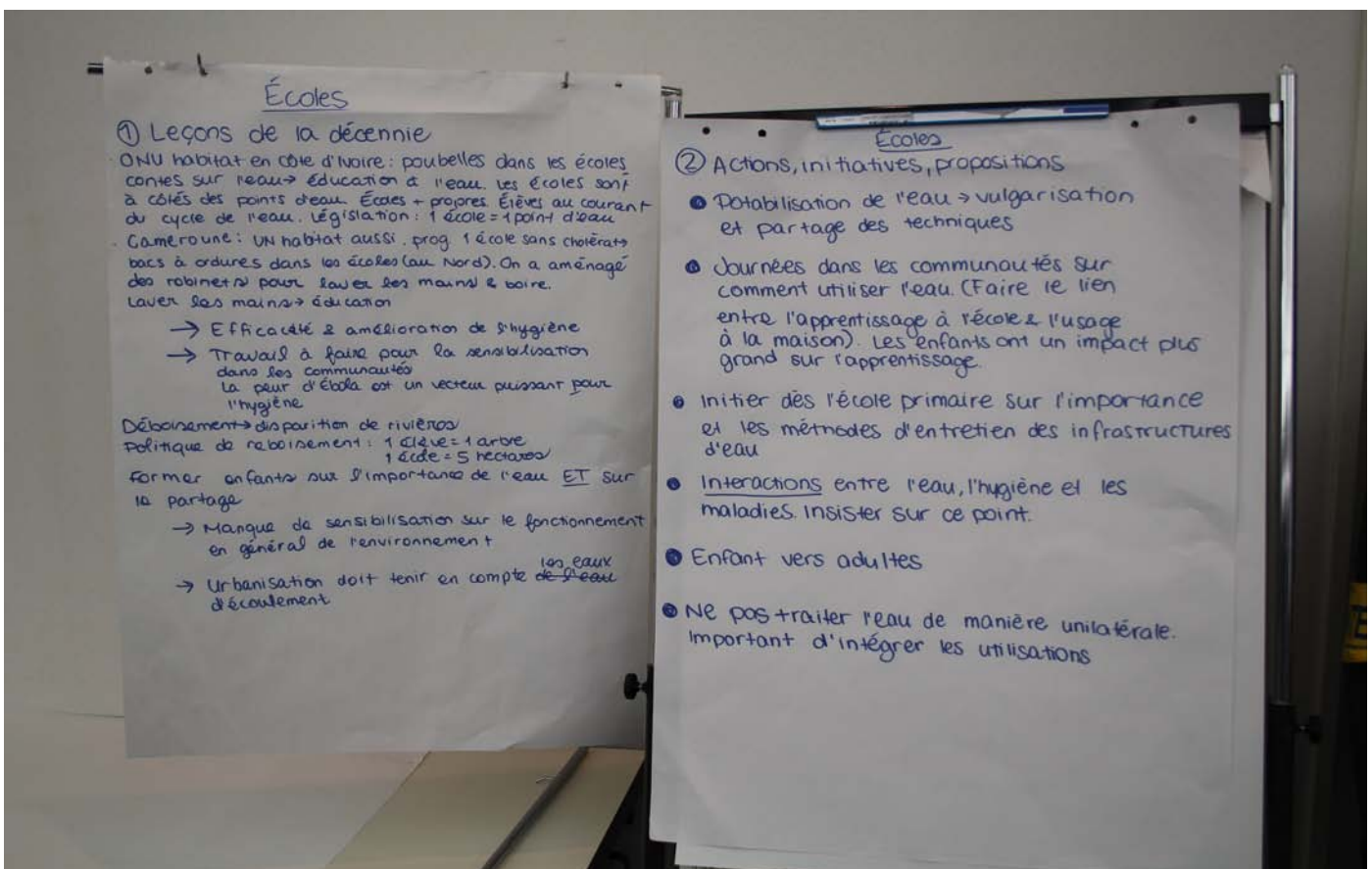
8. There is no structure for community participation in water management.

Even though communities and individuals are the most affected by water management policies, they are often excluded and unaware of decision-making processes, which are dominated by more powerful stakeholders such as large companies, important media channels, and politicians.

This lack of participation often leads to an underrepresentation of the individuals' interests compared to those of the more powerful stakeholders and can result in feelings of inadequacy and discouragement to learn and engage with sustainable principles. These feelings can subsequently hinder action for sustainable development.

9. Traditional practices and knowledge about water are rarely taken into account.

Water is often taught through a scientific context, while certain cultural practices and traditional knowledge are often disregarded. Important cultural and traditional information is often lost when only the Western education model is followed. To worsen matters, individuals from different backgrounds, such as indigenous communities, cannot establish a relation between the topics learnt and their own reality if only Western values are presented. This context can make them feel like outsiders to the mobilization for sustainable development and compromise its global scope.



Proposals made at the roundtables — in French, Nagoya, Japan

Recommendations on water education

The following recommendations were structured to address each issue identified by the workshop participants and reported in the previous section “Implementing the GAP on ESD”. The numbers indicate the issue that each recommendation corresponds to:

1. Human and social scientists should be engaged in both learning and sharing. Institutions need to be open and transparent as well as develop cooperation skills. Joint courses must be offered that are linked to water challenges and community issues at all levels of education (GAP Priority Area 2).

2. Higher education institutions must serve society, develop and apply feedback (GAP Priority Area 5), and transform themselves to become real, successful examples of water management. By getting more involved with issues facing the community, those institutions will share their expertise with the general public and other water professionals for their work to make a bigger impact on society. Both knowledge and benefits related to water should be shared, not only at the local level, but also internationally among all stakeholders. A successful example of knowledge sharing in the field is UN Habitat, which became an example in international cooperation to design and manage human settlements and issues related to them, including sanitation, water provision and pollution.

3. The development and incorporation of sustainable values should be central to ESD for only they can lead to a change of behaviour crucial to its goals. Therefore, water education should not be restricted to pure scientific or factual knowledge, but should develop an organic awareness of the importance and finite availability of the resource and encourage everyday sustainable practices (such as recycling, not leaving the faucet dripping, and not taking long showers).

4. a) Approaching health, diseases and sanitation in relation to water is necessary in ESD. Teaching those topics will enable the learners to prevent a number of potential health problems and empower them with knowledge to be applied in areas where sanitation is deficient – their own homes in many cases. This measure also sheds light on other fields of relevance, highlighting the multidisciplinary nature involved when water is concerned.

4. b) Water purification must be addressed. It is essential to create a bridge between home and school. Students will learn better what they can apply to their daily lives. Learning about the water they consume is a first step to bringing knowledge closer to their own reality. Furthermore, obtaining this knowledge will be useful throughout their lives since it can be applied at home and improve their lives significantly.

4. c) Schools and other learning centres must offer potable water and appropriate sanitation to their students. As many students do not have access to potable water and appropriate sanitation at home, they should have them available at school to improve their health conditions by having at least one place where water consumption is safe as well as to actually experience what they are learning.

5. a) Teacher capacity development needs to be enhanced. It is not enough to have good curricula if the teachers lack the capacity to implement them and vice-versa. Teacher capacity can be improved with training courses, workshops, exchange of ideas with other professionals, etc. This aspect is vital for the achievement of the ESD goals and actions for the forthcoming GAP as teachers are the main catalysers of ESD.

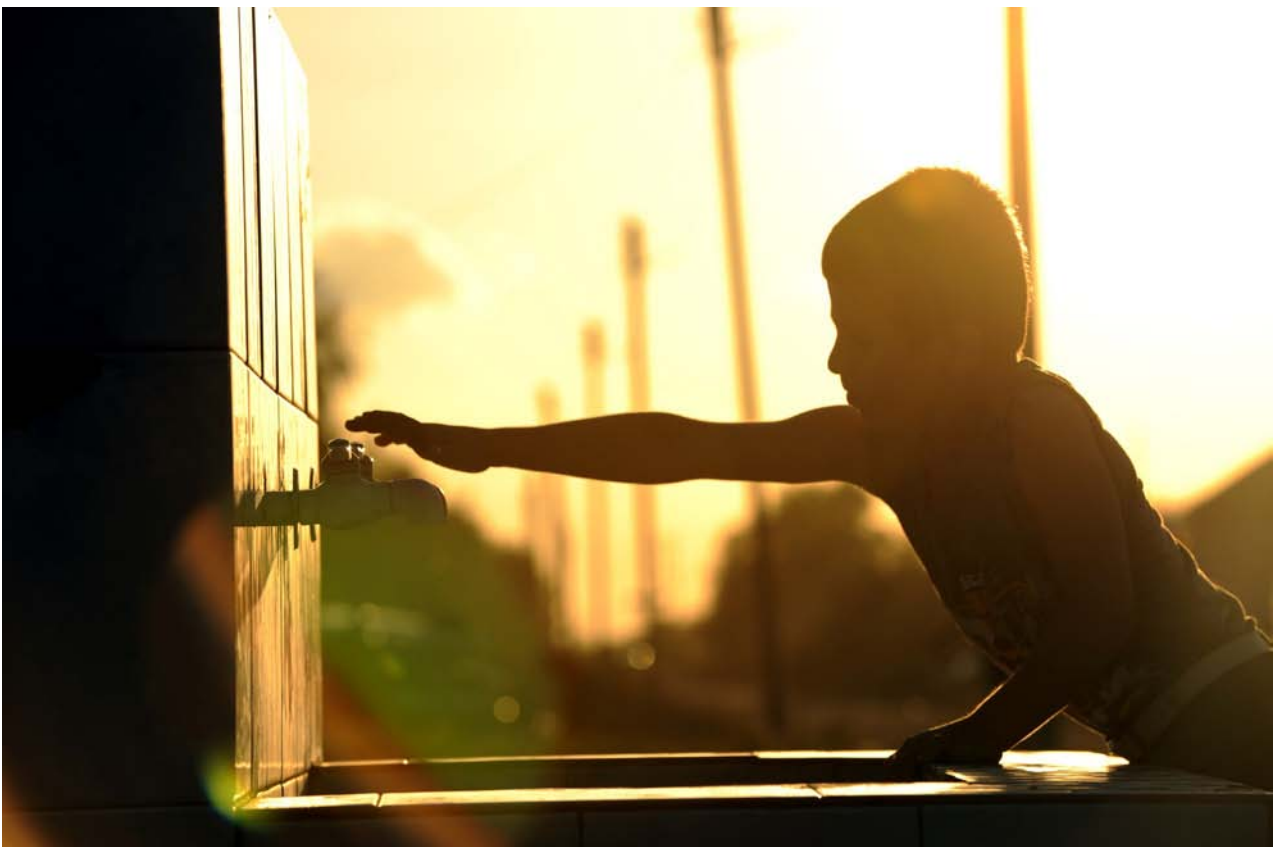
5. b) To ensure that there are enough capacitated teachers to deliver the appropriate training, each school should have one or two teachers who act as “pedagogical directors” responsible for disseminating information. Once trained, those teachers can take on the responsibility to share their new knowledge, materials and skills with the other teachers at the institution. This structure would certainly work better in small countries, while the Ministry of Education would be more involved in larger countries.

6. a) A new culture of innovation and integration is required (Priority Area 2), and it needs to be present in ESD. Water education needs to be holistic, inter-disciplinary and value-enhancing to promote significant systemic change.

6. b) Water education will reach more learners if it is built on diverse stimuli (visual, auditory, sensorial, etc.), making our senses interact and contributing to a more complete learning. Methodologies that include action-based learning should be prioritized since they encourage action, even if on small-scale, from an early age (Priority Area 4). It is also the best way to mobilize and engage youth, ensuring an effective education.

6. c) Sustainable values need to be incorporated in water education such as water conservation and the risks associated with polluting. Such values are actually even more fundamental than acquiring knowledge about water itself as they will speed action towards a sustainable use of water in the long term. Supported by those values, knowledge will come later.

6. d) Teaching should be situated and contextualized in the local reality (situated learning) whenever possible. Learning about basins, reservoirs, sanitation, etc. is much more efficient if local examples are given since students will relate new knowledge to the things they knew previously.



Water and sanitation services to rural parts of Azerbaijan



Students perform a drama demonstrating the importance of sanitation at school in Ethiopia

7. a) Decision-makers, water technicians, communities, stakeholders and mass-media professionals should receive and subsequently promote ESD. They are an integral part of water management; they consist of the main actors who communicate about water issues; they influence the public and form opinions; and they have a special interest in water consumption or deal with water issues as their profession. Therefore, they need to develop and spread sustainable values and practices. Even if their knowledge is often technical, they also need to consider water in its many relations and under many disciplines. They too must be empowered with sustainable knowledge if the goals of ESD are to be fulfilled. In addition, many of them are in a position to disseminate ESD values and practices, being further catalysers of ESD. Sustainable ideas can be communicated to families by children, media, etc. For the media, advertisements explaining these issues could be broadcast. The advertisements could be conceived by volunteers with government support – focusing on the importance of conserving water, not polluting, etc. The private sector could also be involved in the make-up of devices that contribute to sustainability and sanitation and use their innovation to embrace sustainable values, while still making a profit.

7. b) On the other hand, technical knowledge about water is precious. Science should be democratized and disseminated to the general public in a simplified and more general way. For example, platforms such as Google Earth help hold people accountable and force them to become better citizens. A very powerful example is the life straw, which allows children to drink from polluted water with a 99% degree of safety without requiring a previous and complicated technical knowledge. As a final example, an Engineering school which coordinates a project allowing people in small towns to create their own purification devices.

By giving people simple tools or using simpler language to communicate science instead of explaining complex mechanisms, one can already do a lot in terms of their access to clean water. Local populations can use the tools they already have in hand or develop new gadgets to the same ends. In addition, it would be highly beneficial if more people understood the implications of unsustainable practices and developed sustainable values in relation to water and specific fields. Science should be more accessible to the general public; sustainable values should be incorporated as important components of the scientific training as well.

8. a) There should be more room for communities to officially engage in the decision-making process. A good way to implement this idea is by creating water committees, where issues concerning the resource could be discussed and suggestions and proposals presented to government representatives. The committees would be a place where many stakeholders meet and exchange ideas. They have a great potential to enhance cooperation in water management, as well as the exchange of information among the actors involved.

8. b) Minority languages should be used by the media in order to disseminate knowledge about water. Those languages should also be used in festival, theatre plays, and other initiatives which can transmit knowledge about water. This way, ESD would contemplate more people and ethnic minorities would feel more included in the mobilization for sustainable development.

9. Indigenous knowledge should be linked to the mainstream culture and considered as an important source of wisdom about the environment. Furthermore, indigenous communities often show a very strong connection to nature and promote sustainable practices and values, which all ought to acquire.

Other suggestions were given, such as creating economic incentives to decrease the consumption of energy and water. For example, higher taxes could be charged on the consumption of energy at night, so people see in numbers and money the impact of their standards on the use of resources. Though this method is less successful in raising one's awareness of the importance of acting sustainably, it can be a successful starting measure that will initially change the way people act and cause positive change. Awareness, values and knowledge can then follow.



Presentation on the importance of considering indigenous knowledge in water education, Nagoya, Japan

Recommendations tailored for the GAP

- The GAP provides incentives to higher education institutions. Other courses and joint research projects should be provided.
- Universities should become real centres to disseminate knowledge to deal with issues related to water and sustainability.
- Stronger links between school and the community should be created.
- Scientific knowledge should be communicated in accessible ways (demystification of science). Formal and non-formal methods should be used. Economic incentives should be created to encourage sustainable practices.
- All the institutions that provide water education should have the proper infrastructure to allow access to sanitation, potable and freshwater. They should be models and providers of what they are teaching.
- A new empowering methodology should be employed in parallel to the new multidisciplinary education. Once empowered, teachers and educators will have more tools to disseminate sustainable values. Water is an ideal entry point for methodological changes because everyone has experience with it.
- In addition, human behaviour is very different from theory to practice. Behaviour scientists should be involved in the development of new methodologies to teach sustainable values.
- By focusing on the transformation of learning centres, teachers and methodologies, more youth will be empowered to act. Empowering youth grants better advances towards sustainable development, not only because they will be the future of water management and will play a fundamental role in promoting long-term systemic changes, but also because they can generate immediate change at their homes and local communities.
- It is necessary to encourage and support active public participation in water-related decisions. Water volunteers are helpful in supporting wise water management and cooperation since they have an inborn motivation to act for the cause. In addition, volunteers can offer a very good initial, low-cost solution to encourage more public participation in water issues.
- Multilingualism should be considered for publications, workshops and courses related to ESD.
- Community-based value systems need to be developed.
- Water committees should be created to ensure community participation in the decision-making process concerning water since they are important for sharing issues, risks and knowledge. The media should broadcast water related messages and programmes at primetime to reach more spectators.

The way forward

The main strategies for the development of Water Education for Sustainable Development are based on the new Global Action Programme for ESD. It calls for the engagement of multiple actors: governments, all levels of education institutions, communities, stakeholders, companies and individuals. It requires an urgent change in the mentality and the patterns of water consumption, and especially the creation and real adoption of sustainable values, rather than only offering technical or scientific knowledge about the resource. It relies on the commitment of many professionals related to water and education, directly and indirectly, such as mass-media professionals and water technicians. Finally, it highlights the role played by the youth in the process, acknowledging how they can influence their homes and bring about long-lasting changes that will grant sustainability in the future.

The GAP is global and multidisciplinary in nature, aiming to include all sorts of stakeholders, regardless of their influence or power. It is our best plan of action to conduct the desirable systemic changes necessary to build the future we want.



Methgharkila village, Maharashtra, India. Relief is coming in the form of a water tower for the village.

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