

Proposal for Establishment of a UNESCO Category II Centre in the
Republic of Macedonia focused on Education and Research in the Area
of Freshwater Resources:
Water for Environment, Culture and Society (WECS)

October, 2007

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1. Introduction

The fact that development imperatives and population growth are continuously bringing freshwater systems under increased pressure is widely recognised as one of the most challenging global problems for the 21st century. Different regions of the world experience diverse manifestation of this problem, such as overexploitation of surface and groundwater resources (leading to increased competition for water), deteriorating water quality, degradation of aquatic environments, and water-related disasters such as floods and droughts. The number of countries, regions and population groups that are facing these problems is continuously increasing. In recognition that this may lead to a serious global water crisis, the international community, through its various bodies that have water on their agenda, has developed the fundamental concepts of sustainability and equity as principles on which we attempt to confront, mediate and solve water problems.

However the practical applications of these globally accepted principles are frequently facing enormous difficulties. Sectors and regions within countries continue to compete for water resources, and the transboundary nature of many freshwater resources is yet to be fully understood by individual countries and assimilated in appropriate international institutions. There is no abatement in the debate about the extent to which the exploitation and management of freshwater resources can be exposed to the working of the free market through involvement of the private sector, as compared to the traditional and still predominant public ownership and control. In such examples sustainability and equity may be adopted as principles, but their interpretation and application in practice is dependent on many diverse factors such as power relations, knowledge availability, legal settings, and cultural differences.

In view of this situation, the approaches that are required for future dealings with freshwater resources need to be based on the fundamental understanding of the *shared nature* of our waters, which can only be achieved by increased and *shared understanding* of the functioning of water systems. The required understanding is not limited to the functioning of the physical water systems and their relations to the natural environment, but also to our societal and cultural relations with these precious resources. Knowledge generation and sharing becomes crucial aspect of this endeavor, especially in view of the increasing number of actors who have a stake in water.

Water education and research are therefore fundamental for management of our shared water resources in an uncertain future. This is of course not a new realisation, and many national and international institutions and organisations are promoting and delivering focused water-related education and research. What is increasingly needed, however, is an approach to water education and research, which will be *global in nature*, in the sense that the generated water-related knowledge, even if it is produced locally, can be globally shared by educators, researchers and learners. This is especially important for the new generations of learners who will need to take much more responsible roles in the future as global citizens.

The international community, represented by the United Nations, and in particular by UNESCO, promotes such an approach to water-related education and research through encouraging and enabling *partnerships* among different countries and institutions. Although these partnerships can be of different nature and with different set-up, the underlying rationale for these partnerships is to bring down the barriers to mobility of people and knowledge, and to create synergetic learning and research environments with unprecedented knowledge sharing potential.

This proposal fits into these efforts of the international community, and in particular those of UNESCO. It proposes the establishment of a global educational and research centre in the Republic of Macedonia, which will focus on *education and research in the area of water*, and will function in *partnerships* with higher education and knowledge institutions from other countries. The centre will develop its educational activities to contribute to water education in primary, secondary and tertiary levels. It will also aim at raising the general public awareness about the importance and critical issues related to freshwater resources. The centre's research activities will mainly be associated with its post-graduate water education actions (*water-related research*), as well as with research oriented towards improved and more effective water education at all levels (*education-related research*).

It is proposed that the WECS centre is established as an independent centre under the auspices of UNESCO (category II centre), directly connected with the International Hydrological Programme (IHP) of UNESCO. Within the UN Decade of Education for Sustainable Development (DESD: 2005-2014), UNESCO-IHP has the leadership in the thematic programme on Education for Sustainable Water Management. The proposed WECS centre in Macedonia is aimed at contributing to- and supporting the activities in this programme as they are currently being developed in the Water Education Work Plan of UNESCO-IHP.

2. Focus areas of WECS

The overall ambition of the Water Education Work Plan of UNESCO-IHP within DESD is the incorporation of water education at all levels based on the principle of sustainable development. The DESD initiative recognises the evolving nature of the concept of sustainable development, and how it may have different meaning and interpretations in different sectors, regions and cultures of the world. Nevertheless, the initiative calls for some basic shared understanding of the goals of sustainable development in three key areas: society, environment and economy, with culture as an underlying dimension. In all these areas, the essence of sustainable development is the understanding and respect for the diversity of values and valuation frameworks that enable and sustain our human societies. This recognition requires a new approach for water education and research which will embrace the knowledge sharing approach. With this proposal Republic of Macedonia aims to offer its contribution to the global efforts for development and implementation of such new approach to water education and research.

The proposed WECS centre will be set-up as an independent institution in Macedonia. Its main activities will be in two main areas:

1. Water education and research in primary and secondary levels
2. Water education and research at tertiary levels (undergraduate and post-graduate)

2.1. Water Education and research in primary and secondary levels

It has been recognised that actual education of children is most effective when carried out in environments with close relationship between educators and learners. This implies that such environments need to be with consistent and uniform cultural and linguistic set-up, which is usually provided within national educational frameworks. Water education is not an exception with this respect. At the same time, however, the incorporation of the concepts of sustainable development and integrated water resources management in water education, and their introduction at these levels of education require a wider perspective from the side of educators, which can be provided through successful knowledge sharing at international level. Several reasons can be pointed out for this requirement:

- Basic knowledge about the hydrological cycle at the catchment level needs to be associated early on with the awareness about its transboundary nature
- Societal and cultural differences in relation to water and water resources need to be recognised and respected, while finding areas of compatibility and synergy which may lead to shared understanding of sustainability
- The awareness about the connection between local water resources use and *global* or regional environmental and climatic impacts needs to be created in the formative years of education
- Incorporation of most relevant scientific knowledge and its translation into easily assimilated material at these levels of education

The WECS centre will develop its activities in the areas where knowledge sharing at international level may contribute to more effective incorporation of water education based on sustainable development, however without involvement in actual education at these levels, which is carried out within the national educational frameworks.

The main targets of WECS in this area will be as follows:

- Sharing of existing water education curricula and material for primary and secondary levels among countries
- Adaptation of existing curricula and material from one country/region /culture to another
- Development of regionally relevant and acceptable water education curricula and material which will recognise the shared and transboundary nature of water resources
- Research and knowledge sharing on the best modes of delivery of water education at primary and secondary levels, in particular with respect to making

use of Information and Communication Technologies (ICTs) and the new media.

The envisaged activities for achieving these targets are:

- Providing regional and global workshops and short training programmes for educators at primary and secondary levels, focused on inclusion of water education based on sustainable development
- Collection, development and maintenance of knowledge repository with resources on water education for these levels, with the goal of providing easy access to potential educators and learners
- Carrying out comparative research studies about actual implementations of water education at primary and secondary levels, which will support the monitoring, evaluation and adaptation of the Water Education Work Plan within DESD

These activities of WECS will necessarily involve partnership agreements with other similar institutions, from within the UNESCO and the wider UN family, as well as other established national or regional centres with compatible missions and activities. For example, one particular partnership which is envisaged, with a clear and direct link to the above mentioned activities is the ProjectWET (Water Education for Teachers), a USA-based programme already quite active in this area, with which UNESCO-IHP already has active cooperation.

2.2. Water education and research at tertiary levels

At tertiary levels, especially at undergraduate level, water professionals are educated in diverse fields of engineering, environmental sciences, hydrology, economics and other more traditional fields of study. The main challenge at these levels is the integration of the latest scientific knowledge related to water into the various undergraduate programmes that cover water. It is widely acknowledged that sometimes it takes several years for such integrations to take place. There is a need for establishing much closer and easier connections between undergraduate water-related programmes and post-graduate programmes where scientific research is integrated. Such connections can be established through sustained efforts in dissemination of scientific knowledge to water-related curricula at undergraduate levels.

WECS will aim at establishing direct cooperation agreements with leading international water science and education institutions in order to enable structured and effective translation of water-related science into education. One such institution is the UNESCO-IHE Institute for Water Education, based in Delft, The Netherlands, which is recognised for having a leading role in both water research and global water education. A major component of the envisaged cooperation agreement between WECS and UNESCO-IHE will be the *development of curricula and educational material including distance*

learning modules, which could be easily disseminated to *educators at under-graduate level*.

A second major component in the envisaged activities of WECS related to water education at tertiary level is *the establishment and delivery of joint post-graduate education (at Masters level) in partnership with higher education institutions from other countries*. In this approach the WECS centre will not issue post-graduate degrees of its own, but it will contribute to the delivery of the education and research curriculum of existing post-graduate Masters Programmes of partner institution(s) from abroad. Potential candidates who will enroll in a given Masters Programme will spend one part of their studies in Macedonia (at WECS), and another part of their studies at given partner institution. UNESCO-IHE is again an obvious example for establishing such a partnership, although such kind of cooperation will be sought with other higher education organisations from different countries.

The areas in which WECS will seek establishment of joint Masters Programme are as follows:

- Water conflict and resolution
- Information and Communication Technology (ICT) for freshwater resources (Hydroinformatics)
- Hydrology for Integrated Water Resources Management (IWRM)
- Ecohydrology and aquatic ecology
- Hydraulic engineering for water infrastructure
- Urban water and sanitation

WECS centre will not be able to develop all of these areas at the beginning of its functioning. Which areas will be initially developed is conditioned upon the types of partnerships that will be established. The longer term goal of the centre is to develop its programmes in all the proposed areas.

The centre has in fact the ambition to broaden the scope of its educational and research activities much more. The six areas mentioned above are still mainly belonging to traditional engineering and natural sciences fields related to water. As mentioned in the introduction, an integral part of a truly holistic framework for dealing with freshwater resources is the understanding of socio-economic, cultural and artistic relation of human communities with their waters. In some sense this requires mixing two different perspectives from which we define our relations with water. The one that is currently predominant is the view of water as a 'resource', which is there for life support systems and socio-economic development. The alternative view recognises our more intimate connections with our waters that offer us inspiration and aesthetic pleasure, serve as objects of religious sacrament, and act as environmental features that shape and influence our communal culture.

The WECS centre will try to exploit its unique setting in Macedonia, where the awareness of our dual relationship with water is so clear, by attempting to transpose this

awareness into its activities. In other words, the centre will be open for collaborative educational, research and art activities, which come from the fields of social sciences, as well as culture and art studies, as long as they have our relationship with water as a focal point.

All above activities of the WECS centre are conditioned on establishment of a partnership agreement with other higher education institutions and centres from outside Macedonia. This makes the partnership approach inevitable for the functioning of the centre. On the other hand the WECS centre will develop strong links with the higher education and research sector within Macedonia in order to draw upon the local resources for its activities, and contribute to the strengthening of the local capacity in this sector. The existing expertise in this area within Macedonia, although substantial, is dispersed across various institutions, international donors, and non-governmental organisations. While this situation is to some extent inevitable at this stage of development of the country, a systematic and more holistic approach to the freshwater resources development needs the support of more focused and concentrated research and education. The role of the future WECS centre will be to act as an independent body, which can enable the required focusing of education and research.

2.3. *Additional Activities of the centre*

In addition to the educational and research activities introduced above it is expected that WECS will have the following activities:

- Delivery of short courses for the local and regional water sector
- Organisation of water-related conferences, workshops and exhibitions in line with its mission.
- Cooperative activities with other UNESCO category II centres in the area of water, in line with the new strategy of UNESCO for the water-related category I and category II institutes and centres
- Public awareness campaigns on water-related issues
- Limited advisory and consulting support

3. Proposed set-up of WECS

The WECS centre will be endorsed by the Macedonian Government and strongly supported by the relevant Ministries and Government Directorates that are directly involved in water-related issues. The Government of Macedonia will also provide the premises (building with necessary facilities) for the functioning of the WECS centre.

The centre will be set-up with a relatively small permanent scientific staff (10-15) and supporting staff (5-7). The role of the permanent staff will be to realise the functioning of the established partnerships, through delivering and organising the educational and research activities. Studies of foreign students that will come for training and education in

Macedonia through the WECS centre will also be organised by the permanent staff of the centre.

In addition to the permanent staff, about 20 experts from Macedonia are expected to deliver educational and research contributions to the centre on a part-time basis. This will be done through direct links with relevant higher education institutions, in order to bring together their relevant knowledge and expertise. Direct involvement of staff from these institutions in the educational and research activities of the WECS centre is being envisaged, as well as sharing of existing research and educational resources (facilities such as lecturing spaces, laboratories or computing resources). Such links will be regulated through appropriate agreements that will be developed and signed with each institution in question.

Depending on the types of partnerships that will be established, it is expected that a number of foreign experts will also be involved as guest educators and researchers. They will deliver their contributions either by traveling to Macedonia or by distance communication over Internet. Initially the number of these experts is expected to be 25-30.

With this set-up WECS will be able to mobilise the knowledge of about 50-60 experts both from within Macedonia and from abroad. Although finalisation of such numbers can only be carried out after establishing the first partnerships, the above estimate is sufficient for the initial functioning of the centre.

It is expected that interested partner institutions outside of Macedonia will seek support for this partnership from other sources (such as their home government, international donors, or private sector), by which financial support they will match the contribution from the Macedonian Government and enable the sustainability of the programme. It is expected that this contribution will be used for two main purposes:

- Matching the real operational costs of running the WECS
- Fellowships for various training and educational programmes offered through WECS.

3.1. Governance of WECS

It is proposed that the Governance of WECS centre will be by a Governing Board with 3-5 members, majority of which will be appointed by UNESCO, and the rest will be appointed by the Macedonian Government. Among other activities, the Governing Board will have the responsibility to appoint the Executive Director of WECS. The Executive Director will be a full time employee of WECS and will be in charge of the day-to-day running of the centre.

3.2. Financing of WECS

The partnership approach proposed for the working of WECS indicates that the financing of the centre for all operational and administrative costs, including those derived from the Governing Board activities, will be shared by The Government of Macedonia, and a partnering contribution from another country (Government or other institution) that is willing to support the joint programmes. The actual share of the financing will depend on the established partnership. It is however suggested that in principle the following sharing of components can be put in place:

Components financed by the Government of Macedonia:

- All costs for the premises of WECS (except ICT infrastructure)
- Salary costs for local permanent supporting staff of WECS
- Partly salary costs for local permanent scientific staff of WECS
- Limited number of fellowships for established training and educational programmes

Components financed by a partnering contribution (Government or other institution)

- Additional salary costs for local scientific staff of WECS
- Costs for input from invited experts from Macedonia and abroad
- Students fellowships for established joint programmes