

**Proposal for the establishment
of a UNESCO Category II Centre**

**Water for Sustainable Development and
Adaptation to Climate Change**

Belgrade, Serbia

**Jaroslav Černi Institute for the Development of Water Resources,
Belgrade, Serbia**

Summary

Aim

The Centre is proposed to enhance scientific cooperation at regional level and will contribute to international sciences on water research, management and knowledge transfer with a valuable contribution to the current IHP VII phase and the upcoming IHP VIII phase and the World Water Assessment Programme.

Concept

The value of scientific results as a basis for sustainable water management under global change threat will be enhanced by developing methodologies and strategies for adaptation, like the development of indicators which describe global change and its impact on water resources, the formulation and verification of indicators as needed support for political decision processes. Strong Serbian science, research and regional development efforts will be focused and made available on the regional and international level, especially for countries in the region and developing countries. More than 25 years of Serbian contribution to UNESCO IHP will be transferred into a centre which will serve the UNESCO Member States.

Partners

World Water Assessment Programme (WWAP), CEH Wallingford, UNESCO IHE, FRIEND, ISI, International Flood Initiative of UNESCO, WMO, UNU, IAHS and ISDR, International Groundwater Assessment Centre (IGRAC), European Regional Centre for Ecohydrology, IHP-HELP Centre, International Centre for Water Hazard and Risk Management (ICHARM) WMO/Water and Climate Programme, Water Technology Center, Karlsruhe, Germany, International Commission for the Protection of the Danube River (ICPDR), International Association of Water Supply Companies in the Danube Catchment Area (IAWD), International Sava River Basin Commission (Sava Commission), Institute for Water of Republic of Slovenia, Bulgarian National Committee for the International Hydrological Program UNESCO, Faculty of Architecture and Civil Engineering, University of Banja Luka, Bosnia and Herzegovina, Montenegro Hydrometeorological Institute, Faculty of Civil Engineering, University of Skopje, Macedonia, Faculty of Forestry, University of Skopje, Macedonia, Faculty of Natural Sciences and Mathematics, Institute of Biology, University of Skopje, Macedonia, Faculty of Agricultural Sciences and Food, University of Skopje, Macedonia, Faculty of Mining and Geology, University of Belgrade, Serbia, Faculty of Civil Engineering, University of Belgrade, Serbia, Institute for the Biological Research Siniša Stanković, University of Belgrade, Serbia, Faculty of Technical Sciences, University of Novi Sad, Serbia, Faculty of Civil Engineering and Architecture, University of Niš, Serbia

Budget

The budget is foreseen to ensure the assets such as operational work of the Centre, the equipment, and the regular expenses such as communication, water, power, gas, salaries and compensations for the Secretariat and the staff, plus the expenses of holding the sessions of the Governing Board and the meetings of the Scientific Board. The total budget is ensured by

Serbian official authorities and Jaroslav Černi Institute for the Development of Water Resources (JCI).

Key Topics

- Applied Research on sustainable development
- Cooperation for water administration
- Climate Change adaptation strategies
- Capacity development and knowledge transfer
- Research for application education & training

Water for Sustainable Development and Adaptation to Climate Change

Regional Category II Centre under the auspices of UNESCO

At the Jaroslav Černi Institute for the Development of Water Resources, Belgrade, Serbia

The Serbian National Commission for UNESCO and the Serbian National Committee for UNESCO's International Hydrological Programme (IHP), propose the establishment of a UNESCO Category II Centre on the basis of IHP Intergovernmental Council Resolution XV-XX. The Centre is a valuable contribution to meet the goals of IHP-VII. It will specifically target focal areas 1.1, 1.2 and 1.3. Through the foreseen capacity building component, it also makes a significant contribution to IHP VII theme 5. Theme 2 focal areas are another critical aspect among the proposed activities, which foster international networking on structural and methodological topics of water governance. The centre also contributes significantly to fulfilling the ambitious Millennium Development Goals, especially goals 1, 7 and 8.

Integrated water resources management and sustainable development under the global change threat are the key issues addressed by the proposed centre. The centre will contribute to new challenges in the development of scientific research, focused to study, develop and evaluate the implications of global change on the water resources. Transferring research and scientific findings into applied adaptation strategies is the crucial for successful mitigation of effects the population face from the global change impacts. Therefore, the successful administrative structures are a prerequisite for transferring knowledge into practice. Fostering these is one of the targets of the proposed centre. Scientific policy advice and the definition of best practices in sustainable water resource management are of key importance for sustainable development. These keywords are within the new centre's major tasks. State-of-the-art knowledge is indispensable to ensure sustainable development of the societies in future. Consequently, the new centre will promote national and international education, training and awareness-raising at all levels. Worldwide scientific network and operational services as well as the transfer of information and knowledge through IHP are the key for a successful operation of the proposed centre.

Having the fact that the last session of the IHP Bureau sought improved working mechanisms for cooperating with UNESCO IHP and that UNESCO's 18th session of the Intergovernmental Council also calls for a closer cooperation with Member States, the proposed centre offers the

unique opportunity for a joint activity covering a broad range of common interests and efforts, serving both organizations and the international community.

Background

The management of our water resources is very important for the well-being of livelihoods, the environment and economic development. Water resources are significantly affected by global change and involve more than only climate change. There are few areas of the world where river basins and aquifer systems are not impacted by the numerous other drivers related to human activity. A dramatic increase in urbanization has not only impacts on the landscape but also affects the runoff processes in the entire basin; especially areas close to river courses and low lying coastal areas are affected. An intensification of agriculture is contributing to deforestation and desertification. Increased water use associated with agriculture and urbanization is leading to changes in storage infrastructure, high rates of groundwater use, and new conveyance networks. Collectively these changes lead to cumulative effects on water quality. Climate change increases the uncertainty associated with the future availability and variability of freshwater resources, and may even lead to permanent desertification of certain regions of the world.

The impacts of floods and droughts in many areas pose an ever greater challenge and risk and will have to be managed now and in future more frequently than in the 20th century. These are exacerbating factors on top of the direct human-induced changes in the local, terrestrial hydrologic cycle that are further translated into large cumulative effects as one moves from watersheds to river basins, and as one looks at the chronic and progressive depletion and pollution of surface and groundwater reservoirs.

Freshwater availability is a global problem, with nearly 500 million people suffering from water stress or serious water scarcity today. This fact is becoming more relevant if the projected implications of the global change affect our societies in the coming decades. Climate change affects all aspects of water resource management and has many severe implications. Consequently, water stress and water scarcity most devastatingly affect the poorest part of the world population. This is reflected in the UN Millennium Development Goals concerning fresh water supply and sanitation.

Although many countries in the world are affected by the above changes which have to be managed at a regional or river basin level, these changes represents a global problem; therefore a response to its impacts must also be looked at an international level. One can strengthen and facilitate international cooperation bringing all players together: governments, research institutions, universities, other UN agencies, NGOs, and national or international organizations.

Objectives and Functions

The major functions of the Centre are related to sustainable development through the support of hydrological research, education, training and awareness-raising at all levels, as well as on integrated water resource management. Applied research in water resources, the development of tools for operational use, the international networking of scientists and the transfer of information and knowledge are the key topics of the Centre.

Specific objectives of the proposed Centre are:

1. To develop inter-institutional and international research to enhance and contribute to the strengthening of existing scientific effort. Through close collaboration with the partner institutions in Serbia and in South-East Europe, the proposed centre offers the great opportunity to carry out joint research in the field of water resource management and to foster the cooperation within the region.

2. To disseminate, generate and provide scientific and technical information on water resources management issues for the formulation of sound policies leading to sustainable and integrated water resources management at the local, national, regional and global level;

3. To evaluate implications of global change and to develop adaptation strategies

This key objective will put researchers from various fields to work together, such as meteorologists, hydrologists, socio-economists and agronomists, to study the impact of global change threats. The Jaroslav Černi Institute already invests a great deal of money and expertise, e.g. within the scope of the IPDSR project (Consequences of climate change for navigable waterways and options for the economy and inland navigation). Here, two scientists are studying the impact of global change on inland water traffic. Adaptation strategies require indicators. It is one of the important tasks of the Centre to foster the development of indicators for sustainable adaptation to global change. Last but not least, adaptation strategies will be tested and feasibility studies will lead to political advice and best-practice guidelines.

4. To undertake effective capacity-building activities at institutional and professional levels, and awareness-raising activities targeted at various audiences, including the general public. In addition to these new activities, the Centre will host various workshops and conferences. This will strengthen IFI, ISI, HELP, Eco-hydrology and FRIEND Programmes, as well as numerous focal areas in IHP-VII and will help achieving the Millennium Development Goals. The Centre is planned to become an institution for the sustainable management of water resources within the context of global climate change, using and further developing the global hydrological knowledge base.

In addition to the research, capacity-building and management activities introduced above the specific objectives, it is expected that UNESCO cat II center will have the following specified activities:

- Delivery of short courses for the local and regional water sector
- Organization of water-related conferences, workshops and exhibitions
- Cooperative activities with other UNESCO category II centers in the area of water, in line with the strategy of UNESCO which is currently being developed
- Public awareness campaigns on water-related issues
- Limited advisory and consulting support
- Short courses designed to deal with a restricted field of interest
- Tailor-made courses which are developed to deal with specific topics on request to respond to an immediate training need
- Refresher courses to present the state-of-the-art in a certain subject

- Seminars
- Training for young professionals to enhance their capabilities to face challenges of field work
- Specialized conference and short meetings

Structure of the Centre, considering UNESCO document 35 C/19

The Centre is planned to be an institution for the sustainable management of water resources within the context of global change, using and further developing the global hydrological knowledge base. The Center will be an independent entity.

The Centre will be an entity located at the Jaroslav Černi Institute in Belgrade, Serbia, hence facilitating the handling of the financial, administrative and/or technical support provided by partner institutions. The Centre will be composed of the staff of the Institute and other new nominated staff. Applications for the positions will be open in due time.

The Administration of the Center will have the following structures:

1. Governing Board

The main functions of the Governing Board are:

- Ensuring appropriate conditions that Center can be established and become operational in Serbia
- Planning of the Centre's development and activities
- Fund raising for the implementation of the Centre's activities and programmes
- Adopting the Centre's annual planning and budget
- Evaluating the annual reports submitted by the Director of the Centre

Members of the Governing Board are:

- Representatives of Serbian Government
- Representatives of the Jaroslav Černi Institute
- Representatives of UNESCO IHP
- Representatives of Universities, etc.
- Representative of the Director-General of UNESCO
- Representative from Member States of UNESCO wishing to participate in the Institute/Centre's activities.

The Governing Board will select during its first meeting the Director of the Governing Board among its representatives. The Governing Board shall adopt its own rules of procedure. The members of the Governing Board shall be renewed every 3 years.

2. Scientific Board

The Scientific Board will lead the Centre's scientific activities, such as:

- Endorsing annual scientific plan,
- Evaluating annual progress reports.

The Scientific Board elects a President and a Vice President of the Board. The President and Vice President of the Scientific Board are members of the Governing Board. The Scientific Board meets once a year and comprises the following members:

- Representatives of IWA and UNESCO,
- Representatives of both national and international universities and operational hydrological services,
- Representatives of the other countries of the region and international organizations, who shall make an considerable contribution to cover operating/running costs of the Centre,
- Representatives of other UNESCO Centers.

3. Secretariat

The Secretariat will comprise Director of the Centre, Deputy Director, and the staff necessary for the smooth functioning of the Centre.

The main duties of the Director of the Centre are as follows:

- Directing the work of the Centre in accordance with the programmes and directives established by the Governing Board,
- Proposing the plan and budget of the Centre to be adopted by the Governing Board,
- Preparing reports on the activities of the Centre to be submitted to the Governing Board,
- Submitting to the Governing Board any new proposals which are relevant for the development of the Centre.

The Center Secretariat works on a permanent basis.

The members of the Centre secretariat may be selected according to the criteria listed below:

- Members of UNESCO's staff who would be temporarily detached and made available to the Centre, as provided for by UNESCO's regulations and by the decisions of its governing bodies;
- Any technical person appointed by the Director, in accordance with the procedures laid down by the Governing Board;
- Government officials who would be made available to the Centre, as provided by Government regulations.

The Jaroslav Černi Institute acts as one of the national focal points for the topic of water. The Jaroslav Černi Institute fosters cooperation in the field of water between administrative, scientific and operational institutions in Serbia, in South-East Europe and worldwide. National networks guarantee an integration of national research programmes and water-management applications in the water programmes of UNESCO. This allows for detecting synergies and making use of them to advance integrated water management.

Constitution

The Constitution of the Centre will include the following provisions:

- a legal status granting to the Centre, under national legislation, the autonomous legal capacity necessary to exercise its functions and to receive subventions, obtain payments for services rendered and carry out the acquisition of all means required;
- a governing structure for the Centre allowing UNESCO representation within its governing bodies.

Qualification

The Jaroslav Černi Institute is currently a leading institution in Serbia's water sector and is also highly visible both regionally and internationally. JCI employs some 240 individuals, more than 180 of whom are engineers and 12 are doctors of the sciences. It has been accredited by the Serbian Ministry of Science and Technological Development as a scientific and research institute.

Over the past decade, JCI has substantially expanded its scope of activity and is at present actively involved in the planning of basic water sector activities, providing also support to bilateral and international activities by, *inter alia*, preparing the required background information and data and participation in various activities pertaining to Serbia's collaboration with international institutions such as the International Commission for the Protection of the Danube River (ICPDR), the Sava Commission, and the like.

Additionally, JCI is a highly active member of international associations in the water sector, both global (e.g., the International Water Association, IWA) and regional (e.g., the International Association of Waterworks in the Danube River Basin, IAWD).

JCI has organized and hosted many national and international water conferences, including the major IWA conference „Groundwater Management in the Danube River Basin and other Large River Basins” (2007), XXIII Conference of the Danubian Countries on the Hydrological Forecasting and Hydrological Bases of Water Management (2006), Planning and Management of Water Resources Systems (2008), IWA Balkan Regional Young Water Professionals Conference (2010).

JCI has also actively participated in numerous international water-related research projects (e.g., FP6 and INTERREG) and international programs (e.g. CARDS), and has conducted highly-specialized, original research in various segments of the water sector.

In addition, JCI is a publisher of textbooks, monographs and other works addressing various areas such as water use, water protection, protection against the adverse effects of water, and the lake.

Furthermore, engineering design and consultancy are two of JCI's core activities, especially with regard to highly-specific and complex water infrastructure projects in Serbia, in region, and beyond.

JCI is currently involved in several projects in neighbouring countries (Bosnia and Herzegovina, Montenegro and Macedonia) and is seeking to make a breakthrough in North Africa.

Over the past ten years, JCI has hired more than 100 young professionals and is providing for their ongoing training and specialization.

JCI is active in and maintains communications with many countries, both in the region and beyond, and is able to coordinate efforts with numerous institutions and thus ensure capacity building in the national water sector.

Institute has the following existing facilities:

- Offices with all necessary facilities,
- Database of water resources;
- Specialized library (books, journals, periodicals, etc.)
- Conference hall with visual and audio facilities;
- Training facilities, training and lecture halls, computer room, blackboards, projectors, etc.
- Laboratories (Hydraulic Laboratory, Water Quality Laboratory, Soil Physic Laboratory, Rock Mechanics Laboratory, Sediments Laboratory)
- Software
- Equipment and instrumentation for field measurements, including land and bathymetric surveying equipment, velocity and discharge measurement equipment, positioning systems, etc.
- Qualified research and training staff with excellent experience in field and office work.

Coverage

Capacity of the existing structure of the Jaroslav Černi Institute will merge to form the Centre. Researchers from various faculties (i.e. the Faculty of Environmental Engineering, Novi Sad, the Faculty of Mining and Geology, Belgrade, etc.), institutes and other institutions will contribute to the overall capacity of the Centre.

Therefore, it is expected to contribute to enhancing both technical and scientific cooperation and knowledge transfer in related topics at the regional and wider international level. The potential impact of the Centre on scientific and technical cooperation is of a regional and global importance.

The Center will enhance creating networks in the region. The key topic of interest will be to study the hydrology of water systems to solve problems in terms of increasing demand and environmental impacts. This centre will scientifically deal with international water problems by using and offering regional solutions for global impacts.

Contribution of UNESCO

UNESCO shall provide assistance in the form of a technical and/or financial contribution for the activities of the Centre in accordance with the strategic goals and objectives of UNESCO programmes, as well as provide the assistance of its experts in the specialized fields of the Centre. Also, occasionally UNESCO staff members will help working of the Center in the country. Such kind of help will be decided by the Director- General on an exceptional basis if justified by the implementation of a joint activity/project within a priority area.

Financial aspect of the center

The budget needed to cover the major expenses, such as operating the Centre, equipment, regular expenses such as communication, water, power, gas, salaries and compensations for the Secretariat and the staff, as well as expenses for holding the sessions of the Governing Board and the meetings of the Scientific Board, is ensured by Serbian Government and Jaroslav Černi Institute.

The Government of Serbia will fund the Centre through the annual programmes of the Ministry of Agriculture, Trade, Forestry and Water Management as well through the specific contracts related to the activities of the Centre.

Jaroslav Černi Institute would provide funds needed for smooth operation of the Centre, from its annual budget in line with the Centre activities.

Existing communication and negotiation channels will be used to attract the financial as well as technical and scientific support by other ministries and international institutions. The well-established networks of the Jaroslav Černi Institute, which has good contacts with the local Ministries and national operational services, and with the international institutions and professional and scientific organizations over the world, as well as stakeholders.

IHP's objectives and the tasks of the Centre

The proposed Centre target is to enhance significantly the knowledge through applied research, networking, capacity building as well as knowledge share and transfer. The Centre's strategic objective matches with the resolutions of UNESCO's General Conferences. Principal priorities of the IHP VII programme for 2008-2015 (Focal areas 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4 and Theme 5) are addressed by the proposed Centre. The Centre will also serve in promoting capacity-building and taking policy-related scientific decisions for the sustainable water resource management and in supporting ecosystems in the context of global change as requested by the 34th session of the General Conference (GC).

One of the important targets for the Center will be to implement projects under the umbrella of the United Nations system, in particular within the International Decade for Action "Water for Life" (2005-2015). The GC's 34th session also emphasized an increased need for new ways of conveying education and capacity development services in developing countries. These are also the IHP's objectives, the Water Centre's key task and the task of the Serbian National Committee and its member universities. In future, this will also be a central assignment of the proposed Centre.

The new Centre will contribute to the International Flood Initiative (IFI) by providing data and research on the flood frequency and magnitude of floods. The centre would generate a valuable potential that could support WWAP in the preparation of the new series of World Water Development Reports. Existing communication and negotiation channels will be used to ensure the financial, technical and scientific support. The support by responsible ministries and international institutions is also ensured.

Relevant international and regional agencies and scientific NGOs will be linked to the Centre through UNESCO/IHP. Furthermore, the Centre has already undertaken steps to establish technical cooperation with the UNESCO European Regional Center in Poland for Ecohydrology, the UN-Water Decade Programme on Capacity Development (UNW-DPC), CEH Wallingford in the United Kingdom, UNESCO IHE in the Netherlands, as well as with other countries and committees through FRIEND, ISI and the International Flood Initiative of UNESCO. The World Water Assessment Programme favors the creation of the Centre. The proposed Centre will have staff with high international reputation, assuring significant reputation in applied research in hydrology.

Further potential partners for cooperation are the International Groundwater Assessment Centre (IGRAC), IHP-HELP Centre, Dundee, UK, and ICHARM, Tsukuba, Japan.

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Annex

Completed and ongoing projects of Jaroslav Černi Institute

1. International Scientific Projects

- FLOODMED – Monitoring, Forecasting and Best Practices for Flood Mitigation and Prevention in the CADSES Region (INTERREG III B CADSES Programme)
- Isotope Methods for Management of Drinking Water Resources in Water Scarcity Areas (RER/8/012, IAEA)
- WATERWEB – Water Management Strategy and Alleviation of Droughts in Agriculture in the Countries of the Western Balkans (EU FP6 INCO-WB Programme)
- Using Environmental Isotopes for Evaluation of Streamwater/Groundwater Interactions in Selected Aquifers in the Danube Basin (RER/8/016, IAEA)

2. Selected International Projects

- Participation in preparation of the Danube River Basin Management Plan (Serbian contribution)
- Participation in preparation of the Integrated Tisza River Basin Management Plan (Serbian contribution)
- Participation in preparation of the Sava River Basin Management Plan (Serbian contribution)
- Water Information System of Serbia (EuropeAid/121208/D/SV/YU) – with Eptisa and DHI

3. National Scientific Projects

- Effects of Climate Change on Water Resources of Serbia
- Development of Support System for Optimal Maintenance of Large Dams in Serbia
- Influence of Arobicity on Protection and Use of Intergranular Aquifers in Serbia
- Research of Extreme Hydrological Situations – Floods and Droughts in Serbia
- Water Management Balance in Serbia
- Water Supply of Settlements and Groundwater Protection in the Velika Morava Valley
- Development and Implementation of Hydroinformational Systems for the Improvement of Energetic Efficiency of Hydropower Management in the Republic of Serbia.
- Development and Implementation of the Methodology for Pressures, Impacts and Risk Analysis for the WFD Implementation.

4. Important National Projects

- Protection of riparian zone from Iron Gate Dams Reservoirs
- Study of Belgrade Groundwater Source
- Main Belgrade Waste Water Collector – Interceptor
- Rehabilitation of the Great Bačka Channel
- Groundwater Balance in the Republic of Serbia

- Groundwater Monitoring Development in Serbia
- Alternative Solutions for the Water Supply of Vojvodina
- Droughts and National Irrigation Strategy
- Prvonek Dam Design
- Hydropower plants on Ibar River