



WORKSHOP FOR THE FUTURE OF WATER RELATED RESEARCH COLLABORATION BETWEEN THE EU & CENTRAL ASIA

I. Introduction

The “**Workshop for the Future of Water-related Research Collaboration between the EU & Central Asia**” was organized on 11-12 April 2016, in Athens, in the framework of the FP7-funded Project “*STI International Cooperation Network for Central Asia Countries – IncoNet CA*”.

The workshop brought together scientists as well as policymakers from the EU, Central Asia and beyond with the following objectives:

- To present the current water-related research activities and potential in Central Asia;
- To discuss the state of affairs of international and national policies and programmes supporting water related research in Central Asia, including opportunities that the European Research Area can provide;
- To showcase best practice examples of regional and bi-regional EU-CA cooperation in the field of water;
- To draft recommendations for the future of water related research & innovation collaboration between the EU and Central Asia.

The workshop attracted thirty-five EU and Central Asia experts from Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan as well as from France, Germany, Greece, Hungary, the Netherlands, U.K. and Jordan, representing scientific institutions, national authorities, and international cooperation programmes on water related issues as well as the Directorate General for R&I of the European Commission.

II. Outcomes

The workshop focused on the research activities and cooperation programmes in the EU and Central Asia, highlighting the water related research areas, the opportunities, threats and the research needs but also the perspectives for enhanced cooperation between the EU & CA countries in the field of water. Best practice examples of transnational water research collaboration in Europe were presented such as initiatives related to the Danube region & the Balkans but also the Jordan-Palestine-Israel example. Participants commented on the **current status, main challenges, obstacles** and **research needs**, in water research in CA that could benefit from international scientific cooperation, as well as on the main possible contributions from CA for international cooperation.

1. Water Challenges

The **quantity and quality of available water**, as well as the flow regime (upstream countries need more water in winter, downstream countries need it during vegetation period) is a major challenge in Central Asia. This challenge is also intertwined with the challenges of **Climate Change** and **Demographic pressure** which can result to **Food Scarcity** and **soaring food prices**.

2. Obstacles

Scientists in Central Asia face a series of obstacles when it comes to research on water related issues. The most important are related to data, effective research and human resources:

a. *Data*

- Scarcity or lack of data related to water issues;
- Difficult and limited access to available data (research institutions do not provide online information on their past, current and future research projects);
- Not centrally available data which result in duplication of projects;
- Lack of established networks among the countries for data standardization, for comparability, data exchange and joint research initiatives;

b. *Effective Research*

- Poor communication between administration (decision makers) and researchers for the optimal exploitation of the research outputs and, vice-versa, for scientists to focus on the priority challenges for effective water management;
- Methodological gaps in conducting water research within and among CA countries;
- Outdated monitoring and research technologies and insufficient state financing for up-to-date laboratory equipment purchase;

c. *Human Resources*

- Lack of young generation specialists in the water research sector;
- Low mobility of water researchers even between the CA countries, as well as language obstacles for international cooperation with the EU.
- International achievements of individual scientists, including water researchers (publications, citations, impact factors, etc.) are not taken into account in the process of national grant evaluation and support.

3. Recommendations on research needs

There are converging views among the experts that research & innovation collaboration between the EU and Central Asia should concentrate mainly on the **data issue, agriculture food & ecosystems**, and development and exploitation of **innovative technologies**.

3.1 Data issue

Data has been identified as one of the main concerns among the scientists that need to be addressed in order to facilitate research. The data issue has a dual character (A) Collection of data and (B) Use and governance of the collected data.

3.1.a Collection of data

Different methodologies have often been used for collecting water related data, making their statistical analyses, use and comparisons among them problematic. For this reason, and due to the lack or scarcity of data in CA as well as due to the fact that they are not centrally available:

*The **application of international standards** should be strengthened and **data validation from services of joint trust** (local & international authorities, stakeholders) should be introduced to create a robust science data base.*

3.1.b Use and Governance of the collected data

It is of crucial importance that the water-related data be accessible and reach the right end-users and stakeholders. The problem that arises here is the scattered and inconsistent nature of the data collection with restricted access, hindering the ability of national authorities to control and validate these data.

*In such a context, the creation of a **Quality Assured Open Database** (following data validated and agreed international standards) would provide a solution offering transparency, and comparability, facilitating the benefits of sharing data between users with minimal operational cost and enabling a better understanding of catchment wide issues.*

*For this reason, **Data Sharing Agreements** in CA are needed in order to build a network that can efficiently share reliable quality assured and standardized data.*

More specific topics of interest in the field of data and of their use in which an enhanced EU-CA research collaboration would be beneficial, include:

- Compilation and quality control of existing data sets;
- Development or amelioration of monitoring systems and creation of new datasets, especially for the continuation of long-term monitoring programmes (time-series), including an updating of the catalogues of glaciers and inland saline waters;
- Development of open access databases for validated data to stimulate data exchange within but also beyond CA, including meta-data;
- Adopting and where necessary agree modifications to international/regional standards and regulations on water quality;
- Develop proposals to conduct water availability and water quality estimations and forecasts in basins in CA where insufficient data exist;
- Develop robust decision support models for decision makers and end-users.

3.2 Agriculture, food & ecosystems

Water management has direct impact on agriculture in Central Asia and as a consequence on the quality, quantity and price of produced food.

Water quality in CA is directly connected with the overall health of the population as it affects immediately the food chain. “Food security” is closely linked to the protection of ecosystems (land water and aquatic ecosystems) that need water quality assessment procedures to protect human and wildlife health.

There is still acute need to improve the used water quality standards for human health and nature conservation. E.g. water salinity in rivers for drinking purposes is still regulated by total ions content (less than 1 g/L) although ionic composition should be also taken into consideration.

It should be noted that the focus should not only be on how to share and budget for the volumes of water but also how to share the benefits of it. For instance, to consider, sharing the benefits for exploiting upstream water with downstream neighbours for all or part of a river that runs through two or more countries.

More specific topics of interest in the field of agriculture, food and ecosystems in which an enhanced EU-CA research collaboration would be beneficial, include:

Agriculture & food

- Soil salinization studies and land melioration practices;
- Tolerant crops development/ improved irrigation technologies;
- Integrated agriculture-aquaculture multi-trophic farming systems;
- Innovative agro-industry to increase the added value of products (e.g. agro parks, agro-business, farm cooperatives, integrated agriculture-aquaculture systems and food clusters).
- Technologies and methodologies for effective water conservation and improvement of water quality for agriculture and food production

Ecosystems

- Salinization of soils and rapid melting of glaciers, that are largely specific to the CA region
- Ground water and ground water/surface water interactions studies;
- Water quality assessment for human health and wildlife protection;
- Ecosystem services, functioning & biodiversity conservation studies in wetlands and aquatic ecosystems;

3.2.a Water - energy – food –health nexus

The socio-economic aspects of the so-called water-energy-food-health nexus, are essential for the poverty reduction, human well-being and sustainable development in Central Asia. The nexus approach will reveal the inter-links that exist and can contribute to the optimal planning of policies and of technological solutions. Joint EU-CA socio-economic research in that field could be of mutual benefit.

3.3 Development and exploitation of innovative technologies

Innovative water technologies (e.g. earth observation, ICT applications) and improvement/adaptation of already available ones can be a common goal for the EU-CA cooperation.

*In-situ and next generation satellite technologies exploiting the **ESA Sentinel programme** for Earth Observation provide a novel opportunity and insights to understand water at the catchment scale. The use of these platforms coupled with other **GIS techniques, ICT applications and open access** to data, especially in trans-boundary water monitoring and management, can provide solutions to the water challenge in CA.*

Water related hazards, such as floods, draughts, mudflows, landslides, toxic algal blooms, pathogens and emerging pollutants also constitute a major concern in CA that technologies (e.g. **early warning technologies**) can help to predict and prevent catastrophes.

More specific topics of interest in the field of development and/or adaptation of technologies in which an enhanced EU-CA research collaboration would be beneficial, include:

- Earth observation technologies including the calibration, validation and processing of satellite images in CA;
- The use of ICT applications to disseminate data in near-real-time to end-users and stakeholders in CA, especially in trans-boundary water monitoring and management;
- Innovative waste water purification and re-use;
- Innovative water and energy saving technologies;
- Early warning technologies for water related hazards;
- Using ICT and “crowd science” to promote environmental stewardship and water conservation;
- Harmonization of water needs (priorities) of main water users in various branches of economy – hydropower, industry, irrigated agriculture, fisheries and aquaculture; reduce water waste and pollution.

III. Conclusions

The workshop demonstrated that the EU and Central Asia share common interests in addressing water-related challenges. Both the research communities in EU and Central Asia countries dispose expertise which could be aligned in settling many of the identified water challenges. In addition to this, CA as a region disposes unique characteristics in water-linked issues that could be very valuable to the European research.

*Under these circumstances, Central Asia constitutes **an area of high EU research interest** which reaffirms the need for advanced EU-CA collaboration and concrete synergies in water research. Such cooperation can be supported through **actions under the “Horizon 2020” Framework Programme for Research & Technological Development**, possibly through calls with regional focus, or **bilateral research cooperation programmes**.*

The following constitute focal areas that could engender **research actions** related to the identified specific topics of interest in view of strengthening the EU-CA collaboration in the field of water research:

- a. Boosting the **cooperation between the public and private sector** in CA as the example of several similar initiatives in EU shows (e.g. European Innovation Partnership (EIP) for Water). To this effect, **involvement of the agroindustry upfront, end users as well as planning authorities** needs to be ensured.
- b. Taking advantage of the CA **capacity** and **expertise** in water related issues in terms of unique **physical morphology** and **environmental phenomena** linked to global challenges, such as the shrinking, salinization and desertification of the Aral Sea and the melting of CA glaciers.
- c. Jointly working on the debate between **'large and small farms'** (diversification of agriculture) and the **role subsidies** can play in the currently under transformation rural economy in Central Asia.
- d. Extending the **work undertaken by the Danubius ESFRI project** (as well as other related ESFRI projects) that can serve as a model, and further coordinating with the **Water JPI** which could facilitate the stakeholders' consultation among countries in CA.
- e. Strengthening the **flow of information from policy to research** and vice-versa in CA, where water related data are rather scattered and often not adequately validated.
- f. Exploring issues such as **sharing water benefits** and **interlinked transboundary conflicts** in CA as much as it is the case in other river systems like in the Middle East (e.g. Jordan and Tiger rivers) and Southeast Asia (Mekong). Examples from EU and other regions, e.g. the Danube, and the case of Jordan-Israel-Palestine, show the advantages in identifying and quantifying water benefits through research, including socio-economic aspects. Many of the water challenges are common to world regions and could be tackled in a common approach that values best practices and exchange of views on all underlying S&T aspects. **Water scientific diplomacy** must be part of that overall approach.

The strengthening of the EU-CA cooperation in the field of water research could also involve **joint research** and **co-publishing** but also **capacity building** through summer schools and field expeditions / missions in CA and EU, as well as staff exchange. In particular, attention should be given to the human resources development in CA that will calibrate, validate and operate water related technologies. In that respect, training of researchers is of high importance and could include the organization of conferences and summer schools for Academic / Erasmus exchange and placement programmes for CA young researchers.

Acknowledging the need for a community of practice in order to address the obstacles that CA scientists face in the field of water research, future **coordination and support activities** such as a **CA Water Forum**, or a **CA Association of Water Researchers** would be of great importance for the overall advancements in this research area and for establishing a wider network not only among scientists but also among practitioners and policymakers in CA and with the EU.