

Water Challenges for a Changing World Joint Programming Initiative



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A Joint Programming Initiative on Water

European water policy has ambitious goals and deals with complex and systemic issues. It sets challenges for European Research, Development and Innovation (RDI) in the field of water: developing new knowledge and reinforcing mechanisms for knowledge and technology transfer. Joint Programming Initiatives focus on the strengthening and harmonization of public research and innovation activities. The Joint Programming Initiative *Water Challenges for a Changing World* aims at tackling the ambitious challenge of achieving sustainable water systems for a sustainable economy in Europe and abroad. This will be obtained through a multi-disciplinary approach encompassing economic, ecological, societal and technological considerations.

The recent financial crisis and the still struggling European economies call for a change in approach. At the European and global levels, the world is much more interconnected and this leads to the need for globalised solutions across a range of policy areas – including through research. Joint Programming provides the possibility to combine research resources in a more strategic and effective way with a view to tackling grand societal challenges. This will be done by combining national research efforts and making better use of Europe's limited public RDI resources. The water JPI will undoubtedly strengthen Europe's economic position on water.

In May 4th 2010, the High Level Group (GPC) endorsed the Joint Programming Initiative (JPI) on *Water Challenges for a Changing World*. This document has been drafted by representatives of the JPI Partner and Observer countries. It provides the context to this proposal (Trends and Challenges), outlines the JPI objectives and research questions, details the added value and impact, presents the governance scheme and documents National commitment.

Major achievements of the proposed JPI is that, over the period September 2010 – April 2011, via the commitment of its Partner and Observer countries, it has been able to:

- Produce a common **Vision**;
- Design an **Implementation Plan**;
- Set up an **interim Governance**; and
- Carry out an exercise on **Mapping Water Research in Europe**.

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I. Theme for the Joint Programming Initiative

I.1 Trends & Drivers

Water is fundamental for life, not only for direct consumption but also for sanitary requirements, and for the production of food, basic industrial goods and commodities. According to the 2010 State of the Environment Report from the European Environment Agency (EEA, 2010 SOER¹), Europe's freshwaters are affected by water scarcity, droughts, floods and physical modifications. Many water bodies are at risk of failing to meet the aim of the EU Water Framework Directive (WFD, EC, 2000²) to achieve good status by 2015. This was the case for 40 % of surface waters and 30 % of groundwaters in 2004. On the other hand, agricultural emissions and wastewater discharges continue to be prominent pressures with respect to ecological and chemical status (EC, 2007³). The continuing presence of a range of pollutants in a number of Europe's freshwaters threatens aquatic ecosystems and raises concerns for public health. The recent communication on Resource Efficient Europe (EC, 2011⁴) - within the "Europe 2020 Strategy" - calls for the coordination of European Policy and RDI actions (among others) leading to an improvement of water availability and quality.

Overexploitation of resources originates from **unbalances in water demand and availability**, and leads to ecosystem disruption. The 2007 Communication of the European Commission on Water Scarcity & Droughts⁵ stated that water stress affects 130 million inhabitants (30% of population in Europe). Most of them are located in Southern Europe, but Northern countries such as Belgium, Denmark, Germany, Hungary and the United Kingdom suffer from similar problems.

The world population is projected to grow from 6.1 billion in 2000 to 8.9 billion in 2050, therefore increasing by 47 % (UN Report "World population to 2030"⁶). It is expected that the population will increase dramatically in urban and peri-urban areas. This will result in escalating demands for food and for water supply and sanitation services. This development does not only imply a greater need for agricultural and urban water and an increased capacity for discharge of pollutants. It also seriously impacts on water infrastructure. For instance, the increase in paved area will require additional storm water drainage capacity in order to protect human life and property.

International organizations such as the FAO have long warned about the water crisis hiding behind population growth and development⁷. Agricultural water use is more visible to

¹ <http://www.eea.europa.eu/soer>

² EC, 2000. [Directive 2000/60/EC of The European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy.](#)

³ EC, 2007. [Towards sustainable water management in the European Union. Accompanying document to the Communication from the Commission to the European Parliament and the Council. First stage in the implementation of the Water Framework Directive.](#) 2000/60/EC, SEC(2007) 363.

⁴ EC, 2011. [A resource-efficient Europe – Flagship initiative under the Europe 2020 Strategy.](#) COM(2011) 21 final.

⁵ http://ec.europa.eu/environment/water/quantity/eu_action.htm#2007_com

⁶ <http://www.un.org/esa/population/publications/longrange2/WorldPop2300final.pdf>

⁷ [Word agriculture. Towards 2015-2030. Summary report. 2002.](#)

society in irrigated areas, in which water is often scarce. However, rainfed agricultural systems are a relevant water sink even in temperate climates. FAO predicts more limitations to future world agriculture in water availability than in soil availability.

Urban areas around the world suffer from old and deteriorating water infrastructures that are vulnerable to failure due to aging, damage from excavations or over-loading. Leakage of water from supply systems in parts of Europe is substantial. According to the 2010 EEA State of the Environment Report⁸, in some parts of Europe, leakage rates are less than 10 % and close to what is technically and economically feasible. In other parts, however, water loss remains considerable (20% and more). Countries face major challenges in the **construction and maintenance of water-related infrastructure**. Investing in detection and repairing leaks is important. The World Business Council for Sustainable Development⁹ estimates that OECD nations need to invest at least 200 billion \$ per year to replace aging water infrastructure to guarantee supply, reduce leakage rates and protect water quality.

Increased urbanisation pressure pushes away agriculture, even from areas with high agronomical potential, but also provides opportunities for safe re-use of treated wastewater by peri-urban agriculture or landscape irrigation. As a result of soil sealing (e.g. more pavements), urbanization increases runoff. Reduced water infiltration in addition to groundwater depletion results in modified groundwater bodies (scarcity), rapidly changing river flows (floods) and the mobilisation of contaminants from point sources (2010 WssTP SRA Update¹⁰).

Large parts of Europe are now connected to municipal systems supplying treated water under quality-controlled conditions. As a result, health problems are infrequent and mainly limited to the rare coincidence of water source contamination and a failure in the treatment process. However, in some rural areas of Europe drinking water is taken from wells and consumed without any purification. In 2008, ten out of twelve waterborne disease outbreaks reported in the EU were linked to the contamination of private wells (EFSA, 2010¹¹). Worldwide it was estimated that over **880 million people use an unimproved drinking water source and 2.5 billion people are without improved sanitation** (2008, WHO & UNICEF¹²). About 90 % of diarrhoeal diseases are caused by unsafe water and sanitation, leading to the death of about 2.2 million people annually. In the European Region, the annual burden of diarrhoeal disease attributable to poor water quality, sanitation and hygiene in children aged 0–14 years is estimated at 13,548 deaths (5.3% of all deaths) and 31.5 disability-adjusted life years (DALYs) per 10,000 children¹³. Contaminated drinking-water is a frequent cause of diseases such as cholera, typhoid, viral hepatitis A and dysentery. Water may be contaminated with naturally occurring inorganic elements such as arsenic, radon or fluoride. Human activity may also cause water to become contaminated with substances such as lead, nitrates and pesticides.

While municipal wastewater treatment has increasingly been implemented across Europe, the process does not remove all pollutants. Household and industrial chemicals and pharmaceuticals – for example – are being detected in treated effluent that is subsequently discharged to surface waters. Finally water quality is currently threatened by emerging

⁸ <http://www.eea.europa.eu/soer/europe/water-resources-quantity-and-flows>

⁹ <http://www.wbcsd.org/DocRoot/ID1tMGILZ7NL9mBOL2aQ/WaterFactsAndTrends-Update.pdf>

¹⁰ <http://www.wsstp.eu/content/default.asp?PageId=911>

¹¹ <http://www.efsa.europa.eu/en/efsajournal/pub/1496.htm>

¹² UNICEF & World Health Organization, "Progress on Drinking Water and Sanitation: Special Focus on Sanitation", 2008.

¹³ Study on environmental burden of disease in children: key findings. Copenhagen, WHO Regional Office for Europe, 2004 (Fact Sheet EURO/05/04) (<http://www.euro.who.int/document/mediacentre/fs0504e.pdf>, accessed 1 August 2009).

pollutants as a consequence of population growth and accelerated urban concentrations, in addition to non-point pollutants such as pesticides. These **pollutants may have effects on human and ecosystems health**.

Structures such as dams for hydropower or water supply have resulted in significant hydro-morphological modifications – physical changes – to many of Europe's waters. Navigation activities and navigation infrastructure such as cross profile construction – dams, weirs, locks, impoundments, canalisation, straightening, bank reinforcement and deepening – are typically associated with a range of hydro-morphological changes with potential adverse ecological consequences.

Changing demands from people, society, industry and agriculture are only some of the many factors that will influence the water sector in the future. Climate change is projected to increase water shortages, with more frequent and severe droughts projected for many parts of Europe (e.g. in the Mediterranean region). Flood hazards are also projected to increase across much of Europe, particularly in its central, eastern and northern parts. Climate change will further exacerbate ecosystems' disturbance. **Droughts and floods have a clear impact on the status of European ecosystems**. They result in a variety of societal losses which are not always evident or easy to evaluate. According to the EU Report "Water Scarcity and Drought", increased drought was observed in the past 30 years, affecting 100 million inhabitants (20% of European population) in four major events since 1989. The report concluded that in the past 30 years, drought events had a cost of 100 billion € to the European economy (8.7 billion € have been attributed to the drought of 2003 alone). An additional effect of flooding is the pollution of rivers and aquifers resulting from an increase in the load of pollutants washed from soils, more overflows in the sewer systems and the overflow of toxic waste sites. In deltaic areas, floods from the sea will turn fresh groundwater into brackish groundwater.

Future **changes in land use are likely to also influence water quality**. Agricultural irrigation requires massive amounts of water in temperate and semiarid climates, and consumes most of the used water through the process of crop evapotranspiration. This demand is often met by groundwater pumping. Some aquifers may compact when groundwater is depleted, resulting in permanent subsidence. In coastal areas, over-exploitation of aquifers can lead to salt-water intrusion and prolonged droughts. If this situation is combined with an unsustainable use of water, desertification may appear. In southern, central and eastern Europe, 8 % of the territory currently shows very high or high sensitivity to desertification, corresponding to about 14 million ha. If moderate sensitivity is included, more than 40 million ha are affected (Source: DISMED¹⁴, EEA 2010 SOER¹⁵).

A paradigm change is currently developing in the world economy: **from a fossil fuel-economy towards a more bio-based economy**. In the years to come, biomass will become a key raw material for energy generation and the synthesis of bio-polymers. Biomass production will have a major effect on the water system. Intensive agriculture for the production of biofuels will increase the pressure on the water sector through higher agricultural water demand and aggravated phenomena of eutrophication, erosion and sedimentation. This is the case today in the Amazons, where rainforest is being replaced by fast-growing species like Eucalyptus. The bio-based economy also focuses on reducing the

¹⁴ Domingues, F. and Fons-Esteve, J., 2008. *Mapping sensitivity to desertification (DISMED Project)*. EEA-TC-LUSI. European Environment Agency, Copenhagen.

¹⁵ <http://www.eea.europa.eu/soer>

input of fertilizers, herbicides and pesticides, among other agrochemicals, with positive effects on the aquatic environment. The development of a bio-based economy in Europe will also have an impact on the availability of water for private consumers and industrial purposes. There is thus a need to strike a balance between the benefits of such policies (e.g. renewable energy and raw materials) and the impact on the ecological status of water bodies, adjacent land ecosystems and wetlands.

1.2 The Grand Water Challenge

The challenge:

**“Achieving Sustainable Water Systems
for a Sustainable Economy in Europe and Abroad”**

The grand challenge is to achieve sustainable water systems for a sustainable economy in Europe and abroad. This challenge is certainly very ambitious, as it addresses a number of issues of significant importance. Firstly, there is a growing gap between global water demand and water supply. The fast approaching bio-based economy will exert pressure to enlarge this gap. Secondly, with growing water demand and the discharge of different types of pollutants to the environment, our ecosystems will be threatened by overexploitation of water sources and increased quality problems. Thirdly, climate change is expected to intensify drought in some areas and flooding in others. This will result in damage to the ecosystems and to society as a whole.

Addressing this challenge will require a **multi-disciplinary approach, since economic, ecological, technological and societal challenges** are to be addressed (Figure 1). The JPI will contribute to the challenge through coordination of National and Regional RDI policies and programmes.



Figure 1. *Drivers and multidisciplinary challenges to be addressed.*

Economic challenges. The European water market will have an estimated turnover in 2015 of 43 billion \$. The worldwide turnover will amount to 246 billion \$ (source: Global Water Intelligence Report 2011¹⁶). This figure includes pumping stations, filters, conveyance structures and related purification and sanitation equipment. The European water sector is of prime economic importance, as it offers jobs for hundreds of thousands of citizens across Europe. Investments in water technology around the world increase every year, in a market which has become very competitive. The European water industry can benefit from this market, developing customized solutions for site-specific problems. To be competitive, investments in generating knowledge and its valorisation are essential. In fact, the analysis of water technology deployment in the last decades permits to conclude that the risk of ineffective investments is high if the water system is not properly understood. To remain at the forefront of this competitive business, innovation skills are essential. The sector must and should enhance its capacity to cope with economic, demographic, behavioural and climatic changes.

Making Europe the most competitive water sector in the world, lending RDI support to the EU 2020 strategy¹⁷.

Ecological challenges. The anthropogenic pressures and the degradation of biological integrity of ecosystems contribute to a large extent to the decrease of water resources. Overexploitation and degradation of the biotic structure alter ecosystem processes, decreasing ecosystem ability to provide resources to society. Ecological challenges include the preservation and protection of waters as a crucial asset for sustainable development. Significant examples of these challenges include:

- Increase of nutrient loads to lakes and streams, which can trigger the formation of toxic cyanobacterial blooms. The presence of these bacteria reduces water quality, increases the costs of water treatment, generates serious threats for human health and reduces the regional economic potential (i.e. ecosystem services such as biodiversity, tourism, recreation and landscape and aesthetical cultural values).
- Persistent inorganic and organic pollutants constitute a significant threat: these compounds tend to accumulate in the food chains and may affect fisheries and human health.
- Extreme events – such as droughts and floods – also have a clear impact on the health of European ecosystems (e.g. increased pollution, brackish groundwater, etc.).
- Anthropogenic morphological and land use changes and infrastructure works are a significant pressure factor on the ecological status of rivers and lakes.

Enhancing the absorbing and self-purification capacity of the landscape and water ecosystems to reduce the transfer and storage of pollutants. Maintaining and restoring biodiversity and ecosystem services.

¹⁶ <http://www.globalwaterintel.com/publications-guide/market-intelligence-reports/global-water-market-2011/>

¹⁷ [The WssTP, in their Vision document](#), States that “By 2030 the European water sector is the leading centre of expertise for providing safe, clean and affordable water services while protecting nature. The sector applies a variety of new integrated approaches to solve diverse and interlinked problems. It uses efficient and sustainable technologies which enhance the social, economic and environmental well-being of the community as well as the health and well-being of the planet and its peoples”. This vision is fully endorsed by the JPI.

Societal challenges. Access to water is a basic need. Its quantity and quality affect the health and well-being of citizens in Europe and abroad, and this is of course strongly related to economic strength. Raising awareness amongst water users is an important issue. For instance, European citizens need protection from new and emerging water pollutants. Sanitation needs to be extended and intensified, improving connections to centralized systems or implementation of decentralised systems and focusing on cities established near threatened water bodies. Water re-use and nutrient recovery from municipal, industrial and agricultural waste water offer economic advantages and societal gains. Society has an ambivalent relation with water resources. On the one hand, water is a natural resource necessary for societal well-being. If adequately managed, water fulfils a multitude of services and functions for a sustainable livelihood. These encompass domestic and economic services (such as drinking water, hygiene, food, production, recreation, industry and agriculture) and collective services and functions (such as energy and ecology). On the other hand, considering the current pressure, water can no longer be considered an unlimited public resource.

Providing each citizen with clean drinking water and proper sanitation. Securing protection from new and emerging water pollutants and from water hazards.

Technological challenges. The current development of water technology is insufficient to meet the grand challenge of achieving sustainable water systems. Consequently, major scientific and technological breakthroughs are needed in all areas of water use and management. Crossovers are required with related scientific fields, such as energy, sensors, nanotechnology and health. Significant examples of these challenges include:

- The growing concern about multi-resistant micro-organisms in European water bodies;
- The need to recover phosphate and nitrate fertilizers from wastewater and make these substances suitable for reuse;
- New technologies for drinking water production and sanitation;
- The need for reduced energy input in all water processes, but particularly in desalination and water treatment. The prospects for energy co-generation in processes such as sewage treatment; and
- The deployment of information and communication technologies in water management for monitoring as well as for decision making.

These challenges will force science to explore integrated processes in order to develop new water sources reducing energy input in desalination processes and co-generating energy in processes such as sewage treatment. Specific innovations in monitoring technologies and developments in information systems and methodologies are required to address the complexity of water systems and water issues. Finally, many capital-intensive water infrastructures require research to improve design and maintenance, maximize societal benefit and moderate costs.

Ensuring adequate technology deployment in the water sector. Tearing down barriers between scientific fields and European countries to perform adequate technological brokerage.

2. Proposing GPC Members

2.1 JPI Members and Observers

This JPI currently counts on 14 partner countries and 6 Observer countries, as depicted in Figure 2. [Annex III](#) further documents partner country support through Letters of Intent.

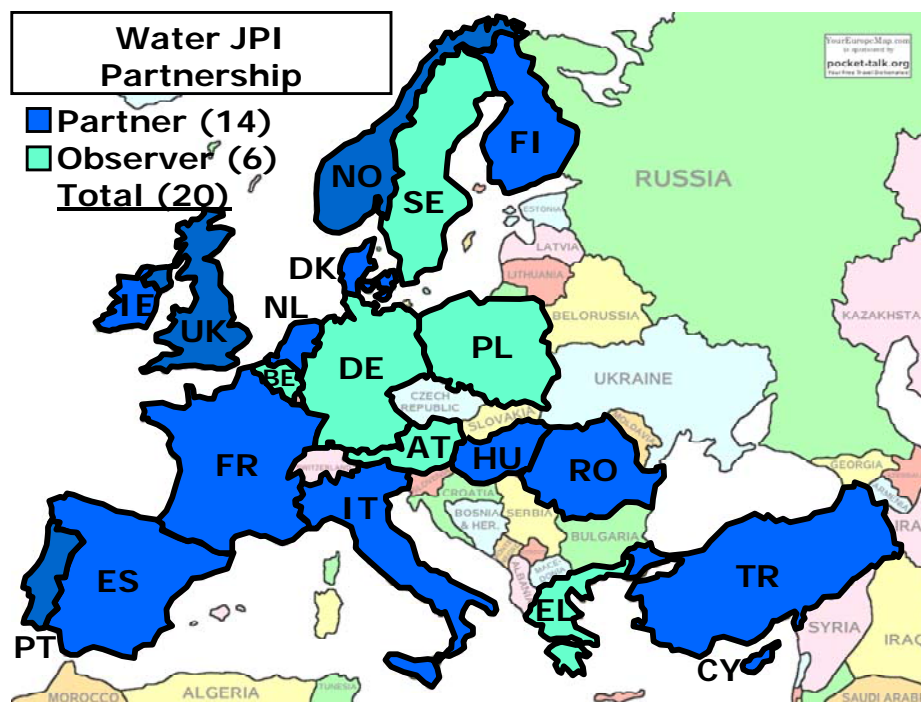


Figure 2. Map of Partner and Observer Countries.

A list of Partner and Observer Countries, Representatives, Institutions and Emails follows.

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2.2 The RDI Programme Logo Gallery

The RDI programmes addressing the Grand Challenge identified by this JPI are introduced below using their logos. Programmes are classified by JPI partner countries. If the programme does not have a logo, the logo of the programme owner and/or manager are presented instead. A complete description of these programmes can be found at the RDI Mapping section of the [Progress Report Document](#).

Cyprus



Denmark



Finland



France



Hungary



Ireland



Italy



The Netherlands



Norway



Portugal



MCTES MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR
Ministry of Science, Technology and Higher Education

Romania



Spain



Turkey



United Kingdom



3. Objectives

This Joint Programming Initiative will mobilise existing RDI programmes to harmonise their research agendas and infrastructures, defining common research needs and developing synergistic joint activities that increase their efficiency by avoiding duplications. This will permit to address the grand challenge with unprecedented effectiveness.

The 2020 vision for the European Research Area¹⁸ claims for implementation of the “fifth freedom” across the ERA: free circulation of researchers, knowledge and technology. It also calls for attractive conditions and effective and efficient governance for carrying out research and investing in RDI intensive sectors in Europe. This JPI has designed a set of objectives representing a contribution to the 2020 vision for the ERA. **These objectives will be achieved by 2020**, and address JPI performance through internal performance indicators:

1. **Involving water end-users for effective RDI results uptake.** This objective is central to the JPI, since it addresses the core aspect of RDI activities: solving societal problems through dynamic interaction with end-users. This interaction will be sought at the JPI governance bodies, but also at the Partner country level. While Europe is the natural domain of this initiative, global impact will also be targeted.

2. **Attaining critical mass of research programmes.** The goal is to involve at least two-thirds of the public National water RDI investment in Europe. This assessment will be based on the periodical update of the JPI mapping exercise¹⁹ performed for the first time in March 15th, 2011. Current JPI partners fund RDI activities for an estimated amount of 225 M€/yr, representing 61 % of the 371 M€/yr estimated for EU Member States and Framework Programme Associated Countries. Progress in JPI implementation is expected to attract additional partners and RDI programmes.

3. **Reaching effective, sustainable coordination of European water RDI.** A permanent dialogue will be established between Member States, Associated Countries and the European Commission. This dialogue will accelerate progress towards the ERA objectives, benchmark water RDI programmes within Europe, facilitate access to research and development results and scientific infrastructure, and promote innovation in the water sector.

4. **Harmonising National water RDI agendas in Partner Countries.** This JPI does not intend to interfere with the proven capacity of individual programme owners and managers to respond to local challenges in a creative way. However, it is expected that by 2020 the water RDI agendas of Partner Countries and the JPI Strategic Agenda will show effective harmonization. This will make the most of national resources and increase the potential of national RDI groups. Continuous prioritization and stakeholder consultation will be required to reach this objective.

5. **Harmonising National water RDI activities in Partner Countries.** The goal is to develop a catalogue of jointly programmed activities whose global budget amounts to at

¹⁸ <http://register.consilium.europa.eu/pdf/en/08/st16/st16767.en08.pdf>

¹⁹ The mapping exercise made part of the [progress report](#) dated March 15th, 2011.

least 20 % of the total water RDI budget of partner Programmes. Activities may include joint calls for proposals, mobility schemes and infrastructure actions. The JPI will enable sharing research facilities, support the development of "rich data sets" over strategic pilot sites, engage in joint benchmarking of models, and develop a joint approach to open access to publications. All activities will be performed under the principle of variable geometry and using financial models to be discussed and defined by JPI partners on a case by case analysis.

6. Supporting European leadership in science and technology. The primary target is to maintain the current European world leadership in water related scientific publications (29 %) and PCT patents (35 %). In both aspects Europe is followed by the USA and by Japan. European leadership will be threatened by 2020 by developed and emerging countries. A secondary target within this objective involves doubling multinational European authorship of scientific publications (from the current 5 % to 10 %). Despite the scientific and technological leadership in water in Europe, internal multinational cooperation remains surprisingly low.

4. Research Questions Being Addressed

To meet the needs of a resource-efficient future, to sustain human and economic development, and to maintain the essential functions of our water ecosystems, an integrated approach to water resource management is needed. Full implementation of the WFD and other water policies will be required to reach good status by 2015. The EU 2020 Strategy and the European Commission's "Blueprint for safeguarding European waters", planned for 2012, further promote sound water management.

Discussions among JPI Partner & Observer countries have led to the identification of **five types of research questions**, addressing different aspects of European society:

1. **Maintaining ecosystem sustainability.** An integrated, trans-disciplinary research approach is required to analyse the influence of external factors on the water cycle. Such factors include:

- Exhaustion, overexploitation and depletion of water resources;
- Pollution;
- Climate change, inducing short to long-term variations in water availability;
- Extreme events (droughts and floods),
- Sea water intrusion; and
- Morphological changes / infrastructures and works on rivers and lakes.

Pollutants are damaging the natural balance of European ecosystems. The development of ecological engineering approaches will permit to retain/degrade certain pollutants and re-use them as raw material for fertilizers and industrial by-products. This JPI aims at developing indicators and models for monitoring of threats, risk assessment and early warning. It will also enhance ecosystem resilience to stress with regards to human pressures. Additional actions will aim at integrating ecosystem regulation in the water management process, at identifying systemic restoration solutions taking into account the good ecological status concept, and at the implementation of ecohydrology.

2. **Developing safe water systems for the citizens.** Water quality and societal wellbeing are currently threatened by emerging pollutants and pathogens. Key knowledge gaps remain, including for example:

- What are the (new) contaminants, such as polar compounds, pharmaceuticals or emerging pathogens including viruses?
- How can we predict their environmental behaviour and treatment, and what impact do they have on human health?
- To what extent are these contaminants removed by natural processes in water and soil, or by physical techniques in drinking water treatment?
- How can the quality of the produced water be maintained in time and throughout the distribution system?
- Which health risks could result from new water concepts such as supply of hot water, cooling towers, water reuse and water in the city?

In addition to promoting societal health, this JPI aims at protecting the citizens' life and property from the devastating effects of natural hazards (also resulting in ecosystem degradation). Climate change may locally increase the frequency and intensity of floods and

droughts, requiring increased RDI efforts from disciplines such as water resources, hydrodynamics, social sciences and geography.

New water management approaches will be required to address the research questions included in this category.

3. Promoting competitiveness in the water industry. The renewed EU Sustainable Development Strategy²⁰ reaffirms the strong political willingness from the EU to move into the sustainable path, where environmental protection goes hand in hand with economic prosperity and social cohesion. Innovative technologies are required by the water industry to create products and services for the citizens and their governments. This JPI will actively engage in the production of problem-solving knowledge leading to the development of market oriented solutions. Cooperation with stakeholders will be sought to ensure that water research results are transformed into business opportunities, so that the European water industry can develop and sustain a leadership position in the world. Technology will be developed for water storage, distribution, measurement, purification, treatment, desalination and irrigation. Focus will be set on new materials, processes, management tools, ICT, energy input and environmental profile.

4. Implementing a water-wise bio-based economy. The most obvious effect of the bio-based economy is the intensification of agriculture. This means that more pressure will be exerted on natural resources to increase production of food and biomass, intensifying the use of water and agrochemicals. Science and technology will be required to develop more efficient agricultural systems. Since the bio-based economy has not been fully deployed yet, joint research will arrive on time to make it water-wise. The complete understanding of agricultural water abstraction effects on European ecosystems and water delivery systems will be developed through joint research. New techniques and plant materials resulting in increased irrigation efficiency and reduced consumptive use and water pollution will be developed.

5. Closing the water cycle gap. Growing freshwater scarcity currently emphasizes the need of closing the water cycle gap by reconciling water supply and demand. Financial water issues need to be analysed for different uses and regions. The demand for closed water systems is obvious in arid areas, where research institutes are currently working on new concepts and technologies. Water scarcity requires new integrated concepts related to water re-use, energy, recovery of valuable substances, monitoring and control, decentralized systems, and the interaction with natural resources. This technological and environmental research must be systematically combined with a socio-economic approach that will investigate the questions of participation, behaviour and commitment of stakeholders. The costs and benefits of the different solutions (including environmental costs and benefits) must be systematically evaluated. The concept of water foot-printing will be deepened, establishing practical methods and certifiable systems. Innovative concepts such as Management of Aquifer Recharge or Soil-Aquifer Treatment will be addressed. RDI activities will be required at different hydrological scales.

The integration of JPI objectives and research questions is schematically presented in Figure 3.

²⁰ Revised in 2009, <http://ec.europa.eu/environment/eussd/>

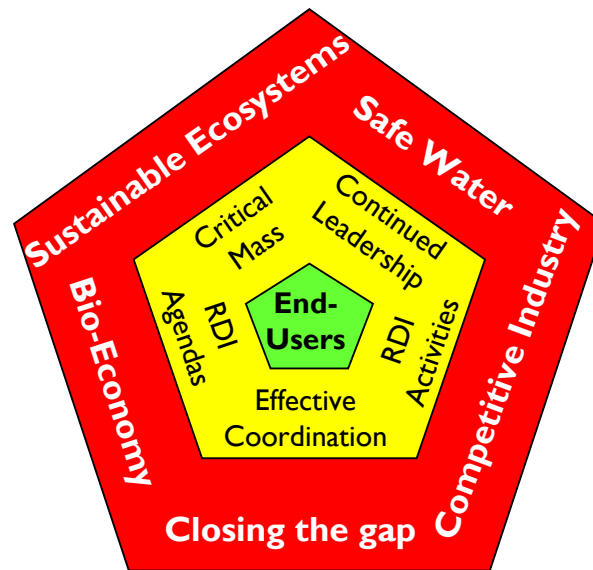


Figure 3. *The vision: Integration of JPI objectives and Research Questions.*

5. Added Value, Benefits and Impact

Water knows no borders. This is particularly true in Europe, where most of the territory is occupied by our 72 transboundary watersheds (with the Danube watershed partly occupying 18 countries). In the WFD, the need is expressed to build a comprehensive and shared vision of the water system such as to bridge its technological, environmental, political and institutional organisation, while taking into account geographical, historical, social and economical perspectives. The WFD has introduced policies, decisions and actions aiming at achieving the principles of integrated management in the field of water resources and systems. Complete fulfilment of WFD goals remain uncertain, mainly due to the difficulty to apprehend the intricacy and intertwining of geographical boundaries, spatial scales, differences in governance modes, institutional and cultural settings, stakeholders, activities, state of aquatic environment, evolution of water bodies and the related pressures.

5.1 Fragmentation of the European water sector

The European water sector is highly fragmented: water resources, water supply and wastewater have often been locally managed. There is a huge diversity of stakeholders, in terms of ways of action, dimension, interaction with water, or water related skills. ***This fragmentation is an obstacle for developing a research strategy for a sustainable and competitive water sector.*** RDI challenges and priorities are often defined in parallel (by regional or national entities). There are numerous research funding networks and organisations identifying key research questions and setting up strategic research agendas.

These include networks (such as the ERANets), other transnational (regional) funding networks such as EUREKA (with AQUEAU in particular); the Framework Programme (FP), LIFE+, COST; Technology Platforms (such as the Water Supply and Sanitation Technology Platform, WssTP), the WFD Common Implementation Strategy Groups, the European Environment Agency, the EC Directorate-General Environment, the European Water Association, the European Water Partnership, the WISE-RTD association, the EurAqua institutes network; etc. This list is not exhaustive. Common funding activities have often remained very small-scaled. In addition, synergies between the different ERANets and other research funding networks dealing with water topics have been limited, inhibiting the establishment of a coherent water RDI framework within the European Research Area. This JPI will not add a new piece in this puzzle. On the contrary, it will promote coordination and cooperation in water RDI.

5.2 The International RDI Scene

Our non-European partners – both traditional (US, Japan) and emerging (China, India, etc.) – are launching large-scale targeted research programmes and are setting up effective collaborations (see Table I for the situation of the RDI systems in Europe, the USA and Japan).

RDI activities are performed at universities, research institutes and in water technology companies to develop innovative water technologies. While excellent research has been carried out throughout Europe, this has not been sufficiently transferred to relevant stakeholders, i.e. utilities, public authorities or industry.

Table 1. Comparison of selected indicators of the RDI systems between EU-25, US and Japan. Notes: ^{a)} 2003 for EU-25, 2004 for USA and Japan; ^{b)} 2004 for EU-25; 2002 for USA; 2003 for Japan; ^{c)} Triadic patents are filed at the European Patent Office (EPO), the United States Patent and Trademark Office (USPTO) and the Japan Patent Office (JPO), for the same invention, by the same applicant or inventor. Data obtained from EUROSTAT, OECD and DG Research and Innovation.

Concept	EU-25	USA	Japan
R&D intensity (% of GDP) (2004)	1.86	2.66	3.18
Share of R&D financed by industry (%) ^(a)	54.8	63.7	74.8
Researchers (FTE) per thousand labour force ^(b)	5.5	9.1	10.1
Share of world scientific publications (%) (2003)	38.3	31.3	9.6
Scientific publications per million population (2003)	639	809	569
Share of world triadic patents ^(c) (%) (2000)	31.5	34.3	26.9
Triadic patents per million population (2000)	30.5	53.1	92.6
High-tech exports (% of total manufacturing exports) (2003)	19.7	28.5	26.5
Share of world high-tech exports (%) (2003)	16.7	19.5	10.6

Additionally, if Europe is to achieve a balanced and sustainable development and economic growth, Europe not only needs to invest more in research, but also needs to invest in improved coordination and harmonisation of research activities. Coordination of water research agendas will improve the competitiveness of the water sector.

A stronger, more coordinated and coherent European response is needed to meet the identified water challenges, where appropriate in collaboration with partners outside the European Research Area.

5.3 Water Joint Programming in the European context

Joint Programming is about tackling common European major societal challenges by combining national research efforts in a strategic and effective way and thereby making better use of Europe's limited public RDI resources. In the wake of the global financial and economic crisis, the need to ensure efficiency and effectiveness in the spending of public funds has become an even bigger imperative.

Addressing the Grand Water Challenge requires a long-lasting, large-base research approach taking into account the great diversity characterizing water quality issues and management practices in Europe. The proposed JPI will facilitate synergies and complementarities of current EU, national and regional initiatives. This JPI will not only fight against duplications, it will also build on the benefits arising from the diversity of water issues in European countries, allowing for intercomparisons and ensuring a wider applicability of its outcomes and achievements.

An active policy on common water RDI in Europe will result in a strong and coordinated, scientific and economic position in the global water sector on the protection and value of water. This will be of mutual benefit and interest, and will be transferable to the rest of the world. Additionally, this can also contribute to meet the needs of developing countries. The need for cooperation in water is not only motivated by efficiency and impact. Water issues lend themselves for cooperation between countries in an almost natural way: rivers, drought and pollution do not respect political boundaries.

With the **Europe 2020 Strategy**, the Commission proposed to the Member States a comprehensive and long-term partnership for addressing together major societal challenges. In the conclusions of its meeting of 4 February 2011, the European Council endorsed the Commission's proposal for an Innovation Union²¹, and launched the European Innovation Partnerships. Europe's expertise and resources must be mobilized in a coherent manner. Synergies between the EU and the Member States must be fostered in order to ensure that innovations with a societal benefit reach the market quickly. This JPI will become one of the building blocks of the "**Water Efficient Europe**" innovation partnership.

Close cooperation with the **Water Supply and Sanitation Technology Platform** (WssTP) is essential for bringing successful research to the market. WssTP was promoted by the European Commission to improve efficiency and financial opportunities in the water sector. This Technology Platform is led by industries in collaboration with academics, research organisations and water users. The European industry is very well represented in WssTP, which is equally committed to meet global challenges and regional demands ensuring water and sanitation services, and to make significant and measurable contributions to the Millennium Development Goals. The different nature of the JPI and WssTP will result in complementarities which will be exploited in both directions. The JPI will guide the production of knowledge to the bottlenecks and areas of societal interest identified by WssTP (among other stakeholders). As a consequence:

- WssTP's role is to voice industry needs, guiding research and development to innovations.
- The JPI's role is to harmonise national public research programmes, so that updated, ambitious, realistic, challenging and problem-solving objectives and research topics are investigated.

Starting from coherent Strategic Research Agendas is essential to exploit complementarities. While the JPI focuses on public-public cooperation, the WssTP explores complex interactions between public and private agents. Additionally, most of the programmes making part of this JPI focus on Research, with interests in development and innovation. Complementarily, WssTP focuses on innovation, although it treasures relevant research and development capacities. The WssTP and this JPI commit to cooperate to build a strong "Water Efficient Europe" innovation partnership.

The nature of a JPI is similar to that of **ERA-NETs** in a number of aspects. The past and present water ERA-NETs have established research networks in which European researchers and funding agencies have harmonized procedures and jointly managed coordinated research projects, thus setting the scene for this JPI. The ERA-NETs have overcome a number of legal and practical barriers, succeeding in setting up common proposal submission and evaluation procedures. The experience gathered through the ERA-

²¹ [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Europe 2020 Flagship Initiative. Innovation Union. EC\(2010\) 1161](#)

NETs will be useful to implement effective water JPI governance, but also to foresee frontier research activities in the water field. Two recently completed ERA-NETs were directly related to this JPI:

- The **IWRM** ERA-NET, focusing on IWRM to sustain the WFD needs, has been considered in many instances as a model for the design of the water JPI. Both research actions are primarily interested in Europe and share the ambition of projecting research results to the world.
- The **CRUE** ERA-NET structured the area of European Flood Research by improving co-ordination between national programmes and establishing a joint research agenda.

The JPI has established fruitful contacts with both ERA-NETs in order to plan for continuity and transition.

Additionally, **SPLASH** is the European Union Water Initiative (EUWI) ERA-NET. It deals with the international aspects of water research in Europe. It is a consortium of 16 ministries, funding agencies and national research and technological development authorities from 11 European countries. SPLASH focuses on Africa and the Mekong region, and takes on board the challenge of providing poor people with access to safe water supplies and improved sanitation. Previous research in the water sector has generally been programmed and managed in isolation by different donors such that overlap and duplication has occurred, and specific gaps and issues may not have been addressed.

Two additional ERA-NETs partially relate to this JPI. The **SNOWMAN** ERA-NET dealt with sustainable soil and groundwater management under the stress of pollution. These issues have been included in this proposal, with the intention of updating the challenges and the research responses focusing in a long-term vision. The **CIRCLE** ERA-NET performed activities focusing on the adaptation to climate change, giving consideration to water scarcity. CIRCLE 2 continues this effort.

Technological and ecological solutions are an imperative condition, but do not represent a sufficient condition. Research is also needed in societal aspects such as governance and behavioural sciences. Joint Programming is meant to tackle grand societal challenges and it is therefore crucial that its research results feed directly into the **policy making process**. There is a need for strengthening the dialogue between policy-makers and researchers in order to maximise the policy-making impact of research projects. Close linkages with **CIS Science Policy Interface** will be crucial. In addition, there is scope for enhanced synergies between **ESFRI** and the JPI in relation to infrastructures that could be supportive to the societal challenges being addressed (e.g. EMSO, EUROARGO and LIFEWATCH).

Water research is related to a number of relevant European research actions. JPIs are not an exception. **Links to other JPIs** exploring water related issues will be established.

5.4 Added Value of the Water Joint Programming Initiative

The challenges identified in this JPI **cannot be fully addressed by any individual partner country alone**. Although the National and Framework Programmes have provided relevant funding to European water research, the wide variety of situations and issues to be tackled and their complex dimension have limited the deployment of successful technologies and policies. The Water JPI provides an opportunity for economies of scale, larger critical mass of resources and for enhanced cross-border programme collaboration. This JPI will permit to widen up the scope of European proposals, and increase the impact of research by exploiting the multiplying effect of trans-national & multi-disciplinary cooperation in Europe and beyond. In addition to this, **confronting the wide variety of water ecosystems in Europe already constitutes a relevant added value**.

The water JPI will produce science-based knowledge leading to **support of European policies**, comprising the identification of problems, their quantification, and the development of feasible technical and managerial solutions. All these aspects will indirectly lead to European policies promoting better life standards for European citizens. The water JPI will also have the capacity to focus on local and regional scale problems, where the transfer from research to policy is more effective. The research questions identified in this document will permit to support the implementation and revision of key EU Directives, as well as to prepare new water-related EU policy documents.

The JPI has been designed to be **sensitive to national, regional and municipal water problems**, thus responding to the large variability in European water issues. While the Framework Program has traditionally focused on a problem-solving approach, all aspects of water science and technology (from basic to pre-competitive; from industrial to sociological) will be targeted in the water JPI.

Among the **RDI benefits of the JPI**, five have a clear European dimension:

- **Align the national RDI agendas**, optimizing their scope and the resulting funding efficiency; effectively covering the wide variety of European water environments.
- Increase **cooperation between European professionals**.
- Design, build and share **large research and development facilities** (i.e., experimental treatment plants).
- Create, maintain and co-operatively exploit **networks of open-field experiments and scientific observatory systems** (i.e., experimental watersheds).
- **Multiply the scientific impact of European Research**, increasing its relevance and scientific leadership.

This JPI will target **citizen well-being and personal development** in Europe and beyond. Research actions to be adopted in the JPI will be required to demonstrate their contribution to improve the life of the citizens in urban and rural communities, in more and less developed regions, from the young to the senior citizens, and with respect for gender issues. Water is known for being at the centre of social conflicts which have historically hurt citizens in Europe and beyond. Water JPI actions will also be encouraged to focus on social

agreement and on conflict resolution. Mediation and advocacy in water issues will be promoted at all levels to ensure that RDI activities are clearly perceived as contributing to improve the life of the citizens in all its dimensions.

Last, but not least, the knowledge produced by this JPI will serve the purpose of **reinforcing Europe in the international context**. The water JPI is an outward looking initiative of the Member States which builds upon previous actions in this area. It will provide a powerful framework for promoting the international interests of the European Union and its Member States in respect to economic growth and trade, foreign affairs, international development and humanitarian activities. European Member States are well recognized world leaders in water management, while the diversity of hydro-climatic, political and cultures has encouraged research and innovation to suit different conditions. The Water JPI will build upon these strengths to increase international projection in water policy, regulation and management. Significant impacts can be envisaged in the scientific and water policy communities, as well as in developing countries:

- The **current European leadership in water research** will be reinforced. Table 2 presents specific statistics for international water publications and patents. In the period 2006-2010, Europe produced 29 % of the world publications in the topic of this JPI. The USA ranked second, with 26 %. Fifteen years ago (1991-1995), the situation was reversed, with the USA leading (37 %) and Europe taking second place (18 %). As previously discussed, European scientists from different countries are increasing the percentage of co-authored papers, but this figure remains below 5 %. Finally, and making a difference with the general data presented in Table I, Europe leads in the registration of international patents in water related topics.
- In coordination with the European Commission and SFIC²², the JPI will establish **bilateral contacts with major public RDI funding organizations in developed and emerging countries**, in order to further coordinate public water RDI activities. Such contacts have indeed already started, with participation at the Workshop and Conference held in India in November 2010. These events paved the way for the upcoming co-ordinated and co-financed call for proposals in the field of water between the EU Framework Programme and India.
- The water management model implemented in Europe through the WFD will be analysed from the RDI perspective, and will be disseminated to the world as a **European contribution to water management**.
- The **international dimension of the Water JPI** will contribute to such issues as the assessment of the water footprint of European imports and compliance with international biodiversity and other environmental conventions and protocols.
- The **European Union Water Initiative** (EUWI)²³ was launched to create the conditions for mobilising all available human and financial EU resources, aiming at achieving the water-related Millennium Development Goals (MDGs)²⁴ (particularly the one devoted to “Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation”). The EUWI reinforces the political commitment and influences Poverty Reduction Strategies and allocation of resources. Efforts to achieve the MDGs embrace planning and action in both water resources development and

²² Strategic Forum for International S&T, <http://register.consilium.europa.eu/pdf/en/10/st01/st01354.en10.pdf>

²³ <http://www.euwi.net/>

²⁴ <http://www.un.org/millenniumgoals/>

management. Water JPI actions devoted to training and mobility, together with dissemination, will play a fundamental role to support the EUWI, since they are being designed with an International Scientific Cooperation perspective.

Only by building on existing resources, better pooling our efforts, focusing on excellence, and by creating an efficient and fully integrated European Research Area in the field of water, will we be able to tackle the grand challenge facing Europe's waters.

Table 2. *Production of scientific papers (Web of Science) and PCT patents for Europe (Member States plus Associated Countries), USA and Japan in different periods of time.*

Concept	Europe	USA	Japan
Production of Scientific papers (%)			
1996-2000	25	34	4
2001-2005	27	31	4
2006-2010	29	26	4
Multinational European Authorship (%)			
1996-2000	2.9	-	-
2001-2005	3.6	-	-
2006-2010	4.7	-	-
Production of PCT international patents (%)			
1995	48	38	7
2010	35	24	12

6. Governance Structure and Implementation

6.1 Governance Structure

The first meeting of the Governing Board, held in April 14th 2011, adopted the JPI Governance Structure presented in the following paragraphs. This structure is detailed in the [Terms of Reference of the Management Structure](#) document.

The Governing Board

Characteristics

The Governing Board (GB) deals exclusively with water-related JPI policy issues; its strategic decisions are based on advice provided by the Stakeholders Advisory Group and the Scientific Board.

Its roles and functions include:

- To draft the short and long term strategy;
- To approve contributions from Partner Countries;
- To approve accession of new countries to the JPI;
- To adopt the Terms of Reference;
- To adopt the composition of the other boards;
- To adopt and resolve calls for proposals; and
- To implement the guidelines for Framework Conditions.

It is composed by at least one representative per Partner Country. It comprises a President, a Vice-president and members. The European Commission acts as a non-voting member.

Implementation

The GB met for the first time in April 14, 2001. This first meeting addressed an ambitious [agenda](#). The meeting:

- Reviewed the activities of the Executive Board and the Coordinating team;
- Adopted the JPI governance structure, nominated the members of the Advisory Board;
- Adopted the Vision Document; and
- Outlined a Work Programme for the rest of 2011 and plan activities for 2012. Activities in this JPI have been implemented through Task Forces. Four Task Forces were created after the Kick Off Meeting: 1) Mapping Public National Water RDI; 2) the Vision Document; 3) selection procedures for the members of the Advisory Board; and 4) the Thematic Analysis phase of the Strategic Research Agenda. The evolution of these Task Forces and the foreseen activities for 2011 are presented in Figure 4:

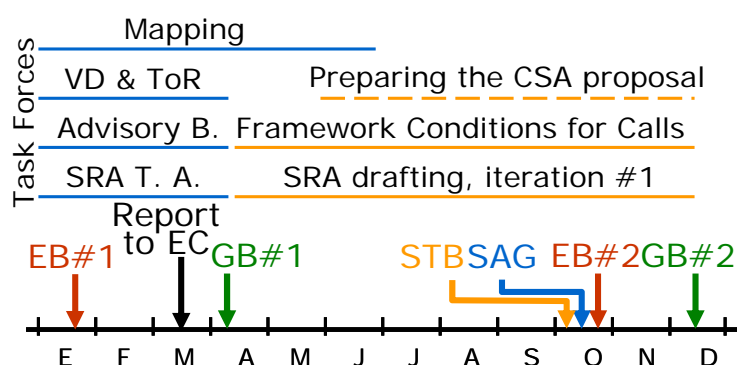


Figure 4. 2011 activities, as outlined by the Governing Board.

Three of the four Task Forces will cease activities shortly after the publication of this document. Only the Mapping Task Force is scheduled to continue till the end of June 2011. Two new Task Forces will start after the first meeting of the GB on The discussion of the [Framework Conditions](#) for calls for proposals, and on the first iteration of the drafting of the Strategic Research Agenda. If a call for proposals opens for a Coordination and Support Action on this JPI, a specific Task Force will start operation in June. The second meeting of the Governing Board will issue management objectives for 2012 that the Executive Board will implement. Informal discussions were held at the GB meeting about the first actions in harmonization of DRI agendas and activities. These discussions will lead to resolutions at the second meeting of the Governing Board.

The Executive Board

Characteristics

The Executive Board (EB) implements the strategy defined and issued by the GB, to which the Executive Board is subordinated.

Its roles and functions include:

- To draft the implementation plan for the strategy elaborated by the Governing Board;
- To set the dates for calls for proposals and draft the Guides for proposers for each call;
- To draft specific regulations for project evaluation and monitoring;
- To run the financial management of the program; and
- To coordinate the Forward Looking Activities (FLA), the programme RDI activities (calls for proposals), the assessment of JPI impact, the training activities, and the dissemination of results.

It is composed by one representative per Partner Country. It comprises a President, a Vice-president and members. The President of the Executive Board is the JPI Coordinator.

Implementation

The EB met for the first time in January 19, 2011. The meeting addressed an ambitious [agenda](#), in which JPI progress was assessed based on discussions led by the Coordination and by the leaders of the Task Forces.

The Coordination introduced a discussion on the upcoming meeting of the Governing Board and on envisaged tentative activities till the end of 2011. Presentations by the European Commission and by the Water Supply and Sanitation Technology Platform completed the agenda. The meeting [minutes](#) and [presentations](#) are available for consultation.

The Advisory Board

The Advisory Board will advise the GB on different issues. It will be composed of two bodies:

The Scientific and Technological Board (STB)

Its purpose is:

- To provide input to the GB from a scientific and technological perspective;
- To define scientific topics in synergy to those mentioned by the European Commission within each Working Program of the theme Environment (including Climate Change) of the Cooperation Specific Program within the Framework Programme and by the Partner States;
- To propose these topics to the GB for approval, in close relation with the Strategic Research Agendas (SRA) defined at the Partners States and at the EU; and
- To organize the evaluation procedures.

Its roles and functions include:

- To inform on the scientific and technological issues expressed by stakeholders from an Academia/Industry perspective; and
- To propose the JPI long term strategy.

It is composed by Academia and Industry experts conducting RDI in the JPI field. It comprises a President, a Vice-president and members.

The first meeting of the Governing Board ***selected ten members of the STB:***

- Dr. Cees Buisman;
- Dr. Damiá Barceló;
- Dr. Eric Servat;
- Dr. Jens Christian Refsgaard;
- Dr. João Santos Pereira;
- Dr. Luc Abbadie;
- Dr. Marc F.P. Bierkens;
- Dr. Merete Johannessen Ulstein;
- Dr. Michele Vurro; and
- Dr. Sveinung Sægrov.

STB membership will be enlarged at the next meeting of the Governing Board.

The Stakeholders Advisory Group (SAG)

Its purpose is:

- To provide input to the GB from the user perspective. Stakeholders will represent the water industry, local/national policy makers, users, NGOs, etc.; and
- To define urgent RDI needs in synergy with those mentioned by the European Commission within each Working Program of the Framework Programme and by the Member States and the Associated countries.

Its roles and functions include:

- To provide and assess scientific issues expressed by Scientific Board from users' perspective; and
- To propose the JPI short term strategy.

The first meeting of the Governing Board ***selected six members of the SAG:***

- Acqueau
- CIS-SPI Group
- FAO Land and Water
- Finnish Environmental Institute
- Júcar River Basin Organization
- WssTP

SAG membership will be enlarged at the next meeting of the Governing Board.

Implementation

The STB and the SAB are tentatively scheduled to meet for the first time in October 2011, immediately before the second meeting of the EB. These meetings will serve the purposes of selecting the respective Presidents and Vice-presidents, and will produce a report on the Vision Document and a document on prospective joint calls for proposals.

The Secretariat

Subordinated to the EB, the Secretariat ensures technical support for the GB and the AB (Scientific Board and Stakeholders Advisory Group), taking care of the administrative implementation of JPI internal instruments. It is composed by Technical staff.

During this interim phase of JPI implementation, MICINN is providing Secretariat, with persons deployed in Madrid and Brussels.

6.2 Mapping National Public RDI activities

An intense Mapping exercise was developed by this JPI. The results are presented in detail at the [JPI Progress Report](#). The following paragraphs present a summary of the mapping activities and results.

This mapping exercise consisted of three steps: a) a mapping survey; b) an estimation procedure based on public water research, development and innovation funding observations and statistical country indicators; and c) the elaboration of country summary reports.

The Mapping survey was prepared using a questionnaire which covers quantitative and qualitative information on water-related RDI programmes. The questionnaire ([view the questionnaire](#)) was generated following the review of similar initiatives carried out previously (e.g. CRUE ERAnet; IWRMnet, etc.). The survey targeted RDI programmes. The initial scope of the survey encompassed competitive research funding and was widened at a later stage to include information on “institutional” funding also. A sample survey can be viewed by clicking [here](#).

Despite the ample coverage of the survey turnout, only 15 countries were covered. This was judged insufficient, since 40 countries currently fall into the categories of Member States and Associated countries. Additionally, for some countries, the survey coverage was known to be partial (i.e. only a limited number of the existing research programmes were represented).

As a consequence, a statistical procedure was devised to obtain different estimates of National public water RDI funding in Europe (Member States, Associated Countries, the ERA, JPI members, JPI observers...) using the existing limited information.

The results of the estimation of European Public National water RDI are presented in the following Table 3:

The current mobilisation obtained by JPI partners represents 61 % of the estimated funding in Member States + Associated Countries. Partners + Observers represent 94 % of the research funding in the ERA (MS+AC). It is important to bear in mind that these European data were estimated from thirteen countries whose surveys were considered to be complete. As a consequence, these can not yet be considered final data. Continuous updates of the mapping information will be performed as new surveys are obtained.

The [JPI Progress Report](#) contains an inventory of RDI agents in Member States and selected Associated Countries. [Annex II](#) in this document presents this inventory for Partner Countries. Country summary reports contain a brief discussion of the RDI programmes, their owners and managers. Fiches are provided from the programmes producing surveys

for this JPI. Links are provided to these surveys, which describe RDI funding operations in detail.

Table 3. *Estimation of Public National Water RDI funding per type of country and per type of association to this JPI.*

Study Target	Group of Countries	National Public Water RDI funding (M€)	Percentage of funding respect to MS+AC (%)
Europe	Member States (MS)	351	94
	Associated Countries (AC)	21	6
	MS + AC	371	100
JPI	Partners	225	61
	Observers	123	33
	Partners + Observers	348	94

6.3 First Steps Towards a Strategic Agenda

The Strategic Agenda (SA) of the Water JPI will establish the main directions and the required activities of the envisioned JPI. In particular, the document will outline the priority RDI areas, strategic topics to be addressed, the main deliverables and the desired impacts. The first phase in the definition of the SA – the Thematic Analysis – is currently being developed, and was presented to the Governing Board in April 14th. The first complete iteration on the SA drafting will be presented to the second meeting of the Governing Board. Specific milestones and actions have been established in order to ensure that the needed information is available for the drafting of the Strategic Agenda. The thematic analysis phase consists on gathering and analysing information on:

- National RDI Priorities;
- European RDI Priorities;
- Priorities proposed by international organizations and other RDI institutions; and
- Priorities deriving from the Vision Document.

A three-step approach has been implemented: 1) Collecting information; 2) Identifying the thematic priorities of these initiatives in water RDI; and 3) Performing a final analysis of the priority themes. The first step has been completed and is presented below.

A number of European initiatives relevant to the Water JPI in terms of their mission and strategy were identified. The most relevant information, such as objectives, aims and the specific RDI topics was compiled. Eight European Initiatives were identified as relevant to the work of the JPI Water. Their strategies and Agendas were closely examined to extract the main topics they focus on. A similar compilation of information and the identification of RDI topics was carried out on the national level. The necessary information was provided by ten Partner Countries with different levels of detail.

Table 4 lists the sixteen topics which were identified and examined on the basis of the aforementioned European and National Agendas. The identification of the topics was primarily guided by the objectives defined at the Vision Document. An additional was set on the different types of water users, and the related impacts on water quantity and quality. This Task Force will identify overlap areas between individual National, European and International initiatives, and will signal RDI areas which are not adequately covered.

6.4

Openness to additional participant countries

This JPI will automatically accept new partner countries, as stated at the “[Terms of Reference of the Management Structure](#)” document:

“New partners will inform of their intention to the President of the Governing Board in writing. Equally, JPI Partners can cease any time by informing the President of the GB in writing. The President of the GB will in turn inform all Partners of these changes. Each GB and EB meetings will start by reviewing changes in JPI partners and observers.”

Table 4. Results of the Thematic Analysis phase of the JPI Strategic Agenda.

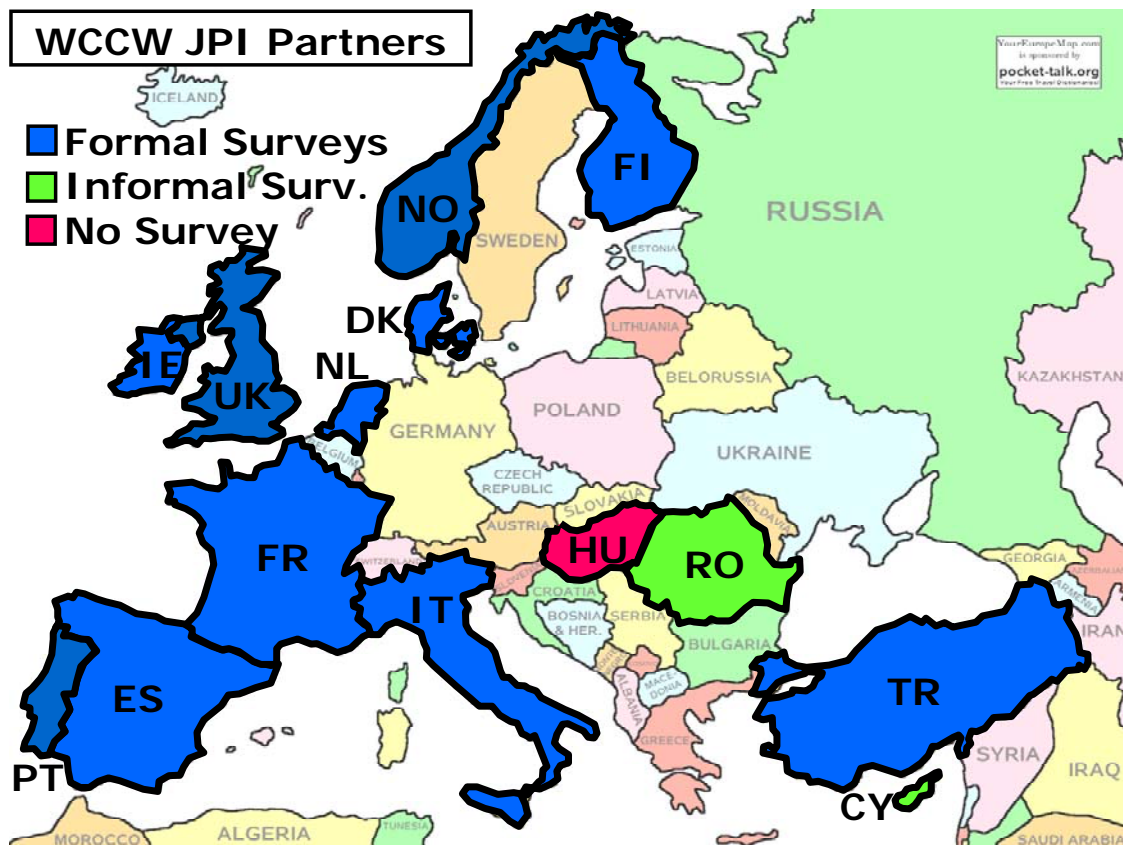
TOPICS	Water JPI	INITIATIVES							NATIONAL STRATEGIES									
		ERA-NETs	CIS SPI	WssTP	WFD	FACCE JPI	FP7	EU 2020	TR	FR	DK	NO	BE	FI	IE	IT	NE	CY
Water quantity & scarcity	✓	✓	✓	✓						✓			✓	✓	✓		✓	✓
Bio-based economy	✓					✓	✓										✓	
Sustainable water manage.	✓	✓	✓	✓	✓		✓	✓	✓			✓		✓	✓	✓	✓	✓
Waste-water treatment					✓		✓		✓	✓	✓	✓			✓		✓	✓
Water foot-printing	✓														✓			
Water quality & pollution	✓		✓		✓		✓		✓	✓	✓	✓			✓	✓	✓	
New pollutants	✓		✓							✓					✓			
Water & health	✓				✓		✓			✓					✓		✓	
Impacts of climate change	✓	✓	✓	✓	✓	✓		✓		✓	✓		✓	✓				
Extreme weather & climate		✓		✓	✓	✓			✓				✓			✓		✓
Water policy			✓		✓			✓				✓		✓	✓			
Agricult. water use	✓		✓	✓	✓	✓	✓		✓					✓				✓
Industrial water use	✓			✓	✓									✓				
Urban water use				✓						✓	✓					✓	✓	✓
Water & energy					✓		✓	✓								✓	✓	
Aquatic eco-systems										✓		✓						

Annex I. Additional JPI Document Repository

- [Progress Report](#)
- [Vision Document](#)
- [Terms of Reference of the Management Structure](#)
- Newsletters
 - [# 1](#), November 1st, 2010
 - [# 2](#), December 1st, 2010
 - [# 3](#), January 1st, 2011
 - [# 4](#), February 1st, 2011
 - [# 5](#), March 1st, 2011
 - [# 6](#), April 1st, 2011

Annex II. Mapping RDI in Partner Countries

Country Summary Reports are presented for the countries highlighted in the map. The map also indicates if formal or informal surveys were received from these countries.



	JPI Partner, EU Member State, Surveyed Funding: 0.60 M€/yr		
	 THE CYPRUS INSTITUTE	 Research Promotion Foundation	 MINISTRY OF AGRICULTURE NATURAL RESOURCES AND ENVIRONMENT PLANNING BUREAU

The [Planning Bureau of Cyprus](#) is the Governmental Office in charge of promoting and coordinating economic and social growth of Cyprus. The Planning Bureau is the primary agency responsible for research planning in Cyprus, developing and following the implementation of a medium- to long-term development strategy. The Strategic Development Plan 2007-2013 sets out the strategic policy for research in Cyprus.

The Planning Bureau's main objectives also include the formulation of a policy on the development of foreign technical assistance as well as the economic cooperation with other countries. Structural funds are also used to co-finance programs and projects with the EU aiming at sustainable economic growth.

The Planning Bureau sets the budget for the [Research Promotion Foundation](#), of Cyprus (RPF), which is the main research funding agency in Cyprus. The Foundation's core objective is the promotion of scientific and technological research and innovation in Cyprus and uses the Strategic Development Plan of the Planning Bureau as a guideline for its funding strategy. It provides funding for the implementation of research and technological development projects as well as promotes the participation of Cypriot research organisations in European research programmes. These aims are directly relevant to the JPI Water goals for water research projects in Europe.

The Research Promotion Foundation develops and monitors competitive programmes, and issues Calls for Proposals, whereby the related funds come from the Cyprus government budget. The Call for Proposals under the National Framework Programme for Research, Technological Development and Innovation 2009-2010 accepts projects proposals under three Thematic Areas: Terrestrial Ecosystems, Pollution Prevention and Control, and Water Ecosystems. Two Sub-topics are directly related to this JPI: a) Climate change and impacts on water ecosystems; and b) Integrated management and sustainable use of water resources, improvement of procedures for water allocation, preservation of water resources, water recycling for multiple use, suppression of water evaporation from water dams.



The [Water Development Department](#) is a government body responsible for implementing the water policy of the Ministry of Agriculture, Natural Resources and Environment in Cyprus. Its main objective is the rational development and management of the water resources of Cyprus, and its responsibilities include:

- the collection, processing and classification of hydrological, hydrogeological, geotechnical and other data necessary for the study, maintenance and safety of the water development works
- the study, design, construction, operation and maintenance of works, such as dams, ponds, irrigation, domestic water supply and sewerage schemes, water treatment works, sewage treatment and desalination plants, and
- the protection of water resources from pollution.

Survey Summary Results (per survey)

- Research Promotion Foundation
 - Total declared funding (M€/year): 0.6
 - Average duration of a project (months): 24-36
 - Average budget of a project (k€): 150

Country orientation towards JPI participation
<ul style="list-style-type: none">• Country orientation to JPI objectives (summarizing results of all programmes):<ul style="list-style-type: none">○ Bio-based economy: Low○ Sustainable ecosystems: Medium○ Healthier water systems: High○ Closing water cycle gap: High• Possible to fund foreign organizations? Yes• Possible to allocate funds to Transnational programmes? Yes

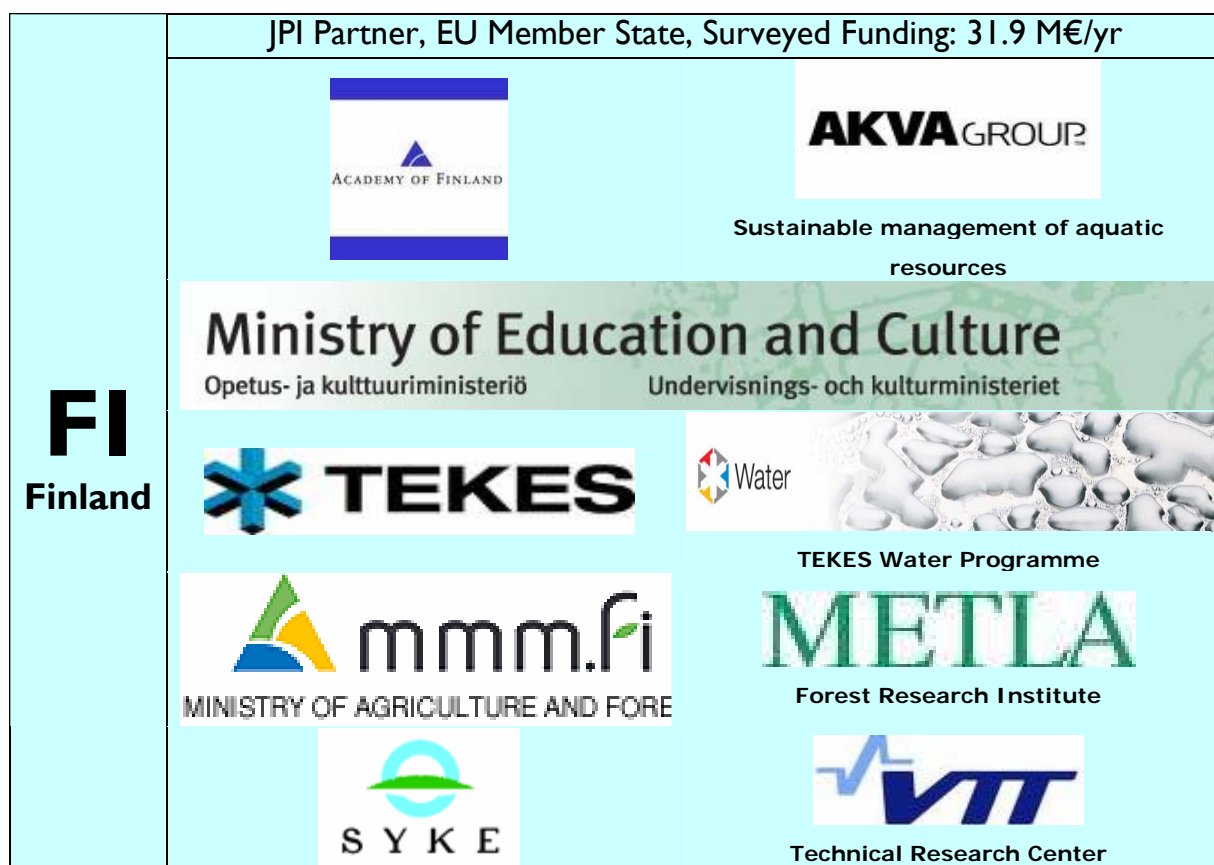
DK Denmark	JPI Partner, EU Member State, Surveyed Funding: 11.45 M€/yr	
	 Danish Agency for Science Technology and Innovation Ministry of Science Technology and Innovation	 Danish Ministry of the Environment

The [Danish Council for Strategic Research](#) seeks to ensure that strategic research in Denmark is organised to meet the challenges facing Danish society. The aim is to ensure Denmark's position as a global frontrunner regarding welfare, wealth and science in the short and long term. The Council aims at strengthening the interaction between publicly financed research and the rest of society, such as privately financed research, private organisations, public institutions and the corporate world. The Council supports politically prioritized and thematically defined research. In 2010 the Council contributed 134 M €. The Council is involved in a number of international networks, such as: All JPI's (except Cultural Heritage, which is administrated by the Danish Council for Independent Research) The BONUS-programme (research cooperation within the Baltic-sea region), and Nordforsk (research cooperation within the Nordic Countries) The Council is also involved in a number of ERA-nets, and is currently involved in the preparation of new proposals. The research programme related to this JPI is the "[Programme Commission on Sustainable Energy and Environment](#)". The programme addresses a wide range of topics, of which some are related to water. The Council allocates specific funds to international cooperation.

The [Danish Ministry of the Environment](#) is responsible for administrative and research tasks in the areas of environmental protection and planning. At the regional and local levels, much of the administrative responsibility has been delegated to municipalities. The Ministry consists of three agencies and several independent Environment Centres across the country. One independent appeal board is also linked to the Ministry. The Danish Environmental Protection Agency is responsible for implementation of the [Danish Action Plan on Ecoinnovation](#) (2010-2011). This programme addresses water research, but also air pollution, waste management and natural resources research. The programme focuses on the development, testing and demonstration of technology. Important programme drivers include relevant legislation and environmental challenges. In the field of water, research highlights include: detection of drinking water quality and pollution, efficient industrial water treatment, municipal wastewater Management and extreme rainfall events.

Survey Summary Results (per survey)	
<ul style="list-style-type: none"> • Programme Commission on Sustainable Energy and Environment <ul style="list-style-type: none"> ○ Total declared funding on water issues (M€/year): 9.25 ○ Average duration of a project (months): 57 ○ Average budget of a project (k€): 2,000 • Danish Action Plan on Ecoinnovation <ul style="list-style-type: none"> ○ Total declared funding on water issues (M€/year): 2.20 ○ Average duration of a project (months): 18 ○ Average budget of a project (k€): 85 	
Country orientation towards JPI participation	
<ul style="list-style-type: none"> • Country orientation to JPI objectives (summarizing results of all programmes): <ul style="list-style-type: none"> ○ Bio-based economy: high ○ Sustainable ecosystems: medium ○ Healthier water systems: medium ○ Closing water cycle gap: medium 	

- Possible to fund foreign organizations? Yes
- Possible to allocate funds to Transnational programmes? Yes



There is a [wide range of funding bodies for water science in Finland](#), mostly ultimately governmental. Funds can be divided into those provided by core budgets for Institutes and Universities and those provided through competition. The central funding body for research beyond core government funding in the area of water research is the [Academy of Finland](#).

The Academy of Finland, operating within the administrative sector of the [Ministry of Education](#) and funded through the state budget, covers all scientific disciplines in its four Research Councils, which are as follows: Biosciences and Environment, Culture and Society, Natural Sciences and Engineering, and Health. Water issues are related to all four Research Councils. The Academy funds research annually, with 340 million euros (2011), accounting for 16 % of government R&D spending.

The Academy of Finland's mission is to finance high-quality scientific research, act as a science and science policy expert, and strengthen the position of science and research. Through its research programmes, the Academy of Finland directs research and allocates research funding to fields that are considered of key importance in terms of science and society. The Academy's research programmes are designed to advance a certain field of research, raise its scientific standards, and create new scientific knowledge and know-how. A major emphasis in Academy research programmes is on multidisciplinary and transdisciplinary, as well as international cooperation. In 2011 the Academy in funding 12 research programmes, and four more programmes are under preparation. A research programme initiative on [Sustainable Management of Aquatic Resources](#) is under preparation to be launched at the autumn 2011.

[Tekes](#), the Finnish Funding Agency for Technology and Innovation, has a minor role in funding fundamental research in aquatic sciences. Nonetheless, Tekes funds applied research for innovations in environmental field e.g. projects concerning development of detectors and telemetry for environmental purposes. Tekes promotes

a broad-based view on innovation: besides funding technological breakthroughs, Tekes emphasises the significance of service-related, design, business, and social innovations. When funding challenging R&D and business development, Tekes works with the top innovative companies and research units in Finland. Every year, Tekes finances some 1,500 business research and development projects, and almost 600 public research projects at universities, research institutes and polytechnics. Research, development and innovation funding is targeted to projects that create in the long-term the greatest benefits for the economy and society. Tekes runs a [Water Program](#).

Other Ministries and research institutions in Finland fund water research e.g., in governmental research institutes directly relating to their activities and policies:



- [Ministry of Agriculture and Forestry](#) (MMM) is responsible for the [Finnish Forest Research Institute](#), and funds the Water Friendly Agriculture programme
- [Ministry of Environment](#) (YM) is responsible for the [Finnish Environment Institute](#)
- The [Technical Research Centre of Finland](#) (VTT) is planning a programme on water.

Survey Summary Results (per survey)

- [The Academy of Finland, running: sustainable management of aquatic resources](#)
 - Total declared funding on water issues (M€/year): 10
 - Average duration of a project (months): 48
 - Average budget of a project (k€): 10
- [TEKES: Water Programme](#)
 - Total declared funding on water issues (M€/year): 18
 - Average duration of a project (months): 24
 - Average budget of a project (k€): 90
- [The Ministry of Agriculture and Forestry of Finland: Water Friendly Agriculture](#)
 - Total declared funding on water issues (M€/year): 3.24
 - Average budget of a project (k€): 3,240
- [The Finnish Forest Research Institute \(METLA\): Prediction and mitigation of nutrient and sediment load from forested catchments](#)
 - Total declared funding on water issues (M€/year): 0.70
 - Webpage: <http://www.metla.fi/hanke/3506/index-en.htm>
 - Average duration of a project (months): 48
 - Average budget of a project (k€): 700
- [The Finnish Environment Institute \(SYKE\): Research Programme on Baltic Sea, freshwaters and water resources](#)
 - Total declared funding on water issues (M€/year):
 - Average duration of a project (months): 37
 - Average budget of a project (k€): 7794 k€
- [VTT Technical Research Centre of Finland: Green Solutions for Water and Waste](#)
 - Total declared funding on water issues (M€/year):
 - Average duration of a project (months): 36 (planned)
 - Average budget of a project (k€): 1200k€/year

Country orientation towards JPI participation

- Country orientation to JPI objectives (summarizing results of all programmes):
 - Bio-based economy: Medium
 - Sustainable ecosystems: High
 - Healthier water systems: High
 - Closing water cycle gap: Medium
- Possible to fund foreign organizations? In some programmes
- Possible to allocate funds to Transnational programmes? In some programmes

FR France	JPI Partner, EU Member State, Surveyed Funding: 22 M€/yr	
		

Twelve French scientific research players have joined forces to found a national research alliance for the environment, [AllEnvi](#), which now also comprises fifteen associate members. AllEnvi is the fourth such alliance created in France, after those for health (Aviesan), energy (Ancre) and digital technologies (Allistene), and its main objective is to ensure better synergy, both within metropolitan France and in the French overseas regions, between research players working on scientific issues relating to food, water, climate and territories. Global change does not only mean the climate, but also the environment, access to water, food, and sustainable agriculture. The existence of a strong, coordinated research sector working on these environmental questions is vital in finding solutions in line with the magnitude of the stakes. AllEnvi will associate all the research and higher education players concerned, reinforce cooperation between members as well as cooperation with other stakeholders, while submitting its priorities to the government and French and European funding agencies, and will be proposing the common research platforms required in many fields of knowledge. Current AllEnvi partners hire a huge percentage of the public scientific manpower dedicated to environmental sciences. The fields covered by AllEnvi include all aspects concerning water resources, aquatic ecosystems, continental coastal and sea, and the uses of these resources and ecosystems.

[Onema](#), the French National Agency for Water and Aquatic Environments, is active in the field of environmental French public service. Created by the Law on water and aquatic environments, dated 30 December 2006, and the implementation decree dated 25 March 2007, it operates under the supervision of the ministry in charge of ecology and sustainable development. Onema organises and produces high-level science and technology advice to assist in formulating, implementing and evaluating public water policy. Its mission is to contribute to overall and sustainable management of water resources and aquatic ecosystems, with a view to restoring water quality and reaching the good chemical and ecological status by 2015 set by the European Water framework directive, adopted on 23 October 2000. The Agency also plays an active role in transferring scientific outputs, methods and tools, to practitioners. ONEMA is co-leading with EU DG RTD, the “Science-Policy Interface” ad hoc activity established under the auspices of the Common Implementation Strategy of the Water Framework Directive (CIS-SPI). The main goal of the activity is to ensure a dynamic interface to identify research needs and to boost usability of available (or to be produced) results to support the implementation of the WFD within the CIS framework. ONEMA is a member of the Member States Mirror Group of the WSSTP and participates in the Scientific Committee of ACQUEAU. Research priorities include: 1) Water cycle and resource availability in the context of climate change; 2) Physical dynamics of aquatic systems and restoration; 3) Biological and ecological dynamics of aquatic systems; 4) Chemical contaminants and ecotoxicological risks; 5) Environmental technologies and methods to reduce pollution; and 6) Socio-economic value of water and aquatic environments.

The [ANR](#) (French National Research Agency) is a research funding organisation. The Agency was established by the French government in 2005 to fund research projects, based on competitive schemes giving researchers the best opportunities to realize their projects and paving the way for groundbreaking new knowledge. The role of the Agency is to bring more flexibility to the French research system, foster new dynamics and devise

cutting edge-strategies for acquiring new knowledge. By identifying priority areas and fostering public-private collaborations, the ANR also aims at enhancing the general level of competitiveness of both the French research system and the French economy. The ANR's approach to funding allows French research to reinforce its international position and better integrate the framework of European cooperation. ANR funds are available in all scientific fields, for both fundamental and industrial research and for public research organisations as well as private companies (through public/private partnerships). ANR's general goal is to fund excellent research, while also facilitating innovation and interdisciplinary work and developing European and international collaborations.

Survey Summary Results (per survey)

- [ONEMA, Office National de l'eau et des milieux aquatiques](#)
 - Total declared funding on water issues (M€/year): 10
 - Average duration of a project (months): 36
 - Average budget of a project (k€): 120
- ANR, Agence National de la Recherche
 - Total declared funding on water issues (M€/year): 12
 - Average duration of a project (months): -
 - Average budget of a project (k€): -

Country orientation towards JPI participation

- Country orientation to JPI objectives (summarizing results of all programmes):
 - Bio-based economy: medium
 - Sustainable ecosystems: high
 - Healthier water systems: high
 - Closing water cycle gap: high
- Possible to fund foreign organizations? (general position for all programmes, with answers such as: no, yes, in specific programmes, in most programmes): No
- Possible to allocate funds to Transnational programmes? (general position for all programmes no, yes, in specific programmes, in most programmes): Yes

HU Hungary	JPI Partner, EU Member State
	

The Science, Technology and Innovation (STI) strategy (2007-2013) of the Government of Hungary has the the general objective of making Hungary's economy driven by knowledge and innovation on the mid-term, and to ensure that Hungarian companies display competitive products and services on the international market. The mid-term objectives include:

- To expand research and development activities of enterprises.
- To create internationally renowned R&D and innovation centres and research universities.
- To create a market of knowledge based on competition and the recognition of performance through the globalization and industrialization of generating and disseminating new knowledge.

Basic and applied research, development, and innovation rely on two cooperating funding agencies in Hungary: The Hungarian Scientific Research Fund and the National Innovation Office.

The [Hungarian Scientific Research Fund](#) (OTKA) has been the major funding agency of basic science and scholarship since 1986. OTKA operates as an independent non-profit organisation since 1991. Its legal status and rules of operation have been designed to provide independent support to scientific research activities and infrastructure, to promote scientific achievements of international standards, and to provide assistance to young researchers. As an independent institution, OTKA reports to the parliament and the government of Hungary. With regards to the funds provided within the annual budget of the Republic of Hungary, the appropriations of OTKA are administered via the budget of the [Hungarian Academy of Sciences](#), operating as Programme owner. During the two decades of its operation, OTKA has supported approximately fifteen thousand research projects with an overall funding worth 218 M€. OTKA's annual budget for 2008 was about 20 M€. It covers the annual financial support of around two thousand research projects (two to four years of duration each), with three hundred to four hundred new research projects starting every year. OTKA administers two rounds of open calls for proposals with a bottom-up approach towards research proposals, postdoctoral research proposals, and proposals for international cooperation every year. The agency operates without thematic restrictions and with a special emphasis on the careers of talented young researchers and on the reintegration of Hungarian researchers returning from postdoctoral trainings or research projects carried out abroad.

The [National Innovation Office](#) (NIH) is the research, development and innovation organization of the Hungarian Government. They provide professional support for private and government initiatives aiming to exploit and promote the market access of national R&D results. To this end the have created a team of

analysts and information management experts. NIH supports national and international cooperation, and creates incentives for the formation of innovation networks. The National Innovation Office represents Hungary at the EU and at international organisations in issues relating to research and innovation. NIH does not have a specific programme for water, but has funded a number of projects on the topic. Additionally, the NIH president has identified Water Challenge as a major research priority, calling for integrated transnational cooperation on R&D for the Danube region.



The [Environmental Protection Agency](#) (EPA) is an independent public body. Its mission is to promote and implement the highest practicable standards of environmental protection and management that embrace the principles of sustainable and balanced development. The main responsibilities of the EPA include:

- Monitoring and reporting on quality of environment;
- License and regulation of industries, waste disposal operations and large fuel storage installations;
- Implementation and enforcement of regulations on the use and release of GMOs; and
- Funding & co-ordination of environmental research.

Through its [research programme](#) (*STRIVE Research Programme 2007-2013*), the EPA will provide approximately €100m funding for environmental research and development to colleges, research organisations and private companies over the period 2007-2013. Research is funded under three main areas: Climate Change, Water and Sustainable Environment. The Water Research is mainly policy-driven. The previous research programme was the ERTDI Programme 2000-2006 with an EPA Research Commitments of €55m. The EPA has participated in a number of ERA-Net projects. These include: SKEP (FP6), ENVHEALTH ERA net (FP7), CIRCLE2 (FP7) and CIRCLE (FP6), and ECO-INNOVERAnet (FP7) The EPA is also involved in the JPI Connecting Climate Knowledge for Europe (CliK'EU).

The [Irish Research Council for Science, Engineering & Technology](#) (IRCSET) operates multi-million euro research funding initiatives which support talented researchers in their early stage career formation across Masters, Doctoral and Postdoctoral levels in the sciences, engineering and technology. The emphasis of the funding programmes is on exploratory research aimed at yielding new concepts, findings and innovations within Ireland. IRCSET runs several research programmes, which are looking at basic research and development in science, engineering and technology; and are not only limited to Water-related research activities. These

programmes are driven by research interests and existing knowledge base of applicant pool of graduates and provide funding towards research projects:

- [Embark Initiative](#) (Total Budget of Programme: 120 M€ since 01/12/2001);
- [Empower Initiative](#): (Total Budget of Programme: 15 M€ since 01/12/2002);
- [Inspire Initiative](#): (Total Budget of Programme: 10.2 M€ for the period: 01/09/2009 – 31/12/2012).

In addition, IRCSET is involved a number of activities at European level, including European Research Area Networks (ERA-NETs) and the European Science Foundation.

[Science Foundation Ireland](#) (SFI) was established in 2000 as the national foundation for research in Ireland. SFI invests in academic researchers and research teams who are most likely to generate new knowledge, leading edge technologies and competitive enterprises in the fields of science and engineering underpinning three areas: Biotechnology; Information & Communications Technology (ICT) and Sustainable Energy & Energy Efficient Technologies (Energy). SFI's mission is to build and strengthen scientific and engineering research and its infrastructure in the areas of greatest strategic value to Ireland's long-term competitiveness and development. The *Research Frontiers & Principal Investigator Programmes* cover all areas of science, engineering and mathematics - Their key drivers are to generate new knowledge, leading edge technologies and competitive enterprises. It is funding Research projects (Universities) – The total budget of the Programme is about 573 M€ in *Principal Investigator Programme* since 2002; and about 156 M€ in [Research Frontiers Programme](#) since 2004. SFI is on the Management Board of JPI on Neurodegeneration and A Healthy diet for a Healthy Life. SFI is NCP for NanoSci-E+ ERANET and SIINN ERANET.

[Enterprise Ireland](#) is the Government agency in Ireland responsible for supporting Irish businesses in the manufacturing and internationally traded service sectors. Specifically, Enterprise Ireland helps businesses to start-up, innovate and ultimately, to achieve global success. Via its [Commercialisation fund - Proof of Concept & Technology Development](#), it funds water-related research and other areas including ICT, Life-Sciences, Bio and Industrial Technologies. Other priorities of the programme include product development. It is providing funding toward applied research. Its annual budget is of approximately €10 million per annum (varying). This is a national fund only providing funding for Demonstration & Research projects to Universities & Research Institutions. The previous relevant programme was ATRP - Advanced Technology Research programme. Enterprise Ireland has a role on several ERA-nets across Europe of strategic importance.

The [Department of Agriculture, Fisheries and Food](#) (DAFF) is a Government Department, which administers three competitive research programmes: Food Institutional Research Measure (FIRM), Research Stimulus Fund (RSF) and COFORD (Competitive Forest Research for Development). The [Research Stimulus Fund](#) (RSF) covers water-related research as well as Climate change, Agri-Economy, Animal Biosciences, Plant Biosciences related activities. It provides funding for research projects to Universities & Research Institutions. DAFF is leading Ireland's involvement in the Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE). It is also involved in "A healthy diet for a Healthy life" JPI and a number of ERA-Nets including Wood Wisdom and Core Organic. The RSF total budget is estimated at 43.5 M€ since 2005.

The [Geological Survey of Ireland](#) (GSI), Department of Communications, Energy and Natural Resources (DCENR), is Ireland's National Earth Science Agency. It is responsible for providing geological advice and information, and for the acquisition of data for this purpose. GSI produces a range of products including maps, reports and databases. The [Griffith Geoscience Research Award Programme](#) provides funding towards water-related research activities and also towards marine and coastal, petroleum, geophysics related research. It is mainly driven by the WFD and aims at developing models for the behaviour of groundwater, including the impacts of climate change and intensifying infrastructure on future groundwater supplies. It provides funding

for research projects to Universities & Research Institutions. Its total budget is of about 10 M€ since 01/06/2007.

The [Marine Institute](#) is the national agency responsible for Marine Research, Technology Development and Innovation (RTDI) with the following role: “to undertake, to co-ordinate, to promote and to assist in marine research and development and to provide such services related to research and development that, in the opinion of the Institute, will promote economic development and create employment and protect the marine environment”. Via its [Marine Research Sub-Programme](#) (*National Development Plan 2007-2013*), it funds research related to Water (e.g. Advanced Marine Technologies (with freshwater applications); Freshwater catchment management - in relation to management of migratory fish species (salmon & eel) and their habitats) and Marine-related research activities. It provides funding to Universities, Research Institutions and Private Sector towards Demonstration, Dissemination and Research projects. It is policy-driven (Water Framework Directive Marine Strategy Framework Directive Habitats & Birds Directives) and the Marine Institute is a partner on the SEAS-ERA (Era-Net) Project, inputting (via DAFF) into the Food & Health JPI and inputting directly into the Oceans JPI.

[Teagasc](#) is the agriculture and food development authority in Ireland. Its mission is to support science-based innovation in the agri-food sector and the broader bioeconomy that will underpin profitability, competitiveness and sustainability. Via the [Teagasc Walsh Fellowship Scheme](#), it funds research in relation to Crops, Environment and Land Use Research; Grassland and Animal Research; Rural Economics and Development Research; Food Research. The main drivers of its water –related research activities are the Nitrates Directive and National Nitrates Action Plan; Water Framework Directive and River Basin District Management Plans; Habitat Directive and National Biodiversity Plan. The annual budget for this programme is of: € 2.4 million per annum. Teagasc is involved in the JPI on Agriculture, food security and climate change; FP7, INTERREG and COST projects. It is the Irish Representative to European Soil Bureau Network (JRC).

The [Office of Public Works](#) (OPW) is the lead State body in Ireland for Flood Risk Management. It has a number of important roles including co-ordinating activities of Government Departments, Local Authorities and other bodies and managing the implementation of the national flood risk management policy. The Government decided in late 2008 to transfer the Coastal Zone Management Division from the Department of Agriculture, Fisheries & Food to the OPW. Via its *Flood Studies Update Programme 2005-2012* aims at producing methodologies for the estimation of design Flows and Design Rainfall. Its total budget is €2 million for the FULL Programme towards Dissemination & Research projects awarded to Universities, Research Institutions & Private Sector. The OPW is actively involved in the ERA-Net CRUE second funding initiative for collaborative research projects.

Survey Summary Results (per survey)

- [Environmental Protection Agency: STRIVE Research Programme 2007-2013](#)
 - Total declared estimated Water Research funding (M€/year): 3.52
 - Average duration of a project (months): variable (9 – 60 months)
 - Average budget of a project (k€): variable (50 - 1,000 +)
- [Irish Research Council for Science, Engineering & Technology Embark Initiative](#)
 - Total declared Water Research funding (M€/year): est. 0.096 (960,000 € since 01/12/2001)
 - Average duration of a project (months): 24
 - Average budget of a project (k€): 48
- [Irish Research Council for Science, Engineering & Technology Empower Initiative](#)
 - Total declared Water Research funding (M€/year): est. 0.08 (630,000 € since 01/12/2002)
 - Average duration of a project (months): 24
 - Average budget of a project (k€): 90
- [Irish Research Council for Science, Engineering & Technology Inspire Initiative](#)

- Total declared Water Research funding (M€/year): est. 0.21 (684,000 € million for the period: 01/09/2009 – 31/12/2012)
- Average duration of a project (months): 24
- Average budget of a project (k€): 90
- [Science Foundation Ireland Research Frontiers Programme](#)
 - Total declared Water Research funding (M€/year): est. 0.62 (3.4 M€ RFP since 2004 & 1.2 M€ PI since 2002)
 - Average duration of a project (months): 36-48 months
 - Average budget of a project (k€): RFP total avg. budget per project 192 k€; PI total avg. budget per project 624 k€
- [Enterprise Ireland Commercialisation fund - Proof of Concept & Technology Development](#)
 - Total declared Water Research funding (M€/year): est. 0.28 (1.4 M€ approx to date - The scheme has been running for 5 years)
 - Average duration of a project (months): 12-18 months for Proof of Concept , 24 - 36 months for Commercialisation Fund
 - Average budget of a project (k€): 120 k€ for Proof of Concept & 300 k€ for Technology Development
- [Department of Agriculture, Fisheries and Food Research Stimulus Fund](#)
 - Total declared Water Research funding (M€/year): est. 1.67 (est. 10 M€ since 2005)
 - Average duration of a project (months): n/a
 - Average budget of a project (k€): 665
- [Geological Survey of Ireland - Griffith Geo-science Research Award](#)
 - Total declared Water Research funding (M€/year): est. 1.4 (est. 4.9 M€ since 01/06/2007)
 - Average duration of a project (months): 72
 - Average budget of a project (k€): 2,000
- [Marine Institute - Marine Research Sub-Programme \(National Development Plan 2007-2013\)](#)
 - Total declared Water Research funding (M€/year): est. 0.63 (est. 2.5 M€ since 01/01/2007)
 - Average duration of a project (months): Demo projects 12-24 Months Research projects 3-7 years
 - Average budget of a project (k€): PhD 100 k€, Post-Doc 400-600 k€, Research Project - 0.5-2 M€, Demo project 100-200 k€
- [Teagasc Walsh Fellowship Scheme](#)
 - Total declared Water Research funding (M€/year): est. 0.147
 - Average duration of a project (months): 36-48
 - Average budget of a project (k€): 64.5 – 86
- [Office of Public Works - Flood Studies Update Programme](#)
 - Total declared Water Research funding (M€/year): est. 0.28 (2 M€ for the period 2005-2012)
 - Average duration of a project (months): 12
 - Average budget of a project (k€): n/a

Country orientation towards JPI participation

- Country orientation to JPI objectives (summarizing results of all programmes):
 - Bio-based economy: Medium
 - Sustainable ecosystems: Very High
 - Healthier water systems: High
 - Closing water cycle gap: High
- Possible to fund foreign organizations? (general position for all programmes, with answers such as: no, yes, in specific programmes, in most programmes): in specific programmes only
- Possible to allocate funds to Transnational programmes? (general position for all programmes no, yes, in specific programmes, in most programmes): in most programmes

JPI Partner, EU Member State, Surveyed Funding: 4.8 M€/yr	
IT Italy	  
	   <p>Ministry for Environment, Territory and Sea Protection</p>

Italy does not have an overall “National Research Programme for water”, but there are three different programmes including different research themes. Three Ministries are responsible for water research in Italy: Ministry for Education, University and Research; Ministry for Agriculture and Forest and Ministry for Environment Territory and Sea.

The [Ministry of Education, University and Research](#) has two research programmes including water issues. The “[PONREC](#) - National Operational Plan Research and Competitiveness 2007-2013 for the Convergence Regions (Calabria, Campania, Puglia, Sicilia)”. It covers the following themes: Axis I - Support to structural changes and strengthening of the scientific-technological potential for the transition to knowledge-based economy; Axis II - Strengthening of the innovative context for the development of competitiveness Axis III - Technical assistance and accompanying measures.

The other programme is “[PRIN](#) - Research Projects of National Interest”. The programme was specifically set up in order to co-fund national research projects carried out by universities. Water is covered under the following themes: Earth Science and Civil Engineering and Architecture.

The [Ministry for Environment Territory and Sea Protection](#) has not a specific research programme, but the department “Soil defence” provides funds for prevention and management of hydrogeologic risk. The Ministry funds through the National Basins Authorities studies, analysis and research on methods and tools to adopt plans and measures regarding flood risk management and water resources protection.

The [Ministry for Agriculture and Forest](#) provides the “[National Strategic Plan for the Rural development](#)”. The area covering water is: Action Plan for research and innovation”: Action 9: Innovation (water management system).

[ISPRA](#) - Institute for Environmental Protection and Research - funds the [SIMM](#) Hydro-Meteo-Marine Forecasting System, which priorities are: Hydrologic extreme events (droughts, floods), marine status and safety of navigation. It is also involved in CRUE-ERANET and IWRM-Net as partner and funder.

The national department of Civil Protection within its programme “*Operative actions for the management of the national regional alert system of hydrogeologic and hydraulic risk*”, funds the National Research Centre (CNR) and other research organizations for specific studies depending on specific needs.

Finally, most of the 20 Italian regions through their environmental and/or agriculture councillorships fund studies and researches on water topics carried out by local universities or institutes of CNR.

Survey Summary Results (per survey)	
<ul style="list-style-type: none"> • National Operational Plan Research and Competitiveness 2007-2013 for the Convergence Regions <ul style="list-style-type: none"> ○ Total declared funding on water issues: 1.11 ○ Average duration of a project (months): 36 ○ Average budget of a project (k€): 500 • Research Projects of National Interest <ul style="list-style-type: none"> ○ Total declared funding on water issues (M€/year): 2.70 ○ Average duration of a project (months): 24 ○ Average budget of a project (k€): 150 • ISPRA: Hydro-Meteo-Marine Forecasting System <ul style="list-style-type: none"> ○ Total declared funding on water issues (M€/year): 1.00 ○ Average duration of a project (months): 12 ○ Average budget of a project (k€): 200 	
Country orientation towards JPI participation	
<ul style="list-style-type: none"> • Country orientation to JPI objectives (summarizing results of all programmes): <ul style="list-style-type: none"> ○ Bio-based economy: medium ○ Sustainable ecosystems: high ○ Healthier water systems: high ○ Closing water cycle gap: high • Possible to fund foreign organizations? no • Possible to allocate funds to Transnational programmes? no 	

<p>NL The Netherlands</p>	<p>JPI Partner, EU Member State, Surveyed Funding: 73.2 M€/yr</p>
	<div data-bbox="507 277 746 510">  </div> <div data-bbox="948 300 1283 443">  </div> <div data-bbox="916 456 1315 524"> <p>Innovation Programme for Water Technology</p> </div> <div data-bbox="494 524 1327 667"> <div data-bbox="494 524 715 667">  </div> <div data-bbox="724 555 1327 609">  </div> </div> <div data-bbox="734 680 1085 703"> <p>STW Perspective Programme</p> </div> <div data-bbox="785 712 1037 860">  </div>

[NL Agency](#) came about through a merger of EVD, The Netherlands Patent Office (Octrooiencentrum Nederland) and SenterNovem. At the beginning of January 2010, the three agencies of the Ministry of Economic Affairs were merged to form one single new organisation. The agencies will combine their expertise in the field of sustainability, innovation and international business and cooperation. NL Agency provides clients with a single contact point for information, advice, financing, networking and regulatory matters. NL Agency's primary target groups are businesses, (knowledge) institutions and government bodies. Private individuals are therefore not a primary target group of NL Agency. The current research programme: [Innovation Programme for Water Technology](#) (Wetsus) is a national research programme. Important drivers for Water research activities in the research programme include economic drivers (to gain a competitive position in the near future). Other priorities include energy. Wetsus' research is carried out within the framework of the Technological Top Institute for Water technology, which is part of the Dutch Innovation Program on Water Technology. The innovation program aims for the development of sustainable water treatment technology with a strong focus on export. Wetsus, operating as a Technological Top Institute, takes care of the pre-competitive technology development within this program. Wetsus focuses on the research and development of entirely new concepts and on breakthrough improvements of existing technology. In both cases, an entirely new approach has been chosen whereby the basic principle is always the integration of various knowledge disciplines. The programme is funding Dissemination and Research projects. NL Agency also funds (international) R&D projects that are close to the market. Funding is provided to Universities, Research Institutions & Private Sector. NL Agency is active in JPI "Healthy diet for a healthy life" and "Water challenges for a changing World" and is the Liaison office for framework programme bilateral cooperation with European and Asian countries. It is also active in Eureka network and Eureka cluster Acqueau.

Other relevant Research, Development and Innovation research programmes in the Netherlands include:




- The [Water Technology Innovation Program](#) the Dutch government promotes the development and distribution of Dutch water technology in the areas of drinking water and industrial water supply, waste water treatment, sensing and monitoring technology, and interaction with the environment. This program supports innovations being created by companies (including SMEs) and research institutes.

- The Research programme: [NWO-theme Water & Climate](#) is planned for 2011-2014 and will cover water & climate change related research activities. The previous programme was entitled: NWO Theme Sustainable Earth Research. Water research activities in the research programme are policy-driven and in support of (Fundamental) research. The programme will fund Research projects and funding will be provided to Universities & Research Institutions. NWO is the secretary for the Netherlands for several ERA-NET's. (http://www.nwo.nl/nwohome.nsf/pages/NWOA_6KYH4N_Eng). NWO is also following all JPI's, and acting as (NL) secretary for a few of these.
- The [societal Innovation Programme](#): Due to climate change and the rising of the sea level the Netherlands is facing societal challenges. By launching two programmes the Netherlands will meet these challenges and will increase economic activities. The first programme is "Building with Nature", where forces of nature are used to protect land. The other one is "[Floodcontrol 2015](#)", using sensors and ICT to manage water systems in the Netherlands.
- [STW Perspective Programme](#). It focuses on solving technological problems by developing new technologies in a multidisciplinary approach, through cooperation with end users, through co-financing by private parties and by setting up special activities like valorization and entrepreneurship.
- [NWO](#) "Water and Climate" and "Sustainable Earth Research" Programmes. The Water and climate programme contributes to innovative insights into the fundamental principles underlying climate extremes, flood security, fresh water supply (for example as drinking water and in agriculture), changing ecosystems and the boundaries of the intrinsic predictability of fluctuations and trends in the climate. The theme will also contribute to knowledge development that benefits the manageability and controllability of water systems. The "Sustainable Earth Research" Programme is being developed under the auspices of the National Partnership for Sustainable Earth research (NPDA), whose members include NWO, Knowledge for Climate Foundation, Energy research programmes, and several larger and smaller institutes that steer research in the field of sustainability and the Earth.
- The [Water Framework Directive Programme](#) funds Innovation projects between public and private parties to meet the challenges as described in the WFD.

Survey Summary Results (per survey)

- [NL Agency: Innovation Programme for Water Technology](#)
 - Total declared Water Research funding (M€/year): 16
 - Average duration of a project (months): 36
 - Average budget of a project (k€): 500
- [NWO-theme Water & Climate](#)
 - Total declared funding (M€/year): Planned activity (budget under discussion)
 - Average duration of a project (months): 36-48 months
 - Average budget of a project (k€): Personnel costs per PhD-student or Postdoc ~ € 200k. Costs for research, however, within certain limits.
- Societal Innovation Program
 - Total declared funding (M€/year): 5.7
 - Average duration of a project (months): 60
 - Average budget of a project (k€): 12.000
- STW Perspective Programme
 - Total declared funding (M€/year): 5
 - Average duration of a project (months): 42
 - Average budget of a project (k€): 5.000
- NWO Water and Climate, Sustainable Earth Research
 - Total declared funding (M€/year): 11.5
 - Average duration of a project (months): 42
 - Average budget of a project (k€): 5.000
- Water Framework Directive
 - Total declared funding (M€/year): 35
 - Average duration of a project (months): 2
 - Average budget of a project (k€): 1

Country orientation towards JPI participation
<ul style="list-style-type: none">• Country orientation to JPI objectives (summarizing results of all programmes):<ul style="list-style-type: none">○ Bio-based economy: High○ Sustainable ecosystems: High○ Healthier water systems: High○ Closing water cycle gap: High• Possible to fund foreign organizations? Yes• Possible to allocate funds to Transnational programmes? Yes

	JPI Observer, Associated Country, Surveyed Funding: 3.33 M€/yr	
	 The Research Council of Norway	

The [Research Council](#) is Norway's official body for the development and implementation of National research strategy. The Council is responsible for enhancing Norway's knowledge base and for promoting basic and applied research and innovation in order to help meet research needs within society. It actively promotes international research cooperation. The RCN has three areas of focus: 1) it serves as an advisory body on research policy issues; 2) it identifies research needs; and 3) it recommends national priorities. Through the establishment and implementation of targeted funding schemes the RCN facilitates the translation of National research policy objectives into action. The RCN serves as a meeting place for researchers, funders and users of research findings, as well as for the different sectors and subject fields that are affiliated with the world of research. The most relevant research programme is "[Norwegian Environmental research towards 2015 \(MILJO2015\)](#)". This programme focuses amongst others on pollutants (POPs, heavy metals, pesticides, eutrophication), on freshwater ecosystems and biodiversity and on wild salmon related research.

The [Norwegian Water Resources and Energy Directorate](#) (NVE) is the second major water research funding institution in Norway. Its mandate is to 1) ensure an integrated and environmentally sound management of the country's water resources; 2) promote efficient energy markets and cost-effective energy systems; and 3) contribute to efficient energy use. The directorate plays a central role in the national flood contingency planning and bears overall responsibility for maintaining national power supplies. In 2009 NVE was assigned greater responsibility for the prevention of damage caused by landslides, debris flows and snow avalanches. NVE is involved in research and development in its fields and is the National centre of expertise for hydrology in Norway. Energy and water are fundamental factors in the struggle to combat poverty, improve health conditions, and increase prosperity in the developing world. NVE has more than thirty years of experience in development assistance. Most work in developing countries involves programmes initiated by the Norwegian Agency for Development Cooperation or the Norwegian Ministry of Foreign Affairs. The Norwegian Environmental Flows Research Programme (2001-2011) has the objective of increasing knowledge of the physical and biological consequences of strongly reduced flows, as well as developing improved methods for the determination of appropriate environmental flows. This will lead to a more effective management, an improved basis for decisions and thus a reduction of conflicts through the use of accepted methods and improved knowledge.

Survey Summary Results (per survey)	
<ul style="list-style-type: none"> • Norwegian Environmental research towards 2015 (MILJO2015) <ul style="list-style-type: none"> ○ Total declared funding on water issues (M€/year): 3 ○ Average duration of a project (months): 36 ○ Average budget of a project (k€): 530 • Norwegian Environmental Flows Research Programme <ul style="list-style-type: none"> ○ Total declared funding on water issues (M€/year): 0.33 ○ Average duration of a project (months): 18 ○ Average budget of a project (k€): 127 	

Country orientation towards JPI participation
<ul style="list-style-type: none">• Country orientation to JPI objectives (summarizing results of all programmes):<ul style="list-style-type: none">○ Bio-based economy: medium○ Sustainable ecosystems: high○ Healthier water systems: medium○ Closing water cycle gap: high• Possible to fund foreign organizations? No• Possible to allocate funds to Transnational programmes? No

PT Portugal	JPI Partner, EU Member State, Surveyed Funding: 1.8 M€/yr	
		

[Fundação para a Ciência e Tecnologia](#) (FCT) is Portugal's main funding agency for research. It is responsible for following the bilateral and multilateral international agreements in science and technology. FCT is a public autonomous institute under the aegis of the Ministry of Science, Technology and Higher Education, which covers all fields of science, from natural sciences to humanities, normally in a responsive mode, aiming at capability enhancement and research excellence. FCT's mission consists in continuously promoting the advancement of scientific and technological knowledge in Portugal, exploring opportunities that become available in any scientific or technological domain to attain the highest international standards in the creation of knowledge, and to stimulate their diffusion and contribution to improve education, health, environment, and the quality of life and well being of the general public. This mission is mainly accomplished through the financing subsequent to the evaluation of the merit of proposals presented by institutions, research teams or individuals in public open calls, and also through cooperation agreements and other forms of support in partnership with universities and other public or private institutions. With a staff of 228 persons, FCT's budget for 2009 was around 630 million €. Funding is structured around the following schemes: promotion of training and career development (fellowships, scholarships, mainly for PhD, Post-doc and PhD in industry), support of centres of excellence (associated laboratories) and research centres (institutional funding), support to infrastructures, promotion and development of scientific activity (research projects) and diffusion of scientific culture. FCT has experience in coordinated actions at national level (join calls with other Ministries) and at the European level; FCT participates in several ERA-Nets and JPIs. The research programme "All Scientific Domains" (Todos os Domínios Científicos) covers research on water issues. The research programme does not have scientific priorities, since it focuses on research excellence. It funds Universities, Research Institutes and Companies.

Survey Summary Results (per survey)
<ul style="list-style-type: none"> • FCT: All Scientific Domains <ul style="list-style-type: none"> ○ Total declared funding on water issues (M€/year): 1,75 ○ Webpage: http://alfa.fct.mctes.pt/fct.phtml.en ○ Average duration of a project (months): 36 ○ Average budget of a project (k€): 100
Country orientation towards JPI participation
<ul style="list-style-type: none"> • Country orientation to JPI objectives (summarizing results of all programmes): <ul style="list-style-type: none"> ○ Bio-based economy: medium ○ Sustainable ecosystems: medium ○ Healthier water systems: medium ○ Closing water cycle gap: medium • Possible to fund foreign organizations? No • Possible to allocate funds to Transnational programmes? Yes

RO Romania	JPI Partner, EU Member State	
		

The National Authority for Scientific Research (NASR or [ANCS](#)) is the specialised organisation of the central public administration responsible for coordination and implementation of R&D activities in Romania. NASR is a public institution, financed from national budget. The rationale to establish the NASR emerged from the requirement to promote the development of the knowledge-based society. Given the relative large gap in research and technology development between Romania and the EU average, NASR assumed the mission to act as the executive manager of the Romanian government's decision to rapidly increase the public support for RTD towards the Lisbon "3% for RTD" ambitious goal.

The NASR's responsibility is to provide strategic and tactical planning and objectives, and to define, apply, monitor and assess all policies in order to reach the national objectives on scientific research and technological development.

NASR mission is to elaborate, apply, monitor and evaluate research, development and innovation policies in compliance with strategy and governing program, with the aim to ensure the enlargement of RDI national and international patrimony, sustainable development access on domestic, European, and global markets, realizing the knowledge base information society, satisfy citizens' needs and increase their quality of life.

The roles and responsibilities of NASR include the definition of a methodological, functional, operational and financial framework to apply policies; it also harmonises the national law with the EU and assumes the *acquis communautaire*. NASR ensures communication with the other public authorities in order to realize the coherence of the Governmental policies with the society and its citizens.

NASR operates under the following functions:

- Politic: to present and unify political points of view regarding research, development and innovation;
- Strategic: to plan strategically and ensure the basis and implementation of policies in the research, development and innovation field;
- Administrative: to foresee, plan, allocate, supervise and evaluate the use of resources for the implementation of policies in the research, development and innovation field;
- Policy monitoring, evaluation and control in research, development and innovation.

Regarding strategic documents, it has to be emphasised that the National R&D Strategy (2007 – 2013) was approved by Governmental Decision 217/2007. Its strategic objectives are:

1. Promotion knowledge creation and S&T development, aiming at obtaining high level, internationally competitive, S&T results;
2. Increase the competitiveness of the Romanian economy, by strengthening the knowledge and S&T transfer towards companies;
3. Increase the quality of life, by development of S&T solutions with strong social impact.

The National Plan for Research, Technological Development and Innovation (PN II) is the main programme by which Romanian Government implements the National Strategy for RDI. PN II is implemented in the 2007-2013 period. The reason for choosing this timeframe was to overlap it with the 7th Framework Programme of the European Union (2007-2013) and Structural funds which are carried out in the same period of time. It is for the first time ever that the R&D sector has a medium term guiding document which serves as

basis for further development. Priority domains and research directions were defined as a result of a foresight exercise that has been carried out during 2006.

PN II aims to achieve the three strategic objectives of the National RDI System:

1. Knowledge creation, respectively to achieve leading edge scientific and technological results, competitive at global level, in order to increase the international visibility of Romanian research sector and subsequently to transfer results in economy.
2. Increasing the competitiveness of Romanian economy by innovation, with impact at company level and by transferring knowledge in economy.
3. Increasing quality of life, respectively to find technical and scientific methods which support social development and improve its human dimension.

PN II consists of 6 specific programs: Human Resources, Capacities, Ideas, Partnerships in priority S&T domains, Innovation and Supporting institutional performance. The total Programme budget is 15.000 M lei (approximately 4.800 M€), entirely covered by the national (public) budget. This budget is divided into a series of scientific priorities which comprise the water issues considered in the JPI, but do not assign specific budget for them. The programme manager for PN II is [UEFISCDI](#), the Executive Unit for Higher Education, Research and Development and Innovation Funding.

The Core program (Nucleu – RO) has the main objective of funding participants' own R&D program, made up of several R&D projects that fit the overall strategy of each field of science. It ensures the basic funding for a limited number of national R&D organisations. Beneficiaries can be public research units which are part of the National R&D system. R&D project components of each Nucleus program cannot be submitted for funding to other programs. Each R&D unit eligible must submit only one Nucleus program. Eligible R&D units that are under the co-ordination of other ministries, have to submit their own programs only agreed by their coordinating ministries and approved by NASR. Within a year, the fund for Nucleus program of an R&D unit cannot be lower than 20% and cannot exceed 60% of their incomes from R&D activities during the past year expressed in real terms. The program has no specific duration; each project proposed by each institution can be annual or multiannual. This program is designed to ensure the basic funding of National R&D Institutes, without altering the principle of competition.

Survey Summary Results (per survey)	
<ul style="list-style-type: none"> • National Plan for Research, Technological Development and Innovation, PN II <ul style="list-style-type: none"> ○ Total declared funding (M€/year): n/a ○ Average duration of a project (months): 36 ○ Average budget of a project (k€): 500 	
Country orientation towards JPI participation	
<ul style="list-style-type: none"> • Country orientation to JPI objectives (summarizing results of all programmes): <ul style="list-style-type: none"> ○ Bio-based economy: medium ○ Sustainable ecosystems: high ○ Healthier water systems: high ○ Closing water cycle gap: medium • Possible to fund foreign organizations? No • Possible to allocate fund Transnational programmes? In some programmes, like in the ERANETs. 	

ES Spain	JPI Partner, EU Member State, Surveyed Funding: 20.0 M€/yr	
		 MICINN

MICINN is the Ministry responsible for research, development and innovation in Spain. Three Directorate Generals are directly related to this JPI, covering the areas of Research, Technology Transfer and International Affairs. Evaluation of research and development proposals partially relies on ANEP, the [National Agency for Evaluation and Prospective](#). Within the *Plan Nacional de I+D+i* - [Spanish National Plan for Research, Development and Innovation](#) - water research is mainly funded through the National Programme for Fundamental Research. Other Programmes related to Innovation, applied research or International activities devote additional funds to water issues.

The current National Plan represents a continuation and refinement of [previous National Plans](#) dating from 1988. During these years, administrative procedures have changed to provide more flexibility to scientists, evaluation procedures have been refined and the requirements of scientific excellence have increased. The National Plan has always represented the major opportunity for RTD funding at the National level, although in the last 20 years the research funding capacity of the regional governments has increased.

The National Plan covers all areas of science and technology. There are no scientific priorities as such, although five major horizontal strategic areas have been identified: 1) Health, 2) Biotechnology, 3) Energy and climate change, 4) Information technologies, and 5) Nanoscience and new industrial materials and processes. Water issues are partially related to some of them.

The National Programme for Fundamental Research funds research projects targeting Universities and Research Institutes. These projects are intended to address scientific and technological problems identified within the scientific community. Stakeholders can be involved, but funding can only be applied to two types of private entities: Technological Centres and non-profit institutions. Proposal evaluation focuses on scientific and technological excellence. Cooperation with international institutions is foreseen, but in general these can not have a budget under the Programme. The most common way of International Participation is through the adscription of individual foreign researchers.

Innovation activities can be funded through a number of specific calls for proposals, including the INNPACTO and CENIT projects, as well as subsidies to Technology Platforms. These activities imply funding to public research and innovation actors and either funding or credit lines to private companies. National organizations are targeted in these programmes, and evaluation takes innovation into consideration, assigning less importance to scientific excellence.

Regional governments within Spain have a significant capacity to fund research and innovation. Regional research funding programmes often selected and funded proposals between 1990 and 2005. In the last years, however, a number of these programmes have evolved to provide basal funding to outstanding research groups. Regional programmes on water are not known, and the funding capacity of these programmes is much smaller than that of the National Plan.

Survey Summary Results (per survey)

- [National Programme for Fundamental Research](#)
 - Total declared funding (M€/year): 13.0
 - Average duration of a project (months): 36
 - Average budget of a project (k€): 115
- [Innovation programmes: INNPACTO and Technology Platforms](#)
 - Total declared funding (M€/year): 2.6
 - Average duration of a project (months): 36
- [CDTI \(Centre for Technological and Industrial Development\)](#)
 - Total declared funding (M€/year): 5.39
 - Average duration of a project (months): 24

Country orientation towards JPI participation

- Country orientation to JPI objectives (summarizing results of all programmes):
 - Bio-based economy: high
 - Sustainable ecosystems: high
 - Healthier water systems: high
 - Closing water cycle gap: high
- Possible to fund foreign organizations? No
- Possible to allocate fund Transnational programmes? Not for the specified programmes, although experience has been accumulated through the ERANET schemes.

TR Turkey	JPI Partner, Associated Country, Surveyed Funding: 4.1 M€/yr	
	 The Scientific and Technological Research Council of Turkey	

[TÜBİTAK](#) is the leading agency for management, funding and conduct of research in Turkey. The Council is an autonomous institution and is governed by a Scientific Board whose members who are selected from prominent scholars from universities, industry and research institutions. TÜBİTAK is responsible for promoting, developing, organizing, conducting and coordinating research and development in line with national targets and priorities. TÜBİTAK acts as an advisory agency to the Turkish Government on science and research issues, and is the secretariat of the Supreme Council for Science and Technology, the highest S&T policy making body in Turkey. Setting its vision as to be an innovative, guiding, participating and cooperating institution in the fields of science and technology, which serves for improvement of the life standards of Turkish society and sustainable development of Turkey, TÜBİTAK not only supports innovation, academic and industrial R&D studies but also in line with national priorities develops scientific and technological policies and manages R&D institutes. Furthermore, TÜBİTAK funds research projects carried out in universities and other public and private organizations, conducts research on strategic areas, develops support programs for public and private sectors, publishes scientific journals, popular science magazines and books, organizes science and society activities and supports undergraduate and graduate students through scholarships. More than 1,500 researchers work in 15 different research institutes of TÜBİTAK where contract research as well as targeted and nation-wide research is conducted.

Four Directorates are related to this JPI, covering the areas of Technology and Innovation, Academic Research, Policy and International Cooperation.

The Support Programme for Scientific and Technological Research Projects (1001) was established to support research for generating new information, interpreting scientific findings, or solving technological problems on a scientific basis, and projects with advanced technology applications. The purpose of the programme is to increase Turkey's competitive capacity in the international market within prioritised areas. Universities and public and private institutions can apply for this programme.

[International Industrial R&D Projects Grant Program](#) (1509) is designed to encourage Turkish companies to carry out international projects such as EUREKA, EUROSTARS and European Union Framework Programmes. Any Turkish company with one or more partners from participating countries can apply for funding. Project application should be made simultaneously with the application to the international joint programme or at most in one month after.

Other Support Programmes of TÜBİTAK devote additional funds for research and innovation in water only for national research. This is the case of the [Support Programme for Scientific and Technological Research Projects](#) or the [Public Sector Research and Development Projects Funding Programme](#).

Water as a research area is also prioritised in National Science, Technology and Innovation Strategy (2011-2016) which is prepared by TÜBİTAK. The vision of Turkey during the upcoming National Science, Technology and Innovation Strategy (UBTYS) 2011-2016 is to contribute to new knowledge and develop innovative technologies to improve the quality of life by transforming the former into products, processes, and services for the benefit of the country and humanity. In this regard the studies have been conducted to prepare National R&D and Innovation Strategy for Water in accordance with the decision of Turkish Supreme Council for Science and Technology.

Survey Summary Results (per survey)

- [TUBITAK: 1509 - International Industrial R&D Projects Grant Programme](#)
 - Total declared funding on water issues (M€/year): The programme has not funded water research projects up to now. However it is open to fund water research projects and virtual common pot, and has a overall budget of 15 M€/year to fund international industrial R&D projects in any research areas. The water research is funded by the other programme specific to industries but only for national use.
 - Average duration of a project (months): 36
 - Average budget of a project (k€): 500
- [The Support Programme for Scientific and Technological Research Projects \(1001\)](#)
 - Total declared funding on water issues (M€/year): 1.3
 - Average duration of a project (months): 24-36
 - Average budget of a project (k€): 60 k€/year
- [Public Sector Research and Development Projects Funding Programme](#)
 - Total declared funding on water issues (M€/year): 2.8 (The programme doesn't have a fixed budget/year, the average values are given. It is not possible for the Programme to allocate budget for transnational activity)
 - Average duration of a project (months): 48
 - Average budget of a project (k€): 1000

Country orientation towards JPI participation

- Country orientation to JPI objectives (summarizing results of all programmes):
 - Bio-based economy: high
 - Sustainable ecosystems: high
 - Healthier water systems: high
 - Closing water cycle gap: high
- Possible to fund foreign organizations? No
- Possible to allocate funds to Transnational programmes? TUBITAK can participate to transnational programmes provided that there is no transnational money transfer. Only "The Support Programme for Scientific and Technological Research Projects" and "International Industrial R&D Projects Grant Programme" allow to participate in transnational programmes by using virtual common pot.

UK United Kingdom	JPI Observer, EU Member State, Surveyed Funding: 11.0 M€/yr	
	  	  

The [Business, Innovation and Skills](#) (BIS) Department of the Government of the United Kingdom pursues global excellence in science and research to help the UK maintain economic prosperity and address key global and domestic challenges, such as climate change and security. Innovation helps BIS deal with complex challenges and drive growth by improving productivity and R&D. The BIS Department coordinates scientific efforts in the country. Responsibilities for water related research are distributed across devolved governments (Scotland, Wales and Northern Ireland) and between different departmental interests (e.g. environment, international development). The largest funders of water research are the [Research Councils](#) and The [Department of Environment, Food and Rural Affairs](#) (DEFRA). Living with Environmental Change (LWEC) is a partnership of twenty two UK public sector funders and users of environmental research that seeks to improve coherence and effectiveness of environmental (including water) research and innovation across its member organisations.

Each year the Research Councils invest around 3,500 M€ in research covering the full spectrum of academic disciplines from the medical and biological sciences to astronomy, physics, chemistry and engineering, social sciences, economics, environmental sciences and the arts and humanities. The focus is on excellence with impact. Global research requires we sustain a diversity of funding approaches, fostering international collaborations, and providing access to the best facilities and infrastructure, and locating skilled researchers in stimulating environments. Research Council research achieves impact – the demonstrable contribution to society and the economy made by knowledge and skilled people. While each of the seven Research Councils is to some extent involved in water research, two of them are more directly related.

The [Natural Environment Research Council](#) (NERC) mission is to gather and apply knowledge, improve understanding and predict the behaviour of the natural environment and its resources. It was established in 1965. NERC funds and manages research and training in earth system science, advancing knowledge of planet Earth as a complex, interacting system. Its work covers the full range of atmospheric, earth, terrestrial and aquatic sciences. Current research programs most related to this JPI include: Changing Water Cycle (€10m over 4 years 2011-14); Storm Risk Mitigation (€5m over 5 years 2010-14) and the Water Security Knowledge Exchange Programme (1.5€ over three years 2011-14). New research programmes related to hydrological extremes are under consideration with possible start dates in 2012 or beyond.

The [Engineering and Physical Sciences Research Council](#) (EPSRC) funds research and training in engineering and the physical sciences, investing around 600 M€/yr in a broad range of subjects. EPSRC operates to meet the needs of industry and society by working in partnership with universities to invest in people and scientific

discovery and innovation. Their research programs most related to this JPI include: water system resilience; the waste, water and land management cluster; the Water for All grand challenge; and cold water cleaning.

The human dimensions to water use are addressed by the [Economic and Social Research Council](#) (ESRC), water use in agriculture and biotechnological aspects are addressed by the Biotechnology and Biological Sciences Research Council (BBSRC), while the health aspects are addressed by the Medical Research Council (MRC).

DEFRA makes policy and legislation, and works with others to deliver policies in areas such as: the natural environment, biodiversity, plants and animals; sustainable development and the green economy; food, farming and fisheries; flood and coastal erosion risk management; and environmental protection and pollution control. DEFRA funds a large number of research projects every year. Projects are funded in a number of ways, including: competitive calls for proposals; non-competitive arrangements; and in partnership with others. Water-related research is carried out under a number of different programmes within the Department. The Water Availability and Quality Programme delivers the Government's policy priorities in the areas of water quality and supply. The Drinking Water Inspectorate R&D Programme provides credible and authoritative information on the health aspects of drinking water quality to ensure that standards and regulations protect public health. The Food and Farming Group funds a significant R&D programme on water quality and use in farming, through the Sustainable Water Management Programme. The Department also funds a significant Flood and Coastal Erosion Risk Management R&D programme.

Regulation of the water environment lies primarily with devolved Environment Agencies for [England and Wales](#) (EA), [Scotland](#) (SEPA) and [Northern Ireland](#) (DENI). These agencies are interested in knowledge exchange and networking to provide the evidence to support their operations.

Survey Summary Results (per survey)

- [Department of Environment, Food and Rural Affairs \(DEFRA\)](#)
 - Water Availability and Quality Programme
 - Total declared funding on water issues (M€/year): 2.9
 - Average duration of a project (months): 18
 - Average budget of a project (k€): 145
 - Drinking Water Inspectorate
 - Total declared funding on water issues (M€/year): 1.1
 - Food and Farming Group
 - Total declared funding on water issues (M€/year): 7.0

Annex III. Letters of Intent by Partner Countries

Letters of intent were received on time for 9 of the 14 partners. Letters were not received on time from Cyprus, Ireland, Italy, Hungary and Romania. Received letters are reproduced in the following pages. In some cases, more than one letter was received from a partner Country. This is often due to the implication of different national programmes.

Ms. Hanne Haarup Thomsen, Head of Office
Danish Agency for Science Technology and Innovation
Bredgade 40, 1260 København K
Denmark

Copenhagen, December 6th 2010

LETTER OF INTENT

With regard to the

**"WATER CHANGES FOR A CHANGING WORLD"
JOINT PROGRAMMING INITIATIVE**

The Danish Agency for Science Technology and Innovation (DASTI, hereafter) is the owner of the Research Programme "The Danish Council for Strategic Research". DASTI is deeply committed to the construction of the European Research Area, playing an active role in the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices the coordination of national tools, ideally, even by the joint setup of new research scenarios. It is our understanding that all these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, DASTI currently runs national programmes supporting applied and/or basic research on hydrological sciences, and participates in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of DASTI to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). DASTI will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives. The representation of DASTI as owner of the Research Programme "The Danish Council for Strategic Research" at the Governance Institutions of the JPI will be as follows:


- The Representative at the Governing Board, where strategic decisions on Joint Programming activities (such as establishing strategic research lines, launching calls or financing activities) will be made, will be Mr. Christian Walther Bruun.
- The Representative at the Executive Board, where the strategy defined and issued by the Governing Board will be implemented, will be Dr. Jørn Rasmussen.

In the case that different Representatives are nominated by different Institutions within my country, coordination will be sought to nominate one National Delegate at the Governing Board and another one at the Executive Board. I am confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,

**Forsknings- og
Innovationsstyrelsen**

Bredgade 40
DK-1260 København K


Ms. Hanne Haarup Thomsen
Head of Office,
Danish Agency for Science Technology and Innovation

Academy of Finland

Letter of Intent

1 (3)

10.3.2011

2/6/14/2011

Enrique Playan
Estacion Experimental de Aula Dei, CSIC
Apdo. 202
50080 Zaragoza
Espana - Spain

LETTER OF INTENT

with regard to the

"WATER CHALLENGES FOR A CHANGING WORLD" JOINT PROGRAMMING INITIATIVE

The Academy of Finland (AKA, hereafter) is the owner of the Research Programme "Sustainable Management of Aquatic Resources". AKA is deeply committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, AKA currently runs national programmes supporting applied and/or basic research on water sciences and technologies, and participates in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of AKA to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). AKA will participate in part or all of the activities, following a case by case analysis of their adaptation to its long-term objectives. The representation of AKA as owner of the Research Programme "Sustainable Management of Aquatic Resources" at the Governance Institutions of the JPI will be as follows:

- The Representative at the Governing Board, where strategic decisions on Joint Programming activities (such as establishing strategic research lines, launching calls or financing activities) will be made, will be **Dr. Laura Raaska**, Director, Biosciences and Environment Research Unit, Academy of Finland
- The Representative at the Executive Board, where the strategy defined and issued by the Governing Board will be implemented, will be **Dr. Kata-Riina Valosaari**, Science Adviser, Biosciences and Environment Research Unit, Academy of Finland




VilhoVuorenkatu 6, PO Box 99, FI-000501 Helsinki, Finland. Tel. +358 9 774 881. Fax +358 9 7748 8299, firstname.lastname@aka.fi, www.aka.fi/en

10.3.2011

In the case that different Representatives are nominated by different Institutions within my country, coordination will be sought to nominate at least one National Delegate at the Governing Board and one National Delegate at the Executive Board. We are confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,



Mr Ossi Malmberg
Vice President, Administration
Academy of Finland

10.3.2011

Annex 1. Co-ordinates of the Representatives

Name: Dr. Laura Raaska
Position: Director, Biosciences and Environment Research Unit
Institution: Academy of Finland
Address: P.O. Box 99 (Vilhonvuorenkatu 6), FI-00501 Helsinki, Finland
Phone: +358 9 774 881, GSM +358 50 563 8006
Email: laura.raaska@aka.fi

Name: Dr. Kata-Riina Valosaari
Position: Science Adviser, Biosciences and Environment Research Unit
Institution: Academy of Finland
Address: P.O. Box 99 (Vilhonvuorenkatu 6), FI-00501 Helsinki, Finland
Phone: +358-9-7748 8216, GSM +358 50 354 3659
Email: kata-riina.valosaari@aka.fi

Prof. Erkki Kemppainen
Director General
MTT Agrifood Research Finland
31600 Jokioinen
Finland

Jokioinen, March 4th 2011

LETTER OF INTENT

With regard to the

"WATER CHALLENGES FOR A CHANGING WORLD" JOINT PROGRAMMING INITIATIVE

MTT Agrifood Research Finland (MTT) is the owner of the Research Programme "Water-friendly Agriculture". MTT is deeply committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, MTT currently runs national programmes supporting applied and/or basic research on water sciences and technologies, and participates in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of MTT to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). MTT will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives.

We are confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,



Prof. Erkki Kemppainen
Director General
MTT Agrifood Research Finland

MTT 31600 Jokioinen Vaihde (03) 41 881	Tervamäentie 179 05840 Hyvinkää Vaihde (019) 457 5700	Hälsälantie 31 A 71750 Maaninka Vaihde (017) 264 4800	Tokvonnantie 518 21500 Pirkkää Vaihde (02) 477 2200	Tutkimusasemantie 15 32400 Ruuska Vaihde (08) 2708 4500	Antinmäentie 1 41330 Viitasaari Vaihde (014) 339 6800	Alapääntie 104 61400 Yläsalo Vaihde (06) 474 6400
Lauttatie 13 00410 Helsinki Vaihde (09) 56 080	Salmijärventie 2, PL 44 69101 Kannus Vaihde 0400 269 384	Karhentie 2 A 50600 Mäkielä Vaihde (015) 321 220	Etelärantatie 55 96300 Rovaniemi Vaihde (03) 41 881	Kipinätie 16 88600 Sotkamo Vaihde (08) 666 1741	Vakolantie 55 03400 Vihti Vaihde (09) 224 251	Varsenontie 63 32100 Ypäjä Vaihde (02) 753 5550

www.mtt.fi



Prof. Björn Klöve
Professor, doctoral programme director
University of Oulu
Pentti Kaiteeran katu 1
FIN-90014 Univ. Oulu
Finland

Oulu 2.3.2011

LETTER OF INTENT

With regard to the

"WATER CHALLENGES FOR A CHANGING WORLD" JOINT PROGRAMMING INITIATIVE

The VALUE doctoral programme (VALUE, hereafter) is deeply committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build-up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, VALUE currently runs national programmes supporting applied and/or basic research on water sciences and technologies, and participates in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of VALUE to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). VALUE will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives.

We are confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,

A handwritten signature in blue ink, appearing to read "Björn Klöve".

Prof. Björn Klöve
VALUE doctoral programme



UNIVERSITY of OULU
OULUN YLIOPISTO



TAMPERE UNIVERSITY OF TECHNOLOGY
Department of Chemistry and Bioengineering

Dr. Jaakko Puhakka
Professor
Head, Department of Chemistry and Bioengineering
Tampere University of Technology
PO Box 541
33101 Tampere
FINLAND

Tampere, March 9th 2011

LETTER OF INTENT

With regard to the

"WATER CHALLENGES FOR A CHANGING WORLD" JOINT PROGRAMMING INITIATIVE

Tampere University of Technology (TUT, hereafter) is the owner of the Research Programme "WATER CHALLENGES FOR A CHANGING WORLD". TUT is deeply committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, TUT currently runs national programmes supporting applied and/or basic research on water sciences and technologies, and participates in water related networks and projects in the Framework Programme. These programmes deal particularly with the following themes:

- *Water and wastewater microbiology and biotechnology (Prof. J. Puhakka)*
- *Water and wastewater engineering and treatment (Prof. T. Tuhkanen)*
- *Water Services Development, Management and Policy (Adjunct prof. T. Katko).*

As a consequence, it is the willingness of TUT to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). TUT will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives.

We are confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,

Dr. Jaakko Puhakka
Professor
Head, Department of Chemistry and Bioengineering

Mailing address
P.O.Box 541
FI-33101 Tampere, Finland

Visiting address
Korkeakoulunkatu 8
33720 Tampere

Tel Int +358 3 3115 11
Fax Int +358 3 3115 2869

www.tut.fi/keb



direction de l'action scientifique
et technique

Mr. Patrick Lavarde
Director General
ONEMA – The French National Agency for Water and Aquatic Ecosystems
5, square Felix Nadar. 94300 Vincennes
France

Vincennes, 15th February 2011

LETTER OF INTENT

With regard to the

“WATER CHALLENGES FOR A CHANGING WORLD” JOINT PROGRAMMING INITIATIVE

The French National Agency for Water and Aquatic Ecosystems (ONEMA, hereafter) is the owner of the Research Programme “Research on continental and littoral waters and related environments - France”. ONEMA is deeply committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, ONEMA currently runs national programmes supporting applied and/or basic research on water sciences and technologies, and participates in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of ONEMA to participate in the definition, implementation and development of the “Water Challenges for a Changing World” Joint Programming Initiative (JPI). ONEMA will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives. The representation of ONEMA as owner of the Research Programme “Research on continental and littoral waters and related environments - France” at the Governance Institutions of the JPI will be as follows:

- The Representative(s) at the Governing Board, where strategic decisions on Joint Programming activities (such as establishing strategic research lines, launching calls or financing activities) will be made, will be Mr Jean Philippe Torterotot, with Mr Wolfram Kloppmann as a deputy.
- The Representative at the Executive Board, where the strategy defined and issued by the Governing Board will be implemented, will be Mr Jean Philippe Torterotot, with Mr Wolfram Kloppmann as a deputy.

In the case that different Representatives are nominated by different Institutions within my country, coordination will be sought to nominate at least one National Delegate at the Governing Board and one National Delegate at the Executive Board. I am confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,

Mr. Patrick Lavarde
Director General

The Netherlands



Ministry of Economic Affairs,
Agriculture and Innovation

> P.O. Box 20101 2500 EC Den Haag The Netherlands

Mr. Michel SCHOUPPE
European Commission
Directorate General for Research and Innovation
Unit I.2 - Environmental Technologies
Rue du Champ de Mars, 21
B-1049 Brussels
Office: CDMA 03/23

**Ministry of Economic Affairs,
Agriculture and Innovation**

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Dealt with by
mevr. K.C.J. Biemans MA
T +31 (0)70 379 6970
F +31 (0)70 379 6199
k.biemans@minez.nl

Our ref.
EL&I / 11057465

Your ref.

Encl.

Date **- 20 APR. 2011 -**

Re Letter of intent with regard to the
'Water Challenges for a Changing World' Joint Programming Initiative

The Dutch ministry of Economic Affairs, Agriculture and Innovation is committed to the construction of the European Research Area. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is my understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Currently the ministry is, in close cooperation with stakeholders from the business and scientific world, undertaking a full revision of national programmes supporting applied and/or basic research on water sciences and technologies.

Without wishing to advance on the above mentioned revision the ministry is willing to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). The ministry will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives. The representation of the ministry at the Governance Institutions of the JPI will be as follows:

- The Representative at the Governing Board, where strategic decisions will be made (such as establishing strategic research lines, launching calls or financing activities) will be myself, Mrs. Renée Bergkamp.
- The Representative at the Executive Board, where the strategy defined and issued by the Governing Board will be implemented, will for the near future be Mr. Hans Kuypers.

I am confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,

R.M. Bergkamp
Director-General of Enterprise and Innovation



Enrique Playán
Profesor de Investigación
Estación Experimental de Aula Dei, CSIC
enrique.playan@eead.csic.es

Contact person/tel.
Per Backe-Hansen/+47 22037303

Our ref.
201102008
Your ref.

Oslo, 7 April 2011

LETTER OF INTENT WITH REGARD TO THE "WATER CHALLENGES FOR A CHANGING WORLD" JOINT PROGRAMMING INITIATIVE

The Research Council of Norway (hereafter RCN) is the owner of the Research Programme "MILJO2015". RCN is deeply committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, RCN currently run national programme activities supporting applied and/or basic research on water sciences and technologies, and encourage national participation in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of RCN to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). RCN will participate in all or parts of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives. The representation of RCN as owner of the Research Programme "MILJO2015" at the Governance Institutions of the JPI will be as follows:

- The Representative(s) at the Governing Board, where strategic decisions on Joint Programming activities (such as establishing strategic research lines, launching calls or financing activities) will be made, will be Programme Coordinator Per Backe-Hansen.

Norway has also nominated Mr. Øyvind Walsø, Head of Section for Water Environment, Norwegian Directorate for Nature Management, representing the Norwegian Ministry of Environment as a National Delegate to the Governing Board.

Norges forskningsråd/
The Research Council of Norway
Stensberggt. 26
Postboks 2700 St. Hanshaugen
NO-0131 Oslo

Telefon +47 22 03 70 00
Telefaks +47 22 03 70 01
post@forskningsradet.no
www.forskningsradet.no
Org.nr. 970141669

All post og e-post som inngår i
saksbehandlingen, bes adressert
til Norges forskningsråd og ikke
til enkeltpersoner.

Kindly address mail and e-mail to
the Research Council of Norway,
not to individual staff.

I am confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours sincerely,
The Research Council of Norway

Ch M. Abildgaard
Dr. Christina I. M. Abildgaard
Director



FCT Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

PORTUGAL LETTER OF INTENT

With regard to the

**"WATER CHALLENGES FOR A CHANGING WORLD"
JOINT PROGRAMMING INITIATIVE**

Lisbon, 23rd March 2011

006615 MAR 23 '11

The FOUNDATION FOR SCIENCE AND TECHNOLOGY (FCT, hereafter), the national research funding agency, is committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, FCT currently runs national programmes supporting applied and/or basic research on water sciences and technologies, and participates in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of FCT to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). FCT will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives. The representation of FCT at the Governance Institutions of the JPI will be as follows:

- The Representative(s) at the Governing Board, where strategic decisions on Joint Programming activities (such as establishing strategic research lines, launching calls or financing activities) will be made, will be Doctor Catarina Resende, Executive Coordinator of FCT Scientific Council for Natural and Environmental Sciences.
- The Representative at the Executive Board, where the strategy defined and issued by the Governing Board will be implemented, will be Doctor Catarina Resende, Executive Coordinator of FCT Scientific Council for Natural and Environmental Sciences.

I am confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,


Lígia Amâncio
FCT Vice - President



SECRETARÍA DE ESTADO
DE ESTADO DE INVESTIGACION
DIRECCIÓN GENERAL DE
INVESTIGACION Y GESTION DEL
PLAN NACIONAL DE I+D+i

Dr Montserrat Torné I Escasany
Director General for Research Projects
Ministry of Science and Innovation
C/ Ramirez de Arellano, 29
24070 Madrid (Spain)

Madrid, 17th February 2011

LETTER OF INTENT

With regard to the

**"WATER CHALLENGES FOR A CHANGING WORLD"
JOINT PROGRAMMING INITIATIVE**

The Ministry of Science and Innovation of Spain (MICINN, hereafter) is the owner of the Research Programme "Plan Nacional de I+D+i". MICINN is deeply committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, MICINN currently runs national programmes supporting applied and/or basic research on water sciences and technologies, and participates in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of MICINN to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). MICINN will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives. The representation of MICINN as owner of the Research Programme "Plan Nacional de I+D+i" at the Governance Institutions of the JPI will be as follows:

- The Representative(s) at the Governing Board, where strategic decisions on Joint Programming activities (such as establishing strategic research lines, launching calls or financing activities) will be made, will be Dr Anibal Gonzalez.
- The Representative at the Executive Board, where the strategy defined and issued by the Governing Board will be implemented, will be Dr Enrique Playan.

In the case that different Representatives are nominated by different Institutions within my country, coordination will be sought to nominate at least one National Delegate at the Governing Board and one National Delegate at the Executive Board. I am confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,


Dr Montserrat Torné I Escasany
Director General for Research Projects





MINISTERIO
DE CIENCIA
E INNOVACIÓN

Carlos Martínez Riera

Secretaría de Estado de Investigación

Director General de Cooperación Internacional y Relaciones
Institucionales

LETTER OF INTENT
With regard to the
"WATER CHALLENGES FOR A CHANGING WORLD"
JOINT PROGRAMMING INITIATIVE

The representation of MICINN as owner of the Research Programme "National R&D&I Plan" at the Governance Institutions of the JPI will be as follows:

The Representatives at the Governing Board are:

Voting person:

Mr. Anibal González
Deputy Director General for Research Projects
Directorate General of Research and Management of the National R&D&I Plan
MICINN
C/ Ramirez Arellano, 29
28071 Madrid, Spain

Alternate person:

Joaquín Serrano
Deputy Director General for European Projects
General Directorate of International Cooperation and Institutional Relations
MICINN
C/ Albacete, 5
28027 Madrid

Yours faithfully,

dgci@micinn.es

Albacete, 5 5ª planta Sur
E-28027 Madrid
Tel.: +34 91 603 71 58
Fax: +34 91 603 70 88

Ankara, 10/01/2011

LETTER OF INTENT

With regard to the

**"WATER CHALLENGES FOR A CHANGING WORLD"
JOINT PROGRAMMING INITIATIVE**

The Scientific and Technological Research Council of Turkey (TUBITAK, hereafter) is the owner of the Research Programme "The Support Programme for Scientific and Technological Research Projects (1001)". TUBITAK is deeply committed to the construction of the European Research Area, wishing to facilitate actively and contribute to the definition and development of common research and innovation agendas, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

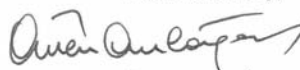
Additionally, from the recognition of the growing pressure upon water resources – quantity and quality – and the resulting relevance of adequate water governance, TUBITAK currently runs national programmes supporting applied and/or basic research on water sciences and technologies, and participates in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of TUBITAK to participate in the definition, implementation and development of the "Water Challenges for a Changing World" Joint Programming Initiative (JPI). TUBITAK will participate in all or part of the foreseen activities, following a case by case analysis of their adaptation to its long-term objectives. The representation of TUBITAK as owner of the Research Programme "The Support Programme for Scientific and Technological Research Projects (1001)" at the Governance Institutions of the JPI will be as follows:

- The Representative at the Governing Board, where strategic decisions on Joint Programming activities (such as establishing strategic research lines, launching calls or financing activities) will be made, and the Representative at the Executive Board, where the strategy defined and issued by the Governing Board will be implemented, will be Mrs. Meltem UNLU TOKCAER

In the case that different Representatives are nominated by different Institutions within my country, coordination will be sought to nominate at least one National Delegate at the Governing Board and one National Delegate at the Executive Board. I am confident that this Initiative will constitute an effective mean to address the water-related challenges affecting our society.

Yours faithfully,



Prof. Dr. Ömer ANLAĞAN
Vice President of TUBITAK

Annex 1. Co-ordinates of the Representative

Name: Mrs. Meltem UNLU TOKCAER
Position: Scientific Programmes Expert
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15 April 2011

Letter of Intent
for collaborating under the
Joint Programming Initiative “Water Challenges for a Changing World”

The Natural Environment Research Council (NERC) is committed to the construction of the European Research Area, wishing to facilitate and contribute to the definition and development of common research and innovation agendas, and, where appropriate, tools and programmes. Transnational cooperation in the agreed European needs will only be accessible through the sharing of good practices and the coordination of national strategies and tools. It is our understanding that these constitute key points for the build up of the Joint Programming Initiatives.

Additionally, from the recognition of the growing pressure upon water resources - quantity and quality - and the resulting relevance of adequate water governance, NERC, including its institutes such as the Centre for Ecology and Hydrology (CEH), currently run national programmes supporting applied and/or basic research on water sciences and technologies, and participate in water related networks and projects in the Framework Programme.

As a consequence, it is the willingness of NERC to participate in the definition, implementation and development of the Joint Programming Initiative (JPI) ‘Water’. For the UK, a significant benefit of the JPI Water is about co-alignment of existing activities and strategic planning, with no assumption that joint calls are required to achieve significant benefits. Therefore, the UK wishes the JPI Water to remain flexible and firmly driven by the member states themselves. Additionally there must be no assumption the JPI Water will require cross-border funding under a common pot or any other similar arrangement for pooling national funds.

NERC will participate on the Governing Board and Executive Board of the JPI Water. However, the names of our nominees to these positions are to be decided shortly.

In the case that different representatives are nominated by different institutions within the United Kingdom, NERC will co-ordinate with these UK institutions to nominate one National Delegate at the Governing Board and one National Delegate at the Executive Board. I am confident that this Initiative will constitute an effective means to address the water-related challenges affecting our society.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Philip P Newton', with a stylized flourish at the end.

Dr Philip P Newton
Director, Science Delivery
Natural Environment Research Council