"Water Challenges for a Changing World"

Joint Programming Initiative

Water JPI activities, instruments, management and procedures

June 2014

DISCLAIMER

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Table of Contents

LIST OF ABBREVIATIONS

ARC: Aqua Research Collaboration

ACQUEAU: A cluster of EUREKA (see below) dedicated to financing water innovations.

CIS-SPI Common Implementation Strategy/Science-Policy activity

CSC: Call Steering Committee

D-o-D: anticipated degree of difficulty in implementation

EIP: European Innovation Partnership

EMWIS: Euro-Mediterranean Information System on know-how in the Water sector

ESFRI: The European Strategy Forum on Research Infrastructures

EURAQUA: European Network of Freshwater Research Organizations

EUREKA: A European intergovernmental organisation for market-driven industrial R&D

EUREAU: the European Federation of National Associations of Water and Wastewater Services

EWA: European Water Association

FACCE: JPI on Agriculture, Food Security and Climate Change

GPC: Group for Joint Programming

H2020: Horizon2020

HDHL: JPI on a Healthy Diet for a Healthy Life

IGBP: International Geosphere and Biosphere Programme

IHDP: International Human Dimensions Programme of Global Environmental Change

IP: Implementation Plan

JAIP: Joint Activities Action Plan

JPI: Joint Programming Initiative

KH: Knowledge Hub

MACSUR: Modelling European Agriculture with Climate Change for Food Security

RDI: Research, Development and Innovation

RI: Research Infrastructure

RTD: Research, Technology and Development

SAG: Stakeholders Advisory Board

SME: Small and Medium Enterprise

SRIA: Strategic Research and Innovation Agenda

STB: Scientific and Technical Board

WFD: Water Framework Directive

WssTP: Water supply and sanitation Technology Platform

EXECUTIVE SUMMARY

There are currently ten European Joint Programming Initiatives (JPIs) covering varied fields from Degenerative Diseases to the Oceans. The Water JPI is a voluntary Alliance of 25 countries addressing the Grand Challenge of "Achieving Sustainable Water Systems for a Sustainable Economy in Europe and Abroad". The Water JPI has the objectives of increasing coordination in European water research, development and innovation (RDI), and addresses issues such as user participation, attaining targets in the coordinated use of funds and progress in the integration of RDI agendas and activities.

This report describes the types of activities, instruments and procedures to be carried out by the programme. A set of flexible, open and adaptive instruments, suited to collaboration between partners working together, in variable geometry, are defined. This standardisation is provided for use in the work of the Water JPI and also assists clarity in communication with wider communities.

The instruments are placed into their contexts as types of activity which interface the JPI with society, improve the efficiency of research programmes and/or empower the Research, Development and Innovation actors. Procedures associated with the instruments, such as physical meetings, one/two stage Project calls and internet based events are outlined. The instruments which are carried out by the JPI partners themselves include pilot and joint calls for collaborative research, workshops (eg. to share good practice, explore strategic issues or for knowledge Exchange), webinars, mobility and infrastructure actions. Indications of the requirements and sequences of events needed to implement them are considered. Relevant instruments of the European Commission, such as Co-ordination and Support Actions, ERA-NET Cofund, Marie Skłodowska-Curie actions and Article 185 are also assessed along with those of other bodies (including regional and global initiatives). Examples of the specific instruments implemented or under consideration in the other JPIs, which may have application within the Water JPI are also described, along with the assessments and experiences in their implementation.

This document forms part of a suite of reports, which are delivered in a planned sequence by the WatEUr Co-ordination and Support Action, to support the progression of the Water JPI. The Strategic Research and Innovation Agenda (SRIA) Version 1.0 will be published in June 2014. The SRIA and this current document will feed into the development of a Joint Activities Implementation Plan (JAIP), which contains an Implementation Plan for the second half of 2014 and 2015. The overarching Implementation plan for the Water JPI will be based on the JAIP, and will extend its planning period till 2016. The first Water JPI Implementation Plan will be made available after summer 2014.

1. Introduction

1.1. Purpose and Objectives

The purpose of this document is to consider and prescribe the types of activities to be undertaken by the Water JPI. Links will be designed between these activities, fostering synergies between them across the Water Joint Programming Initiative (JPI). Funding instruments will be designed and identified, with an emphasis on research, development or innovation, or involving the whole knowledge production chain.

The objectives are to define a small set of flexible, open and adaptive instruments suited to collaboration between partners working together, in variable geometry, where they can share common priorities and agreed approaches. The instruments described will also include a range of existing "off-the shelf" instruments relevant to achieving the aims of the Water JPI, including those which are current in other parts of the RDI landscape, thereby facilitating synergies with other funding programmes.

The value of this standardisation is two-fold. It provides a mechanism for ensuring consistency and compatibility between the component parts of the Water JPI itself and also provides clarity of understanding in communication and collaboration with the wider community.

1.2. The Context of Joint Programming

The concept of JPIs emerged in 2008 (European Commission 2008), and most of the currently ten active JPIs began around 2010 and 2011. Their objectives are defined by a grand societal challenge, such as aging population, migration flows, climate change, food security, urbanisation. Multi and interdisciplinary research is an essential characteristic, as societal issues are usually driven by complex combinations of factors. Therefore solutions are rarely provided through the traditional single research and professional disciplines. This also highlights the merits in effective coordination of research efforts at European level to achieve a critical mass of resources and range of research skills to develop common solutions. JPIs seek to pool data and expertise scattered across Europe, to enable cross-border researcher mobility and training, to disseminate research findings and to speak with one voice in the international arena.

Participation in JPIs is voluntary and based on variable geometry. Member States and Associated Countries were the initial target for JPI participation. Some third countries have begun to join specific JPIs. The governance is designed to be simple and responsive, with flexible management structures. The high level decision making is by a Governing Board (populated by country delegates), which defines the rules for collaboration and the specific tasks to be realised. There is also a Steering Committee (country experts or executive officers), which has responsibility for execution of the tasks and activities.

The Strategic Research and Innovation Agenda (SRIA) is a key element of coordination of research programmes within the JPIs. It is developed via a consultation process with knowledge of the national RDI landscapes, using panels of experts (and in some cases through wider consultations). Implementation of the coordination of research programmes is usually

carried out by funding agencies in participating countries. It typically takes the form of common calls for proposals or alignment of nationally funded RDI projects, addressing priority topics identified in the SRIA.

There are also bodies and projects which draw the activities of all of the JPIs together. This includes the GPC, which is the high level Group for Joint Programming (ERAC-GPC - *Groupe de haut niveau pour la Programmation Conjointe*), and the "JPIs To Co Work" FP7 Coordination and Support Action, which has shared good practice across the JPI's (eg. Meyer and Dinges 2013). It is useful to note the table below, which has distilled some the actions and instruments which are common to many of the JPIs. The next section of this document is focussed upon the Water JPI. However, where relevant, approaches and examples from other JPIs will be described.

Actions	**Instrument**
Joint research actions	Joint research projects (calls) Foresight Research Alliances
Cross border mobility and training of human resources	Mobility of researchers PhD schools
Knowledge sharing	Sharing Knowledge platform Mapping activities and research needs identification
Networking activities	Knowledge hubs Stakeholder involvement plan
Joint research infrastructures	
Alignment of policies and programmes	
International outreach activities	

Table 1 - Actions and instruments adopted/planned by JPIs, as reported within the JPIs to co-Work Project.

1.3. Current Status of the Water JPI

The water JPI has come a long way since its official kick off in September 2010. A Vision Document was released in April 2011. This document presents the grand challenge: "Achieving Sustainable Water Systems for a Sustainable Economy in Europe and Abroad" (Water JPI 2011). Specific challenges were identified in the economic, ecological, societal and technological domains. Water JPI Objectives address the need for increased coordination in European research, development and innovation (RDI), and address issues such as user participation, attaining targets in the coordinated use of funds and progress in the integration of RDI agendas and activities. The research questions are cast in five axes: sustainable ecosystems, healthier water systems for the citizens, improving water use in the industry, the bio-based economy, and closing the water cycle gap.

The development of the Water JPI was energized with the onset of the dedicated FP7 Coordination and Support Action WatEUr ("Tackling European Water Challenges"). This three-year project covers the calendar years 2013-2015. It is bringing developments in mapping European RDI efforts, the development of the Water JPI SRIA, the Implementation of the Water JPI and Cooperation outside Europe.

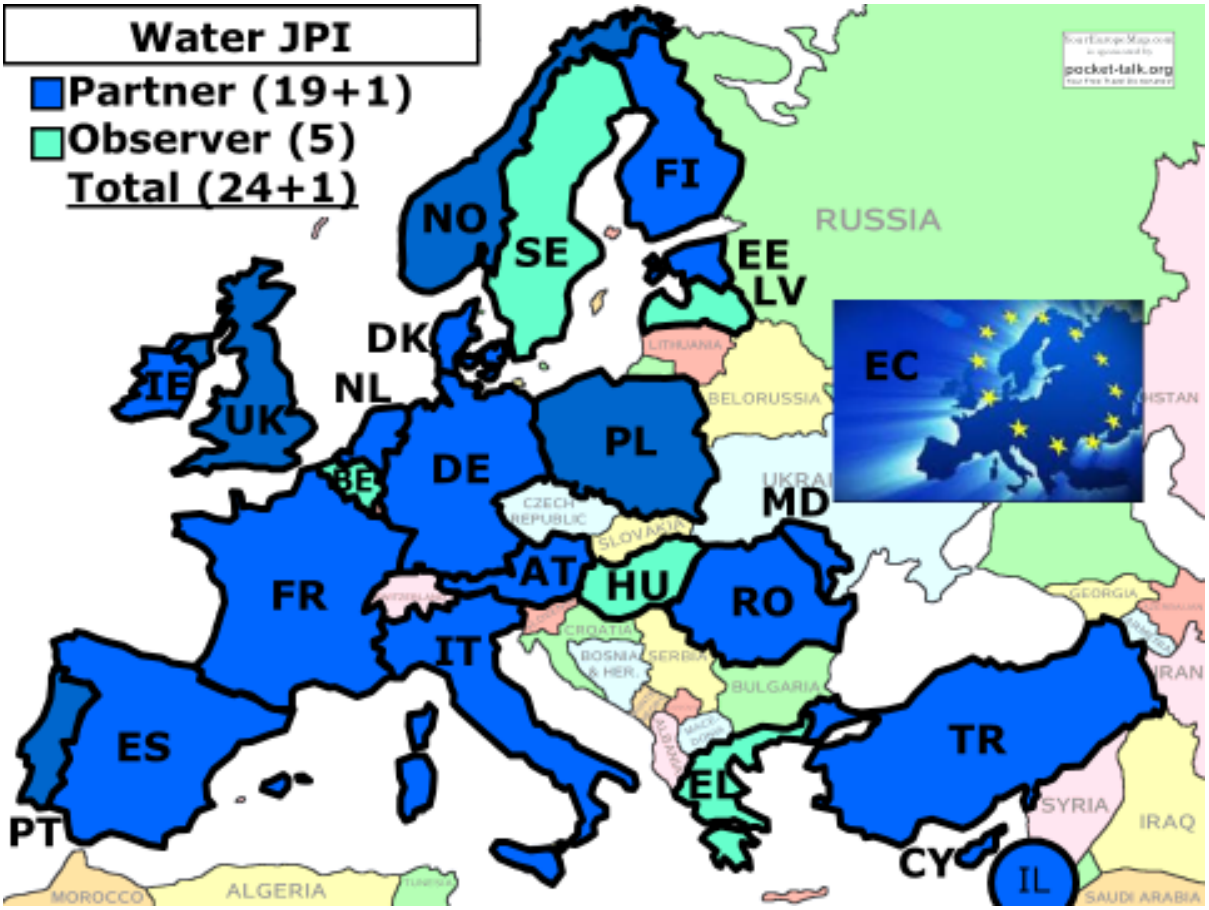


Figure 1- The Partner and Observer Countries of the Water Joint Programming Initiative

The first Water JPI mapping report was produced in 2011, based on information gathered from partner countries and other European countries. This mapping report concluded that European countries invest some 370 M€/yr in Water RDI, while the European commission invests 130 M€/yr. This results in a total investment in Europe of 500 M€/yr. Figures 2 and 3 illustrate the trends in European water research and innovation in their international context at the outset of the Water JPI.

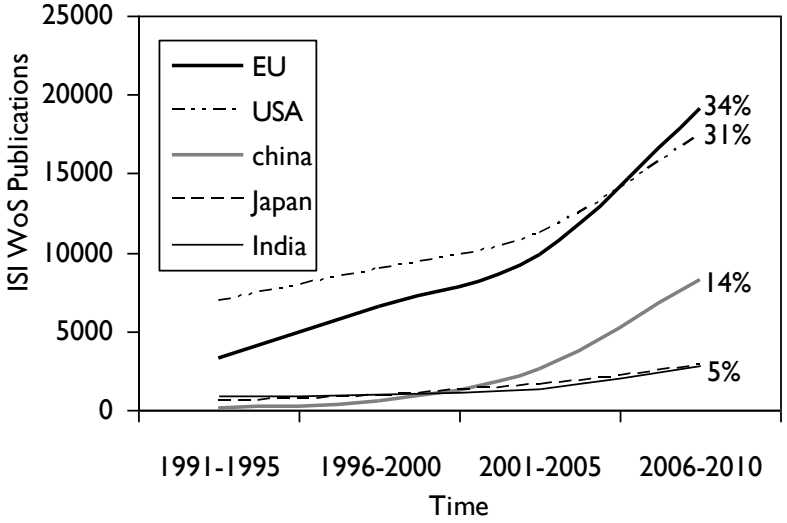


Figure 2 - European water-related scientific performance since the 1990s

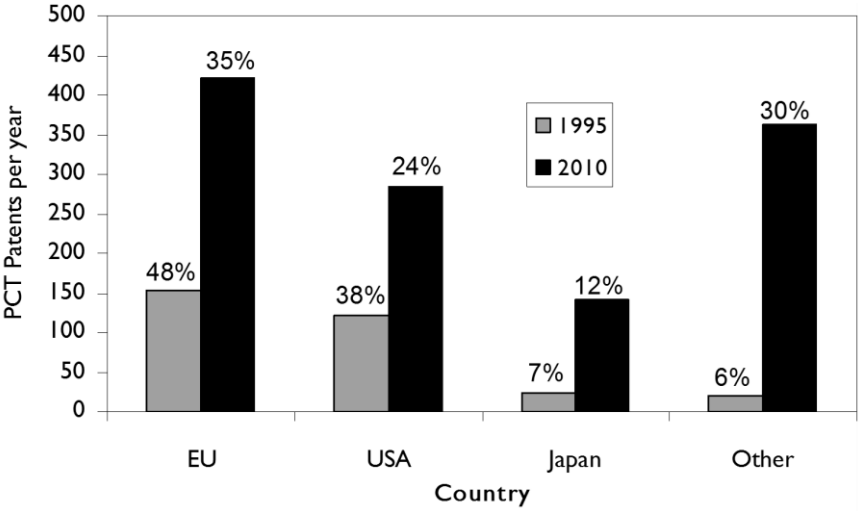


Figure 3 - Indicators of water-related innovation in Europe and the world, in terms of patents. European authorship increased from 152 to 421, although the world share of these patents decreased from 48 to 35%.

A new mapping effort is underway, with intense activity in two areas: Firstly a questionnaire being filled in by Water JPI partners and observers, as well as by other EU Member States and Associated Countries; and secondly, desk research focusing on publications and patents database analyses.

The first version of the Water JPI SRIA was released in May 2013. This version, named 0.5, represented a major collective effort towards the development of Joint Activities in the period 2013-2016 (Water JPI 2013). It led to the publication of the Water JPI Pilot Call and the interaction with Horizon 2020 stated in the 2015-2060 work programme of Societal Challenge 5. A new version of the Water JPI SRIA (version 1.0) will be released in June 2014. This document is largely based on a dedicated scoping workshop and a more extensive public consultation.

The Implementation of the Water JPI has started in parallel to the development of this document. A Pilot Call for proposals was launched on November 2013, and the received proposals were evaluated in May 2014. In addition to this Pilot Call, two ERA-NETs Cofund were published in the first Horizon 2020 work programme: one for 2014 and another one for 2015. These ERA-NETs permit the water JPI to obtain additional funds for Calls to be published in 2015 and 2016, respectively. A proposal has been submitted for the 2014 ERA-NET Cofund.

Cooperation outside Europe is progressing fast. Seven countries outside Europe have been analysed and prioritised. Contacts have already started with some of them. South Africa is the first partner outside Europe to cooperate in a Water JPI activity: the 2014 ERA-NET Cofund proposal. It is expected that more countries outside Europe will participate in joint Water JPI activities in the near future.

These activities are complemented by two additional activities: coordination and communication / dissemination. These horizontal activities are feeding the rest and providing internal communication and wide societal dissemination.

1.4. Parallel and Converging Efforts in European RDI

Many of the objectives of the Horizon 2020 programme of the European Commission have common purpose to those of the JPI. These include building critical mass, alignment and encouraging synergies between national programmes (EC 2014). Some of the instruments of the EC will be further considered later in this paper, including research and innovation grants, ERA-NETs and other forms of cofounding.

The key part of the Work Programme for water innovation is Societal Challenge 5: Climate action, environment, resource efficiency and raw materials. This Challenge funds research and innovation with the following specific objectives:

- to achieve a resource – and water - efficient and climate change resilient economy and society,
- the protection and sustainable management of natural resources and ecosystems, and

- a sustainable supply and use of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources and eco-systems.

Water innovation is one of the particular focus areas of Horizon 2020. Reference is made to key European body Strategic Implementation plans or European road maps relevant to the area. For water these are mainly the:

- Europe 2020 Resource-efficient Europe Roadmap,
- European Innovation Partnership (EIP) on Water and its Strategic Implementation Plan,
- Research gaps identified through the Water Framework Directive (WFD), Common Implementation Strategy/Science-Policy activity (CIS-SPI),
- Relevant European Technology Platforms (ETPs). For water the most relevant ETP is the European Technology Platform for Water – WssTP. The Sustainable Chemistry ETp (SUSCHEM) also has interests on the water sector.
- ACQUEAU, the EUREKA cluster for water, awarding excellent innovation projects with the EUREKA label, and
- Other Professional Associations, such as EURAQUA, EUREAU, ARC, EMWIS or EWA.

The Water JPI is strongly involved in the governance of the EIP on Water, participating at the Steering Group and at the Task Force. Coordination with the EIP on Water is quite important, since the Water JPI is a major knowledge provider to European Innovators (most of the European RDI funds come from the European Countries, and 88% of this funding is provided by Water JPI partner countries). In addition, the Water JPI funds innovation activities through a number of partner national and regional agencies and programmes.

The majority of JPIs follow the concept of a Strategic Research Agenda (SRA) or a Strategic Research and Innovation Agenda (SRIA). Whilst some JPI's have developed SRA's (eg. FACCE), JPI Oceans, JPI Urban and the Water JPI have decided to make more explicit reference to the applied research and innovation community, by use of the title 'Strategic Research and Innovation Agenda'. The stage of development of these agendas varies in each JPI. There are also variations in the degrees of interaction between SRIA development, in the establishment and continuation of networks, mapping programmes, consulting stakeholder groups, launching and managing calls. Some JPIs use different forms of agenda or follow a multi-step process of development, with new versions developed during the programme. Out of ten JPIs, at least six have finalised their Strategic Agenda (Neurodegenerative Diseases, Climate, Healthy Diet, FACCE, Demographic Change and the Water JPI). JPI Urban Europe has published a Strategic Research Framework which will lead into a SRIA (JPI Urban Europe 2011). Some JPIs have funded the process of SRA development and are following strategic activities on pure in-kind contributions from the core members of JPIs. Others (including the Water JPI) have used a Cooperation and Support Action to fully explore and develop the Strategic Agenda.

The first Water JPI SRIA (version 0.5) was released in May 2013. This version included a brief summary of potential instruments (Water JPI 2013). Version 1.0 (to be released in June 2014) progressed by giving consideration to specific instruments which may be utilised to pursue

specific themes. An example is given in Table 2 of this document. The Water JPI SRIA and this current document will feed into the development of a Joint Activities Action Plan (JAIP). The JAIP is one of the building blocks produced in the WatEUr Coordination and Support Action, and contains an Implementation Plan for the second half of 2014 and 2015. The overarching Implementation plan for the Water JPI will be based on the JAIP, and will extend its operation till 2016. The first Water JPI Implementation Plan will be released after summer 2014. The combination of the SRIA and the catalogue of activities, instruments and procedures lead to the selection of a few urgent and/or important RDI needs and gaps which are planned to be implemented using specific instruments.

SRIA Priority Theme	Standard instruments	Additional instruments
Promoting Competitiveness in the Water Industry	• Projects. • Mobility. • Networking. • Demonstration (marketing, promoting, public relations, scaling up after pilot activities). • Website • Twitter • PhD and post graduate network => mobility schemes • Exchange of facilities (e.g. labs, open software, platforms – pilot sites, data access)	• Secondment of research persons into organizations of innovation appliers/ recipients. • SMEs' involvement in innovation => link with H2020 specific instruments. • Clusters of national SMEs along supply-chain (market platform, link to EIP market place). • Alignment of funding schemes and research implementation. • Exploitation of results using joint platforms. • Joint collaborative clusters of project activists • Training programs or facilities

Table 2 – An example of consideration of instruments specific to one of the priority themes explored in the Lyon Workshop (April 2014) during development of the Strategic Research and Innovation Agenda (SRIA) Version 1.0.

2. Methodological approach

The methods described in the following sections are classed into "activities", "instruments" and "procedures". The three methods are related in a number of ways (see Table 3). For the purposes of this document, the "activities" define functions to be performed by the Water JPI, whilst the "instruments" are specific tools used to pursue a defined objective applied to a type of "activity" (usually within well-defined times and budgets). The "procedures" are the mechanisms or processes involved in carrying out the instruments, which are presented in a standardized way adapted to the Water JPI and formulated through consensus.

Activities	Of the Water JPI	Of the European Commission	Of Third Parties
Interfacing with Society	Strategic and Knowledge Exchange Workshops		Other JPIs, EIP on Water, Belmont Forum, COST…
Empowering RDI Actors	Webinar and Infoday		
	Exploratory workshops (eg. Sandpits or Ideas Labs on specific RDI topics)		
	Alignment of on-going RDI projects (Knowledge hub)		
	Collaborative projects (eg. Pilot and Joint calls)	ERA-NET Cofund	
	Mobility actions	Marie S. Curie Actions	
	Infrastructure actions	Infrastructure actions	
		Access to data	
		Article 185	
Improving the efficiency of RDI programmes	Sharing good practices on funding and management		
	Alignment		
		Co-ordination and Support Actions	
		ERA-NET Cofund	
		Article 185	

Table 3 – Table showing relationships between the types of activities and instruments relevant to the Water JPI.

Each of the instruments is accompanied by an indication of the anticipated degree of difficulty in implementation (DoD). This was adapted from a similar indicator used by FACCE (2013). It is an attempt to give a qualitative indication of the potential workload associated with each measure and the intensity of the associated risks.

3. Activities

3.1. Interfacing with society

The Water JPI is committed to interfacing with society for a broader participatory approach to water challenges and needs, speeding up RDI results uptake and strengthening the links between Water science, policy and industry. This commitment is closely related to the common aims of Joint Programming and to the objectives of the Water JPI.

A key responsibility of the Water JPI is to ensure that it addresses issues of public interest, and that RDI results are made accessible through appropriate dissemination activities. The JPI also needs to identify and prioritise future RDI needs, preparing to address them (including assisting in creating critical mass required to do so). There is therefore a requirement to respond to the needs of policy, decision makers, business and European society at large for knowledge-based information and services to address water issues. Engendering societal trust, ensuring transparency, clarity and encouraging the willingness to actively engage and to respond to the wider public is therefore an essential part of Water JPI activities. In addition to web-based information on the main Water JPI website, the strategic and knowledge based workshops will seek to develop and enhance activity at the interfaces with society.

3.2. Empowering RDI actors

RDI actors are researchers, technologists and innovators from public and private institutions in partner countries. RDI actors will be supported by the Water JPI through increasing information exchange efforts, providing access to water RDI results and data, funding RDI transnational collaborative projects, creating opportunities for further training, nurturing transnational Water RDI infrastructures, and involving/engaging all actors in the setting of goals, priorities and strategies.

In maintaining and enhancing the European RDI community, the Water JPI is seeking to provide prioritised and early knowledge of environmental, technological and socio economic issues and trends relevant to Water RDI. This will be strengthened by activities including the sharing of current research (goals, methodologies, results and databases). The Water JPI will seek gaps in knowledge and capabilities, and will identify emerging research topics requiring an intensification of efforts. In this respect the Water JPI is pro-active, eg. through joint calls for proposals using instruments of the JPI itself, EC or third parties.

Knowledge Hubs consisting mainly of closely networked groups of research groups working at national levels to achieve common objectives in specific science areas have been created in

some JPIs. These are described and considered further in Section 4. A physical meeting will provide a useful procedure to open opportunities for the development of proposals for H2020 topics on water with research, policy and industry groups. Links with H2020 will also be two-way, as the JPI will provide a channel to conduct a dialogue with the Commission on future H2020 calls.

3.3. Improving the efficiency of RDI programmes

The Water JPI will improve the efficiency of the partner RDI programmes by optimizing internal procedures through the sharing of good practice. The Water JPI will also foster the alignment of existing national strategies and programmes, as a way to progress in Joint Programming. Instruments which contribute to this activity include the ERA-NET Cofund, CSA and, potentially, Article 185. As mutually beneficial opportunities for alignment are developed (reducing duplication and fragmentation, while increasing coordination and collaboration), the more strategic long term commitments to harmonisation of agendas can be planned, making a positive contribution to the ERA.

A high priority for the water JPI is to carry out activities which offer greater value for the same cost or same value for less cost to stakeholders, including society at large. The benefits of some of these activities may not be easy to quantify within the timescale of the Water JPI, whose objectives have been set for 2020.

This document is also intended to be a positive contribution to the efficiency of the Water JPI itself, through improved mutual understanding and clarity regarding the available options for implementation. Related activities within the Water JPI include reviews of the SRIA and benchmarking and monitoring of the Water JPI, with flexible management approaches to respond to the outputs of these activities. The evaluation of research performance will also include the assessment of the functioning of the governance structures.

4. Instruments

This section describes the range of instruments available and likely to be of greatest value to the JPI. There is a vast range of possibilities, and inevitable overlaps between the instruments described. However, this listing has been limited to the instruments which show most promise for implementation in the Water JPI, and is therefore not exhaustive. Instruments have been divided into those which are likely to be organised or generated by the Water JPI itself, those of the European Commission and, finally those which have been developed by other organisations engaged in or using water RDI, in and beyond Europe.

4.1. Water JPI Instruments

Strategic and Knowledge Exchange Workshops

These workshops will increase the connectivity of the RDI communities in academia with industry for greater economic impact and growth, in addition to wider society, to raise awareness to the water challenges ahead. The engagement of wider society in the workshops will also provide the Water JPI with the opportunities to gather broader and differing perspectives and opinions on specific issues. The workshops may be designed to report, consult and take forward essential strategic components of the Water JPI, such as the SRIA, to present specific RDI results to targeted audiences, to foster linkages with related JPIs, ERA-NETs, ETPs, EIP on Water or other stakeholders.

Outcomes are expected to include the dissemination of information/ideas about relevant scientific/technological outputs, trends, gaps, needs, priorities and opportunities. Proposals and recommendations on Water topics for H2020 may also emerge.

DoD - Low

Webinar and Infoday

Use of innovative information technologies and powerful social networks to exchange information with RDI actors. This instrument is targeted to promote dialogue, engagement, commitment and partnerships towards the achievement of specific objectives/priorities. A common application of this instrument is the dissemination of complex Water JPI activities, such as Calls for Proposals.

DoD - Low

Sharing good practices on funding and management

Workshops for sharing good practices among RDI Programme owners and managers provide an efficient instrument to improving Programme efficiency across Europe. For example, subject areas can include funding and management, monitoring and evaluating projects at the National level (or deriving from Transnational Calls).

Discussing the instruments and procedures of National European Programmes will contribute to the establishment of benchmarks leading to the improvement of overall efficiency in funding and management. Light, dynamic and case-study-based workshops will be designed to attract and sustain the attention of Programme owners and managers.

DoD - Low/Medium

Exploratory workshops, using Sandpit or Ideas Labs formats on specific RDI topics

A "Sandpit", or the similarly constructed "Ideas Laboratory" formats are a way to generate innovative research proposals. Participants are drawn together from a range of disciplines to

develop novel ideas, discussion and proposals around an important challenge. Usually 20 - 30 participants are carefully selected from applicants to a 2-5 day residential workshop, often at a location which is well-removed from the participants' usual workplace. The outcomes are multi-disciplinary research projects that are cutting edge and, sometimes, unlikely to get funded through another source. Participants are usually incentivised by the proposition that, with appropriate peer review, some of the research ideas generated are highly likely to be recommended for funding (from a clear funding pot) at the end of the workshop or a short time afterwards.

DoD - Medium

Knowledge hub

The knowledge hub is a network consisting of selected research groups and their scientists from JPI member countries within a defined area of research. This instrument is developed to contribute to optimising research outcomes by facilitating the exchange of information among the actors, creating critical mass and avoiding duplications. Each participating country is responsible for deciding which of its national scientists are eligible to join the knowledge hub and the funding it makes available to its selected members. Based on a selection process, the knowledge hub instrument aims at producing a well-balanced network of members providing all the expertise required to reach the defined goals.

Participants in the Knowledge Hub are research groups. The added value of the knowledge hub instrument include establishing a critical mass of research and technological excellence, integration and sharing of knowledge, infrastructures, data and modelling tools, training and capacity building, in addition to improved communication and networking with stakeholders and the scientific community.

Good examples of Knowledge Hubs exist in the framework of two Joint Programming Initiatives, Agriculture, Food Security and Climate Change (FACCE) and A Healthy Diet for a Healthy Life (HDHL). FACCE set up the Knowledge Hub MACSUR, Modelling European Agriculture with Climate Change for Food Security in 2011. MACSUR consists of 73 research groups from 17 JPI partners, with a total estimated cost of 15 million euros for 3 years (FACCE MACSUR 2012). HDHL adopted the Knowledge Hub on the Determinants of Diet and Physical Activity – DEDIPAC in 2012. This involves 160 researchers from 12 participating countries (JPI HDHL 2011).

D-o-D: High. This is viewed as medium in FACCE, which has had a KH embedded in its planning for more than 3 years. The instrument remains onerous even after establishment, due to the degree of innovation of the instrument - many scientists are not aware of how the Knowledge Hub Works (FACCE 2013).

Collaborative projects – Pilot and Joint Calls

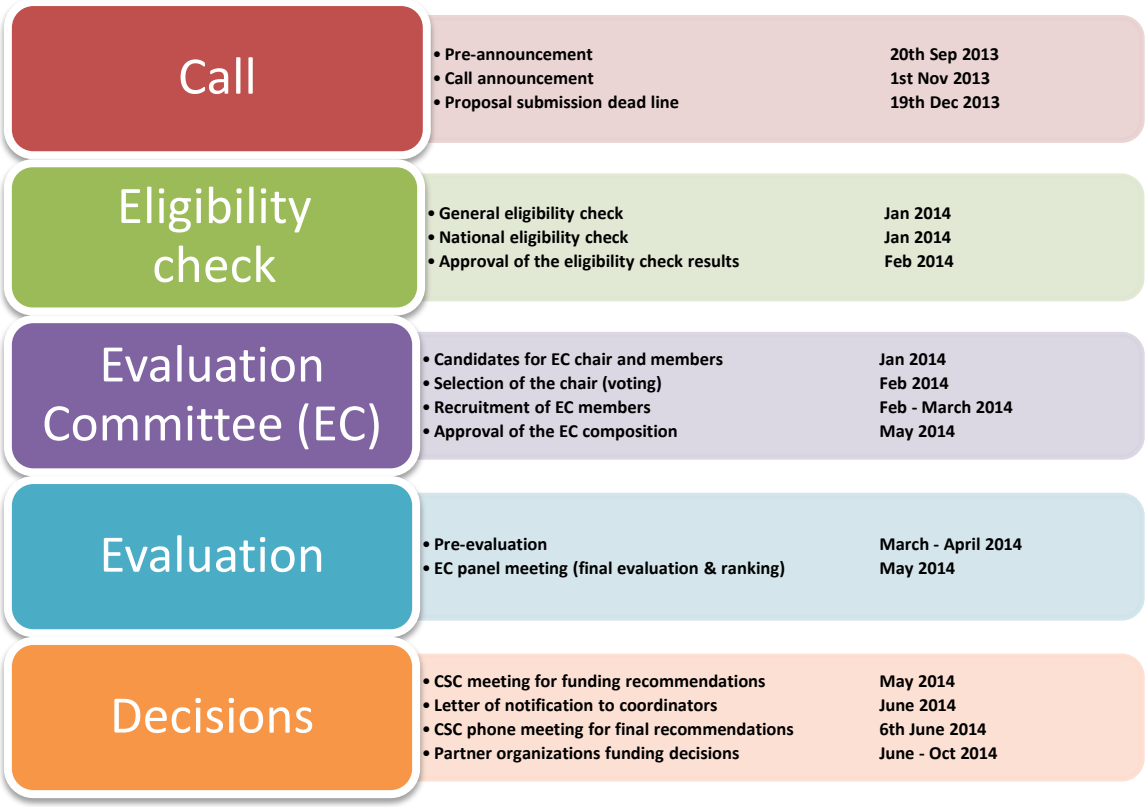
Pilot actions are implemented with the primary objective to test procedures and instruments of cooperation and coordination in the framework of JPIs. In the Water JPI this has been developed from the priorities which have emerged from a survey of JPI partners, initially in

advance and then in parallel with SRIA development. The Pilot Joint Call action demonstrates some of the value of the Water JPI in recognising key priorities in water RDI and taking practical steps to mobilise the transnational research community to address them. The experience of developing and implementing the Joint Call will test and provide potential templates for further calls to be developed in the JAIP, based upon the SRIA. The steps in this process are illustrated in Table below

- Initial processing
  - Submission of applications (Nov – Dec 2013)
  - General and national eligibility check (Jan - Feb 2014)
  - Selection of Evaluation Committee members (Feb – March 2014)
- Scientific evaluation
  - Draft statements (April 2014)
  - Evaluation Committee meeting and statements (May 2014)
- Decisions
  - Call Steering Committee funding recommendations (June 2014)
  - National decisions (June – Oct 2014)

In brief, the Pilot Call had to be approved by the Governing Board before being published by the Water JPI, lead agency and all funding partners on their respective websites. All applications were directly submitted to the online services of the lead agency (Call Secretary). The submission of proposals to the Pilot Call was a one stage process. After eligibility checks, each eligible application was pre-reviewed by independent, international experts (later forming the Evaluation Committee). The lead agency has carried out the review procedure.

The proposals were evaluated, compared and ranked by the Evaluation Committee panel meeting installed by the Call Secretary with Call Steering Committee (CSC). The Evaluation Committee assigns rankings to the individual proposals. This ranking is forwarded to the CSC which will take a formal funding decision on the basis of the advice from the Evaluation Committee and taking into account the available budget. The Summary Evaluation Reports produced by Evaluation Committee to each proposal will be sent to the applicants after the CSC decision. National decisions will be done after this. The projects start within a predefined period after taking the funding decision.



A joint call may be implemented as a two-step process allowing for the submission of pre-proposals and/or letters of interest. In this case, the evaluation process will also have two stages, one dealing with the pre-proposals and one devoted to the full proposals. A two-step procedure is recommended if a large number of applications can be expected and if the feasibility of projects should be demonstrated before submitting a full proposal. Complex calls, including calls with in-kind contributions, may be more likely to ask for two-step procedures than regular research funding calls. The relative merits of one or two stage application processes are further considered under the procedures section. Dependent on the responses to the Waterworks ERA-net CoFund proposals, future calls may also be built upon these frameworks.

DoD: Medium

Alignment of National Programmes

The EC Commissioner Geoghegan-Quinn stated at the Dublin Conference in February 2013 that "By aligning and co-ordinating the institutional and competitive funding committed under national research programmes, which accounts for 88% of the public research in Europe, we can better exploit our resources for maximal societal impact". The GPC set up a Working Group which has explored the definitions and principles of alignment across the JPIs. They have acknowledged that alignment must be practical and lead to changes, identifying best practices and barriers to collaboration. Many individuals, groups and organisations are involved, including administrators, researchers and funders.

In part, alignment can result from many of the other instruments described in this document, eg. Through joint calls and Knowledge Hubs, but it is also identifiable as a specific instrument in itself. Further examples of instruments designed to promote alignment in other JPIs include Thematic Annual Planning in FACCE and Fast Track synthesis papers on research priorities and actions to inform alignment activities in JPI Climate (2011).

A major aim of this instrument is not to interfere with the proven capacity of programme owners and managers from partner countries and the EC (eg. Through Horizon 2020) to respond to local challenges in a creative way. There is, however, a big opportunity for the Water JPI, with development of the SRIA and information from the mapping of partner RDI programmes, to enhance dialogue with and between partner countries, so as to make the most of national resources and increase the potential of national RDI groups. The harmonisation of agendas through alignment can therefore boost efficiency in RDI expenditures and be a positive contribution to the ERA.

Harmonisation of procedures in the Water JPI can be assessed at many stages, including with regard to planning, funding, disbursement, monitoring, evaluation and reporting. This requires transparent discussion at the JPI governing bodies and in the light of the RDI programmes composing the JPI. On the basis of progress made in earlier phases of the collaboration, WatEUr will consolidate the shared lessons learned and thereby identify additional measures that may encourage and support more effective harmonisation in research programme development.

D-o-D: Medium

Mobility actions

Mobility actions can involve capacity transfer of single persons working or visiting a place different from the one they belong to (foreign Institutes, other sectors); or even the exchange of larger groups, e.g. between research infrastructures. The European Commission already has instruments to do so, but the support for mobility of researchers and students could also be strengthened at national and regional levels, in addition to increasing communication on bilateral or multilateral successful initiatives. There is potential to align national tools, coordination between national calls and EU calls for proposals to facilitate researcher mobility. Dedicated R&I strategies encompassing mobility at regional level are needed. Short and long term mobility actions can be developed in the framework of dedicated programs at international/national level or be part of the specific policies of an individual research Institute.

D-o-D: Low

Infrastructure actions

Research infrastructures (RIs) play an increasingly important role in the advancement of knowledge and technology. The term 'research infrastructures' refers to facilities, resources and related services used by the scientific community to conduct top-level research. RIs may be 'single-sited' (a single resource at a single location), 'distributed' (a network of distributed resources), or 'virtual' (the service is provided electronically).

Research infrastructures (RIs) are a key instrument in bringing together a wide diversity of stakeholders to look for solutions to many of the problems society is facing today, offering unique research services to users from different countries, attracting young people to science and helping to shape scientific communities.

For example, in the water RDI field this includes networks of experimental facilities for hydraulics research and field observatories, including research catchments, rivers, lakes, estuaries and coastal systems and the associated networks of data collection equipment (including the related databases). In the case of transnational access, this may be implemented within thematic joint calls between Member States, with or without the support of the EC. This may be in the form of in-kind arrangements or funded initiatives.

The provision of access to, or a sharing of, a research infrastructure should be ruled by a Memorandum of Understanding between involved parties (user and infrastructure provider). This agreement defines the terms whereby the infrastructure provider will put a facility at disposal to the user partner as a platform to carry out an experiment, detailing the access/sharing conditions and commitments for both infrastructure providers and users. Cost sharing conditions, reporting, data and IPR may also be included.

D-o-D: Medium

4.2. The Instruments of the European Commission

Co-ordination and Support Actions

The Co-ordination and Support Actions (CSAs) are the only funding support from the EC so far to develop the JPI on strategic level. The CSAs have provided funding to assist JPIs in organising joint actions, but this support only lasts for a 2-3 years. The CSA of the pilot JPI Neuro-degenerative Diseases finished in 2013 and has led to discussions as to how to continue to fund the launched actions. So far, CSAs have been funded once to get joint JPI actions started. It is not yet clear, whether CSAs will be funded a second time or can be a permanent support mechanisms for management and coordination activities. Options include top-up of in-kind contributions or funding through a common pot. This issue of how to sustain the JPI in future, with or without a CSA, is an important one for many JPI's including Water JPI.

The WatEUr CSA project, started on 1st January 2013, prepares and supports the successful development and implementation of the Water JPI. Together, they will promote the harmonization of research agendas and activities in partner countries, support European leadership in water science and technology, foster effective use of Europe's limited public research funds and pave the way for efficient sharing of best practices across national programmes.

The H2020 Water Innovation area also highlights the strengthening of international R&I cooperation in the field of water through two associated Coordination and support actions in 2014 (Strategic cooperation partnerships between Europe and the rest of the World) and 2015 (Coordination platform: Africa) in addition to R&I on the Research and Innovation on

Development of water supply and sanitation technology, systems and tools, and/or methodologies - focussing on non-EU Mediterranean countries and Africa.

DoD – N/A (as already in place and ongoing to 2015)

ERA-NET Cofund

ERA-NETs aim to coordinate national research programmes, which address well defined scientific problems. Their objectives are usually specified from the perspective of the researchers and programmes in the scientific field where they operate. The focus of an ERA-net is upon joint calls of transnational proposals. Support is provided by participating national agencies funding relevant national programmes, with additional resources from the Framework Programme (FP) in the case of ERA-net plus. The process follows a call for ERANETs published by the Commission, now under H2020. The governance is by a Steering Committee composed of representatives of participating agencies.

In the case of the Water JPI, ERA-NETs Cofund provides a means of implementing the Water JPI SRIA through the alignment of national research programmes via transnational calls. On the 8th April 2014 Water JPI submitted a proposal to the Call H2020-WATER-2014-one-stage which scope is "Technical solutions: developing technological solutions and services for water distribution and measurement, waste water treatment and reuse, desalination, floods and droughts, etc.". The proposal considers training and mobility of researchers and international cooperation beyond Europe. It has also ensured the participation of one RDI programme from a country outside Europe - South Africa. A new action is planned for the Call H2020-WATER-2015.

DoD Medium: First stages of calls established within H2020 and first proposal (as described above) have been carried out.

Infrastructure actions

The European Strategy Forum on Research Infrastructures (ESFRI) regularly updates a Roadmap which "identifies new Research Infrastructures (RI) of pan-European interest corresponding to the long term needs of the European research communities, covering all scientific areas, regardless of possible location" (ESFRI 2012). Research infrastructures of the ESFRI Roadmap are proposed by international consortia and evaluated by panels of independent international experts set up by ESFRI. Proposals that satisfy criteria of scientific excellence, European uniqueness, open access policy and organisational maturity are included in the roadmap. The RIs referred to in this Roadmap may receive some funding from ESFRI for their "preparatory phase" (typically 3-5 years to build up the basis for the RI, e.g. legal framework, rules for the use of the RI, governance).

The Water JPI has previously provided letters of support for proposals to ESFRI and this option is open for future water-related proposals. Examples of current proposals to ESFRI which are relevant to the Water JPI include a proposal for hydrological field observatories across Europe and experimental facilities for hydraulics research. Regional initiatives across JPI partner countries, such as the DANUBIUS initiative which integrates river and coastal infrastructure in the Danube system, are also examples worthy of consideration.

D-0-D: Medium (for integration of existing national infrastructures)

Access to Data

Over the last two decades the provision of open and interoperable access to data has become increasingly important, particularly with regard to environmental data. The variety of data formats, databases, web services and more, present challenges with regard to cataloguing, formatting, processing and displaying the data. Each one of these categories has its own peculiar issues, with a strong common need: standards. Cataloguing data is solved with standard metadata. For geographic information in general the INSPIRE directive "aims to create a European Union (EU) spatial data infrastructure. This will enable the sharing of environmental spatial information among public sector organizations and better facilitate public access to spatial information across Europe" (EC 2007). The basic common principles of INSPIRE are: firstly, that data should be collected only once and kept where it can be maintained most effectively. Secondly, it should be possible to combine seamless spatial information from different sources across Europe and share it with many users and applications. Thirdly that it should be possible for information collected at one level/scale to be shared with all levels/scales. Finally, that Geographic information needed for good governance at all levels should be readily and transparently available.

The emphasis is moving towards individual organisations making their data available using standards-based web services (as is a requirement of INSPIRE) for others to access, rather than creating centralised databases. There are already examples of EU initiatives designed to integrate water data and considering how best to use this approach, including the GEOWOW Project which is looking at ways of exchanging hydrological, oceanographic and weather data, and further developing standards. Another example is the MELODIES (Maximising the Exploitation of Linked open Data in Enterprise and Science) initiative which is looking at the Linked Open Data approach for a range of "services", integrating data and processing workflows to produce information products.

It is notable that JPI Demographic Change has developed a Data Project, using their Fast Track Project instrument to carry out an exploratory collaboration across 12 of the JPI countries, including a critical analysis of 337 European and National databases.

D-o-D: Medium

Marie Skłodowska-Curie actions

Marie Skłodowska-Curie Actions are open to researchers of all ages and levels of experience, regardless of nationality. There are two categories of researchers: "Early Stage Researcher" (with less than 4 years of research experience, without a doctoral degree) and "Experienced Researcher" (with doctoral degree or at least 4 years of research experience).

The Marie Skłodowska-Curie Actions are:

- Initial Training Networks (ITN) - an action providing training opportunities for Early Stage Researchers usually provided by a network of universities, businesses and research institutes;
- Intra-European Fellowships for Career Development (IEF) – an individual grant allowing an Experienced Researcher to move within Europe to pursue his/her research project;
- Career Integration Grants (CIG)– a lump sum to encourage Experienced Researchers to settle/return in Europe;
- Co-funding of Regional, National, and International Programmes (COFUND) – a co-funding mechanism providing an-extra financial support to national, regional research mobility programmes;
- Industry Academia Partnerships and Pathways (IAPP) – an action promoting partnership and collaboration between business and academia. Early Stage Researchers, Experienced Researchers, or technical research staff can participate;
- International Outgoing Fellowships (IOF) – an individual grant for Experienced Researchers willing to receive a research training in a host institution in a third country (outside Europe);
- International Incoming Fellowships (IIF) - an individual grant for Experienced Researchers based in third countries (non-Europeans) willing to receive a research training in a host institution based in Europe;
- International Research Staff Exchange Scheme (IRSES) – a staff exchange scheme fostering collaboration between research institutions based in Europe and in Third countries.

DoD: Low

Article 185

Article 185 initiatives, as in ERA-nets, have taken the perspective from researchers to define their objectives. Article 185 initiatives also try to integrate national research efforts in a joint research programme. They are initiated by interested Member States and are more ambitious and have a wider scope than ERA-nets. So far they have been implemented through calls of transnational projects. There have been efforts to integrate national programmes and projects as "in kind" contributions, but they have not been fully coordinated.

Under the Seventh Framework Programme identification criteria required for the establishment of an Article 185 action were as follows:

·Relevance to EU objectives and to those of the Framework Programme
·Presence of a pre-existing basis (existing or envisaged national research programmes)
·Critical mass, with regard to the size and the number of programmes involved and the similarity of activities they cover
·European added value
·Efficiency of Article 185 as the most appropriate means for achieving the objectives

In an Article 185, participating countries bring together their own national programmes on a specific research area (e.g. "Baltic sea" for BONUS), also meaning that this specific area is not funded at the sole national level. The EU also contributes a substantial amount of funding. Calls are launched in a similar way to ERA-Nets.

In the Communication of EC "Partnering in Research and Innovation" COM(2011) 572 final, it is reported that the EC will only consider making a proposal for an Article 185 Initiative where a JPI has demonstrated in its Strategic Research Agenda that it has the capacity for significant collaboration, in addition to the necessary scale and scope to support full integration of national programmes.

In interviews conducted in the JPI to CoWork initiative, all JPIs responded that they do not intend to use Article 185 Initiatives. For instance, FACCE view this as a "very challenging instrument", indicating that an Article 185 has to be set up through a Decision of the European Parliament and of the Council, via the co-decision procedure.

D-o-D: Very High

4.3. The instruments of Third Parties

Other JPIs

Many of the instruments used in Water JPI are also common to other JPI's (eg. See listing in Table 1). However, it is worth mentioning a few others which may be worthy of consideration by the Water JPI. Some JPIs have planned to establish Centres of Excellence (FACCE and HDDL). In FACCE and JPND (JPND 2012) there are Thematic Annual Programmes (TAPS), and in both JPI Climate and JPI Demographic Change (JPDC 2014) there is a "Fast track" mechanism available, contributing to the alignment of nationally funded projects to achieve specific identified priority research (as also referred to in section 4.1.8).

The EIP on Water

The EIP Water facilitates the development of innovative solutions to address major European and global water challenges involving the public and private sector, non-governmental organisations and the general public. Five thematic priorities have been selected: Water reuse and recycling, Water and wastewater treatment (including recovery of resources), Water-energy nexus, Flood and drought risk management, Ecosystem services. There are also three cross cutting priorities: Water governance, Decision support systems and monitoring, Financing for innovation. In addition, Smart technology has been defined as an enabling factor for all priorities. The EIP Water will develop tools to support water related innovation and will be open to any actor dealing with water and innovation. Tools developed from 2013 onwards are:

- Annual EIP Water meetings, open to a wide audience to present the activities of the Action Groups and the progress in implementing the EIP Water tools and activities as well as a brokerage event between water innovation supply and demand.

- Web Based Market Place, to create and establish a community on (and a place for "matchmaking" in) innovation topics in the field of water in Europe and worldwide, connecting problem owners and owners of solutions, regardless of their geographical position. The market place will offer several features, driven by the stakeholders' interests.
- Other potential tools include Booster teams to support innovation activities of SME's, trade missions, innovation competitions, innovation platforms (regional, national and/or international), in addition to finance-related, smart and dissemination tools.

Belmont forum

The Belmont Forum is a high level group of the world's major and emerging funders of global environmental change research and international science councils (The Belmont Forum 2011). They have already funded two calls of water related subject areas including freshwater security and the vulnerability of coastal systems. The call procedure was organised in two steps, first a pre-proposal and, after the first round of review, a full proposal. The pre-proposal was evaluated by a Panel of Experts for each theme, with the full proposal peer reviewed using external and panel review, sharing a common review form. Projects were encouraged to consider attributing a specific budget to clustering activities with other projects within their theme and other relevant activities. Each consortium needed to have at least one academic participant from a minimum of 3 different countries, represented by the participating Partner Organizations. They were required to show clear links through to users and include collaboration between natural and social sciences, and other sciences where relevant. Researchers from countries not represented by any of the Partner Organizations can participate in the research projects at their own expense.

The FACCE JPI has already organised a joint call with the Belmont Forum. It is proposed that the Water JPI learns from this experience. Given that the Forum already includes some JPI Partner countries, and several countries beyond Europe with which the Water JPI is exploring partnerships, it could be worthwhile to pursue potential collaboration with this alliance.

D-o-D: Medium

Additional third parties

The Coordination of nationally-funded research (COST) is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level (COST 2014). In each COST Action there is a network centered on nationally-funded research projects in fields that are of interest to at least five COST countries. COST provides the Actions with financial support for joint activities such as conferences, short-term scientific exchanges and publications. Each Action has an objective, defined goals and clear deliverables. One of the main characteristics is the flexibility, allowing for easy implementation and light management of the research initiatives. Activities are launched following a "bottom-up" approach, meaning that the initiative comes from the European researchers themselves and only countries interested in the Action participate via a continuous open call. A COST Action builds up a network of nationally funded projects. The JPI could identify specific themes where interaction of researchers could have a clear added

value. Researchers could be invited to organise themselves, thereby providing additional "networking" of national research activities.

Several other alliances are active covering geographical subsets of European countries. For example:

- NordForsk - an organisation under the Nordic Council of Ministers (Iceland, Finland, Norway, Sweden, Denmark) that provides funding for Nordic research cooperation as well as advice and input on Nordic research policy.
- DACH – German, Austrian, Swiss Research Cooperation.

There are also global science programmes, which are dependent upon alignment of national research agendas, and are facilitated by networks of small programme offices, eg. IGBP, IHDP, Future Earth.

DoD: Medium

5. Procedures

5.1. Physical meetings

These can be carried out at a variety of scales from small subgroup meetings through to larger committee meetings and workshops internal to the Water JPI or engaging with wider communities. The lead in time to physical meetings is often longer and more resource intensive than remote internet based events, due to the needs to communicate a suitable venue, selected location and book accommodation, travel, venues and refreshments. During the period of the Water JPI these will provide substantial interaction between participants, the secretariat, Stakeholder Advisory Group, Science and Technology Board, Executive and Governing Boards. They also provide major opportunities for knowledge exchange, to discuss and resolve issues and agree ways forward across the JPI, in addition to demonstrating the achievement of significant milestones and deliverables.

Procedures associated with the Joint Activities which require physical meetings will include SRIA workshops (with experts and stakeholders) and an official launch of SRIA 1.0. (with research, policy and industry groups and the media). Physical meetings are also proposed for the kick-off of the projects which start up from the Emerging Water Contaminants Pilot Call, and for a "Good practices on funding and management workshop". A meeting will also be held for the development of proposals for H2020 topics on water. Webstreaming is also a possible option for any of these meetings.

5.2. Internet events

It is also planned to use webinars and twitter feeds events to engage with wider communities regarding the Waterworks 2014 initiative. This will include a partnering event and one to reach a much wider public. A Twitter event was used successfully with the Water JPI Pilot Call action.

5.3. Call for proposals

One step vs. two step call procedures

In general terms, two-step procedures reduce the overall work-load for applicants, as fewer full proposals have to be written. On the other hand, two-step procedures can significantly prolong the time from the first submissions to the award decisions.

Using one step procedure, the evaluation process can be quick, as was demonstrated by the Water JPI Pilot Call action. However, this procedure requires very developed and practical methods to be available, on how to set the eligibility criteria in general and at the country levels.

Funding modes - virtual, real and mixed

Different funding models can be adopted for the implementation of joint calls. Three modes of pooling money in common pots are available: real common pot, virtual common pot or mixed common pot. S. Meyer and M. Dinges (2013) described these three funding modes in relation to the JPI To CoWork Initiative. The three modes are described below:

- "Real common pots" occur when countries pool resources in a common and centrally administered budget, which then provides funding for awarded proposals. A real common pot provides opportunities to "decouple" funding from spending. Challenges related to common pots include the building of trust among participants, the political commitment and the establishment of a legal common ground. Funding and spending modalities must be carefully crafted, also taking account of the possibility of compensatory balances to be incorporated over the longer term.
- "Virtual common pots" mean that countries pay for their own participants, applying national rules. In some projects participating countries agree to joint calls, e.g. with joint announcements, joint application rules and joint peer review procedures, whilst in other projects only the research topics are jointly agreed, with all other procedures handled nationally. A Virtual common pot was applied in the Water JPI Pilot Call action. If the applicant/applicants of one funding country does not succeed in the evaluation (i.e. get recommendations to be funded), the funds promised by that country remain unused. On the other hand, it is also possible that a country would seek additional funding in a case where its partner is in a

consortium, where other countries can still fund their partners, but the individual country has already used all its allocated funds.

- "Mixed common pots" include elements of both above mentioned models. Parts of the budget are earmarked as real common pot, eg. to compensate for mismatches between national funding contributions, while other parts are reserved for national players. This scheme is used in ERA-net Plus actions where EC funding is top-up funding for national contributions.

6. Concluding remarks

In conclusion, the choice of instruments to be implemented within the Water JPI is potentially very wide, although there is a much narrower range which are likely to be of greatest benefit and implemented with low or medium degrees of difficulty. There are also a variety of possibilities for joint actions or collaborations within the JPI which are at more advanced stage of consideration, planning and implementation. In some cases, these have already been implemented in the CSA, eg. the transnational Pilot Call.

As mentioned above, the intention of this document is to provide a base line of commonly understood activities, instruments and procedures for the specific use of Water JPI. The Water JPI and supporting CSA, WatEUr, are intended to be flexible and responsive, so additional instruments which may emerge at later stages will not be excluded. For example, the application of these instruments in relation to taking forward the priority areas identified and explored within the SRIA (as exampled in the SRIA workshop in Lyon, 2014) will also become clearer in the longer term as the Water JPI moves forward. The SRIA and this current document will provide inputs to the development of a Joint Activities Implementation Plan (JAIP) for 2014 and 2015. During the latter half of 2014, all of these products will feed into an overarching Implementation Plan for the Water JPI.

7. List of Tables

8. List of Figures

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