

IC4WATER Coordination and Support Action

Water



International Cooperation

SC5-11-2016: Stepping up EU research and innovation cooperation in the water area

D 2.2

Mapping report.

Identification of relevant international countries for RDI cooperation

(WP 2)

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List of Abbreviations

ARIMNET – Agricultural Research in the Mediterranean Network

BONUS2 - Joint Baltic Sea research and development programme

BRICS – Brazil, Russia, India, China and South Africa. Acronym developed from the names of these countries that are in a similar stage of newly advanced economic development

CEWP – China Europe Water Platform

CONFAP – Brazilian National Council of State Funding Agencies

CSA - Coordination and Support Action

D - Deliverable

DAC – Development Assistance Committee

EIP - European Innovation Partnership

ERA-NET MED – ERA-NET instrument for the Euro-Mediterranean cooperation

GLAAS – UN-Global Analysis and Assessment of Sanitation and Drinking-Water

IWA – International Water Association

IWMI – International Water Management Institute

IWRA – International Water Resources Association

LAC - Latin American and the Caribbean

ODA – Official Development Assistance

OECD - Organisation for Economic Cooperation and Development

PRIMA - Partnership for Research and Innovation in the Mediterranean Area

RDI - Research Development and Innovation

SFIC - Strategic Forum for International Scientific and Technological Cooperation

SIWI – Stockholm International Water Institute

WWC – World Water Council

Executive Summary

The Joint Programming Initiative (JPI) on “Water Challenges for a Changing World” (Water JPI) was launched in 2010 and later formally approved by the European Council in December 2011. The Water JPI comprises 23 Partner countries and three Observers, which represent the majority of the European public water research, development and innovation (RDI) funding.

The Water JPI aims to produce science-based knowledge leading to support of European policies, comprising the identification of challenges and problems, their quantification, and the development of feasible technical and managerial solutions. It will coordinate water RDI in the participating countries and as such provide a strong platform for international cooperation in the water domain.

Through the Coordination Support Action (CSA) IC4WATER (International Cooperation, Supporting International Cooperation Activities on Water), the Water JPI is developing a common strategy for international cooperation, including the identification of criteria for this strategy. The strategic criteria should, among other things, be the basis for positioning European stakeholders as attractive RDI partners internationally and for selection of relevant international key partners for this collaboration.

One of the aims of IC4WATER is to extend and strengthen this international cooperation further, including the selection of countries outside Europe for future cooperation. To do that, a number of questions have to be addressed including clarification of the purpose of the cooperation and what Europe and European research and innovation stakeholders could learn and gain from it, and further how the international cooperation could benefit the European economy.

In order to provide a basis for addressing these questions, Task 2.2 should review and, update and analyse the previous mapping exercises and on the basis of the strategic criteria defined in Task 2.1 identify the most relevant third countries to be considered in the enlargement of the Water JPI. To get a clearer picture of the political priorities governing the support to international RDI cooperation by the member countries, a small survey in the form of a questionnaire to the IC4WATER member countries was carried out.

One of the criteria, which was not part of the previous mapping exercises, is innovation, which has attracted more and more attention, both at national and at European level as a common denominator for the future orientation in research. Innovation is also an important factor in terms of becoming an attractive partner for international cooperation. Onwards those countries which are successful in innovation will have a competitive advantage commercially as well as societally.

Based on specifically identified innovation criteria and indicators, it was shown that the innovation potential is highest in the North-Western European countries, including France, Switzerland and Austria.

A procedure to select third countries for future international cooperation was developed and described in a simple methodology. The start point of this procedure is the political agenda behind the support to international RDI cooperation. Based on the purpose of the support, selection of criteria and indicators for the identification of preferred countries have been identified. Based on the survey carried out it was concluded, that the primary reason for supporting international RDI cooperation was to speed up and accelerate excellence of own RDI and to a lesser degree to facilitate national/European commercial interests. However, it was also concluded that the preferred way for international RDI was to take part in multi-stakeholder projects with the involvement of private sector.

Results of the analysis showed that the Water JPI should primarily aim at establishing international cooperation with the countries which match the European stakeholders on

excellence, that is the North American countries, the BRICS countries and South Korea, Japan and Singapore. Next in line are the countries which have experienced a major step forward within the last decades, such as Chile, Vietnam, Malaysia, Ghana, Senegal, Lebanon and Russia, and the third category which should be kept under observation for future cooperation are those countries, i.e. in Africa, which have had high economic growth lately.

1. Introduction and background

The Joint Programming Initiative (JPI) on “Water Challenges for a Changing World” (Water JPI) was launched in 2010 and later formally approved by the European Council in December 2011. The water sector in Europe has a wide variety of stakeholders and is, despite many national and European facilitating organizations, still rather fragmented. There is also a significant difference among the different European countries as to which degree the different stakeholders work together to solve the problems. The water JPI offers a very good platform for cross-border cooperation, involving all stakeholders, also those with different agendas for cooperation, and a more common and unified focus on water RDI across Europe.

The Water JPI aims to produce science-based knowledge leading to the support of European policies; comprising the identification of challenges and problems, their quantification, and the development of feasible technical and managerial solutions. It will coordinate water RDI in the participating countries and as such provide a strong platform for international cooperation in the water domain.

Through the Coordination Support Action (CSA) IC4WATER (International Cooperation, Supporting International Cooperation Activities on Water), the Water JPI is developing a common strategy for international cooperation, including the identification of criteria for this strategy.

To develop such a strategy for international RDI cooperation, including positioning European stakeholders as an attractive RDI partner internationally and selection of relevant international key partners for this collaboration, is not a simple task. It implies that clear principles and criteria can be identified and also be followed when implementing the strategy after its approval by the Water JPI Governing Board. This will never be case to the full extent. First, such a strategy will be defined by different political agendas or purposes of the different countries participating in the cooperation and also by different agendas of the counterparts in the targeted countries. Secondly, the international cooperation has often been ‘opportunity based’, as mentioned by Guido Schmidt from EIP Water¹ and it will also be the case to a certain degree forward. Thirdly, that it is often initiated based on previous experience and cooperation and also often as a result of personal relationships. Thus, in many cases the international RDI cooperation has started as a bottom-up approach, often - we will have to admit - based on availability of funding for this type of research and innovation programming. Nevertheless, despite some limitations in terms of following it strictly, it is necessary to have such a strategy for international RDI cooperation, not the least by those institutions allocating funding for such RDI activities. It will ensure that resources are not wasted on the obvious cases with a high probability of failure, both by those providing the funding and those spending the funding. It also contributes to a clarification of own purposes and intentions with the Water JPI international collaboration.

Prior to the IC4WATER CSA, the Water JPI has dealt with the different aspects of international cooperation in different projects launched by the Water JPI, including the CSA WatEUr, and the ERA-NETS WaterWorks 2014, and WaterWorks2015. The international cooperation and the involvement of international partners of relevance have taken place by different means, mostly through participation in workshops and joint research calls. The current action follows up on these activities which led to effective cooperation actions (e.g. participation in calls, in knowledge hub, integration of member), see Figure 1, and aims to develop a common strategy, as mentioned above.

¹ List of strategic criteria. IC4Water Deliverable (D) 2.1. December 2017.

Previously, the activities started by mapping existing RDI programmes and cooperations. RDI in the different EU member states was analysed in terms of the nature of the RDI in the innovation chain, the funding mechanisms, the types of projects funded and the significance of the different stakeholders taking part in the RDI². This mapping has been followed up by a later mapping exercise focusing on European water challenges which also addresses global water challenges, as well as mapping European water networks³.

The projects also included analysis of some countries outside Europe, namely Brazil, Canada, China, India, South Africa, USA and Vietnam⁴. These analysis of the potential international partners were used as a starting point for inviting them to take part in the Water JPI activities, including several joint calls and workshops within Water JPI activities.

Recently, relevant institutions from some of these countries have taken part in various activities, including workshops (IC4WATER/Water JPI SDG workshop in Dublin⁵, Water JPI geographical

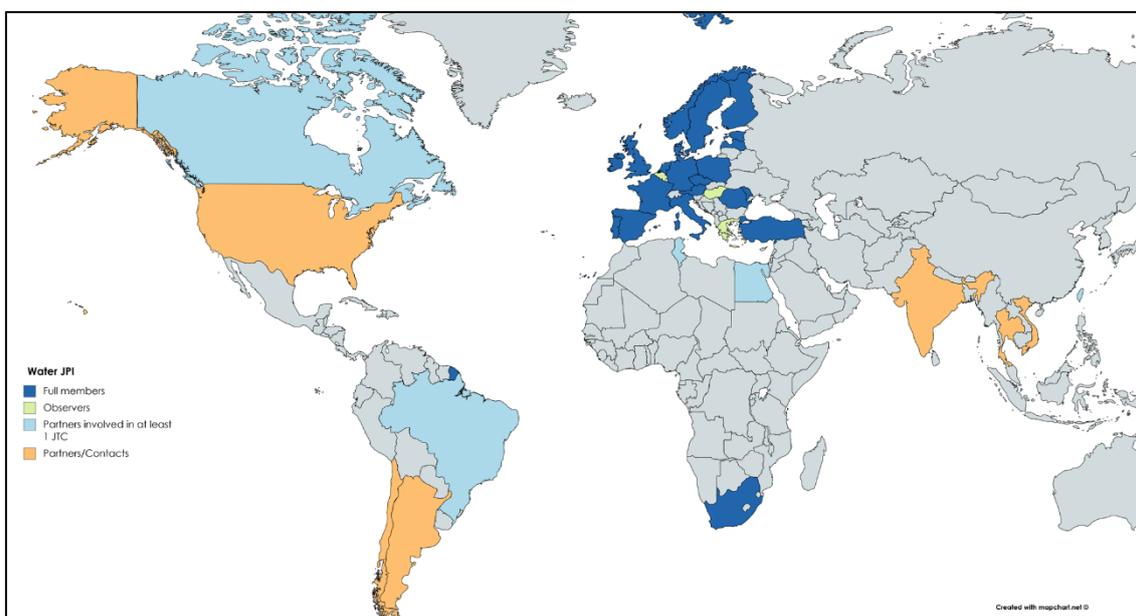


Figure 1. Current international Water JPI memberships and partnership

workshops for the Mediterranean areas in Tangier and for the Americas in Montreal in 2017⁶, IC4WATER/Water JPI Vienna workshop on International cooperation⁷), which have strengthened the links with these countries.

2. CSA IC4WATER

Despite previous initiatives facilitating and supporting international cooperation, it is evident that there are a number of barriers and challenges to be overcome when starting new international cooperation activities recently confirmed by representatives from different networks and platforms⁸. A need for a more strategic, systematic and prioritised approach to

² Mapping Water RDI in Europe. WatEUr D2.2. December 2014

³ Third Year Mapping Report, WatEUr D2.3. June 2016.

⁴ Mapping Beyond Europe Report, WatEUr D5.1, 2016

⁵ IC4WATER. Water JPI SRIA and UN Sustainable Development Goals report. D 5.1. June 2018.

⁶ WaterWorks2015. International Cooperation Progress report, D 6.4. December 2017.

⁷ IC4WATER. Proceedings from Workshop on International Cooperation. Towards a Common Strategy on International Cooperation. Vienna, Austria – 19th September 2018.

⁸ IC4WATER. Discussion Document: Feedback from Survey on International Cooperation for 2018 Water JPI workshop: Towards a Common Strategy on International Cooperation. August 2018.

international cooperation in order to leverage European interests on a broader scale in the water domain was recognised. IC4WATER aims to achieve this and thereby to promote the stepping up of international cooperation by focusing on a number of aspects, including:

- Sharing of best practices
- Intensified networking
- Closer coordination of existing initiatives and activities
- Establishment of new relationships to facilitate multidisciplinary networking.

Updating of the mapping and analysis of the existing research cooperation models (bi- and multilateral) should also be part of the scope of the CSA.

WP 2 of IC4WATER has specifically been formulated with the aim to extend and strengthen this international cooperation further. However, it has been clarified that the international cooperation has to be built on a strategic view on the cooperation. What is the purpose of the cooperation and what could Europe and European research and innovation stakeholders learn and gain from it, in what way do we see this benefit European economy? etc. Based on these questions we might be able to define which types and geographies of international cooperation should be promoted.

Task 2.2 is defined to provide inputs to these questions. Thus, the scope and the objectives of Task 2.2 are to:

1. Review, update and analyse the previous mapping exercises with emphasis on some of the criteria which were not considered in the first mapping exercises, i.e. for innovation
2. Exchange with the Strategic Forum for International Cooperation to identify synergies
3. Use the strategic criteria defined in Task 2.1 to complement the mapping and identify the most relevant countries and contact to peer institutions to be considered in the enlargement of the Water JPI.

A survey among the Water JPI partners was carried out to get a better idea especially on the questions arising when selecting countries outside Europe for future cooperation, including policies behind supporting international research cooperation and country preferences by the Water JPI partner countries, see Annex 1. The survey also raised some questions on which types of funding are available through the different funding agencies, including which stakeholders are eligible for funding through the different funding mechanisms.

2.1. Review of previous mapping exercises

The previous mapping exercises (2013, 2014 and 2016)⁹ provide a comprehensive understanding of the European RDI water-landscape, since they describe a number of features characterizing RDI activities in the European domain, such as strategies, policies and programmes as well as various aspects of funding and infrastructure of the water sector specifically in relation to RDI.

The water RDI landscape has probably not changed much in the EU since the last updating in 2016 in terms of which water themes are covered, even if there is a considerable increase in publications covering the Water JPI SRIA themes (multiplied by three or four in European MS and Associated countries as shown in the Figure 2 below – Source: Web of Science).

⁹

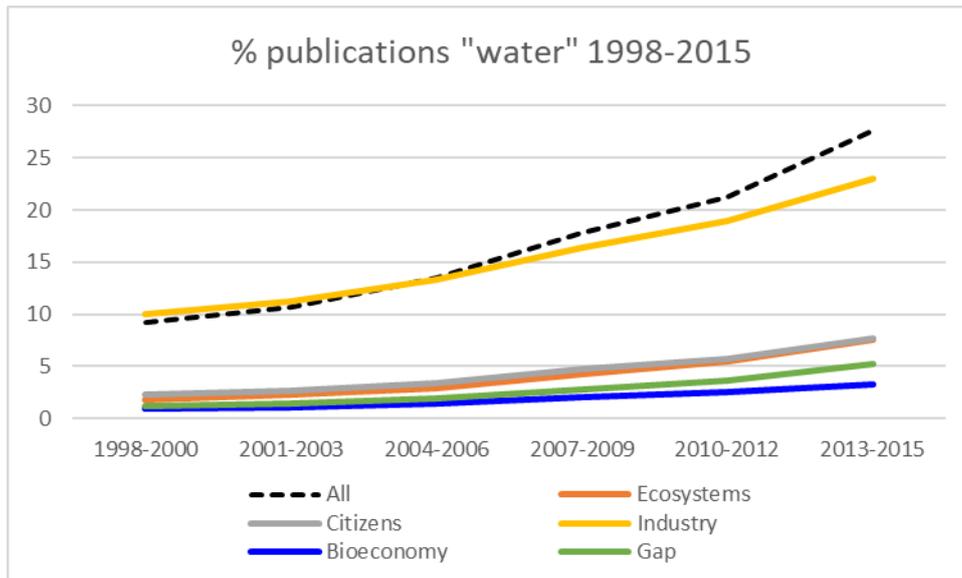


Figure 2. Publications on water 1998 – 2015.

The major European contributors in terms of scientific publications are presented in Figure 3 (total number, number per GDP – 1999 - 2016).

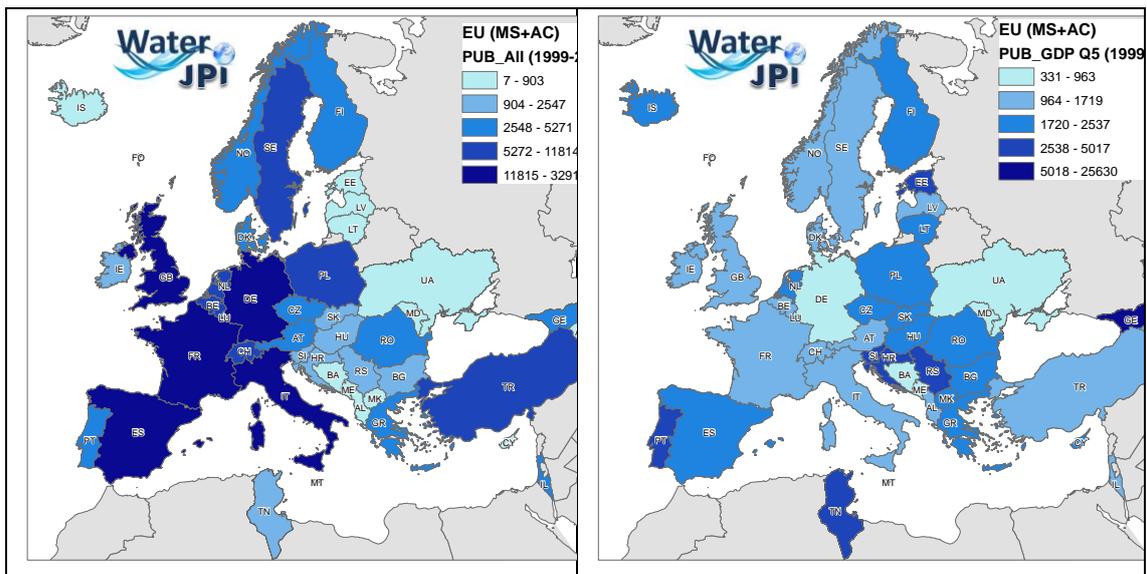


Figure 3. Scientific publications per GDP in Europe

One of the major changes integrated hereby is the enlargement of the Water JPI membership (as a result of previous Water JPI activities), which should be considered for this mapping update.

In addition, one distinct feature has attracted more and more attention, both on national and on European scale, namely innovation as a common denominator for the future orientation in research. Innovation is defined in many ways, but here it should be understood as activities taking place to take research to commercialization, to create commercial or societal value of the research results in terms of new solutions, technologies and companies with the dual effect of solving the challenges in Europe and creating increased export and sales of European products and services in regions outside Europe thereby creating growth of the European societies.

Innovation is a multi-stakeholder exercise, with researchers, companies, utilities, governmental agencies and often facilitating organizations taking part in the initiatives. This is at the same time one of the challenges to be dealt with when framing and facilitating innovation by funding agencies. As it has been – and still is - the most common principle that only researchers and research institutions can obtain funding from the national funding agencies in Europe according to the survey carried out, has been confirmed by 11 out of 15 respondents representing the funding agencies or the national research ministries of the Water JPI partner countries, see Figure 4.

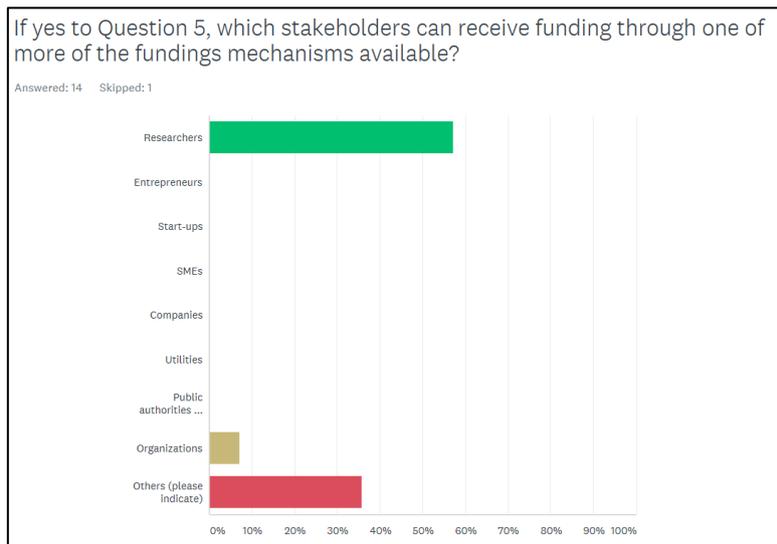


Figure 4. Stakeholders eligible for funding through the Water JPI members.

The updating of the previous mapping exercises in this report therefore provides some characteristics of importance for innovation in the European countries as the future key political orientation governing the state of the play for governmental RDI funding strategies. This is fully in accordance with the EU framework programmes, which is already stated in connection with the launch of Horizon 2020¹⁰: “...the goal is to ensure Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation” and is seen as “...as a means to drive economic growth and create jobs”. That will be even more clear in Horizon Europe, with the objectives to: “...strengthen the EU's scientific and technological bases, to boost Europe's innovation capacity, competitiveness and jobs, and to deliver on citizens' priorities and sustain our socioeconomic model and values, by:

- Ensuring essential investment and stimulating private investment
- Making regulatory frameworks fit for innovation
- Becoming a front runner in market-creating innovation
- Reconnecting R&I with citizens through EU-wide R&I missions
- Supporting the dissemination of innovation throughout the Union
- Investing in skills and empower universities to become more entrepreneurial and interdisciplinary¹¹

To stimulate water innovation in Europe, the European Innovation Partnership (EIP) Water was launched in 2012. EIP Water aims to “...stimulate creative and innovative solutions that

¹⁰ <https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

¹¹ https://ec.europa.eu/info/sites/info/files/horizon-europe-presentation_2018_en.pdf

*contribute significantly to tackling water challenges at the European and global level, while stimulating sustainable economic growth and job creation...*¹². It intends to foster collaboration in the water sector across the public and private sector, non-governmental organisations and the general public¹³.

Innovation as the orientation for future political focus for RDI funding is becoming more and more important, since a number of research funding agencies will, despite the current strategies do not seem to reflect this, be focusing more and more on the innovation part of RDI, both influenced by the change of focus in the EU framework programmes in recent years and also governed by growth strategies of many European countries in the aftermath of the financial crisis in the years after 2008. An alternative is that innovation funding agencies are created as a supplementary instrument to research funding agencies as it is the case in Denmark with the launch of the Innovation Fund Denmark.

The criteria for characterization the potential for innovation were not explicitly part of the previous mapping exercises, although the indicators for innovation are to a certain degree included to reflect other political purposes as well, such as the intention of achieving excellence as a political prioritization for societal value and growth. The criteria and indicators are both 1) those which relate to innovation as a political marker for the outcome of basic and applied research downstream the innovation chain, i.e. patents, and 2) those reflecting the factors strengthening the national water sector and the export potential of the European countries and as such catalyst for increased growth of the European water sector in general and for export to non-European countries as well.

Thus, there are at least two political aims or agendas behind innovation as a key focus area for governments and their agencies. The increased focus on innovation as a catalyst for increased export has not – as mentioned above - yet materialised in the strategies of the funding agencies, at least not if the responses to this question in the survey carried out within Task 2.2 should be taken for fully granted. There are, of course, elements of the funding strategies supporting innovation for this purpose. The outcome of the survey is a bit contradictory on that point. On the one hand, few of the respondents see the RDI support to international research cooperation as a door-opener to the foreign markets, on the other hand many of the respondents point out that the support is governed by governmental political and economic agendas.

It is acknowledged, though, by many European policymakers that it is a necessity to speed up innovation to meet the ever increasing global problems and challenges in the water domain. New solutions and technologies have to be developed to enable protection of the environment and supply enough water of the right quality for all purposes. The challenges are seen everywhere, but are often most prevailing in countries with high population growth rates, significant poverty problems, water scarcity and lack of human resources and infrastructure to solve their own problems.

In Table 1, the key criteria and indicators for the two types of agendas behind the focus on innovation are shown, and of these 4 selected indicators forming the basis for leveraging the innovation potential are given for the European countries. The first criterion should be understood such that promoting innovation in the national water sector will create solutions and technologies which then can be exported to countries in need for such solutions and thereby also contributing to the second criterion, which also depends on the bonds and partnerships established with the beneficiary countries, together with the foreign allocations to these countries. Such a national double strategy, promoting innovation for establishing solutions for

¹² European Commission. Science for the Environment Policy. Future Brief: Innovation in the European Water Sector. February 2015.

¹³ <http://www.eip-water.eu/about/basics>

solving own problems and for export at foreign markets, is fulfilling both economic and environmental goals.

In Table 1, some selected criteria for characterising the potential and the basis for innovation in Europe are shown. However, for some of these indicators, no consistent and reliable data exists, and in Table 2 those for which data is available are shown.

Table 1. Criteria and indicators for innovation

Political orientation (purpose)	Criterion	Indicators
Increased innovation	Potential for market development and increased export	RDI investments
		Number of patents
		Number of researchers
		Number of EU participations in projects with non-EU countries
		Investments in the national water sector
		Development aid
		Participation in international initiatives (international programmes, organizations, projects) related to water

Table 2. The Water JPI member and non-member countries analysed according to some selected innovation indicators

Water JPI members	RDI investments (mill. USD) ¹	Number of patents for the year 2016	Number of researchers per mill. inhabitants	Development aid per capita 2016 (USD) ²	Participation in international water associations and networks ³
Austria	12797	98	4937	137,59	√4
Cyprus	131	6	1064		
Czech Republic	6699	39	3400	18,85	
Denmark	7877	132	7311	447,05	√√
Estonia	544	174	3279	23	
Finland	7178	110	7011	234,13	√
France	60585	640	4233	137,35	√√
Germany	109562	1043	4318	214,73	√
Ireland	3625	29	4422	151,20	
Israel	11760	140	8250	24	
Italy	29448	260	1983	63,38	√√
Latvia	-	5	-	10	

Water JPI members	RDI investments (mill. USD) ¹	Number of patents for the year 2016	Number of researchers per mill. inhabitants	Development aid per capita 2016 (USD) ²	Participation in international water associations and networks ³
Moldova	66	4	746		
The Netherlands	16404	322	4513	338,38	√√
Norway	5805	105	5687	812,58	
Poland	9149	38	2053	11,45	
Portugal	3856	25	3643	30,07	√√
Romania	1569	13	906		√
Spain	19356	174	2627	34,52	√√
South Africa					
Sweden	14191	157	6877	701,10	√√
Turkey	15933	24	1163	47	√√
United Kingdom	43811	706	4254	284,85	√√
Observers					
Belgium	11935	124	4529	167,20	√
Greece	2436	16	2652	25,04	√
Hungary	3408	40	2671	15	√
Non Water JPI members					
Croatia	732		1436	12	
Bulgaria	1005	2	1827		√
Iceland	291	8	5621	120,29	
Lithuania	851	7	3063	14	√
Luxemburg	712	17	4725	609,48	
Serbia	755		1830		
Slovenia	1505	15	4140	29,04	√
Slovakia	1379	15	2713	16,56	√
Switzerland	14744	248	4455	421,37	√√

1: <http://uis.unesco.org/apps/visualisations/research-and-development-spending/>

2: OECD. 2016

3: International organizations active in Europe and beyond such as WWC, IWA, IWRA, GWP, IWMI, SIWI, CEWP

4: √: Involved in up to 2 major international organizations, √√: Involved in a number of international organizations

As can be seen at a glance from the data in Table 2, the innovation potential is highest in the North-Western European countries, including France, Switzerland and Austria. They are also the

countries, which are most active on the international scene and with the strongest economic sector. In terms of the capacity and strength of the water business, it is difficult to find key figures, except for the water service providers/utilities. For this category, it is dominated by the French and the British water companies. However, when also including the technology providers, countries like France, Germany, The Netherlands, Austria and Denmark are known as strong players with strong companies domiciled in these countries active in the Third World which is well reflected by the figures of total expenditure on RDI and the international water networking in associations.

2.2. Use the strategic criteria (cf. T2.1) to complement the mapping and identify the most relevant countries for future collaboration with outside Europe

Task 2.1 has identified a number of criteria for selection of strategic international cooperation partners outside Europe thereby enlarging the international outreach as well as indicators for these criteria¹⁴. The criteria and indicators identified were not intended to be a strategy for selection of the partner countries, since that is dependent on the purpose of the collaboration, that is the political agenda for supporting a particular country or region. In Deliverable D 2.1 report, examples of such guiding purposes of the collaboration are listed, of which could be mentioned mutual strengthening of the research excellence and capacity with highly developed countries, guidance aspects for defining research capacity building in less developed countries, door-opener for new markets, support of EU geopolitics, etc.

With no reference to the purpose of the international collaboration, the criteria and the indicators listed in Deliverable D 2.1 are developed to frame and guide activities leading to a more systematic and prioritised approach to international cooperation. The criteria identified include 9, which are shown in Table 4.

Table 3. Strategic criteria and examples of indicators defined by T2.1¹⁵

Criteria	Examples of indicators
Scientific excellence	Total publications, total patents, water related publications, water related patents, number of citations, number of scientists, technology developers, and entrepreneurs, Investments in RDI
Potential for market development	Population, GDP per capita, market for new technology, profile of companies, investments by financial institutions
Common interest	Support to water related RDI, river basins or catchments shared with neighbouring countries, water policy, water-related challenges, water related RDI infrastructure of common interest
Established collaboration/contacts	Participation in international RDI initiatives related to water, participation in EU funding programmes, participation in multilateral water platforms, no of publications co-authored with European researchers in the water-related area
Profile of national funding agencies	National funding agencies, policy of funding agencies in relation to international collaboration, funding capacity of national funding agencies

¹⁴ List of Strategic Criteria. IC4WATER D 2.1, December 2017.

¹⁵ List of Strategic Criteria. IC4WATER D 2.1, December 2017.

Criteria	Examples of indicators
Profile of national stakeholders	Dedicated water related RDI centres, water-related organizations, national stakeholders in national and international projects and initiatives
Geopolitical criteria	Strategic interest for EU, BRIC country
Enabling environment for partnering and RDI activities	Logistics, safety aspects, mobility, communication, dedication to personal data protection, matching IPR, cultural similarity including gender, legal framework conditions
Added value of cooperation	Contribution to poverty eradication, contribution to development of RDI infrastructures, contribution to personal welfare, contribution to UN SDG's

Some criteria mentioned earlier were not included in the list, i.e. such criteria linked to a political purpose of getting inspiration and new input for innovation in own RDI communities and institutions.

The list of criteria and indicators was discussed at a workshop in Madrid, 19 November 2017, but no exact conclusions as to which criteria and indicators should be applied to select the future international partners were drawn, since that would require as mentioned above a consensus, or at least a common agreement - on the purpose of the collaboration.

2.3 Identification of national strategies for international RDI cooperation in JPI member countries future collaboration with outside Europe

2.3.1 Methodology

In the past, the international partners were selected based on a number of different non-prioritised criteria. Previous experience and traditional, historical bonds from some of the Water JPI partners as well as personal and institutional bilateral contacts have played a significant role. The identification of the international research partners was opportunity-based and based on the opinion that it would be beneficial for Water JPI to enlarge the cooperation to involve international partners, simply because it would stimulate and inspire the members of the network to improve performance in broad terms.

In some cases, it led to very promising and well-functioning cooperation, but since a lot of resources have to be injected to really make international research cooperation materialise, it is very important that the involvement of third country partners is done on a well-thought and strategic basis, including an acknowledgement of the political purpose(s) of the cooperation.

The methodology for identification and selection of the most relevant partner countries from such a strategic point of view reflecting a thorough and systematic approach to the selection of future international partners is shown in Figure 5.

The first step would be to select the countries to be candidates for future cooperation. Basically, the starting point is those countries which have been involved previously at different levels and within different activities, including both those which have concretely taken part in Water JPI activities and those which have been considered to take part, but where the attempt to integrate the countries for different reasons did not materialise. Although this mapping exercise does not aim to exclude or disqualify any already committed partners, they will be part of the analysis, and the results can be used to review the decisions taken in the past.

In addition to the already known partners, a number of other relevant partner countries will be exposed to the selected criteria and indicators, identified but not prioritised within Task 2.1.

To provide more information on which countries could be of interest to be approached for cooperation, a survey carried out as part of this task was structured to give some indications on the national policies behind the support to international research cooperation. The Water JPI members were asked to address questions on the political agendas behind the support, which is a prerequisite for selection of the right criteria and indicators for identifying the right partner countries outside Europe. The Water JPI members were also asked whether they had any particular priorities as to which countries or regions they would target as the most preferred partners. The conclusions on the latter question could be considered along with the list of countries involved in the former initiatives under Water JPI, see Table 2. National policies should not, however, be the only guiding factor to govern the selection of countries to be involved by Water JPI in the future, being a multilateral organisation, harbouring members with different political purposes and agendas.

The next step is – on the basis of the political priorities - to define a list of strategic criteria and indicators for international cooperation and for selecting the best future partners for this cooperation. Examples of such strategic criteria and indicators have been developed within Task 2.1 and reported in Deliverable D 2.1, see Table 3. Based on an analysis of potential international partner countries on the basis of the selected criteria and indicators, an identification of future partner countries could then be carried out.

It will not be part of the analysis how identified potential relevant partners should be involved, or what vehicles and incentives should be on the table and which funding arrangements should be available to enable this cooperation.

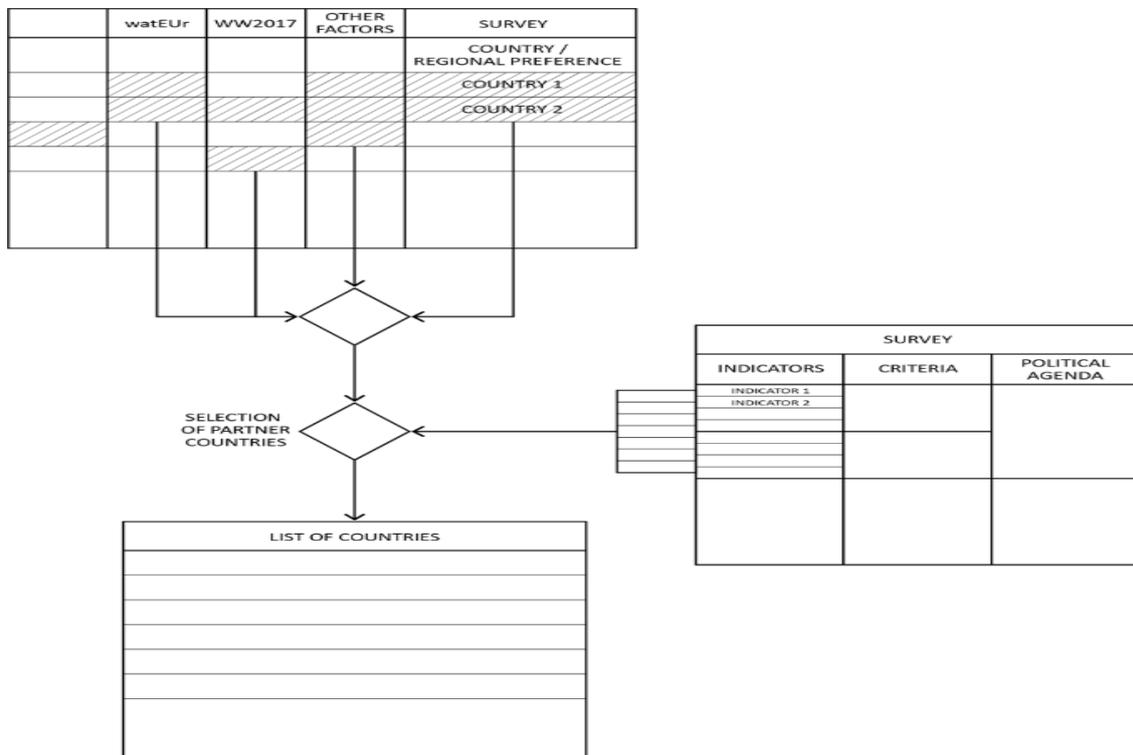


Figure 5. Methodology for selection of future partner countries

2.3.2 Countries of interest

A number of countries from outside Europe - and institutions in these countries - have so far participated in the Water JPI activities. In Table 3, the different international partner countries which have been involved so far - or have been approached or considered by water JPI to be involved - in the different activities are listed. Some of the countries were directly targeted in the beginning of Water JPI. Others were later involved through some Water JPI activities (WaterWorks2015 and WaterWorks2017), such as Egypt, Tunisia, South Africa, others again through regional workshop for African, Mediterranean and American regions¹⁶. Many countries were targeted both through existing contacts, but also indirectly through cooperation with regional organizations and networks not necessarily focusing on water, including other JPIs, such as SFIC, BONUS2, ERA-NET Med, ARIMNET, CONFAP, PRIMA, Inno Indigo, Belmont Forum, GWP, AFRIALLIANCE, etc.

2.3.3 Survey outputs

To get a more precise idea on geographic preferences, the member countries were asked through the survey, which countries or regions outside Europe they prefer or have prioritised to work with. We got a response from 15 of the Water JPI member countries, corresponding to 79%. Seventy three per cent (11) of the respondents came from governmental funding agencies, and 4 (27 %) from government departments. The responses on that point varied quite significantly, although some rather firm conclusions could be drawn. Some of the member countries had different mechanisms for different types of support, depending on the purpose of the cooperation. Some member countries had support mechanisms for the whole range of countries – reflecting different political purposes of the cooperation – ranging from development aid to DAC countries¹⁷, covering the whole range from the least developed countries to the Upper Middle Income Countries like China, Brazil and Malaysia. Other responses gave more clear political priorities.

No doubt, other “criteria” as mentioned above such as historical bonds and relations and common language also have played a significant role in the choice of cooperation partners – and still do -, i.e. there have been specific partnership preferences between France and Western Africa, Portugal and Spain some Latin American and the Caribbean (LAC) countries, etc.

Table 4 shows how the different countries are scored in the survey. Many of the Water JPI countries mentioned specifically USA, Canada, China, India and Japan as preferred partners. Russia and the Mediterranean countries were also specifically mentioned by more Water JPI members. African countries were not mentioned – except by one respondent – and in certain cases where they were indirectly mentioned as representing the OECD DAC countries, including Low Income Countries. This corresponds quite nicely with the fact that development aid was not seen as a primary factor governing the support to international research cooperation. Since the starting point is those countries already involved or having been considered to be involved, not all countries are mentioned.

2.3.4 Other aspects for selection of future research partners

Some other aspects should be taken into account when looking for the future research partners outside Europe:

¹⁶ WaterWorks2015. International Cooperation Progress report. D 6.4. December 2017.

¹⁷ http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC_List_ODA_Recipients2018to2020_flows_En.pdf

- Certain countries have grown into very strong water countries in the sense that they have a strong political focus on innovation and on water solutions and technologies, and for that reason have developed competitive companies and innovative products with a high global market share, i.e. countries like Singapore and South Korea. These countries have developed into strong competitors to the dominance of European water companies on the international markets. They are also included in the list of potential partners for international cooperation.
- Some countries are very active in global water organisations, such as WWC, IWA, IAH, IAWR, and GWP, which also could be an incentive for European RDI stakeholders to establish partnerships with institutions from these countries. This is also reflected in the list of countries to be included in the evaluation.
- Some countries have recently shown very high economic growth – although for quite a few of them from a low point – and these countries might, within a medium term time perspective, develop into attractive partner countries for Water JPI. A selection of these countries is included in the list as well.
- A fourth factor could be countries which face the same challenges as Europe and, for historical and cultural reasons, have a similar approach and mind-set for meeting those challenges, i.e. Australia.

Table 4: Third countries involved at different levels or to be involved

Third country Partner				
	WatEUR ¹	WW2015; WW2017 ²	Survey ³	Other factors ⁴
Australia			3	√
USA		√ - B	1	√
Canada	√	√ - C	1	√
Brazil		√ - C	1	√
Mexico			1	
Argentina		√ - B	2	
Chile		√ - B	2	
Peru				
India	√		1	√
China			1	√
South Korea			2	√
Japan			1	√
Singapore			2	√
Vietnam	√		2	√
Taiwan	√		2	√
Malaysia			2	√
Thailand	√		2	
RSA	√	√ - C	1	
Egypt	√	√ - C	1	
Ghana		√ - A	3	
Burkina Faso		√ - A	3	√
Côte d'Ivoire		√ - A	3	√
Kenya				√
Senegal		√ - A	3	√

Third country Partner				
	WatEUR ¹	WW2015; WW2017 ²	Survey ³	Other factors ⁴
Cameroon				
Ethiopia			3	√
Nigeria			3	
Rwanda			3	√
Uganda				
Morocco		√ - A and B	1	√
Algeria				
Jordan		√ - B	1	
Lebanon				
Tunisia	√	√ - C	1	
Russia			1	

1: Tackling European Water Challenges (watEUR). Third Year Mapping Report. June 2016

2: Approached during later stages of Water JPI within different activities (calls, workshops, etc.). A: Approached for soft activities, B: Approached for funding activities, C: Committed

3: 1: Mentioned by most of the respondents as preferred partner; 2: Mentioned of more than 3 respondents; 3: Only mentioned indirectly as part of a regional preference, i.e. LAC countries or Low Income Countries in Africa, etc.

4: Strong, innovative and competitive water sector; Active in global water organisations; High economic growth; Similar approach to challenges

Based on the outcome of the survey responses, on previous experience and intentions on cooperation, and on a number of other factors mentioned above, the countries shown in Table 2 are selected to be further analysed according to the methodology and using criteria and indicators reflecting different political purposes to select among them who Water JPI should further strive to get on board concretely in the future. To a certain degree, the list is arbitrary, since a number of other countries, i.e. some of the LAC countries, some South East Asian countries like Indonesia and the Philippines, etc. Such countries might be taken into consideration at a later stage, if appropriate. It should be taken into account that Water JPI also has to mobilise resources for the enlargement of the network.

3. Discussion on the different purposes of international RDI collaboration

Parallel to the attempts to condensate key criteria and indicators for international collaboration, work in the ERA-NET Cofund Action WaterWorks 2015 on how to use international organisations and platforms for facilitating international collaboration has been carried out and reported¹⁸.

As it is mentioned in a working document of T 2.1¹⁹, the list of criteria and indicators should be narrowed down according to the orientation and the strategy of the country. However, there will not be full consensus on what purposes are the most important ones among the different Water JPI members, as also shown by the responses of the survey. That will be dependent on the policy of the country in question. Some countries will put emphasis on aspects which lead to excellence in research and innovation among own stakeholders, thereby accelerating growth of the water business. Others may prioritise traditional development aid aspects and policies acknowledging that support to beneficiary countries may eventually lead to higher welfare and

¹⁸ Discussion document: Feedback from Survey on International Cooperation 2018 Water JPI Workshop towards a Common Strategy on International Cooperation. IC4WATER August 2018.

¹⁹ List of Strategic Criteria. IC4WATER D 2.1, December 2017.

thus increased absorption capacity for solutions and technologies from own resource base. Others again may use the international cooperation on water as part of a geopolitical strategy, etc.

3.1 Survey outputs

In the survey mentioned in the methodology chapter 2.3.1, the member countries have been asked which political agendas are governing their support to international research cooperation, which then would – at least to a certain degree – indicate which criteria and indicators are the most relevant ones when selecting the future partner countries outside Europe.

The purposes which were included in the survey were:

1. Stimulating and improving excellence; to learn and get inspired by researchers, entrepreneurs and other stakeholders coming from another cultural background
2. Stimulating and improving excellence; to get exposed to challenges where they are most urgent and complex
3. Export promotion; door opener for business and export by showcasing and exposing competencies, solutions and technologies in targeted markets
4. Capacity building; to enhance capacity of target country/region to enable them to solve their problems and thereby promote growth and be a more competent and resourceful business partner
5. Foreign aid; aligning to a donor agenda by providing solutions for meeting the challenges in the beneficiary country
6. Solving global challenges; for mutual benefit by providing solutions to problems outside Europe contributing to meet the challenges we face in Europe as well
7. No overall political agenda; the individual institutions decide themselves whether they want to take part in international cooperation.

The responses were rather consistent on the political priorities, since most member countries mention that accelerating excellence is a main driver and purpose behind the support strategy (9 out of 15 respondents as the main priority), see Figure 6 showing average scores. The second highest score was for number 6 “Solving global challenges”, where 2 out of 15 respondents gave it first priority and 8 as third priority. A more development aid oriented policy did not govern the support strategy to any significant extent, since only one respondent scored it as second priority which was the highest score for this category. The category 3 export promotion and market access was apparently not an important driver for supporting international research cooperation either, since only one of the respondents gave a second priority and the rest gave less than third priority. This is in line with the fact that a minority of the countries provide support to other stakeholders than researchers, namely only 4 countries out of 15.

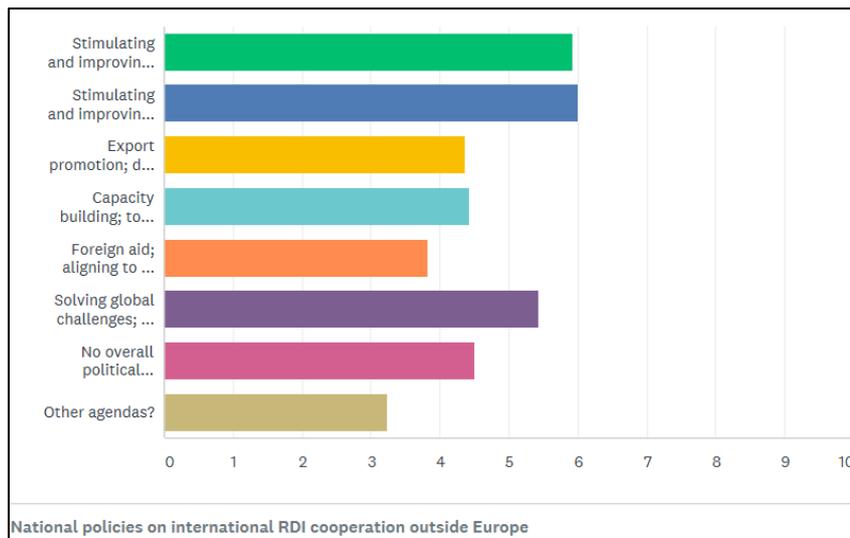


Figure 6. Political agendas behind support to international RDI cooperation

Following the methodology for the selection of future partner countries, the purpose of European countries for supporting international research cooperation is here narrowed down to 3, which are then considered to be the main categories of political prioritization and orientation among Water JPI members. They are the following, some of them being more or less complementary:

1. Excellence - to accelerate RDI excellence of own stakeholders by cooperating with countries with high quality standards, competencies and political prioritization of RDI
2. Joining forces - to jointly solve global challenges by providing solutions to solve the problems in regions outside Europe
3. Market access and export promotion - to use RDI partnerships and cooperation as a door-opener to specific markets outside Europe.

These 3 different political priorities are used as basis for selection of the criterion indicators shown in Tables 5-7. On the basis of the data obtained for those criteria, the potential partners countries along with those already being considered and/or involved, can be evaluated in terms of being attractive partners for international cooperation.

3.2 Criteria and indicators reflecting the selected political priorities

3.2.1 Excellence accelerator

As mentioned, excellence acceleration is a driving incentive for most countries to support international cooperation outside Europe. There is no doubt that a number of countries see international cooperation as an accelerator for improving the excellence of their own researchers taking part in the research partnerships. European researchers exposed to international researchers coming from another cultural background and with a different mind-set on what it takes, often get new inspiration and bring home new ideas and new ways of thinking stimulating their own research. But a prerequisite for an European researcher to be inspired is that the international partner has an equal professional expertise to match the one of the European partner.

The question is, then, on this basis what are the main criteria and indicators for stimulating excellence by the international partners? What are the key parameters which characterise an international partner, who would be able to improve excellence? The criterion is, as mentioned,

excellence itself, that is the professional expertise and competencies of the international partner. Task 2.1 identified a number of such indicators for excellence, of which some are shown in Table 5. According to the methodology, we have analysed the selected countries for 6 different indicators, namely:

- Water related publications
- Water related publications per inhabitants
- Number of researchers per inhabitants
- Number of patents (2007 – 2016), EU MS representing 32.3% of the patents taken during this reference time
- RDI investments
- Participation in EU projects.

As it can be noticed, there is quite a difference in the extent to which the countries that are selected live up the criterion of matching the European researchers on excellence. However, for some of the indicators, there is a time lag before a change in excellence can be observed, i.e. number of publications and especially citations. A very good example is China. It does not seem to be excellent in terms of publications in international journals per inhabitants. However, a quick analysis of the number of water related papers in Water Research within the last years shows that the Chinese researchers these years are really propelling. The number of papers with a Chinese first author in the February issue of Water Research has increased from 10 to 22 between 2014 and 2018. Concerning the number of papers published with a majority of Chinese authors (not only with Chinese first authors) the increase is even more significant. The same trend is observed for other international journals.

In terms of publications, Table 6 presents the international publications of selected countries, showing the existing successful partnerships between Europe (MS and Associated Countries) and other countries

Table 5. Excellence indicators for selected countries

Third country	Water related publications ¹	Water related publications per mill inhabitants	Number of researchers per mill. inhabitants	Number of patents ² 2007 - 2016	Investments in RDI ³	Participation in EU projects ⁴	Countries of interest for international cooperation ⁵
Australia	22280	898	4539	19 061	23129	XX	√√
USA	127041	389	4255	637 257	476460	XX	√√
Canada	25273	683	4552	35.905	27793	XX	√√
Brazil	19771	95	881	5 843	42001	XX	√
Mexico	7609	61	224	2 411	11519	X	
Argentina	4442	101	1202	366	5045		√
Chile	2514	143	430	1 107	1517		√
Peru	548	17	-	112	407		
India	22581	17	156	13 753	48063	X	√
China	67591	49	1096	192 970	370605	XX	√√
South Korea	11851	231	6856	140 514	73099	XX	√√
Japan	22430	178	5328	458 697	169554	X	√√
Singapore	2401	429	6729	8 239	10069	X	√√
Vietnam	929	10	673	118	1777	X	
Taiwan	7041	298	-	10 681	-	XX	√
Malaysia	-	-	2024	2 714	9728	X	√
Thailand	3233	49	964	782	5138		
RSA	5184	91	432	3 453	5489	XX	√
Egypt	3205	33	665	454	6082		√
Ghana	536	18	38	9	276	X	
Burkina Faso	55	3	47	1	65		
Côte d'Ivoire	204	8	69	13	-		
Kenya	1208	24	225	58	788	XX	
Senegal	369	24	362	32	149	X	

Third country	Water related publications ¹	Water related publications per mill inhabitants	Number of researchers per mill. inhabitants	Number of patents ² 2007 - 2016	Investments in RDI ³	Participation in EU projects ⁴	Countries of interest for international cooperation ⁵
Ethiopia			44	1	787	X	
Cameroon	354	15	-	19	-		
Rwanda	-	-	12	2	-	X	
Nigeria	-	-	38	40	1374	X	
Uganda	342	9	26	9	114		
Morocco	1159	33	1020	329	1483		√
Algeria	1056	25	168	82	241		
Jordan	1044	104	-	68	263		√
Lebanon	484	81	-	55	-		√
Tunisia	-	-	1800	69	827		
Russia	5761	39	3094	9 261	40330		√

1: Web Of Science 1998 - 2015

2: The worldwide patent database_collection of published applications from 100 countries – PATBASE (FUIIPAT)

3: <http://uis.unesco.org/apps/visualisations/research-and-development-spending/>

4: XX: > 30 project participations 2014 – 2016; X: < 30 project participations 2014 - 2016

5: Cut off criterion: water related publications per mill inhabitants > 50 or Investments in RDI > 25.000 M USD, modified by the other factors if significant results occur

Table 6. Existing scientific cooperation between selected countries

Double entry table to explain with whom the Europeans are publishing in terms of water – related challenges – in % of total international publications

	Europe (MS +)	Australia	Brazil	Canada	Chile	China	Egypt	India	Japan	Korea	South	Morocco	Russia	Senegal	RSA	USA	Taiwan	Thailand	Vietnam
Australia	21.5		0.97	2.8	0.23	8.1	0.15	1.41	1.63	0.74	0.03	0.35	0.02	1.0	10.5	0.25	0.82	0.32	
Brazil	15.76	1,09		1,55	0,37	1.15	0.09	0.34	0,45	0.09	0.02	0.08	0.09	0.11	8.9	0.07	0.06	0.06	
Canada	19.78	2.5	1.24		0.24	5.9	0.29	1.08	1.11	0.78	0.19	0.48	0.05	0.38	17.1	0.23	0.17	0.05	
Chile	37.5	2.11	5.38	2.47		0.67	0	0.44	0.64	0.28	0.12	0.16	0	0.64	15.4	0.24	0.08	0.08	
China	8.2	2.66	0.12	2.19	0.02		0.09	2.29	2.37	0.67	0.01	0.19	0	0.1	9.94	0.99	0.13	0.07	
Egypt	19.87	1.12	0.28	2.25	0	1.18		1.12	3.5	1.6	0.44	0.22	0	0.47	10.4	0.09	0.22	0.06	
India	8.78	1.39	0.31	1.20	0.05	0.88	0.16		1.39	1.22	0.03	0.09	0.03	0.37	5.6	0.37	0.21	0.11	
Japan	8.89	1.62	0.40	1.27	0.07	7.25	0.58	1.40		2.05	0.02	0.51	0.02	0.13	7.06	0.58	1.82	0.86	
South Korea	5.39	1.39	0.15	1.66	0.06	3.76	0.43	2.32	3.86		0.04	0.35	0	0.93	15.1	0.35	0.32	0.36	
Morocco	79.1	0.52	0.60	4.14	0.26	0.43	2.24	0.52	0.34	0.43		0.34	0.43	0.43	6.9	0	0	0.17	
Russia	32.4	1.35	0.43	2.10	0.07	2.20	0.12	0.36	1.98	0.73	0.07		0	0.33	9.73	0.21	0.23	0.24	
Senegal	86.0	1.08	2.71	4.07	0	0	0	1.90	1.08	0	1.35	0		0.54	12.7	0	0.81	0.81	

RSA	24.3	4.32	0.42	1.87	0.31	1.35	0.29	1.60	0.54	0.21	0.08	0.37	0		8.45	0.13	0.31	0.13
USA	14.2	1.84	1.38	3.4	0.30	5.27	0.26	1.0	1.24	1.41	0.06	0.44	0.04	0.34		0.56	0.34	0.05
Taiwan	4.37	0.79	0.18	0.84	0.08	6.36	0.04	1.19	1.85	0.60	0	0.17	0	0.11	10.1		0.51	0.31
Thailand	17.1	5.7	0.46	1.33	0.06	2.78	0.22	1.45	12.6	1.17	0	0.37	0.09	0.49	13.3	1.11		1.7
Vietnam	53.0	7/75	0.75	1.40	0.21	5.38	0.21	2.58	20.8	4.63	0.21	1.51	0.32	0.75	7.32	2.37	5.92	

3.2.2 Market access, export promotion

Indicators for market access and export facilitation should reflect both the ability of the country/region in question to pay now or in the near future for the services offered by European stakeholders, the need of investments because of ageing infrastructure and health deterioration, the prospects in terms of economic growth to improve the current situation and also legal and administrative barriers for export to the beneficiary country. While the latter factor is very difficult to quantify, it is much easier to suggest some indicators for the first three mentioned factors, which are given in Table 7.

Table 7. Market access and export indicators

Third country	GDP per capita (USD)	Economic growth (%) ¹	Investments in water infrastructure ²	Diarrhoea deaths in children under 5 years of age per 100.000 inhabitants due to inadequate sanitation ³	Countries of interest for international cooperation
Australia	53799	3,04			✓
USA	59531	2,27			✓
Canada	45032	3,05			✓
Brazil	9821	0,98	9240	2,1	✓
Mexico	8910	2,04	2394	3,7	✓
Argentina	3937	2,85		1,6	
Chile	15346	1,49		0,2	
Peru	6571	2,53		4,8	
India	1942	6,68	3554	71,7	✓
China	8826	6,90	53794	4,9	✓
South Korea	29742	3,06			✓
Japan	38428	1,71			✓
Singapore	57714	3,62			✓
Vietnam	2342	6,81		9,5	✓
Taiwan	-	-			
Malaysia	9951	5,90	291	1	✓
Thailand	6595	3,91		2,9	
RSA	6151	1,32	3550	31,8	✓
Egypt	2412	4,18			
Ghana	2046	8,14		71,1	✓
Burkina Faso	642	6,30		150,2	✓
Côte d'Ivoire	1537	7,70		148,9	✓
Kenya	1594	4,87	370	92,4	✓
Senegal	1329	7,15	87	50,8	✓
Ethiopia	767	10,25	197	89,6	✓
Cameroon	1451	3,55			
Rwanda	748	6,06	57	63,6	✓
Nigeria	1968	0,81	602	168,8	
Uganda	606	3,86			
Morocco	3007	4,09			✓

Third country	GDP per capita (USD)	Economic growth (%) ¹	Investments in water infrastructure ²	Diarrhoea deaths in children under 5 years of age per 100.000 inhabitants due to inadequate sanitation ³	Countries of interest for international cooperation
Algeria	4055	1,60			
Jordan	4129	1,97			
Lebanon	8808	1,53			
Tunisia	3464	1,96			
Russia	10743	1,55			√

1: <https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg>

2: Financing Universal Water, Sanitation and Hygiene under the Sustainable Development Goals. UN-Water Global Analysis and Assessment of Sanitation and Drinking Water. GLAAS 2017 Report.

3: Financing Universal Water, Sanitation and Hygiene under the Sustainable Development Goals. UN-Water Global Analysis and Assessment of Sanitation and Drinking Water. GLAAS 2017 Report, Annex DI

3.2.3 Joining forces for solving global challenges

Indicators for selection of partner countries to join forces for solving global challenges should comprise parameters which show the ability of the partner country to contribute (economic capacity, professional expertise and technical capabilities) and awareness and political focus on the challenges. Based on this assumption, some indicators providing answers as to whether the countries live up to such expectations are selected and provided in Table 8.

Table 8. Joining forces for solving global challenges

Third country	Investments in RDI ¹	Number of patents filed 2016 ²	Economic growth ³	Participation in multi-lateral water platforms ⁴	Investments in water infrastructure ⁵	Countries of interest for international cooperation
Australia	23129	1899	3,04	√		√
USA	476460	69399	2,27	√		√
Canada	27793	2857	3,05	√		√
Brazil	42001	625	0,98	√	9240	√
Mexico	11519	294	2,04		2394	
Argentina	5045	48	2,85		1707	
Chile	1517	198	1,49			
Peru	407	17	2,53		1745	
India	48063	1843	6,68	√	3554	√
China	370605	43743	6,90	√	53794	√
South	73099	18819	3,06	√		√
Japan	169554	51082	1,71	√		√
Singapore	10069	1010	3,62			√
Vietnam	1777	10	6,81			
Taiwan	-		-	√		
Malaysia	9728	195	5,90		291	√

Third country	Investments in RDI ¹	Number of patents filed 2016 ²	Economic growth ³	Participation in multi-lateral water platforms ⁴	Investments in water infrastructure ⁵	Countries of interest for international cooperation
Thailand	5138	195	3,91		1406	
RSA	5489	303	1,32	√	3550	√
Egypt	6082	46	4,18			
Ghana	276	1	8,14			
Burkina	65	0	6,30		45	
Côte	-	3	7,70		181	
Kenya	788	5	4,87		370	
Senegal	149	8	7,15	√	87	
Ethiopia	787	0	10,25		197	
Cameroon	-	2	3,55			
Rwanda	-	0	6,06		57	
Nigeria	1374	4	0,81		602	
Uganda	114	0	3,86			
Morocco	1483	36	4,09	√		
Algeria	241	13	1,60			
Jordan	263	2	1,97			
Lebanon	-	9	1,53	√		
Tunisia	827	3	1,96			
Russia	40330	856	1,55			√

1: <http://uis.unesco.org/apps/visualisations/research-and-development-spending/>

2: The worldwide patent database collection of published applications from 100 countries – PATBASE (FUIIPAT)

3: <https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg>

4: WWC, IWA, IWRA, GWP, IWMI, etc.

5: Financing Universal Water, Sanitation and Hygiene under the Sustainable Development Goals. UN-Water Global Analysis and Assessment of Sanitation and Drinking Water. GLAAS 2017 Report.

4. Conclusions

Different potential Water JPI partner countries have been proposed for being involved in international RDI cooperation with the Water JPI, as indicated in Table 6. To summarize the priorities for reaching a conclusion as to which countries to select by Water JPI, a weighted approach for the three main political purposes can be applied, which then will lead to a list of countries which are shown in the table.

It has then to be decided, however, how many countries should be prioritised and pursued in an effort to enlarge Water JPI, which eventually will depend on the resources available for this activity within the network. The approach should also include a more precise assessment of which ministry/institutional counterpart should be addressed for realizing the cooperation. This should be done parallel to an analysis on barriers, i.e. political or economic, for the potential cooperation. Not the least, it should be discussed how the approach should be carried out, probably in a stepwise procedure, and adapted to the particular country to be approached. Such an analysis has to be carried out prior to any steps to be taken to approach the proper institution or agency to be the operational counterpart for such arrangements.

To enhance success with the effort, coordination with or support by SFIC would probably be useful as a door-opener for the arrangement.

The countries in Table 8 are divided up in four categories:

- Those countries who already have a concrete cooperation with Water JPI
- Those who have been approached previously by Water JPI and are obvious partner countries
- Those considered having a good basis for cooperation now
- And those who have a potential for being a preferred RDI partner at a later stage.

The latter category comprises mainly countries which currently have strong economic growth and therefore also are expected to develop into an attractive RDI partner on medium term, 3 – 5 years, time perspective.

Table 9. Suggestions for new Water JPI international partner countries

Potential Water JPI partner countries	Political agendas behind support to international research cooperation			Suggestions for future partner for Water JPI
	Accelerating excellence in RDI	Joint effort for solving global challenges	Achieving market access and export promotion	
Australia	√	√	√	1
USA	√	√	√	1
Canada	√	√	√	1
Brazil	√	√	√	0
Mexico			√	
Argentina	√			
Chile	√		√	2
Peru				
India	√	√	√	1
China	√	√	√	1
South Korea	√	√	√	1
Japan	√	√	√	1
Singapore	√		√	1
Vietnam			√	2
Taiwan	√			
Malaysia	√		√	2
Thailand				
RSA	√	√	√	0
Egypt			√	0
Ghana			√	2
Burkina Faso			√	
Côte d'Ivoire			√	
Kenya			√	3
Senegal		√	√	2
Ethiopia			√	3
Cameroon				
Rwanda			√	3

Potential Water JPI partner countries	Political agendas behind support to international research cooperation			Suggestions for future partner for Water JPI
	Accelerating excellence in RDI	Joint effort for solving global challenges	Achieving market access and export promotion	
Nigeria				
Uganda				
Morocco			√	3
Algeria				
Jordan	√			
Lebanon	√	√		2
Tunisia				
Russia	√		√	2

0: Countries already concretely involved; 1: Countries, some of which have been approached before, and that should be sought integrated now; 2: countries which should be considered to take on board in a first round of enlargement; 3: countries that should be analysed further for integrating within the next years; countries that are good candidates for cooperation at a medium term perspective.

Report Annexes

Annex 1. Questionnaire to Water JPI members

1. Country

2. Which governmental institutional level are you representing?

- Ministry department directly linked to policy makers and putting decisions on RDI into practice
- Governmental (funding) agency implementing political decisions on RDI support

3. What is/are the main political agenda(s) behind the support to participation in RDI cooperation initiatives (as single researchers, research consortia, multi-stakeholder consortia) with partners from countries outside Europe? Please note, that there might be overlapping agendas in the categories mentioned. Please prioritise.

⋮	<input type="text"/>	Stimulating and improving excellence; to learn and get inspired by researchers, entrepreneurs and other stakeholders coming from another cultural background
⋮	<input type="text"/>	Stimulating and improving excellence; to get exposed to challenges where they are most urgent and complex
⋮	<input type="text"/>	Export promotion; door opener for business and export by showcasing and exposing competencies, solutions and technologies in targeted markets
⋮	<input type="text"/>	Capacity building; to enhance capacity of target country/region to enable them to solve their problems and thereby promote growth and be a more competent and resourceful business partner
⋮	<input type="text"/>	Foreign aid; aligning to a donor agenda by providing solutions for meeting the challenges in the beneficiary country
⋮	<input type="text"/>	Solving global challenges; for mutual benefit by providing solutions to problems outside Europe contributing to meet the challenges we face in Europe as well
⋮	<input type="text"/>	No overall political agenda; the individual institutions decide themselves whether they want to take part in international cooperation
⋮	<input type="text"/>	Other agendas?

4. If other political agendas than listed in the previous question, which ones? Please explain

5. Are there any national funding available for international RDI cooperation outside Europe either for bilateral (national/regional) or multilateral cooperation?

Yes

No

6. If yes to Question 5, which stakeholders can receive funding through one of more of the fundings mechanisms available?

Researchers

Companies

Entrepreneurs

Utilities

Start-ups

Public authorities and institutions

SMEs

Organizations

Others (please indicate)

7. If yes to Question 5, which type of funding is available

Grants only for national stakeholders for bilateral cooperation

Support to European organizations facilitating international cooperation

Grants for national stakeholders as well as counterparts for bilateral cooperation

Support to international organizations facilitating cooperation

Grants for national stakeholders for multilateral cooperation

Others types of funding (please indicate) or comments to the above

8. Are there country or regional priorities for which countries are selected for international cooperation

yes

No

9. If yes to question 8, what are the criteria for selection of a particular country/region for cooperation (linked to question 1)

10. If yes to question 8, which countries and/or regions are being given priority?