



BeWater

Making society an active participant in water adaptation to global change

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Mobilisation and Mutual Learning (MML) Action Plans:
mainstreaming Science in Society actions in research

D.7.1 Study on national support mechanisms to international water management research

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References

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Executive Summary

This study is a consolidation of facts and opinions executed by experts from three European organisations (Europe for Business Ltd, Ecologic Institute and Deep Blue Consultants). The information collected on European initiatives in water management falls into two categories:

- An analysis assessing the involvement of national funding agencies for the water management sector in targeted countries of BeWater project: Belgium, Cyprus, Finland, Germany, Greece, Italy, Slovenia Spain, the Netherlands, the United Kingdom and Tunisia.
- The identification of key factors (lack of matching funds, lack of adequate analysis of opportunities, lack of synchronisation of local funding cycles with the EU cycles, language barriers, nationalism) and organisations, which influence the performance of research organisations in those counties in international research.

This study primarily aims at identifying national agencies and funding research organisations in water management sector in targeted countries. Therefore, this study determines critical factors that influence the ability of research organisations to launch or get involved in collaborative projects with European counterparties.

The analysis provides a comprehensive view of research system aspects and number of practices in different countries in Europe and beyond. A higher priority will be given to challenges currently facing the water management and research sector as well as proposed a broader approach to water sector policies.

In order to fulfil the main objective of this analysis, only the main research funding agencies in each country are highlighted.



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Regarding the second objective of this analysis, there is a set of key factors pointed out that caused difficulties for the organisations to get involved in collaborative projects. Three of them are the most recurrent:

- The challenge to prepare researchers: this implies improving all the education chain in the country, from the basic education schools to the University;
- The challenge to protect research funding from economic crisis: this implies equalizing the professional valorisation between a researcher and an industrial employee;
- Partial challenge due to language barriers: which must be removed to established a smoothly communication between researchers.

The complete main difficulty matrix can be found in chapter 13 (Conclusions) of this report. The specific challenges of each country are described in the respective country chapter.

This deliverable is a useful tool for policy and decision makers that facilitates a better understanding of the existing difficulties as a way for finding solutions that can contribute to the increase of international cooperation in Europe and North Africa.



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1. Introduction

1.1 The European context

The importance of water-related innovation has been recognized by policy makers in recent years by its increasing inclusion in policy and research agendas, e.g. the water-related challenges addressed in the Horizon2020 programme¹, the Water Framework Directive (WFD)², the European Innovation Partnership on Water (EIP Water)³ within the EU 2020 Innovation Union⁴, the Joint Programming Initiative of EU Member states on Water (JPI Water)⁵, the Joint Programming Initiative of EU Member states on Climate (JPI Climate)⁶. In general, the water sector has the reputation of being less dynamic and innovative than other sectors, e.g. energy. The figures of innovation and Research and Development (R&D) intensity in the water sector are lower compared to other sectors.⁷ European Innovation Partnership on Water has identified a number of barriers that are perceived to hamper water-related innovations one of them is the lack of funding and financial flow for innovation into the water management sector.⁸

The D.7.1 presents the result of the research related to the international cooperation and bilateral cooperation components of Europe and one North Africa country's (Tunisia) programme to R&D and innovation in water management (i.e. European funded programmes where Europeans can apply and bilateral agreements).

The target countries considered in this analysis are: Belgium, Cyprus, Finland, Germany, Greece, Italy, Slovenia, Spain, The Netherlands, The United Kingdom and Tunisia.

This analysis is the result of task 7.1 of WP7 'Study of national funding agencies action in international cooperation projects'. The Work Package 7 objectives are as follows: to ensure the sustainability and enhance the impact of the BeWater project. This study identifies agencies and other bodies active within the national support systems to research in the eleven-targeted countries. Moreover, it identifies the critical factors that influence the ability of research organizations from the targeted countries to launch or get involved in collaborative projects with European counterparts.

The national schemes or international and bilateral agreements of funding will give legal, administrative or financial context.

1.2 Background of the study

¹ European Commission, 'Climate Action, Environment, Resource Efficiency and Raw Materials.' Horizon2020, The EU Framework Programme for Research and Innovation

² European Commission, 'Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the fields of water policy.'

³ The European Innovation Partnership on Water (EIP Water). <<http://www.eip-water.eu/about/basics>>

⁴ European Commission, 'EU Innovation Union.' <http://ec.europa.eu/research/innovation-union/index_en.cfm>

⁵ Joint Programming Initiative Water <<http://www.waterjpi.eu>>

⁶ Joint Programming Initiative Climate <<http://www.jpi-climate.eu/home>>

⁷ Adam Tinson and Peter Kenway, "The water industry: a case to answer", New Policy Institute.

<<https://www.unison.org.uk/content/uploads/2013/06/On-line-Catalogue216213.pdf>>

⁸ 4th European Water Conference, Brussels, 23-24 March 2015. <<http://ec.europa.eu/environment/water/2015conference/pdf/report.pdf>>



The present study was conducted in the framework of the BeWater project, 'Making society an active participant in water adaptation to global change', which is financed under Science in Society thematic programme of 7th European Framework Programme for Research and Technological Development (RTD).

The BeWater project intends to boost the dialogue and collaboration between science and society in sustainable **water management sector and adaptation** to the impacts of global change in the Mediterranean. In particular this deliverable targets water related funding in the 11 countries of project partners. BeWater involves society in discussions on current water use sector and its related problems, and raises public awareness of the importance of **sustainable water management** by actively engaging with local communities with particular focus on the expected climate change impacts at River Basin scale.

The deliverable follows two dominant approaches, involving two main blocks of activities:

1. A study about the national support mechanisms to international cooperation research in the targeted countries;
2. The identification of critical factors and key organizations, which influence the performance of research organizations in those countries in international research.

In such a framework, the present deliverable will analyse the existing forms of funding and cooperation between European countries, within R&D, and it will point out the difficulties that must be solved by the partnerships.

The individual eleven countries chapters are structured as follows:

- Overview
- Main funding agencies or other bodies
- Key Challenges which Influence the performance of Research Organizations

2. Belgium

2.1 Overview

Belgian is a federation with three regions (Brussels-Capital Region [BCR], Flanders and Wallonia). Water research and innovation in Belgium is funded by institutions on federal and regional level, with



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an annual estimated funding budget of more than 12 M €. ⁹

The regions' competencies are strictly separated. In order to promote the regional potential the Region developed the Regional Plan for Innovation emphasizing the key 4 strategic objectives¹⁰:

- Use smart specialisation to drive development of the economy and employment;
- Create a favourable environment for innovative companies;
- Increase the attractiveness of Brussels as the European hub for knowledge;
- Increase the regional participation in European projects.

The sub-chapter below identifies the main funding agencies or other bodies in the following order: The Belgian Federal Science Policy Office, The Agency for Innovation by Science and Technology, National Fund for Scientific Research and The Flanders Hydraulics Research.

2.2 Main funding agencies or other bodies

The Belgian Federal Science Policy Office

The Belgian Federal Science Policy Office, previously known as the 'Federal Office for Scientific, Technical and Cultural Affairs' (BELSPO), is a federal administration. It has an annual budget of about 513 M € and employs a staff of about 2.700. The OSTC is responsible for preparing, implementing and evaluating the science policy and its extensions as well as to giving support to other Federal Scientific Institutions in order to co-ordinate and valorise research activities and implement scientific means in support of authority competences.

One of the OSTC themes is water research in Belgium. They, as the main funding body, are giving various grants for young and experienced researchers in the terms of water research. This institutional body has the Research Programmes Department, which supports the research activities.

The Research Programmes department' objectives are as follows:

- To develop multi-annual, topic-specific programmes as a response to problems addressed by policies of public authorities, such as social cohesion, sustainable development or information society.
- To run basic research programmes in the framework of the "inter-university attraction poles" programme (IAP).

The Agency for Innovation by Science and Technology

⁹ The Belgian Federal Science Policy Office, 'Belgian Report on Science, Technology and Innovation 2010' <http://www.belspo.be/belspo/organisation/publ/pub_ostc/BRISTI/Bristi_tome1_2010_en.pdf>

¹⁰ Regional Plan for Innovation, page 3. <<http://www.innovativebrussels.irisnet.be/en/documents/mise-a-jour-du-pri-en>>



The Agency for Innovation by Science and Technology (IWT) is a governmental research funding authority of the Flemish Government, which promotes the innovation through science and technology in Flanders.

One of IWT's key objectives is to stimulate the Flemish participation to international RTD and innovation programmes and research in the industry and in private research institutions. Furthermore, IWT is functioning as the NCP - organisation for Flanders and the Flemish Eureka office and part of Enterprise Europe Network-Flanders. IWT a key objective is to stimulate research in the industry and in private research institutions. In addition, IWT targets the researchers from universities, industry and intermediate organisations.

National Fund for Scientific Research

With regard to the French-speaking Community, the Fonds de la Recherche Scientifique (FNRS) constitutes the main funding authority. It was established in 1928 and its founding objective is the promotion of basic scientific research. There are four funds associated with the organisation: Medical Research, Nuclear Science, Collective Basic Research and Agro-Industrial Research. The FNRS does not own or provide its own research facilities, all research is carried out at and through universities as its main task is the support of individual researchers, through temporary grants. It also gives grants to qualified researchers, scientific research workers and research managers. Huge parts of the FNRS' budget come from subsidies by the French Community and the Federal State of Belgium, but the organisation also receives private funds.

The foremost funding principle is scientific excellence, whereby the applicants are selected via peer-review evaluation. To ensure a high quality, the selection process is organised through 32 scientific committees, whose members are leading national and international scientists in their respective field. Therefore – in the absence of specifically targeted calls - it gives its support exclusively to proposals freely created by interested researchers in all scientific areas.

The Flanders Hydraulics Research

The Flanders Hydraulics Research (WL) belongs to the Department of Mobility and Public Works of the Flemish Authorities. WL gives support to the agencies (water managers of navigable waterways in Flanders) and Maritime Access Division in the field of research. It also advises in the field of hydrology, hydraulics and nautical sciences, operational services of flood forecasting and flood warning. The institution acts as Ambassador of CRUE ERA-Net (external relations of the network after formal ending of CRUE as an FP6 coordination action), and is partner in CIRCLE-2 ERA-Net on climate change adaptation. The WL objective is to fund and develop actions and measures concerning water quantity issues, flooding and water scarcity with a focus on navigable rivers and the sea, especially with regard to climate change and its effects.



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2.3 Key challenges which influence the performance of research organizations

This analysis has highlighted the key challenges that influence opportunities of the involvement in collaborative projects in Belgium. These are pointed out as follows:

Main challenges pointed out	Details
Regionalised administration of Belgium	A strongly regionalized Belgium administration based on political partition causes the barriers that lead to incoherent funding patterns and slow decision-making processes as a result.
Lack of cooperation between research, development and innovation bodies	Most of the research activities in the field of water management are funded at Belgian Universities that have a strong autonomy in their choice of research areas. Therefore, there is a strong need for reinforced dialogue and interaction between research, development and innovation. This must be based not only on mutual understanding but also on explicit collaboration and interaction frameworks identifying the respective demands and goals. Coherent cooperation between scientists and other members of the public would have an impact towards the development of sustainable policies and a higher level of internationalization.
Lack of analytical data	The reinforcement of strategic intelligence throughout the policy cycle would enable to analyse and monitor the regional situation, with feedback from beneficiaries and on-going international benchmarking. An increase of the allocations for water research and innovation within the budgets of the Flemish Region and the French Community, would straighten the regional potential.

3. Cyprus

3.1 Overview

The research and innovation system in Cyprus started developing in the beginning of the 21st century, together with the preparations for the accession of the country to the EU. Governance in RTDI (as in all policies) is centralised because of the small size of the country. RTDI is dominated by public funding.¹¹

The research system has been restructured and modernised in the last ten years. The Research Promotion Foundation (RPF) was established in 1996 as an initiative of the Government to promote the development of technological and scientific research.

The Planning Bureau supervises the conception of research and innovation policy and is responsible for the formulation of strategy, the identification of objectives and the introduction of policy measures aiming at the promotion of research activities in Cyprus.¹²

According to Water JPI, the main source of research funding is the government, with a contribution of 68%, followed by external funding, mainly European, at 15% and by the enterprise contribution of 12.7%.¹³

The next 3.2 section identifies the main funding agencies or other bodies in the following order: The National Council for Research and Innovation, The Cyprus Scientific Council, The Ministry of Energy, Commerce, Industry and Tourism, Water Development Department and The Energy, Environment and Water Research Centre.



3.2 Main funding agencies or other bodies

The National Council for Research and Innovation

Two new organisations, the National Council for Research and Innovation (NCRI), composed of cabinet ministers and chaired by the President, and the Cyprus Scientific Council (CySC), a technical advisory board composed of high calibre scientists are two organisations created in recent years responsible for strategy and planning. The NCRI has exclusive responsibility for the adoption of long-term strategies in research and innovation.

Research policy development is based on the goals outlined in the **Revised National Reform Programme** of the Republic of Cyprus, which is responsible for:

¹¹ Deloitte, Researchers' Report 2014, Country Profile: Cyprus.

¹² http://ec.europa.eu/euraxess/pdf/research_policies/country_files/Cyprus_Country_Profile_RR2014_FINAL.pdf

¹³ Ministry of Finance, Republic of Cyprus, 'Strategic development plan, 2007-2013.' Published: 03/06/2003.

¹⁴ http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/cy/policydocument/policydoc_mig_0004

¹⁵ Water JPI, 'Water RDI Mapping in Europe, 2nd Year Mapping: Cyprus.'

¹⁶ <http://www.waterjpi.eu/images/WatEUR%20Mapping%20Report/ANNEX%201%20CountryFiches/CY%20Cyprus%20Fiche.pdf>



- The definition of medium and long term national goals and aspirations in RTDI, which conform to the wider development goals of the state and the implementation of the strategic objectives of the EU.
- The expansion of functions and assigning programmes to the Research Promotion Foundation (RPF) in accordance with emerging needs.

The latest programme of RPF funding covered the period 2009-2010 and was launched in June 2009, with a tentative deadline to be concluded by September 2009. However, contracts were delayed due to administrative reasons (late appointment of RPF General Manager and Board). The selection was finally completed in 2012 and contracts started being signed at the end of 2012. The total budget of selected programmes has been reduced by 35% compared to initial budget.

The Cyprus Scientific Council

The Cyprus Scientific Council (CySC) is an advisory scientific body and brings together scientists, who advise the Government and the National Council for Research and Innovation for the wider development strategy and policy in research and innovation. The advisory scientific board (composed of 18 members of qualified scientists) advises to the government. Their operations took off slowly but they are expected to be more active in the future. The CySC is also responsible for:

- Providing advice to the NCRI for determining scientific and other priorities, establishing research centres, institutes and thematic research networks and developing partnerships with research centres and organizations abroad;
- Advising on the long term planning of the RPF and the evaluation of on-going programmes and the impact of their results.

The Ministry of Energy, Commerce, Industry and Tourism

The previous Ministry of Commerce, Industry and Tourism (MCIT), renamed in 2013 to Ministry of Energy, Commerce, Industry, Tourism (MCIT) is responsible for industrial policy, including the promotion of technology and entrepreneurship. A new “Technology Unit” was created in 2011 in the Ministry, which is expanding the activities of the already existing Technology Department and is expected to play a more active role. The Ministry of Agriculture is active in technology transfer services in water sector.

Water Development Department

The Water Development Department (MOA) is responsible for implementing the water policy of the Ministry of Agriculture, Natural Resources and Environment. The main objective of this policy is rational development, protection and management of the water resources of Cyprus. In this context, the responsibilities of the department cover a wide and diverse spectrum, which includes:



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- The protection of the water resources from pollution;
- The construction, operation and maintenance of works referring to water pollution

The Water Development Department acts as Beneficiary for the implementation of various sewerage and water management projects, which are co-financed by the Cohesion Fund under the Priority Axis "Basic infrastructure in Environment and Energy" of the Operational Programme "Sustainable Development and Competitiveness"¹⁴.

The Planning Bureau acts as the Managing Authority of the Structural and Cohesion Funds and has overall responsibility for the management and exploitation of the resources available. For the implementation, monitoring and controlling of programmes and projects to be co-financed, other public sector bodies are also involved. The Intermediate Body, responsible for the Water Development Department's projects that are co-financed by the Cohesion Fund, is the Department of Control of the Ministry of Communications and Works.

The Energy, Environment and Water Research Centre

The Energy, Environment and Water Research Center (EEWRC) was established in December 2007 as the first Research Center of The Cyprus Institute. The Center works in close collaboration with the Massachusetts Institute of Technology (MIT), the Max Planck Institute for Chemistry, the Cyprus Research Promotion Foundation (RPF) and many national institutions and organizations in Cyprus and the region.

Research at EEWRC deals with societally relevant issues related to energy, environment, climate and water. EEWRC's overarching mission is the understanding of and preparing for the major challenges and changes in the environment, socio-economic structures and societies in the Eastern Mediterranean in the 21st century. Problems of national and regional importance and global significance are addressed with an emphasis on their specific regional, Eastern Mediterranean manifestations.

Research activities are defined in the framework of EEWRC's and carried out by the following established divisions:

- Energy and Renewables
- Environment and Climate
- Water and Natural Resources

Research at EEWRC strives to be interdisciplinary and issue-driven, embracing the physical, chemical, biological and human/socio-economic sciences. The EEWRC focuses its research on three major focus areas:

- Achieving a low carbon economy via the adoption of measures for energy efficiency and the employment of renewable energies to reduce the dependence on hydrocarbon energy sources.

¹⁴ European Commission, 'Cyprus – Operational programme 2007-2013: Sustainable Development and Competitiveness.' Press release, Brussels, 15 November 2007. <http://europa.eu/rapid/press-release_MEMO-07-462_en.htm?locale=en>



3.3 Key challenges which influence the performance of research organizations

The present study can be considered as a fact book which displays Cyprus **funding instruments** and the bilateral agreements for Cyprus cooperation with the EU and other countries in the field of water management, having the following main target groups: Universities, Decision Makers, Non-government organisations, research organisations.

This analysis has highlighted the key challenges that influence opportunities of the involvement in collaborative projects in Cyprus. These are pointed out as follows:

Main challenges pointed out	Details
Partial difficulty due to language barriers	According to University of Cyprus source, researchers from Cyprus in some of the cases are facing language barriers. Sometimes they are participating in European project as partners but not as leaders because of lack of knowledge and language barriers. Despite of this fact Cyprus researchers are active and are member of various international level projects, for instance AGWATER, ENORASIS, RECARE and etc. ¹⁵
Low demand for researchers and PhD holders from local industry	According to University of Cyprus data, there is low demand for researchers and PhD holders from local industry and it can be described as the major risk for the researchers. The country itself is small comparing with other European countries and despite the fact that researchers have all necessary infrastructure and tools the demand of researchers is rather low at local level. In the Republic of Cyprus, researchers employed for the implementation of a national research programme receive a higher salary than those working for a university or a private company, thus constituting very attractive working conditions for researchers who win grants. ¹⁶
Economic crisis negatively affected the number of researchers who had the knowledge and experience in international research projects	The last decade has shown a significant increase of R&D&I funding for various disciplines including water research through national funding agencies. The government of the Republic of Cyprus has adopted a package of measures aimed at training researchers to meet its R&D targets by promoting attractive employment conditions in public research institutions. However, the research and innovation system in Cyprus is relatively new. The financial crisis (2008-2013) affected the budget for R&D that has been put on hold during the process of fiscal consolidation. Due to this reason funding for researchers was relatively reduced. ¹⁷

¹⁵ The Cyprus Institute, 'International Collaborations.' <<http://www.cyi.ac.cy/cyi/about-us/international-collaborations.html>>

¹⁶ University of Cyprus, General Information. <<http://www.ucy.ac.cy/en/general-information>>

¹⁷ The Center for European and International Affairs of the University of Nicosia, 'Cyprus and the EU: appraisal and challenges.' International conference, Nicosia, 28 January, 2013. <<http://www.unic.ac.cy/news-and-events/173/node/2133#.VckN6mBsufQ>>



4. Finland

4.1 Overview

Finland has a wide range of funding bodies for water science and management. It is estimated that total declared water R&D funding is 31,9 M €. In total there was a 47 M € increase in the funding of research and development in the Government Budget for 2015.¹⁸ According to Statistics Finland (the only Finnish public authority specially established for statistics), R&D funding is increasing by close to 50 M € in Government Budget in 2015.¹⁹ Most funding bodies are governmental in Finland. Research in the water sector in Finland is mainly carried out by universities and research institutes. Funding comes from the institutional basic funding and from the money raised externally and almost always competitively.²⁰



Several doctoral programmes in Finland (as well as in Holland, Germany and the United Kingdom) were introduced in this field or have a thematic interface with water research. These include the Doctoral Programme in Integrated Catchment and Water Resources Management (VALUE), the Doctoral Programme in the Built Environment (RYM-TO), the Finnish Graduate School in Environmental Science and Technology (EnSTe), the Graduate School in Environmental Health (SYTYKE), and the Doctoral Programme in Public Health (DPPH).²¹

The sub-chapter below identifies the main funding agencies or other bodies in the following order: Academy of Finland, The Finish Funding Agency for Innovation and The Ministry of Agriculture and Forestry, The Ministry of the Environment.

4.2. Main funding agencies or other bodies

Academy of Finland

The Academy of Finland (AKA) is the prime funding agency for basic research in Finland. It is committed to promote scientific research, advance the application of research results, and support international research cooperation. The agency also acts as an expert resource in science policy issues and awards funding for research. The Academy supports

¹⁸ The Ministry of Finance, Budget Review 2015. <<http://verkkojulkaisut.vm.fi/zine/39/cover>>

¹⁹ Statistics Finland, Government R&D funding in the state budget. <http://www.stat.fi/tit/tkker/index_en.html>

²⁰ Water JPI, Water RDI Mapping in Europe, 2nd Year Mapping. WatEUR CSA – Finland.

<<http://www.waterjpi.eu/images/WatEUR%20Mapping%20Report/ANNEX%201%20CountryFiches/FI%20Finland%20Fiche.pdf>>

²¹ Aalto University, 'National and international doctoral programmes.'

<<https://into.aalto.fi/display/enddoctoralchem/National+and+international+doctoral+programmes>>



research career development and encourages researcher mobility, both nationally and internationally.

Academy of Finland's funding for research in the water sector has been on the increase. In 2007–2010, funding from the Research Council for Bio-sciences and Environment totalled an estimated 26.5 M €, and annual funding volumes have been rising. Total funding from the Research Council for Natural Sciences and Engineering in 2007–2010 was at least 2.9 M €. In 2009, the Research Council for Natural Sciences and Engineering announced a targeted call on the subject of water engineering research. The Research Council for Culture and Society and the Research Council for Health have also granted funding to individual projects in the water sector. The water sector research programme:

Title of the programme	Sustainable Governance of Aquatic Resources (AKVA) 2012-2016
Description	The research programme will respond to both the scientific development needs and the societal research needs. All these needs are associated, on the one hand, with the 2015 Finnish Government Resolution on Water Protection Policy Outlines and, on the other hand, with research needs emerging from international water policy.
The aim of the programme	The aims of the programme are: 1) support scientific research that contributes to the sustainable management, adequacy and future safety of water and aquatic resources. 2) Contribute to enhancing the scientific standards of water research in Finland. 3) Integrate excellence from different disciplines in joint projects. 4) Research, analyse and synthesise the aquatic environment as a whole for securing future demand for water and the increasing needs for protection.
Budget	N/A

The Finish Funding Agency for Innovation

The Finish Funding Agency for Innovation (Tekes) is the main public funding organisation for applied research and technology. Tekes promotes a broad-based view on innovation and emphasises the service-related, design business and social innovations. They are working with the top innovative companies and research units in Finland. Tekes finances around 1,500 business R&D projects, and almost 600 public research projects.

Tekes provides innovation funding for companies, research organisations and public sector service providers. The main target group consists of SMEs seeking growth in internationalisation. Tekes innovation funding helps companies to grow more quickly and renew their business operations. The funding can be used for R&D, business and organisational development, and in planning for global growth.

The Tekes programmes and initiatives are topical entities targeted at financial and expert service areas. Within the programmes and initiatives, businesses and public



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research units can develop new know-how, build networks and have an impact on the development of their field. Water theme related programmes are as follows:

Programme	Water Programme (2008-2012)
Description	The programme improved the competitiveness of the companies and research institutions in the sector, by activating the actors to cooperation in domestic and international networks, by coaching the actors in communication and pitching skills, by producing surveys and reviews of current themes in the sector, by increasing information dissemination and networking in numerous programme events and seminars, and by promoting the Finnish water sector in domestic and international media.
Budget	Water programme financed RDI-projects with a total of 49 M €, amounting to 92 projects for companies (33,1 M €) and 30 projects for public research organizations (15,9 M €). The total volume of these 122 water sector development projects was 94,2 M €.

Programme	Arctic Seas Programme (2014-2017)
Description	Arctic Seas programme aims at turning Finland into an internationally attractive centre of Arctic know-how. Goals of the Arctic Seas programme: 1) Finland is an Arctic know-how hub Europe and world-wide; 2) Create new Arctic business activities. 3) Network Finnish actors into internationally significant investment projects.
Budget	N/A

The Ministry of Agriculture and Forestry

The Ministry of Agriculture and Forestry (MMM) steers the policy on sustainable use of natural resources. Legislative work is carried out as part of the Finnish Government and the EU institutions and decision-making.

Renewable natural resources derive from the renewal capacity of nature itself. Among other things, they comprise all plants and animals. According to the principle of sustainable development, renewable natural resources must be used so that their value is preserved for the future: meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Water is an indispensable natural resource. Finland has high-quality water in abundance. The amount of water per resident is the greatest in eastern and northern Finland. The west coast suffers from seasonal flooding, while in certain dry and densely populated regions in southern and south-western Finland there is some shortage of suitable sources for the abstraction of high-quality drinking water.

Programmes related to water theme:

Programme	Land use and technical planning in managing flood risks
Description	The objective of the project is to develop a method for analysing the different risks of climate change in order to assess the extent of



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	these risks, recognize available adaptation opportunities as well as assess the costs and benefits of different adaptation options.
Budget	N/A

Programme	WaterAdapt
Description	WaterAdapt aims to evaluate the impacts of climate change on the occurrence of heavy rains, water resources, floods and droughts, and what measures should be taken to adapt to these changes. The following issues are also examined: the pressures to change regulation practices, minimum building site elevations and water supply management measures due to climate changes. The results of the study can be used in the evaluation of future needs to change the rules and practices of regulation.
Budget	N/A

The Ministry of the Environment

The Ministry of the Environment (YM) is responsible for preparing matters to be submitted for consideration by the Government and Parliament, such as matters concerning communities, the built environment, housing, biodiversity, sustainable use of natural resources and environmental protection.

YM promotes the protection of waters and the safeguarding of water resources on many levels: regionally, through bilateral cooperation with other states, and globally.

YM is responsible for implementing the Blueprint. Several development needs related to the implementation can be taken into account in river basin management planning, and as part of various development projects. Important development objectives include measures related to the reduction of eutrophication, hazardous substances, environmental flows, restoration, climate change adaptation, and greater efficiency of water use. It would also be important to successfully integrate water resources and marine environmental protection into measures taken to manage flood risks in river basins as a whole.

YM is implementing **National water protection policy**. The Government's resolution on guidelines for water protection lays down national objectives for the protection of waters. It also defines measures, which will restore the good condition of inland waters, coastal waters and groundwater by 2015. The goal is to:

- Reduce environmental load which causes eutrophication;
- Reduce risks caused by hazardous substances;
- Conserve the diversity of water ecosystems.

Regional water resource management plans and programmes. The Finnish government has approved seven regional river basin management plans. These plans and the related action plans include information on the condition of water bodies, the



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factors affecting them and measures which will restore inland and coastal waters in these regions to good condition by 2015.

4.3 Key challenges which influence the performance of research organizations

This analysis has highlighted the key challenges that influence the opportunities for the involvement in collaborative projects in Finland. These are pointed out as follows:

Main challenges pointed out	Details
Insufficient collaboration between public and private research sector	The issues that affect the funding system in terms of international cooperation are that universities receive the largest amount of competitive research funding. University researchers are successfully enrolled and awarded for research projects. According to the national statistics two thirds of all research funding goes to universities while the private sector is not so actively involved into research projects.
Lack of interest to join private sector due to funding scheme	The reason is that universities in Finland have a high quality in research and a lot of researchers do not want to leave universities and join the private research companies. University researchers submit an average of 200 – 250 applications to above mentioned national support bodies every year, of which approximately 35% receive funding.
Top-down research approach	Another critical risk is the top-down research approach, as researchers from the European Federation of Public Service Unions have pointed out. According to Johan Willner, Professor of Economics at the School of Abo Akademi, a top-down research approach can cause a reduction of outstanding innovative projects. The Government's and the main public funding agencies' policies promote less efficient project results. Top-down monitoring and performance-based funding can be counterproductive for Finland's scientists and researchers.

5. Germany

5.1 Overview

In Germany, water issues take high priority in education and research due to the important practical implications from water supply, to shipping through to ecology. In nearly all the German universities of applied sciences, the subject of water is examined from many



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different perspectives in order to educate specialists for the various water-related tasks. In addition, the national and state level agencies, as well as non-university research centres carries out research in the field of water. Industry and the large public water companies contribute to a considerable part of water research and technological development.²²

In Germany, water research is largely funded by the Federal Ministry for Education and Research (BMBF) and the German Research Foundation (DFG). The BMBF's support is provided as project support in research programmes or as basic funding provided to institutions and in part, with co-financing by one or more Federal States ("Länder"). In the institutional sector, water research is supported via various institutes within the Helmholtz Association of German Research Centres (HGF). DFG usually funds knowledge-oriented research without stipulation of topics, using a range of funding programmes or instruments. In addition, various other ministries and bodies e.g. The Federal States of Germany (landers) play roles as well, within their area of responsibility, e.g. through supporting departmental research on water management.

The sub-chapter below identifies the main funding agencies or other bodies in the following order: The Federal Ministry for Education and Research, The German Research Foundation, The German States (Landers), The Helmholtz Association of German Research Centres.

5.2 Main funding agencies or other bodies

The Federal Ministry for Education and Research

The Federal Ministry for Education and Research (BMBF) has established the High-Tech Strategy that strengthens Germany's position as leading in science and technology areas. The High-Tech Strategy highlights solutions to the challenges in the field of climate/energy, health/nutrition. Education and research are priority areas of Federal Government policy.

The BMBF aims to support sustainability research in Germany with the third framework programme (FONA). This programme directly refers to water management topics. Research for Sustainable Development develops innovative solutions for these challenges and delivers decision-making tools for future oriented action. From 2010 to 2014 the Federal Ministry invested funds of almost two billion Euros in sustainability research, as part of the framework programme "Research for Sustainable Development" (FONA). Under the new framework programme FONA new funds will be made available, starting in 2015.

The Ministry is also using FONA to support preventative research in three main areas:

- The global common goods climate, biodiversity and the oceans;

²² German Research Foundation, Annual Report 2014.

<http://www.dfg.de/download/pdf/dfg_im_profil/geschaeftsstelle/publikationen/dfg_jb2014.pdf>



- Intelligent use of resources;
- The improvement of living standards and competitiveness in Germany.

As part of the FONA, BMBF has launched agenda in water research and innovation with the funding priority called 'Sustainable Water Management' (NaWaM). This programme funds the development of innovative technologies, processes and system solutions for sustainable management of water resources. The aim is the development of key technologies in cooperation with industry, their international dissemination and adaptation to changing basic conditions. In particular small and medium-sized enterprises are encouraging to participate in collaborative projects.

The funding priorities are divided into the following fields:

- 'Water and Energy'
- 'Water in Urban Areas'
- 'Water and Environment'
- 'Water and Nutrition'

Another important measure that the Ministry's funding in relation to water management is 'Future-oriented Technologies and Concepts for an Energy-efficient and Resource-saving Water Management (ER-WAS)'. The aim of ER-WAS is to support applied and practice-oriented research projects covering these issues. The program primarily addresses the areas of public water supply and wastewater management. With ER-WAS, BMBF funds twelve joint projects with 27 M €.

The German Research Foundation

The German Research Foundation (DFG) is the self-governing organisation for science and research in Germany. This organisation brings together higher education institutions and research organisations in terms of research projects. It is defined as the largest and most sophisticated research-funding organisation in Germany. Its aim is to provide financial support for research in higher education and public research institutions. However, the organisation does not run any research establishments itself.

Approximately 750 employees are working at the DFG headquarters with the budget of 2,7 B €. The DFG funds research in all disciplines using a bottom-up approach. That means that scientists and researchers can process their application with no subject restrictions to the organization.

DFG supports PhD students, junior researchers, and senior researchers in relation to water management. The organisation even has a Senate Commission on Water Research, which provides advice on the DFG's funding programmes, promotes interdisciplinary and international collaboration, advises on core work areas and developmental trends, and supports coordination activities with other funding organisations active in the field of water research.

An important task of the commission is to help the interdisciplinary field of water research organise itself by enhancing effective communication between scientists and



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individual research areas. The commission's primary objective is to advise basic research in the field of water management.

DFG as mentioned above offers various funding programmes and it covers water management projects. Funding programmes are detail in the following table:

Programme	Description
Individual Grants Programmes	The researchers who have completed their academic training are eligible to submit project proposals: - Research grants and scientific Networks; - Research fellowships and Emmy Noether Programme;
Coordinated Programmes	Promote cooperation and structural innovation by encouraging national and international collaboration in areas of current relevance.
Excellence Initiative	Lasts for five years (2012 through 2017), allocates 2,7 B € in funding. This Initiative promotes top-level research and improves the quality of German universities and research institutions in general and also funds research in water management.
International Programmes	The DFG supports international research cooperation in all of its funding programmes and with a multitude of instruments. Regardless of the specific type of project funding involved, researchers may apply for necessary funds in addition to the project funding itself.

In order to carry out its activities in the interest of research, the DFG maintains partnerships and relations with a large number of partner organisations on all continents. In many countries around the world, formal agreements continue to be a necessary prerequisite for cooperation in the field of science and research.

The German States (Landers)

Länders also provide funding for research and innovation under their own programmes. Regional research and innovation policy is to some extent based on the Federal Government's research funding priorities but also follows regional funding agendas. The länder are responsible for higher education legislation and for financing institutions of higher education. The Federal Government steers activities mainly by providing additional funding under individual programmes and initiatives (see Initiative for Excellence, Higher Education Pact). The Federal Government and the länder jointly support the Deutsche Forschungsgemeinschaft (DFG). The central task of this self-governing organisation of science and re- search in Germany is to award research funding to universities in a competitive procedure. Joint federal and länder support is also provided for the above mentioned non-university research institutions of the large research organisations.

The Federal Government and the Länder provide joint basic funding to the following research organisations and institutions on a long-term basis and in a competitive procedure:



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- Helmholtz Association (HGF),
- Max Planck Society (MPG),
- Fraunhofer-Gesellschaft (FhG),
- Leibniz Association (WGI),
- National Academy of Science and Engineering (acatech),
- Institute for Advanced Study Berlin (WK), German National Academy of Sciences (Leopoldina).

The Helmholtz Association of German Research Centres

The Helmholtz Association performs cutting-edge research, which contributes substantially to solving the grand challenges of science, society and industry. Scientists at Helmholtz concentrate on researching the highly complex systems, which determine human life and the environment. Its work is divided into six strategic fields with one of them as 'Earth and Environment', which covers water management. Scientist and researchers can apply for funding by setting out their proposed objectives within water research area.

Research field 'Earth and Environment' focuses on expanding and interconnecting long-term observation systems, improving predictions and applying results within society. One special goal is to formulate scientifically based policy recommendations on how the Earth's resources can be used in a sustainable fashion without destroying the foundations of life. Its research programmes are divided into six subtopics and two of them named 'Oceans' and 'Terrestrial Environment' includes water resource management, risk assessment and risk reduction of flood.

It is worth it to mention that the 'Oceans Programme' focuses on the role of the ocean in climate change and the potential risks of water pollution. 'Terrestrial Environment' focuses on water resources management. Additionally, the estimates show that Helmholtz researchers have risen 1,26 B € for their scientific research work in 2013.

5.3 Key challenges which influence the performance of research organizations

The present study can be considered as a fact book which displays Germany **national funding instruments** for German cooperation with the EU and other countries in the field of water, having the following main target groups: Universities, Decision Makers, Non-government organisations, research organisations. The study has highlighted that it is hard to understand the complex overall system of water management in Germany.

This analysis has highlighted the key challenges that influence the opportunities of involvement in collaborative projects in Germany. These are pointed out as follows:

Main challenges pointed out	Details
Lack of interdisciplinary research and targeted coordination of efforts	The Senate Commission on Water of the German Research Foundation (KoWa) identified this as a subject of discussion. Conclusions were made that a strategic process is necessary to develop common goals and integrate the different competences among water scientists. Only with joint effort water research community will be able to solve the biggest challenges of today and the future.

	KoWa has stated that the German water research landscape has achieved valuable results so far due to internationalisation. However, government encourages German water researches to be more international while becoming international experts. ²³
Lack of long-term funding	Another challenge is the lack of long-term financing that was stated during the round-table discussion 'Meeting the new challenges in international water research – discussing strengths and weaknesses of existing centres and potential for developing new structures' ²⁴ . Stuttgart University had made a concern in regard to the term of financed project. The report stated that if the government wants to achieve and meet the policy goals in regard to water research, the projects should get long-term finance. Long-term financing guarantees the sustainability and resilience of water projects. ²⁵ Lack of long-term financing for water research projects, affects the research organisations capacity to be more international.

6. Greece

6.1 Overview

Greece is one of the countries' that has a Mediterranean moderate climate and it is the 31st among 50 countries in the world that faces water stress. Greek Islands, which are receiving less rainfall than the mainland, suffer from water shortages. Water distribution in the entire Greece is unequal and for this reason Greek Government has strategic priorities on water management.



Strategic priorities go under the supervision of national bodies of Greece. The priorities on Research and Technology include:

- The protection of water resources by increasing the knowledge about sustainable water management systems and research results in Greece;
- To establish the sector priorities for a policy on Science and Technology, one of them being the water sector.²⁶

²³ German Research Foundation, 'Annual Report 2014,' pages 9-11.

<http://www.dfg.de/download/pdf/dfg_im_profil/geschaefsstelle/publikationen/dfg_jb2014.pdf>

²⁴ German Research Foundation, 'Meeting the new challenges in international water research – discussing strengths and weaknesses of existing centers and potential for developing new structures.' Summary of the round-table discussion. Page 2. <http://www.dfg-wasserkommission.de/de/kowa-home/dateien/dokumente/ags/int_water_research/iwr_result_paper.pdf>

²⁵ Rainer Helming, Christopherus Braun and Sabine Manthey, 'Upscaling of two-phase flow processes in heterogeneous porous media: determination of constitutive relationships.' In *Calibration and Reliability in Groundwater Modeling: A few steps closer to reality* ed. by K. Kovar and Z. Hrkal, the International Association of Hydrological Sciences, 2003, pages 28-29.

²⁶ The General Secretariat for Research and Technology, 'New Programming Period 2014-2020,' page 4-5.



The funding for water Research Development and Innovation is quite small, approximately 1.8 M €. ²⁷ Water pollution issues, sustainable management of water resources are discussed and inserted in the 'New Programming Period 2014-2020'.²⁸

The sub-chapter below identifies the main funding agencies or other bodies in the following order: The General Secretariat for Research and Technology and The National Council for Research and Technology.

6.2. Main funding agencies or other bodies

The General Secretariat for Research and Technology

The main funding body in terms of water management issues in Greece is The General Secretariat for Research and Technology (GSRT) of the Ministry of Development. This body was founded in 1985 and it is the central Department for the administration of the Greek R&D system and can be described as the main policy maker and programme owner concerning the R&D system in Greece.

The General Secretariat's policy is being implemented through operational programmes. The current programme is designed for the period of six years (2014-2020) and addresses the major group of activities as follows:

- Increase demand for new knowledge and research results and increase of investment in knowledge-intensive sectors in Greece. Researchers in public and private centres are encouraged to develop new entrepreneur initiatives in collaboration with the appropriate funding organisations.
- Re-organisation of the public research system. It is essential to increase the effectiveness in the administration and management of the research centres. At the same time, to promote selective development of research units.
- Increase of the gross domestic expenditure in R&D to 1.5% of GDP.

The thematic priorities of the research and technology policy are based on two main policy tools, which guide the research activities and also include sustainable water management sector, which goes under the priority of renewable energy resources.

The National Council for Research and Technology

The other funding body is The National Council for Research and Technology (NCRT). This body is the advisory body of the State and one of the major priorities for this body is the formulation and implementation of national policy for Research, Technology and Innovation. The Council directly reports to the Minister of Education and Religious Affairs. The Council seeks:

- To promote international cooperation between the Greek research community and the international community;

²⁷ Water JPI, 'Water RDI Mapping in Europe, 2nd Year Mapping – Greece.'

<<http://www.waterjpi.eu/images/WatEUR%20Mapping%20Report/ANNEX%201%20CountryFiches/GR%20Greece%20Fiche.pdf>>

²⁸ The General Secretariat for Research and Technology, 'New Programming Period 2014-2020,' page 7.



- To engage the academic and scientific communities within Greece.

The Council seeks to guarantee the highest of scientific standards among the academic and scientific communities while helping to identify and develop such cooperation. The Council supports and offers funding for the highest quality and most promising research projects in all relevant fields with emphasis on those that can create areas of excellence in Greek research.

6.3 Key challenges which influence the performance of research organizations

This analysis has highlighted the key challenges that influence the opportunities for involvement in collaborative projects in Greece. These are pointed out as follows:

Main challenges pointed out	Details
Factors due to economic crises	Uppsatser Fran Kulturgeografiska Institutionen has stated that the government took all the necessary steps to implement the timetable requirements for research institutions to get or be involved in international projects. Nevertheless, due to economic challenges the implementation process of the 7 th FP and Horizon 2020 is being delayed. According to PhD Professor A. Valavanidis at National and Kapodistrian University of Athens, the establishment of water projects and networks becomes a challenging task for the national and public researchers. The government has already spent a lot of EU funds for the creation of such institutions.
Lack of scientific knowledge and capacity to be involved in EU calls	Greece faces a problem that is related to the slow process of decision-making and complexity of the workflow involved in EU calls. This leads to a deficiency of scientific knowledge and personnel in Greece to use EU funds in the appropriate way, as the European Academies Science Advisory Council (EASAC) has stated.
Lack of transparent procedures	There is a lack of efficient and transparent procedures to disseminate the information on EU funding opportunities. Corruption as a factor exists in Greece and this is one of the main reasons why administrative procedures cause slow decision-making processes in R&D implementation.

7. Italy

7.1 Overview

Italy, as a country, does not have an overall 'National Research Programme for water'. However water topics are included in a few Research Development and Innovation programmes managed by national and regional institutions. The Programmes are: The National Operational Programme for Research and Competitiveness 2007-2013²⁹, The National Operational Programme for Research and Competitiveness 2014-2020³⁰, the New National Research Programme 2014-2020.³¹



Italy does not have funding agencies acting for policy implementation. Research performers such as universities and research agencies for instance National Research Council, Agency for New technologies, Energy and as well as science associations play a role for policy implementation, also by acting as experts for specific aims. Most of public research performers report directly to The Ministry of Education, University and Research.³²

The main RDI funding agency which implements water management projects is The Ministry of Education, University and Research.

The sub-chapter below identifies the main funding agencies or other bodies in the following order: The Ministry of Education, University and Research and The National Research Council.

7.2 Main funding agencies or other bodies

The Ministry of Education, University and Research

The main RDI funding agency is The Ministry of Education, University and Research (MIUR) in Italy. This institution is therefore responsible for the implementation of the National Plan for Research, which outlines the main actions of the national and regional programming in R&I according to the European policies.

²⁹ The Ministry of Education, University and Research, 'The National Operational Programme for Research and Competitiveness 2007-2013.' <<http://www.ponrec.it/en/programme/>>

³⁰ The Ministry of Education, University and Research, 'National Operational Programme for Research and Competitiveness 2014-2020'.

³¹ The Ministry of Education, University and Research, 'New National Research Programme 2014-2020.'

<http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/it/highlights/highlight_0005>

³² Era Watch, 'Country Profile – Italy.'

<<http://erawatch.jrc.ec.europa.eu/erawatch/opencms/system/modules/com.everis.erawatch.template/pages/exportTypesToHtml.jsp?contentid=1e86dab6-7d1a-11df-b939-53862385bcfa&country=Italy&option=PDF>>



MUIR has published the R&D strategy, 2014 – 2020, with identified following objectives:

- Increase the effectiveness and efficiency of R&I investments;
- Present a multiannual research and innovation strategy aligned with the Europe2020 Strategy and Horizon 2020.

The total Water RDI Funding for Italy is 4.8 M €. MUIR is improving the efficiency of research and promotes innovation. The major societal challenges have been defined at European level and national and can be summarized as follows:

- Climate and the environment;
- Energy;
- Health;
- Cultural heritage

Water issues were inserted under the formal approval and adoption at the National Plan for Research. This Plan strengthens the national system of R&D and its clearly defined objectives guarantee the better integration of research needs and governance strategies.

Another Plan for which MUIR is responsible for, is the National Operational Plan Research and Competitiveness 2014-2020. Within the institutional funding a growing share has been attributed on the basis of universities' performances and public researcher organisations. This Plan supports financially projects and social innovation actions and it also covers water topics.

The governmental funding is highly competitive in Italy and based on projects. The breakdown of project-based funds by category of instruments is structured as follows:

- PRIN programme (National Interest Research Program). It funds basic research of universities and private research organisations; can be dedicated as the most representative competitive mechanism due to the fact that the evolution procedures are based on peer reviewing by integrating external experts.
- FIRB programme (Basic Research Investment Fund) funds the basic research performed by universities, private research organisations, firms and other private bodies. The evaluation procedure is quite similar to PRIN programme because it is based on peer reviewing. Furthermore, the involvement of international experts is foreseen in the procedure.

National Research Council

The National Research Council (CNR) is a public organization; whose duty is to carry out, promote, spread, transfer and improve research activities in the main sectors to achieve knowledge growth and its application for the scientific, technological, economic and social development of the Country.

To this end, the activities of the organization are divided into macro areas of interdisciplinary scientific and technological research, concerning several sectors: biotechnology, medicine, materials, environment and land, information and



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communications, advanced systems of production, judicial and socio-economic sciences, classical studies and arts.

CNR is distributed all over Italy through a network of institutes aiming at promoting a wide diffusion of its competences throughout the national territory and at facilitating contacts and cooperation with local firms and organizations.

From the financial point of view, the main resources come from the State, but also from the market: even 30% of its balance sheet, an extraordinary result, is the result of revenues coming from external job orders for studies and activities of technical advice as well as from agreements with firms, contracts with the European Union and with other international organizations.

The National Research Council:

- Performs and promotes research activities in pursuit of excellence and strategic relevance within the national and international ambit, within the framework of the European cooperation and integration as well as of the cooperation with university research and with other public and private bodies.
- Manages and coordinates national and international programs and supports scientific and research activities of great interest for the national system, within the framework of the plan and of the cooperation with universities and other public and private bodies.

Focus on **Earth and Environment** theme, which covers water management.

7.3 Key challenges which influence the performance of research organizations

This analysis has highlighted key challenges that influence opportunities for the involvement in collaborative projects in Italy. These are pointed out as follows:

Main challenges pointed out	Details
Insufficient resources for Higher Education	In 2014 the funding of R&D consisted of a flow of resources coming from two main players: the government and the business sectors and it is 1.2% GDP. The distribution of funds shows that public funding is mainly directed towards universities and public research organisations, whereas business research funds flows are almost completely absorbed by firms. The public sector plays also a non-negligible role in financing private R&D expenditure. A 9.1% percentage of funding from abroad underlines the capacity of the national research system to attract funds, mainly in the business research, from EU programmes.
Low share of skilled human	According to Eurostat data, in 2012, 0.91% of the active population in Full Time Equivalent (FTE) was employed in R&D. Researchers



capital	<p>were 0.43% of the active population. The total number of researchers in FTE, 110,823, is concentrated in universities (45,223) and in the business sector (43,073). Human resources in Science and Technology (HRST) recorded higher unemployment from 2011 to 2012 (from 232,000 to 307,000), and rose as percentage of total unemployment too (from 2.8% to 3.6%), mainly due to the recession that increased the overall unemployment rate up to 12%.</p> <p>The number of new students in 2011-2012 decreased dramatically in comparison to 2003-2004 (-17.2%) and in 2012 the university system reported nearly 15,000 young researchers with non-permanent positions and little opportunity to compete for permanent ones. University work is no longer attractive due to the level of wages, frozen by law since 2011, and the low probability of obtaining a permanent position. With reduced public funding, universities have been under pressure to increase student fees, further reducing new enrolments.</p>
Low R&D intensity and specialization of firms	<p>The distribution of the R&D funded by the business sector by sector of performance is a peculiar feature of the Italian scientific and innovative system. The weight of industry is absolutely prevalent and this may suggest a low propensity of the business sector to commit resources for the collaboration with public science. Such a situation is one of the causes of the well-known lack of cooperation between public research and the industrial sector. Since 2011 policies made an effort to streamline access to public funds for R&I, especially for SMEs, and some measures promote public/private partnerships.</p>
Difficulty for researchers to understand the application procedures due to bureaucracy burden	<p>To the national bureaucratic system related to customs import we must add the more or less complex bureaucracy of Italian entities participating in an international research project. The redundant internal control methods that Italian entities must implement to manage financial resources coming from the European community sets the need for a lower level of bureaucratic complexity or to generate support mechanisms that could facilitate the management of a project and its resources (for instance, simplifying processes and requirements over the staff of researchers through providing them on-line expert support for management).</p>

8. Slovenia

8.1 Overview

Slovenian government bodies are one of the essential funding bodies for research and development. The government bodies fund research projects in most cases. Nevertheless the Slovenian government is carrying out The National Research and Development Programme which defines the main policy goals: a) increase the impact of research and development (R&D) in Slovenia; b) increase public and business R&D funding 3% of GDP; c) promote human development for R&D.³³ International cooperation and implementation of ERA principles are an important part of Slovenian R&D policy as well.

Slovenia has 4 public universities (University of Ljubljana, University of Maribor, University of Primorska, University of Nova Gorica), 15 National Research Institutes, 2 Technology Parks, Centres of Excellence, which are operating in various research areas; one of them is water management.³⁴

The sub-chapter below identifies the main funding agencies or other bodies in the following order: Slovenian Research Agency and Slovenian Science Foundation.



8.2 Main funding agencies or other bodies

Slovenian Research Agency

The Slovenian Research Agency (ARRS) is an independent public funding organisation, which perform tasks relating to the National Research and Development Programme and creation of European Research Area. The Slovenian government established the agency in 2003. The bodies of the agency are the Management Board and the Scientific Council, the highest decision-making body representing six scientific disciplines.

ARRS provides framework for scientific research within the national budget and other sources; promotes high quality scientific research in Slovenia and its application; fosters internationally comparable evaluation standards in Slovenia; provides the transparency of organising research community in Slovenia; promotes international research cooperation; analyses R&D activities and provides science policy expertise.

³³ Slovenian Research Agency, 'Slovenian R&D Policy.' <<https://www.arrs.gov.si/en/gradivo/dokum/inc/ARRS-Leaflet.pdf>>

³⁴ Ibid, p 3.



ARRS issues a public call at least once a year and public and private research organisations can apply for the funding. Water management projects are coherent to framework of natural sciences and engineering.

ARRS performs the following tasks:

- Selects and finances research and infrastructure programmes that provide a public service in the research field;
- Monitors the usefulness, innovation level, efficiency, quality, competitiveness and professionalism of the work research organisations allocated funding or other incentives;

The Slovenian Research agency is, throughout different international initiatives and forums, connected with similar institutions from other European countries and even broader. As a full member the agency participates in the two most important associations of research councils:

- **ESF – European Science foundation**
- **EUROHORCs – European Heads of Research Councils**
- **NORFACE ERA-NET**

Cooperation with similar institutions from other countries is important due to the exchange of good practices, harmonisation of positions about further development of European science policy and especially because of permanent development of competent, reliable and independent evaluation systems.

Slovenian Science Foundation

The Slovenian Science Foundation (SZF) is an independent and autonomous national institution that facilitates the pursuit, application, and promotion of new achievements and technologies in all branches of science. It was founded in 1994 by some of the most prominent Slovenian institutions, including the Slovenian Academy of Science and Arts, the University of Ljubljana, and the University of Maribor.

As a national non-governmental institution working in the field of science and through a comprehensive programme of cooperation, especially with related national and international non-governmental science foundations, the Slovenian Science Foundation develops and extends international scientific cooperation on behalf of the Slovenian scientific community with a view to accelerating and promoting scientific research. Students can apply for grant funding for further study at postgraduate level from the foundation twice a year, in autumn and spring. These grants are subject to the availability of funds.

SZF joined the European Science Foundation (ESF) in 1995. ESF programmes supported up to 2003 included Life, Environmental and Earth Sciences, Physical and Engineering Sciences as well as the Humanities (Cultural Exchange in Europe).

The foundation also organizes the international Slovenian Science Festival. Each year, the festival is dedicated to a different scientist, event, or occasion. With 2011 designated as the International Year of Chemistry and the International Year of Forests,



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the 17th edition of the festival opened with the slogan "The Planetary Challenges for Today and Tomorrow".

8.3 Key challenges which influence the performance of research organizations

This analysis has highlighted a key challenges that influence the opportunities for involvement in collaborative projects in Slovenia. These are pointed out as follows:

Main challenges pointed out	Details
Lack of funding	In spite of the ambitious goal to reach the Slovenian target to invest 3% of GDP in research and development by 2010, the share of funding for research and development activities in 2008 attained only 1.65 % of GDP or the amount of 616.9 MEUR of gross national expenditure. In this connection, the share of the state budget amounted to 0.52 % of GDP or to 193.1 MEUR, and the share of total public sources (together with public inflows from abroad) to 0.57 % GDP or to 212.9 MEUR.
Imbalanced share of funds among sectors	Funds for research in the business sector are, understandably, intended almost exclusively for natural science and technical science (99 %), while the share of funds for these sciences conducted by public research organisations is 63 %, and 37 % for social sciences and humanities (data for 2013).
Service sector underrepresented	It is typical for Slovenia to have relatively low use of funds for research and development in the service sector (in 2008, the service activities used 16 % of funds, spent for research in the business sector, and at the same time, contributed 55 % of added value, created in the economy).
Lack of funding for higher education	From the state budget in 2008 funds for R&D, Slovenia allocated 45.8 %, to the state sector or public research institutes, to higher education sector or higher educational establishments 41.2 %, followed by 12.2 % to the private sector, 0.7 % to the non-profit private sector and by 0.1 % to the foreign sector. The share of the funds for R&D in higher educational sector in a number is too low.
Low effectiveness of funds	The funding system for research activities in Slovenia is characterized by relatively high number of different instruments, which leads to the fragmentation and lower effectiveness of invested funds. Still, Slovenia has not developed a comprehensive system of ex-post analyses of scientific results, which could be used for measurement of concrete societal impacts of research work, financed by the state.

9. Spain

9.1 Overview

Spain does not have a specific programme for water Research, Development and Innovation (RDI), however issues related to water management are funded through National Programmes within the State Plan for Research, Development and Innovation³⁵. In total Budget for RDI activities were 430 M€ in 2013. MINECO (Ministerio de Economía y Competitividad) is the main funding body in Spain. The main objective for this organization is to promote high-quality scientific research, researchers and their career development in science and technology; to support innovation and science dissemination.



It is worth to mention that regional governments, which are autonomous, for instance, the Executive Council of Catalonia³⁶, the Regional Government of Andalusia³⁷, the Basque autonomous Community³⁸, within Spain have a capacity, which can be described as significant to fund research and innovation activities. Regional research programmes regularly are funding innovation and research proposals. Capacity of research funding over the regional governments has increased over 20 years due to the fact that The National Plan always represents the major opportunities and capabilities for RTD funding at the National level.

The sub-chapter below identifies the main funding agencies or other bodies in the following order: The Ministry of Economic Affairs and Competitiveness, The Ministry of Agriculture and Food Research and Technology, The Centre for Industrial Technological Development, Agency for International Development Cooperation.

9.2 Main funding agencies or other bodies

The Ministry of Economic and Competitiveness

³⁵ MINECO, 'Spanish National Plan for Scientific and Technical Research and Innovation' 2013-2016.

<http://www.idi.mineco.gob.es/stfls/MICINN/Investigacion/FICHEROS/Spanish_RDTI_Plan_2013-2016.pdf>

³⁶ Government of Catalonia, 'Memorandum of Understanding to facilitate greater business and economic cooperation between the Governments of Catalonia and California.' April 6th 2015.

<http://www.catalangovernment.eu/pres_gov/government/en/news/282118/support-majority-catalan-people-will-continue-protect-catalonias-interests.html>

³⁷ The Regional Government of Andalusia, 'Metropolitan water services quality management' 2004-2010 Andalusian Environment Plan.

<http://www.juntadeandalucia.es/medioambiente/web/Bloques_Tematicos/Estrategias_Ambientales/Planes/Planes_tematicos/Plan_Andaluz_Medio_Ambiente/PMA_Version_Ingles/CHAPTER_IV_2.pdf>

³⁸ Administration of the Basque Country Autonomous Community, "Environmental Framework Programme of the Basque Country 2020" December 2014.

<http://www.irekia.euskadi.eus/uploads/attachments/6057/Environmental_Framework_Programme_2020.pdf?1426067174>



The main RDI funding agency in Spain is The Ministry of Economic and Competitiveness (MINECO). This Ministry implements governmental policy on economic issues and reforms to improve scientific research and innovation in all sectors, one of them covers water management sector.

The Ministry is structured into the following governing bodies:

- The State Secretariat for Economy and Business Support;
- State Secretariat for Commerce;
- The State Secretariat for Research, Development and Innovation.

The last Secretariat is responsible for policies of scientific and technical research, development and innovation, including the water management. This Secretariat owns and manages the '**State Plan for Research, Development and Innovation**'.

This Plan promotes high-quality scientific research, trainings in science and technology.

Within the State Plan for Research, Development and Innovation water research is funded through the following National Programmes:

- State Plan Promoting RDI Business Leadership;
- State Plan on RDI Oriented Towards Societal Challenges, aligned with H2020 Societal Challenges;
- State Plan Promoting Excellence in Scientific and Technological Research.

MINECO plays an important role for the Water Joint Programming Initiative (Water JPI) as a Partner organisation. The Joint Programming "Water Challenges for a Changing World" (WatEUR) aims to achieve sustainable water systems for a sustainable economy in Europe and beyond. WatEUR prepares and supports the successful development and implementation of the Water JPI.

The Ministry of Agriculture, Food and Environment

The second most important organization, which is responsible for water policy, water quality, sustainable irrigation management and related issues in the context of the Water Framework Directive, is the Ministry of Agriculture, Food and Environment (MAGRAMA). Multiannual Financial Framework of the European Union (2014-2020) emphasised the importance of MAGRAMA's responsibilities within research and innovation areas.

This ministry plays an important role on the policies in favour of sustainable development in Spain. **The Spanish Sustainable Development Strategy** (SSDS) includes the promotion and protection of the fundamental rights and intra and inter-generational solidarity. Due to this the SSDS includes and efficient a rational use of natural resources, particularly those related to energy, water and biodiversity.

Its activity in participating in international cooperation is also increasing in the last couple of years. The ministry is developing their relations with other international partners in water management systems, e.g. Italy, Portugal, and France. International agreements or arrangements are directly related to water recourses and their management. Their



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capacity to fund research and innovation projects is slightly smaller than that of the Ministry of Economy and Competitiveness.

National Institute for Agriculture and Food Research and Technology

The third organisation is the Spanish National Institute for Agriculture and Food Research and Technology (INIA). This institute is one of the autonomous research organizations of the Ministry of Science and Innovation (MICINN) in Spain.

INIA staff comprises around 900 people with approximately 180 scientists. One important part of the work carried out at the INIA consists in the scientific support to the activities of different ministries (Environment, Health, Agriculture). The INIA is involved in 23 EU projects, 125 national projects financed by ministries and 40 more projects financed by a variety of organizations. The budget obtained yearly exclusively for research and innovation purposes exceeds the 10 M €.

The INIA headquarters provide almost any technical facility required for research with the advantage of a rapid communication with all the Research Institutes located at the Spanish capital. The INIA manages certain research programs from different Ministries.

Some of these research programmes cover issues regarding sustainable water management system for instance, '**Strategic and National Plan for Technical and Scientific Research and Innovation 2013-2016**'. This Plan is the framework instrument, which was established to achieve general objectives during the period 2013-2016. The Plan encourages the active participation of the organizations, which are focusing in water and agriculture sector.

The Centre for Industrial Technological Development

The other organization worth to mention and insert into this study is The Centre for Industrial Technological Development (CDTI). This Public Business Entity is answering to the Ministry of Economy and Competitiveness and channels the funding and support applications for national and international R&D&I projects of Spanish companies. The CDTI seeks to improve the technological level of Spanish companies by means of implementing the following activities:

- Fostering Spanish participation in international technological cooperation programmes;
- Supporting the setting up and consolidating technological companies;
- Financial and economic assessment of R&D projects implemented by Spanish companies.

CDTI has the Supporting Mechanisms for EU programmes such as Horizon2020, EUREKA, R&D Projects. The table below summarises the three types of projects.



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	Individual R&D project	National Cooperation R&D projects	International Technological Cooperation Projects
Beneficiaries	Companies	An Economic Interest Grouping (EIG) must be formalised or a consortium governed by a private collaboration agreement comprised of, at least, two independent companies. The maximum number of participating companies shall be 6.	Individual companies or an EIG or a consortium made up of at least two independent companies.
Length of the project	The length of these projects may be from 12 to 36 months.	The length of these projects may be from 12 to 36 months.	The length of these projects may be from 12 to 36 months.
Project budget	The minimum fundable budget is around 175,000 €.	The minimum fundable budget will be around 500,000 €, with a minimum budget of around 1750,000 €. The distribution of the participation of each company (or group of affiliate or associated companies) shall be balanced and no single company can hold a stake of over 65% of the total budget under any circumstances.	The minimum fundable budget is around 175,000 €. In the case of projects run by a consortium or an EIG, the minimum budget for the project will be around 500,000 €.

International Technological Cooperation Projects are promoted by an international consortium related to the Spanish participation in programs of international technological cooperation managed by the CDTI (multilateral, bilateral program of international projects with certification and unilateral monitoring by the CDTI). These projects enable Spanish companies to reinforce their technological capacities, by likewise expanding the impact of their products, processes and services on the global markets.

Agency for International Development Cooperation

The Spanish Agency for International Cooperation for Development (AECID) is the principal management organ of the Spanish Cooperation, aimed at poverty reduction and sustainable human development. According to its statute, the agency created to foster the full exercise of development, conceived as a fundamental human right, with the poverty reduction process of the construction of this right.



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The AECID is attached to the Ministry of Foreign Affairs and Cooperation through the State Secretariat for International Cooperation and Latin America (SECIPI). Law 23/1998, of July 7. The International Development Cooperation Agency contemplates the executive organ of the Spanish Cooperation, and its object falls within your priorities: promotion of development and balance in international relations, prevention and emergency situations, promotion of democracy and the promotion of relations with partner countries. It counts with instruments such as technical cooperation, economic and financial cooperation, humanitarian aid and development education and public awareness. They also are working in the area of water management in terms of international cooperation with other foreign partners.

Water and Sanitation is one of the main aid sectors. Spanish cooperation is firmly committed to the water and sanitation sector. **The Fourth Master Plan** (2013-2016) points to this sector as a strategic and critical area and sets the goal of "Promoting a strategy to enable the implementation of the human right to water and sanitation, giving priority to the most vulnerable and marginalized sectors". Table below summarizes the international Spanish cooperation.

Spanish cooperation	Description	Budget
Cooperation Fund for Water and Sanitation in Latin America and the Caribbean (FCAS)	The initiative is without precedent; never before had a single cooperation organism gathered such a large amount of funds for water and sanitation in Latin America.	790 M € in donations
Spanish Cooperation with Nicaragua	The project is implemented in the field by the NGO International Solidarity with the Association of Municipalities of North Chinandega (AMUNORCHI) and aims at ensuring the human right to clean water and sanitation, also as a means to combat poverty.	20 M € in donations

9.3 Key challenges which influence the performance of research organizations

The present study can be considered as a fact book which displays the Spanish **funding instruments** and the bilateral agreements for Spanish cooperation with the EU and other countries in the field of water, within the following main target groups: Universities, Decision Makers, Non-government organisations, research organisations.

This analysis has highlighted key challenges that influence the opportunities for involvement in collaborative projects in Spain. These are pointed out as follows:

Main challenges pointed out	Details
The state-designed	Young researchers even if they are interested in the water management sector do not want to start a Ph.D. before knowing for

scientific career path lacks of flexibility. The career path is too long and unclear.	<p>sure whether they have secured funding. Delays in the national programmes such as National Fellowships occur protests and affected young researchers ambition to continue their work. The budget cuts and the decreasing number of scientists is also one of the critical risks for getting or being involved into international projects.</p> <p>The education minister Inigo Mendez de Vigo has announced that the reduction of National Fellowships program had been 'very painful' but necessary evaluating the fact of negative effects by current economic situation in the country³⁹.</p> <p>In Spain the state-designed scientific career path lacks flexibility and only the older scientist and well known for governmental body can work in the field of science</p>
Difficulty for researchers to understand the application procedures due to bureaucracy burden	<p>According to the Complutense University report it is declared that innovative water policies require strong budgets, sound finance and burden distribution. Top-down planning models fails when researchers want to get funding for the water projects. For this reason a lot of scientists decide not to start international projects due to the burned of bureaucracy which has negative impact within scientist community in Spain.⁴⁰</p>
Economic crisis recreated the number of researchers who had the knowledge and experience in international research projects	<p>The national agencies are failing to substantively address the problems and to share the information among the researchers. Researchers would like to have more flexibility in management therefore at this moment the national funding system have limited management flexibility. Between 2011 and 2013 the research institutions lost more than 2000 staff members, many of whom were scientists, researchers on contracts. Positions have also declined under recent government-wide restrictions due to the economic crisis, which have started in 2008 and finished in 2015 and its negative effects in Spain.</p> <p>The recovery for Spanish research agencies is slow and is struggling to maintain scientific productivity. The specific challenge in water management is the reduced funding from 51 M € to 30 M € for 2015.⁴¹</p>
Lack of well-defined state policies in the area of R&D&I in	<p>According to Euro Scientists, international portal for scientist community all around the Europe, even if scientists express their interest to get the funding in research projects related to water management, it is hard for them to develop projects because there</p>

³⁹ European Commission, Press release reference P-028764.

⁴⁰ Víctor Antonio Luque, Miguel Ángel Luque, 'A vueltas can las SICAV, Reflexiones críticas desde el punto de vista economico-tributario.' *Papeles de Europa*, Vol 27, No2 (2014). <<http://revistas.ucm.es/index.php/PADE/article/view/48671>>

⁴¹ Elisabeth Pain, 'Slow Recovery for Embattled Spanish Research Agency.' *Science Magazine*, 28 February 2014. <<http://news.sciencemag.org/europe/2014/02/slow-recovery-embattled-spanish-research-agency>>



water sector	is the lack of well-defined state policies for water management sector. However, the other countries, for instance Northern European have clearly defined state policies for water management system.
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10. The Netherlands

10.1 Overview

The Netherlands academia and private sector invest heavily in water-related R&D&I. It is estimated according to Water JPI that declared funding for water related issues is 100 M €. Around 2 000 companies are active in the Netherlands water sector, of which 1 500 in water technology and 500 in delta technology. Due to this reason the Netherlands water expertise helps solve global water issues. There are several agencies and programmes, which are encouraging the collaboration between scientists and entrepreneurs in the water management sector.



The main water research funding agencies are: the Ministry of Infrastructure and the Environment (IENM), The Netherlands Organisation for Scientific Research (NWO), the Ministry of Economic Affairs (EZ), the Ministry of Education, Culture and Science (OCW) and the Netherlands Enterprise Agency (RVO). **Top sector Water** programme also plays an important role in the area of water management in the Netherlands. Top sector Water is a collective programme of the Dutch government, private sector and public research institutes to promote and support innovation and export in the private sector. Top sector Water has set an ambitious and firm goal: To double the added value between 2010 and 2020. It represents three pillars: Maritime, Delta and Water technology. Besides the Top sector Water different national and regional programmes exist with a focus on public tasks. For the JPI Water only the delta and water technology sector are of importance.

The sub-chapter below identifies the main funding agencies or other bodies in the following order: The Ministry of Education, Culture and Science, The Ministry of Economic Affairs, The Ministry of Infrastructure and the Environment, The Netherlands Enterprise Agency and The Netherlands Organisation for Scientific Research.

10.2 Main funding agencies or other bodies

The Ministry of Education, Culture and Science



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The Netherlands' government spends more than 4.5 B € on science every year. The scientific research of the Netherlands ranks among the best in the world and the government is taking high standard measures to keep in at the top.

Government science plans for 2015-2025 pursue to three general aims:

- Dutch science must be world-class;
- Dutch science must have stronger links with and maximum impact on society and industry.

According to the Ministry of Education, Culture and Science sources the government wants to sustain Dutch research institutions' success in Europe and to spur them on to win even more European project grants. Due to fact that European funding is often not enough for scientists to carry out their research, the government as from 2015 will provide an extra 5 M € for scientist that receive European project grants.

Headlines **2025 Vision for Science** is announcing that in 2025 the Dutch science will be of worldwide significance. In 2025, Dutch science should have maximum impact on society and the private sector. That is why the government wishes to:

Priority	Make science accessible to everyone	Confidence in science and scientific integrity	Strengthening cooperation between science and the private sector
Description	The government has the ambition to have sixty per cent of all publicly funded scientific articles available in Open Access by 2018. In 2024 this should be 100%. Publicly financed research should be available to anyone who wishes to consult it.	Science has an important position in society. Therefore an active policy to safeguard quality and integrity is essential. The government wants to stimulate replication studies. This means that research should be reproducible. The government also wants to strengthen the position of the National Board for Research Integrity (LOWI).	Cooperation between scientists and entrepreneurs can lead to scientific breakthroughs. This could offer new opportunities for society or the economy.

The Ministry of Economic Affairs

The water sector for The Ministry of Economic Affairs (EZ) is important issue due to fact



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that Ministry dedicated a lot of effort to turn the action plan into concrete points for action and innovation contracts. Arrangements and agreements between business, scientists and the government has had been set out.

One of the agreements between business and innovation is called, **Innovation fund (MKB+)**. Entrepreneurs usually have great difficulty finding investors for innovative projects. The development of new products or technologies is expensive. Moreover, the outcome of a new product is never certain. The government has therefore decided to set up a new innovation fund for loans to entrepreneurs with ideas that make sense.

The Dutch market for informal risk capital is less developed than in its Anglo-Saxon counterparts. Dutch companies find it notoriously difficult to raise funds. In the Netherlands there is low availability of risk capital or venture capital - loans without guaranteed return or where investors settle for less security or income.

The government has earmarked the water industry as a top sector as a result industry and science will target investment in this sector. In this respect, it is important to highlight a new programmes which are being to set up to encourage young scientists, professionals to look to foreign markets. Innovation opportunities are included in government investments, for example in the flood protection programme.

The Ministry of Infrastructure and the Environment

The Ministry of Infrastructure and the Environment implements the Delta programme which is the current R&D programme for water management. The Delta Programme was announced in September 2008 with the aim of to look further ahead and make effective plans for the long-term sustainable water management of flood protection. The government is carrying out this Programme to prepare and be aware of the consequences of the rising sea level and temperature and to protect the Netherlands against flooding and to secure freshwater supplies.

The Delta Programme is aimed at:

- Ensuring sufficient freshwater supplies;
- Protecting the Netherlands against flooding.

With the help of efficient Delta Programme the Netherlands are international leaders in water management sector. The Netherlands is sharing their good practice in water management with other countries.

The Delta Programme 2015 has new working approaches in these areas: the water-robust spatial planning, the availability of fresh water and water safety.

The water-robust spatial planning. This topic includes sound protection against flooding, prevents water nuisance and keeping this approach it leads to achieving a better water quality and healthy eco system.

Water safety. The Delta Committee had made considerable investments in dealing with hydrologic changes in water system. The Committee defines that the condition of dikes and dunes has to be monitoring by the concrete time framework. The safety



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standards for every dike are assured keeping the same system of multifunctional use of dikes.

The access to fresh water. The major question is how to introduce a fair water supply for the inhabitants and how to satisfy their demand.

The Netherlands Enterprise Agency

The Netherlands Enterprise Agency is part of the Ministry of Economic Affairs. The organisation has been working since 2014 and is the result of a merger between NL Agency and the Dienst Regelingen.

This Agency helps entrepreneurs in innovative and international business. It encourages business to use and get grants, also by helping to find business partners and compliance with laws and regulations. The Agency focuses on providing services to entrepreneurs, they work locally and abroad with governments, knowledge centres, and international organisations.

The Netherlands Enterprise Agency carries out **Sustainable Water Fund** (FDW) for the Dutch Ministry of Foreign Affairs. Sustainable Water Fund is a Public-Private Partnership facility, which aims to finance projects in the area of water safety and water security.

The Sustainable Water Fund stimulates public/private collaboration in the water sector in order to contribute towards water safety and water reliability in developing countries. It can be described as collective initiatives between governmental bodies, industry, scientists and Non-Governmental Organisations (NGOs), such bodies could be eligible for subsidies from FDW:

- Safe deltas and improved basin management;
- Efficient and sustainable water use;
- Improved access to drinking water and sanitation.

The Netherlands Organisation for Scientific Research

The Netherlands Organisation for Scientific Research (NOW) is committed in the coming years to encourage collaboration in the science, both nationally and internationally. The organisation puts on the table 3 yearlong strategies. During the strategy of period 2015-2018, the organisation continues its work in the area of science and especially water management sector.

NWO has several programmes to water management sector hence it is described as a global issue. Research funded in this programme investigated the role of fresh water in ecology, the major water cycles and water management.



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Programme	Details
'System Earth'	Is part of the NWO-wide theme with the three central themes: worldwide water systems, freshwater ecology and water and society. The programme granted 17 research proposals in a single funding round.
'Planetary Boundaries Fresh Water Cycle'	Programme is also part of NWO-wide theme. With the help of this programme NWO wants to contribute to establishing the global boundaries of freshwater use. The aim is to develop the knowledge needed to gain a better understanding of where the boundaries lie. The provision of drinking water and the programme applies to the use of water in agriculture and the supply of energy.
'Water and Climate'	Is another theme within the NWO. This theme covers research in the areas such as the fundamental principles underlying extreme weather, flood security, changing ecosystems, fresh water supply and climate predictability. Part of this programme is 'Building with nature' which brings various disciplines from the natural and social sciences together, including hydrology, climatology, morphology, ecology, marine geology and marine physics. This programme has strong a multidisciplinary focus and aims at strengthening the scientific innovation approach and increasing the innovative capacity.

10.3 Key challenges which influence the performance of research organizations

The present study can be considered as a fact book, which displays the Netherlands **funding instruments** and the bilateral agreements for the Netherlands cooperation with the EU and other countries in the field of water. However, it is hard to identify the challenges in terms of water research with which the research organisations are facing in the Netherlands. As it was mentioned above the government is giving significant funding for public and private organisations to win the EU and international project grants.

This analysis has highlighted key challenges that influence opportunities for the involvement in collaborative projects in Netherlands. These are pointed out as follows:

Main challenges pointed out	Details
The state-designed scientific career path lacks of flexibility. The career path is too	A Research scientist earns an average salary of 43,444 € per year. Most people with this job move to other positions after 20 years in this career ⁴² , Pay Scale research stated this. University of Amsterdam in annual report has stated that career paths are generally too long and it is essential to offer clear career paths for scientist in order to attract and keep highly qualified staff in the

⁴² Pay Scale, 'Salary Data & Career Research Center (Netherlands)'
 <<http://www.payscale.com/research/NL/Country=Netherlands/Salary>>

long and unclear.	Netherlands. Researchers in universities and public research organizations have the best equipment and tools for research. ⁴³ According to Euraxess source, government tries to fund as much as possible for the best research equipment that the researchers would provide relevant and newest research and publications. It is declared that the total funding in the Netherlands for research is €8,1 billion. ⁴⁴
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11. The United Kingdom

11.1 Overview

The United Kingdom (the UK) is a world leader in water research, particularly in the global water cycle and its interaction with climate change. The country is deploying new technologies, processes and knowledge that help make the global water sector more innovative and profitable in the coming future.⁴⁵

In terms of water research, the UK has the Water Research and Innovation Framework that highlights key water research and innovation priorities and mechanisms to ensure better coherence and co-ordination of different public funding schemes for water research and innovation.

The Framework is based on recognition that academia, research organisations and government need to provide the evidence to support effective decision-making while working with other users of water. It is estimated that the UK allocates 47 M € per year for water Research & Innovation.⁴⁶

It is outlined that by 2030 the UK will be a key contributor in providing integrated solutions in water security and sustainability. To achieve this result the Framework clearly defines the major funding agencies in the UK that supports, co-funds or funds water research projects.⁴⁷

The sub-chapter below identifies the main funding agencies or other bodies in the following order: The Department of Environment, Food and Rural Affairs, The Natural



⁴³ University of Amsterdam, '2014 Annual Report and Annual Statement of Accounts' 30 June 2015. <<http://www.uva.nl/en/about-the-uva/uva-profile/mission-and-identity/annual-reports/annual-reports.html>>
⁴⁴ Euraxess, The Netherlands for Research. <<http://www.euraxess.nl>>
⁴⁵ Government Office for Science, *Taking Responsibility for Water*, United Kingdom Water Research and Innovation Framework 2011-2030, Page 2. <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/294176/11-1416-taking-responsibility-for-water-summary.pdf>
⁴⁶ Living With Environmental Change, United Kingdom Water Research and Innovation Framework 2011-2030, Page 3-4. <<http://www.lwec.org.uk/sites/default/files/Taking%20Responsibility%20for%20Water%20Full%20doc.pdf>>
⁴⁷ Ibid, p 2.



Environment Research Council, The Economic and Social Research Council and Department for Business, Innovation & Skills.

11.2 Main funding agencies or other bodies

The Department of Environment, Food and Rural Affairs

The Department of Environment, Food and Rural Affairs (DEFRA) is the UK government department responsible for policy and regulations on environmental, food and rural issues. DEFRA is a ministerial department, supported by 35 agencies and public bodies. It is estimated that between April 2015 and March 2021, the government will invest 2.3 B £ in more than 1,500 projects across England.

The Department priorities are:

- Lading the world in food and farming;
- Protecting country from floods and animal and plant diseases;
- Championing the countryside and improving rural services.

These priorities are stated out as policy regulations that are strongly implementing in the UK. DEFRA is focused on achieving a number of specific outcomes one of which is sustainable water use aiming to achieve a balance between water quality, environment, supply and demand. The department supports and funds various research projects to protect country from floods. Research projects are funded through competitions, which are advertised.

DEFRA sponsored a few executive non-departmental public bodies which are implementing programmes related to water management issues. The public bodies are presented in the table below.

Title of non-departmental public body	The Environment Agency (EA)
Details	<p>The agency is an executive non-departmental public body, sponsored by DEFRA, manages government investments in reducing flood risk. 6 years investment programme 'Flood and Coastal Erosion Risk Management Programme', which has been started in April 2015 to March 2021, will allocate 60 M £ to research projects for better management of floods and coastal erosion risk. This programme is implementing through 12 Regional Flood & Coastal Committees in England.</p> <p>The Environment Agency is consulting with Committees about flood and coastal erosion risk management work in their region and take their comments into consideration. Committees are required to consent the programme covering their region. Committees are composed of a</p>



	chairperson appointed by the Secretary of State and members appointed by lead local flood authorities, and by the Environment Agency.
Budget	N/A

Title of non-departmental public body	The Drinking Water Inspectorate (DWI)
Details	<p>The Inspectorate is the independent regulator of drinking water in England and Wales that ensures that water companies supply safe drinking water, which would be acceptable to consumers and meets the standards set down in law. DWI R&D Drinking Water Quality and Health Evidence Plan ensures that both standards and regulations would protect public health.</p> <p>DEFRA also allocates significant farming and food grants which has to reduce agricultural water pollution. Catchment Sensitive Farming (CSF) is a project run by DEFRA, EA in partnership with Natural England (NE). It raises awareness of diffuse water pollution from agriculture by giving grants in selecting areas in England in R&D. Water Grant Scheme allocates 10 M £ for 2015/16. The aim of the grants is to improve the environmental performance of farms.</p>
Budget	N/A

The Natural Environment Research Council

The Natural Environment Research Council (NERC) is UK's leading public funder of environmental science. NERC also funds national capability – the large research infrastructure, facilities, services and data centres that enable the research and make its results available. The Council works in partnership with business, government, civil society, the public and the wider research community to shape the environmental economic growth and public wellbeing by investing 330 M £ each year in cutting-edge research, postgraduate training and innovation in universities and research centres.

NERC sets out these responsibilities:

- To advance knowledge and technology; and to provide services and trained scientists and engineers which meet the needs of users and beneficiaries;
- To generate public awareness, communicate research outcomes, encourage public engagement and dialogue.

NERC funds excellent, peer-revised science that helps to understand and predict how planet works and manages environmental responsibility. The Council funds discovery and strategy research by investing in world-class skills.



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NERC has several support mechanisms for different kinds of research. Some of the funding is strategically directed towards research into a particular area. Types of funding are as follow:

Strategic research	Discovery science	Innovation funding
NERC's strategic research is designed to address major scientific questions that are important for the UK's prosperity and wellbeing in the 21st century - many of them revolving around how we can manage environmental change, make the best use of scarce resources and build resilience to natural hazards.	Research that is driven by curiosity rather than by a strategic agenda can have enormous benefits far beyond the advancement of knowledge, and often they are least expected.	NERC doesn't only fund science; it also helps turn that science into action, connecting researchers with those who can put their knowledge and skills to use, whether in industry, government or the third sector.

NERC funds a number of schemes to enable researchers to work with partners in business, policy and non-governmental organisations (NGOs), providing access to the latest knowledge and expertise. Each delivers cost-effective research driven by partners' priorities, and creates an opportunity for long-term collaboration with the research base.

The table below summarizes the research programmes related to water management:

Title	'Changing Water Cycle' (2009-2015)
Details	<p>The programme fosters interdisciplinary research that links applied water resources issues seamlessly to fundamental climate system science. The high level science goals are:</p> <ul style="list-style-type: none"> • To develop an integrated, quantitative understanding of the changes taking place in the global water cycle, involving all components of the earth system - the atmosphere, ocean, land surface. • To improve predictions for the next few decades of regional precipitation, evapotranspiration, soil moisture, hydrological storage and fluxes, focusing on the requirement to quantify and narrow the uncertainty in predictions. • To understand how local to regional scale hydrological and biogeochemical processes are responding and will respond to changing climate and land use, together with their consequent impacts on the sustainable use of soil and water.
Budget	10 M £ (5 M £ from the Climate System theme, 2-3 M £ from the Natural Hazards theme, 2-8 M £ from the Sustainable Use of Natural Resources theme).



Title	'Arctic Research Programme for the UK' (2010 - 2016)
Details	<p>The programme targets six key audiences – the scientific community, politicians, policy makers, business and other users of the Arctic environment, members of the public including young people. The outcomes of this programme are:</p> <ul style="list-style-type: none"> • Enhance UK Arctic research capability through effective collaboration within the science community; • Improve engagement and dialogue with politicians and policy advisors to facilitate evidence- based policymaking; • Improve engagement and dialogue with business communities to provide scientific research and evidence that has economic benefits for the UK.
Budget	N/A

The Economic and Social Research Council

The Economic and Social Research Council (ESRC) is the a non-department public body and the UK's largest organisation for funding research on economic and social issues established by Royal Charter in 1965. The Council supports independent, high quality research, which has an impact on business, the public sector and the third sector. The total budget for 2014/15 is 213 M £. At any time ESRC supports over 4,000 researchers and postgraduate students in academic institutions and independent research institutes.

The Council provides Research Grants for excellent ideas. The range of grants is from 350,000 £ to 1 M £. The Council research programmes that are mostly related to water include:

Waterworld	Freshwater Security and Coastal Vulnerability
The project involves policy analysis and interviews with stakeholders in Somerset as one case study, and five other case study regions across Europe. The project turns the issues such as flooding and scarcity management for agriculture, nature, and the supply of drinking water to the daylight.	The project will focus on the identification and characterization of natural process-human practices interactions that govern water budgeting in selected regions, and on the development of approaches that support the evolution of resilient communities/regions through improved seasonal (months to multi-year) forecasting of droughts, taking into account natural (hydro-meteorological) and socio-economic drivers.
The estimated budget	The estimated budget
N/A	2,5 M £

Department for Business, Innovation & Skills



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The Department for Business, Innovation & Skills (BIS) is the department for economic growth. The department invests in skills and education to promote trade, boost innovation and help people to start and grow a business. BIS also protects consumers and reduces the impact of regulation.

BIS responsibilities for water is devolved between different departments and governments. The Government published its new Science and Innovation Strategy, presented to Parliament by the Minister of State for Universities, Science and Cities by Command of Her Majesty, setting out long-term plan for expanding the UK's innovation infrastructure. One of the purposes of this strategy is to commit to the continuation of the long-term arrangements that the UK enjoys.

The Government committed to provide 5.9 B £ in capital support for science and research to 2021. The Research Excellence Framework declares funding availability for research projects in water management area. BIS is supporting innovative SMEs with high growth potential in terms of water management and water supply.

11.3 Key challenges which influence the performance of research organizations

This analysis has highlighted several key challenges that influence opportunities for the involvement in collaborative projects in UK. These can be pointed out as follows:

Main challenges pointed out	Details
Restrictive visa regimes	Science – research and innovation – works without borders, that are why success in science absolutely depends on movement of people. The science society is concerned about the restrictive visa regimes applied in the United Kingdom. British scientists agreed that one of the critical risks for scientific developments is the limit for non-EU scientists. The government is giving grants to the scientists who are EU nationals; it means that non-EU scientists, due to the limited access to the territory, cannot easily participate to British scientific progress. Laboratories depend on an international workforce and it was estimated that 700,000 more researchers would be needed by 2020 to meet the target and the allied objective of increasing spending on R&D 3% of the UK's GDP. ⁴⁸ Now unnecessary visa requirements – interviews with consular officials, expensive medical appointments with consulate-prescribed doctors, and a hefty dossier of supporting material and documents – make the process for visa applications harmful.
Constant	University of Oxford officials stated that research and innovation

⁴⁸ Universities UK, 'Efficiency, effectiveness and value for money.' Page 3-7.

<<http://www.universitiesuk.ac.uk/highereducation/Documents/2015/EfficiencyEffectivenessValueForMoney.pdf>>



speculations about Brexit	<p>grants have become a part of politics, which is full of bureaucracy, and that science has been a 'low priority'. The recent discussions to leave the EU would be a disaster for British science. It means that the United Kingdom is much more dependent on the EU than everybody thought. Brexit constitutes a serious risk for the British scientists.⁴⁹</p> <p>British labs were awarded over €1bn between 2007 and 2014 from EU funding. Mobility schemes and fellowships are the main drivers in many disciplines of science. All these factors show that there is a net financial as well as scientific gain from the EU.⁵⁰</p> <p>Comparing with the United Kingdom's science policy, the science programmes are largely politics-free in the EU. As a result, EU initiatives give a better picture and provide a better access for grants than through national UK policy on science.</p>
The UK do not establish robust international funding schemes	The Science and Technology Committee of House of Lords has pointed out that international funding schemes could attract more talented scientists to the UK from around the world. Those scientists could collaborate with successful British scientists.
Lack of budget protection during economic crisis (2008-2009)	The R&I&D budgets are poorly protected as they are depending on the current economic climate. If there are major cuts in public spending, research budget will have to take its fair share. R&D&I is an investment to secure the global future of the UK. University College London professors are very concerned that the current economic climate means a reduction in funding, for research in particular. Investment in research represents a way to stimulate economic recovery and ensure that the UK can support the most talented researchers and generate the best ideas.
The concentration of R&D in a few key sectors in the UK	According to the Office for National Statistics data, the key sectors are: pharmaceutical sector (4,9 B £ in 2011), computer programming and information service activities (1,819 B £ in 2011), motor vehicles and parts (1,525 B £ in 2011). Other sectors are left behind the scene and this could lead to an unfair distribution between the other sectors, e.g. energy.

⁴⁹ Matthew Freeman, 'EU science funding: the UK cannot afford to lose out on this pot of money.' The Guardian, 13 May 2015. <http://www.theguardian.com/higher-education-network/2015/may/13/eu-science-funding-the-uk-cannot-afford-to-lose-out-on-this-pot-of-money>

⁵⁰ EraWatch, United Kingdom Country Fiche <http://erawatch.jrc.ec.europa.eu/erawatch/opencms/system/modules/com.everis.erawatch.template/pages/exportTypesToHtml.jsp?contentid=456c4b7f-7d1e-11df-b939-53862385bcfa&country=United%20Kingdom&option=PDF>



12. Tunisia

12.1 Overview

Tunisia has faced the challenge due to a lack of policies related to the rationalization of the use of water and the modernization of its distribution network. The government and the national water utility, known by the acronym SONEDE, launched the National Water Security Investment Program to ensure uninterrupted water services over the next decade, despite fast growing demand and the negative impact of climate change. With its focus on improving infrastructure and sound management policies, Tunisia has not only achieved one of the highest access rates to water and sanitation services among middle-income countries in the Middle East and North Africa region, but continues to invest and adjust to meet growing demand.⁵¹

The sub-chapter below identifies the main funding agencies or other bodies in the following order: The Ministry of Higher Education and Scientific Research and The Ministry of Agriculture and Environment.



12.2 Main funding agencies or other bodies

The Ministry of Higher Education and Scientific Research

The Ministry of Higher Education and Scientific Research (MHESR) is responsible for:

- Developing and implementing the higher education and scientific research policy;
- Monitoring the activities of universities, higher education and research institutions and research structures;
- Monitoring the university life of students and coordinating the activities of students' services offices.

Together with the World Bank, MHESR is implementing a range of water related programmes. The programmes are as follow:

Title of programme	<i>The Urban Water Supply Project</i>	<i>The Second water Sector Investment</i>	<i>The Northern Tunis Wastewater Project</i>
Description	The objective of which was to ensure	Aimed at promoting more efficient management and	Supported the goals of providing

⁵¹ The World Bank, 'Water: Tunisia's Other Development Challenge'. <<http://www.worldbank.org/en/news/feature/2014/09/04/water-tunisia-s-other-development-challenge>>



	the continuity of water service for the growing population of Greater Tunis and other targeted cities through augmentation, upgrade and renewal of water supply infrastructure.	operation of selected public irrigation schemes; to improve access to and the quality of drinking water for households in rural communities; and to assist the Ministries of Agriculture and Water Resources, Environment and Sustainable Development, and other stakeholders to make better decisions relating to integrated water resources management in Tunisia.	an environmentally safe disposal system for treated wastewater not intended for reuse; while increasing the quantity and quality of treated wastewater available to farmers, to encourage its reuse in agriculture.
Total budget	N/A	N/A	N/A

MHESR is participating in ERANET-Med project. The main aim of the project is to enhance Euro-Mediterranean co-ownership through innovation and competitive research in the societal challenges of the region. The project aims at reducing fragmentation of programming in the Mediterranean region by increasing coordination among national research programmes of European Member States, Associated Countries and Mediterranean Partner Countries.

The main goals of the project:

- Establish a framework for communication and coordination of programme owners and managers related to S&T cooperation from Europe and Mediterranean Partner Countries;
- Strengthen Euro-Mediterranean R&I Cooperation promoting joint activities.

The Ministry of Agriculture and Environment

The Ministry of Agriculture and Environment (ONAGRI) had created the National Water Distribution Utility to supply all the country with potable water and to help research organisations to get funding on the topics related to water management.

The main activities are:

- Water production: production, treatment and transport,
- Water distribution: management and maintenance of drinking water network and equipment and management of customers,
- Development: studies, works and supply.

Tunisia is very aware of the threats facing the Mediterranean and, as a signatory to the Barcelona convention, is working to consolidate its international collaboration in marine



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This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 612385

science, particularly with the other countries of the Mediterranean Basin. Generally speaking, Tunisia's priorities in terms of international cooperation in the field of scientific research are threefold:

- Speeding up the integration of Tunisia into European research and EU framework programmes,
- Developing our technological R&D development capacity to serve our economy and society,
- Promoting the integration of Tunisia into world-class scientific debate.

International cooperation in marine science is in line with these priorities and focuses in particular on issues affecting the entire Mediterranean such as:

- Research into fishing resources and their joint management, particularly where stocks are shared by several countries.
- Knowledge about the condition of the Mediterranean and the mechanisms by which pollution is spread. Setting up databases can facilitate research into ways of limiting pollution. It would be interesting to be involved in the Mytimed project on monitoring the quality of coastal waters using biological integrators for the sustainable protection of the eastern Mediterranean.
- Continuing work on the management of coastal zones, particularly lagoon environments with similar characteristics throughout the Mediterranean countries; this task is to be achieved by setting up a Mediterranean lagoons network and operational tools for managing them.

On the integrated management of coastal areas several projects have been conducted:

- Project on the conservation of coastal wetlands and coastal ecosystems in the Mediterranean Basin,
- Project on the preservation and monitoring of the ecosystem at Ichkeul,
- Projects for the rehabilitation of the lakes north and south of Tunis,
- The national programme for the protection of the coastline of Tunisia against marine erosion
- The European Melmarina projects 2002 – 2006 on the monitoring and modelling of coastal lagoons and the CIRCE project 2007 - 2011 that is studying the impact of climate change on the environment of the Mediterranean region
- The Mediterranean Environmental Technical Assistance Program METAP (World Bank and European Investment Bank), which implemented a protection programme for the coastal marine resources in the Gulf of Gabes in 2003.

12.3 Key challenges which influence the performance of research organizations

This analysis has highlighted key challenges that influence opportunities for the involvement in collaborative project in Tunisia. These are pointed out as follows:

Main challenges	Details
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pointed out	
Lack of capacity and know-how	According to the Middle East and North African Scientific Community, almost 3000 North African scientists leave their country of origin to settle in institutes and universities in well-developed countries. The main problems faced by researchers in Tunisia are low salaries, difficulty in getting funding and dedicating entirely to research. The scientific community sees structural problems such as poor quality of teaching and a lack of political stance.
Bureaucratic barriers in terms of high index of corruption	The Tunisian Association of Public Controllers reported that bribery in the scientific community and governmental bodies are still one of the obstacles to research in Tunisia. Corruption has increased in Tunisia in the wake of its uprising, according to Transparency International. Tunisia's rank, in the annual index of corruption perception, fell from 59 to 73. What is worse is that three successive interim governments have failed to look into this matter, which leads to only one conclusion for observers of Tunisian economic, scientific and political life: the beast of corruption remains powerful. Administrative officials of universities are responsible for scientific research carried out by the researchers., Unfortunately, 'bribery doubled in the sea port of Rades and in the administrative routine and bureaucracy, both of these factors are literally destroying our scientific society, and the crisis is getting worse, and no one cares', Maher Kshouk, head of the Tunisian administration of Education, said.
Lack of understanding the forms, scientific definitions of the European Union	According to Pr. H'maied Ben Aziza, Rector of the Tunis University, another difficulty for the establishment of partnerships is the preparation of researchers to meet the European Union programme requirements. The capacity to respond to calls for proposals and notices of the European Union is difficult because of lack of understanding of spreadsheets, forms and scientific definitions. Language barriers also can be described as one of the obstacles.
Issues related to bureaucracy barriers	Tunisia has to bring down bureaucracy barriers to ensure international cooperation in science and education. The balanced development of higher education is ensured when the country ensures through a transparent and less bureaucratic processes. At this moment bureaucracy caused low-added value activities. The World Bank said that administrative issues cost the country about 13% of its revenues.

13. Conclusions



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This study presents the national support mechanisms regarding international cooperation research in water management in the European and North Africa targeted countries of BeWater, as well as the key factors and organizations which influence the performance of research organizations in those countries in international research. The specific individual national mechanisms, and the respective difficulties to international cooperation partnerships, can be found in each country chapter.

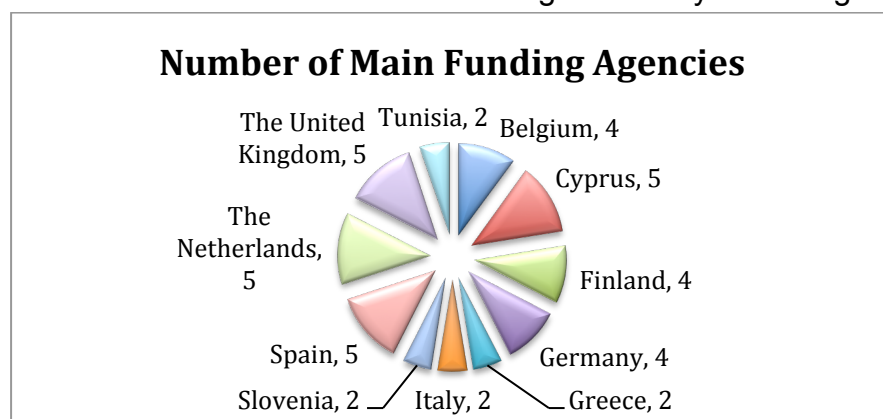
Main Funding Agencies and Other Bodies

Figure 1 shows the numbers of national funding agencies that are involved in project implementation through the international cooperation. The number of significant agencies is reduced; this does not imply that they are not involved in international projects. As can be seen in the national chapters, the funding agencies are implementing a significant number of programmes in terms of water management.

It is a common place that the funds for research in terms of water management come mostly from governmental origin, and are restricted to budget limitations and priorities. It is common to find private foundations as well.

It is not common to find private resources funding projects. Many companies develop at their headquarters their own research oriented to their business, and only apply the results at their subsidiaries abroad. As a rule, those companies are not interested to fund research in cooperation.

Figure 1 summarizes the number of main funding entities by each targeted country:



Key Challenges which Influence the Performance of Research Organizations

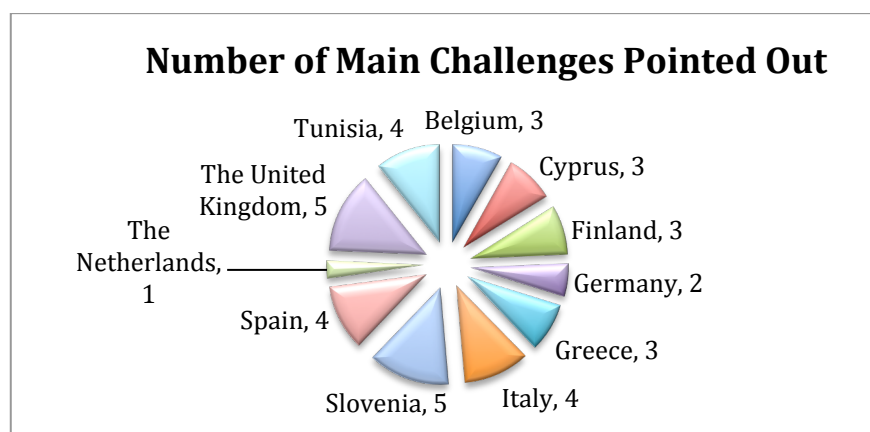
There are many challenges pointed out by countries: some of them are specific for the country, but a set of them is common ones.

There are some challenges that should be treated internally by each country as, for instance:

- The challenge to prepare researchers: this implies in improving all the education chain in the country, from basic education schools to the University;

- The challenge to protect research funding from economic crisis: this implies in equalizing the professional valorisation between a researcher and an industrial employee;
- Partial challenge due to language barriers: which must be removed to established a smoothly communication between researchers.

On the other side, there are a number of challenges that should be analysed, and solved, for instance, the lack of transparent system in funding mechanisms, bureaucracy burned and the financial crisis negative effects to research systems. Figure 2 summarizes the quantity of main challenges for international cooperation partnerships related to each country.



The following matrix shows the most recurrent challenges faced by the targeted countries concerning partnerships for international cooperation in terms of water management.

Main challenges pointed out	Belgium	Cyprus	Finland	Germany	Greece	Italy	Slovenia	Spain	The Netherlands	The United Kingdom	Tunisia	TOTAL
Lack of well-defined state policies in the area of R&D&I in water sector						X	X	X		X		4
Economic crisis decreased the number of researchers who had the knowledge and experience in international research projects		X			X			X		X		4
Difficulty for researchers to understand the application procedures due to bureaucracy burden						X		X			X	3
The state-designed scientific career path lacks of flexibility. The career path is too long and unclear								X	X			2
Insufficient collaboration between public			X			X						2

and private research sector												
Low share of skilled human capital						X					X	2
Lack of interest to join private sector due to funding scheme			X									1
Regionalised administration	X											1
Low demand for researchers and PhD holders from local industry		X										1
Partially difficult due to language barriers		X									X	2
Lack of interdisciplinary research and a targeted coordination of efforts				X						X		2
Lack of efficient and transparent procedures to disseminate the information about the opportunities of the EU funding system.					X					X		2
Lack of analytical data	X						X					2
Lack of cooperation between research, development and innovation bodies	X						X					2
Slow process of decision and complexity of workflow involved in the EU calls.					X							1
Top-down research approach			X									1
Low effectiveness of funds							X					1
Constant speculations about political situation										X		1
Lack of long-term funding				X			X			X		3
TOTALS	3	3	3	2	3	4	5	4	1	5	4	

Comments

The number of agencies and other entities could be increased if some of the challenges mentioned in item 13.2 could be solved. Some of them perhaps could be solved in a shorter term than others, like the one that implies simplifying the projects' proposal process, which is easier than improving any national education system.

Another nature of challenge that can be perceived from the matrix is the one related to administrative/financial processes in general. The bureaucracy involved in international cooperation projects, and in national funding agencies and/or regulatory entities, is not understandable for many researchers. Better mechanisms (than the existing ones) could be created to support researchers in the task of preparing proposals.

