2. Water Diplomacy and its Future in the National, Regional, European and Global Environments

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List of Acronyms

BEIS	Department for Business, Energy and Industrial Strategy
BV	Dutch abbreviation for a private limited liability company
CAS	Czech Academy of Sciences
CZELO	Czech Liaison Office for Research, Development and Innovation
Defra	Department for Environment, Food and Rural Affairs (in the UK)
DFID	Department for International Development (in the UK)
DG	Directorate General (e.g. of the European Commission)
DG RTD	Directorate General for Research and Innovation
DIT	Department for International Trade (in the UK)
EEAS	European External Action Service
FCO	Foreign and Commonwealth Office (in the UK)
GIZ	Gesellschaft für Internationale Zusammenarbeit
IWaSP	International Water Stewardship Programme
JPI	Joint Programming Initiative
MDGs	Millennium Development Goals
NGO	Non-governmental organizations
NWP	Netherlands Water Partnership
OECD	Organisation for Economic Co-operation and Development
S.A.W.E.R. system	Solar Air Water Earth Resource
TFEU	Treaty on the Functioning of the European Union
UK	United Kingdom
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
WFD	Water Framework Directive

1. Introduction

Water diplomacy is a new field of diplomacy that combines the methods of science diplomacy (focusing on close ties between the worlds of science and diplomacy) with traditional diplomatic instruments. It is defined by its emphasis on water-related topics: access to drinking water, water sanitation, water scarcity, flooding, etc. All these categories are included in the broader category of international water management.

Water management is a multifarious responsibility that extends to agriculture, national security, public health and other areas. A diplomacy that promotes efficient water management requires the involvement of different actors who need to understand and take into account the 'water dimension' of a specific diplomatic situation. As needed, it can employ the tools of pre-emptive diplomacy, designed to head off critical international problems, and crisis management. That is why the cooperation of government officials with the scientific community (including experts in the hard sciences, technical disciplines, the social sciences and the humanities) is crucial to successful water diplomacy. The case of water management is very well suited for a study of the practice of science diplomacy.

The internal structure of this case study reflects the different approaches to water management and water diplomacy in three EU Member States: the Czech Republic, the Netherlands and the United Kingdom. The subcase of each country offers us insight into the governance arrangements, the stakeholder landscape, and the processes and procedures applied in the water policy agenda in each country. The entire case study is complemented by an analysis of water diplomacy at the EU level, mainly focusing on the role of the EEAS and the relevant Directorate Generals (DGs), as they step into a more important role in water diplomacy—a new ambition of the European Union as pointed out by relevant stakeholders.

This case study is an example of a foreign policy driven analysis, as it focuses mainly on actors, topics and instruments that contribute to the achievement of foreign policy goals as mentioned in main conceptual documents of the three countries and the EU. It mainly studies the science for diplomacy category – methods and instruments that contribute to an effective cooperation and communication between the scientific and diplomatic communities and follow diplomatic objectives.

2. Water Management in the Netherlands and Dutch Water Diplomacy

Dutch engineers have used invention, science and technology to fend off sea water for centuries. Since the Dutch people began to settle in areas threatened by flooding, they have successively protected themselves with mounds, seawalls, concrete-and-metal structures and recently with sand nourishment. In the process, they have reclaimed large areas of land from the sea. During the middle ages, Dutch engineers were already travelling to Northern Germany to advise on flood control construction[1]. Nevertheless, systematic, large-scale flood protection only developed in the twentieth century, when the means for large-scale monitoring of conditions as well as improved institutional organization became available. Improvements in flood management were always linked to critical events such as large floods. In the first half of the twentieth century, such events inspired a more integrated approach to flood management involving all the governmental institutions in the Netherlands dedicated to water issues. Naturally, the systemic transformations of the Netherlands' approach to flood management were coupled with a growing body of

[1] Pye, Michael (2015): The Edge of the World. How the North Sea Made Us Who We Are. London: Penguin UK.; Mauelshagen, Franz (2007): Flood Disasters and Political Culture at the German North Sea Coast: A Long-Term Historical Perspective. In: Historical Social Research 32, no. 3.

knowledge about flood control. While Dutch flood management experts have always travelled and worked abroad, their value is now even greater in a more and more globalized world. Since the second half of the nineteenth century, the Netherlands' governmental water management was staffed by civil engineers[2]. In the 1970s, the engineers were joined by ecologists, which led the government to take a more complex approach to water management[3]. At the same time, Dutch companies, which were often contracted to implement the government's water management plans, grew in expertise. They are now some of the world's most renowned business' experts in the sector. Dutch water management scientists played a significant role in formulating flood risk reduction plans for post-Hurricane Katrina New Orleans and for New York City after Hurricane Sandy. The Dutch government has advised on water management plans for low-lying countries in river deltas like Bangladesh[4].

2.1. Water legislation and policy

Since 2009, water management in the Netherlands has been regulated by one law: the **Water Act**. That law replaced and integrated eight other laws related to different aspects of water management[5]. Except for its definition of transboundary water basins, the Water Act does not explicitly mention any international aspects of water management. However, it does task the Dutch government (and by inference the minister responsible for water management) to develop a **National Water Plan** and a **Delta Programme**, which provide for international cooperation and take into account other foreign aspects of water management. The National Water Plan[6] outlines the overarching objectives of Dutch national water policy. In principle, it is to be revised every six years. The Delta Programme contributes to the National Water Plan in the areas of flood safety and provision of drinking water. It contains all the concrete measures to be taken to ensure adequate water supplies as well as water quality[7]. According to the Water Act, the Delta Programme may also have 'ambitions in other policy domains', but does not specify which other domains. In other words, the National Water Plan is the Netherlands' strategic policy document, while the Delta Programme sets out the tactics to be used on the operational level for achieving the objectives of the National Water Plan. Besides national objectives, the Plan and the Programme often mention some international objectives. The Delta Programme acknowledges the international, transboundary character of flood protection efforts. The international theme most often mentioned in the Programme is the benefit to Dutch businesses of exporting flood management expertise and exchanging knowledge, technology and experiences with countries in similar low-lying delta regions, such as Bangladesh and Indonesia. An occasional topic is the need for cooperation with the European Commission and the OECD.[8] In 2016, the Dutch government produced an

[2] Disco, Cornelis (2002): Remaking "Nature": The Ecological Turn in Dutch Water Management. In: Science, Technology, & Human Values 27, no. 2.

[3] Ibid.

[4] Ministerie van Infrastructuur en Milieu and Ministerie van Economische Zaken Landbouw en Innovatie (2016): Deltaprogramma 2017: Voortgang Kennisagenda. The Hague: MinIenM.

[5] Arnold, Geo et al. (2011): Water Management in the Netherlands. Utrecht: Rijkswaterstaat, Centre for Water Management.

[6] Ministerie van Infrastructuur en Milieu and Ministerie van Economische Zaken (2015): Nationaal Waterplan 2016-2021. Den Haag: MinIenM.

[7] Ministerie van Infrastructuur en Milieu and Ministerie van Economische Zaken Landbouw en Innovatie (2017): Deltaprogramma 2018: Doorwerken Aan Een Duurzame En Veilige Delta. The Hague: MinIenM.

[8] Ministerie van Infrastructuur en Milieu and Ministerie van Economische Zaken Landbouw en Innovatie (2016): Deltaprogramma 2017: Voortgang Kennisagenda. The Hague: MinIenM.; Ministerie van Infrastructuur en Milieu and Ministerie van Economische Zaken Landbouw en Innovatie (2017): Deltaprogramma 2018: Doorwerken Aan Een Duurzame En Veilige Delta. The Hague: MinIenM.

internationally-oriented **International Water Ambition.**[9] It was issued in cooperation between the Minister for Infrastructure and the Environment, the Minister of Foreign Trade and Development Cooperation, and the Minister of Economic Affairs. Given the inter-ministerial cooperation that produced the 'ambition', the integrated definition of water safety and security it contains may not come as a surprise. The Netherlands' International Water Ambition can be seen as an informal statement of Dutch foreign policy in the domain of water management and climate change. Its objectives are reflected in a broad range of 'water instruments' outlined in the document, including funding, partnerships and disaster assistance. In addition, according to the International Water Ambition, the Netherlands aims to become a global 'centre of excellence' in the domain of water safety and security.

2.2. Governance mode

In terms of its mode of governance, the Dutch water management system is a **mixture** of hierarchical, network and market elements. Given the importance of flood protection to the country, the **central government has a clear duty of oversight** of the water management system and its activities. Lower-level authorities are often assigned to carry out water management projects, but monitoring and inspection responsibilities remain with the central government. There is a large number of actors in the system (see below) with different expertise in terms of water supply, water quality and project management. That means that once projects are started, they are seldom implemented by one governmental organization but rely on the **cooperation of many stakeholders**, such as the public works agency, provincial governments, water boards, municipalities, consulting and water management companies, and sometimes citizens and civic organizations. Finally, in some construction projects there are **tenders or market-based mechanisms** to find the most suitable bidder to participate in the project.

2.3. Stakeholder landscape

The various institutions and organizations that influence water management are set out below. The relevant stakeholders are identified in bold text.

The Netherlands' geographic location has propelled water management to high importance in Dutch policy making, which applies to all levels of government and stretches out into civil society and the knowledge sector. Policy-making crosses national boundaries. The Dutch government collaborates with other states as well as international stakeholders. The Netherlands is a leader of a network of stakeholders, promoting best practices and sharing its water management knowledge. Improving social welfare and commercial opportunities are the main drivers of its policies. Water management is an opportunity for the Netherlands and Dutch companies to conquer a unique position in the global market for flood management technology and mitigation of the effects of climate change.

2.3.1. Actors in Dutch foreign policy

Two ministries constitute the core of Dutch foreign policy as it relates to water management activities. The **Ministry of Infrastructure and Water Management** is nominally in charge. Together with the **Ministry of Economic Affairs and Climate Policy**, the Ministry of Infrastructure and Water Management implements the **Delta Programme**, which establishes an annual focus and planned activities, mainly for Dutch national water management but also for its international activities. Since 2014, the **Ministry of Foreign**

[9] Ministerie van Infrastructuur en Milieu (2016): Synergos Communicatie, Internationale Waterambitie. Den Haag: Ministerie van Infrastructuur en Milieu.

Affairs has leveraged its cooperation in the framework of the Delta Programme to draw foreign attention to the Netherlands' water management knowledge and expertise[10]. Both of the core ministries collaborate on preparing and implementing the National Water Plan, the International Water Ambition and the National Climate Adaptation Strategy. The Ministry of Infrastructure and Water Management has appointed two responsible employees: the **Delta Commissioner** and the **Water Envoy**. The Commissioner has quasi-ministerial rank and is charged with specific tasks in the implementation of the Delta Programmes, for which Dutch law defines a position that is unique in the world. The Delta Commissioner maintains contact with organizations and international working groups interested in river basin management. He or she makes policy recommendations to the EU via the relevant Dutch government ministries. Such recommendations may relate to river basin management and adaptive delta/coastal management. The Water Envoy is a function that is unique to the Dutch government. Although 'special envoys' have often been appointed by the Netherlands and other countries[11], the efforts of the Dutch Water Envoy are dedicated to water in all its facets. The position is unique in the world. The naming of a Water Envoy in 2015 created a thematic ambassadorship that is helping to reinforce the Dutch national Water Ambition and contributes to international marketing of Dutch knowledge and expertise.

2.3.2. System of advisory councils

Several advisory councils and institutions of knowledge contribute expertise to the Dutch government and its national and foreign strategies for science, technology and innovation. The **Advisory Council on International Affairs** (*Adviesraad Internationale Vraagstukken*) has not given advice on water management topics, rather on typical foreign policy topic such as security; The **Advisory Council for Science, Technology and Innovation** (*Adviesraad voor wetenschap, technologie en innovatie*) has published an advice on STI diplomacy in 2017 which does not mention water management. The **Royal Netherlands Academy of Arts** and Sciences (Koninklijke Nederlandse Akademie van Wetenschappen) has published reports on scientific cooperation in general and attractiveness of NL for scientists. The **Netherlands Scientific Council for Government Policy** (*Wetenschappelijke Raad voor het Regeringsbeleid*) does not focus on water specifically. Some advices on technology or foreign policy use water management as case study. It has not provided an advice relevant for water management since 2010.

These advisory councils influence a large share of Dutch policy making, including its foreign policy and its Science, Technology & Innovation Policy, as well as the general direction of policy overall. However, none of these advisory councils is focused exclusively on water management. An exception was a dedicated **Water Governance Centre**, which was set up as a platform devoted to all matters relating to water management. The Centre has since been closed down, but before it closed, it commissioned a report on water diplomacy[12]. Several Dutch universities advise the government and are well-known for their approaches to water management. Among them, TU Delft and the University of Twente take a civil engineering approach, while Wageningen University upholds a tradition that focuses on ecological systems. The Netherlands also has set up a **Risk Reduction Team**, which is a team of experts tasked with making a quick response to disasters worldwide.

[10] The Ministry of Foreign Affairs houses the ministers of foreign affairs as well as of foreign trade and development cooperation. Besides the cooperation on the Delta Programme, its water management activities are unknown.

[11] Among others, the Ministry of Foreign Affairs has/has had Envoys for the Sustainable Development Goals, the climate or rare earths.

[12] Genderen, Ruben Van, Jan Rood (2011): Water Diplomacy: A Niche for the Netherlands? The Hague: Netherlands Institute of International Relations 'Clingendael'.

2.3.3. Collaboration between the public and private sectors

As mentioned above, Dutch expertise and skills in water management has gained a global reputation and is in high demand. The Dutch government encourages that demand to grow through active promotion and networking activities. It now cooperates directly with several countries and with international platforms for sharing relevant knowledge and experience. The Dutch approach to adaptive Delta management has been applied in Bangladesh and Vietnam. The Netherlands assisted in the development of the *Bangladesh Delta Plan 2100*. Dutch institutes of knowledge collaborated with Bangladeshi authorities on a long-term, adaptive strategy and corresponding funding scheme. In Vietnam, a Delta Plan was developed for the Mekong Delta and was presented at the end of 2013. In Colombia, the Netherlands has contributed to finding natural solutions to drainage problems and an early warning system for floods. In addition, the Netherlands has identified countries such as Egypt, India, Indonesia and Mozambique as potential partners in the long term. On top of all this, the Netherlands led the formation of a **Delta Coalition** in 2016, which has twelve member states[13]. The Coalition has the aim of (a) making deltas more resilient, (b) preventing global water problems, (c) agenda-setting, (d) sharing knowledge, and (e) promoting practical solutions to water management issues. The Netherlands considers China and the United States[14] to be its peers in the field of water management, with which it seeks to build productive relationships. Dutch water management expertise has piqued the interest of the **OECD** and the **World Bank**, which is a member of the **Water Mondiaal program**[15]. The OECD has established a Water Governance Initiative, to which the Dutch Delta Programme contributes. In the domain of **non-governmental organisations** (NGOs), there are several Dutch **environmental consultancies**, **water technology companies**, and **non-profit organisations** that operate transnationally. Two of them are the **Water, Sanitation and Hygiene (WASH) alliance** and the **Netherlands Water Partnership (NWP)**. WASH aims to bring sustainability to foreign water and sanitation programs. It is carrying out a variety of projects in Africa and Asia, including capacity building and knowledge transfer projects. The NWP does not run water projects itself, but rather facilitates networking. It is the first port of call for those seeking Dutch water expertise. The organization is composed of groups of experts categorised by topics and regions. These experts direct inquirers to Dutch companies, NGO's, government agencies, and knowledge institutes in the water sector and their foreign counterparts. The NWP's connecting and match-making encompasses a range of networking activities, including attending international events, fielding direct requests from members, and organizing incoming and outgoing missions. Its ambition to be open and connective requires agility and eagerness to seek out opportunities on the part of its experts. While the NWP does work with scientists and diplomats, its relationship with them is mainly as a facilitator of contacts. The NWP's areas of concentration are aligned with the policy agenda put forward by the Dutch government. Its synergy with the national government gives the Netherlands a much stronger and more supported position in the international field of water management, both bilaterally and in the framework of international organizations.

[13] Member states are: Bangladesh, Colombia, Egypt, France, Myanmar, Indonesia, Japan, Mozambique, Philippines, South-Korea, Vietnam, and Netherlands.

[14] Since hurricane Sandy in 2012, intensive contacts have been established with a Memorandum of Understanding between US department of Housing and Urban Development and then Dutch Ministry of Infrastructure and Environment as a result.

[15] There are some other international networks dealing with water, such as the Delta Alliance, Partners for Water, European Partnership for Innovation in Water and the Netherlands Water Partnership.

2.4. De-facto governance practices

Various Dutch organizations address a **large range of water issues** in foreign countries. These include water quality, water quantity, sanitation, irrigation, and mitigation of and adaptation to the effects of climate change. Of course, the ability to export knowledge of such a diversity of issues requires wide-ranging expertise, a national interest in supporting such exports, a strong economic sector and ambition to set policy internationally. Over the years, the Dutch water management sector is (or at least perceives itself as) a jack-of-all-trades as regards water management issues, **not only in terms of the content of its knowledge, but also in terms of process and procedures**. Dutch organizations provide services for capacity-building, training, technology transfer, policy making, consultancy and research. Such versatility allows for approaches tailored to the target country's requests, requirements and opportunities.

Based on conversations with practitioners of science diplomacy, **expressed rules of conduct** for their work are rare. Rules for their conduct are tacit and adapt dynamically whenever situations change. Practitioners of water diplomacy, just as science diplomats, need to know what could be called the 'typical' diplomatic rules and procedures. Such typical rules of conduct involve knowing a host country's culture, and how people there think, talk, and work. Familiarity with the cultural context is paramount to effective interaction with organisations from a foreign country. Cultural rules must be learned from experience and socialisation. Diplomats who increase their work experience in the foreign context increase their chances of successfully pursuing effective science diplomacy.

Cultural idiosyncrasies are a potential point of leverage for **greater involvement in water diplomacy by the EU**. Of course, there are abundant situations in which a clear **division of labour** between the EU and its Member States would be desirable, especially in countries where Member States already have deployed diplomats involved in the field of water management. However, even there, the EU can play a useful supporting role in situations where non-governmental actors, be they civil society organisations or commercial firms, encounter the **vicissitudes of unpredictable or unstable domestic governance**.

International exchanges of water management knowledge and expertise occur **in various ways**. Both government and non-governmental diplomats attend **trade fairs** or organise and join **trade missions**. They set up **personal meetings** for scientists and foreign policy makers, sometimes based on requests for information or match-making, sometimes based on their own noticing of an opportunity. Such networking facilitates the exchange of resources**, including contacts, knowledge and prospects for government funding**.

2.4.1. The cultural context

A set of broader societal developments in the Netherlands has influenced concepts of water management and how it is executed. These developments include an increase in the number of scientific and other disciplines (professions, fields) that take an interest in the subject, raising public concern about climate change, and the Netherlands' increasing self-perception as a welfare state that takes international responsibility and offers support to other countries.

First, concern about the water environment have been increasing in **many different scientific disciplines**, such as hydrology, physics, engineering, ecology, and even the social sciences.[16] This greater interest in the subject has led researchers to discover and

[16] Disco, Cornelis (2002): Remaking "Nature": The Ecological Turn in Dutch Water Management. In: Science, Technology, & Human Values 27, no. 2.; Verduijn, Simon H., Sander V. Meijerink, Pieter Leroy (2012): How the Second Delta Committee Set the Agenda for Climate Adaptation Policy: A Dutch Case Study on Framing Strategies for Policy Change. In: Water Alternatives 5, no. 2.

employ more and more sophisticated and technology-intensive research methods. It has also resulted in more integrated, increasingly interdisciplinary approaches to water management, river basin management, integrated coastal zone management and adaptive water management[17].Second, certainly there is a is rising concern about **climate change** and problems it can cause, such as a rise in sea level, droughts, and changes in the biome. Climate change is putting water systems under pressure, requiring well-organized water management systems. The Netherlands' Delta Programme, coastal maintenance programme and other initiatives result from an upward trend in the learning curve with respect to water management.

Finally, the Netherlands has a long tradition of supporting other countries in their water management efforts by making its expertise and knowledge widely available[18]. The Delta Programme documents state:"The efforts for water safety and freshwater supply the Netherlands has undertaken in the past decades have laid the foundations for a prosperous country. The Netherlands is home to the safest delta in the world. It has to stay that way. This requires substantial effort and the commitment of all the innovative power that public and private parties possess. This immediately generates a wonderful product for export[19]."This business model attitude is mirrored in the field of water management, where the Netherlands is not just seeking to promote the interests of Dutch businesses, but also to render real assistance to countries in need of water management expertise and technology, as well as immediate relief in the wake of water-related disasters. In this effort, the Netherlands intends to 'link its national approach with the international market, making the country a testing ground and showcase for innovative, iconic projects and increasing the level of knowledge'[20]. In addition, supporting countries abroad provides opportunities for increasing knowledge of extreme environmental conditions and situations.

2.4.2. International aspects of governance

In addition to the above-mentioned policy documents, an advisory report to the Dutch Ministry of Foreign Affairs has been published on **water diplomacy**. The report suggests that the Ministry is well-positioned to act as a **broker, a central hub and an enabler** as well as a **norm entrepreneur** in the field of water diplomacy.

The Netherlands' presence in the world as a source of expertise in water management emerges from **different narratives** as its starting points. On the one hand, there is the **developmental perspective,** which focuses on grand challenges and puts the Sustainable Development Goals front and centre. One official interviewed by the authors told us:

> *"The world needs to become a better place, i.e. the Sustainable Development Goals, and the Netherlands will contribute to this. […] First comes help and then trade. So, the mechanism is not that the Netherlands has to be better off and then let's see how the world fares. No, the world needs to be better off and the assumption is that, because this task is so large and the Netherlands has relevant expertise, we will also benefit."* (personal communication)

[17] Huntjens, Patrick, et al. (2011): Adaptive Water Management and Policy Learning in a Changing Climate: A Formal Comparative Analysis of Eight Water Management Regimes in Europe, Africa and Asia. In: Environmental Policy and Governance 21, no. 3.

[18] Ministerie van Verkeer en Waterstaat, Ministerie van Volkshuisvesting Ruimtelijke Ordening en Milieubeheer, and Ministerie van Landbouw Natuur en Voedselkwaliteit (2009): Nationaal Waterplan 2009-2015. Den Haag: MinVenW.; Ministerie van Infrastructuur en Milieu and Ministerie van Economische Zaken Landbouw en Innovatie (2017): Deltaprogramma 2018: Doorwerken Aan Een Duurzame En Veilige Delta. The Hague: MinIenM.

[19] Ministerie van Infrastructuur en Milieu (2012): Deltaprogramma 2013: Werk Aan De Delta. De Weg Naar Deltabeslissingen. The Hague: MinIenM.

[20] Ministerie van Infrastructuur en Milieu (2016): Synergos Communicatie, Internationale Waterambitie. Den Haag: Ministerie van Infrastructuur en Milieu, p. 9.

This narrative is most apparent in the inter-ministerially produced International Water Ambition, which aims for the Netherlands to take an active, preventive approach towards water security. Of course, Dutch businesses may in the end profit from the government's efforts to promote more integrated water management approaches at home and abroad, but they are not the priority in this narrative. There is a second, different narrative, in which **contributing to the Dutch economy** is the prime objective. An expression that appears in this context is 'BV Nederland'. 'BV' is the Dutch abbreviation for a private limited liability company. Framing the Netherlands as 'the Netherlands, Ltd.' emphasizes what technological leadership can bring to economic growth. Focusing on benefits to society at home and abroad is seen as just a different way of doing the same thing, i.e. it is window-dressing for the real goal. The Dutch approach to transferring its water management knowledge internationally is therefore marked by a dialectic between achieving global sustainable development objectives and supporting the national economy. One of our interviewees said:

> *"It is good that societal challenges are included in economic policy, […] because money is not a remedy for everything and it does not always bring happiness. Conversely, it should be allowed to earn money with the solutions to environmental problems we find: circular economy, smart cities, etc. Netherlands Ltd., the knowledge economy of the Netherlands should surely profit from that."* (personal communication)

In practice, the above two narratives are not as clear-cut as we present them here. For example, the Netherlands' Water Envoy's work is sometimes characterized as 'economic diplomacy'[21], even though it epitomises the strong focus on international development of the first narrative. Both narratives about the reasons for the Dutch presence in world water management are reflected in practice. The developmental perspective is the most common approach taken by the media and is the basis of the work of the Dutch special Water Envoy (see below). Travelling the world and advising governments worldwide, the Envoy aims to contribute to putting the Sustainable Development Goals into practice in order to achieve 'the necessary transformation towards a world that is sustainable, inclusive and climate-proof'[22]. That is the objective of the Netherlands' **strategic agenda** for water management, as described in *The Geography of Future Water Challenges*[23]. The Netherlands assistance to Bangladesh in the development of a plan for the Ganges River delta, the "Bangladesh Deltaplan 2100" illustrates the developmental approach[24]. The second narrative is reflected in the work of various attachés from Dutch ministries, including attachés from the Ministry for Infrastructure and Water Management, development cooperation specialists and the **innovation attachés** of the Ministry of Economic Affairs. One of the latter ministry's tasks is connecting Dutch companies with foreign companies.

3. UK Water Management and Water Diplomacy

Unlike countries that suffer from water scarcity or that are faced with the challenge of sharing their water resources, the UK is relatively autonomous in terms of its water environment and its governance. The UK's island geography means that it does not share

[21] Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (2015): Henk Ovink benoemd tot Nederlands eerste Watergezant. Retrieved from: https://www.algemenebestuursdienst.nl/actueel/nieuws/2015/03/12/henk-ovink-watergezant as accessed 4 July 2019.

[22] Ligtvoet, Willem, et al. (2018): The Geography of Future Water Challenges. The Hague: PBL Netherlands Environmental Assessment Agency, p. 7.

[23] Ibid.

[24] Ministerie van Infrastructuur en Milieu and Ministerie van Economische Zaken (2016): Deltaprogramma 2017: Werk Aan De Delta. Opgaven Verbinden, Samen Op Koers. The Hague: MinIenM.

any freshwater resources with other countries, except along its border with the Republic of Ireland. The UK does, however, have a rich history of water management as a domestic concern. Its interest in international water management issues is growing as a part of its commitment to international development and foreign affairs. Moreover, the UK is not immune to the growing threats and challenges to water management brought about by climate change and thus rising sea levels as well as increased urbanisation.

3.1. Governance and the background of the case

3.1.1. Water management as a domestic issue

As in most countries, effective management of water is an important concern in the UK. Water management is generally understood as a domestic concern and includes the management of water resources for environmental, agricultural and industrial uses, the control of flooding, the supply of water and the treatment of sewage. The history of domestic water management in the UK largely mirrors changes in government and governance more generally[25].Briefly summarised, UK water management was a heavily decentralised and ad-hoc activity before and during World War II[26]. There followed a period of national consolidation and enactment of legislation including a series of 'Water Acts' that defined relationships and responsibilities with regard to water. Regulations were issued to control pollution and consumer prices. Eventually the supplying of water was privatised in the 1980s[27]. At that time, a number of private water companies took over responsibility for all provision of services and a government agency—now called the **Environment Agency**—was established to regulate the environmental impact of the water supply industry[28].Water management in the UK is still decentralised. Policies are different in England, Scotland, Wales and Northern Ireland. This report focuses on the details of domestic water management in England only. The most recent government policy document on water management focuses on enhancing competition, improving conservation, and ensuring that water companies are more efficient and customer-focused[29]. The UK's planned departure from the EU means that the UK will no longer be subject to EU directives on water management. There is therefore a lot of uncertainty about the future development of water management in the UK.

3.1.2. Water management as a foreign policy issue

The UK is an island nation. It therefore avoids many of the disputes that can arise from shared water systems, such as boundary rivers and lakes[30]. However, water management is still a foreign policy issue for the UK in a number of respects. First, the UK has been party to the EU treaties and has therefore had a role in negotiating and implementing EU

[25] Royal Geographical Society (with IBG) (2012): Water policy in the UK: The challenges. RGS-IBG Policy Briefing, p 13, Retrieved from: https://www.rgs.org/getattachment/Professionals/Policy/RGSIBGPolicyDocumentWater_732pp.pdf/?lang=en-GB

[26] HM Government (2006): The development of the water industry in England and Wales. Ofwat and Defra. Retrieved from: https://www.ofwat.gov.uk/wp-content/uploads/2015/11/rpt_com_devwatindust270106.pdf

[27] Ibid.

[28] Ibid.

[29] Royal Geographical Society (with IBG) (2012): Water policy in the UK: The challenges. RGS-IBG Policy Briefing, p 13, Retrieved from: https://www.rgs.org/getattachment/Professionals/Policy/RGSIBGPolicyDocumentWater_732pp.pdf/?lang=en-GB

[30] Susskind, Lawrence, Shafiqul Islam (2012): Water Diplomacy: Creating Value and Building Trust in Transboundary Water Negotiations. In: Science & Diplomacy. 1, no. 3, Retrieved from: http://www.sciencediplomacy.org/perspective/2012/water-diplomacy

directives related to water. Since its membership of the European Community in the 1970s, the UK has been involved in the development and implementation of a growing body of water management standards across the continent[31]. Second, the UK gains from the exchange of experience and expertise in water management through collaborative research and commercial partnerships with other countries. Third, the UK has made commitments and contributions to water management in other countries as part of its programs of international development and overseas aid. The UK government sees water security and sanitation initiatives as a valuable way to contribute to global security and development. Water issues are also being viewed in a 'nexus' of issues along with food and energy issues, which has been described by the former UK chief scientist as a 'perfect storm of global events'[32]. Fourth, the UK cannot avoid the impacts of transnational issues such as the impact of climate change on water management. Such global issues can have domestic consequences, such as shifting rain patterns, but often require international collaborations to respond to them.

Finally, the sustainable development agenda is raising important questions about equity in the distribution of resources.

3.1.3. Water Science and the UK

The importance of science to the issue of water management is abundantly clear. In the UK, increased scientific understanding of water management issues is a key priority for investment into research[33]. The UK's vision of the future is that it will 'be a key contributor in providing integrated solutions in water security and sustainability'[34] not only in its domestic market but also on international markets, making use of the full potential of UK companies and public bodies in water research and innovation[35]. The contributions of the UK can also include the social, political and economic expertise that the UK has in water management, in particular the management of flood risk. The scientific knowledge that can be considered relevant for science diplomacy in the area of water management extends beyond the biophysical and the technical sciences, similar to the Netherlands. Scholars of social, economic and political science are becoming involved in the production of evidence reviews on issues related to water management, such as flood resilience[36] and flood risk[37].

3.2. Stakeholder landscape

3.2.1. National domestic policies

In the UK, government policy is set out by periodic white papers, which are government documents that define the future direction that the government would like to take on

[31] HM Government (2006): The development of the water industry in England and Wales. Ofwat and Defra. Retrieved from: https://www.ofwat.gov.uk/wp-content/uploads/2015/11/rpt_com_devwatindust270106.pdf

[32] Beddington, John (2009): Food, energy, water and the climate: A perfect storm of global events? HM Government. Retrieved from: https://webarchive.nationalarchives.gov.uk/20121206120858/http://www.bis.gov.uk/assets/goscience/docs/p/perfect-storm-paper.pdf

[33] NERC (2019): Water. Retrieved from: https://nerc.ukri.org/innovation/activities/infrastructure/water/

[34] NERC (2010): Taking Responsibility for Water: United Kingdom Water Research and Innovation Framework 2011 – 2030. Retrieved from: https://nerc.ukri.org/research/partnerships/ride/lwec/ukwrip/

[35] Ibid, p. 34.

[36] HM Government (2016): National Flood Resilience Review. Retrieved from: https://www.gov.uk/government/publications/national-flood-resilience-review

[37] HM Government (2018): Research and analysis: Science Advisory Council: Communicating risk report. Retrieved from: https://www.gov.uk/government/publications/science-advisory-council-communicating-risk-report

issues. National strategies for water management were recently set out in a white paper entitled *Water for Life*[38], and a white paper prepared under a Labour government entitled *Future Water — The Government's water strategy for England*[39]. The governments of Scotland, Wales and Northern Ireland each generate and implement their own policy agendas[40]. Over time, the **UK Government** has legislated the policy through acts of Parliament, secondary legislation and guidance that it provides to water regulators. **Water regulators** are independent bodies established to regulate the activities of the water industry. They include the Environment Agency, the Drinking Water Inspectorate and the Office of Water Services[41]. The **water industry** has played a central role in defining the direction for development of UK water management. In addition to government white papers, a manifesto published by the water industry in 2018 set out their vision for the UK water sector into the 2020s[42]. The legal system, including the **UK courts**, are responsible for enforcing government policy. A number of **UK non-governmental organisations,** e.g., the Rivers Trust, the Wildlife Trust, and the Freshwater Habitats Trust, also have a role in the governance of water management[43].

3.2.2. UK foreign policies

The UK government has a number of departments that deal with foreign policy issues. Each of them plays a different role in foreign policy related to water management. Water management is not listed as a core part of UK Foreign and Commonwealth Office (FCO)

policy in its 'single departmental plan.'[44] However, the FCO does contribute to water-related activities through the government's broader international development work, which focuses on promoting sustainable global growth, human rights, mitigation of the effects of climate change and prevention of conflicts[45]. Disputes over water resources are well recognised by the UK government as a source of conflict. This recognition has underpinned investment by the **UK Department for International Development** (DFID) in activities for improving water quality and quantity in other countries. Its most recent policy paper on water and sanitation in developing countries was prepared in 2013.[46] This paper described the UK government's response to water and sanitation as part of its commitment to the Millennium Development Goals (MDGs). DFID funds a range of activities, including

[38] HM Government (2011): Water for life. Retrieved from: https://www.gov.uk/government/publications/water-for-life

[39] HM Government (2008): Future Water: The Government's water strategy for England. Retrieved from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69346/pb13562-future-water-080204.pdf

[40] Scottish Government (2019): Water. Retrieved from: https://www.gov.scot/policies/water/; Natural Resources Wales (2019): Water resources management planning. Retrieved from: https://naturalresources.wales/about-us/what-we-do/water/water-resource-management-planning/?lang=en as accessed March 2019.

[41] HM Government (2006): The development of the water industry in England and Wales. Ofwat and Defra. Retrieved from: https://www.ofwat.gov.uk/wp-content/uploads/2015/11/rpt_com_devwatindust270106.pdf

[42] Water UK (2018): A Manifesto for Water. Retrieved from: http://www.water.org.uk/publication/a-manifesto-for-water/

[43] Waterwise: What we do. Retrieved from: https://www.waterwise.org.uk/what-we-do/ as accessed March 2019.

[44] HM Government (2018): Foreign and Commonwealth Office single departmental plan. Retrieved from: https://www.gov.uk/government/publications/foreign-and-commonwealth-office-single-departmental-plan/foreign-and-commonwealth-office-single-departmental-plan-may-2018

[45] HM Government: Foreign and Commonwealth Office. Retrieved from: https://www.gov.uk/government/organisations/foreign-commonwealth-office as accessed July 2019.

[46] HM Government (2015): 2010 to 2015 government policy: water and sanitation in developing countries. Retrieved from: https://www.gov.uk/government/publications/2010-to-2015-government-policy-water-and-sanitation-in-developing-countries/2010-to-2015-government-policy-water-and-sanitation-in-developing-countries

initiatives by research organisations, civil society organisations, and other bodies such as the **World Bank.** These projects also support the international development objectives of the UK government. In 2012, for example, DFID made a commitment to assist 60 million people through its water, sanitation and hygiene (WASH) programmes by December 2015[47]. Investment in such projects is ongoing.[48] The **Department for International Trade** (DIT) has the role of helping UK-based companies succeed in the global economy[49] and take advantage of the commercial opportunities in international water management. As recently as 2015, the DIT identified the UK's offering of expertise in water management as a potential priority for support[50].

The FCO collaborates with the **Department for Business, Energy and Industrial Strategy** (BEIS) to build partnerships and cooperation in science and innovation through its **UK Science and Innovation Network**. This network employs 110 officers in over 40 countries who work in a set of priority areas.[51] Water management does not feature as a formal priority for the network, but it is still recognised informally as an important issue worthy of attention. For example, the Science and Innovation Network co-organised a conference in South Africa in 2015 called 'Emerging Frontiers for Sustainable Water — A Trilateral Partnership: Africa-India-UK', which focused on sharing lessons learned in the science and policy of water management.[52]

3.2.3. Public and private sector collaborations

One important governance arrangement for water management in the UK is partnerships between public bodies and private organisations. The **UK Water Partnership**[53] is an example, where private industry, government agencies and research organisations collaborate to develop solutions and provide advisory services for managing water-related issues. Private companies participate in designing and implementing strategies for water management, often in collaboration with other industrial partners, public bodies, and local communities. Similar governance organisations are also found at the European level, such as the **European Water Partnership.**[54] These organisations add another dimension of private interest to the foreign policy goals of countries as related to water management. They also illustrate how the technical and economic expertise of scientists can contribute to issues of water management.

[47] HM Government (2015): DFID Annual Report and Accounts 2014-15 Results: Water, sanitation and hygiene sector. Retrieved from: https://www.gov.uk/government/publications/dfid-annual-report-and-accounts-2014-15-results-achieved-by-sector-water-sanitation-and-hygiene/dfid-annual-report-and-accounts-2014-15-results-water-sanitation-and-hygiene-sector

[48] In December 2018, for example, DFID made a contribution of up to £18 million to a World Bank initiative to support the Palestinian Authority to implement priority activities in the water and energy sectors. See World Bank (2018): United Kingdom Contributes Up to US$23 Million Through the World Bank for Palestinian Water and Energy Projects. Retrieved from: https://www.worldbank.org/en/news/press-release/2018/12/10/united-kingdom-joins-the-palestinian-partnership-for-infrastructure-development-a-contribution-of-up-to-us-23-million-for-improving-water-and-energy-services

[49] HM Government (2015): Water and treated water. Retrieved from: https://www.gov.uk/government/publications/water-and-treated-water/water-and-treated-water

[50] Ibid.

[51] HM Government: UK Science and Innovation Network. Retrieved from: https://www.gov.uk/world/organisations/uk-science-and-innovation-network as accessed March 2019.

[52] Sunil Kumar (2015): Innovations for a clean water. In: UK Foreign and Commonwealth Office Blogs. Retrieved from: https://blogs.fco.gov.uk/sunilkumar/2015/08/31/innovations-for-a-clean-water/

[53] UK Water Partnership: Members. Retrieved from: https://www.theukwaterpartnership.org/members/ as accessed March 2019.

[54] European Water Partnership: Home. Retrieved from: https://www.ewp.eu as accessed March 2019.

3.2.4. Research collaboration

As regards water-related technologies and management, the UK is an active participant in **international research programmes**, which include scientific collaborations across borders. One example is the International Water Stewardship Programme (IWaSP), which is co-funded by DFID in association with the German Gesellschaft für Internationale Zusammenarbeit (GIZ). IWaSP is a water security programme operating in Africa, Asia and the Caribbean. It establishes partnerships between the public sector, the private sector and civil society in order to build local capacities for water management.[55]

In addition to its commercial potential and its ability to contribute to international development agendas, UK water science contributes to the development and implementation of policy in the UK and at the EU level. UK scientists have provided **scientific advice and support** to the implementation of the EU's Water Framework Directive (WFD,)[56] for example, through the Working Group on Ecological Status (Ecostat) mandated by the WFD's Common Implementation Strategy[57]. UK water science is also contributing to scientific collaboration in the European Research Area through EU joint programming initiatives, such as "Water Challenges for a Changing World" (JPI Water). JPI Water involves the UK, the Netherlands, the Czech Republic, and other EU Member States, as well as international partners such as Brazil and South Africa.[58]

3.2.5. Informal inter-state relations

In addition to its formal foreign policy activities in the area of water management, the UK also has many informal inter-state relations. A particularly notable example is the relationship between the UK and the Netherlands in the area of water management infrastructure and expertise. Policymakers in the UK have an active interest in the work of the Netherlands in the field because of the Netherlands' recognised achievements in managing challenges similar to those faced by the UK in terms of the risks and impacts of flooding and coastal erosion. In 2016, for example, a number of **members of the UK Parliament** visited the Netherlands in order to meet with the Delta Programme Commissioner and better understand the work that office is doing in water management.[59] The UK's Environment Agency has also forged active links with the Netherlands in order to share expertise and learn from its experience with coastal and flood risk management.[60] The Netherlands is also a common standard of reference for UK scientific research and advice with regards to water management. A recent review of flood management in the UK by the Cabinet Office, the **Department for Environment, Food and Rural Affairs** (Defra), the Environment Agency, the **Met Office**, and the government's **Chief Scientist,** entitled the *National Flood Resilience Review*[61], made 60 references to the Netherlands

[55] IWaSP: Who we are. Retrieved from: http://www.iwasp.org/who-we-are as accessed March 2019.

[56] European Union (2000): Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. Retrieved from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060

[57] European Commission (2015): Water Framework Directive scientific and technical support related to ecological status - summary report of JRC activities in 2015. Retrieved from: https://ec.europa.eu/jrc/en/publication/water-framework-directive-scientific-and-technical-support-related-ecological-status-summary-report

[58] Water JPI: About Water JPI. Retrieved from: http://www.waterjpi.eu/about-us as accessed March 2019.

[59] Delta Programme Commissioner (2016): United Kingdom interested in Dutch approach to water. Retrieved from: https://english.deltacommissaris.nl/news/news/2016/06/09/united-kingdom-interested-in-dutch-approach-to-water

[60] Boyd, Emma Howard (2017): The Netherlands and why partnership matters in flood risk management. In: Gov.UK Blog. Retrieved from: https://environmentagency.blog.gov.uk/2017/08/07/the-netherlands-and-why-partnership-matters-in-flood-risk-management/

[61] HM Government (2016): National Flood Resilience Review. Retrieved from: https://www.gov.uk/government/publications/national-flood-resilience-review

throughout. Despite its active interest in developments in other countries, the UK has its own environmental dynamic and political culture that drive its water management policies. These can be understood by examining its de-facto governance practices.

3.3. De-facto governance practices

As the above outline of the stakeholder landscape illustrates, water management in the UK is managed with reference to a diverse set of governance arrangements. There is no single 'top down', 'bottom up' or 'market-based' governance framework for water management, either domestically or as a foreign policy issue. Indeed, the domestic, foreign, and scientific dimensions of water management reflect the how complex modern governance is in any national setting. While the UK government has a role in setting priorities and creating the overall policy environment, businesses, civil society and the changing environment itself also have decisive influences on the UK's system of governance for water management.

The scientific dimension influences the entire governance system. In some cases, such as establishing and monitoring standards to be mandated by EU directives, the role of science is clear. Scientific expertise significantly contributes to cooperation between public and private sector bodies as well.

For the purposes of this report, it is important to discuss the nature of diplomacy with respect to water governance. The 'tools of water diplomacy' are described by Maruf Oladotun Orewole as negotiation, co-operation, conventions, treaties, agreements, and scientific and technical knowledge[62].

In contrast to countries with significant transboundary water systems, where **negotiation** is a very important tool of water diplomacy,[63] the UK's international negotiations in the area of water management is mostly limited to its work as a member state of the European Union and as a signer of the other international conventions related to water management.

Despite its lack of transboundary waters, the UK has invested significantly in international development and scientific research pursuant to programs such as IWaSP. Similarly, the UK has been active in the development and implementation of relevant **conventions, treaties and agreements**. These instruments have directly shaped UK domestic policy in the form of EU directives, but have also been important to defining the UK's foreign assistance goals as implemented by DFID and other agencies.

Diffusing scientific and technical knowledge is one of the major focuses of the UK's water diplomacy. The UK is an active participant in many international science projects. It contributes scientific advice to the EU Commission on monitoring water standards and works with its partners abroad to improve water security. It donates and sells scientific and technical experience and expertise across borders in the service of UK policy priorities. The UK's scientific and technical knowledge plays a hugely important role in improving water management beyond its national jurisdiction.

In addition to the previously mentioned tools of water diplomacy, the case of the UK highlights two other pertinent ways the UK engages in water diplomacy: 'adaptation' and 'relation'.

Adaptation refers to the adaptation of scientific knowledge, technical solutions, people and problem solving to different social and political cultures. For example, the scientific

[62] Orewole, Maruf Oladotun (2018): Water diplomacy: Solving the equations of conflict, economic growth, social well-being and ecosystem demand. In: IM. Mujtaba, T. Majozi, MK. Amosa (eds.) Water Management: Social and Technological Perspectives. 1st ed. Boca Raton: CRC Press.

[63] Susskind, Lawrence, Shafiqul Islam (2012): Water Diplomacy: Creating Value and Building Trust in Transboundary Water Negotiations. In: Science & Diplomacy. 1, no. 3, Retrieved from: http://www.sciencediplomacy.org/perspective/2012/water-diplomacy

and technological tools developed in the Netherlands must be adapted before they can be applied in the UK.

The translation of scientific knowledge, technical solutions, people and problem framings from one country to another raises important issues with regards to governance. It is important to take into account, for example, the differing understanding of risk in between various national settings[64] and differences in fluvial environments[65]. Adaptation of science and technology, along with the other things, is a tool that should be employed in water-related diplomatic activities.

The UK case also highlights the value of **relations** as a resource for water governance. Of particular note is the relationship that has long existed between the Netherlands and the UK with regard to water management. The draining of the English Fens in the seventeenth century, for example, was a historical illustration of effective international collaboration and partnership. The Fens are low-lying marshlands in the east of England that historically were subject to seasonal flooding. The Fens supported a vibrant ecosystem and a traditional way of life[66]. In the early seventeenth century, technological developments and the economic advantages of draining this area for agriculture led to a series of major changes in the landscape. Drawing on the experience and expertise of the Dutch, major UK landholders — including King Charles I himself — invested in a major feat of engineering. They installed dikes, sluices, pumps and windmills, and thereby channelled excess water off the land and out to sea[67]. The process depended heavily on the international relationship between the Dutch and the English. Connections between the nobility in the two countries, well-developed trade in goods, and technical traditions[68] facilitated the transfer and acceptance of Dutch technologies. The trust and mutual respect between the two countries was essential to success of the project. That trust and respect continues today, as evidenced by a recent visit by a parliamentary delegation to observe the Delta Programme and by Dutch cooperation with the UK Environment Agency.

4. Water Management and Water Diplomacy in the Czech Republic

Due to its inland position, Czech water management efforts are focused on the quality and supply of fresh water. Lately there has been an increase in interest in water-related issues, especially drought prevention and mitigation of its effects, water sanitation (including control of hormones and pharmaceutics in waters), and precision farming.[69] This interest has been translated into specific research projects, marketing of excellence strategies, and new diplomatic tools that have been put in practice after 2000.

[64] Ale, Ben (2005): Tolerable or Acceptable: A Comparison of Risk Regulation in the United Kingdom and in the Netherlands. In: *Risk Analysis.* Vol. 25, no. 2, pp. 231-241, Retrieved from: https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1539-6924.2005.00585.x

[65] Ertsen, Maurits (2015): People, protection and parameters: Comparing flooding in the UK and the Netherlands. lecture delivered at Museum of London for Gresham College, London, 13 January 2015. Retrieved from: https://www.gresham.ac.uk/lectures-and-events/people-protection-and-parameters-comparing-flooding-in-the-uk-and-the

[66] Merchant, Carolyn (1983): Hydraulic technologies and the agricultural transformation of the English fens. In: Environmental Review. Vol. 7, no. 2, pp. 165-178.

[67] Ibid.

[68] Wilson, Charles (1946): Holland and Britain. London: Collins.; Jardine, Lisa (2008): Going Dutch: How England Plundered Holland's Glory. Harper Press.

[69] Interview 1, Czech University of Life Sciences Prague, Prague, December 2018.

4.1. Governance and water policy in the Czech Republic

The transition period in the 1990s after the fall of the Iron Curtain was crucial for Czech water management. With the assistance of experts from Western European countries such as the Netherlands, France and Germany, the Czech Republic's outdated water infrastructure was reconstructed to ensure adequate sanitation. The objective was to build a water supply and sanitation system that met international environmental standards. The biggest problem then identified in the Czech Republic was the lack of rational economic water management, which was a heritage of the communist era[70]. Waterworks and sewage companies were privatized and eleven state-owned companies were split into 40 associations controlled by municipalities and private companies[71]. In addition, during the 1990s a transboundary framework for shared water resources in Central Europe was developed, providing a basis for today's cooperation. During the 1990s and at the beginning of the 21st century, improving water sanitation and building up cross-border water cooperation dominated Czech governance activities in the field. After establishing a sustainable UNECE water framework and infrastructure for water supplies, Czech officials started to deal with other topics in the water agenda, such as flood control[72] and more recently with drought[73]. Their efforts are reflected in domestic legislation enacted to comply with the EU Water Framework Directive[74].

The main drawback of Czech water management and its water diplomacy is that its great potential in the scientific domain is not backed up or used by its diplomats to its full extent. If it were, it would serve the Czech Republic's foreign policy goals and help it to face global challenges. The scientific and foreign policy worlds are still two separate domains. Science diplomacy is a new element in Czech foreign policy and has many uncertainties about how to organise it and set priorities.

4.1.1. Water management as a domestic issue

The number one domestic issue related to water is drought, which is a threat to the domestic economy and agriculture. Fighting the effects of drought is an official priority of the current Minister of Environment, who has held the post since 2014. The Ministry of Environment, in cooperation with the T.G. Masaryk Water Research Institute, established a working group (DROUGHT) in 2014 that has since been joined with another working group (WATER) set up by the Ministry of Agriculture and the Research Institute for Soil and Water Conservation. The aim of the inter-department commission WATER-DROUGHT is to take the know-how of flood prevention and management that has resulted from flood control being the main topic of Czech water management for the last 20 years and apply it to a new challenge in the Czech Republic, the increasing water scarcity. The collaboration

[70] Ministry of Housing, Physical Planning and Environment of the Netherlands (1994): Water Supply and Sanitation in Bulgaria, the Czech Republic, Romania and the Slovak Republic. pp. 28-9, Retrieved from: https://www.ircwash.org/sites/default/files/821-EUREAST94-14809.pdf as accessed 10 May 2019.

[71] Transparency International (2011): Privatizace vodárenství v České republice: Kam odtékají zisky. p. 5, Retrieved from: https://www.transparency.cz/wp-content/uploads/TIC_vodarenstvi_cz.pdf as accessed 10 May 2019.

[72] E. g., Ministerstvo zemědělství ČR (2000): Strategie ochrany před povodněmi pro území České republiky. Retrieved from: http://eagri.cz/public/web/file/365715/Strategie_ochrany_pred_povodnemi.pdf as accessed 29 April 2019. ; Výzkumný ústav vodohospodářský T. G. Masaryka (2015): Strategie ochrany před negativními dopady povodní a erozními jevy přírodě blízkým opatřeními v České republice. Retrieved from: http://www.vodavkrajine.cz/sites/default/files/vystup/informace_o_vysledcich_projektu_a_jejich_vyuziti.pdf as accessed 9 May 2019.

[73] Meziresortní komise VODA-SUCHO (2016): Koncepce ochrany před následky sucha pro území České republiky. Retrieved from: http://www.suchovkrajine.cz/sites/default/files/podklad/koncepce_sucho.pdf

[74] European Union (2000): Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. Retrieved from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060

of the ministries, research institutions and NGOs[75] that are members of the commissions has led to the publication of documents proposing a range of measures for retaining water in the soil and developing water resources for agriculture. The main strategic document is called the *Conception of Protection against the Consequences of Drought for the Czech Republic*[76]. It was adopted by the Czech government in 2017[77]. However, few of the proposals in the document have so far been implemented[78].

Because most Czechs own country houses and grow vegetables and plants in their gardens, drought is not only a concern for government, agriculture, and industry, but is also a concern for almost every citizen. It has been used as an issue in political campaigns. Even though the list of water management topics that impact the Czech Republic is a long one, drought is the only issue perceived as a real problem for society by the media and the public. The other topics are reserved to experts, scientists and politicians.

4.1.2. Czech water diplomacy

One of the strengths of Czech science diplomacy is its use of public diplomacy. The Czech Republic is a small country and its international prestige is maximized by efficient use of branding strategies and public diplomacy instruments. Czech water diplomacy is not guided by a specific conceptual document (nor does the latest version of the main conceptual foreign policy document explicitly mention science or water diplomacy[79]). Still, Czech know-how in water-related research and innovation has become an integral feature of the part of many state PR campaigns. The government promotes the Czech Republic as the 'nano' country'[80], for instance, and will display its S.A.W.E.R. system for producing drinking water at the Czech pavilion at EXPO 2020 in Dubai[81].

The crucial task for Czech science diplomacy in general, and in its water diplomacy in particular, is shifting the perception of the Czech Republic from being a receiving country for technology transfer to that of a donor. The Czech Republic is a new member of the European Union and has been the receiving partner in many twinning projects. It has not structured its international technological strategy around an active approach to using its considerable technological expertise in the international context. There are many 'niches' in water management where the Czech Republic could contribute to high quality science diplomacy projects as a technological leader, projects that would better market its innovation, science and technology potential to the world. An example is the use of nanotechnology in water sanitation.

The Czech Republic is not especially active in international organizations (including UN organizations and agencies) that engage experts and scientists. For instance, the Czech

[75] More information about members of the commission WATER-DROUGHTS are available at Meziresortní komise VODA-SUCHO: Seznam členů komise. Retrieved from: http://www.suchovkrajine.cz/sites/default/files/podklad/seznam_clenu_komise.pdf as accessed 14 May 2019.

[76] Meziresortní komise VODA-SUCHO: Koncepce ochrany před následky sucha pro území České republiky.

[77] Meziresortní komise VODA-SUCHO: O meziresortní komisi VODA-SUCHO. Retrieved from: http://www.suchovkrajine.cz/komise-voda-sucho/komise as accessed 14 May 2019.

[78] More information are available at Meziresortní komise VODA-SUCHO (2019): Poziční zpráva o pokroku při plnění koncepce ochrany před následky sucha pro území České republiky za rok 2018. Retrieved from: http://www.suchovkrajine.cz/sites/default/files/podklad/pozicni_zprava_2018.pdf

[79] Ministerstvo zahraniční věcí ČR (2015): Koncepce české zahraniční politiky. Retrieved from: https://www.mzv.cz/jnp/cz/zahranicni_vztahy/analyzy_a_koncepce/koncepce_zahranicni_politiky_cr.html

[80] See for instance Czech Invest: Nanotechnology & Advanced Materials. Retrieved from: https://www.czechinvest.org/en/Keysectors/Nanotechnology

[81] The technological element of the Czech national exhibition in Dubai 2020 is a joint project of the Czech Academy of Sciences and Czech Technical University (CTU), more details available at: Expo 2020: Water created by the S.A.W.E.R. system is drinkable. Retrieved from: https://www.czexpo.com/en/news/6/water-created-by-the-sawer-system-is-drinkable

Republic still perceives UNESCO only as a cultural organization[82]. This limited perspective, and a lack of involvement by Czech experts and officials in the organization, reduces the Czech Republic's opportunities to participate in international projects and lowers its national influence over debates and the international agenda in the field of water management.

For Czech diplomacy now, water management is important mostly in the context of managing transboundary waters. The Czech Republic is a riparian state that hosts a number of essential European rivers, such as the Elbe, Danube and Oder rivers and their basins. Cross-boundary water cooperation is based on joint international commissions that deal with the technical aspects of water protection, such as reducing water contamination, ensuring balance in the water ecosystem and protecting drinking water sources. This cooperation enhances compliance with the EU Water Framework Directive[83] and the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes[84]. Cooperation on management of river basins is a shared priority of the Visegrad Four countries (the Czech Republic, Slovakia, Hungary, and Poland). The Czech Republic's bilateral relations also play an important role in its international water cooperation. Apart from neighbouring states, with which the Czech Republic has numerous bilateral and multilateral agreements relating to shared water resources[85], Israel is the Czech Republic's main partner and source of inspiration for water management strategies[86].

Czech water diplomacy has a development policy aspect. The *Development Cooperation Strategy of the Czech Republic 2018-2030*[87] stresses water supply and water resource protection as two of its main targets for development aid. Czech scientists have transferred their knowledge about water sanitation, in particular about cleaning water contaminated by chemicals and heavy metals like chromium using nanotechnology, to partners abroad[88]. Moreover, the Czech Republic has been involved in educational activities for water treatment in developing countries. In that regard, Czech scientists have long been engaged in Nepal. Nevertheless, the sharing of Czech know-how with developing countries is based on individual research projects for which scientists must search for financial and diplomatic support on a case-by-case basis. Therefore, the range of Czech actors in development assistance, which includes the Czech Development Agency, the Ministry of Education, Youth and Sports, various NGOs, and private companies, is poorly integrated. There is a huge gap between the scientific and the foreign policy domains[89].

4.2. Stakeholder landscape

The stakeholder landscape in the area of water management and water diplomacy is very heterogeneous and unstable. The two areas can be described as 'evolving'. A common

[82] Interviews, UNESCO, Prague, December, 2019.

[83] European Union (2000): Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. Retrieved from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060

[84] Ministerstvo životního prostředí ČR (2013): Mezinárodní spolupráce České republiky v ochraně vod. Retrieved from: https://www.mzp.cz/C1257458002F0DC7/cz/mezinarodni_spoluprace/$FILE/OOV-brozura_mezinarodni_spoluprace-20131003.pdf

[85] Ibid.

[86] Siegel, Seth (2017): Budiž voda: Izraelská inspirace pro svět ohrožený nedostatkem vody. Praha: Aligier.

[87] Ministerstvo zahraničních věcí ČR (2017): Strategie rozvojové zahraniční spolupráce České republiky 2018-2030. Retrieved from: https://www.mzv.cz/file/2583329/strategie_mzv_2017_A4_09.pdf

[88] Rozvojovka (2013): Zázračná voda „z Česka" léčí, čistí i zvětšuje plody ovoce. Retrieved from: http://www.rozvojovka.cz/clanky/1317-zazracna-voda-z-ceska-leci-cisti-i-zvetsuje-plody-ovoce.htm as accessed 16 May 2019.; Akademie věd ČR (2012): Nanocentrum spojuje věd s praxí. In: Akademický bulletin. Retrieved from: http://abicko.avcr.cz/2012/10/06/nanocentrum.html as accessed 16 May 2019.

[89] Interview 1, Czech University of Life Sciences Prague, Prague, December 2018.

remark made by the numerous people we interviewed for purposes of this research was that there are no fixed priorities, processes, or strategies. They also saw no connection between domestic mechanisms for cooperation between Czech national and regional actors (in the fields of both science and administration) and the Czech Republic's foreign policy[90]. Foreign Ministry officials and representatives of the Office of the Government hesitate about where to place science diplomats (including those interested in water diplomacy) and what institution should be the one mainly responsible and the 'owner' of a project. At the same time, the Czech Republic's activities in the domain of science and water diplomacy show a high degree of personal involvement and enthusiasm flexibility and creativity.

The **national foreign policy actors** include several ministries (mainly the Ministry of Agriculture, Ministry of Environment, Ministry of Education and Ministry of Foreign Affairs)[91]. There is no central coordinating body that controls the goals and use of science diplomacy. There is no clear definition of science diplomacy at the national level or mechanism for sharing best practices. The Office of the Government has been given special competence in the Czech Republic's research and innovation agenda. It has formed the **Research, Development and Innovation Council (R&D&I Council)**, which is a professional and consulting body working in the field of research, experimental development and innovation[92]. The only conceptual document relative to the field of science diplomacy, the *Innovation Strategy of the Czech Republic 2019-2030*[93]*,* was published by the Government, but it is more of a document setting the course of domestic policy than a foreign policy document.

Unlike the ever-changing internal mechanisms for coordinating the Czech Republic's science diplomacy, its international outposts involved in science diplomacy in general and water diplomacy in particular have a relatively stable position. They have two priorities. The first is representing the interests of Czech science and innovation and the second is promoting Czech science and innovation through direct contact with foreign audiences.

CZELO[94] (the Czech Liaison Office for Research, Development and Innovation) is a project of the Czech Technological Centre of the Czech Academy of Sciences (CAS). Its main purpose is to 'facilitate the integration of the Czech Republic into European cooperation in research, development and innovation'[95]. CZELO does not drive Czech foreign policy, but through its activities and networking practices it contributes to developing new mechanisms for cooperation between the worlds of diplomacy and science. However, its ambition does not extend to external EU activities. It is limited to internal EU projects.

Czech Centres are 'contributory organisation[s]' of the Ministry of Foreign Affairs of the Czech Republic, established to promote the Czech Republic abroad. The network of Czech Centres abroad is an active tool of the foreign policy of the Czech Republic in the area of public diplomacy'[96]. As of 2019, the network of Czech Centres includes 24 centres abroad based all over the world, plus the Czech House in Moscow. The Czech Centres are relevant to science diplomacy (and water diplomacy) because they are officially considered to be a tool of foreign policy and because they devote a large part of their public diplomacy activities to the promotion of Czech science, technologies and innovation. An example is

[90] Interview, Ministry of Environment of the Czech Republic, Prague, September 2019.

[91] At the Czech Ministry of Foreign Affairs, the science diplomacy agenda falls into the domain of Economic diplomacy department and there are not special topic units at the moment (2019).

[92] More information available at Research, Development and Innovation Council: About us. Retrieved from: https://www.vyzkum.cz/Default.aspx?lang=en

[93] Research, Development and Innovation Council (2019): Innovation Strategy of the Czech Republic 2019-2030. Retrieved from: https://www.vyzkum.cz/FrontAktualita.aspx?aktualita=867990

[94] More information available at CZELO: Home. Retrieved from: https://www.czelo.cz/en

[95] Interview, CZELO, Brussels, November 2018.

[96] More information available at Czech Centres: About us. Retrieved from: http://www.czechcentres.cz/en/about-us/

the Czech Innovation Expo. There is no doubt at the central government level or the local level in the Czech Republic that the Czech Centres' promotion of science, and their work in close partnership with scientists, are integral parts of the Czech foreign policy strategy. The Science Café sessions that popularize Czech science organised by the Czech Centre in Brussels in cooperation with CZELO serve as an illustration. The Czech Centres are also a good example of balanced and open cooperation between the administrative and scientific communities of the Czech Republic.

4.3. De-facto governance practices

Government officials and diplomatic stakeholders are interconnected with scientific institutions in three dimensions: (1) calls for projects; (2) development aid; and (3) involvement in public diplomacy. Project calls are a direct link between state and scientific actors where academia is requested to fulfil certain requirements of the ministries. Their use has often been found to be problematic and projects are sometimes not realized. Project calls in the area of water management most commonly have requirements for addressing water scarcity and the retention of water in the landscape of Czech territory[97]. The WATER-DROUGHT Commission, whose members come from various ministries (although not from the Ministry of Foreign Affairs) as well as from research institutions and NGOs, is undertaking an exceptional effort to tackle water scarcity in the Czech Republic. This special case of the interconnection of scientists and politicians results from prioritization of that issue in the agenda of the Minister of Environment and from great public concern about drought.

Development aid activities have both a diplomatic and a scientific, dimension. Whereas diplomacy officially provides financial support for the Czech Republic's aid mission, experts guarantee the technical part of its activities.

Public diplomacy instruments promote Czech scientific research and facilities abroad in order to share the prestige of Czech academia. Czech research institutions and individual scientists use the Czech Centres, Czech Trade, Czech Invest and CZELO as platforms to search for international partners and economic support for their activities. Since communication among diplomatic and scientific actors in the Czech Republic is not facilitated by any official body, or by any strategic document, actors in scientific sphere use personal contacts and private channels for international cooperation and even for diplomacy. Consequently, ad hoc international cooperation is a common feature of Czech science diplomacy[98].

5. The EU – Between National and Global Governance in Water Diplomacy

5.1. Water legislation and policy

The history of the general legal framework of EU water law can be divided into three phases of European integration. Regulations first appeared during the period 1975–86 as directives were issued on diverse topics such as surface waters, bathing waters, discharges of hazardous substances in surface waters and groundwater, and particularly the quality of water for human consumption. The majority of the mentioned directives were revised in the 1990s. In addition, during the second period of time new water legislation was adopted,

[97] Interview 2, Czech University of Life Sciences, Prague, December 2018.

[98] Interview 1, Czech University of Life Sciences Prague, Prague, December 2018.; Interview, Technical University of Liberec, Prague-Liberec, December 2018.

e.g., directives on urban waste water treatment and nitrates pollution. In the third period, the 2000 Water Framework Directive (WFD)[99] was introduced in order to integrate all previous legislation related to water issues. This main water policy document was later included in the EU environmental policy defined by Articles 191-193 of the Treaty on the Functioning of the European Union (TFEU)[100] [101]. In 2007, EU water policy was broadened further by the Flood Directive[102]. The European Commission and Member State representatives have recently held a conversation about updating and reframing the EU Water Framework Directive[103].

5.2. EU water diplomacy

Apart from EU water legislation, there is a significant effort within the EU to create a complex framework for its water diplomacy. That effort started in 2013[104] when the first document dealing with the issue was published. In 2018, Council Conclusions on EU Water Diplomacy[105] were published. Other documents related the water agenda (e.g., water governance guidelines) are in preparation[106]. EU water diplomacy aims to be a pre-emptive diplomatic tool 'for peace, security and stability'[107] building upon the long-term, positive experience of water cooperation within the EU. In addition to the ambition of ensuring sustainable water supplies and water sanitation in regions of focus (e.g., Central Asia, Middle East, and Mediterranean region), EU water diplomacy is targeting one of grand challenges of the twenty-first century, water scarcity[108].

Generally, most EU Member States support the EU's ambition to become a global actor in water governance and to share best practices in water cooperation and management outside of the EU. The most active countries are those with advanced water management know-how and vast experience in water cooperation, such as the Netherlands, Finland and Slovenia[109]. Member States are also participating in platforms for sharing water management know-how with third countries, for example, Denmark, Estonia, Finland, France, the Netherlands and others are engaging in the EU-India Water Forum and the China-EU Water Platform. Member States' involvement with cooperation platforms depends not only on their expertise in water issues but also on historical ties they may have with a particular country[110].

In order to become a globally-recognised actor in water-related issues, the European Union needs to gain credibility in water governance. The EU is known for its high standards for

[99] European Union (2000): Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. Retrieved from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060

[100] Ibid.

[101] European Commission: General Framework of EU Water Law: Legal basis for water policy. Retrieved from: https://www.era-comm.eu/EU_water_law/part_2/index.html as accessed 10 May 2019.

[102] European Union (2007): Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks. Retrieved from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0060&from=EN

[103] Interview, Czech Permanent Representation to the EU, 2018.

[104] Council of the European Union (2013): Water Diplomacy – Council Conclusions. Retrieved from: http://www.europarl.europa.eu/meetdocs/2009_2014/documents/droi/dv/1407_councilconclusions_/1407_councilconclusions_en.pdf

[105] Council of the European Union (2018): Water Diplomacy – Council Conclusions. Retrieved from: http://data.consilium.europa.eu/doc/document/ST-13991-2018-INIT/en/pdf

[106] Interview, European External Action Service (EEAS), Brussels, February 2019.

[107] Council of the European Union (2018): Water Diplomacy – Council Conclusions, p. 3, Retrieved from: http://data.consilium.europa.eu/doc/document/ST-13991-2018-INIT/en/pdf

[108] Ibid.

[109] Interview, EEAS, 2019.

[110] Interview, Directorate-General for Environment (DG ENV), Brussels, February 2019.

water quality and its positive experience with cross-border cooperation within its borders, which supports its credibility and trustworthiness in the field. The European Union is preparing a revision of the Water Framework Directive in order to advance water management within the EU. The revision will include standards for recycling water and using it in agriculture. The EU Member States support advancing the EU's expertise in the water agenda[111].

5.3. Stakeholder landscape

From a science diplomacy perspective, there are two groups of stakeholders in the EU, the scientific actors and the diplomatic/political actors, who are engaged in framing EU water diplomacy. The European Union has several **platforms for water-related issues** (the Joint Programming Initiative for Water, the Water Supply and Sanitation Technology Platform (WSSTP), a European Technology Platform, and the European Innovation Partnership for Water). Diverse research institutions, universities, think tanks, private and public companies are members of these platforms. They are chosen by the European Commission, pay membership fees, and are consulted as needed. The **Directorate General for Research and Innovation** (DG RTD) communicates with experts and exchanges information with **sectoral DGs**. The communication channel between DG RTD and other DGs is hampered because the involvement of the DG RTD is seen as interference in internal sectoral political issues of the other DGs. Since sectoral DGs consult on their policies with the College of the **European Commission**, which sets priorities for EU domestic and foreign policy, and with the **European External Action Service (EEAS)**, this operational problem is one of the chief obstacles for EU water diplomacy, and its science diplomacy in general, to overcome[112].

EU Member States are also crucial players in EU water diplomacy because European water diplomacy documents were produced by the European Council. National experts play an important role in the consultation process for water issues[113]. As shown in the national subcases discussed above, Dutch professionals are well-known for their expertise in advanced technologies and their know-how in the field. However, other national experts are also involved, e.g., a Czech expert participated in the special committee that prepared the Nitrates Directive[114]. Member States engage in an EU water dialogue with third countries, e.g. with India, China, and Israel, where their bilateral relationship with a particular country can have a positive impact[115]. Last but not least, the EU builds on the best practices in water management and governance of its Member States.

5.4. De-facto governance practices

Official communication channels exist among the DGs dealing with the water agenda. These include regular meetings with desk officers that deal with water issues in specific regions that include their colleagues from other DGs and from the EEAS[116]. Science and politics interface in technical units of the DGs, which communicate with DG RTD. The technical units of DGs´ ambitions are (1) to support sectoral policies; (2) to stress the application and implementation of the outcomes of funded research projects; (3) to hire staff with policy and research backgrounds to mediate communication between the world of

[111] Interview, Czech Permanent Representation to the EU, 2018.

[112] Interview, Directorate-General for Research, Technology and Development (DG RTD), Brussels, February 2019.

[113] Interview, Czech Permanent Representation to the EU, 2018.

[114] Interview, T. G. Masaryk Water Research Institute, Prague, December 2018.

[115] Interview, DG ENV, Brussels, 2019.

[116] Ibid.

diplomacy and the world of science; and (4) to address operational gaps inside the EU institutions[117]. The biggest barrier to realizing DG RTD's goals in practice is that the support of DG RTD for sectoral policies is often seen as interference in the affairs of other DGs. Therefore, communication between DG RTD and the technical units of other DGs could be improved in the future[118].

Among many other objectives, DG RTD is supposed to serve as a bridge between scientific and diplomatic bodies. For consulting with the scientific community, DG RTD takes advantage of researchers' participation in EU-funded research projects and on platforms such as the Joint Programming Initiative for Water (JPI Water), whose members come from various research institutes, universities, private and public companies, and think tanks. JPI Water also implements international cooperation activities, identifying priority countries to seek further collaboration and implements joint calls.[119] The scientific research projects produce outputs for the implementation by science diplomats. However EU science diplomacy for water-related issues needs a more effective interconnection between sectoral policy makers and experts[120].

An **example** for science diplomacy with the focus on water issues: **EU-Central Asia water science diplomacy platform**.

The European Commission explicitly aims to use scientific cooperation as an instrument to improve international relations (science for diplomacy) in this region and the term "Science Diplomacy" was explicitly used to describe a new Stakeholder Platform launched in 2018 focusing on water. The stakeholder platform aims to find novel solutions to address the regional water challenges founded on a scientific basis and sensitive to societal constraints. The instrument has the explicit aim to deploy scientific cooperation to help to overcome the divides and conflicts.

In Central Asia, water conflicts have a long history: Kyrgyzstan and Tajikistan, the upstream countries, depend on water for power generation during the cold season, Kazakhstan, Uzbekistan and Turkmenistan, the downstream countries need water for irrigation to grow crops. Thus, also water diplomacy was implemented, for example in terms of diagnoses of water problems, identification of intervention points, and proposals of solutions – ideally sensitive to the different points of views, competing needs and political uncertainty.[121]

The transfer of innovative technologies which have been successfully deployed in individual Central Asian countries or in European Union Member States can help to address the environmental challenges pressing all five countries: Strong population growth and an aging population, dominance of drylands and land degradation, close interdependence of water, energy production and food security, largely agricultural-based economies with low agricultural productivity, above-average effects of climate change in the region.

The EU Strategy for Central Asia, signed in 2007 and reviewed in 2015, also prioritizes the thematic fields of environment and water. With the objective to advance water policy reforms, so called National Policy Dialogues (NPDs) on water have been launched and the main operational EU instruments of the Water Initiative (EUWI) component for Eastern

[117] Interview, Directorate-General for Research, Technology and Development (DG RTD), Brussels, February 2019.
[118] Ibid.
[119] Water JPI: Cooperation beyond Europe. Retrieved from: http://www.waterjpi.eu/international-cooperation/cooperation-beyond-europe-1, as accessed 20 August 2019. Calls of Water JPI involved already Brazil, Canada, Egypt, South Africa, Taiwan, and Tunesia. Priority countries for further cooperation are Brazil, Canada, China, India, South Africa, the United States and Vietnam.
[120] Interview, DG RTD, Brussels, 2019.
[121] See International Crisis Group (2018): End the Weaponisation of Water in Central Asia. Retrieved from: https://www.crisisgroup.org/europe-central-asia/central-asia/kazakhstan/end-weaponisation-water-central-asia ; Water Diplomacy. Retrieved from: http://waterdiplomacy.org

Europe, the Caucasus and Central Asia (EECCA) have been implemented in all CA countries (except Uzbekistan) since 2006.[122] Water was highlighted in the Council Conclusions on the EU strategy for Central Asia adopted by the Council in 2017[123].

Financial support was provided through of cooperation and development projects supported by the EU's Development Cooperation Instrument (DCI) and the Framework Programmes for Research and Technological Development (or Research and Innovation respectively) and by several EU Member States.

At the meeting of EU-Central Asia Working Group on Environment and Climate Change in February 2017, the idea to establish the **Central Asian Regional Water Stakeholder's Platform (WASP)** was developed and reconfirmed in June 2018, when a Working Group discussed a possible extension of its scope to water issues.

The perceived need to re-engage the stakeholders around the new terminology of "science diplomacy" and a new way of framing (explicitly not in the format of "the governmental stakeholders speak and the scientific stakeholders listen" or conferences) but as an interactive platform that is complementary to the existing water platforms[124]. Several advantages can be observed: Due to its focus on the scientific aspects, it was possible to engage the target groups into multi-level governance dialogues. The emphasis on scientific evidence also set the long-term perspective needed for science diplomacy: The expectation is that more trans-boundary cooperation and regional integration between the Central Asian states ultimately contributes to conflict resolution. Thus, the aim was to establish reliable communication between decision makers and researchers with a focus on specific challenges such as data generation, management and exchange, low cooperation and mobility on the operational level of water management authorities and water-related researchers.

The stakeholder platform aims to support dialogue horizontally (transregional between stakeholders from similar groups) and vertically (between different groups) and includes the political and administrative level (e.g. regional political decision makers, European Commission DG Research, DEVCO and special representative for Central Asia, ministries, embassies), researchers, private sector and civil society (including for example chambers of commerce, donor platforms, etc.).

While there are already lots of dialogue fora, science diplomacy was highlighted as a means to cooperate concretely to identify successful initiatives from policy and scientific perspectives and to discuss the specific needs to improve the framework conditions.

Science diplomacy was offered at the launch event as a tool for the bi-regional policy dialogue and trans-boundary cooperation. Water is a politically charged topic in the region and there are many potential conflict lines (upstream/downstream; energy vs. agriculture)

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[122] EUWI EECCA Working Group: Report on Implementation of the European Union Water Initiative National Policy Dialogues on Integrated Water Resources Management and on Water Supply and Sanitation. Retrieved from: https://www.oecd.org/environment/outreach/Progress%20report_OECD%20UNECE_ENG.pdf

[123] Council Conclusions on the EU strategy for Central Asia. Council document 10387/17, 19 June 2017, p 5.; Cf also EC Regional Strategy Paper for assistance to Central Asia for the period 2007-2013. Retrieved from: http://www.eeas.europa.eu/archives/docs/central_asia/rsp/07_13_en.pdf

[124] Including for example several international initiatives: International Fund for Saving the Aral Sea (IFAS): an International organization supported by the CA governments - http://ec-ifas.waterunites-ca.org/; Interstate Commission for Water Coordination of CA (ICWC): body comprising the five ministries of water resources - http://icwc-aral.uz/; Innovation and Scientific Research Cluster in the field of water management: joint initiative of the Regional Environmental Centre for CA (CAREC) and Tashkent Institute of Irrigation and Agricultural Mechanization Engineers https://carececo.org/en/main/news/CAIEF2018-cluster-opening/, International Water Management Institute, IWMI - http://centralasia.iwmi.cgiar.org; http://centralasia.iwmi.cgiar.org/show-projects/?C=851; as well as several national initiatives: Germany's Central Asian Water project - https://www.cawa-project.net/; Regional water management programme of the Swiss Agency for Development and Cooperation - https://www.eda.admin.ch/deza/en/home/countries/central-asia.html; USAid - https://www.usaid.gov/central-asia-regional .

but there is also a concretely expressed wish in the region to cooperate, to "make water a non-political issue". While water availability is one of the highly controversial topics in the region, a dialogue on *water quality* offers an easier avenue towards productive exchange and agreements. Based on interactive settings, the stakeholders highlighted specific technologies, exchanged general information on water research but also discussed topics such as gender or the inclusion of policy modules in curricula for water scientists.

This is thus an example of the shift from pure policy dialogue towards dialogues between policy, science and practitioners. It also shows a professionalization of science diplomacy: there is an increased awareness and capacity building to introduce policy thinking to scientists and to bring scientists into policy fora.

An aspect that is not yet adequately addressed in the EU-Central Asian science diplomacy initiative on water is the involvement of the EU Member States. A larger event is planned in 2020 where additional donors will be involved that might take up the results in their programming.

6. Conclusion

In this case study, we have illustrated the issue of water management as both a domestic and foreign policy issue in the Netherlands, the UK and the Czech Republic. In charting the stakeholder landscape and considering how de-facto governance arrangements take advantage of the tools of water diplomacy, the report provides an overview of where water-related science diplomacy stands today. Further research is needed to examine how science can be used strategically by the three countries to further their foreign policy ambitions with respect to water. There are areas where such research could be conducted, from seeking a more in-depth understanding of the negotiation and implementation of EU directives to analysis of the effectiveness of foreign aid for development projects in the area of water management. In addition, there is further potential to gain understanding of the market for water management expertise, which is being supported by government departments and research councils, as well as the involvement of private industry as a partner in water management projects in the three countries and abroad.

As the report shows, there is no single understanding of water science diplomacy at the national level in the three countries. The three subcases present some common features, such as acceptance that scientific expertise must be part of decision-making and foreign policy, but every country has its own specific approach and different de-facto governance practices. Dutch water management and water diplomacy is an example of a niche where the Netherlands is positioned as an expert. Its expertise is based on its long cultural, scientific and technical experience, and makes the Netherlands a reliable partner for water-related projects on all levels (regional, bilateral, EU and global). The UK case is characterized by complex governance methods and the importance of water diplomacy as a part of development aid and technical assistance. Czech water diplomacy is a new element of Czech foreign policy that is seeking to find a place in both traditional and public diplomacy. Its main focus is on bilateral and international transboundary waters cooperation.

The EU case is unique, with no relationship to national science diplomacy models, even though its practice does reflect the ambitions, areas of expertise and excellences of its Member States. EU water diplomacy deserves more attention in future research as a new thematic field of EU external action. It offers an insight into new management and organizational methods used by the EU for its diplomacy and for cooperation among its different actors and units. The EU experience is a perfect example of project management in diplomacy, applicable to both pre-emptive diplomacy and crisis management.

The UK case of water management illustrates that the kinds of 'science' that are relevant to foreign policy extend beyond the biophysical sciences, to incorporate the economic, social and political sciences. This enables the 'adaptation' and 'relation' that this report posits are essential tools of water diplomacy. The UK case also emphasises the complexity of governance systems involving many state and non-state actors, which is not conducive to a straightforward governance structure. Grand narratives and an over-arching foreign policy agenda for UK water governance do not exist. The most fruitful future scholarship in this area is therefore likely to be research that examines detailed case studies of individual elements of UK water management.

Czech water diplomacy is similar to Czech science diplomacy in general. It is still in transition, revealing uncertainties about the organizational and coordination centre for the country's foreign policy agenda. More importantly, it is evidence of the Czech Republic's difficult passage from the position of a receiver to that of a donor. Although we can find niches of excellence like nanotechnology, the Czech Republic still takes a quite passive approach to diplomacy, when it needs higher ambitions and more self-confidence. Unfortunately, Czech water diplomacy is suffering from a gap between academia and government ministries, a lack of vision, and working methods that do not unify science, expertise and policy making. As a result, Czech science diplomacy is more about individual scientific networking and cooperation, and less about the country's foreign policy ambitions on the EU and global levels.

7. References

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