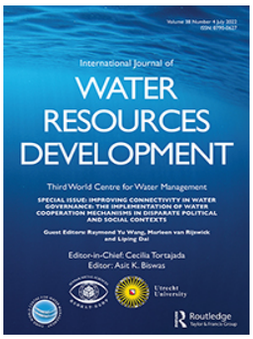

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Governance conditions to overcome the challenges of realizing safe urban bathing water sites

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ABSTRACT

This study aims to identify governance conditions to realize urban bathing water sites using case study material from two cities in the Netherlands. Urban waters in Europe are increasingly considered an attractive feature for bathing, but research on the realization of urban bathing water sites has been limited. We find that it is important to account for the connectivity between water systems characteristics and governance conditions to increase effectiveness in the realization of urban bathing water sites. Ambitions regarding urban bathing water sites should be addressed in a wider policy context to create co-benefits, like other ambitions related to water quality, resilience and health. An analytical framework has been developed that could be used to support development and evaluation of future urban bathing water initiatives.

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Urban bathing water; connectivity; Bathing Water Directive; governance conditions; policy effectiveness; Water Framework Directive

Introduction

Urban bathing

Local policy makers in Europe increasingly recognize urban waters as attractive features for tourism, water recreation and a healthy lifestyle for members of the public. As a result of economic prosperity, citizens have more time and means for recreation, and tourism is increasing (ETA, 2016), although differences can be observed across Europe (Eurostat, 2017). Due to climate change, the number of warm days is expected to increase (IPCC, 2014), increasing the need for urban spaces that help citizens cool down (Kabisch, 2015). This article focuses on the role of governance conditions in the realization of urban bathing water sites using case study material from the cities of Amsterdam and Rotterdam in the Netherlands. A bathing water site (or bathing site) is defined here as an area of surface water where a considerable number of people go bathing (European Bathing Water Directive, 2006/7/EC – BWD). Conditions were identified using a triangulation of methods, including interviews with actors involved and desk research on the case studies, and consultation with an international expert panel on the validity of the results in other European cities. Governance conditions are defined in this study as the elements

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Supplemental data for this article can be accessed here.

and activities that are necessary in a governance approach to realize water quality objectives; governance is defined as a process of interaction between public and/or private actors (authorities, stakeholders and citizens), ultimately aimed at the realization of collective goals (Lange et al., 2013).

One could argue that urban bathing water is of little importance compared to other water-related challenges that cities are facing in Europe. These include flooding and drought due to climate change (EEA, 2017), issues related to the availability of drinking water resources and sanitation infrastructure (UN, 2018), and the ecological ambitions set out in the European Water Framework Directive, 2000/60/EC – WFD (Grizzetti et al., 2017). Such issues may pose bigger challenges to cities (Koop & Van Leeuwen, 2017). On the other hand, efforts to improve urban bathing water quality may assist other water quality ambitions, and vice versa, and should therefore not be seen in isolation (EEA, 2019). A better understanding of the governance conditions for the realization of safe urban bathing water sites could thus be helpful in realizing other goals related to urban water quality, such as the UN Sustainable Development Goals, especially goals number 3 (good health and well-being), 6 (clean water and sanitation) and 11 (sustainable cities) (UN, 2015).

Local authorities in Western Europe are developing urban 'beaches', bathing areas and water playgrounds in cities (e.g. Paris-Plages, Amsterdam Somerlust, Copenhagen Harbour, Basel Rhein). The realization of these sites is accompanied by programmes for water quality improvement that should facilitate swimming in these waters. Citizens appreciate these urban 'beaches' and use them frequently, although systematic observations of the numbers of visitors are scarce and unreported (EEA, 2019). The Amsterdam City Swim attracted over 3000 participants (https://www.amsterdamcityswim.nl/). Such events are increasing in number and frequency (Leenen, 2018).

Proximity to and access to water have long been at the centre of human culture, and have both benefits and risks in terms of health and well-being (Grellier et al., 2017). The benefits of urban blue spaces (including coasts, rivers and lakes, as well as canals and water features) for physical health and well-being are opportunities for physical exercise and a healthier lifestyle, as well as social interactions and stress relief (Björk et al., 2008; Gascon et al., 2015). The risks include drowning, injury (e.g. due to bulky waste such as bicycles or shipwrecks), and health risks due to microbiological or chemical pollution (Björk et al., 2008; WHO, 2003). These risks need to be overcome to realize safe urban bathing waters.

Governance challenges

The governance for realizing safe urban bathing waters poses a variety of challenges. Some of them have been described in the literature, but a joint analysis of water quality aspects and governance conditions seems to be lacking so far. A recent literature review finds that empirical studies on how conditions of governance can positively contribute to specific water quality issues are scarce (Wuijts et al., 2018).

There is an ongoing concern with regard to water quality and prevention of injuries or drowning, which may hamper the realization of urban bathing water sites. Sewage water discharge, stormwater overflows, pollution from (former) industries, agricultural emissions, traffic and shipping are all factors that influence the water quality, both

continuously and occasionally, e.g. after heavy rainfall. These potential sources of pollution limit the use of the water for recreation, and harm the ecological status of the water system itself. The variety of stakeholders that need to be involved to address these sources of pollution, as well as the complexity of relevant legal and policy frameworks, also add to the challenges local authorities face in realizing urban bathing water sites (Rietveld et al., 2016; Smith Korfmacher et al., 2015).

Urban water quality varies considerably in cities worldwide. Some cities generate vast amounts of (solid) waste, release hazardous substances into the environment and discharge untreated wastewater into the surface water (Koop & Van Leeuwen, 2017). In other cities, solid waste is collected and wastewater treatment is common practice, and in some cities stormwater overflows have been largely remediated (Jensen et al., 2015). These disparities between cities exist in Europe as well, although most European countries have taken significant steps to improve wastewater treatment and waste collection to realize the European ambitions set out in the Urban Waste Water Directive, 98/15/EC – UWWD (Gawlik et al., 2017).

In addition to the more technical conditions related to water quality and physical safety, other governance conditions also play an important role in the realization of urban bathing water sites that contribute to a healthy urban living environment. The urban context implies the involvement of multiple stakeholders with different views, and interaction with multiple policy domains and legal frameworks. Governance approaches, with the involvement of multiple actors at multiple levels, are often considered more effective in dealing with complex urban water issues compared to conventional legal frameworks with top-down central steering mechanisms (Howarth, 2017; Lee, 2009).

The challenges posed by multi-actor and multi-level governance approaches to complex water issues are extensively described in the scientific literature (Edelenbos et al., 2013; Woodhouse & Muller, 2017). Most studies so far have focused on the planning rather than the implementation phase. The role of governance in urban water management has mainly been studied in regard to resilience (Hegger et al., 2014; Koop & Van Leeuwen, 2015a; Mees, 2014) and sustainable development (Van Broekhoven & Vernay, 2018), focusing on challenges of governance (Koop & Van Leeuwen, 2017), governance arrangements (Hegger et al., 2014), capacities for governance (Koop & Van Leeuwen, 2015a; OECD, 2016), public–private arrangements (Mees, 2014), the criteria for evaluation, such as effectiveness, efficiency and legitimacy (Adger et al., 2005; Alexander et al., 2016), the adaptive capacity of governance (Arnold & Gunderson, 2013; Folke et al., 2016; Green et al., 2016; Huitema et al., 2009) and the conditions for good governance (Bucknall, 2006; OECD, 2015).

Aim and research question

In this study, we analyzed experiences in the implementation of urban bathing water ambitions in two Dutch cities, Amsterdam and Rotterdam, aiming to improve the understanding of the role of governance conditions in this type of water usage. The term 'implementation' refers to an explicit phase in the policy process: the execution of interventions to achieve policy objectives. The concept of 'implementation' in legal studies also refers to the transposition of European legislation into national law. In this article, we studied implementation in a broader perspective, i.e. including the necessary

conditions, such as the involvement of stakeholders, trade-offs and the selection of policy instruments, to support implementation. To avoid confusion over the term 'implementation', we have used the term 'realization' when referring to this wider scope. When we mean implementation in the legal context of implementing EU directives, we use the term 'transposition'. Due to the large variety in urban water quality in cities worldwide, this study was limited to Europe and the relevant EU regulatory frameworks.

The central question formulated for this study is, What governance conditions influence the realization of safe urban bathing waters in practice? To address this question, we distinguished conditions related to content (characterization of urban bathing water in terms of issues, drivers, values and interventions), organization (the role of stakeholders, trade-offs and regulations) and realization (interventions, monitoring and enforcement) using an analytical framework for sustainable water governance with a specific focus on the conditions for safe urban bathing water quality.

Analytical framework

Although multiple frameworks are available for analyzing conditions of water governance (OECD, 2015; Pahl-Wostl et al., 2012; Van Rijswick et al., 2014), there are none that specifically address the conditions to realize safe *urban* bathing waters. We selected the governance framework developed for sustainable water governance by Van Rijswick et al. (2014), because it explicitly addresses realization challenges. With its diagnostic nature, this multidisciplinary framework aims to identify strengths and weaknesses in water governance approaches that need to be addressed to deal with water issues effectively. The framework encompasses 10 building blocks, which are interdependent and evolve during the different steps of a policy process. Each building block contains several questions that need to be answered to assess the governance approach for that building block.

We combined this framework with the specific information needs related to urban bathing water. These information needs were extracted from the guidelines for safe recreational water as developed by the World Health Organization in 2003 and evaluated in 2018 (WHO, 2003, 2018) and the water safety planning approach for drinking water (WHO, 2009). The WHO guidelines for safe recreation water strongly focus on microbiological safety. In an urban environment, however, the role of chemical pollution is also relevant, as is the presence of underwater objects (e.g. bulky waste). Furthermore, the rapid and complex response of the water system after rainfall can result in instant water quality changes, as the dominance of paving causes immediate runoff to the sewage system or surface water. For this reason, elements of the water safety planning approach were added to this study's analytical framework as well.

The combined framework is depicted in Figure 1. Information used to characterize urban bathing water (issues, drivers, interventions) is relevant to all building blocks, not only to 'water system knowledge' and 'engineering and monitoring', but the nature of this connectivity differs for the three dimensions in the analytical framework. Enhancing connectivity means linking actors, issues and sectors across hydrological scales and institutional levels to realize effective policy solutions for complex environmental problems that also account for different values and interests at stake (Ingold et al., 2019). Figure 1 shows which information should feed into the different governance building

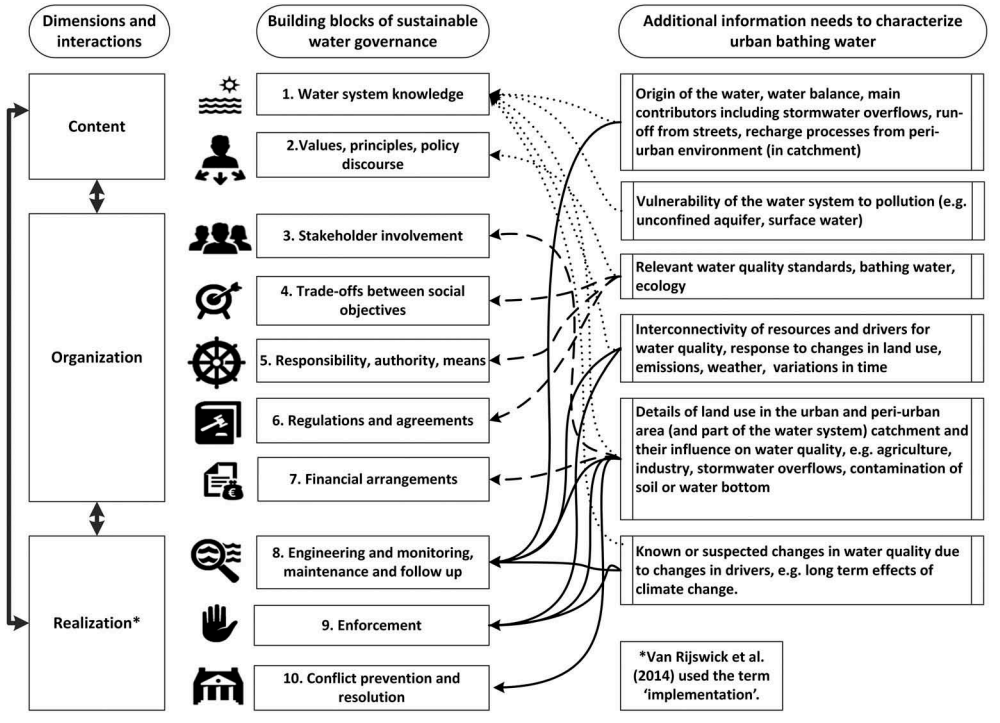

Figure 1. Analytical framework used for this study: a combination of the framework of sustainable water governance (Van Rijswick et al., 2014) (left) and additional information needs to characterize urban bathing water, based on WHO (2003, 2009) (right).

blocks. It also indicates the complexity of the connectivity between water quality and governance conditions. For example, knowledge on discharge of pollution and effects of measures helps identify stakeholders who need to be involved to realize water quality improvement. Information on water quality objectives feeds discussion of values and trade-offs. The experiences in the case studies related to this connectivity will be described for each of the dimensions of the analytical framework: content, organization and realization.

Method

Scope

This study was restricted to empirical research in one country, the Netherlands, to eliminate differences in the mode of transposition of EU regulations into national legislation and policy programmes that might influence the results (Giakoumis & Voulvoulis, 2018). We chose two cases with different ambitions and strategies regarding urban bathing water. The Netherlands is a water-rich country that traditionally has a strong connection with blue spaces. It has one of the highest numbers of official bathing sites among the member states of the EU (EEA, 2019). These sites are increasingly situated in

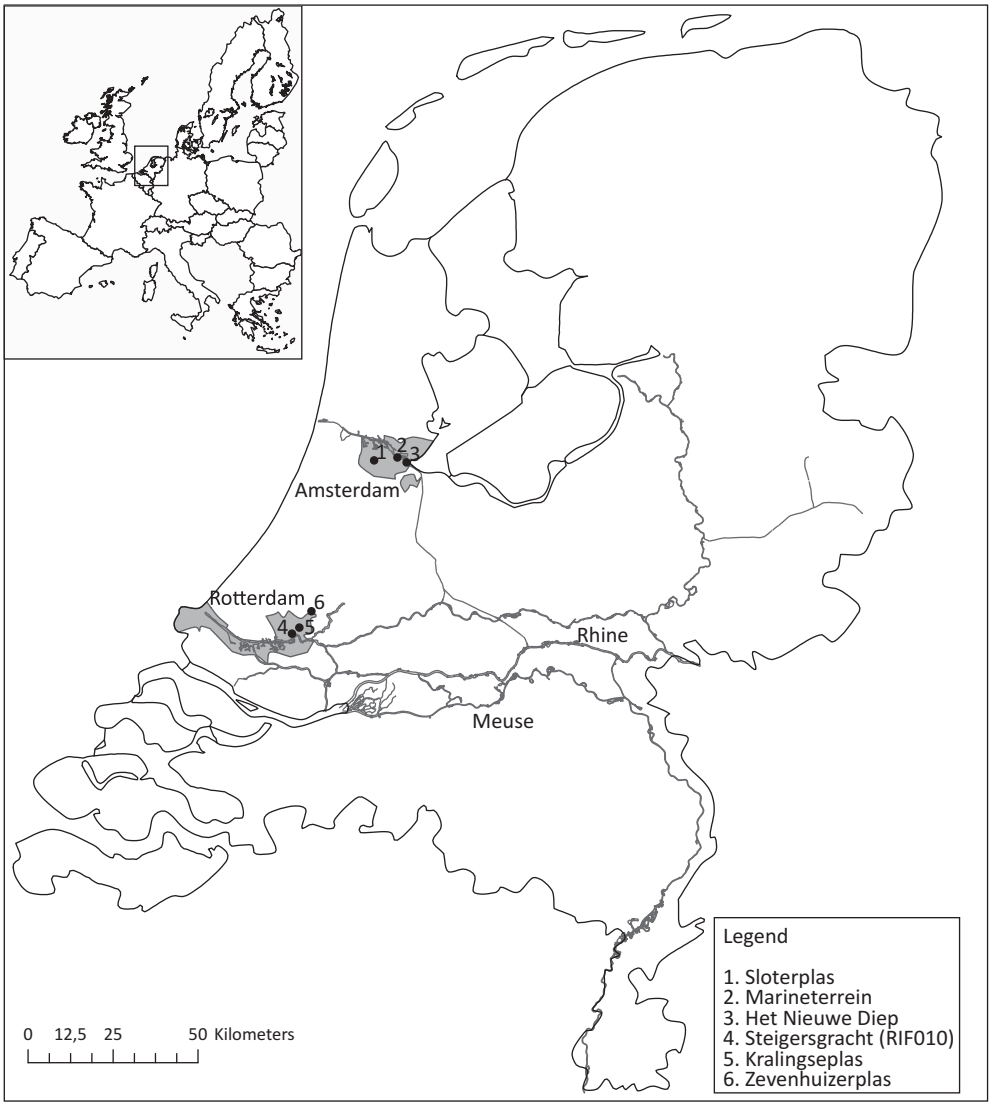

Figure 2. Bathing water sites studied in Amsterdam and Rotterdam.

urban settings and thus offer interesting cases for study that can be relevant in other countries as well. Legislation on bathing water is primarily set at a European level, so similar legal requirements apply to all EU member states. WHO guidelines regarding recreation water were used as input for the BWD. For the upcoming revision of the BWD, the WHO has carried out an evaluation and formulated some recommendations, e.g. regarding the addition of new parameters to the BWD and monitoring frequency (WHO, 2018). Therefore, both the WHO guidelines and the European directives such as the BWD, UWWD and WFD are relevant to this study. To test the validity of the results of our case studies, compared to experiences in other settings, observations of the realization of blue-space interventions in other cities across Europe (Malmö, Plymouth, Barcelona, Tallinn, Tartu and Thessaloniki) were used for comparison and reflection.

Case studies

Our cases are in the cities of Amsterdam and Rotterdam, in the provinces of North Holland and South Holland, respectively (Figure 2). Provinces are the competent authority to register bathing water locations under the BWD, regional water authorities for the water quality within their jurisdiction, and municipalities for the collection of wastewater and the quality of the outdoor environment for citizens. Both Amsterdam and Rotterdam have large harbours and are known for their water-related functions, such as shipping and industry, and cultural values. Both cities face challenges concerning urbanization, migration, ageing, inequality and the effects of climate change. Both have a strong ambition to create a healthy and attractive urban environment (Table 1). Within the same institutional context, the two cities have opted for different strategies to realize their ambitions for a healthy urban environment, with different outcomes. The similarities of these cities in institutional context and urban challenges offer a specific view on the governance conditions that enable the realization of urban bathing water sites (Yin, 2009).

In total, we selected six bathing sites, three in each city, for our analysis. Since the aim of the study was to understand the role of governance conditions in the realization of urban bathing water sites, the cases were selected in such a way that both the characteristics and understanding of the water system and the local plans and ambitions were different for each site (Tables 1 and 2).

Policy plans and other relevant documents on local water quality and its drivers, as well as semi-structured interviews with stakeholders (both authorities and private actors), were used as sources of information to analyze the governance conditions for the six urban bathing water locations (Figure 1, Table 2). In total, 10 representatives from the municipalities, regional water authorities, provinces, environmental services (the agency for environmental licensing, monitoring and enforcement issued by provinces and municipalities), local public health services and private organizations were interviewed in Amsterdam, and nine in Rotterdam (Table 1), using a standardized questionnaire based on the information needs of the analytical framework, as outlined in Figure 1 (in the online supplemental material at https://doi.org/10.1080/07900627.2020.1755617). All the interviews were reported back to the interviewees so their contents could be checked.

International expert panel consultation

Since the cases are all in the Netherlands, an international expert panel was consulted to explore whether the results regarding the governance conditions can be considered valid in other European cities as well. Experts on spatial planning, water quality, public health and well-being, and governance from the EU H2020 BlueHealth research project (Grellier et al., 2017) were asked about their experiences with the realization of blue spaces. Interventions in Malmö (Sweden), Plymouth (United Kingdom), Barcelona (Spain), Tallinn and Tartu (Estonia), and Thessaloniki (Greece) were discussed, using the methodology of appreciative inquiry (Cooperrider et al., 2008). This methodology for structuring discussions was chosen because it starts with the positives. People who are experiencing positive feelings are more flexible, creative, integrative, open to information and efficient in their thinking. This helped to identify what went well in the realization of blue spaces and what could be done in the future. The discussion was structured by key questions

Table 1. Water characteristics of Amsterdam and Rotterdam.

	Amsterdam	Rotterdam
Population	821,752 (2016)	623,652 (2015)
Size (km^2)	219.32	319.35
% water surface	~25%	~35%
Water system	Situated at lake IJ and river Amstel, fed by surrounding polders, interconnected network of characteristic historic canals. Sloterplas and Het Nieuwe Diep are not part of the urban water system.	Situated at the river Nieuwe Maas, the delta of the river Rhine, and the rivers Schie and Rotte. Surrounding polders. Canals within city centre. Nieuwe Maas is the artery in the city design.
Water quality risks for bathing water (not city-specific)	• Waterborne and vector-borne infectious diseases • Cyanobacteria • Waterbed pollution • Oil contamination	
Potential sources of water quality risks (not city-specific)	• Overflow of sewage system (infectious diseases and nutrients – cyanobacteria) • Feedwater from polders or upstream parts of a river • Rats and other carriers of vector-borne diseases • Waterbed pollution: shipping and former industrial activity • Shipping and harbour activities • Runoff of street dirt (animal waste, fuel leakage, metals from rooftops, drainpipes)	
Water ambitions	*Provincial policy*: Realize urban bathing sites within 10 km from home for all inhabitants of the province *Local policy*: Water for all, including bathing water; Swim Lab initiative	*Provincial policy*: No explicit urban bathing water policy, BWD leading *Local policy*: An attractive water city, clear water with a richness of plants, WFD objectives; contest on ideas for public spaces; RIF010
Parties involved in realization of urban bathing water policies and interviewed for this study	• Province of North Holland • Regional water authority Waternet • City of Amsterdam • Amsterdam district committees • Amsterdam Public Health Service • Project Agency Marineterrein • Citizen groups for local initiatives	• Province of South Holland • Regional water authorities Schieland and Krimpenerwaard, Delfland, Hollandse Delta • Environmental Service Midden Holland • City of Rotterdam • Rotterdam Public Health Service • RIF010 Urban Surfing Rotterdam • Citizen groups for local initiatives
Locations discussed in interviews	• Sloterplas* • Het Nieuwe Diep** • Marineterrein**	• Steigersgracht (RIF010)*** • Kralingse Plas* • Zevenhuizer Plas*

* Registered official bathing water site for the EU BWD.
** Candidate bathing water site.
*** Surf centre with bathing capacity (listed as a swimming pool).

derived from the interview results in the case studies. The discussion results were used to reflect on commonalities and differences between the case study results and the expert panel's experiences. The expert panel discussion was organized under the Chatham House Rule (UK Royal Institute of International Affairs, 1927) and recorded and transcribed for analysis.

Results

This section presents the results from the interviews, complemented by underlying documents such as the water plans of provinces, municipalities and water authorities

Table 2. Bathing water sites studied in Amsterdam and Rotterdam.

	Case study areas
Amsterdam	Sloterstrand: a city beach on the Sloterplas, a lake in the eastern part of Amsterdam. Official bathing site with good water quality according to the BWD, although issues with blue-green algae occur in summer. Low-income area, multiple nationalities. A drowning incident shortly after the opening of the new beach caused discussion of roles and responsibilities and usage of the area. Het Nieuwe Diep: a candidate bathing site (lake connected to the IJ), identified at Swim Lab. Concern from nature preservation group for the adjacent park. Good water quality observed, and first designs for a safe bathing area were made, when waterbed pollution with lead was discovered. Based on the advice of the local public health service, the municipality decided to end the initiative. Marineterrein: The Project Agency Marineterrein is redeveloping the former harbour and grounds of the Royal Navy in the city centre. Candidate bathing site, although water quality is an issue (overflows and soil pollution). Project Agency has overcome this issue by warning visitors that bathing is at their own risk because water quality cannot be guaranteed at all times.
Rotterdam	Steigersgracht (RiF010): The realization of a wave construction for surfing in a dead-end branch of the river Rotte in the city centre. The project is the result of a contest among the citizens of Rotterdam on the use of public space. The initiative has no specific water quality ambitions. The project will be realized as a construction separated from the water system itself. The project is therefore designated as a swimming pool and needs to meet the requirements for swimming pools. Neighbours questioned the effect of the project on water quality and were afraid of noise pollution. In a recent judgement, the Council of State ruled that the water permit was rightfully granted, as the realization of the RiF010 project would not lead to deterioration of the waterbody's state (RvS 201703571/1/A1). Regarding nuisance for neighbours, the municipality was instructed to order the initiator to take measures to reduce noise levels – casing of installations (RvS 201800767/1/A1 and 201800953/1/A1). Kralingse Plas: Official bathing site with good water quality according to the BWD. In a recent large-scale clean-up of waterbed pollution with lead, a top layer of sand was deposited on the waterbed. This sand turned out to have traces of phosphorus. Since then, cyanobacteria dominate during the bathing season and beyond. An interactive process to develop a vision for the lake clarified that removal of the sand was the only 'real' solution to the water quality issues, but it is unfeasible within the financial means available. Zevenhuizerplas: Official bathing site. A deep lake with good water quality according to the BWD. To extend the bathing season, citizens have suggested heating part of the lake. Although the idea was well received, authorities are hesitant due to possible water quality risks, and finding a way forward seems difficult.

(Municipality of Amsterdam, 2016a; Municipality of Rotterdam et al., 2016) and the scholarly literature. It is structured following the dimensions of the analytical framework: content, organization and realization. Each of these three subsections has two parts: background information from collected documents; and results from interviews and expert panel discussion. Finally, the results from interviews and expert panel discussion are structured by the individual building blocks in each of the subsections.

The questionnaires used for the interviews contained questions related to all the building blocks of the framework. Some questions were relevant to several building blocks. The reports of the individual interviews were assembled in a spreadsheet, containing the results of all individual questions, and clustered according to the building blocks of the analytical framework. Consequently, the results of the individual questions from the individual interviews were first combined into a synopsis for each of the building blocks, for Amsterdam and Rotterdam separately (Table 3). The results were then aggregated into text covering each of the cases. Two researchers carried out this aggregation individually and then compared and discussed it, to avoid interpretation errors.

During the interviews, stakeholders were asked what they considered important governance conditions for the realization of urban bathing water sites, given their personal experiences (see supplementary material). The expert panel members were asked similar questions. These governance conditions were assembled and clustered

Table 3. Results of analysis of stakeholder interviews and policy documents for Amsterdam and Rotterdam, structured by the building blocks of the analytical framework.

	Building blocks water governance	Amsterdam	Rotterdam
Content	**Water system knowledge**	• The characteristics of the water system, physical safety and monitoring results play a significant role in the development of a registered bathing water site. Nevertheless, bathing also occurs at places where safety is a known issue due to shipping or water quality. Various risks regarding the water system are known, but it is difficult to balance risks and benefits adequately because of knowledge gaps.	• The first step for a new bathing water location is the water authority's assessment of the desirability of realizing a new location in that place from the perspective of water quality; no other pressures that could influence this quality, such as sewage overflows or rats. The Environmental Service uses criteria to check on physical safety. If the results of these assessments are negative, the initiative usually ends there, even if some initiators wish to pursue their idea.
	Values, principles, policy discourse	• Citizens and the city council want to create places to swim. Stakeholders want to facilitate this but struggle with the balance between risks and benefits. The Swim Lab initiative resulted in various ideas, but these have not been realized yet. • It is important to make people aware of the risks.	• Interviewees hold different views. The water authority has a restrained policy; the municipality has no explicit policy on bathing water, the Environmental Service and the province are concentrating on citizen involvement and the use of official bathing sites.
Organization	**Stakeholder involvement**	• The water authority, the province, the municipality, civil servants and administrators, the local public health service and other actors, such as a rowing club, architects and other specialists, were involved in Swim Lab. The initiators approached people in their own networks. • Due to administrative changes, the process was halted. Parties involved say that the state of policy realization and the policy itself and opportunities (e.g. missed opportunities for financing of bathing water development) are unclear to them.	• The province is responsible for bathing water. The Environmental Service executes this legal task. Water authorities and location managers or initiators (municipalities, private parties, Staatsbosbeheer) are also involved. The local public health service is involved in questions regarding health issues in public spaces. • Regarding water management (quality and quantity) and climate adaptation, the municipality is drafting a water plan jointly with regional water authorities within the municipal borders. • Stakeholders are involved based on their responsibilities.
	Trade-offs between social objectives	• There is a shared wish for more opportunities for recreation in surface water. Exercise promotes good health. People's health improves if they can swim in their neighbourhood. • Finances and clear responsibilities are important conditions. • Initiatives need to fit in an urban context: safety, water quality and no nuisance to residents.	• Smart combinations regarding flood protection and health. However, more attention is needed to the risks of bathing in open water (water authority). It needs to be safe and healthy (local public health service). Bathing water locations should not introduce new water quality issues and additional management needs (municipality).

(*Continued*)

Table 3. (Continued).

	Building blocks water governance	Amsterdam	Rotterdam
	 **Responsibility, authority and means**	• Allocation of responsibilities is unclear and disintegrated, even to the municipality. A central figure who has an overview of current initiatives and can be approached with questions is lacking. • For the Marineterrein, a public–private approach was chosen. Project Agency Marineterrein was involved in the design and creation of a public outdoor space that allows room for innovation, e.g. in water quality monitoring.	• Local public health service: advice and information on health issues. Management of bathing water location: municipality or another initiator. Municipality: licensing Environment and Planning Act, management of other waters, not assigned to water authorities. Water authorities, licence for water initiatives, monitoring. Province registers bathing sites. Environmental Service: advice, warning, ban, enforcement of bathing water policy.
	 **Regulations and Agreements**	• The rules for bathing sites are not always clear to the actors involved. According to the interviewees, the BWD does not include all water quality risks (only two microbiological parameters), is not flexible and has limited connection to an integrated risk assessment. A policy is needed for those locations where people tend to swim, but which will not be candidates for registration due to water quality, safety reasons or inconvenience to neighbours.	• Instruments do work, but it is complex, according to the province. The presence of cyanobacteria is often a driver to remove a location from the list of official bathing sites, but this is not proper motivation according to the BWD. • Legal anchoring is missing for water quality issues at water playgrounds and water ornaments.
	 **Financial arrangements**	• For the municipal bathing water policy, a one-off budget was available. This hampered the realization of initiatives due to the lack of resources for operational management by the district committees.	• For the development of new locations, financial means are sometimes an issue: in the candidate phase, initiators have to pay for monitoring. • The RIF010 project targets a small niche among Rotterdam citizens, but has the trade-off of more money becoming available for water quality improvement (creating a flushing facility for the Rotte River).
Realization	 **Engineering and monitoring, maintenance and follow-up**	• New developments were followed up, e.g. the development of Het Nieuwe Diep (halted due to lead contamination of the waterbed), Marineterrein (further research on soil contamination), and Sloterplas (safety check and measures after a drowning incident).	• Capacity building is taking place in the National Working Group on Bathing Water. • The Environmental Service evaluates the season and reports back to the province.

(*Continued*)

Table 3. (Continued).

Building blocks water governance	Amsterdam	Rotterdam
Enforcement	• There is communication on the risks of bathing in open water by the local public health service. • The status of bathing sites is reported according to the BWD (national website). The bathing water policy of the city of Amsterdam itself is not explicitly reported. • Only the Project Agency Marineterrein communicates on the progress of plans in a newsletter and neighbourhood events.	• Water quality is monitored and reported by the website and bathing water app. Complaints by the public are often addressed to the municipality. Changes in water quality may manifest themselves quickly. The municipality knows the water system and wants to inform its citizens. They regard the monitoring frequency of two weeks as insufficient for complaints. Views differ between the municipality and the Environmental Service on who should inform the public.
Conflict prevention and resolution	• Discussion of responsibilities resulted in a restraining policy regarding the development of new bathing sites.	• The Council of State ruled that the water permit had been rightfully granted since the realization of the RIF010 project does not lead to measurable deterioration of water quality (< 1% of the Good Ecological Potential), based on the prior *Weser* judgement by the ECJ (Van Rijswick & Backes, 2015). Evidence by data was important in this judgement.

according to the building blocks of the analytical framework (Table 4) and analyzed. The reflection was based on document analysis within each of the subsections for the different dimensions of the analytical framework (Figure 1). The factors in shaded cells were mentioned both in the case study interviews and in the expert panel discussion. Nine governance conditions were thus identified as important for the realization of urban bathing.

Content dimension: characteristics of urban bathing water (issues, drivers and values)

Background information from collected documents

Water is a dominant feature in the urban design of both Amsterdam and Rotterdam; both are situated in a river delta and surrounded by polders. Water management is an important task of the water authorities and municipalities. As a result of climate change, the cities are expected to be more prone to flooding, e.g. due to heavy rainfall. Both cities' water plans contain targeted strategies to realize flood resilience as well as water quality objectives regarding ecosystems and recreational use (Municipality of Amsterdam, 2016a; Municipality of Rotterdam et al., 2016).

Table 4. Governance conditions for the realization of urban bathing water sites mentioned in the interviews or by the expert panel, structured by the building blocks of the analytical framework.

	Building blocks of water governance		Governance conditions for the realization of urban bathing water sites	Mentioned by respondents*	
				Amsterdam	Rotterdam
Content		Water system knowledge	**1. Healthy design**		
			• Include health in the design of a bathing water location. Discuss first with the water authority on water quality before furnishing a new area for bathing.	Y	Y
			• Build capacity for healthy design at local public health services.	N	Y
		Values, principles, policy discourse	**2. Use of incentives and administrative support**		
			• Administrative priority of bathing water. Facilitate bathing, but in a good way. Water is a commodity.	Y	Y
			• A trigger/incentive to get things started.	Y	Y
			• Clarify ambitions and risks for administrators and civil servants at the start of the process.	Y	N
Organization		Stakeholder involvement	**3. Engagement at all stages and beyond usual networks**		
			• Interact with and join forces with other stakeholders.	Y	Y
			• Identify stakeholders, not only from existing networks.	Y	N
			• Open up the process to private actors as well.	Y	Y
		Trade-offs between social objectives	**4. The importance of a shared vision**		
			• Appreciate citizens' initiatives (within a vision) and look for solutions.	Y	Y
		Responsibility, authority and means	**5. Transparent allocation of roles and responsibilities to public and private actors**		
			• Clear allocation of roles and responsibilities.	Y	Y
			• A central figure who oversees current initiatives (both content and procedure), and who knows the actors involved.	Y	N
		Regulations and agreements	**6. A guiding framework on how to act**		
			• A framework that helps clarify roles and responsibilities but also offers flexibility to act, for instance on the suitability of a location or unofficial locations where people are bathing.	Y	N
			• Anchoring of initiatives in organizations beyond election terms.	Y	Y
		Financial arrangements	**7. Resources for management and maintenance**	Y	N
Realization		Engineering and monitoring, maintenance and follow-up	**8. Evidence-based decision making**		
			• Evidence-based decision making. • Real-time monitoring of water quality.	Y	Y
		Enforcement	**9. Comprehensive communication of risks**		
			• Comprehensive communication to citizens of the risks of bathing in open water.	Y	Y
			• Better communication of policy results (in numbers).	Y	Y
		Conflict prevention and resolution	No success factors mentioned.	–	–

* Shaded: mentioned by the expert panel as well.

The excess water from the surrounding polders, the water quality of the river Rhine, and discharges from urban activities all influence water quality. Runoff from rooftops and streets may be polluted with animal faeces; stormwater overflows may discharge untreated wastewater in case of excess rain; and houseboat sewage pipes may be leak due to variations in water level.

For bathing water, the microbiological water quality is the primary focus, but chemical pollution needs to be considered as well (WHO, 2003). For instance, excessive levels of nutrients (nitrogen and phosphorus) may provide growing conditions for toxic cyanobacteria. In an urban context, waterbed pollution due to former industrial or harbour activities is a potential risk for bathers. One of the complexities to consider is the extent of the unknown factors. One example of such a source is an unintended connection of the wastewater discharge system to the rainwater collection system, letting untreated wastewater be discharged into the surface water. Estimates of cross-connections between those two systems vary from 1% to 30% (De Man et al., 2014; Marsalek & Rochfort, 2004). Old urban centres are particularly vulnerable to such cross-connections as modifications to the system occur over long periods.

In their most recent water plans, both cities aim for smart combinations of functions, such as squares developed for water storage in case of heavy rainfall that also serve as playgrounds in dry weather (DELVA Landscape Architects/Urbanism, 2017; Municipality of Amsterdam, 2016b). With the increasing number of warm days, people will want to spend more time outdoors, and preferably close to their homes (Greven & Jakobs, 2015). The province of North Holland (Amsterdam) aims to create official urban bathing water sites according to the BWD within 10 km of peoples' homes (Municipality of Amsterdam et al., 2016). At the same time, however, outdoor swimming pools are closing due to financial issues. Interviewees said that various risks regarding the water system are known, but that it is difficult to balance risks and benefits adequately because of knowledge gaps regarding the actual response of the water system. They gave several examples that show the importance of water system knowledge when realizing bathing water sites, for instance, regarding the development of cyanobacteria and the influence of sewage overflows on surface water quality.

The lead contamination of the waterbed at Het Nieuwe Diep (Amsterdam) (Table 2) is an example of a discussion of the actual risks between different experts, and resulted in the municipality choosing to halt the development because of liability concerns. Interviewees said that citizens seem to be relatively unaware of risks and mainly focus on opportunities.

Results from interviews and expert panel discussion

Water system knowledge: healthy design (Condition 1). The interviewees in both cities stressed the importance of three criteria for assessment when developing a bathing site: water quality, safety, and acceptable nuisance levels for neighbours. Such an assessment helps determine whether a design can contribute to health and well-being. Sometimes realizing water quality objectives may be unfeasible without disproportional costs or limitations of other uses, such as the reduction of overflows or industrial discharges. In neither of the cities is the development of bathing sites a motive for more structural interventions, such as the remediation of stormwater overflows or the improvement of feedwater quality from adjacent polders.

Values, principles, policy discourse: incentives and administrative support (Condition 2). Interviewees from both Amsterdam and Rotterdam mentioned the importance of an incentive to initiate the realization of urban bathing water sites. Such an incentive was identified as important by members of the expert panel as well. Knowledge of the water system and water quality is an important prerequisite to those who develop and manage the system and for identifying possible co-benefits and using this incentive. The RiF010 project in Rotterdam (Table 2) is an example of an initiative in which actors managed to create a synergetic solution with multiple gains, realizing a recreation location while at the same time improving a system to comply with the ecological objectives of the WFD. RiF010 faced difficulties in its realization due to neighbours' concerns about nuisance and those of urban planners on urban design. The private initiator of the project and the municipality indicated in the interviews that the political support of the alderman was important in getting through the bureaucracy of licensing.

The Amsterdam City Swim, an annual event in which participants swim in the Amsterdam canals to raise funds for charity organizations, was this incentive in the case of Amsterdam. Policy ambitions were formulated, and a budget assigned, and the Swim Lab meeting was organized as a breeding ground for new ideas and engagement. In Amsterdam, the development of a bathing water policy was not incorporated into the municipal Water Department but into the Department of Sports and Forest. This might explain some of the difficulties that were experienced during realization of new urban bathing water sites: unexpected new information on the quality of the waterbed hampered the realization process and resulted in a bathing ban for one of the locations listed as a candidate under the BWD (Table 2).

Organization dimension: stakeholders, trade-offs, authorities and means, regulations, financial arrangements

Background information from collected documents

EU environmental legislation aims to ensure that cities have clean air and water, that the natural environment and its biodiversity are protected, that cities deal properly with waste and wastewater, and that green infrastructure is promoted. In the context of urban bathing water, the BWD, WFD and UWWD are the most important European directives that need to be considered. Box 1 describes the aims and requirements of these directives related to bathing water. Authorities involved in the realization of urban bathing water sites are provinces, municipalities, water authorities and supporting services such as the Public Health Service and Environmental Service (Table 1).

Results from interviews and expert panel discussion

Stakeholder involvement: engagement at all stages and beyond usual networks (Condition 3). In the Amsterdam Swim Lab, various stakeholders were invited: authorities such as the province, the municipality and the water authority, and other actors such as entrepreneurs, architects, citizens and organizations like a rowing club. These stakeholders were mostly part of existing networks of the organizers. One of the interviewees in Amsterdam said that there are more stakeholders than 'these usual suspects': 'We

Box 1. Aims and objectives of the Bathing Water Directive (2006/7/EC, BWD), Water Framework Directive (2000/60/EC, WFD) and Urban Waste Water Directive (98/15/EC, UWWD) related to urban bathing.

The BWD aims to ensure safe and healthy bathing sites, with a focus on microbiological and physical safety. Microbiological water quality is represented by two parameters that are regarded as indicators of faecal contamination: intestinal enterococci and *Escherichia coli* (2006/7/EC, Annex I). For a candidate bathing site, a bathing water profile should be drafted, including an assessment of causes of pollution that might affect bathing waters and impair bathers' health, including the potential for proliferation of cyanobacteria (blue-green algae), macro-algae or phytoplankton (Annex II), and water quality needs to be monitored for a period of three years. These risks, however, were quantified in acceptable levels in the directive. A recent evaluation of the BWD by WHO (2018) resulted in advice to offer more guidance or standards regarding cyanobacteria and other non-faecal microbiological contaminants.

The WFD has a more general objective, in which water is considered a heritage that should be safeguarded for future generations. To this end, objectives were formulated for good ecological and chemical status, as well as connections to specific functions. With regard to bathing water, the WFD links its objectives to the BWD (Article 6 and Annex VI) and lists bathing sites as Protected Areas (Article 6). Regarding necessary measures, the WFD refers to the requirements of the BWD.

The UWWD sets objectives for the collection, treatment and discharge of wastewater and wastewater effluent to protect the environment from the effects of discharges of urban wastewater and certain industrial sectors (Article 12). To this end, the capacity of the collecting system should be sufficient to minimize the use of stormwater overflows, and requirements have been set for discharges from urban wastewater treatment plants, including biochemical and chemical oxygen demand, suspended solids, and nitrogen and phosphorus loads. If the effluent is discharged into a sensitive area, more stringent requirements need to be set to ensure adequate protection. Criteria for identification of sensitive areas include the presence of vulnerable freshwater bodies (eutrophication), drinking water resources and the fulfilment of other council directives (Annex II).

should further explore who they are and what their views are on urban bathing water ambitions.' The involvement of many stakeholders, however, often ended with the event itself. The municipality narrowed the process down afterwards but did not communicate the underlying reasoning to the stakeholders. Consequently, stakeholders felt less engaged and committed to the objectives. The international experts stressed the importance of including different views and voices in the process, as well as the importance of the contextual setting. The forces at play and how processes work vary by community. Rotterdam has no specific bathing water policy; development of new bathing water sites comes from individual, often private, initiatives. The example of the Zevenhuizerplas (Table 2) shows that although the citizens' initiative was well received by the authorities, different views on the risks of water quality made it difficult to move forward with the initiative. One of the interviewees said that finding the right direction within the municipal organization to get things done can be very challenging, especially for citizens.

Trade-offs: the importance of a shared vision (Condition 4). In the Amsterdam case study, interviewees frequently mentioned the need for a shared vision, especially regarding bathing at unofficial locations and agreements by the authorities about interventions for and management of these locations. Unofficial locations are not monitored nor checked for safety, so their use is often not advisable for reasons of water quality or safety. Yet on warm days these places might be used by many people. The experts noted that if there is a joint goal, e.g. to improve the quality of life for people in the city, and administrative support, it is possible to overcome issues, for instance financial ones. To identify potential trade-offs, it is important to ask stakeholders about their values and context. Combining facts and people's visions is a powerful tool to convince both the local government and society. Waterfront renovation, ecological objectives, water infrastructure (drinking water, sewage and urban drainage) renovation, and flood resilience

measures (e.g. water squares) are all potential vehicles to realize urban bathing sites and other blue spaces. However, their design must minimize health risks.

One example of an urban initiative in which water system knowledge was used to create co-benefits for water quality is Rotterdam's RiF010 project (RiF010 Foundation, 2015) (Table 2). This project will be built as a swimming pool in the existing dead-end branch of the river Rotte, and therefore will no longer be a part of the water system. The feedwater for the pool comes from the Rotte, and the Environmental Service has set conditions for water treatment to meet the legal requirements for swimming pools. From a general water quality perspective the location is a dead-end branch of the Rotte, so flushing would benefit both RiF010 and the water system as a whole (Schieland and the Krimpenerwaard, 2017). RiF010 created momentum to realize this improvement by connecting the dead-end branch of the Rotte to the river Nieuwe Maas, increasing water flows.

The experts pointed out that taking a broader perspective (more than just water) might be important when assessing the effects of interventions and creating engagement. What other contextual factors may play a role, and what other benefits can be identified? Experts said that in their experience policy makers considered the supporting scientific base important for follow-up.

Responsibility, authority and means: clear allocation of roles and responsibilities for public and private actors (Condition 5). The Swim Lab process in Amsterdam was not followed up, although all of the interviewees indicated that the demand for urban bathing water sites had increased. The process failed to improve clarity on risks and responsibilities. Almost all interviewees mentioned the need for an explicit framework that helps clarify roles and responsibilities but also offers flexibility to act.

In both cases, authorities and their legal responsibilities dominate discussions of urban bathing water policy. The public health aspect related to this policy could explain this. Private actors, aiming to develop new initiatives, have trouble finding their way around the administrative bodies, and perceive this process as laborious. Experts expressed difficulties similar to those expressed by the private actors. However, those who were successful stressed the importance of community-led bottom-up initiatives, and the use of data to get the development of blue spaces started with policy makers.

Regulations and agreements: a guiding framework on how to act (Condition 6). From a generic perspective, the BWD, WFD and UWWD seem to encompass sufficient building blocks for the development and preservation of safe urban bathing water. On the case study level, the interviewees indicated that the rules for urban bathing sites are not always clear to the actors involved (De Swart et al., 2016). This is especially true for locations where people tend to swim but which will not be candidates for registration as official bathing sites due to water quality issues, safety reasons or nuisance to neighbours. The presence of cyanobacteria is often a motive for the province to remove a location from the list of bathing sites. However, according to the BWD, the presence of cyanobacteria is not a criterion for assessing bathing water quality as 'poor'. Furthermore, a permanent ban on bathing can only be introduced if a location has been assessed as poor for five consecutive years (Article 5). Interviewees mentioned the dilemma between facilitating new initiatives for recreation and taking on responsibilities that cannot be

fulfilled, e.g. regarding bathing water quality, safety, and ecological objectives set by the WFD.

The interviewees regarded the scope of the BWD as too limited, since it uses only two microbiological parameters for faecal contamination and does not include further water quality risks. They also felt that it is not flexible enough, and that the connection to an integrated risk assessment is too limited. Bathing water profiles we studied seem to focus on physical safety. The WFD and UWWD are rarely mentioned as relevant frameworks for bathing waters, but the case law for RiF010 shows that the WFD objectives need to be considered when realizing urban water recreation initiatives (RvS 201703571/1/A1). Based on the prior *Weser* judgement by the ECJ (C-461/13), it was important in the argumentation before the Council of State regarding the water permit for RiF010 that no measurable deterioration was foreseen (< 1% of the Good Ecological Potential) and that this expectation was supported by evidence.

Implementation of these directives seems to take place on parallel tracks, with little interaction.

Financial arrangements: resources for management and maintenance (Condition 7). Financial arrangements to develop new urban blue spaces or bathing sites seem to be less of an issue than the means for monitoring and maintenance. The experts stressed the importance of continued and sustainable support by local government beyond election terms.

Realization dimension: interventions, monitoring, enforcement and conflict resolution

Results from background documents, interviews and expert panel discussion

Engineering and monitoring, maintenance and follow up: evidence-based decision making (Condition 8). The case studies showed the importance of understanding the water system and its pressures when developing, realizing and managing a bathing water site in the urban context, where other interests are at stake as well. For instance, gaps in water system knowledge, and especially the role of unknown factors in the clean-up of the waterbed, have contributed to the current issues with the Kralingse Plas in Rotterdam (Table 2). The sand used in a large-scale clean-up of waterbed pollution turned out to contain sludge with traces of phosphorus. Since the application of this sludge, cyanobacteria have dominated during the bathing season and beyond. Removal of the sand seems the only 'real' solution to the water quality problems but is unfeasible within the available financial means. Other examples have demonstrated that understanding of the water system is crucial at all stages but that not all actors have a sufficient understanding of the system, and not all actors who have this understanding are involved. The microbiological response to interventions in a water system is complex, and interventions may have unforeseen effects (e.g. Kralingse Plas, Rotterdam). This implies the need for a realization strategy that facilitates learning from and adaptation of interventions, based on monitoring results.

Finally, targeted monitoring can be a powerful tool to improve understanding of the water system and its drivers of contamination. At the Marineterrein in Amsterdam (Table 2), the source of microbiological contamination appeared to be a faulty connection in a

building on the terrain proper, after initial suspicion of inflow from bordering canals and discharge of human excreta from ships.

Enforcement: comprehensive communication of risks (Condition 9). Safe urban bathing is not assigned as a formal responsibility to any of the governmental stakeholders, except for official bathing sites, which are a provincial responsibility in the Netherlands. Due to concerns about risks and responsibilities, especially at unofficial bathing sites, and administrative changes, the municipality of Amsterdam has restricted its ambitions to official bathing sites, and only one candidate bathing site: the Marineterrein is being monitored as a candidate location (Table 2).

The interviewees said that it is problematic to invest in safety measures at an unofficial bathing site because it might give bathers the impression that this is an official bathing site. On the other hand, forbidding bathing at a location implies a need for enforcement. The Project Agency Marineterrein has overcome this dilemma by actively informing the public (through signage, websites and a newsletter) that the site is not an official bathing site, and that people swim at their own risk.

Conflict resolution. Governance conditions related to conflict resolution were not mentioned by the interviewees or the expert panel, but the presence of multiple activities that may affect urban water quality is in itself a potential source of conflicts over objectives, responsibilities, agreements, etc (Van Rijswick et al., 2014). RiF010 shows the complexity of developing a recreational initiative in the city centre, where multiple interests are at stake (Table 2). The case law for RiF010 shows that the WFD objectives needed to be accounted for when developing urban water recreation initiatives (RvS 201703571/1/A1). The interviewees identified a shared vision and agreements on principles regarding bathing water use as important conditions for realization in the case studies.

Discussion

Governance conditions for the realization of urban bathing water sites

In their pursuit of healthy lifestyles and the substantial improvement of water quality over the past decades, cities in Europe are increasingly developing urban bathing sites, urban beaches and water playgrounds (Assmuth et al., 2017; Jensen et al., 2015). However, the ongoing presence of multiple potential sources of pollution, knowledge gaps regarding responses of the water system (e.g. cyanobacteria blooms), and the complexities of multiple stakeholders, interests and legal frameworks challenge the realization of urban bathing water ambitions. The central goal of this study is to identify which governance conditions influence the realization of safe urban bathing waters.

The members of the expert panel and the interviewees identified connectivity of water system knowledge to other policy domains as an important condition to realize urban bathing water sites and to make use of other urban developments. Despite the challenges described, cities may also face developments such as waterfront regeneration, flood protection and infrastructure renovations, which may act as a window of opportunity to realize healthy blue spaces. Copenhagen (Jensen et al., 2015) shows the power of using these opportunities. The city has used its large-scale harbour regeneration to renovate

stormwater overflows, and to create safe urban bathing sites. Other enabling governance conditions identified were the use of incentives to kick off, anchoring of urban bathing water policy, a clear allocation of roles and responsibilities, comprehensive and interactive communication with stakeholders and citizens, and a targeted monitoring and follow-up strategy that supports this process to realize and maintain safe urban bathing sites. These conditions for adaptive governance can be recognized for other environmental issues as well (Arnold & Gunderson, 2013; Folke et al., 2016), although the urban environment contributes to the complexity of adaptive governance (Green et al., 2016).

The intricate relationship with urban water characteristics can be recognized in most of the governance conditions that enable the realization of policy objectives. This relationship is undeniable with regard to healthy design and communication of risks. In addition, to develop a shared vision, understanding of the water system is important for setting achievable goals. The realization of urban bathing sites, however, needs to consider additional factors. The development of blue spaces to improve citizens' health might require something different from the common sectoral water approach. Including socio-cultural aspects of blue infrastructure in urban development may address the specific needs of specific user groups and thus make blue spaces more inclusive (Assmuth et al., 2017). Moreover, the public appreciation of urban bathing and its potential health benefits (Smith Korfmacher et al., 2015) may also be an incentive to implement measures that serve other water quality objectives that are less favoured by public opinion (Jensen et al., 2015). Considering urban bathing in the context of creating an attractive and healthy environment for citizens can be a powerful shared ambition for local stakeholders.

Citizen engagement requires different approaches than those used to address the more official stakeholders. To this end, cooperation with, for instance, NGOs or community groups can be valuable. Co-designing interventions with neighbours and stakeholders is important for success in the quality of the outdoor environment for those who live in that neighbourhood. The experts advised, among other things, engaging with those stakeholders who do not spontaneously participate.

Another co-benefit could be created by pursuing an integrated approach for water quality management and the objectives set by the WFD, BWD and UWWD. So far, their realization seems to take place on parallel tracks, creating benefits only incidentally, as described in the RiF010 case.

Data used for this study

In this study, we analyzed the governance conditions that might influence a straightforward realization of urban bathing water sites in the European context for two cities in the Netherlands, Amsterdam and Rotterdam. For our analysis, we used scientific and grey literature and semi-structured interviews with the stakeholders. Actors' and stakeholders' experiences were used to identify relevant governance conditions. Their actual effects on the realization of urban bathing sites were not investigated. The validity of the results was tested by comparing conditions for the two cities identified by different stakeholders, reflection by the experts, and reflection based on document analysis. Although a number of conditions were identified in the case studies and by the experts, not all governance conditions were mentioned in the case studies or by the expert panel. The open-ended questions used in the interviews, the specific expertise of the interviewees and the local

circumstances could explain these differences. To test the actual contribution of governance conditions to the realization of urban bathing sites, a longitudinal study during the full policy cycle is required in different case studies and countries.

Use of the analytical framework

The analytical framework used in this study had two components: an existing analytical framework for sustainable water governance (Van Rijswick et al., 2014), and the information needed to identify water quality issues, drivers of pollution and possible interventions related to urban bathing water. The urban water characteristics appeared to be relevant to all the building blocks of the water governance framework, but, the type of information that was needed differed for the various building blocks in the related dimensions. The framework supports deeper questioning during interviews on water quality issues in practice and their relation with the different building blocks of governance, which resulted in the identification of governance conditions. It also identifies how knowledge gaps in system understanding might affect other building blocks. The use of such a combined framework may also support further understanding of the intricate relation of the relevant Sustainable Development Goals and European ambitions at the urban water level and other societal interests at stake. Thus, it could contribute to the identification of opportunities to achieve these ambitions.

The building blocks of the framework facilitate a systematic understanding of the strengths and weaknesses of a governance approach, and although all the building blocks are interlinked, two observations can be made in this regard. First, the structure of the framework suggests a clear division between the three dimensions that would allow separate analysis of the building blocks related to realization. However, to address a question related to the realization of specific ambitions, the interlinked building blocks must be included as well. Moreover, the framework could be improved by additional structuring of the framework following the policy cycle. This would also benefit the second observation, that governance conditions might change during a policy cycle. As a result, to be effective, a governance approach should possibly be different in the realization phase than it was during the planning phase. This could be the case, for instance, for financial arrangements or stakeholders that need to be involved. The question of whether governance conditions evolve in the process of realization could be an area for future research.

Conclusions

To improve effectiveness, policy design for urban bathing water ambitions needs to account for the intricate relationship between urban water characteristics and governance conditions. This connectivity is relevant at all stages of the policy process. The use of incentives to kick off, anchoring of urban bathing water policy, a clear allocation of roles and responsibilities, and comprehensive and interactive communication with stakeholders and citizens were identified as other important success factors to get started and create continuity for operational management. A targeted monitoring and follow-up strategy supports this process to realize and maintain safe urban bathing water sites.

Effectiveness can be further increased if the benefits are considered in the broader context of urban planning and public health. The benefits and risks of blue spaces overlap

with policy arenas such as public health, inclusiveness and tourism. These policy arenas usually go beyond the traditional playing field of water authorities. Moreover, water authorities and water management departments in municipalities also play an important role in creating co-benefits with other water ambitions, such as the ecological objectives of the WFD and public health benefits. So far, the realization of urban bathing water and the ecological objectives of the WFD seem to be taking place on parallel tracks.

Although the regulatory framework of the WFD, BWD and UWWD seems to be sufficient to develop and preserve safe urban bathing water sites from a generic perspective, it is recommended to develop further guidance on the interactions between these directives and their local realization to support local authorities. The urban setting presents specific challenges, including waterbed pollution, oil spills, strong variations in water quality, and the many actors involved.

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